

**James A. Koppenhaver, P.E.**  
**304 Logan Avenue, Wyomissing, PA 19610**  
**(484) 794-9949 koppenhaverpe@gmail.com**

October 22, 2020

Location: Scott Univer  
88 Whipoorwill Rd E  
Armonk, NY 10504

Installer: Mr. Anthony Sicari, New York State Solar Farm  
871 State Route, #208,  
Gardiner, NY, 12525

Re: Structural Certification for Solar Energy System's Rooftop Appurtenances

To Whom It May Concern:

The purpose of this letter is to certify that the existing roof framing is adequate to support the additional loads from solar panels at the above location.

I have evaluated the structural wood framing of the existing roof with the additional loading to account for the proposed solar panel application. Deflection and stresses of the structural components remain within the allowable for the existing roof. Compliance Method is through an Engineered Design in accordance with the 2020 Residential Code of New York State and Risk Category II for Wind Pressures from 115 mph, 3-sec. gust, Exposure B, and a Ground Snow Load of 30 psf. Mounting locations and methods are as indicated in our plan submission.

The existing structure is certified to be structurally adequate to support the reactions of the solar panels in addition to the original design loading. The support of the solar modules is chassis with ballast blocks. The total dead load of the solar modules, chassis and ballast blocks is 5.27 psf. The existing roof membrane is fully adhered, over the original roof and structural design included ballast stones. The existing steel roof joists can support 20 psf live load or flat roof snow load, 7 psf roof membrane, insulation, and decking, 3psf MEP loads, and 6 psf for the solar panel system.

Taking into consideration the risk to building and land, it is my professional opinion, with a reasonable degree of engineering certainty and probability, that the structural integrity of the roof framing will remain sound with the solar panel installation. Should you have any questions with regard to the information contained in this letter, please do not hesitate to contact me.

Submitted,



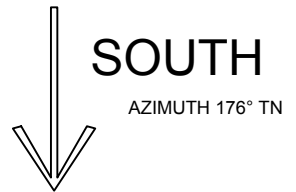
CONFORMING TO 2020 RESIDENTIAL CODE OF NEW YORK STATE & 2017 NEC

**LEGEND:**

- SOLAR MODULE
- M MAIN SERVICE
- INV MICRO INVERTER
- PP PV DEDICATED PANEL
- JB JUNCTION BOX

- CONDUIT RUN
- STRUCTURES
- DRIVEWAY
- PROPERTY LINE
- FIRE ACCESS



SITE PLAN DETAIL:  
SCALE: 3/32" = 1'-0"

**3' FIRE SETBACK  
AROUND BUILDING**

(15) MODULES  
WITH INTEGRATED  
MICROINVERTER  
ROOF 4

4'-10" WALKWAY

DRIVEWAY

RACKING-MOUNTED JUNCTION BOX

DURABLOCK BALLAST MOUNTED CONDUIT

(14) MODULES WITH INTEGRATED MICROINVERTER ROOF 3

ROOF MOUNTED CONDUIT

(8) MODULES WITH INTEGRATED MICROINVERTER ROOF 1

DURABLOCK BALLAST  
MOUNTED CONDUIT TO HOOK  
OVER ROOF EDGE THEN DOWN  
EXTERIOR WALL THEN  
PENETRATE INTO BASEMENT

PV DEDICATED PANEL #1 ON  
INTERIOR WALL OF BASEMENT  
PV DEDICATED PANEL #2 ON  
INTERIOR WALL OF BASEMENT

NEW GENERATION  
PANEL ON INTERIOR  
WALL OF BASEMENT

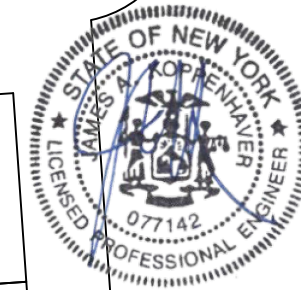
(3) POWERWALLS ON  
INTERIOR WALL OF  
BASEMENT

LOCATION OF MAIN  
SERVICE DISCONNECT ON  
INTERIOR WALL OF  
BASEMENT (BREAKER IN  
TESLA BACKUP GATEWAY)

LOCATION OF SUB PANEL ON  
INTERIOR WALL OF BASEMENT

(18) MODULES  
WITH INTEGRATED  
MICROINVERTER  
ROOF 2

RACKING-MOUNTED  
JUNCTION BOX



SITE PLAN:  
SCALE: 1/100" = 1'-0"

INTERIOR LOT

DOOR ACCESS TO BASEMENT  
PRIMARY FIRE ACCESS TO ROOF

DRIVEWAY

SINGLE  
FAMILY  
DWELLING

LOCATION OF  
UTILITY METER ON  
EXTERIOR POLE

WHIPPOORWILL RD E

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**CUSTOMER:**  
SCOTT UNIVER  
RESIDENCE  
88 WHIPPOORWILL RD E  
ARMONK, NY 10504

**PV SYSTEM CONFIGURATION:**

SYSTEM SIZE: 17.6 kW DC

SYSTEM SIZE: 17.325 kW AC

PV MODULES: (55) SUNPOWER

E19-320-E-AC

MICRO INVERTER: (5 BRANCHES)

**BATTERY BACKUP:**

(3) TESLA POWERWALL 2

MAX CONTINUOUS POWER: 5kW PER POWERWALL

**TOTAL PV + BATTERY: 32.325 kW AC**

DRAWN BY: NYSOLAR-AS

DATE: 10-14-2020

REV: 0

INSTALLER CODE: 0

**SHEET #: PV1**

SHEET TITLE: SITE PLAN

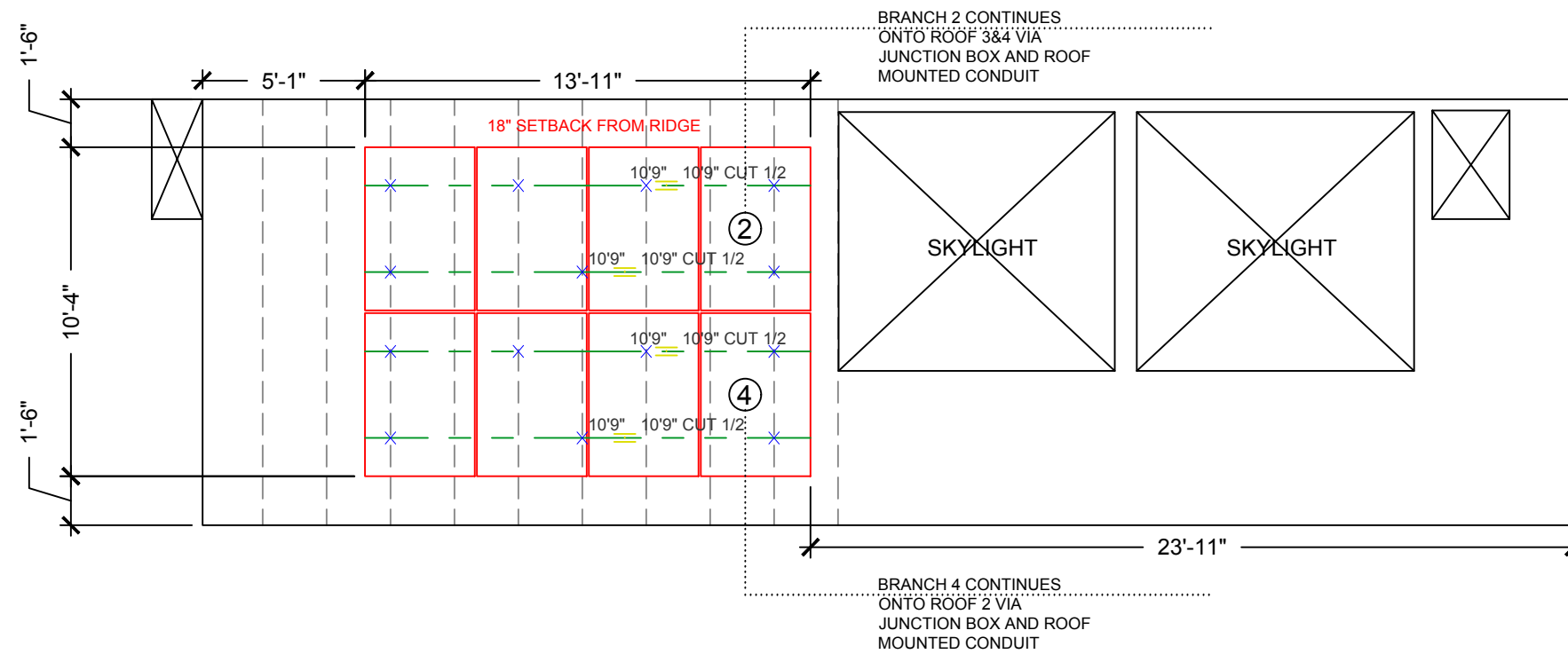
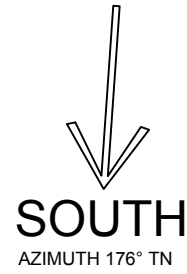
1 OF 10 SHEETS

SCALE: LISTED

SOLAR ARRAYS AND THEIR SYSTEM  
COMPONENTS SHALL BE INSTALLED  
IN CONJUNCTION WITH LOCAL  
CODES, 2020 RESIDENTIAL CODE OF  
NEW YORK STATE & 2017 NEC

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ROOF 1 ARRAY LAYOUT (3/16"=1'-0" SCALE)



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PV SYSTEM CONFIGURATION:  
SYSTEM SIZE: 17.6 kW DC  
SYSTEM SIZE: 17.325 kW AC  
PV MODULES: (55) SUNPOWER  
E19-320-E-AC  
MICRO INVERTER: (5 BRANCHES)

BATTERY BACKUP:  
(3) TESLA POWERWALL 2  
MAX CONTINUOUS POWER: 5kW PER POWERWALL  
TOTAL PV + BATTERY: 32.325 kW AC

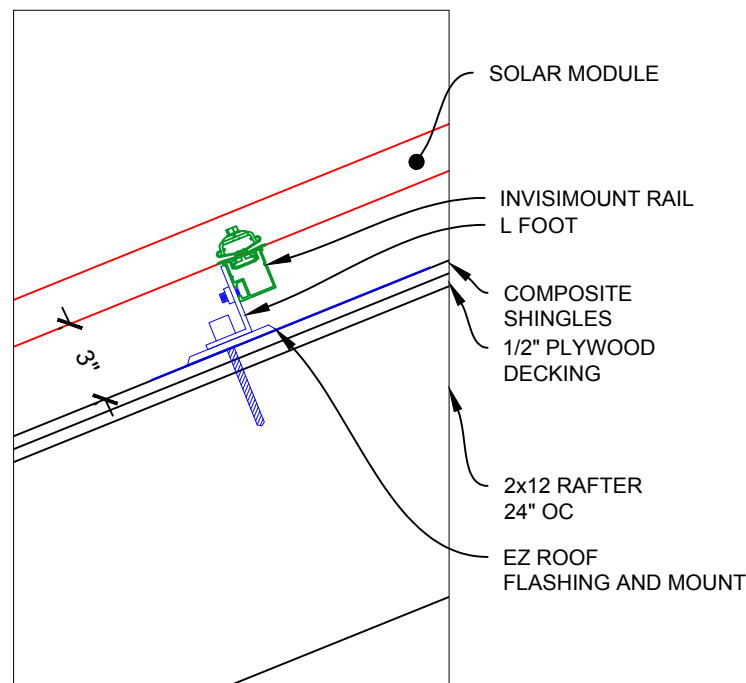
DRAWN BY: NYSOLAR-AS  
DATE: 10-14-2020  
REV: 0  
INSTALLER CODE: 0

SHEET #: PV2

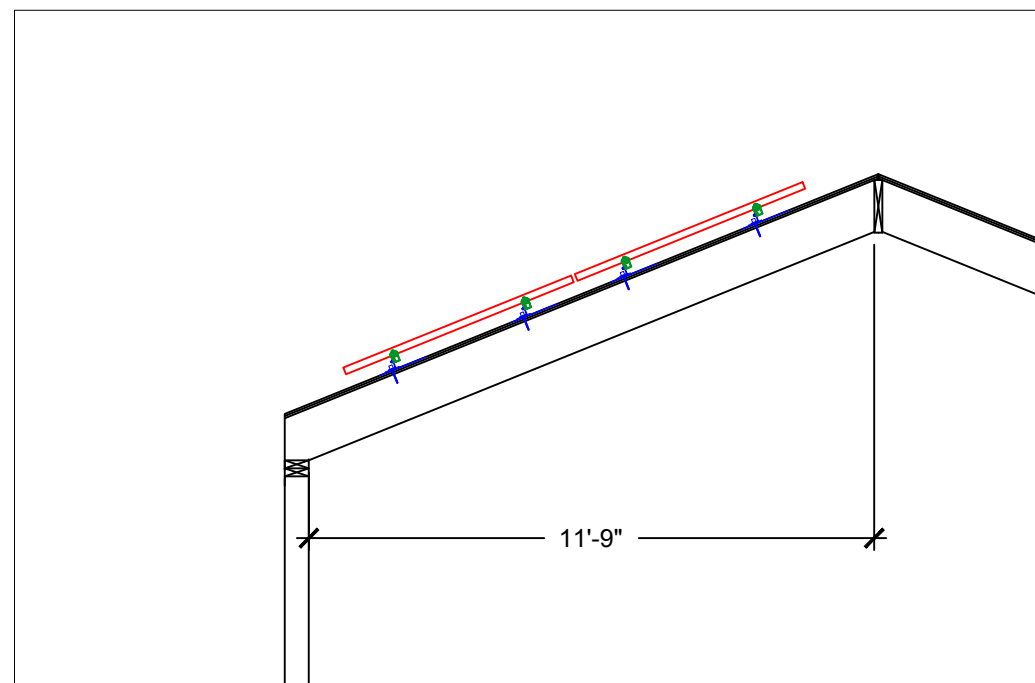
SHEET TITLE: STRUCTURAL AND  
PV LAYOUT ROOF 1  
2 OF 10 SHEETS  
SCALE: LISTED

SOLAR ARRAYS AND THEIR SYSTEM  
COMPONENTS SHALL BE INSTALLED  
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NEW YORK STATE & 2017 NEC

MOUNT DETAIL (1-1/2" = 1'-0"SCALE)



ROOF 1 ATTIC X SECTION (1/4" = 1'-0"SCALE)



SYMBOL KEY:

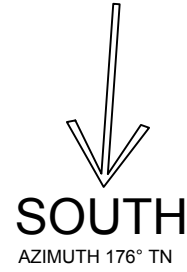
- × MOUNT
- RAIL
- - - RAFTERS
- ROOF
- SOLAR MODULE
- ⊕ BRANCH LAYOUT
- ⊞ SPLICE

STRUCTURAL SPECS:

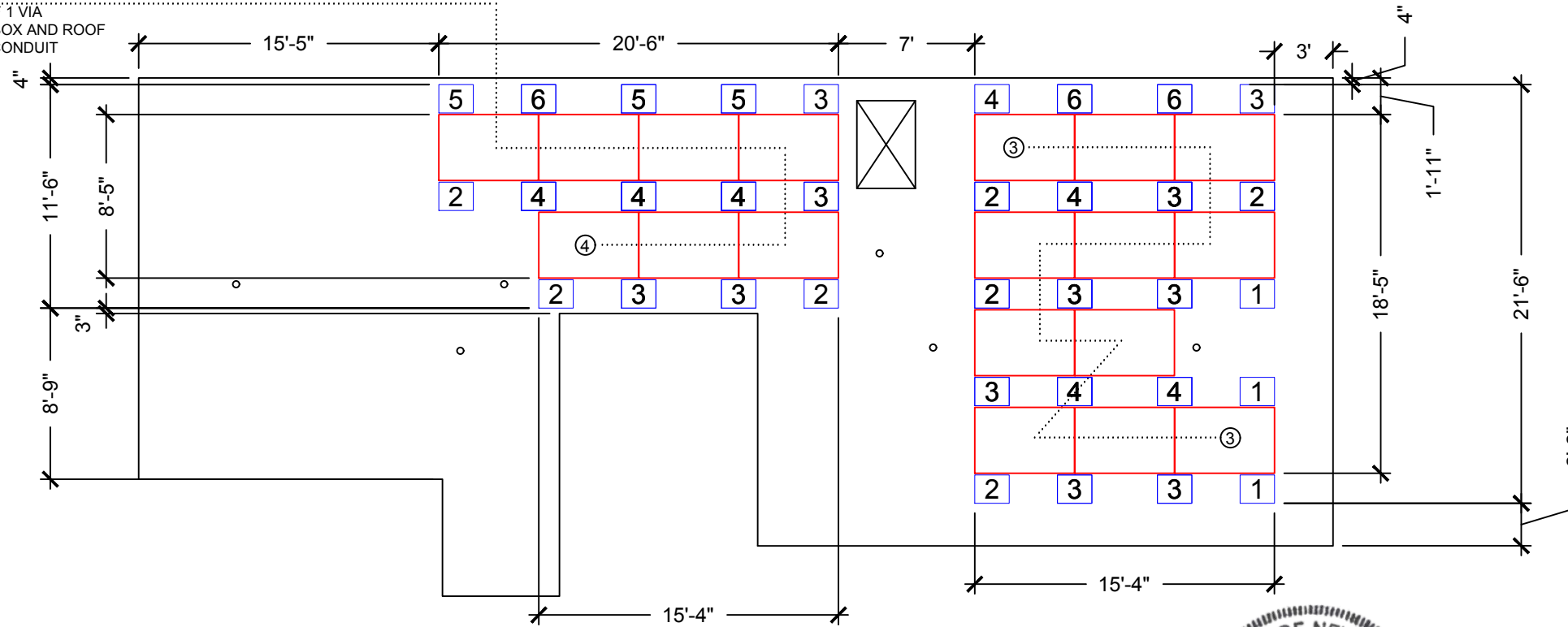
MODULE WIDTH, LENGTH:	41.2"x61.3"
MODULE WEIGHT:	42.9 LBS
# OF MODULES:	8
TOTAL MODULE WEIGHT:	343.2 LBS
TOTAL RACKING WEIGHT:	85.8 LBS
ARRAY WEIGHT:	429 LBS
ARRAY AREA:	143.5 SQFT
ARRAY DEAD LOAD:	2.99 LBS/SQFT
ROOF MATERIAL:	COMP SHINGLE
RAFTER SIZE:	2x12
RAFTER SPACING:	24" OC
RAFTER SPAN:	11'9"
NUMBER OF MOUNTS:	14
LOAD PER MOUNT:	30.64 LBS
ROOF PITCH:	22°
ROOF HEIGHT:	18'

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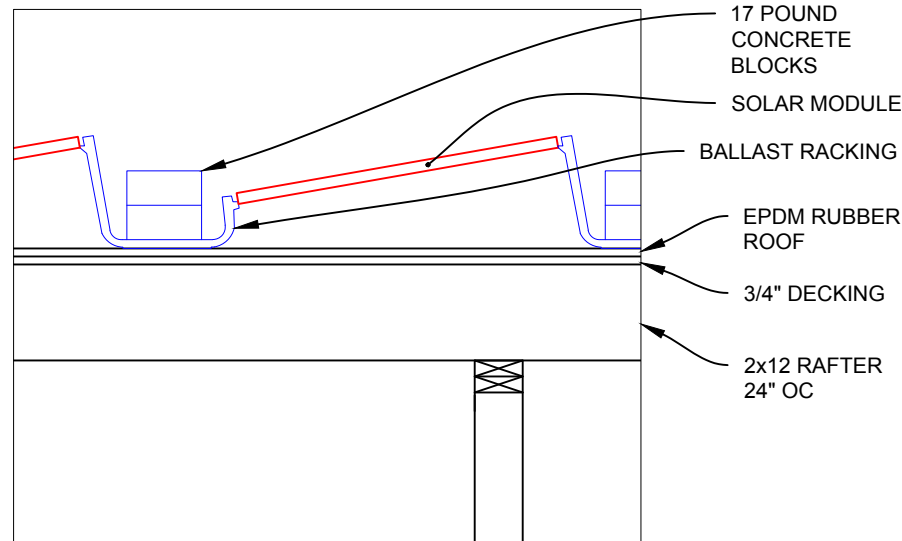
ROOF 2 ARRAY LAYOUT (1/8"=1'-0" SCALE)



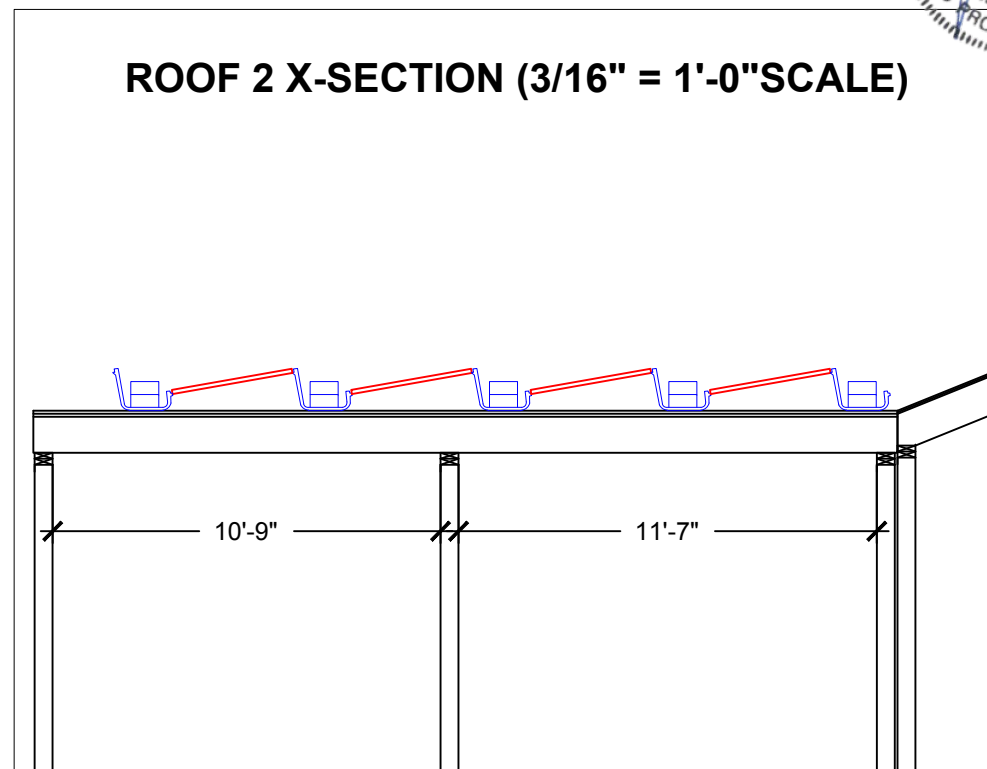
BRANCH 4 CONTINUES ONTO ROOF 1 VIA JUNCTION BOX AND ROOF MOUNTED CONDUIT



MOUNT DETAIL (1/2" = 1'-0"SCALE)



ROOF 2 X-SECTION (3/16" = 1'-0"SCALE)



**SYMBOL KEY:**

- # BALLAST BAY
- ROOF
- SOLAR MODULE
- Ⓞ BRANCH LAYOUT

**STRUCTURAL SPECS:**

MODULE WIDTH, LENGTH:	41.2"x61.3"
MODULE WEIGHT:	42.9 LBS
# OF MODULES:	18
TOTAL MODULE WEIGHT:	772.2 LBS
TOTAL RACKING WEIGHT:	1,887 LBS
ARRAY WEIGHT:	2,659.2 LBS
ARRAY AREA:	521 SQFT
ARRAY DEAD LOAD:	5.1 LBS/SQFT
ROOF MATERIAL:	EPDM
RAFTER SIZE:	2x12
RAFTER SPACING:	24" OC
RAFTER SPAN:	11'7"
ROOF PITCH:	2°
BALLAST TILT:	10°
ROOF HEIGHT:	16'

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**PV SYSTEM CONFIGURATION:**  
SYSTEM SIZE: 17.6 kW DC  
SYSTEM SIZE: 17.325 kW AC  
PV MODULES: (55) SUNPOWER E19-320-E-AC  
MICRO INVERTER: (5 BRANCHES)

**BATTERY BACKUP:**  
(3) TESLA POWERWALL 2  
MAX CONTINUOUS POWER: 5kW PER POWERWALL  
**TOTAL PV + BATTERY: 32.325 kW AC**

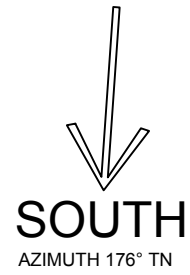
DRAWN BY: NYSOLAR-AS  
DATE: 10-14-2020  
REV: 0  
INSTALLER CODE: 0

**SHEET #: PV3**  
SHEET TITLE: STRUCTURAL AND PV LAYOUT ROOF 2  
3 OF 10 SHEETS  
SCALE: LISTED

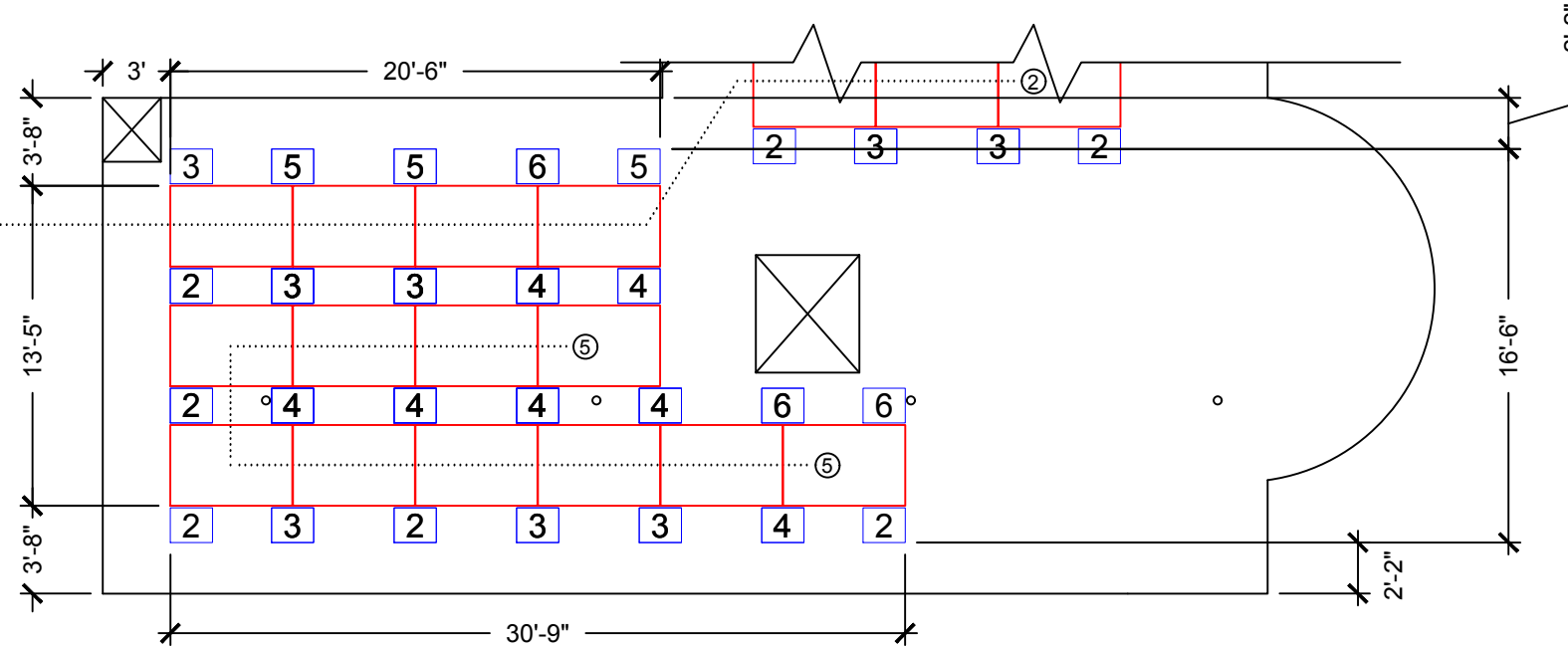
SOLAR ARRAYS AND THEIR SYSTEM COMPONENTS SHALL BE INSTALLED IN CONJUNCTION WITH LOCAL CODES, 2020 RESIDENTIAL CODE OF NEW YORK STATE & 2017 NEC

CONFORMING TO 2020 RESIDENTIAL CODE OF NEW YORK STATE & 2017 NEC

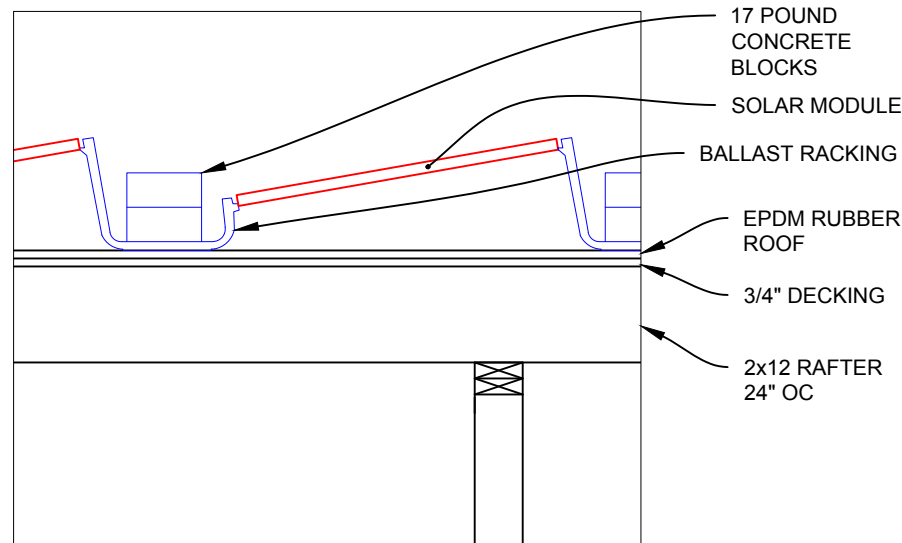
ROOF 3 ARRAY LAYOUT (1/8"=1'-0" SCALE)



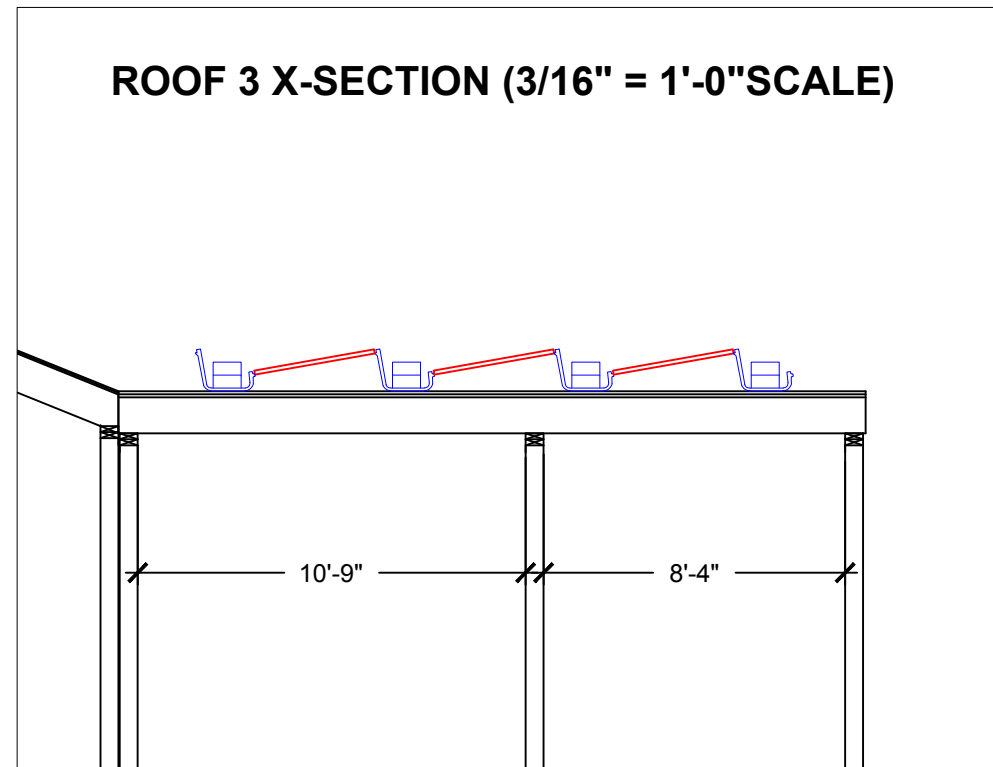
BRANCH 2 CONTINUES ONTO ROOF 1&4 VIA JUNCTION BOX AND ROOF MOUNTED CONDUIT



MOUNT DETAIL (1/2" = 1'-0"SCALE)



ROOF 3 X-SECTION (3/16" = 1'-0"SCALE)



**SYMBOL KEY:**

- # BALLAST BAY
- ROOF
- SOLAR MODULE
- ⊕ BRANCH LAYOUT

**STRUCTURAL SPECS:**

MODULE WIDTH, LENGTH:	41.2"x61.3"
MODULE WEIGHT:	42.9 LBS
# OF MODULES:	14
TOTAL MODULE WEIGHT:	600.6 LBS
TOTAL RACKING WEIGHT:	1,513 LBS
ARRAY WEIGHT:	2,113.6 LBS
ARRAY AREA:	403.9 SQFT
ARRAY DEAD LOAD:	5.23 LBS/SQFT
ROOF MATERIAL:	EPDM
RAFTER SIZE:	2x12
RAFTER SPACING:	24" OC
RAFTER SPAN:	10'9"
ROOF PITCH:	2°
BALLAST TILT:	10°
ROOF HEIGHT:	16'

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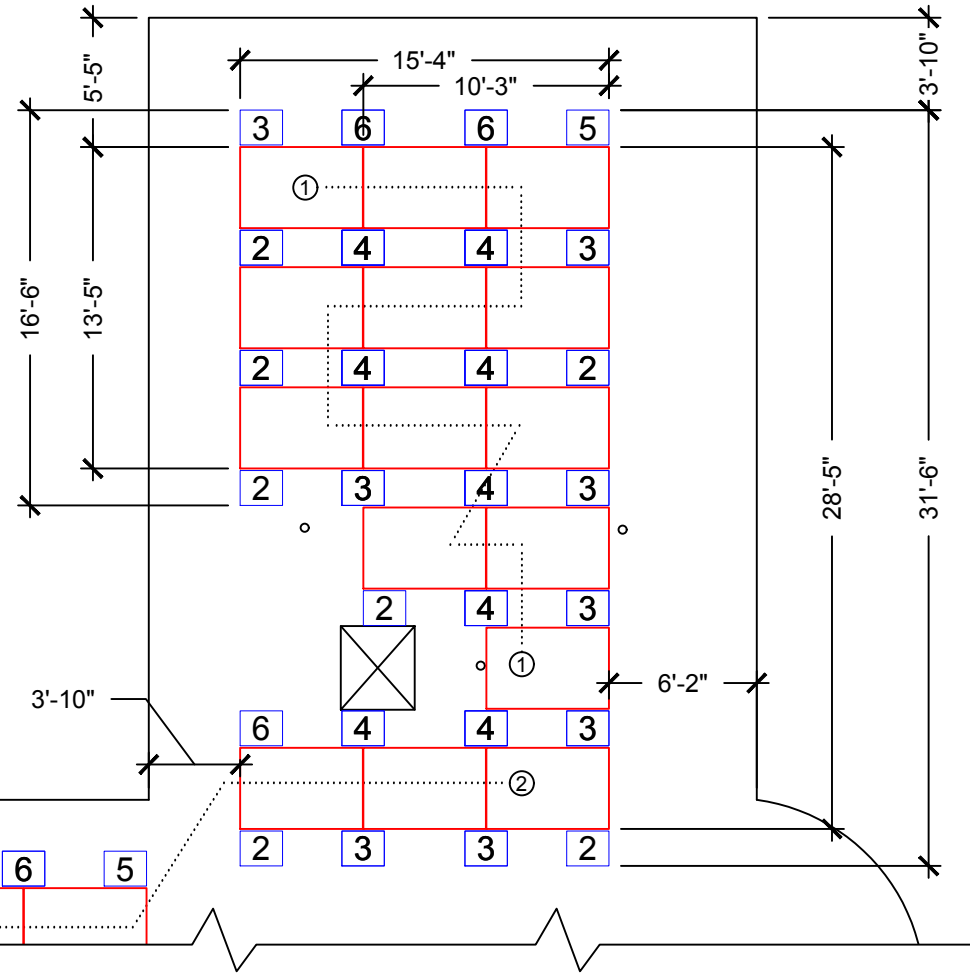
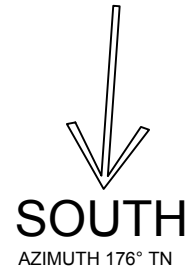
**PV SYSTEM CONFIGURATION:**  
 SYSTEM SIZE: 17.6 kW DC  
 SYSTEM SIZE: 17.325 kW AC  
 PV MODULES: (55) SUNPOWER E19-320-E-AC  
 MICRO INVERTER: (5 BRANCHES)  
**BATTERY BACKUP:**  
 (3) TESLA POWERWALL 2  
 MAX CONTINUOUS POWER: 5kW PER POWERWALL  
**TOTAL PV + BATTERY: 32.325 kW AC**

DRAWN BY: NYSOLAR-AS  
 DATE: 10-14-2020  
 REV: 0  
 INSTALLER CODE: 0

**SHEET #: PV4**  
 SHEET TITLE: STRUCTURAL AND PV LAYOUT ROOF 3  
 4 OF 10 SHEETS  
 SCALE: LISTED

SOLAR ARRAYS AND THEIR SYSTEM COMPONENTS SHALL BE INSTALLED IN CONJUNCTION WITH LOCAL CODES, 2020 RESIDENTIAL CODE OF NEW YORK STATE & 2017 NEC

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**ROOF 4 ARRAY LAYOUT**  
(3/16"=1'-0" SCALE)

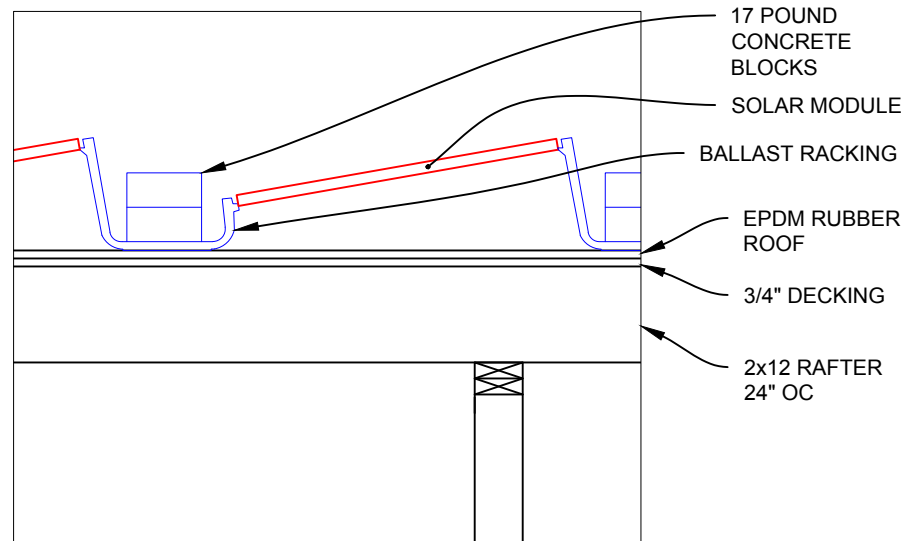


**SYMBOL KEY:**

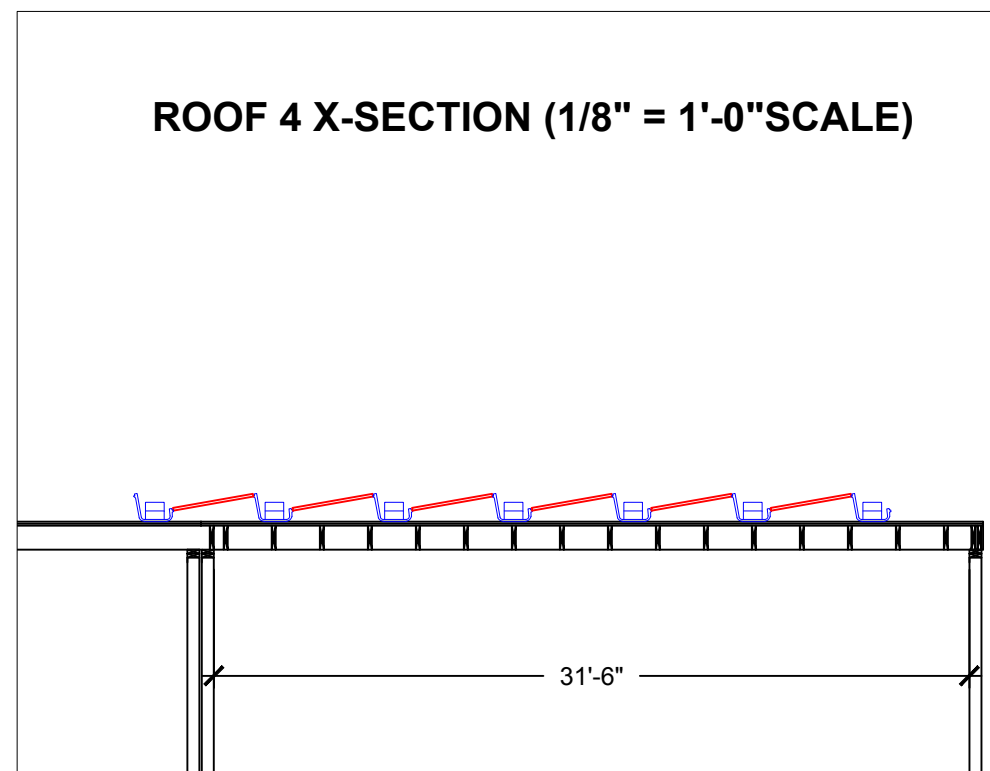
- # BALLAST BAY
- ROOF
- SOLAR MODULE
- ⊕ BRANCH LAYOUT

BRANCH 2 CONTINUES ONTO ROOF 1&3 VIA JUNCTION BOX AND ROOF MOUNTED CONDUIT

**MOUNT DETAIL (1/2" = 1'-0"SCALE)**



**ROOF 4 X-SECTION (1/8" = 1'-0"SCALE)**



**STRUCTURAL SPECS:**

MODULE WIDTH, LENGTH:	41.2"x61.3"
MODULE WEIGHT:	42.9 LBS
# OF MODULES:	15
TOTAL MODULE WEIGHT:	643.5 LBS
TOTAL RACKING WEIGHT:	1,581 LBS
ARRAY WEIGHT:	2,224.5 LBS
ARRAY AREA:	422 SQFT
ARRAY DEAD LOAD:	5.27 LBS/SQFT
ROOF MATERIAL:	EPDM
RAFTER SIZE:	2x12
RAFTER SPACING:	24" OC
RAFTER SPAN:	11'7"
ROOF PITCH:	2°
BALLAST TILT:	10°
ROOF HEIGHT:	16'

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RESIDENCE  
88 WHIPPOORWILL RD E  
ARMONK, NY 10504

**PV SYSTEM CONFIGURATION:**  
SYSTEM SIZE: 17.6 kW DC  
SYSTEM SIZE: 17.325 kW AC  
PV MODULES: (55) SUNPOWER  
E19-320-E-AC  
MICRO INVERTER: (5 BRANCHES)

**BATTERY BACKUP:**  
(3) TESLA POWERWALL 2  
MAX CONTINUOUS POWER: 5kW PER POWERWALL  
**TOTAL PV + BATTERY: 32.325 kW AC**

DRAWN BY: NYSOLAR-AS  
DATE: 10-14-2020  
REV: 0  
INSTALLER CODE: 0

**SHEET #: PV5**  
SHEET TITLE: STRUCTURAL AND  
PV LAYOUT ROOF 4  
5 OF 10 SHEETS  
SCALE: LISTED

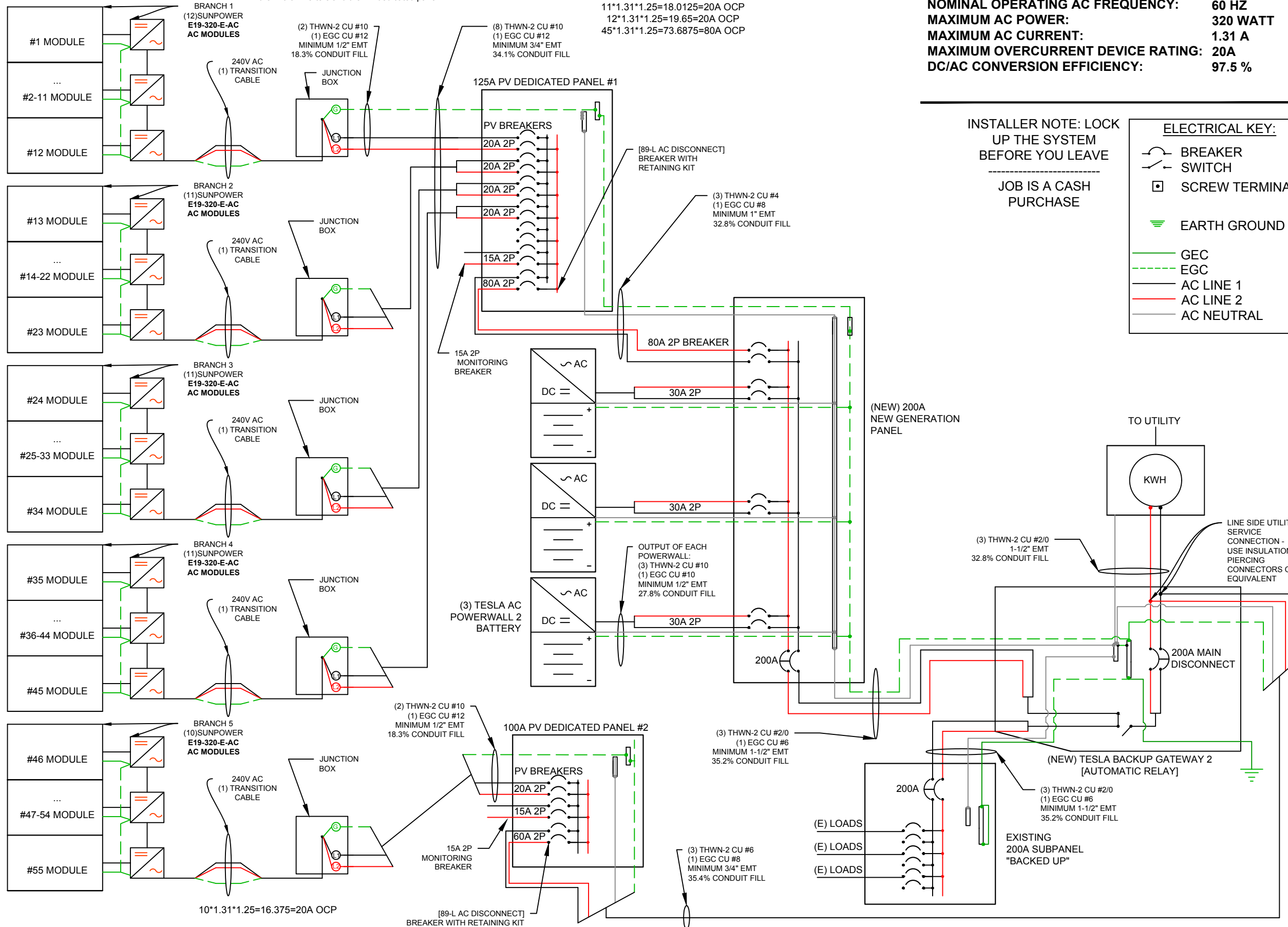
SOLAR ARRAYS AND THEIR SYSTEM COMPONENTS SHALL BE INSTALLED IN CONJUNCTION WITH LOCAL CODES, 2020 RESIDENTIAL CODE OF NEW YORK STATE & 2017 NEC

# CONFORMING TO 2020 RESIDENTIAL CODE OF NEW YORK STATE & 2017 NEC

See included documentation from the manufacturer indicating that there is no neutral conductor required between the micro inverters and the PV dedicated panel

11\*1.31\*1.25=18.0125=20A OCP  
 12\*1.31\*1.25=19.65=20A OCP  
 45\*1.31\*1.25=73.6875=80A OCP

**SUNPOWER 320 WATT AC MODULE SPECS:**  
 NOMINAL OPERATING AC VOLTAGE: 240 V  
 NOMINAL OPERATING AC FREQUENCY: 60 HZ  
 MAXIMUM AC POWER: 320 WATT  
 MAXIMUM AC CURRENT: 1.31 A  
 MAXIMUM OVERCURRENT DEVICE RATING: 20A  
 DC/AC CONVERSION EFFICIENCY: 97.5 %



INSTALLER NOTE: LOCK UP THE SYSTEM BEFORE YOU LEAVE  
 JOB IS A CASH PURCHASE

**ELECTRICAL KEY:**

- BREAKER
- SWITCH
- SCREW TERMINAL
- EARTH GROUND
- GEC
- EGC
- AC LINE 1
- AC LINE 2
- AC NEUTRAL

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**PV SYSTEM CONFIGURATION:**  
 SYSTEM SIZE: 17.6 kW DC  
 SYSTEM SIZE: 17.325 kW AC  
 PV MODULES: (65) SUNPOWER E19-320-E-AC  
 MICRO INVERTER: (5 BRANCHES)  
**BATTERY BACKUP:**  
 (3) TESLA POWERWALL 2  
 MAX CONTINUOUS POWER: 5kW PER POWERWALL  
**TOTAL PV + BATTERY: 32.325 kW AC**

DRAWN BY: NYSOLAR-AS  
 DATE: 10-14-2020  
 REV: 0  
 INSTALLER CODE: 0

**SHEET #: PV6**  
 SHEET TITLE: ELECTRICAL  
 6 OF 10 SHEETS  
 SCALE: N/A

SOLAR ARRAYS AND THEIR SYSTEM COMPONENTS SHALL BE INSTALLED IN CONJUNCTION WITH LOCAL CODES, 2020 RESIDENTIAL CODE OF NEW YORK STATE & 2017 NEC

NEC 690.5(c)  
PLACE THIS LABEL ON INVERTER(S) OR NEAR  
GROUND-FAULT INDICATOR (ON INVERTER(S) U.O.N.)

**WARNING**  
ELECTRIC SHOCK HAZARD  
IF A GROUND FAULT IS INDICATED,  
NORMALLY GROUNDED CONDUCTORS  
MAY BE UNGROUNDED AND  
ENERGIZED

NEC 690.17  
PLACE THIS LABEL ON ALL DISCONNECTING  
MEANS WHERE ENERGIZED IN AN OPEN POSITION

**WARNING**  
ELECTRIC SHOCK HAZARD  
DO NOT TOUCH TERMINALS  
TERMINALS ON BOTH THE  
LINE AND LOAD SIDE MAY  
BE ENERGIZED IN THE  
OPEN POSITION

NEC 705.12(D)(7)  
PLACE THIS LABEL AT P.O.C. TO SERVICE  
DISTRIBUTION EQUIPMENT (I.E. MAIN PANEL (AND  
SUBPANEL IF APPLICABLE))

**WARNING**  
INVERTER OUTPUT CONNECTION  
DO NOT RELOCATE THIS  
OVERCURRENT DEVICE

NEC 690.31 (E) 3 & 4  
PLACE ON ALL JUNCTION BOXES EXPOSED  
RACEWAYS EVERY 10'

**PHOTOVOLTAIC  
POWER SOURCE**

NEC 690.54  
PLACE THIS LABEL AT "INTERACTIVE POINT OF  
INTERCONNECTION" (AT MAIN SERVICE PANEL AND  
SUBPANEL IF APPLICABLE)

INTERACTIVE PHOTOVOLTAIC POWER SOURCE  
RATED AC OUTPUT CURRENT (A): 72.05 A  
NOMINAL OPERATING AC VOLTAGE (V): 240 V

NEC 690.52  
PLACE THIS LABEL ON SERVICE  
DISTRIBUTION EQUIPMENT

**SUNPOWER 320 WATT AC MODULE SPECS:**  
NOMINAL OPERATING AC VOLTAGE: 240 V  
NOMINAL OPERATING AC FREQUENCY: 60 HZ  
MAXIMUM AC POWER: 320 WATT  
MAXIMUM AC CURRENT: 1.31 A  
MAXIMUM OVERCURRENT DEVICE RATING: 20A  
DC/AC CONVERSION EFFICIENCY: 97.5 %

NEC 705.12(D)(4)  
PLACE THIS LABEL ON ALL EQUIPMENT CONTAINING  
OVERCURRENT DEVICES IN CIRCUITS SUPPLYING  
POWER TO A BUSBAR OR CONDUCTORS SUPPLIED  
FROM MULTIPLE SOURCES.

**CAUTION**  
CONTAINS MULTIPLE POWER  
SOURCES

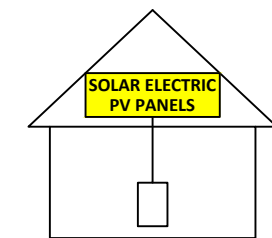
NEC 690.35(F)  
PLACE THIS LABEL AT EACH JUNCTION BOX, COMBINER  
BOX, INVERTER AND DEVICE WHERE ENERGIZED,  
UNGROUNDING CIRCUITS MAY BE EXPOSED DURING  
SERVICE.

**WARNING**  
ELECTRIC SHOCK HAZARD  
THE DC CONDUCTORS OF THIS  
PHOTOVOLTAIC SYSTEM ARE UNGROUNDED  
AND MAY BE ENERGIZED

**RAPID SHUTDOWN SWITCH  
FOR SOLAR PV SYSTEM**

**SOLAR PV SYSTEM EQUIPPED  
WITH RAPID SHUTDOWN**

TURN RAPID SHUTDOWN  
SWITCH TO THE  
"OFF" POSITION TO  
SHUTDOWN PV SYSTEM  
AND REDUCE  
SHOCK HAZARD  
IN ARRAY



RAPID SHUTDOWN:

**PHOTOVOLTAIC SYSTEM  
EQUIPPED WITH  
RAPID SHUTDOWN**

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**PV SYSTEM CONFIGURATION:**  
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SYSTEM SIZE: 17.325 kW AC  
PV MODULES:(65) SUNPOWER  
E19-320-E-AC  
MICRO INVERTER: (5 BRANCHES)

**BATTERY BACKUP:**  
(3) TESLA POWERWALL 2  
MAX CONTINUOUS POWER: 5kW PER POWERWALL

**TOTAL PV + BATTERY: 32.325 kW AC**

DRAWN BY: NYSOLAR-AS  
DATE: 10-14-2020  
REV: 0  
INSTALLER CODE: 0

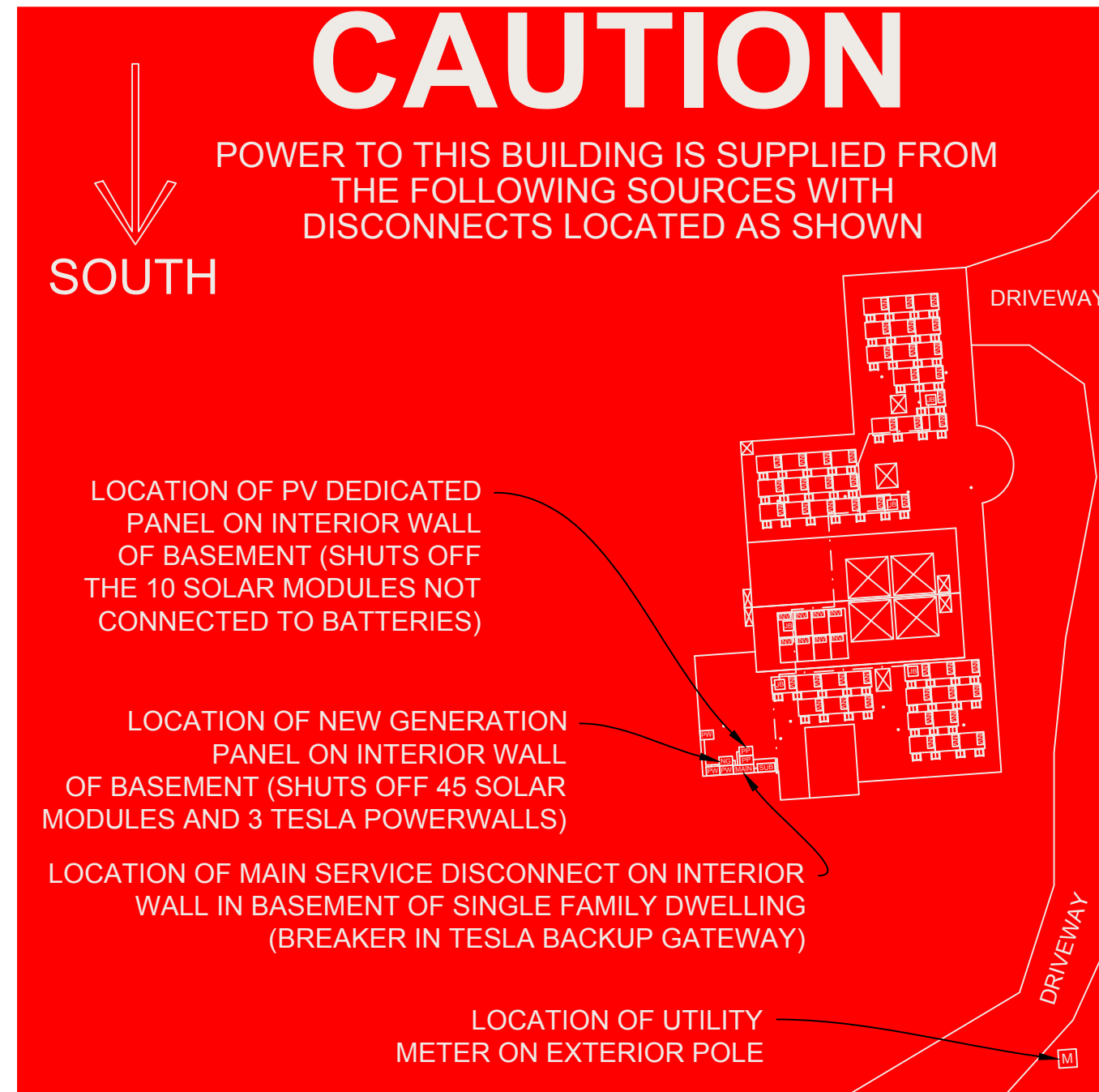
**SHEET #: PV7**

**SHEET TITLE: LABELS**  
7 OF 10 SHEETS  
SCALE: N/A

SOLAR ARRAYS AND THEIR SYSTEM  
COMPONENTS SHALL BE INSTALLED  
IN CONJUNCTION WITH LOCAL  
CODES, 2020 RESIDENTIAL CODE OF  
NEW YORK STATE & 2017 NEC



NEC 690.14(D)(4) LINKS TO 705.10 DIRECTORY  
A permanent plaque or directory denoting all electric power sources on or in the premises must be installed at each service equipment location and all interconnected electric power production sources.



LOCATION OF PV DEDICATED PANEL ON INTERIOR WALL OF BASEMENT (SHUTS OFF THE 10 SOLAR MODULES NOT CONNECTED TO BATTERIES)

LOCATION OF NEW GENERATION PANEL ON INTERIOR WALL OF BASEMENT (SHUTS OFF 45 SOLAR MODULES AND 3 TESLA POWERWALLS)

LOCATION OF MAIN SERVICE DISCONNECT ON INTERIOR WALL IN BASEMENT OF SINGLE FAMILY DWELLING (BREAKER IN TESLA BACKUP GATEWAY)

LOCATION OF UTILITY METER ON EXTERIOR POLE

NEW YORK STATE SOLAR FARM INC.

871 STATE ROUTE 208

GARDINER, NY 12525 USA

PHONE: 1.877.SOLAR.95

BuySolarLocal.com

SUNPOWER®

by  
New York State Solar Farm

CUSTOMER:  
SCOTT UNIVER  
RESIDENCE  
88 WHIPPOORWILL RD E  
ARMONK, NY 10504

PV SYSTEM CONFIGURATION:  
SYSTEM SIZE: 17.6 kW DC  
SYSTEM SIZE: 17.325 kW AC  
PV MODULES: (55) SUNPOWER  
E19-320-E-AC  
MICRO INVERTER: (5 BRANCHES)

BATTERY BACKUP:  
(3) TESLA POWERWALL 2  
MAX CONTINUOUS POWER: 5kW PER POWERWALL

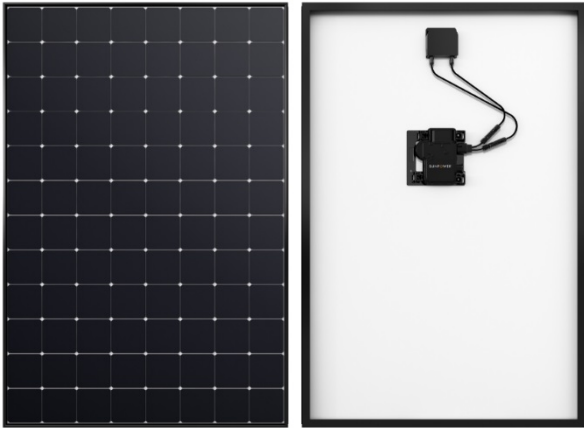
TOTAL PV + BATTERY: 32.325 kW AC

DRAWN BY: NYSOLAR-AS  
DATE: 10-14-2020  
REV: 0  
INSTALLER CODE: 0

SHEET #: PV8

SHEET TITLE: LABELS  
8 OF 10 SHEETS  
SCALE: N/A

SOLAR ARRAYS AND THEIR SYSTEM COMPONENTS SHALL BE INSTALLED IN CONJUNCTION WITH LOCAL CODES, 2020 RESIDENTIAL CODE OF NEW YORK STATE & 2017 NEC



## SunPower® E-Series: E20-327 | E19-320

# SunPower® Residential AC Module

Built specifically for use with the SunPower Equinox™ system, the only fully integrated solution designed, engineered, and warranted by one manufacturer.



### Maximum Power. Minimalist Design.

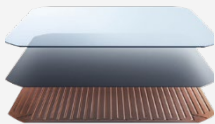
Industry-leading efficiency means more power and savings per available space. With fewer modules required and hidden microinverters, less is truly more.



### Highest Lifetime Energy and Savings.

Designed to deliver 60% more energy over 25 years in real-world conditions like partial shade and high temperatures.<sup>1</sup>

## Fundamentally Different. And Better.



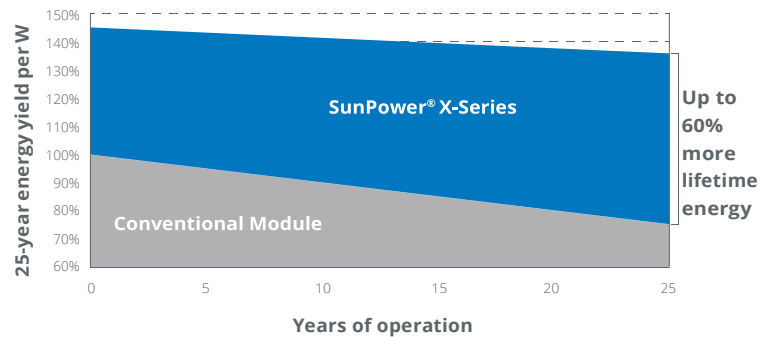
### The SunPower® Maxeon® Solar Cell

- Enables highest-efficiency modules available.<sup>2</sup>
- Unmatched reliability<sup>3</sup>
- Patented solid metal foundation prevents breakage and corrosion



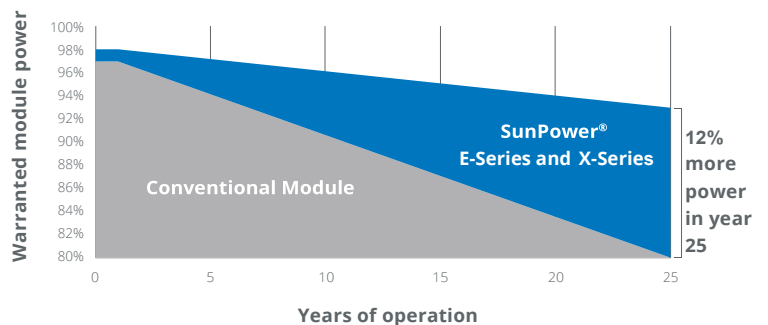
### Factory-integrated Microinverter

- Simpler, faster installation
- Integrated wire management, rapid shutdown
- Engineered and calibrated by SunPower for SunPower modules



### Best Reliability. Best Warranty.

With more than 25 million modules deployed around the world, SunPower technology is proven to last. That's why we stand behind our module and microinverter with the industry's best 25-year Combined Power and Product Warranty, including the highest Power Warranty in solar.



## E-Series: E20-327 | E19-320 SunPower® Residential AC Module

AC Electrical Data		
Inverter Model: Enphase IQ 7XS (IQ7XS-96-ACM-US)	@240 VAC	@208 VAC
Peak Output Power	320 VA	320 VA
Max. Continuous Output Power	315 VA	315 VA
Nom. (L-L) Voltage/Range <sup>2</sup> (V)	240 / 211–264	208 / 183–229
Max. Continuous Output Current (A)	1.31	1.51
Max. Units per 20 A (LL) Branch Circuit <sup>3</sup>	12 (single phase)	10 (two pole) wye
CEC Weighted Efficiency	97.5%	97.0%
Nom. Frequency	60 Hz	
Extended Frequency Range	47–68 Hz	
AC Short Circuit Fault Current Over 3 Cycles	5.8 A rms	
Overvoltage Class AC Port	III	
AC Port Backfeed Current	18 mA	
Power Factor Setting	1.0	
Power Factor (adjustable)	0.7 lead. / 0.7 lag.	
No active phase balancing for three-phase installations		

	DC Power Data	
	SPR-E20-327-E-AC	SPR-E19-320-E-AC
Nom. Power <sup>5</sup> (P <sub>nom</sub> )	327 W	320 W
Power Tol.	+5/-0%	+5/-0%
Module Efficiency	20.4%	19.9%
Temp. Coef. (Power)	-0.35%/°C	-0.35%/°C
Shade Tol.	<ul style="list-style-type: none"> <li>• Three bypass diodes</li> <li>• Integrated module-level maximum power point tracking</li> </ul>	

Tested Operating Conditions	
Operating Temp.	-40°F to +185°F (-40°C to +85°C)
Max. Ambient Temp.	122°F (50°C)
Max. Load	Wind: 62 psf, 3000 Pa, 305 kg/m <sup>2</sup> front & back Snow: 125 psf, 6000 Pa, 611 kg/m <sup>2</sup> front
Impact Resistance	1 inch (25 mm) diameter hail at 52 mph (23 m/s)

Mechanical Data	
Solar Cells	96 Monocrystalline Moxeon Gen III
Front Glass	High-transmission tempered glass with anti-reflective coating
Environmental Rating	Outdoor rated
Frame	Class 1 black anodized (highest AAMA rating)
Weight	42.9 lbs (19.5 kg)
Recommended Max. Module Spacing	1.3 in. (33 mm)

1 SunPower 360 W compared to a conventional module on same-sized arrays (260 W, 16% efficient, approx. 1.6 m<sup>2</sup>). 4% more energy per watt (based on third-party module characterization and PVSim), 0.75%/yr slower degradation (Campeau, Z. et al. "SunPower Module Degradation Rate," SunPower white paper, 2013).

2 Based on search of datasheet values from websites of top 10 manufacturers per IHS, as of January 2017.

3 #1 rank in "Fraunhofer PV Durability Initiative for Solar Modules: Part 3." PVTech Power Magazine, 2015. Campeau, Z. et al. "SunPower Module Degradation Rate," SunPower white paper, 2013.

4 Factory set to 1547a-2014 default settings. CA Rule 21 default settings profile set during commissioning. See the Equinox Installation Guide #518101 for more information.

5 Standard Test Conditions (1000 W/m<sup>2</sup> irradiance, AM 1.5, 25°C). NREL calibration standard: SOMS current, LACCS FF and voltage. All DC voltage is fully contained within the module.

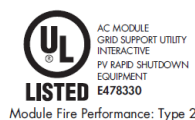
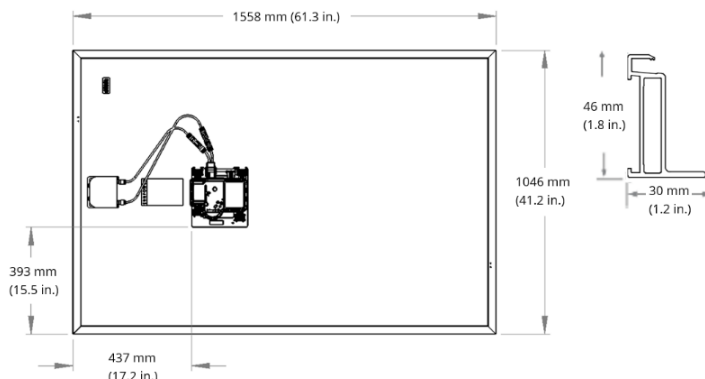
6 This product is UL Listed as PVRSE and conforms with NEC 2014 and NEC 2017 690.12; and C22.1-2015 Rule 64-218 Rapid Shutdown of PV Systems, for AC and DC conductors; when installed according to manufacturer's instructions.

See [www.sunpower.com/facts](http://www.sunpower.com/facts) for more reference information.

For more details, see extended datasheet [www.sunpower.com/datasheets](http://www.sunpower.com/datasheets). Specifications included in this datasheet are subject to change without notice.

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Warranties, Certifications, and Compliance	
Warranties	<ul style="list-style-type: none"> <li>• 25-year limited power warranty</li> <li>• 25-year limited product warranty</li> </ul>
Certifications and Compliance	<ul style="list-style-type: none"> <li>• UL 1703</li> <li>• UL 1741 / IEEE-1547</li> <li>• UL 1741 AC Module (Type 2 fire rated)</li> <li>• UL 62109-1 / IEC 62109-2</li> <li>• FCC Part 15 Class B</li> <li>• ICES-0003 Class B</li> <li>• CAN/CSA-C22.2 NO. 107.1-01</li> <li>• CA Rule 21 (UL 1741 SA)<sup>4</sup> (includes Volt/Var and Reactive Power Priority)</li> <li>• UL Listed PV Rapid Shutdown Equipment<sup>5</sup></li> </ul> <p>Enables installation in accordance with:</p> <ul style="list-style-type: none"> <li>• NEC 690.6 (AC module)</li> <li>• NEC 690.12 Rapid Shutdown (inside and outside the array)</li> <li>• NEC 690.15 AC Connectors, 690.33(A)-(E)(1)</li> </ul> <p>When used with InvisiMount racking and InvisiMount accessories (UL 2703):</p> <ul style="list-style-type: none"> <li>• Module grounding and bonding through InvisiMount</li> <li>• Class A fire rated</li> </ul> <p>When used with AC module Q Cables and accessories (UL 6703 and UL 2238)<sup>6</sup>:</p> <ul style="list-style-type: none"> <li>• Rated for load break disconnect</li> </ul>
PID Test	Potential-induced degradation free



# SUNPOWER®

Please read the Safety and Installation Instructions for details.

531948 RevA

# POWERWALL

## Backup Gateway 2

The Backup Gateway 2 for Tesla Powerwall provides energy management and monitoring for solar self-consumption, time-based control, and backup.

The Backup Gateway 2 controls connection to the grid, automatically detecting outages and providing a seamless transition to backup power. When equipped with a main circuit breaker, the Backup Gateway 2 can be installed at the service entrance. When the optional internal panelboard is installed, the Backup Gateway 2 can also function as a load center.

The Backup Gateway 2 communicates directly with Powerwall, allowing you to monitor energy use and manage backup energy reserves from any mobile device with the Tesla app.



### PERFORMANCE SPECIFICATIONS

<b>AC Voltage (Nominal)</b>	120/240V
<b>Feed-In Type</b>	Split Phase
<b>Grid Frequency</b>	60 Hz
<b>Current Rating</b>	200 A
<b>Maximum Input Short Circuit Current</b>	10 kA <sup>1</sup>
<b>Overcurrent Protection Device</b>	100-200A; Service Entrance Rated <sup>1</sup>
<b>Overvoltage Category</b>	Category IV
<b>AC Meter</b>	Revenue accurate (+/- 0.2 %)
<b>Primary Connectivity</b>	Ethernet, Wi-Fi
<b>Secondary Connectivity</b>	Cellular (3G, LTE/4G) <sup>2</sup>
<b>User Interface</b>	Tesla App
<b>Operating Modes</b>	Support for solar self-consumption, time-based control, backup, and off-grid
<b>Backup Transition</b>	Automatic disconnect for seamless backup
<b>Modularity</b>	Supports up to 10 AC-coupled Powerwalls
<b>Optional Internal Panelboard</b>	200A 6-space / 12 circuit Eaton BR Circuit Breakers
<b>Warranty</b>	10 years

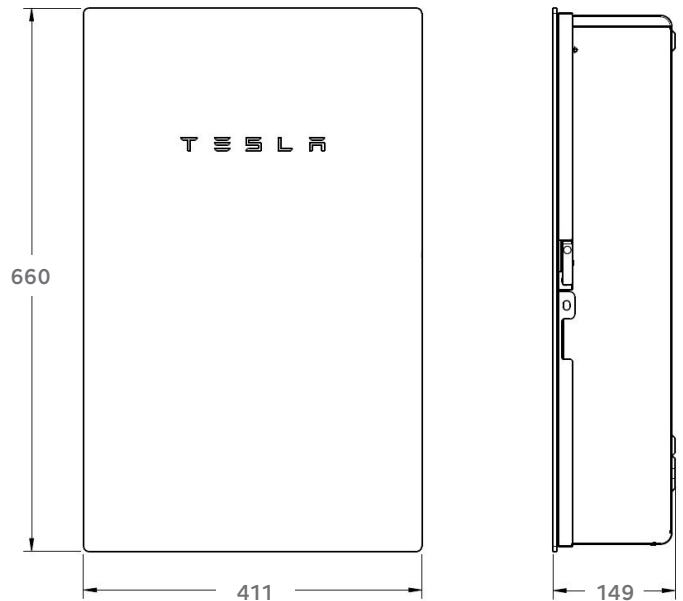
<sup>1</sup> When protected by Class J fuses, Backup Gateway 2 is suitable for use in circuits capable of delivering not more than 22kA symmetrical amperes.  
<sup>2</sup> The customer is expected to provide internet connectivity for Backup Gateway 2; cellular should not be used as the primary mode of connectivity. Cellular connectivity subject to network operator service coverage and signal strength.

### COMPLIANCE INFORMATION

<b>Certifications</b>	UL 67, UL 869A, UL 916, UL 1741 PCS CSA 22.2 0.19, CSA 22.2 205
<b>Emissions</b>	FCC Part 15, ICES 003

### MECHANICAL SPECIFICATIONS

<b>Dimensions</b>	660 mm x 411 mm x 149 mm (26 in x 16 in x 6 in)
<b>Weight</b>	20.4 kg (45 lb)
<b>Mounting options</b>	Wall mount, Semi-flush mount



### ENVIRONMENTAL SPECIFICATIONS

<b>Operating Temperature</b>	-20°C to 50°C (-4°F to 122°F)
<b>Operating Humidity (RH)</b>	Up to 100%, condensing
<b>Maximum Elevation</b>	3000 m (9843 ft)
<b>Environment</b>	Indoor and outdoor rated
<b>Enclosure Type</b>	NEMA 3R

# POWERWALL

Tesla Powerwall is a fully-integrated AC battery system for residential or light commercial use. Its rechargeable lithium-ion battery pack provides energy storage for solar self-consumption, time-based control, and backup.

Powerwall's electrical interface provides a simple connection to any home or building. Its revolutionary compact design achieves market-leading energy density and is easy to install, enabling owners to quickly realize the benefits of reliable, clean power.



## PERFORMANCE SPECIFICATIONS

AC Voltage (Nominal)	120/240 V
Feed-In Type	Split Phase
Grid Frequency	60 Hz
Total Energy <sup>1</sup>	14 kWh
Usable Energy <sup>1</sup>	13.5 kWh
Real Power, max continuous <sup>2</sup>	5 kW (charge and discharge)
Real Power, peak (10s, off-grid/backup) <sup>2</sup>	7 kW (charge and discharge)
Apparent Power, max continuous	5.8 kVA (charge and discharge)
Apparent Power, peak (10s, off-grid/backup)	7.2 kVA (charge and discharge)
Maximum Supply Fault Current	10 kA
Maximum Output Fault Current	32 A
Overcurrent Protection Device	30 A
Imbalance for Split-Phase Loads	100%
Power Factor Output Range	+/- 1.0 adjustable
Power Factor Range (full-rated power)	+/- 0.85
Internal Battery DC Voltage	50 V
Round Trip Efficiency <sup>1,3</sup>	90%
Warranty	10 years

<sup>1</sup>Values provided for 25°C (77°F), 3.3 kW charge/discharge power.

<sup>2</sup>In Backup mode, grid charge power is limited to 3.3 kW.

<sup>3</sup>AC to battery to AC, at beginning of life.

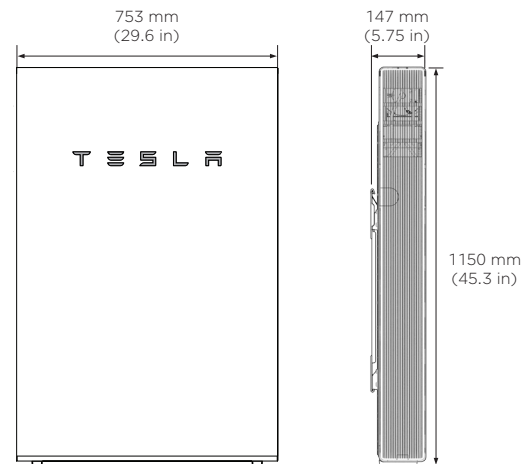
## COMPLIANCE INFORMATION

Certifications	UL 1642, UL 1741, UL 1973, UL 9540, IEEE 1547, UN 38.3
Grid Connection	Worldwide Compatibility
Emissions	FCC Part 15 Class B, ICES 003
Environmental	RoHS Directive 2011/65/EU
Seismic	AC156, IEEE 693-2005 (high)

## MECHANICAL SPECIFICATIONS

Dimensions <sup>1</sup>	1150 mm x 753 mm x 147 mm (45.3 in x 29.6 in x 5.75 in)
Weight <sup>1</sup>	114 kg (251.3 lbs)
Mounting options	Floor or wall mount

<sup>1</sup>Dimensions and weight differ slightly if manufactured before March 2019. Contact Tesla for additional information.



## ENVIRONMENTAL SPECIFICATIONS

Operating Temperature	-20°C to 50°C (-4°F to 122°F)
Recommended Temperature	0°C to 30°C (32°F to 86°F)
Operating Humidity (RH)	Up to 100%, condensing
Storage Conditions	-20°C to 30°C (-4°F to 86°F) Up to 95% RH, non-condensing State of Energy (SoE): 25% initial
Maximum Elevation	3000 m (9843 ft)
Environment	Indoor and outdoor rated
Enclosure Type	NEMA 3R
Ingress Rating	IP67 (Battery & Power Electronics) IP56 (Wiring Compartment)
Wet Location Rating	Yes
Noise Level @ 1m	< 40 dBA at 30°C (86°F)

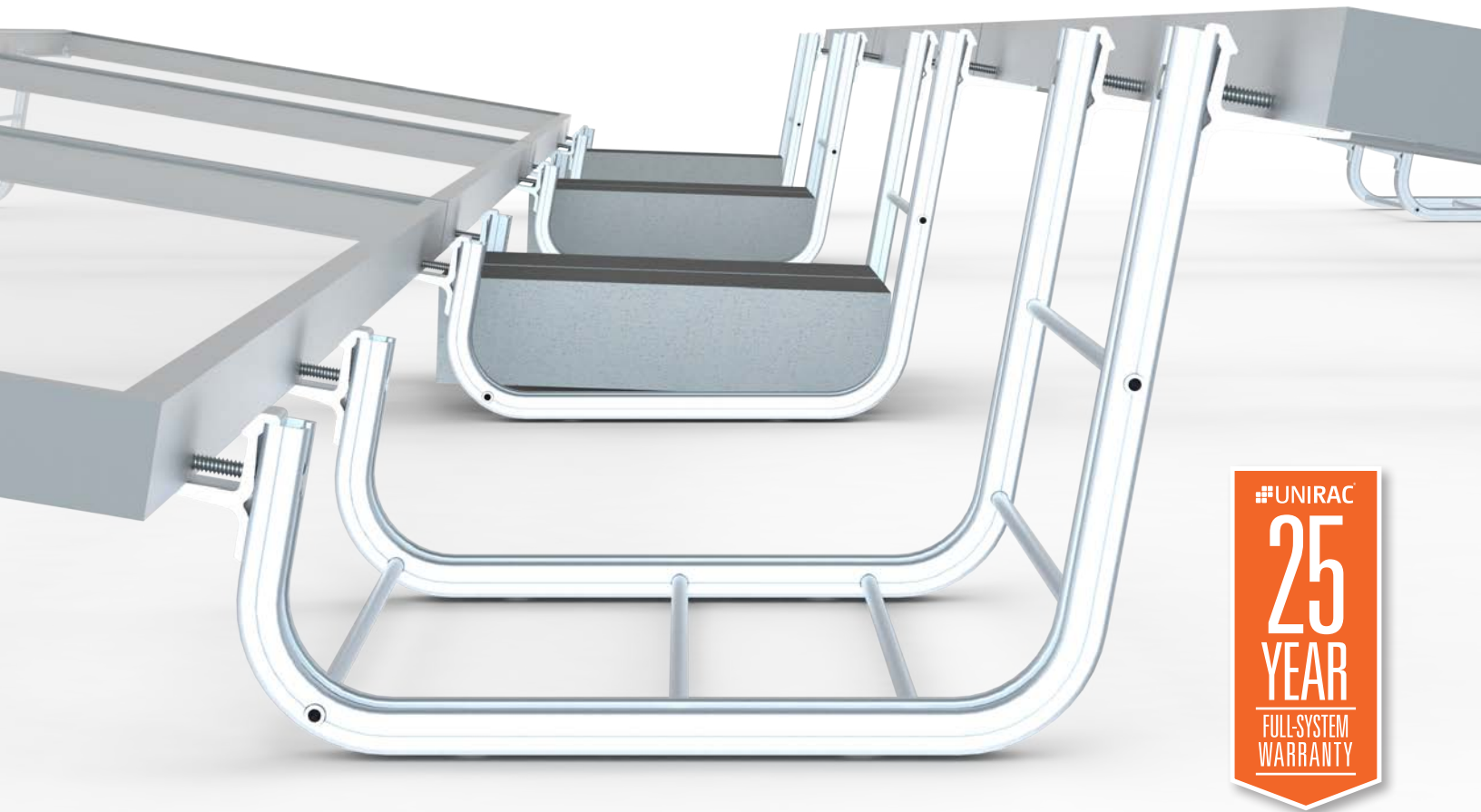
# ROOFMOUNT | RM10

SOUTH FACING 10 DEGREE TILT



BETTER SOLAR STARTS HERE

**RM10** introduced the Power of Speed & Simplicity to the ballasted flat roof solar industry. The system consists of only two major components, minimizing installation time. Quickly design around roof obstacles and bond the system with just the turn of a wrench. Optional roof attachments, roof pads, and MLPE mount provide a complete solution. UNIRAC's unmatched commercial project support makes construction easy, from permitting through installation, and **RM10** is supported by North America's largest distribution network. Plus, enjoy peace of mind with UNIRAC's industry-leading 25-year warranty.



## FEWER PARTS • FASTER INSTALLATION

FOR QUESTIONS OR CUSTOMER SERVICE VISIT [UNIRAC.COM](http://UNIRAC.COM) OR CALL (505) 248-2702

# ROOFMOUNT | RM10

SOUTH FACING 10 DEGREE TILT

# UNIRAC

BETTER SOLAR STARTS HERE

## SIMPLE DESIGN

### TWO MAJOR COMPONENTS. ONE TOOL

RM10 supports most framed PV modules at 10 degree tilt. The component list consists of only two major components – a fully assembled ballast bay and a universal module clip. Our engineers specified a chemical locking hex bolt, providing a UL2703 certified grounding path from module to ballast bay, with just the turn of a wrench. RM is designed to conveniently work with off the shelf wire management products. A snap into place, membrane-friendly, rubber roof pad is also available as a low-cost option for roof protection.

## AVAILABILITY

### NATIONWIDE NETWORK

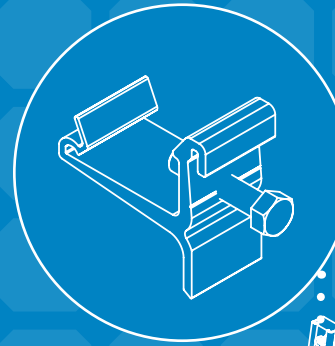
UNIRAC maintains the largest network of stocking distributors for our racking solutions. Our partners have distinguished their level of customer support, availability, and overall value, thereby providing the highest level of service to users of UNIRAC products. Count on our partners for fast and accurate delivery to meet your project needs. Visit [unirac.com](http://unirac.com) for a list of distributors.

## AUTOMATED DESIGN TOOL

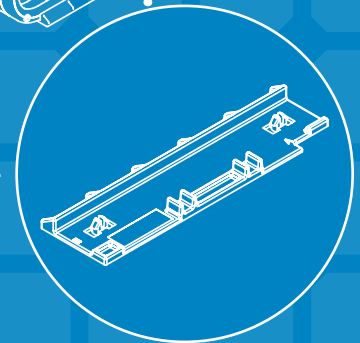
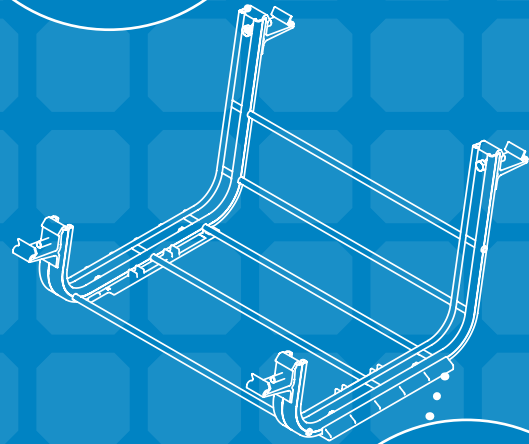
### DESIGN PLATFORM AT YOUR SERVICE

Creating a bill of materials is just a few clicks away with **U-Builder**, a powerful online tool that streamlines the process of designing a code compliant solar mounting system. Save time by creating a user profile, and recall preferences and projects automatically when you log in. You will enjoy the ability to share projects with customers: there's no need to print results and send to a distributor, just click and share.

**LISTED** **UL2703** BONDING & GROUNDING  
MECHANICAL LOADING  
SYSTEM FIRE CLASSIFICATION

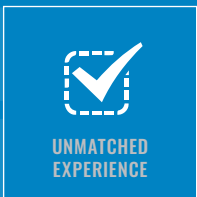


INTEGRATED  
BONDING  
CLIP



OPTIONAL  
ROOF PAD

## UNIRAC CUSTOMER SERVICE MEANS THE HIGHEST LEVEL OF PRODUCT SUPPORT



UNMATCHED  
EXPERIENCE



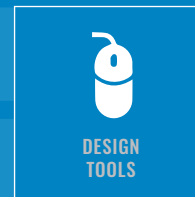
CERTIFIED  
QUALITY



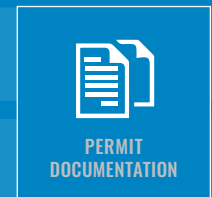
ENGINEERING  
EXCELLENCE



BANKABLE  
WARRANTY



DESIGN  
TOOLS



PERMIT  
DOCUMENTATION

### TECHNICAL SUPPORT

UNIRAC's technical support team is dedicated to answering questions & addressing issues in real time. An online library of documents including engineering reports, stamped letters and technical data sheets greatly simplifies your permitting and project planning process.

### CERTIFIED QUALITY PROVIDER

UNIRAC is the only PV mounting vendor with ISO certifications for 9001:2015, 14001:2015 and OHSAS 18001:2007, which means we deliver the highest standards for fit, form, and function. These certifications demonstrate our excellence and commitment to first class business practices.

### BANKABLE WARRANTY

Don't leave your project to chance, UNIRAC has the financial strength to back our products and reduce your risk. Have peace of mind knowing you are receiving products of exceptional quality. **ROOFMOUNT** is covered by a twenty five (25) year limited product warranty.

PROTECT YOUR REPUTATION WITH QUALITY RACKING SOLUTIONS BACKED BY ENGINEERING EXCELLENCE AND A SUPERIOR SUPPLY CHAIN



# U-BUILDER PROJECT REPORT

VERSION: 3.0.9

<b>PROJECT TITLE</b>	<b>PROJECT ID</b>	<b>CREATED</b>
ROOFMOUNT RM10	C3AEC1D8	Oct. 19, 2020, 4:23 p.m.

<b>NAME</b>	
<b>ADDRESS</b>	88 Whipoorwill Rd E, Armonk, NY 10504, USA
<b>CITY, STATE</b>	Armonk, NY
<b>MODULE</b>	Sunpower E19/320

Designed by [bret@nyssf.com](mailto:bret@nyssf.com)

ROOFMOUNT RM10

Sunpower

47 - E19/320

824.31 ft<sup>2</sup>

15.04 KW



# ENGINEERING REPORT

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## Plan review

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<b>AVERAGE PSF</b>	<b>5.49 psf</b>
TOTAL NUMBER OF MODULES	47
TOTAL KW	15.04 KW
TOTAL AREA	~1360 ft <sup>2</sup>
TOTAL WEIGHT ON ROOF	7465 lbs
RACKING WEIGHT	298 lbs
MODULE WEIGHT	2016 lbs
BALLAST WEIGHT	4981 lbs
MAX BAY LOAD (DEAD)	148 lbs

## Loads Used for Design

---

BUILDING CODE	ASCE 7-16
BASIC WIND SPEED	115.00 mph
GROUND SNOW LOAD	30.00 psf
SEISMIC (SS)	0.27
ELEVATION	634.00 ft
WIND EXPOSURE	B
MRI	50

## Loads Determined by Zip

---

10504

CITY, STATE	Armonk, NY
BASIC WIND SPEED	106.00 mph
GROUND SNOW LOAD	30.00 psf

## Inspection

---

PRODUCT	ROOFMOUNT RM10
MODULE MANUFACTURER	Sunpower
MODEL	E19/320
MODULE WATTS	320 watts
MODULE LENGTH	61.30"
MODULE WIDTH	41.20"
MODULE THICKNESS	1.80"
MODULE WEIGHT	42.90 lbs
BALLAST BLOCK (CMU) WEIGHT	17.0 lbs
MAX BLOCKS PER BAY	4
BUILDING HEIGHT	15.00 ft
ROOF TYPE	EPDM
PARAPET HEIGHT	<= 1/2 Array Height (<= 6 inches)

## Roof Area 1 - Array 1

<b>AVERAGE PSF</b>	<b>5.58 psf</b>	<b>MINIMUM SEISMIC SEPARATION (UNATTACHED ARRAYS) *</b>	
TOTAL NUMBER OF MODULES:	15	ARRAY TO ARRAY:	12.0"
TOTAL KW:	4.80 KW	TO FIXED OBJECT ON ROOF:	24.0"
TOTAL AREA:	425 ft <sup>2</sup>	TO ROOF EDGE WITH QUALIFYING PARAPET:	24.0"
TOTAL WEIGHT ON ROOF:	2373 lbs	TO ROOF EDGE WITHOUT QUALIFYING PARAPET:	48.0"
RACKING WEIGHT:	95 lbs	MAX ARRAY (SEISMIC) (FOR UNATTACHED ARRAYS) *	
MODULE WEIGHT:	644 lbs	MAX NUMBER OF NORTH-SOUTH ROWS:	41
BALLAST WEIGHT:	1581 lbs	MAX NUMBER OF EAST-WEST COLUMNS:	181
		*See ASCE 7-16 Section 13.6.12 for more details	

## Roof Area 1 - Array 2

<b>AVERAGE PSF</b>	<b>5.51 psf</b>	<b>MINIMUM SEISMIC SEPARATION (UNATTACHED ARRAYS) *</b>	
TOTAL NUMBER OF MODULES:	14	ARRAY TO ARRAY:	12.0"
TOTAL KW:	4.48 KW	TO FIXED OBJECT ON ROOF:	24.0"
TOTAL AREA:	408 ft <sup>2</sup>	TO ROOF EDGE WITH QUALIFYING PARAPET:	24.0"
TOTAL WEIGHT ON ROOF:	2246 lbs	TO ROOF EDGE WITHOUT QUALIFYING PARAPET:	48.0"
RACKING WEIGHT:	84 lbs	MAX ARRAY (SEISMIC) (FOR UNATTACHED ARRAYS) *	
MODULE WEIGHT:	601 lbs	MAX NUMBER OF NORTH-SOUTH ROWS:	41
BALLAST WEIGHT:	1513 lbs	MAX NUMBER OF EAST-WEST COLUMNS:	181
		*See ASCE 7-16 Section 13.6.12 for more details	

## Roof Area 2 - Array 1

<b>AVERAGE PSF</b>	<b>5.09 psf</b>	<b>MINIMUM SEISMIC SEPARATION (UNATTACHED ARRAYS) *</b>	
TOTAL NUMBER OF MODULES:	11	ARRAY TO ARRAY:	12.0"
TOTAL KW:	3.52 KW	TO FIXED OBJECT ON ROOF:	24.0"
TOTAL AREA:	315 ft <sup>2</sup>	TO ROOF EDGE WITH QUALIFYING PARAPET:	24.0"
TOTAL WEIGHT ON ROOF:	1602 lbs	TO ROOF EDGE WITHOUT QUALIFYING PARAPET:	48.0"
RACKING WEIGHT:	70 lbs	MAX ARRAY (SEISMIC) (FOR UNATTACHED ARRAYS) *	
MODULE WEIGHT:	472 lbs	MAX NUMBER OF NORTH-SOUTH ROWS:	41
BALLAST WEIGHT:	1020 lbs	MAX NUMBER OF EAST-WEST COLUMNS:	181
		*See ASCE 7-16 Section 13.6.12 for more details	

# Roof Area 2 - Array 2

**AVERAGE PSF** 5.86 psf

TOTAL NUMBER OF MODULES:	7
TOTAL KW:	2.24 KW
TOTAL AREA:	212 ft <sup>2</sup>
TOTAL WEIGHT ON ROOF:	1244 lbs
RACKING WEIGHT:	49 lbs
MODULE WEIGHT:	300 lbs
BALLAST WEIGHT:	867 lbs

**MINIMUM SEISMIC SEPARATION (UNATTACHED ARRAYS) \***

ARRAY TO ARRAY:	12.0"
TO FIXED OBJECT ON ROOF:	24.0"
TO ROOF EDGE WITH QUALIFYING PARAPET:	24.0"
TO ROOF EDGE WITHOUT QUALIFYING PARAPET:	48.0"
<b>MAX ARRAY (SEISMIC) (FOR UNATTACHED ARRAYS) *</b>	
MAX NUMBER OF NORTH-SOUTH ROWS:	41
MAX NUMBER OF EAST-WEST COLUMNS:	181

\*See ASCE 7-16 Section 13.6.12 for more details

## RM10 U-BUILDER PRODUCT ASSUMPTIONS

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### RM10 – Ballasted Flat Roof Systems

*Limitations of Responsibility: It is the user's responsibility to ensure that inputs are correct for your specific project.*

*Unirac is not the solar, electrical, or building engineer of record and is not responsible for the solar, electrical, or building design for this project.*

#### Building Assumptions

1. Risk Category II
2. Building Height  $\leq 50$  ft
3. Building Height  $> 50$  ft: only where  $(\text{longest length of building} \times \text{building height})^{0.5} \leq 100$  ft
4. Roof Slope  $\geq 0^\circ$  (0:12) and  $\leq 3^\circ$  (5/8:12) for Seismic Design Category C, D, E and F. For low seismic regions Seismic Design Category A and B (provided Array Importance factor = 1.0), Roof Slope  $\geq 0^\circ$  (0:12) and  $\leq 7^\circ$  (1 1/2:12).
5. Roofing Material Types: EDPM, PVC, TPO, or Mineral Cap
6. Surrounding Building Grade: Level

#### Ballast Blocks

The installer is responsible for procuring the ballast blocks (Concrete Masonry Units – CMU) and verifying the required minimum weight needed for this design. CMU should comply with ASTM standard specification for concrete roof pavers designation (C1491 or C90 with an integral water repellent suitable for the climate it is placed). It is recommended that the blocks are inspected periodically for any signs of degradation. If degradation of the block is observed, the block should immediately be replaced.

The CMU ballast block should have nominal dimensions of 4"x8"x16". The actual block dimensions are 3/8" less than the nominal dimensions. Ballast blocks should have a weight as specified for the project in the "Inspection" section of this report.

#### Design Parameters

1. Risk Category II
2. Wind Design
  - a. Basic Wind Speed: 85-120 mph (ASCE 7-05)/110-150 mph (ASCE 7-10)/90-180 mph (ASCE 7-16)
  - b. Exposure: B, C or D (ASCE 7-05/ASCE 7-10)
  - c. 25 year Design Life/50 year Design Life for ASCE 7-16
  - d. Elevation: Insertion of the project at - grade elevation can result in a reduction of wind pressure. If your project is in a special case study region or in an area where wind studies have been performed, please verify with your jurisdiction to ensure that elevation effects have not already been factored into the wind speed. If elevation effects have been included in your wind speed, please select 0 ft as the project site elevation.
  - e. Wind Tunnel Testing: Wind tunnel testing coefficients have been utilized for design of the system.
3. Snow Design
  - a. Ground Snow Load: 0-80 psf (ASCE 7-10/ASCE 7-16)
  - b. Exposure Factor: 0.9
  - c. Thermal Factor: 1.2
  - d. Roof Snow Load: Calculation per Section 7.3 (ASCE 7-05/ASCE 7-10/ASCE 7-16)
  - e. Unbalanced/Drifting/Sliding: Results are based on the uniform snow loading and do not consider unbalanced, drifting, and sliding conditions
4. Seismic Design
  - a. Report *SEAOC PV1-2012/ASCE 7-16 SECTION 13.6.12 – Structural Seismic Requirements and Commentary for Rooftop Solar Photovoltaic Arrays*
  - b. Seismic Site Class: A, B, C, or D (ASCE 7-05/ASCE 7-10/ASCE 7-16)
  - c. Importance Factor Array ( $I_p$ ): 1.0
  - d. Importance Factor Building ( $I_e$ ): 1.0
  - e. Site Class: D

#### Properties

1. Bay Weight: ~3.5 lbs
2. Module Gaps (E/W) = 0.25 in
3. Bays: North row bays overhang the module by ~19.5 inches.

#### Module Properties

1. Module return flange: Minimum of 0.9in (when using 1-3/4 in. clip bolts) is required.
2. Module return flange: Minimum of 0.65in (when using 2 in. clip bolts) is required.

## Testing

1. Coefficient of Friction
2. Wind Tunnel
3. UL 2703
4. Component Testing (Bay and Clamp)

## Setbacks

For the wind tunnel recommendations in U-Builder to apply, the following setbacks should be observed/followed for U-Builder wind design:

1. Modules should be placed a minimum of 3 feet from the edge of the building in any direction.
2. If the array is located near an obstruction that is 3.5 feet wide and 3.5 feet high or larger, the nearest module of the array must be located a distance from the obstruction that is greater than or equal to the height of the obstruction.  
Exception: When using ASCE 7-16 Building Code and using the obstruction feature in the module editor to accurately model the size and location of obstruction.
3. Installations within the setbacks listed above require site specific engineering<sup>2</sup>
4. The setbacks above are for wind. High seismic areas, fire access isles, mechanical equipment, etc., may require larger setbacks than listed above for wind.

## Site Specific Engineering

Conditions listed below are beyond the current capabilities of U-Builder. Site specific engineering is required.

1. Wind designs for a project design life exceeding 25 years<sup>1/ASCE 7-16</sup>
2. Building assumptions and design parameters outside of U-Builder assumptions<sup>2</sup>
3. Attachments<sup>2</sup>
4. Risk Category III or IV projects (U-Builder can be adjusted for the correct wind, but not the seismic or snow design)<sup>2</sup>
5. Wind tunnel testing reduction factors are not permitted by the Authority Having Jurisdiction (AHJ)<sup>3</sup>
6. Seismic designs that fall outside SEAOC PV1-2012/ASCE 7-16 SECTION 13.6.12 recommendations (>3% roof slope, or AHJ's that require shake table testing or non-linear site-specific response history analysis)<sup>3</sup>
7. Signed and sealed site-specific calculations, layouts, and drawings<sup>3</sup>

## Notes:

<sup>1</sup>Please contact info@unirac.com.

<sup>2</sup>Please contact EngineeringServices@unirac.com for more information.

<sup>3</sup>Please contact Theresa Allen with PZSE Structural Engineers at theresa@pzse.com. These items will require direct coordination with PZSE to complete the requested services.

# SunPower® InvisiMount™ | Residential Mounting System

## Simple and Fast Installation

- Integrated module-to-rail grounding
- Pre-assembled mid and end clamps
- Levitating mid clamp for easy placement
- Mid clamp width facilitates consistent, even module spacing
- UL 2703 Listed integrated grounding

## Flexible Design

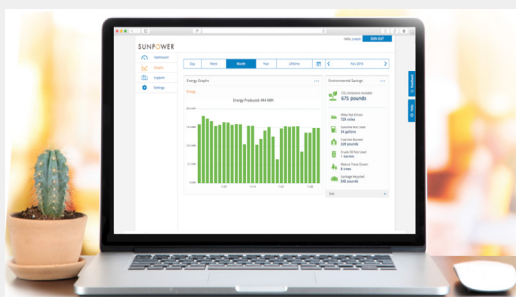
- Addresses nearly all sloped residential roofs
- Design in landscape and portrait with up to 8' rail span
- Pre-drilled rails and rail splice
- Rails enable easy obstacle management

## Customer-Preferred Aesthetics

- #1 module and #1 mounting aesthetics
- Best-in-class system aesthetics
- Premium, low-profile design
- Black anodized components
- Hidden mid clamps and capped, flush end clamps

## Part of Superior System

- Built for use with SunPower DC and AC modules
- Best-in-class system reliability and aesthetics
- Optional rooftop transition flashing, rail-mounted J-box, and wire management rail clips
- Combine with SunPower modules and SunPower EnergyLink® monitoring app



## Elegant Simplicity

SunPower® InvisiMount™ is a SunPower-designed rail-based mounting system. The InvisiMount system addresses residential sloped roofs and combines faster installation time, design flexibility, and superior aesthetics. The InvisiMount product was specifically envisioned and engineered to pair with SunPower modules. The resulting system-level approach amplifies the aesthetic and installation benefits—for homeowners and for installers.

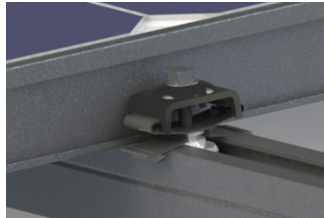
[sunpower.com](https://sunpower.com)



# SunPower® InvisiMount™ | Residential Mounting System

## InvisiMount Components

Module<sup>1</sup> / Mid Clamp and Rail



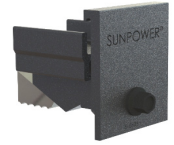
Module<sup>1</sup> / End Clamp and Rail



Ground Lug Assembly



Row-to-Row Spacer



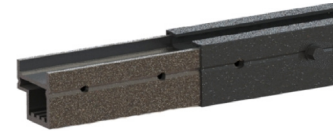
End Clamp



Mid Clamp



Row-to-Row Grounding Clip



Rail and Rail Splice

InvisiMount Component Details		
Mid clamp	Black oxide stainless steel 300 series	63 g (2.2 oz)
End clamp	Black anodized aluminum 6000 series	110 g (3.88 oz)
Rail	Black anodized aluminum 6000 series	830 g/m (9 oz/ft)
Rail splice	Aluminum alloy 6000 series	830 g/m (9 oz/ft)
Rail bolt	M10-1.5 x 25 mm; custom T-head SS304	18 g (0.63 oz)
Rail nut	M10-1.5; DIN 6923 SS304	nominal
Ground lug assembly	SS304; A2-70 bolt; tin-plated copper lug	106.5 g (3.75 oz)
Row-to-row grounding clip	SS 301 with SS 304 M6 bolts	75 g (2.6 oz)
Row-to-row spacer	Black POM-grade plastic	5 g (0.18 oz)

InvisiMount Operating Conditions	
Temperature	-40° C to 90° C (-40° F to 194° F)
Max. Load (LRFD)	<ul style="list-style-type: none"> <li>• 3000 Pa uplift</li> <li>• 6000 Pa downforce</li> </ul>

Roof Attachment Hardware Supported by Design Tool	
Application	<ul style="list-style-type: none"> <li>• Composition Shingle Rafter Attachment</li> <li>• Composition Shingle Roof Decking Attachment</li> <li>• Curved and Flat Tile Roof Attachment</li> <li>• Universal interface for other roof attachments</li> </ul>

InvisiMount Component LRFD Capacities <sup>2</sup>		
Mid clamp	Uplift	664 lbf
	Shear	540 lbf
End clamp	Uplift	899 lbf
	Shear	220 lbf
Rail	Moment: upward	548 lbf-ft
	Moment: downward	580 lbf-ft
Rail splice	Moment: upward	548 lbf-ft
	Moment: downward	580 lbf-ft
L-foot	Uplift	1000 lbf
	Shear	390 lbf

InvisiMount Warranties And Certifications	
Warranties	<ul style="list-style-type: none"> <li>• 25-year product warranty</li> <li>• 5-year finish warranty</li> </ul>
Certifications	<ul style="list-style-type: none"> <li>• UL 2703 Listed</li> <li>• Class A Fire Rated</li> </ul>

Roof Attachment Hardware Warranties	
Refer to roof attachment hardware manufacturer's documentation.	

<sup>1</sup> Module frame that is compatible with the InvisiMount system required for hardware interoperability.

<sup>2</sup> SunPower recommends that all Equinox™, InvisiMount™, and AC module systems always be designed using the InvisiMount Span Tables #524734. If a designer decides to instead use the component capacities listed in this document to design a system, note that the capacities shown are Load and Resistance Factor Design (LRFD) design loads, and are NOT to be used for Allowable Stress Design (ASD) calculations; and that a licensed Professional Engineer (PE) must then stamp all calculations. If you have any questions please contact SunPower Technical Support at 1-855-977-7867.

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April 27, 2020

SunPower  
77 Rio Robles  
San Jose, CA 95134  
TEL: (408) 514-4063

Attn: Sunpower – Engineering Department

Re: Engineering Certification for the SunPower Corporation Invisimount Mounting System Span Tables and Design Methodology, Document #524734 Rev E.

PZSE, Inc.-Structural Engineers has reviewed the SunPower Invisimount Mounting System Span Tables published April 27, 2020 and their design methodology. This certification covers the module clamp, rail analysis, and attachment Tile hook/L bracket components. All information, data and analysis contained within are based on, and comply with, the following building codes and typical specifications:

**Building Codes:**

1. Minimum Design Loads for Buildings and other Structures, ASCE/SEI 7-10, ASCE/SEI 7-16.
2. 2015, 2018 Building Code, by International Code Council, Inc
3. 2017 NY State Uniform Code Supplement
4. 2020 NY State Building Code
5. 2015 Aluminum Design Manual, by The Aluminum Association
6. CPP Wind Tunnel report number 9790, dated 16 February 2017.
7. SEAOC PV-2, 2017
8. 2015 NDS, by the American Wood Council
9. UL 2703 Testing report for PV solar panels.
10. AC428, Acceptance Criteria for Modular Framing Systems Used to Support Photovoltaic (PV) Panels, November 1, 2012 by ICC-ES

**Component and Cladding Roof Zones:**

The Components and Cladding Roof Zones shall be determined based on ASCE 7 Chapter 30, and CPP Wind Tunnel test number 9790, dated 16 February 2017.

**Notes:**

- 1) Racking system and panels shall be installed per manufacturer's specifications.
- 2) Design assumptions are specified in the Inputs pages of attached span tables.
- 3) Attachment design is based on 5/16" Dia. Lag Screw with 2.5" Embedment into SPF#2 or equivalent per NDS. Designer shall be responsible for verifying project specific site conditions.
- 4) Wind speeds are LRFD values.
- 5) Attachment spacing(s) apply to seismic design category E or less.





**Design Responsibility:**

These tables are intended to be used under the responsible charge of a registered design professional where required by the authority having jurisdiction. In all cases, these tables should be used under the direction of a design professional with sufficient structural engineering knowledge and experience to be able to:

- Evaluate whether these tables are applicable to the project, and
- Understand and determine the appropriate values for all input parameters of these tables.

This letter certifies that the loading criteria and design basis SunPower Invisimount Mounting System Span Tables are in compliance with the Codes above.

This certification excludes the capacity check of the building structure to support the loads imposed on the building by the array, such as bending strength of roof rafters spanning between supports. This requires additional knowledge of the building and is outside the scope of the design tool and our review.

If you have any questions on the above, do not hesitate to call.

Prepared By:  
PZSE, Inc. - Structural Engineers  
Roseville, CA



# SUNPOWER®

Exposure B  
 Ground Snow (psf) 30  
 Roof Height (ft) 20

INVISIMOUNT ALLOWABLE SPANS - ZONE 1 (IN)											
Slope →	9.46 °	14.04 °	18.43 °	22.62 °	26.57 °	30.26 °	33.69 °	36.87 °	39.81 °	42.51 °	45 °
Speed ↓	2:12	3:12	4:12	5:12	6:12	7:12	8:12	9:12	10:12	11:12	12:12
90	72	72	72	80	80	80	96	96	96	96	96
95	72	72	72	80	80	80	96	96	96	96	96
100	72	72	72	80	80	80	96	96	96	96	96
105	72	72	72	80	80	80	96	96	96	96	96
110	72	72	72	80	80	80	96	96	96	96	96
120	72	72	72	80	80	80	96	96	96	96	96
130	72	72	72	80	96	80	80	96	96	96	96

INVISIMOUNT ALLOWABLE SPANS - ZONE 2 (IN)											
Slope →	9.46 °	14.04 °	18.43 °	22.62 °	26.57 °	30.26 °	33.69 °	36.87 °	39.81 °	42.51 °	45 °
Speed ↓	2:12	3:12	4:12	5:12	6:12	7:12	8:12	9:12	10:12	11:12	12:12
90	72	72	72	80	80	80	96	96	96	96	96
95	72	72	72	80	80	80	96	96	96	96	96
100	72	72	72	80	80	80	96	96	96	96	96
105	72	72	72	80	80	80	96	96	96	96	96
110	72	72	72	80	80	80	96	96	96	96	96
120	72	72	72	80	80	80	96	96	96	80	80
130	72	72	72	80	80	80	80	96	80	80	80

INVISIMOUNT ALLOWABLE SPANS - ZONE 3 (IN)											
Slope →	9.46 °	14.04 °	18.43 °	22.62 °	26.57 °	30.26 °	33.69 °	36.87 °	39.81 °	42.51 °	45 °
Speed ↓	2:12	3:12	4:12	5:12	6:12	7:12	8:12	9:12	10:12	11:12	12:12
90	72	72	72	80	80	80	96	96	96	96	96
95	72	72	72	80	80	80	96	96	96	96	96
100	72	72	72	80	80	80	96	96	96	96	80
105	72	72	72	80	80	80	96	96	96	80	80
110	72	72	72	80	80	80	96	96	80	80	80
120	72	72	72	80	80	80	96	80	80	72	72
130	72	72	72	80	80	80	80	80	72	72	64

Notes:

- Tables are based on strength of the InvisiMount rail and approved roof attachment in the Engineering Summary Letter of this document, in conformance with IBC and referenced standards.
- The color of a given cell indicates the area on the module where clamps may be installed. Green cells allow clamps to be installed in Portrait or Landscape orientations; Orange allows clamps to be installed only in Portrait; Blue allows clamps to be installed only in Portrait within the given dimensions from the edge. Refer to the key at the beginning of this document for more details.
- Maximum allowable cantilever is equal to 1/3 of the allowable span.
- Wind speeds are ultimate values in mph, as defined in ASCE 7. Wind pressure coefficients are derived from ASCE 7 Chapter 30.
- User is responsible for verifying the strength of the roof.

# SUNPOWER®

Exposure B  
 Ground Snow (psf) 30  
 Roof Height (ft) 30

INVISIMOUNT ALLOWABLE SPANS - ZONE 1 (IN)											
Slope →	9.46 °	14.04 °	18.43 °	22.62 °	26.57 °	30.26 °	33.69 °	36.87 °	39.81 °	42.51 °	45 °
Speed ↓	2:12	3:12	4:12	5:12	6:12	7:12	8:12	9:12	10:12	11:12	12:12
90	72	72	72	80	80	80	96	96	96	96	96
95	72	72	72	80	80	80	96	96	96	96	96
100	72	72	72	80	80	80	96	96	96	96	96
105	72	72	72	80	80	80	96	96	96	96	96
110	72	72	72	80	80	80	96	96	96	96	96
120	72	72	72	80	96	80	96	96	96	96	96
130	72	72	72	80	80	80	80	96	96	96	96

INVISIMOUNT ALLOWABLE SPANS - ZONE 2 (IN)											
Slope →	9.46 °	14.04 °	18.43 °	22.62 °	26.57 °	30.26 °	33.69 °	36.87 °	39.81 °	42.51 °	45 °
Speed ↓	2:12	3:12	4:12	5:12	6:12	7:12	8:12	9:12	10:12	11:12	12:12
90	72	72	72	80	80	80	96	96	96	96	96
95	72	72	72	80	80	80	96	96	96	96	96
100	72	72	72	80	80	80	96	96	96	96	96
105	72	72	72	80	80	80	96	96	96	96	96
110	72	72	72	80	80	80	96	96	96	96	80
120	72	72	72	80	80	80	96	96	80	80	80
130	72	72	72	80	80	80	80	80	80	80	72

INVISIMOUNT ALLOWABLE SPANS - ZONE 3 (IN)											
Slope →	9.46 °	14.04 °	18.43 °	22.62 °	26.57 °	30.26 °	33.69 °	36.87 °	39.81 °	42.51 °	45 °
Speed ↓	2:12	3:12	4:12	5:12	6:12	7:12	8:12	9:12	10:12	11:12	12:12
90	72	72	72	80	80	80	96	96	96	96	96
95	72	72	72	80	80	80	96	96	96	96	80
100	72	72	72	80	80	80	96	96	96	80	80
105	72	72	72	80	80	80	96	96	80	80	80
110	72	72	72	80	80	80	96	80	80	80	72
120	72	72	72	80	80	80	80	80	72	72	64
130	64	64	64	72	72	80	80	72	64	64	64

Notes:

- Tables are based on strength of the InvisiMount rail and approved roof attachment in the Engineering Summary Letter of this document, in conformance with IBC and referenced standards.
- The color of a given cell indicates the area on the module where clamps may be installed. Green cells allow clamps to be installed in Portrait or Landscape orientations; Orange allows clamps to be installed only in Portrait; Blue allows clamps to be installed only in Portrait within the given dimensions from the edge. Refer to the key at the beginning of this document for more details.
- Maximum allowable cantilever is equal to 1/3 of the allowable span.
- Wind speeds are ultimate values in mph, as defined in ASCE 7. Wind pressure coefficients are derived from ASCE 7 Chapter 30.
- User is responsible for verifying the strength of the roof.



**SUNMODO CORPORATION**  
14800 NE 65<sup>th</sup> Street  
Vancouver, WA 98682

## SUNMODO EZ ROOF MOUNT L-FOOT KITS FOR SHINGLE ROOFS

**CSI Section:**  
06 25 23 Wood, Plastic, and Composite Fastenings  
07 71 00-Roof Specialties

### 1.0 RECOGNITION

SunModo EZ Roof Mount L-Foot Kits for Shingle Roofs recognized in this report has been evaluated for use as mounting assemblies to attach solar panels and other types of approved equipment on roofs with asphalt shingle roof coverings. The structural performance and weather protection properties of the SunModo EZ Roof Mount L-Foot Kits for Shingle Roofs have been evaluated and comply with the intent of the provisions of the following codes and regulations:

- 2015, 2012, 2009 and 2006 International Building Code® (IBC)
- 2015, 2012, 2009 and 2006 International Residential Code® (IRC)

### 2.0 LIMITATIONS

Use of the EZ Roof Mount Kits-K10068-XXX recognized in this report is subject to the following limitations:

**2.1 EZ Roof Mount Kits - K10068- XXX** shall be installed in accordance with this report, the manufacturer’s published installation instructions and the codes listed in Section 1.0 of this report. Where conflicts occur, the more restrictive shall govern.

**2.2** Calculations to verify the imposed loads on the EZ Roof Mount assemblies do not exceed the allowable loads contained in [Table 1](#) of this report and shall be submitted to the code official when requested. The calculations shall be prepared by a registered design professional when required by the statutes of the jurisdiction in which the project is to be constructed.

**2.3** Fasteners used in contact with fire-retardant-treated or preservative-treated lumber shall comply with 2015 IBC Section 2304.10.5 (2012, 2009 and 2006 IBC Section 2304.9.5 or the 2015, 2012 and 2009 IRC Section R317.3 (2006 IRC Section R319.3), as applicable. The report holder or lumber treater shall be contacted for recommendations on minimum corrosion resistance and

connection capacities of fasteners used with the specific proprietary preservative-treated or fire-retardant treated lumber

### 3.0 PRODUCT USE

**3.1 General:** EZ Roof Mount Kits – K10068-XXX are mounting assemblies used to attach solar panels and other types of approved equipment on roofs with asphalt shingle roof coverings.

EZ Roof Mounts are specifically designed to be used for installation of solar collectors for thermal energy or photovoltaic energy production in accordance with IBC Section 1511 and IRC Sections M2301 on roofs.

**3.2 Design:** Tabulated allowable loads shown in Table 1 of this report are based on allowable stress design (ASD) and include the load duration factor,  $C_D$ , corresponding with the applicable loads in accordance with the ANSI/AWC National Design Specification (NDS).

Where the roof mounts are exposed to sustained temperatures exceeding 100°F (37.8°C), uplift allowable loads shall be adjusted by the temperature factor,  $C_t$ , in accordance with Section 10.3.4 or the NDS temperature factor,  $C_t$ , which applies to the roof mount connected to supporting wood members where sustained temperatures up to 150°F (65.6°C). When products are attached to wood framing having a moisture content greater than 19 percent (16 percent for engineered wood products), or where wet service is expected, the allowable loads shall be adjusted by the wet service factor,  $C_M$ , specified in Section 10.3.3 of the NDS. Connected wood members shall be analyzed for load-carrying capacity at the connection in accordance with the NDS.

**3.3 Installation:** EZ Roof Mount Kit – K10068-001 shall be installed using the 5/16-inch (7.94 mm) diameter stainless steel lag screws at each bracket location as described in the manufacturer’s published installation instructions. Lag screws shall penetrate into the roof rafter a minimum of 2½-inches (63.5 mm). Prior to installation, the roof rafter shall be bored with the required lead and clearance holes for the unthreaded and shank portions of the lag screw as set forth in Section 12.1.4 of the NDS-15 (Section 11.1.4 of the NDS-12 and -05). Threaded portion of the lag screw shall be inserted into its lead hole by turning with a wrench and not driving by a hammer.

Use of auxiliary holes in the Shoe other than the use of an extra fastener to stop the shoe from rotating during installation is outside the scope of this report.

Flashing shall be installed the full length under the shingle up to the raised portion of the flashing to prevent water

The product described in this Uniform Evaluation Service (UES) Report has been evaluated as an alternative material, design or method of construction in order to satisfy and comply with the intent of the provision of the code, as noted in this report, and for at least equivalence to that prescribed in the code in quality, strength, effectiveness, fire resistance, durability and safety, as applicable, in accordance with IBC Section 104.11. This document shall only be reproduced in its entirety.





ingress under the shingle. No portion of the flashing shall be bent upward; the flashing shall rest fully against the roof shingles.

EZ Roof Mount Kit - K10068-020 shall be installed using four OMG Screws XHD002B complying with Section 4.2 of this report. The wood screws shall penetrate and extend beyond the wood sheathing by ½ inch (12.7 mm) as described in the manufacturer's published installation instructions.

## 4.0 PRODUCT DESCRIPTION

### 4.1 Product Information

**4.1.1 EZ Roof Mount Kit – K10068-001:** consists of five basic components: (1) shoe assembly with captive waterproof washer, (2) lag bolt to fasten through the shingles to the wood roof rafter, (3) flashing that is placed under the row of shingles above the shoe and then over the shoe, (4) L-Foot that is placed over the protruding shoe threads and (5) hex cap that is secured on to the shoe. [Figures 2](#) to [6](#) of this report illustrate the components.

**4.1.2 EZ Roof Mount Kit – K10068-020:** consists of five basic components: (1) shoe assembly with captive waterproof washer, (2) OMG Screws XHD002B (lag bolt not included), (3) flashing, (4) L-Foot, and (5) hex cap. [Figures 2](#) through [7](#) of this report illustrate the components.

**4.2 Material information:** EZ Roof Mount is fabricated from aluminum. The Shoe assembly is fabricated using casting aluminum alloy with dimensions of 2.80 inches (71 mm) in diameter and 1.00 inches (25.4 mm) in height. The Shoe assembly is secured using one 5/16-inch (7.94 mm) diameter lag bolt that is 4 inches (102 mm) in length and made of stainless steel. Flashing is fabricated from sheet aluminum with dimensions of 10.0 inches (254 mm) in width, 12.5 inches (318 mm) in length and 0.04 inches (1.02 mm) in thickness.

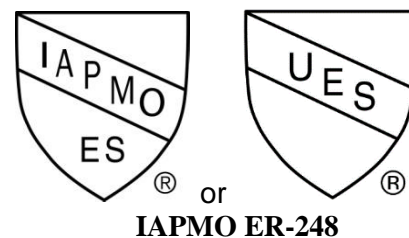
The L-foot is a 2.00 inch (50.8 mm) long unequal leg angle made from 6005-T5 aluminum with dimensions of 3.00 inches (76.2 mm) in depth, 2.00 inches (50.8 mm) in width and 0.24 inches (6.10 mm) in thickness. The L-foot contains a 0.375-inch (9.53 mm) diameter round hole with a 0.83 inch (21.1 mm) wide and 0.99 inch (25.15 mm) (in base) that is located in the center of the base leg. One slot measuring 1.64 inches (41.7 mm) long by 0.40 inch (10.2 mm) wide occurs in the center and is located 0.30 inches (7.62 mm) from the top edge of the vertical leg, which has a scallop front and rear face. Table 2 of this report provides component material properties and figures.

Fasteners used to secure the EZ Roof Mount Kit – K10068-020 to minimum ½-inch (12.7 mm) thick plywood roof sheathing complying with DOC PS1 shall be OMG Screws XHD002B 0.202-inch (5.13 mm) diameter wood screws

complying with ASTM D1761 and F1575. The wood screws shall be long enough to penetrate and extend beyond the wood sheathing by 0.5 inch (12.7 mm). Wood screws shall be corrosion-resistant. [Table 1](#) of this report provides pull-out capacities and allowable lateral loads for typical roof sheathing.

## 5.0 IDENTIFICATION

SunModo's EZ Roof Mount Kits - K10068-XXX are identified with a label bearing the manufacturer's name and address, product designation, IAPMO Uniform ES Marks of Conformity, compliance code, the name of the inspection agency (when applicable) and this evaluation report number (ER-248).



## 6.0 SUBSTANTIATING DATA

Testing and analysis data submitted is in conformance with IAPMO UES Evaluation Criteria for Joist Hangers and Miscellaneous Connectors (EC 002-2017).

Rain test data and thickness of aluminum flashing submitted is in conformance with ICC-ES AC 286, Roof Flashing for Pipe Penetrations—Approved October 2012, editorially revised August 2013. Rain test conforms to Underwriters Laboratory Standard for Gas Vents, (UL 441-96 Section 25). Test results are from laboratories in compliance with ISO/IEC 17025.



## 7.0 STATEMENT OF RECOGNITION

This evaluation report describes the results of research carried out by IAPMO Uniform Evaluation Service on SunModo EZ Roof Mount L-Foot Kits for Shingle Roofs to assess conformance to the codes shown in Section 1.0 of this report and serves as documentation of the product certification.

**Brian Gerber, P.E., S.E.**  
Vice President, Technical Operations  
Uniform Evaluation Service

**Richard Beck, PE, CBO, MCP**  
Vice President, Uniform Evaluation Service

**GP Russ Chaney**  
CEO, The IAPMO Group

For additional information about this evaluation report please visit [www.uniform-es.org](http://www.uniform-es.org) or email us at [info@uniform-es.org](mailto:info@uniform-es.org)



<b>Table 1: Allowable Loads (lbs)</b>			
<b>EZ Roof Mount Kit – K10068-001</b>			
<b>Load Direction (Figure 1)</b>	<b>Test Load at 0.250-inch deflection</b>	<b>Test Load at 0.125 inch deflection</b>	<b>Allowable Design Load<sup>1, 2</sup></b>
Uplift (Withdrawal) <sup>3</sup>	1,800	695	715
Lateral	240	130	260
<b>EZ Roof Mount Kit – K10068-020<sup>4</sup></b>			
<b>Load Direction (Figure 1)</b>	<b>Test Load at 0.250-inch deflection</b>	<b>Test Load at 0.125-inch deflection</b>	<b>Allowable Design Load<sup>1, 2</sup></b>
Uplift -2 in. screw	770	396	200
Lateral -2 in. screw	232	114	85
Uplift - 3 in. screw	777	390	177
Lateral - 3 in. screw	264	157	102

For SI: 1 inch =25.4 mmm

### Footnotes

1. Allowable load values are based on the least value from ultimate load tests divided by the safety factor, calculated fastener capacity (withdrawal or lateral) for wood, or allowable stress of the connector load (specified in Section 5.4 of EC002-2016), whichever is the lowest.
2. Allowable load values are based on lumber with a specific gravity of 0.55 (Southern Pine or equal).
3. Allowable load values for withdrawal are based on a minimum fastener penetration of 2½ inches into the roof rafter.
4. Allowable load values are based on 4 fasteners penetrating through minimum ½-inch thick wood sheathing.



Figure 1, Loading Directions

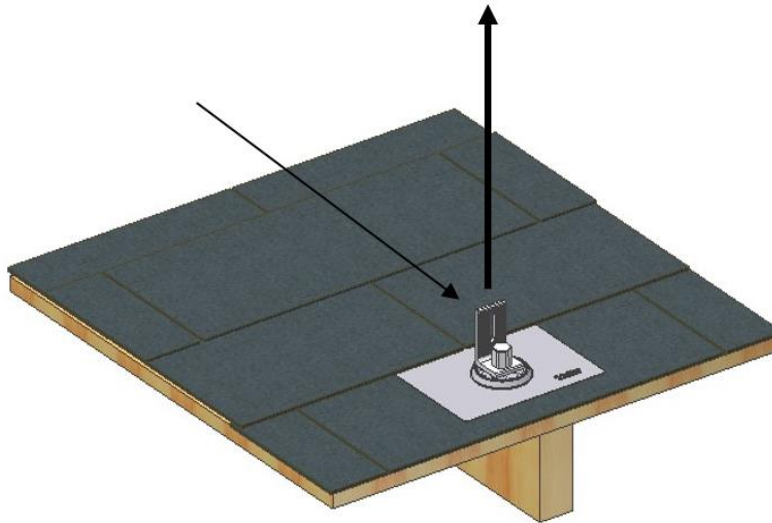


TABLE 2: MATERIAL PROPERITES	
Component	Material
<b>EZ Roof Mount Kit –K10068-XXX</b>	
Shoe	Aluminum alloy ANSI/AA A380.0
Waterproof Washer	EPDM with durometer rating of 60
Lag Bolt	304 stainless steel ASTM A 240
OMG Screw XHD002B (#15x2 or #15x3)	Corrosion resistant wood screws
L-foot	Aluminum alloy 6005-T5 ASTM B221
Hex Cap	Aluminum alloy ANSI/AA A380.0
Flashing	Aluminum alloy 1060 ASTM B209





## EZ ROOF MOUNT COMPONENTS



Figure 2: Shoe Assembly



Figure 5: Hex Cap



Figure 3: Lag Bolt



Figure 6: Flashing

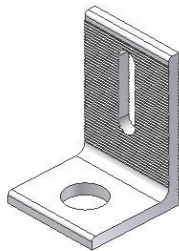


Figure 4: L-foot



Figure 7: OMG Screws



Town of North Castle  
Department of Building & Engineering  
15 Bedford Road  
Armonk, NY 10504

Dear Sir or Madam:

Enclosed please find application documents for the following Solar PV Roof-Mounted System Installation for **SBL: 107.02-2-38, Univer, 88 Whipoorwill Rd. E, Armonk, NY 10504** (in order of documents submitted):

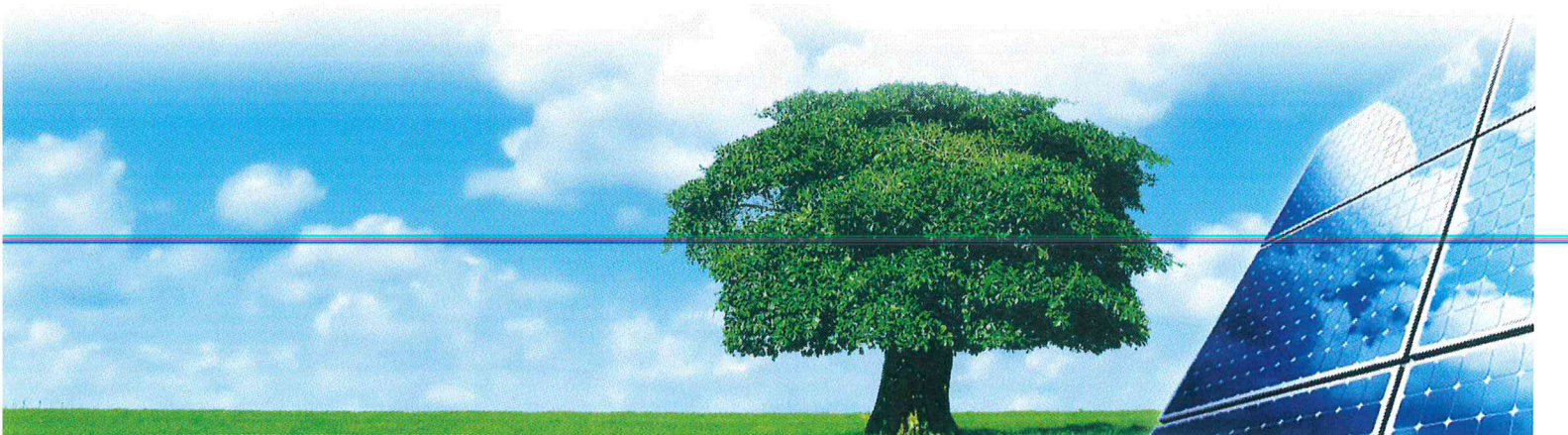
- Application for Building Permit w/ \$222.00 Check for BP App Fees
- RPRC Completeness Review
- Gross Land Coverage Calculations Worksheet – Marked as Not Applicable to Project
- Floor Area Calculations Worksheet – Marked as Not Applicable to Project
- Tree Removal Permit Application - Marked as Not Applicable to Project
- Administrative Wetland Permit Application - Not applicable to Project
- Property Homeowner Consent Form signed
- SWIS Electrical Job Application w/ Check for \$50.00
- Westchester County Home Improvement License # WC-25236-H12
- Westchester County Master Electrician License # 800
- Insurance Certificates
- Three (3) Aerial Photos of residence
- Tax Parcel addresses of residence/adjacent properties
- Three (3) Plan Sets with Specifications
- UPS Pre-paid Self-addressed Return envelope

If there is any additional documentation needed, please do not hesitate to email or call our office at 845.256.6051 and we will gladly forward it.

Thanking you in advance for all your help!

Sincerely,

Anthony S. Sicari, Jr.  
NYS Solar Farm, Inc.  
1935 Route 44/55  
Modena, NY 12548  
kathy@nyssf.com  
845.256.6051





## Town of North Castle Building Department

17 Bedford Road

Armonk, New York 10504-1898

Telephone: (914) 273-3000 ext. 44 Fax: (914) 273-3554

[www.northcastleny.com](http://www.northcastleny.com)

## Residential Building Permit Application

NOTE: TWO (2) SETS OF ALL REQUIRED DOCUMENTS MUST BE SUBMITTED WITH THIS APPLICATION

**Section I-** PROJECT ADDRESS: 88 Whipoorwill Rd. E, Armonk, NY 10504 DATE: 11/05/20

**Section II-** CONTACT INFORMATION: (Please print clearly. All information must be current.)

APPLICANT: NYS Solar Farm, Inc.

ADDRESS: 1548 Rte 44-55, Modena, NY 12548

PHONE: 845-256-6051 MOBILE: 845-706-8168 EMAIL: kathy@nyssf.com

PROPERTY OWNER: Scott Univer

ADDRESS: 88 Whipoorwill Road East, Armonk, NY 10504

PHONE: 914-417-7828 MOBILE: 914-417-7828 EMAIL: suniver6@gmail.com

**Section III-** DESCRIPTION OF WORK: (Any work conducted outside of the house requires approval from the RPRC unless the proposed action is minor in nature and complies with 355-26 C (3) of the Town of North Castle code.)

PV Solar Install - Roof Mount

**Section IV-** USE AND OCCUPANCY:

EXISTING/ CURRENT USE: Single Family Residence

PROPOSED RESIDENTIAL:

One Family Dwelling     Two Family Dwelling     Townhouse     Detached Accessory Structure

**Section V-** PERMIT FEES: (\$100 app fee plus \$14 per \$1000, cost of construction and a \$75 CO fee.)

ESTIMATED COST OF CONSTRUCTION (Based on fair market value labor & material) \$ 43,300

AFFIDAVIT OF CONSTRUCTION COST: This affidavit must be completed by the Design Professional if the estimated cost is \$20,000 or more.

# Town of North Castle Building Department

## Section V- (Continued)

I James A. Koppenhaver, PE do hereby affirm and certify as follows: (i) I am the architect/engineer (circle one) licensed by the State of New York; (ii) I have reviewed the plans, drawings and specifications for this application and am fully familiar with the proposed construction; (iii) based on my experience, I estimate the total cost of construction including all labor, all materials, all professional fees and all associated costs to be approximately \$43,313, and (iv) pursuant to Penal Law 210.45, I acknowledge that a false statement made knowingly is a Class A misdemeanor.

Signature: [Signature] Date: 11/05/20



## Section VI- CONTACT INFORMATION: (Please print clearly. All information must be current)

ARCHITECT/ ENG: J. Koppenhaver, PE  
ADDRESS: 304 Logan Avenue, Wyomissing, PA 19610  
PHONE: 484-794-9949 MOBILE: \_\_\_\_\_  
EMAIL: koppenhaverpe@gmail.com

CONTRACTOR: NYS Solar Farm, Inc.  
ADDRESS: 1948 Route 44-55, Modena, NY 12548  
PHONE: 845-256-6051 MOBILE: 845-706-8168 EMAIL: kathy@nyssf.com

PLUMBER: n/a  
ADDRESS: \_\_\_\_\_  
PHONE: \_\_\_\_\_ MOBILE: \_\_\_\_\_ EMAIL: \_\_\_\_\_

ELECTRICIAN: Vincent Ricotta, NYSSF, Inc.  
ADDRESS: 1948 Route 44-55, Modena, NY 12548  
PHONE: 845-256-6051 MOBILE: \_\_\_\_\_ EMAIL: Vincent@nyssf.com

## Section VII- APPLICANT CERTIFICATION

I hereby certify that I have read the instructions & examined this application and know the same to be true & correct. All provisions of laws & ordinances covering this type of work will be complied with whether specified herein or not. The granting of a permit does not presume to give authority to violate or cancel the provisions of any other state or local law regulating construction or land use or the performance of construction.

Signature: [Signature] Date: 11/06/20

# Town of North Castle Building Department

## Section VIII- AFFIDAVIT OF OWNER AUTHORIZATION IF APPLICABLE: (To be notarized)

STATE OF NEW YORK }  
COUNTY OF WESTCHESTER } SS:

The applicant Anthony S. Sicari, Jr. / NYSSF, Inc. has proper consent from said owner to make this application as submitted and said owner agrees to all terms and conditions placed upon same.

Owner's Name (PRINT) Scott Univer Owner's Signature [Signature]

Sworn to before me this 6th day of Nov, 2020

Notary Signature [Signature]

**BIANCA V. CAUCHI**  
Notary Public, State of New York  
No. 01CA6233239  
Qualified in Ulster County  
Term Expires December 27, 2020  
Notary Stamp Here

### OFFICE USE ONLY - DO NOT WRITE BELOW THIS LINE

Zone: \_\_\_\_\_ Section: \_\_\_\_\_ Block: \_\_\_\_\_ Lot: \_\_\_\_\_

#### Building Department Checklist:

Does this permit require RPRC approval?  Yes  No

GC License  Work. Comp.  Liability. Ins.  Disability  Two sets of documents

Permit Fee \_\_\_\_\_ Payment:  Check #: \_\_\_\_\_  Cash  Credit Card

Name on check: \_\_\_\_\_

Received By: \_\_\_\_\_ Application No.: \_\_\_\_\_

### **BUILDING INSPECTOR APPROVAL**

Has all the conditions of the RPRC been met?  Yes  NA

Is a Flood Development permit required?  Yes  No

Reviewed By: \_\_\_\_\_ Date: \_\_\_\_\_

Building Inspector Approval: \_\_\_\_\_ Date: \_\_\_\_\_

Conditions: \_\_\_\_\_

NEW YORK STATE SOLAR FARM INC

ACCOUNT D  
871 ROUTE 208  
GARDINER, NY 12525

50-1139/219

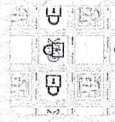
11/3/2020

PAY TO THE ORDER OF TOWN OF NORTHCASTLE

\$ \*\*75.00

Seventy-Five and 00/100 \*\*\*\*\* DOLLARS

TOWN OF NORTHCASTLE



*[Signature]*  
AUTHORIZED SIGNATURE

MEMO

Scott Univer COC Fees

TRUE WATERMARK PAPER - HOLD TO LIGHT TO VIEW

HEAT SENSITIVE RED IMAGE DISAPPEARS WITH HEAT

⑈002891⑈ ⑆021911398⑆ 8320027098⑈

DOCUMENT INCLUDES VISIBLE FIBERS, CHEMICAL REACTIVE PROPERTIES AND FEATURES A FOIL HOLOGRAM

NEW YORK STATE SOLAR FARM INC

ACCOUNT D  
871 ROUTE 208  
GARDINER, NY 12525

50-1139/219

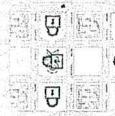
11/3/2020

PAY TO THE ORDER OF TOWN OF NORTHCASTLE

\$ \*\*702.00

Seven Hundred Two and 00/100 \*\*\*\*\* DOLLARS

TOWN OF NORTHCASTLE



*[Signature]*  
AUTHORIZED SIGNATURE

MEMO

Scott Univer BP Fees

TRUE WATERMARK PAPER - HOLD TO LIGHT TO VIEW

HEAT SENSITIVE RED IMAGE DISAPPEARS WITH HEAT

⑈002892⑈ ⑆021911398⑆ 8320027098⑈



**Town of North Castle  
Residential Project Review Committee**

17 Bedford Road Armonk, New York 10504  
(914) 273-3542 (914) 273-3554 (fax)

**RPRC COMPLETENESS REVIEW FORM**

*This form represents the standard requirements for a completeness review for all Residential Project Review Committee submissions. Failure to provide all of the information requested will result in a determination that the application is incomplete.*

Project Name on Plan: Scott Univer

Initial Submittal  Revised Preliminary

Street Location: 88 Whippoorwill Rd. E, Armonk, NY 10504

Zoning District: \_\_\_\_\_ Property Acreage: 2.201 Tax Map Parcel ID: 107.02-2-38

Date: 11/05/20

**DEPARTMENTAL USE ONLY**

Date Filed: \_\_\_\_\_ Staff Name: \_\_\_\_\_

**Preliminary Plan Completeness Review Checklist**

Items marked with a  are complete, items left blank  are incomplete and must be completed, "NA" means not applicable.

- 1. Plan prepared by a registered architect or professional engineer
- 2. Aerial photo (Google Earth) showing the applicant's entire property and adjacent properties and streets
- 3. Map showing the applicant's entire property and adjacent properties and streets
- 4. A locator map at a convenient scale
- 5. The proposed location, use and design of all buildings and structures
- 6. Existing topography and proposed grade elevations
- 7. Location of drives
- 8. Location of all existing and proposed site improvements, including drains, culverts, retaining walls and fences

**RPRC COMPLETENESS REVIEW FORM**

Page 2

<input type="checkbox"/>	9. Description of method of water supply and sewage disposal and location of such facilities
<input type="checkbox"/>	10. The name and address of the applicant, property owner(s) if other than the applicant and of the planner, engineer, architect, surveyor and/or other professionals engaged to work
<input type="checkbox"/>	11. Submission of a Zoning Conformance Table depicting the plan's compliance with the minimum requirements of the Zoning District
<input type="checkbox"/>	12. If a tree removal permit is being sought, submission of a plan depicting the location and graphical removal status of all Town-regulated trees within the proposed area of disturbance. In addition, the tree plan shall be accompanied by a tree inventory includes a unique ID number, the species, size, health condition and removal status of each tree.
<input type="checkbox"/>	13. If a wetlands permit is being sought, identification of the wetland and the 100-foot wetland buffer.

More information about the items required herein can be obtained from the North Castle Planning Department. A copy of the Town Code can be obtained from Town Clerk or on the North Castle homepage: <http://www.northcastleny.com/townhall.html>

_____	On this date, all items necessary for a technical review of the proposed site plan have been submitted and constitute a COMPLETE APPLICATION.
-------	---





**TOWN OF NORTH CASTLE  
WESTCHESTER COUNTY  
17 Bedford Road  
Armonk, New York 10504-1898**

**PLANNING DEPARTMENT  
Adam R. Kaufman, AICP  
Director of Planning**

Telephone: (914) 273-3542  
Fax: (914) 273-3554  
[www.northcastleny.com](http://www.northcastleny.com)

**GROSS LAND COVERAGE CALCULATIONS WORKSHEET**

Application Name or Identifying Title: Scott Univer Date: 11/05/20

Tax Map Designation or Proposed Lot No.: 107.02-2-38

Gross Lot Coverage - PV Solar Panel Installation - Roof Mounted System

1. Total lot Area (Net Lot Area for Lots Created After 12/13/06): \_\_\_\_\_
2. **Maximum** permitted gross land coverage (per Section 213-22.2C): \_\_\_\_\_
3. **BONUS** maximum gross land cover (per Section 213-22.2C): \_\_\_\_\_  
Distance principal home is beyond minimum front yard setback  
\_\_\_\_\_ x 10 = \_\_\_\_\_
4. **TOTAL Maximum Permitted gross land coverage** = Sum of lines 2 and 3 \_\_\_\_\_
5. Amount of lot area covered by **principal building**:  
\_\_\_\_\_ existing + \_\_\_\_\_ proposed = \_\_\_\_\_
6. Amount of lot area covered by **accessory buildings**:  
\_\_\_\_\_ existing + \_\_\_\_\_ proposed = \_\_\_\_\_
7. Amount of lot area covered by **decks**:  
\_\_\_\_\_ existing + \_\_\_\_\_ proposed = \_\_\_\_\_
8. Amount of lot area covered by **porches**:  
\_\_\_\_\_ existing + \_\_\_\_\_ proposed = \_\_\_\_\_
9. Amount of lot area covered by **driveway, parking areas and walkways**:  
\_\_\_\_\_ existing + \_\_\_\_\_ proposed = \_\_\_\_\_
10. Amount of lot area covered by **terraces**:  
\_\_\_\_\_ existing + \_\_\_\_\_ proposed = \_\_\_\_\_
11. Amount of lot area covered by **tennis court, pool and mechanical equip**:  
\_\_\_\_\_ existing + \_\_\_\_\_ proposed = \_\_\_\_\_
12. Amount of lot area covered by **all other structures**:  
\_\_\_\_\_ existing + \_\_\_\_\_ proposed = \_\_\_\_\_
13. Proposed **gross land coverage**: Total of Lines 5 – 12 = \_\_\_\_\_

N/A

If Line 13 is less than or equal to Line 4, your proposal **complies** with the Town's maximum gross land coverage regulations and the project may **proceed** to the Residential Project Review Committee for review. If Line 13 is greater than Line 4 your proposal does not comply with the Town's regulations.

Signature and Seal of Professional Preparing Worksheet

Date



TOWN OF NORTH CASTLE  
 WESTCHESTER COUNTY  
 17 Bedford Road  
 Armonk, New York 10504-1898

PLANNING DEPARTMENT  
 Adam R. Kaufman, AICP  
 Director of Planning

Telephone: (914) 273-3542  
 Fax: (914) 273-3554  
[www.northcastleny.com](http://www.northcastleny.com)

**FLOOR AREA CALCULATIONS WORKSHEET**

Application Name or Identifying Title: Scott Univer Date: 11/05/20

Tax Map Designation or Proposed Lot No.: 107.02-2-38

Floor Area PV Solar Panel Installation - Roof Mounted System

1. Total Lot Area (Net Lot Area for Lots Created After 12/13/06): \_\_\_\_\_
2. **Maximum** permitted floor area (per Section 213-22.2B): \_\_\_\_\_
3. Amount of floor area contained within first floor:  
 \_\_\_\_\_ existing + \_\_\_\_\_ proposed = \_\_\_\_\_
4. Amount of floor area contained within second floor:  
 \_\_\_\_\_ existing + \_\_\_\_\_ proposed = \_\_\_\_\_
5. Amount of floor area contained within garage:  
 \_\_\_\_\_ existing + \_\_\_\_\_ proposed = \_\_\_\_\_
6. Amount of floor area contained within porches capable of being enclosed:  
 \_\_\_\_\_ existing + \_\_\_\_\_ proposed = \_\_\_\_\_
7. Amount of floor area contained within basement (if applicable – see definition):  
 \_\_\_\_\_ existing + \_\_\_\_\_ proposed = \_\_\_\_\_
8. Amount of floor area contained within attic (if applicable – see definition):  
 \_\_\_\_\_ existing + \_\_\_\_\_ proposed = \_\_\_\_\_
9. Amount of floor area contained within all accessory buildings:  
 \_\_\_\_\_ existing + \_\_\_\_\_ proposed = \_\_\_\_\_
10. **Proposed floor area:** Total of Lines 3 – 9 = \_\_\_\_\_

*N/A*

If Line 10 is less than or equal to Line 2, your proposal **complies** with the Town's maximum floor area regulations and the project may proceed to the Residential Project Review Committee for review. If Line 10 is greater than Line 2 your proposal does not comply with the Town's regulations.

Signature and Seal of Professional Preparing Worksheet \_\_\_\_\_

Date \_\_\_\_\_



# TOWN OF NORTH CASTLE

WESTCHESTER COUNTY  
17 Bedford Road  
Armonk, New York 10504-1898

PLANNING BOARD  
BUILDING DEPARTMENT

## Tree Removal Permit Application

Telephone: (914) 273-3542 – Planning  
(914) 273-8625 – Building  
Fax: (914) 273-3554  
[www.northcastleny.com](http://www.northcastleny.com)

SUBMIT TO APPLICABLE DEPARTMENT: North Castle Planning Board or North Castle Building Department  
Town of North Castle, 17 Bedford Road, Armonk, New York 10504

Tracking # _____	For Office Use Only	Permit # _____
Date: ____ / ____ / ____		Fee: \$ _____
		Date Issued: ____ / ____ / ____

I. IDENTIFICATION OF APPLICANT Date 11/05/20

Owner: Scott Univer n/a

Phone: 914-417-7828 Email: Suniver6@gmail.com

Address: 88 Whippoorwill Rd. E  
Armonk, NY 10504

Applicant (if other than owner): NYS Solar Farm, Inc.

Phone: 845-256-6051 Email: Kathy@nyssf.com

Address: 1938 Route 44-55  
Modena, NY 12548

Company Removing Trees: No Trees being removed - PV Solar Panel Install - Roof Mounted System

Phone: \_\_\_\_\_ Email: \_\_\_\_\_

Address: \_\_\_\_\_

COST OF TREE REMOVAL \$ \_\_\_\_\_

Applicant SIGNATURE: [Signature]

OWNER SIGNATURE: n/a

IF DIFFERENT THAN OWNER

2. IDENTIFICATION OF SUBJECT PROPERTY

Address: 88 Whippoorwill Rd. E, Armonk, NY 10504

Abutting Street(s): Whippoorwill Road

Tax Map Designation - Section/Block/Lot: 107.02-2-38

3. TYPE OF PROPOSED ACTIVITY No Tree Removal - PV Solar Panel Install - Roof Mounted System

Removal of a tree within a property's regulated setback zone or landscape buffer zone

Removal of a Significant Tree

Removal of any tree in wetlands, within clearing lines, or Conservation Easements

Clearing/Thinning

Removal of a Significant Tree Removal of any street tree within the Right of Way

Removal in any calendar year of more than ten (10) trees on any lot

Removal of a dangerous/hazardous tree

4. SITE PLAN OR MAP SKETCH

Please provide a copy of a site plan, if available, or a detailed map sketch with subject tree(s) to be removed clearly identified. Existing trees within the area of disturbance should be graphically depicted as being removed or remaining. Trees to be preserved should be graphically depicted as receiving tree protection measures. Each tree within the area of disturbance should be identified with a unique ID number on the site plan. In addition to the graphical depiction of each tree, a Tree Inventory should be submitted. The Tree Inventory should include the Unique ID Number, Species, Size (DBH), Health Condition, and removal status of all trees within the disturbance area.

Note: Copies of tax maps of the property are available in the Assessor's Office.

5. TREE REMOVAL DESCRIPTION (INCLUDE HOW MANY TREES WILL BE REMOVED)

No trees being removed. This is a PV Solar Panel Install - Roof Mounted System

6. INSURANCE & HOME IMPROVEMENT LICENSE

Worker's Comp 01/01/21 (Exp. Date) Liability 11/05/21 (Exp. Date) Waiver \_\_\_\_\_ (Exp. Date)

(Please have the Town of North Castle listed as the certificate holder)

A Westchester  
this application

County Home Improvement License must be submitted with  
for it to be deemed complete.

7. FUTURE PLANS

Do you have any intention of doing any site work other than tree removal?

Yes  No PV Solar Panel Install - Roof Mounted System

Application No: \_\_\_\_\_  
Fee: \_\_\_\_\_ Date: \_\_\_\_\_

## ADMINISTRATIVE WETLAND PERMIT APPLICATION

### TOWN OF NORTH CASTLE

17 Bedford Road  
Armonk, New York 10504

#### Project Information

Project Address: 88 Whippoorwill Rd. E, Armonk, NY 10504

Sheet: \_\_\_\_\_ Block: \_\_\_\_\_ Lot(s): \_\_\_\_\_ Zoning District: \_\_\_\_\_ Lot Area: \_\_\_\_\_

Project Description (identify the improvements proposed within the wetland/wetland buffer):  
PV Solar Panel Installation - Roof Mounted System

#### Owner/Agent Information

Owner/Agent Name: NYS Solar Farm, Inc. Phone: 845-256-6051

Owner/Agent Address: 1938 Route 44-55 Modena, NY 12548 Email: kathy@nyssf.com

#### To Be Completed By Owner/Applicant

- Date of RPRC Review: to be determined by town
- Is the project located within the NYCDEP Watershed?  Yes  No
- Total area of proposed disturbance:  < 5,000 s.f.  5,000 s.f. - < 1 acre  ≥ 1 acre - Roof Mounted PV Solar Panel Install
- Total area of wetland: \_\_\_\_\_ and/or wetland buffer disturbance: \_\_\_\_\_
- Total area of mitigation: none  
 Plantings  Invasive species removal/monitoring  No-mow zone  
 Prohibition of pesticides/herbicides  Other \_\_\_\_\_
- Does the proposed action require any other permits/approvals from other agencies/Departments? no  
 Planning Board  Town Board  Zoning Board of Appeals  Building Department  
 Town Highway  Tree Removal  Sediment & Erosion Control  Floodplain Activity  
 NYSDEC SWPPP/NOI,  NYSDEC Wetland  NYCDEP  WCDOH  NYS DOT
- Requested waivers: \_\_\_\_\_

Note: Initially, all applications shall be submitted with three sets of plans that illustrate the existing conditions (2' contours, well, SSDS, structures, etc.) and proposed improvements. Said plan must include a line which encircles the total area of proposed land disturbance and the approximate area of disturbance must be calculated (square feet).

Mitigation for proposed impacts within the regulated area must be provided. The Town Wetland Consultant may require additional materials, information, reports and plans, as determined necessary, to review and evaluate the proposed action. Application materials outlined under §209-6 of the Town Code must be submitted, unless waived. Pursuant to §209-6D, the applicant shall be responsible for the reimbursement of consultant services related to the

## TOWN OF NORTH CASTLE ENVIRONMENTAL QUESTIONNAIRE

The purpose of this Questionnaire is to determine whether a Town Wetland Permit/Coverage under the NYSDEC SPDES General Permit for Stormwater Discharges is required. This form does not provide authorization to commence work.

### Project Information

Project Address: 88 Whippoorwill Rd. E, Armonk, NY 10504

Sheet: 107.02 Block: 2 Lot(s): 38

Project Description: PV Solar Panel Install - Roof Mounted System

Note: This questionnaire must be accompanied with a Plot Plan that clearly illustrates the location and dimensions of the proposed activity. Said Plot Plan must include a line which encircles the total area of proposed land disturbance and the approximate area of disturbance must be calculated (square feet). Failure to submit these items will delay review.

### Owner's Information

Owner's Name: Scott Univer Phone: 914-417-7828

Owner's Address: 88 Whippoorwill Rd. E, Armonk, NY 10504


### Authorized Agent's Information (if applicable)

Agent's Name: A. Sicari, Jr. NYS Solar Farm, Inc. Phone: 845-256-6051

Agent's Address: 1938 Route 44-55  
Modena, NY 12548

As the owner/agent (circle one), I hereby state that to the best of my knowledge, the information provided herein is accurate. In addition, I hereby grant permission to the Town's professional consultants to enter onto my property to conduct a site inspection.

Owner/Agent Name (print): Anthony S. Sicari, Jr. NYS Solar Farm, Inc.

Owner/Agent Name (signature):  Date: 11/6/20

FOR TOWN USE - PLEASE DO NOT WRITE BELOW THIS LINE

1. The existing/proposed use is:  Residential  Nonresidential
2. Is a Town Wetland Permit required?  Yes  No
3. Date of RPRC Review: \_\_\_\_\_
4. If Yes, what type of Wetland Permit is required?  Administrative  Planning Board
5. Reason why a Wetland Permit is required: \_\_\_\_\_

---

6. Is the project located within the NYCDEP Watershed?  Yes  No
7. Area of proposed disturbance:  < 5,000 s.f.  5,000 s.f. - < 1 acre  ≥ 1 acre

SUNPOWER®

by New York State Solar Farm

**NEW YORK STATE SOLAR FARM 1938 STATE ROUTE 44/55, MODENA, NY 12548**

UNIVERSAL NEW YORK PROPERTY OWNER'S ENDORSEMENT  
(Person applying for building permit is not the property owner)

State of New York county of Westchester --I hereby certify that

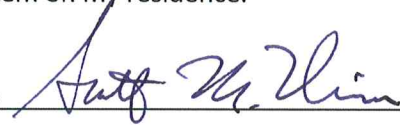
I, Scott Univer am the owner in fee of

88 Whipoorwill Rd. E, Armonk, NY 10504 (address) in the Town of

North Castle.

I also hereby authorize Anthony S. Sicari, Jr. of SunPower by New York State Solar Farm, Inc. to apply for, file, and receive permit(s) to perform the installation of a photovoltaic system on my residence.

Owner Signature



Date

11/7/20

**SunPower® by New York State Solar Farm**

**SunPower® Master Dealer**

**Solar System Design and Installation**

1938 Rt. 44/55, Modena, NY 12548 Tel: 845-255-0610 Email: [info@nyssf.com](mailto:info@nyssf.com)



**JOB APPLICATION**

**STATE WIDE INSPECTION SERVICES, INC.**

*Service With Integrity*

21 Old Main Street, Suite 203, Fishkill; NY 12524  
tel 845.202.7224 fax 914.219.1062 SWISNY.com

Office Use	Elect. Permit #		Date 11/05/20						
	Bldg Permit #		Sq Ft 1490.4 Total						
	Temp #		Roof Array Area						
	Final Certificate #		Utility ID # Con-Ed						
City / Village Armonk	Zip 10504	Township North Castle	County Westchester						
Address 88 Whippoorwill Rd., E	Cross Street Whippoorwill	Section 107.02	Block 2	Lot 38					
Owner Name / Address (if different than above) Scott Univer		Contact Number 845-256-6051							
<input type="checkbox"/> Basement <input type="checkbox"/> 1st Fl. <input type="checkbox"/> 2nd Fl. <input type="checkbox"/> 3rd Fl. <input type="checkbox"/> More Than 3 Fl. <input type="checkbox"/> Garage <input type="checkbox"/> Attic <input checked="" type="checkbox"/> Outside <input checked="" type="checkbox"/> Residential <input type="checkbox"/> Commercial									
Receptacles	Special Recept Amt Amps	GFCI	AFCI	Switches	Dimmers	Smoke Alarms	Carbon Monox	Hood	Trash Compact
Range (s)	Cooktop (s)	Oven (s)	Dishwashers	Refrigerator	Disposal	Microwave	Warm Draw	Features Incandescent   Fluorescent	
<b>SERVICE</b>									
Amperage	Voltage	1P	3P	# Meters	# Disconnect	<input type="checkbox"/> Underground <input type="checkbox"/> Overhead	<input type="checkbox"/> New <input type="checkbox"/> Change	<input type="checkbox"/> Reconnect	
<input type="checkbox"/> Visual Re-Inspection			<input type="checkbox"/> Safety Re-Inspection			<input type="checkbox"/> Re-Inspection			
Additional Information PV Solar Install - Roof Mount System Size: 17.6 kW (32.325 kW w/ Batteries) PV Modules: (55) Sunpower E19-320-E-AC Micro Inverter (55) Branches = 5 E19-320-E-AC 200 Amp Main Service Panel  125A PV Dedicated Panel 1: (1) 15 amp 2 pole breaker (4) 20 amp 2 pole breaker (1) 80 amp 2 pole breaker  100A PV Dedicated Panel 2: (1) 15 amp 2 pole breaker (1) 20 amp 2 pole breaker (1) 60 amp 2 pole breaker  PV Modules- 55 - E19-320-E-AC Inverter - 55 Micro Inverters Load Center- Combiner Box - Monitor- Junction Box- 5 Roof Mounted Disconnect- AC Disconnect- Fused Disconnect- Unfused Disconnect- Production Meter- DC Disconnect									
<small>This application is valid for one (1) year from the date received by SWIS. This application is intended to cover the above listed items to be inspected, if at any time of inspection additional items have been installed, you are authorized to make the inspection and adjust the fee for the additional items inspected. The applicant declares that there is no open applications for the above address with any other inspection company. The applicant, owner or authorized agent agrees to all the above terms and conditions as set forth for the application.</small>									
Inspector	Date Finalized		Inspector #						
Contractor NYS Solar Farm, Inc.	Date 11/05/20		Signature						
Address 1938 Route 44-55	City / State Modena, NY		Zip Code 12548						
License # H/I wc-25236-H12 Elec 800	ID #		Phone # 845-256-6051						



Westchester  
gov.com

George Latimer  
Westchester County Executive

James Maisano  
Director, Consumer Protection

## Department of Consumer Protection Home Improvement License

NEW YORK STATE SOLAR FARM INC.  
871 STATE ROUTE 208  
GARDINER, NY-12525

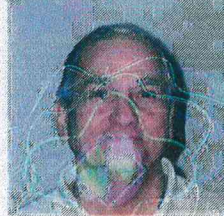
This license is issued in accordance with Article XVI of the Westchester County Consumer Protection Code and is valid only upon  
presence of the official department seal. Proof of citizenship or immigration status is not required for issuance of this license.  
NOT FOR FEDERAL PURPOSES

License Number  
WC-25236-H12

Date of Expiration  
07/26/2022



Westchester County Electrical Licensing Board  
Westchester County Consumer Protection  
**Master Electrician License 2020**



Vincent Ricotta  
D.O.B: 8/18/1940  
Company:  
NYS Solar Farm Inc  
871 State Route 208  
Gardiner, NY 12525

License No. 800  
Expires on:12/31/2020

A handwritten signature in black ink, appearing to read "Peter Borducci".

Peter Borducci

Westchester  
gov.com

George Latimer

Westchester County Executive

WESTCHESTER COUNTY DEPARTMENT OF CONSUMER PROTECTION

WESTCHESTER COUNTY ELECTRICAL LICENSING BOARD

**VINCENT RICOTTA**  
**NYS SOLAR FARM INC**  
**871 STATE ROUTE 208**  
**GARDINER, NY 12525**

Hereby maintains an active **Master Electrician License** in accordance with the Westchester County Electrical License Law and the Rules and Regulations of the Electrical Licensing Board. This license shall remain valid unless modified, suspended or revoked prior to the expiration date below.

License Number: **800**

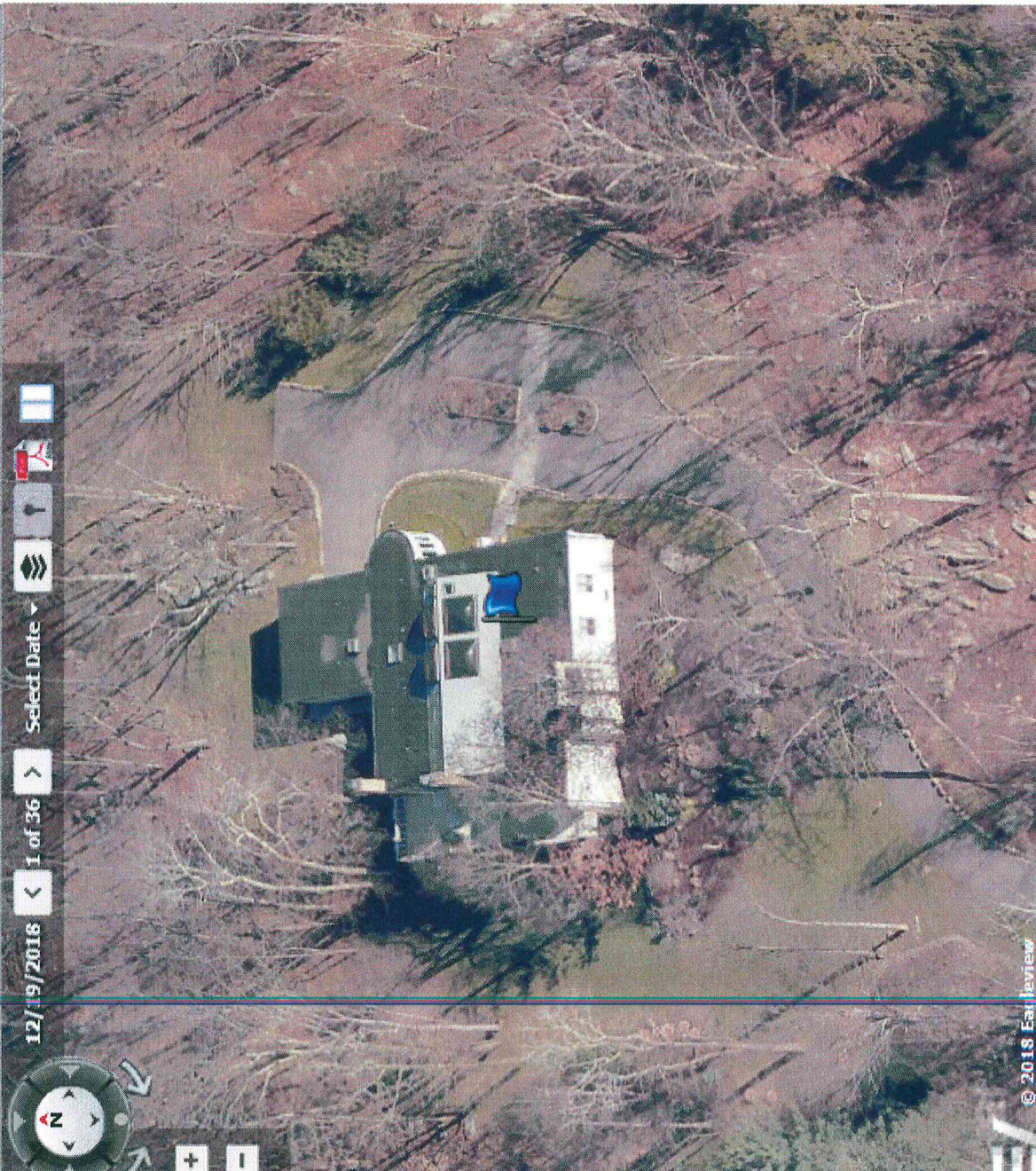
License Expires: **12/31/2020**

Certificate Issued: **10/24/2019**



PEC0E00800



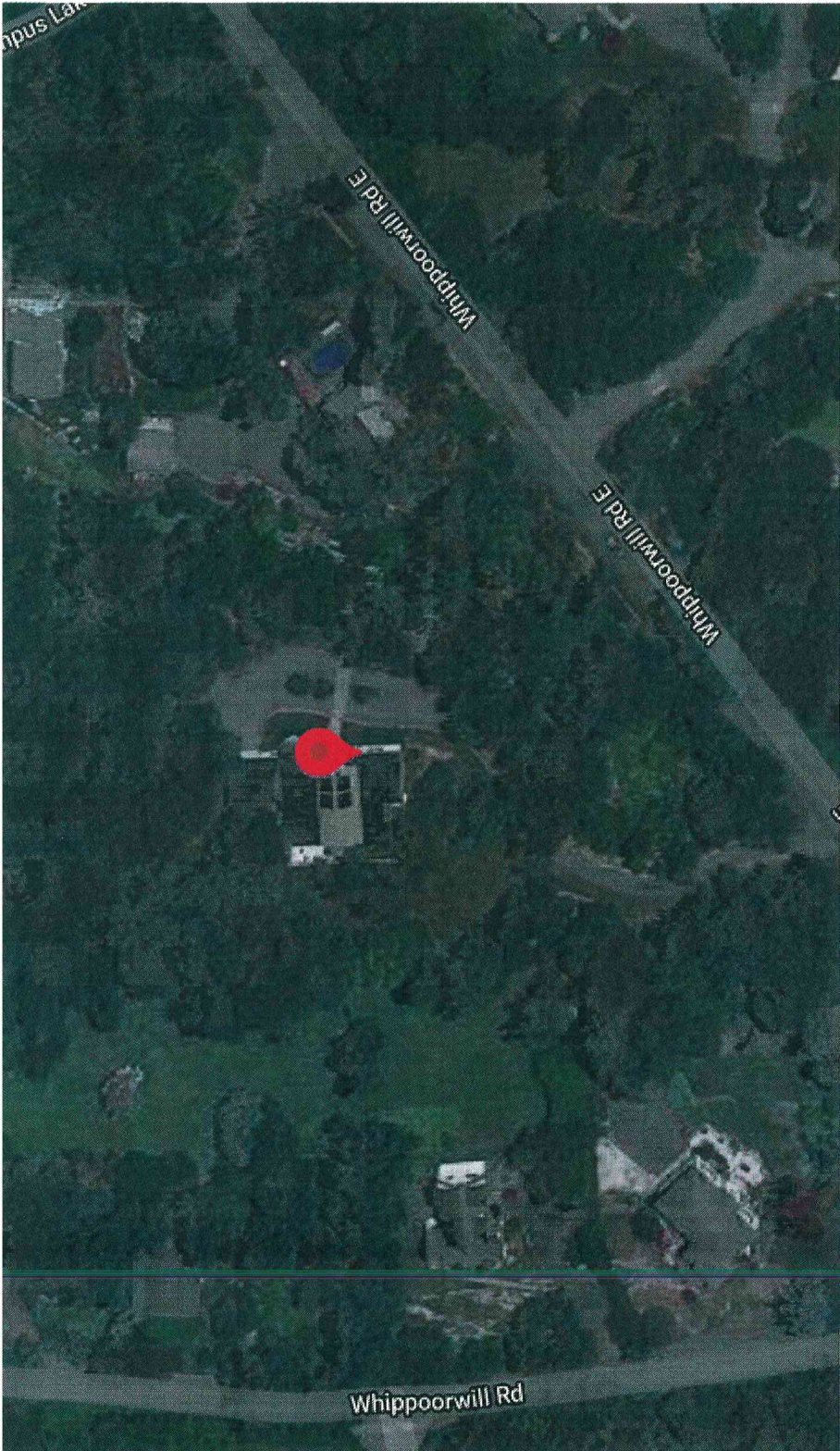


12/19/2018

< 1 of 36 >

Select Date







# CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY)  
11/03/2020

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

**IMPORTANT:** If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must have ADDITIONAL INSURED provisions or be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).


<b>PRODUCER</b> Integrated Brokerage Services, Inc. 303 Sunnyside Blvd Suite 25 Plainview NY 11803	<b>CONTACT NAME:</b> Richard Fenick <b>PHONE (A/C, No, Ext):</b> (516) 997-2900 <b>E-MAIL ADDRESS:</b> richardf@ibsinsurance.com	<b>FAX (A/C, No):</b> (516) 997-2910
	<b>INSURER(S) AFFORDING COVERAGE</b>	
<b>INSURED</b> New York State Solar Farm, Inc 871 State Route 208 Gardiner NY 12525	<b>INSURER A:</b> Westchester Surplus Lines Ins Co <b>INSURER B:</b> United Wisconsin Insurance Company <b>INSURER C:</b> Hartford Fire Insurance Co <b>INSURER D:</b> <b>INSURER E:</b> <b>INSURER F:</b>	<b>NAIC #</b> 10172 29157 19682

**COVERAGES**      **CERTIFICATE NUMBER:** CL2011318385      **REVISION NUMBER:**

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSD	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS
A	<input checked="" type="checkbox"/> COMMERCIAL GENERAL LIABILITY <input type="checkbox"/> CLAIMS-MADE <input checked="" type="checkbox"/> OCCUR GEN'L AGGREGATE LIMIT APPLIES PER: <input checked="" type="checkbox"/> POLICY <input type="checkbox"/> PRO-JECT <input type="checkbox"/> LOC OTHER:			G71201600003	11/05/2020	11/05/2021	EACH OCCURRENCE \$ 1,000,000 DAMAGE TO RENTED PREMISES (Ea occurrence) \$ 50,000 MED EXP (Any one person) \$ 5,000 PERSONAL & ADV INJURY \$ 1,000,000 GENERAL AGGREGATE \$ 2,000,000 PRODUCTS - COMP/OP AGG \$ 2,000,000
	<b>AUTOMOBILE LIABILITY</b> <input type="checkbox"/> ANY AUTO <input type="checkbox"/> OWNED AUTOS ONLY <input type="checkbox"/> SCHEDULED AUTOS NON-OWNED AUTOS ONLY <input type="checkbox"/> HIRED AUTOS ONLY						COMBINED SINGLE LIMIT (Ea accident) \$ BODILY INJURY (Per person) \$ BODILY INJURY (Per accident) \$ PROPERTY DAMAGE (Per accident) \$
	<input type="checkbox"/> UMBRELLA LIAB <input type="checkbox"/> OCCUR <input type="checkbox"/> EXCESS LIAB <input type="checkbox"/> CLAIMS-MADE DED    RETENTION \$						EACH OCCURRENCE \$ AGGREGATE \$
B	<b>WORKERS COMPENSATION AND EMPLOYERS' LIABILITY</b> ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? (Mandatory in NH) If yes, describe under DESCRIPTION OF OPERATIONS below		N/A	WC50600166019SZ	08/14/2020	08/14/2021	<input checked="" type="checkbox"/> PER STATUTE <input type="checkbox"/> OTH-ER E.L. EACH ACCIDENT \$ 1,000,000 E.L. DISEASE - EA EMPLOYEE \$ 1,000,000 E.L. DISEASE - POLICY LIMIT \$ 1,000,000
C	Contractor's Equipment - Installation Floater			12MSBI5789K1	11/05/2020	11/05/2021	Any one premises: \$150,000

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)

<b>CERTIFICATE HOLDER</b> Town of North Castle 17 Bedford Road Armonk NY 10504	<b>CANCELLATION</b> SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS. AUTHORIZED REPRESENTATIVE 
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CERTIFICATE OF NYS WORKERS' COMPENSATION INSURANCE COVERAGE

<p>1a. Legal Name &amp; Address of Insured (use street address only)</p> <p>New York State Solar Farm Inc 871 State Route 208 Gardiner, NY 12525</p> <p>Work Location of Insured (Only required if coverage is specifically limited to certain locations in New York State, i.e., a Wrap-Up Policy)</p>	<p>1b. Business Telephone Number of Insured</p> <p>845-255-0610</p> <p>1c. NYS Unemployment Insurance Employer Registration Number of Insured</p> <p>1d. Federal Employer Identification Number of Insured or Social Security Number</p> <p>320239169</p>
<p>2. Name and Address of Entity Requesting Proof of Coverage (Entity Being Listed as the Certificate Holder)</p> <p>Town of North Castle 17 Bedford Road Armonk, NY 10504</p>	<p>3a. Name of Insurance Carrier</p> <p>United Wisconsin Insurance Company</p> <p>3b. Policy Number of Entity Listed in Box "1a"</p> <p>WC506-00166-020-SZ</p> <p>3c. Policy effective period</p> <p>1/1/2020 to 1/1/2021</p> <p>3d. The Proprietor, Partners or Executive Officers are</p> <p><input type="checkbox"/> included. (Only check box if all partners/officers included)</p> <p><input checked="" type="checkbox"/> all excluded or certain partners/officers excluded.</p>

This certifies that the insurance carrier indicated above in box "3" insures the business referenced above in box "1a" for workers' compensation under the New York State Workers' Compensation Law. (To use this form, New York (NY) must be listed under Item 3A on the INFORMATION PAGE of the workers' compensation insurance policy). The Insurance Carrier or its licensed agent will send this Certificate of Insurance to the entity listed above as the certificate holder in box "2".

The insurance carrier must notify the above certificate holder and the Workers' Compensation Board within 10 days IF a policy is canceled due to nonpayment of premiums or within 30 days IF there are reasons other than nonpayment of premiums that cancel the policy or eliminate the insured from the coverage indicated on this Certificate. (These notices may be sent by regular mail.) Otherwise, this Certificate is valid for one year after this form is approved by the insurance carrier or its licensed agent, or until the policy expiration date listed in box "3c", whichever is earlier.

This certificate is issued as a matter of information only and confers no rights upon the certificate holder. This certificate does not amend, extend or alter the coverage afforded by the policy listed, nor does it confer any rights or responsibilities beyond those contained in the referenced policy.

This certificate may be used as evidence of a Workers' Compensation contract of insurance only while the underlying policy is in effect.

Please Note: Upon cancellation of the workers' compensation policy indicated on this form, if the business continues to be named on a permit, license or contract issued by a certificate holder, the business must provide that certificate holder with a new Certificate of Workers' Compensation Coverage or other authorized proof that the business is complying with the mandatory coverage requirements of the New York State Workers' Compensation Law.

Under penalty of perjury, I certify that I am an authorized representative or licensed agent of the insurance carrier referenced above and that the named insured has the coverage as depicted on this form.

Approved by: Alicia Christiansen (Print name of authorized representative or licensed agent of insurance carrier)

Approved by: Alicia Christiansen (Signature) 1-3-2020 (Date)

Title: Assistant Director of Sales Operations

Telephone Number of authorized representative or licensed agent of insurance carrier: 941-306-3077

Please Note: Only insurance carriers and their licensed agents are authorized to issue Form C-105.2. Insurance brokers are NOT authorized to issue it.



# CERTIFICATE OF INSURANCE COVERAGE DISABILITY AND PAID FAMILY LEAVE BENEFITS LAW

**PART 1. To be completed by Disability and Paid Family Leave Benefits Carrier or Licensed Insurance Agent of that Carrier**

<p>1a. Legal Name &amp; Address of Insured (use street address only) NEW YORK STATE SOLAR FARM, INC.  1938 ROUTE 44/55 MODENA, NY 12548  Work Location of Insured (Only required if coverage is specifically limited to certain locations in New York State, i.e., Wrap-Up Policy)</p>	<p>1b. Business Telephone Number of Insured 518-610-8164  1c. Federal Employer Identification Number of Insured or Social Security Number 320239169</p>
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<p>2. Name and Address of Entity Requesting Proof of Coverage (Entity Being Listed as the Certificate Holder) Town of North Castle  17 Bedford Road Armonk, NY 10504</p>	<p>3a. Name of Insurance Carrier <b>ShelterPoint Life Insurance Company</b>  3b. Policy Number of Entity Listed in Box "1a" DBL362330  3c. Policy effective period 07/15/2019 to 07/14/2021</p>
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4. Policy provides the following benefits:

- A. Both disability and paid family leave benefits.
- B. Disability benefits only.
- C. Paid family leave benefits only.

5. Policy covers:

- A. All of the employer's employees eligible under the NYS Disability and Paid Family Leave Benefits Law.
- B. Only the following class or classes of employer's employees:

Under penalty of perjury, I certify that I am an authorized representative or licensed agent of the insurance carrier referenced above and that the named insured has NYS Disability and/or Paid Family Leave Benefits insurance coverage as described above.

Date Signed 7/8/2020 By   
(Signature of insurance carrier's authorized representative or NYS Licensed Insurance Agent of that insurance carrier)

Telephone Number 516-829-8100 Name and Title Richard White, Chief Executive Officer

**IMPORTANT:** If Boxes 4A and 5A are checked, and this form is signed by the insurance carrier's authorized representative or NYS Licensed Insurance Agent of that carrier, this certificate is COMPLETE. Mail it directly to the certificate holder.

If Box 4B, 4C or 5B is checked, this certificate is NOT COMPLETE for purposes of Section 220, Subd. 8 of the NYS Disability and Paid Family Leave Benefits Law. It must be mailed for completion to the Workers' Compensation Board, Plans Acceptance Unit, PO Box 5200, Binghamton, NY 13902-5200.

**PART 2. To be completed by the NYS Workers' Compensation Board (Only if Box 4C or 5B of Part 1 has been checked)**

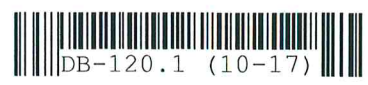
**State of New York  
Workers' Compensation Board**

According to information maintained by the NYS Workers' Compensation Board, the above-named employer has complied with the NYS Disability and Paid Family Leave Benefits Law with respect to all of his/her employees.

Date Signed \_\_\_\_\_ By \_\_\_\_\_  
(Signature of Authorized NYS Workers' Compensation Board Employee)

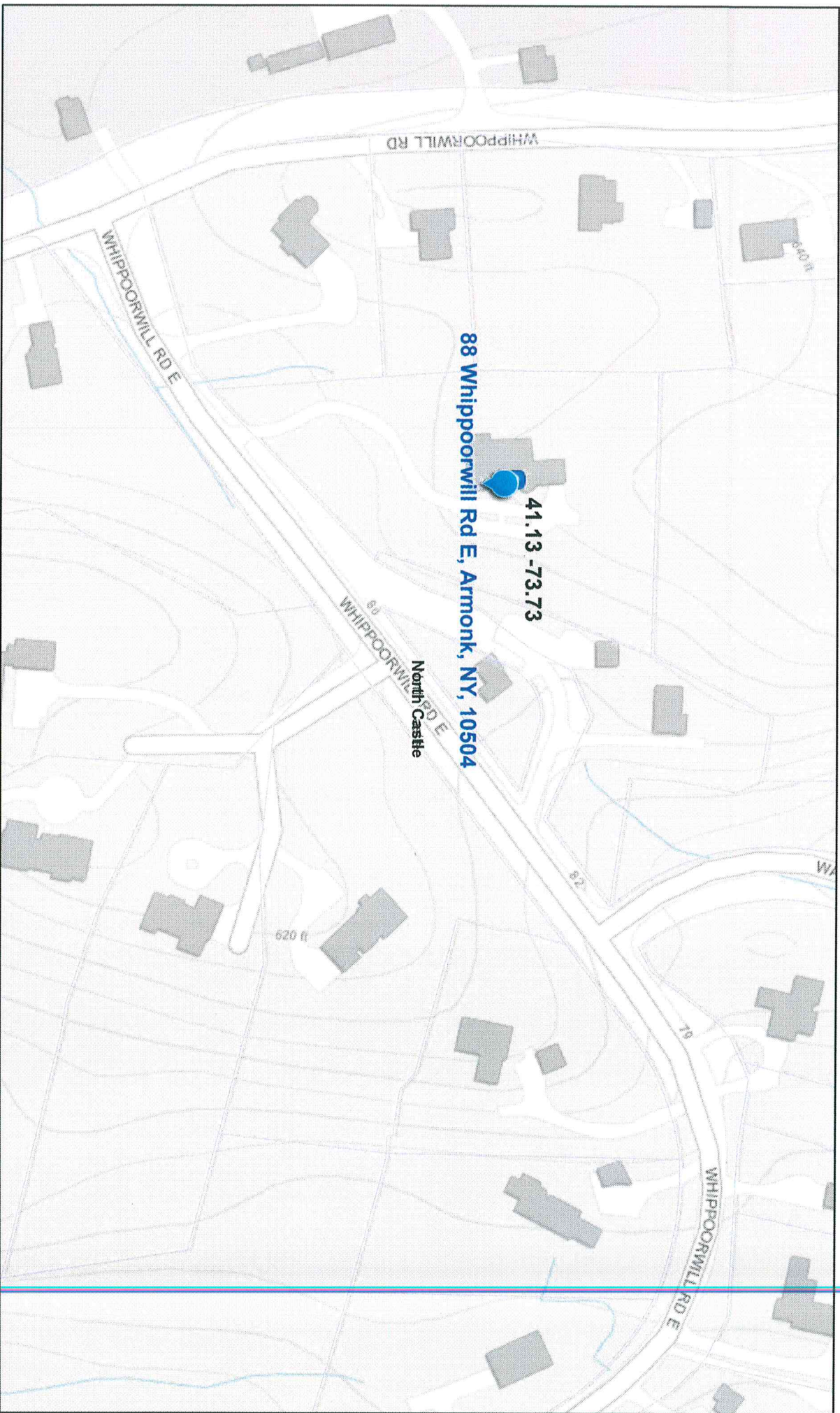
Telephone Number \_\_\_\_\_ Name and Title \_\_\_\_\_

**Please Note:** Only insurance carriers licensed to write NYS disability and paid family leave benefits insurance policies and NYS licensed insurance agents of those insurance carriers are authorized to issue Form DB-120.1. Insurance brokers are NOT authorized to issue this form.





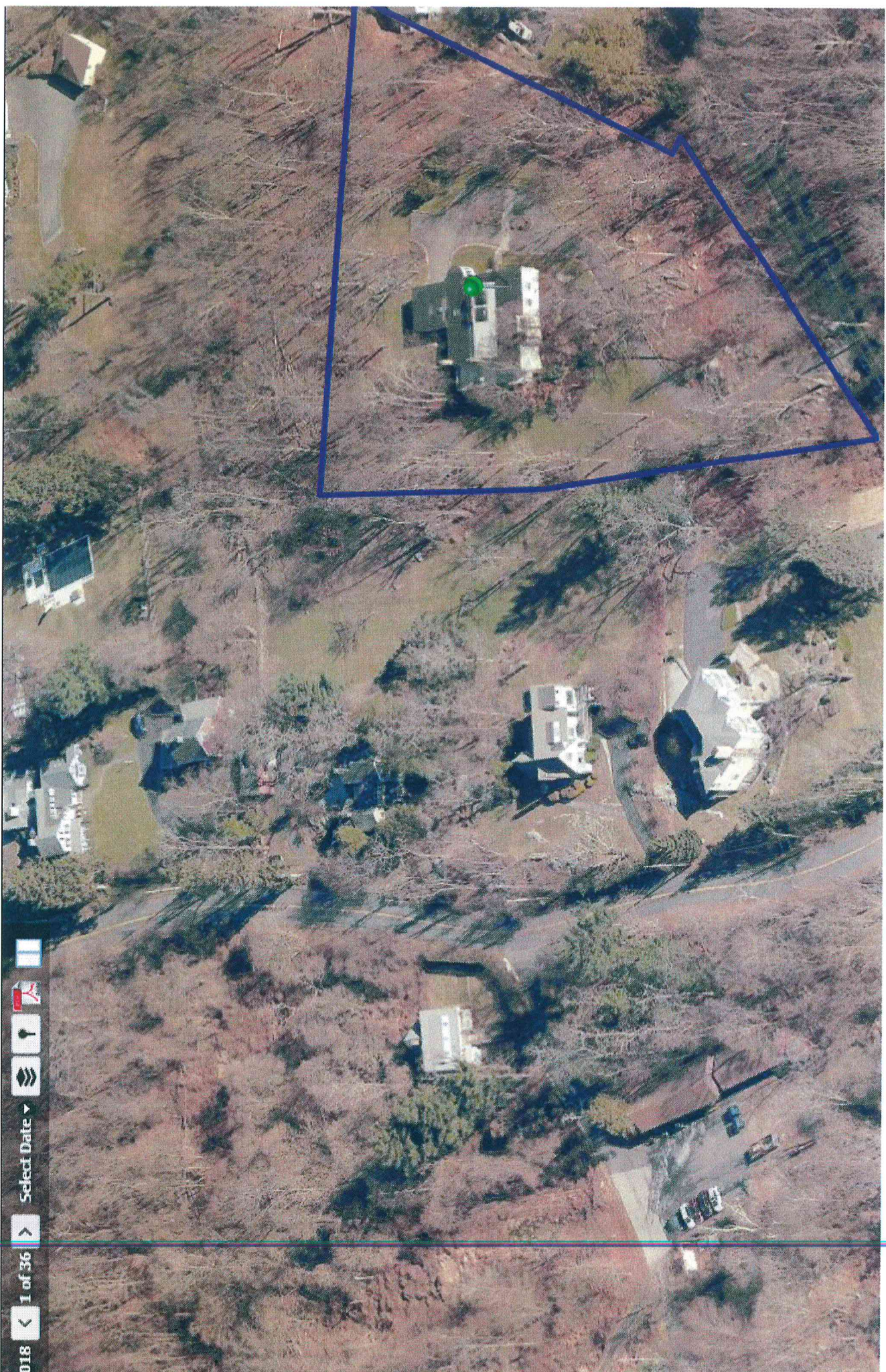
# Mapping Westchester County



District Boundaries  
Municipal Boundaries



Go to Location (Latitude, Longitude):



**Current Occupant**  
100 WHIPPOORWILL RD E  
ARMONK, NY 10504

**Current Occupant**  
54 WHIPPOORWILL RD  
ARMONK, NY 10504

**Current Occupant**  
88 WHIPPOORWILL RD E  
ARMONK, NY 10504

**Current Occupant**  
3 LEDGEWOOD PL  
ARMONK, NY 10504

**Current Occupant**  
52 WHIPPOORWILL RD  
ARMONK, NY 10504

**Current Occupant**  
82 WHIPPOORWILL RD E  
ARMONK, NY 10504