



## HISTORIC PRESERVATION COMMISSION

Marc Elrich  
*County Executive*

Sandra I. Heiler  
*Chairman*

Date: February 21, 2020

### MEMORANDUM

TO: Hadi Mansouri  
Department of Permitting Services

FROM: Dan Bruechert  
Historic Preservation Section  
Maryland-National Capital Park & Planning Commission

SUBJECT: Historic Area Work Permit #900839: Solar Panels

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The Montgomery County Historic Preservation Commission (HPC) has reviewed the attached application for a Historic Area Work Permit (HAWP). This application was **approved** at the February 12, 2020 HPC meeting.

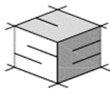
The HPC staff has reviewed and stamped the attached construction drawings.

THE BUILDING PERMIT FOR THIS PROJECT SHALL BE ISSUED CONDITIONAL UPON ADHERENCE TO THE ABOVE APPROVED HAWP CONDITIONS AND MAY REQUIRE APPROVAL BY DPS OR ANOTHER LOCAL OFFICE BEFORE WORK CAN BEGIN.

Applicant: Sonja Price  
Address: 7420 Maple Avenue, Takoma Park

This HAWP approval is subject to the general condition that the applicant will obtain all other applicable Montgomery County or local government agency permits. After the issuance of these permits, the applicant must contact this Historic Preservation Office if any changes to the approved plan are made. Once work is complete the applicant will contact Dan Bruechert at 301.563.3400 or [dan.bruechert@montgomeryplanning.org](mailto:dan.bruechert@montgomeryplanning.org) to schedule a follow-up site visit.





**Sustainable Energy Systems, LLC**

4509 Metropolitan Court  
Frederick, MD 21704  
Attn: Mr. Rollie Bells

December 4, 2019

Re: 7420 Maple Avenue – Takoma Park, MD 20912  
Structural Certification.

**JUAN  
UTRERA**

Digitally signed  
by JUAN UTRERA  
Date: 2019.12.04  
10:28:14 -05'00'

Mr. Bells:

In accordance with your request I, Juan Utrera P.E. acting as an independent structural engineer for the project, located on 7420 Maple Avenue – Takoma Park, MD 20912, have reviewed the information provided by Sustainable Energy Systems, LLC for the installation of solar panels on the existing roof system.

The proposed solar panels will add an additional 3 PSF of dead load to the roof framing system; the solar panels are to be supported using the Everest Cross Rail System and the L-Mount fastened to the existing roof framing at 72" O.C. maximum.

**Conclusions & Recommendations:**

**Roof 1:**

The existing roof rafters spaced @ 16" O.C. are structurally sound to support the additional 3 PSF imposed by the solar panels. Please note that at 9.08 SF per mount location the rafters can support the 272 pounds of snow load imposed by the design ground snow load of 30 PSF.

**Roof 2:**

The existing roof rafters spaced @ 16" O.C. are structurally sound to support the additional 3 PSF imposed by the solar panels. Please note that at 6.05 SF per mount location the rafters can support the 182 pounds of snow load imposed by the design ground snow load of 30 PSF.

**Roof 3:**

The existing roof rafters spaced @ 16" O.C. are structurally sound to support the additional 3 PSF imposed by the solar panels. Please note that at 6.75 SF per mount location the rafters can support the 202 pounds of snow load imposed by the design ground snow load of 30 PSF.

**Roof 4:**

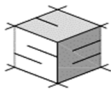
The existing roof rafters spaced @ 16" O.C. are structurally sound to support the additional 3 PSF imposed by the solar panels. Please note that at 8.63 SF per mount location the rafters can support the 259 pounds of snow load imposed by the design ground snow load of 30 PSF.

**Roof 5:**

The existing roof rafters spaced @ 16" O.C. are structurally sound to support the additional 3 PSF imposed by the solar panels. Please note that at 7.47 SF per mount location the rafters can support the 224 pounds of snow load imposed by the design ground snow load of 30 PSF.

**Roof 6:**

The existing roof rafters spaced @ 16" O.C. are structurally sound to support the additional 3 PSF imposed by the solar panels. Please note that at 8.27 SF per mount location the rafters can support the 248 pounds of snow load imposed by the design ground snow load of 30 PSF.



**Roof 7:**

The existing roof rafters spaced @ 16" O.C. are structurally sound to support the additional 3 PSF imposed by the solar panels. Please note that at 7.14 SF per mount location the rafters can support the 214 pounds of snow load imposed by the design ground snow load of 30 PSF.

The proposed solar panel collectors and the Everest Cross Rail System to support the collectors comply with the 2015 International Building Code (IBC) and the Uniform Solar Energy Code. The mounting hardware will work well with the existing roof framing.

Should you have any questions regarding the information submitted, or if I can be of further assistance please call me at (301) 748-2769.

Sincerely,

Juan M. Utrera, P.E.  
President



12/04/2019

Professional Certification: I hereby certify that these documents were prepared or approved by me, and that I am a professional engineer duly licensed under the laws of the State of Maryland.  
License No. 24518      Expiration Date: 9/21/2021

APPROVED  
Montgomery County  
Historic Preservation Commission  
  
*Sandra L. Heiler*

**REVIEWED**  
By Dan.Bruechert at 3:30 pm, Feb 21, 2020



PO BOX 1340  
FREDERICK, MD 21702-0340 (301)788-4003 [WWW.SUSTAINABLEENERGYSYSTEMS.NET](http://WWW.SUSTAINABLEENERGYSYSTEMS.NET)

Project: Ward Solar Project Property Owner: Sonja Prince Ward

Address: 7420 Maple Avenue, Takoma Park, MD, 20912

I reviewed the design of the photovoltaic (PV) system, as designed by the manufacturer, and the design criteria utilized for the mounting equipment and panel mounting assembly (rack system) for the installation of 53 panels supported by the rack system, as shown on the drawings prepared for the above referenced address. I certify that the configurations and design criteria meet the standards and requirements of the International Residential Code (IRC) and the International Existing Building Code (IEBC) adopted by Montgomery County in COMCOR 08.00.02.

The attachment of the rack system to the building at the above address, including the location, number, and type of the attachment points; the number of fasteners per attachment point; and the specific type of fasteners (size, diameter, length, minimum embedment into structural framing etc.) meets the standards and requirements of the IRC and IEBC adopted by Montgomery County in COMCOR 08.00.02.

I evaluated the existing roof structure of the building at the above address and analyzed its capacity to support the additional loads imposed by the PV system. I certify that no structural modifications of the existing roof structure are required. The existing roof structure meets the standards and requirements of the IRC and IEBC, adopted by Montgomery County in COMCOR 08.00.02, necessary to support the PV system.


I evaluated the existing roof structure of the building at the above address and analyzed its capacity to support the additional loads imposed by the PV system. Structural modifications of the existing roof structure are required. I certify that the roof structure, as modified on the drawings for this project, will support the additional loads imposed by the PV system. I further certify that design of the modified roof structure meets the standards and requirements of the IRC and IEBC, adopted by Montgomery County in COMCOR 08.00.02.

I prepared or approved the construction documents for the mounting equipment, rack system, roof structure for this project.

24518

Maryland PE License

Date: 12-04-2019

Signature: 

JUAN  
UTRERA

Digitally signed  
by JUAN UTRERA  
Date: 2019.12.04  
10:28:35 -05'00'



12/04/2019

Professional Certification: I hereby certify that these documents were prepared or approved by me, and that I am a professional engineer duly licensed under the laws of the State of Maryland.  
License No. 24518 Expiration Date: 9/21/2021



PO BOX 1340  
FREDERICK, MD 21702-0340 (301)788-4003 [WWW.SUSTAINABLEENERGYSYSTEMS.NET](http://WWW.SUSTAINABLEENERGYSYSTEMS.NET)

Property Owner's Name: Sonja Prince Ward

Property Owner's Address: 7420 Maple Ave Takoma Park MD 20712

I certify that:

I prepared or approved the electrical drawings and related documents for the photovoltaic (PV) system at the above location.

The design of the PV system, and all electrical installations and equipment, meets the standards and requirements of the National Electrical Code as adopted by Montgomery County in COMCOR 17.02.01.

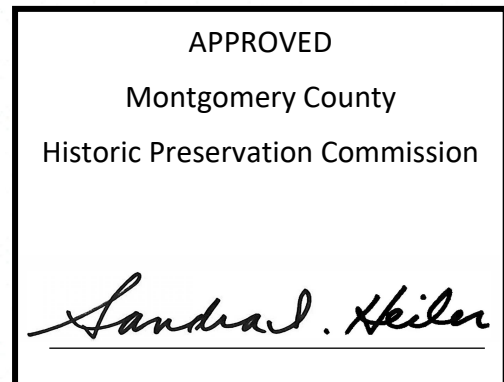
I reviewed and completed the *Worksheet for PV System* which was attached to the permit application for the PV system at the above location

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Montgomery County Master Electrician License Number: ME203184

Date: 12/11/2019

Signature: 



# City of Takoma Park

## Housing and Community Development Department

Main Office 301-891-7119  
Fax 301-270-4568  
[www.takomaparkmd.gov](http://www.takomaparkmd.gov)



7500 Maple Avenue  
Takoma Park, MD 20912

### MUNICIPALITY LETTER

December 4, 2019

**To:** Sonja Prince Ward [sonprnc@aol.com](mailto:sonprnc@aol.com)

**To:** Department of Permitting Services  
255 Rockville Pike, 2<sup>nd</sup> Floor  
Rockville, Maryland 20850-4166 Fax 240-777-6398; 240-777-6262; 240-777-6223

**From:** Planning and Development Services Division

### **THIS IS NOT A PERMIT – For Informational Purposes Only**

VALID FOR ONE YEAR FROM DATE OF ISSUE

The property owner is responsible for obtaining all required permits from Montgomery County and the City of Takoma Park. If this property is in the **Takoma Park Historic District**, it is subject to Montgomery County Historic Preservation requirements.

**Representative/email:** Sylvia Weber, [permitting@sustainableenergysystems.net](mailto:permitting@sustainableenergysystems.net) 301-788-4003

**Location of Project:** 7420 Maple Avenue, Takoma Park, MD 20912

**Proposed Scope of Work:** Installing 53 roof mounted solar panels, 16.695 kW

The purpose of this municipality letter is to inform you that the City of Takoma Park has regulations and city permit requirements that may apply to your project. This municipality letter serves as notification that, in addition to all Montgomery County requirements, you are required to comply with all City permitting requirements, including:

- Tree Impact Assessment/Tree Protection Plan
- Stormwater management
- City Right of Way

Failure to comply with these requirements could result in the issuance of a Stop Work Order and other administrative actions within the provisions of the law. Details of Takoma Park's permit requirements are attached on page 2.

The issuance of this letter does not indicate approval of the project nor does it authorize the property owner to proceed with the project. The City retains the right to review and comment on project plans during the Montgomery County review process.

# City Of Takoma Park



## The City of Takoma Park permits for the following issues:

### **Tree Impact Assessment/Tree Protection Plan/Tree Removal Application:**

Construction activities that occur within 50 feet of any urban forest tree (7 5/8" in diameter or greater), located on the property or on an adjacent property, may require a Tree Impact Assessment and Tree Protection Plan. Make sure to submit a Tree Impact Assessment and schedule a site visit with the City's Urban Forest Manager if any urban forest tree will be impacted by the proposed construction. The removal of any urban forest tree will require a tree removal application. The tree ordinance is detailed in the City Code, section 12.12. For permit information check: <https://takomaparkmd.gov/services/permits/tree-permits/> The City's Urban Forest Manager can be reached at 301-891-7612 or [janvz@takomaparkmd.gov](mailto:janvz@takomaparkmd.gov)

### **Stormwater Management:**

If you plan to develop or redevelop property, you may be required to provide appropriate stormwater management measures to control or manage runoff, as detailed in City Code section 16.04. All commercial or institutional development in the city must apply for Stormwater Management Permit regardless of the size of the land disturbance. Additions or modifications to existing detached single-family residential properties do not require a Stormwater Management permit if the project does not disturb more than 5,000 square feet of land area. For more information: <https://takomaparkmd.gov/government/public-works/stormwater-management-program/>. The City Engineer should be contacted to determine if a City permit is required at 301-891-7620.

### **City Right of Way:**

- To place a **construction dumpster or storage container** temporarily on a City right of way (usually an adjacent road), you will need to obtain a permit. A permit is not required if the dumpster is placed in a privately-owned driveway or parking lot.
- If you plan to install a new **driveway apron**, or enlarge or replace an existing driveway apron, you need a Driveway Apron Permit.
- If you plan to construct a **fence** in the City right of way, you need to request a Fence Agreement. If approved, the Agreement will be recorded in the Land Records of Montgomery County.

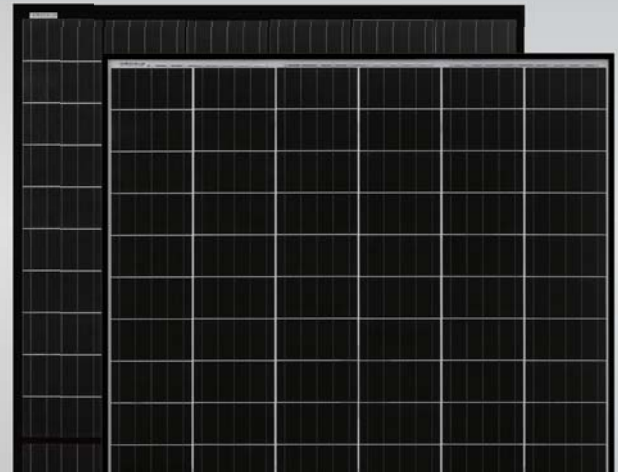
For more information and applications for City permits, see <https://takomaparkmd.gov/services/permits/> or contact the Takoma Park Department of Public Works at 301-891-7633.

**Failure to comply with the City's permitting requirements could result in the issuance of a Stop Work Order and other administrative actions within the provisions of the law.**

# Eagle HC 60M G2 315-335 Watt

MONO PERC HALF CELL MODULE

Positive power tolerance of 0~+3%



## KEY FEATURES



### Diamond Cell Technology

Uniquely designed high performance 5 busbar mono PERC half cell



### Higher Module Power

Decrease in current loss yields higher module efficiency



### Shade Tolerance

More shade tolerance due to twin arrays



### PID FREE

Reinforced cell prevents potential induced degradation



### Strength and Durability

Certified for high snow (5400Pa) and wind (2400 Pa) loads

- ISO9001:2008 Quality Standards
- ISO14001:2004 Environmental Standards
- OHSAS18001 Occupational Health & Safety Standards
- IEC61215, IEC61730 certified products
- UL1703 certified products

Nomenclature:

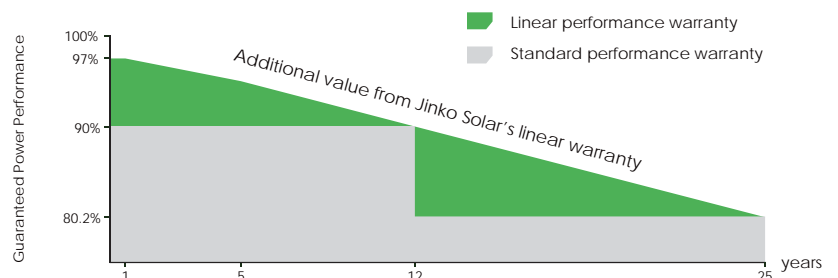
**JKM335M-60HBL**

Code	Cell	Code	Backsheet	Code	Cell
null	Full	null	White	null	Normal
H	Half	B	Black	L	Diamond



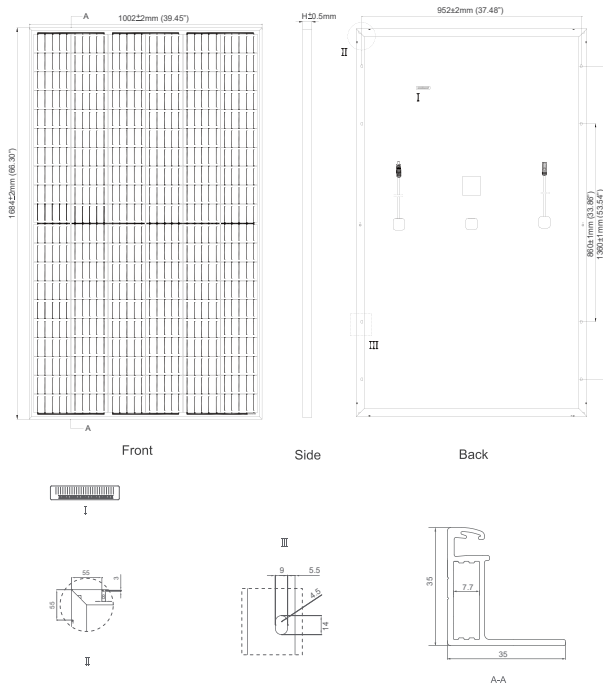
## LINEAR PERFORMANCE WARRANTY

10 Year Product Warranty • 25 Year Linear Power Warranty





## Engineering Drawings

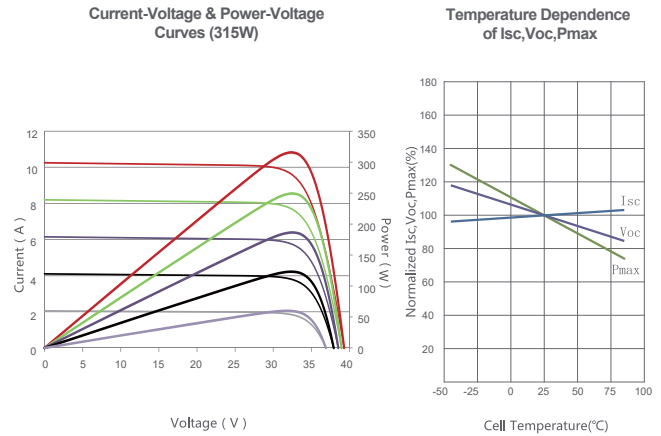


## Packaging Configuration

( Two pallets = One stack )

30pcs/pallet, 60pcs/stack, 780pcs/40'HQ Container

## Electrical Performance & Temperature Dependence



## Mechanical Characteristics

Cell Type	Mono PERC Diamond Cell (158.75 x 158.75 mm)
No. of Half-cells	120 (6×20)
Dimensions	1684×1002×35mm (66.30×39.45×1.38 inch)
Weight	19.0 kg (41.9 lbs)
Front Glass	3.2mm, Anti-Reflection Coating, High Transmission, Low Iron, Tempered Glass
Frame	Anodized Aluminum Alloy
Junction Box	IP67 Rated
Output Cables	12AWG, Anode 1525mm (60.04 in), Cathode 1525mm (60.04 in) or Customized Length
Fire Type	Type 1

## SPECIFICATIONS

Module Type	JKM315M-60HL		JKM320M-60HL		JKM325M-60HL		JKM330M-60HL		JKM335M-60HL	
	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT
Maximum Power (Pmax)	315Wp	235Wp	320Wp	239Wp	325Wp	242Wp	330Wp	246Wp	335Wp	250Wp
Maximum Power Voltage (Vmp)	33.2V	31.2V	33.4V	31.4V	33.6V	31.6V	33.8V	31.8V	34.0V	32.0V
Maximum Power Current (Imp)	9.49A	7.56A	9.59A	7.62A	9.68A	7.66A	9.77A	7.74A	9.87A	7.82A
Open-circuit Voltage (Voc)	40.7V	37.6V	40.9V	37.8V	41.1V	38.0V	41.3V	38.2V	41.5V	38.4V
Short-circuit Current (Isc)	10.04A	8.33A	10.15A	8.44A	10.20A	8.54A	10.31A	8.65A	10.36A	8.74A
Module Efficiency STC (%)	18.67%		18.96%		19.26%		19.56%		19.85%	
Operating Temperature (°C)	-40°C~+85°C									
Maximum System Voltage	1000VDC(UL)/1000VDC(IEC)									
Maximum Series Fuse Rating	20A									
Power Tolerance	0~+3%									
Temperature Coefficients of Pmax	-0.36%/°C									
Temperature Coefficients of Voc	-0.28%/°C									
Temperature Coefficients of Isc	0.048%/°C									
Nominal Operating Cell Temperature (NOCT)	45±2°C									

STC: Irradiance 1000W/m<sup>2</sup> Cell Temperature 25°C AM=1.5

NOCT: Irradiance 800W/m<sup>2</sup> Ambient Temperature 20°C AM=1.5 Wind Speed 1m/s

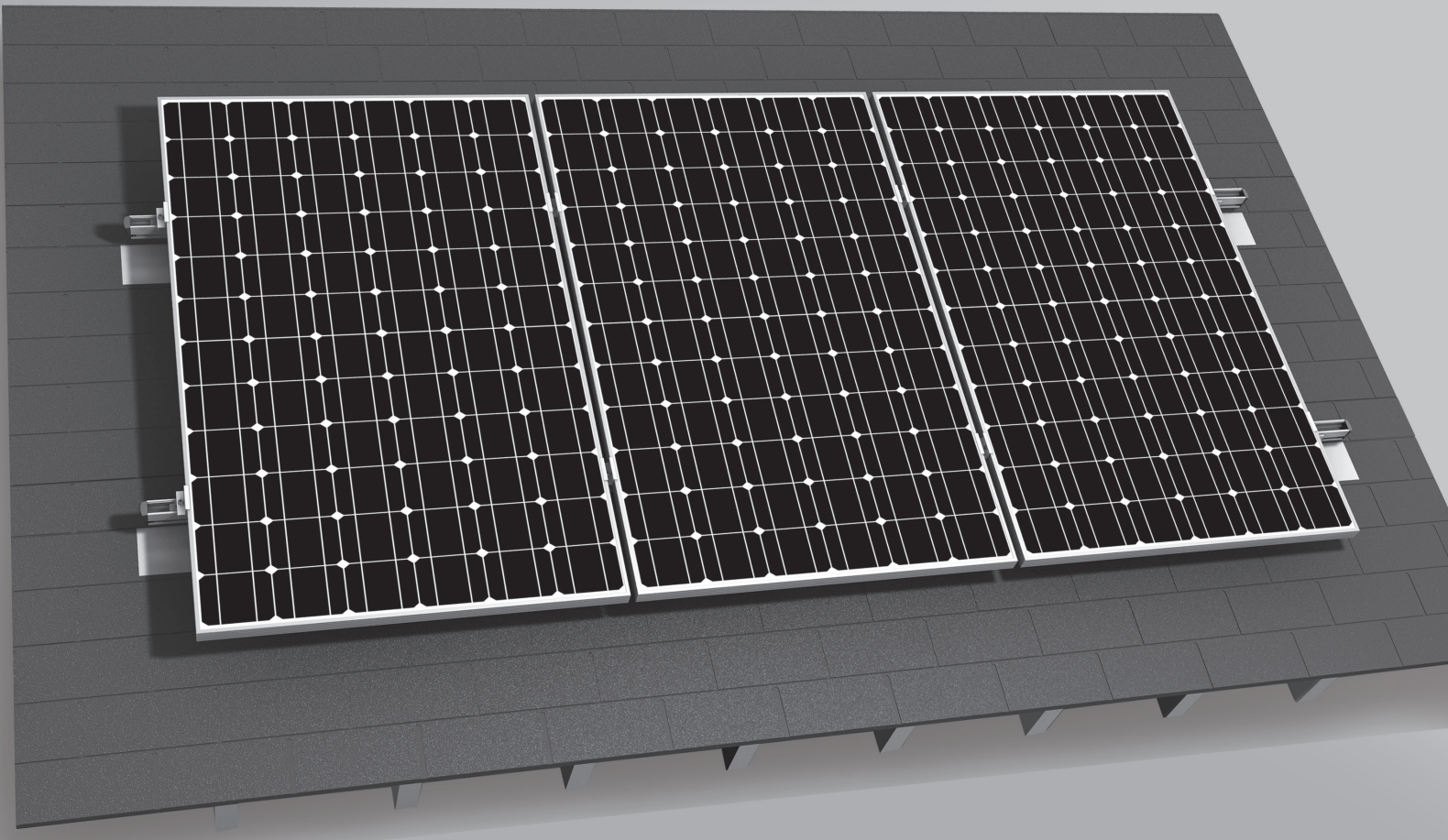
\* Power measurement tolerance: ± 3%

CAUTION: READ SAFETY AND INSTALLATION INSTRUCTIONS BEFORE USING THE PRODUCT.

© Jinko Solar Co., Ltd. All rights reserved. Specifications included in this datasheet are subject to change without notice.  
JKM315-335M-60HL-A1-US



# CrossRail System



- ▶ High quality, German-engineered system optimized for residential installation
- ▶ MK3 mounting hardware simplifies module installation - fast, easy and secure
- ▶ Easily integrates with third party roof attachment products
- ▶ L-Foot provides adjustability and compatibility with common roof types
- ▶ 100% code compliant, structural validation for all solar states
- ▶ 3 rail sizes available to suit all structural conditions
- ▶ Most components also available in dark anodized color
- ▶ Fast installation with minimal component count result in low total installed cost
- ▶ Simple to design using our code compliant Everest Online Design Tool



## Components



CrossRail 48-X/48-XL/80



Rail Connector 48-X/48-XL



Mid Clamp



End Clamp



Yeti Clamp



WEEB Lug



L-Foot, Slotted Set



Aluminum End Clamp Set



eComp Kit

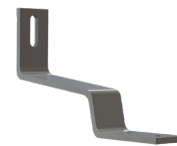
## Attachments



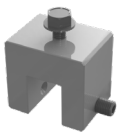
Tile Hook 35



SingleHook



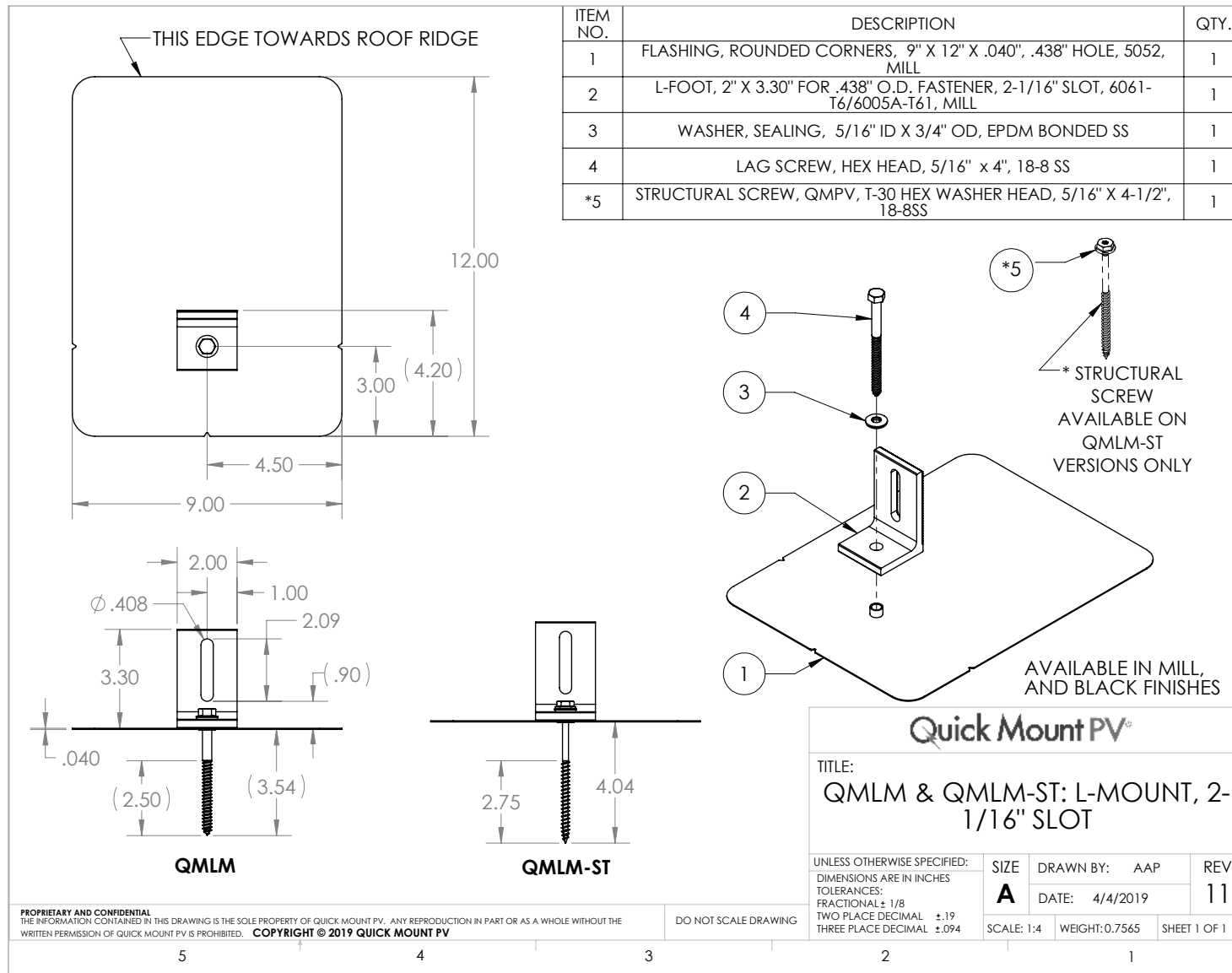
Flat Tile Hook



Standing Seam PowerClamp

# L-Mount | QMLM / QMLM-ST

Elevated Water Seal Technology®



# Single Phase Inverter with HD-Wave Technology

for North America

SE3000H-US / SE3800H-US / SE5000H-US / SE6000H-US /  
SE7600H-US / SE10000H-US / SE11400H-US



## Optimized installation with HD-Wave technology

- / Specifically designed to work with power optimizers
- / Record-breaking efficiency
- / Fixed voltage inverter for longer strings
- / Integrated arc fault protection and rapid shutdown for NEC 2014 and 2017, per article 690.11 and 690.12
- / UL1741 SA certified, for CPUC Rule 21 grid compliance
- / Extremely small
- / Built-in module-level monitoring
- / Outdoor and indoor installation
- / Optional: Revenue grade data, ANSI C12.20 Class 0.5 (0.5% accuracy)

# / Single Phase Inverter with HD-Wave Technology for North America

SE3000H-US / SE3800H-US / SE5000H-US / SE6000H-US/  
SE7600H-US / SE10000H-US / SE11400H-US

SE3000H-US SE3800H-US SE5000H-US SE6000H-US SE7600H-US SE10000H-US SE11400H-US

OUTPUT									
Rated AC Power Output	3000	3800 @ 240V 3300 @ 208V	5000	6000 @ 240V 5000 @ 208V	7600	10000	11400 @ 240V 10000 @ 208V	VA	
Maximum AC Power Output	3000	3800 @ 240V 3300 @ 208V	5000	6000 @ 240V 5000 @ 208V	7600	10000	11400 @ 240V 10000 @ 208V	VA	
AC Output Voltage Min.-Nom.-Max. (211 - 240 - 264)	✓	✓	✓	✓	✓	✓	✓	Vac	
AC Output Voltage Min.-Nom.-Max. (183 - 208 - 229)	-	✓	-	✓	-	-	✓	Vac	
AC Frequency (Nominal)	59.3 - 60 - 60.5 <sup>(1)</sup>							Hz	
Maximum Continuous Output Current @240V	12.5	16	21	25	32	42	47.5	A	
Maximum Continuous Output Current @208V	-	16	-	24	-	-	48.5	A	
GFDI Threshold	1							A	
Utility Monitoring, Islanding Protection, Country Configurable Thresholds	Yes								
INPUT									
Maximum DC Power @240V	4650	5900	7750	9300	11800	15500	17650	W	
Maximum DC Power @208V	-	5100	-	7750	-	-	15500	W	
Transformer-less, Ungrounded	Yes								
Maximum Input Voltage	480							Vdc	
Nominal DC Input Voltage	380				400			Vdc	
Maximum Input Current @240V <sup>(2)</sup>	8.5	10.5	13.5	16.5	20	27	30.5	Adc	
Maximum Input Current @208V <sup>(2)</sup>	-	9	-	13.5	-	-	27	Adc	
Max. Input Short Circuit Current	45							Adc	
Reverse-Polarity Protection	Yes								
Ground-Fault Isolation Detection	600k $\Omega$ Sensitivity								
Maximum Inverter Efficiency	99	99.2						%	
CEC Weighted Efficiency	99						99 @ 240V 98.5 @ 208V	%	
Nighttime Power Consumption	< 2.5							W	
ADDITIONAL FEATURES									
Supported Communication Interfaces	RS485, Ethernet, ZigBee (optional), Cellular (optional)								
Revenue Grade Data, ANSI C12.20	Optional <sup>(3)</sup>								
Rapid Shutdown - NEC 2014 and 2017 690.12	Automatic Rapid Shutdown upon AC Grid Disconnect								
STANDARD COMPLIANCE									
Safety	UL1741, UL1741 SA, UL1699B, CSA C22.2, Canadian AFCI according to T.I.L. M-07								
Grid Connection Standards	IEEE1547, Rule 21, Rule 14 (HI)								
Emissions	FCC Part 15 Class B								
INSTALLATION SPECIFICATIONS									
AC Output Conduit Size / AWG Range	1" Maximum / 14-6 AWG				1" Maximum /14-4 AWG				
DC Input Conduit Size / # of Strings / AWG Range	1" Maximum / 1-2 strings / 14-6 AWG				1" Maximum / 1-3 strings / 14-6 AWG				
Dimensions with Safety Switch (HxWxD)	17.7 x 14.6 x 6.8 / 450 x 370 x 174				21.3 x 14.6 x 7.3 / 540 x 370 x 185				in / mm
Weight with Safety Switch	22 / 10		25.1 / 11.4		26.2 / 11.9		38.8 / 17.6		lb / kg
Noise	< 25				< 50				dBA
Cooling	Natural Convection								
Operating Temperature Range	-13 to +140 / -25 to +60 <sup>(4)</sup> (-40°F / -40°C option) <sup>(5)</sup>							°F / °C	
Protection Rating	NEMA 4X (Inverter with Safety Switch)								

<sup>(1)</sup> For other regional settings please contact SolarEdge support

<sup>(2)</sup> A higher current source may be used; the inverter will limit its input current to the values stated

<sup>(3)</sup> Revenue grade inverter P/N: SExxxH-US000NNC2

<sup>(4)</sup> For power de-rating information refer to: <https://www.solaredge.com/sites/default/files/se-temperature-derating-note-na.pdf>

<sup>(5)</sup> -40 version P/N: SExxxH-US000NNU4

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# Power Optimizer

For North America

P320 / P340 / P370 / P400 / P405 / P505

POWER OPTIMIZER



## PV power optimization at the module-level

- Specifically designed to work with SolarEdge inverters
- Up to 25% more energy
- Superior efficiency (99.5%)
- Mitigates all types of module mismatch losses, from manufacturing tolerance to partial shading
- Flexible system design for maximum space utilization
- Fast installation with a single bolt
- Next generation maintenance with module-level monitoring
- Meets NEC requirements for arc fault protection (AFCI) and Photovoltaic Rapid Shutdown System (PVRSS)
- Module-level voltage shutdown for installer and firefighter safety

# / Power Optimizer

## For North America

P320 / P340 / P370 / P400 / P405 / P505

Optimizer model (typical module compatibility)	P320 (for 60-cell modules)	P340 (for high-power 60-cell modules)	P370 (for higher-power 60 and 72-cell modules)	P400 (for 72 & 96-cell modules)	P405 (for thin film modules)	P505 (for higher current modules)	
<b>INPUT</b>							
Rated Input DC Power <sup>(1)</sup>	320	340	370	400	405	505	W
Absolute Maximum Input Voltage (Voc at lowest temperature)	48		60	80	125 <sup>(2)</sup>		Vdc
MPPT Operating Range	8 - 48		8 - 60	8 - 80	12.5 - 105		Vdc
Maximum Short Circuit Current (Isc)	11			10.1		14	Adc
Maximum DC Input Current	13.75			12.63		17.5	Adc
Maximum Efficiency	99.5						%
Weighted Efficiency	98.8					98.6	%
Overvoltage Category	II						
<b>OUTPUT DURING OPERATION (POWER OPTIMIZER CONNECTED TO OPERATING SOLAREEDGE INVERTER)</b>							
Maximum Output Current	15						Adc
Maximum Output Voltage	60			85			Vdc
<b>OUTPUT DURING STANDBY (POWER OPTIMIZER DISCONNECTED FROM SOLAREEDGE INVERTER OR SOLAREEDGE INVERTER OFF)</b>							
Safety Output Voltage per Power Optimizer	1 ± 0.1						Vdc
<b>STANDARD COMPLIANCE</b>							
EMC	FCC Part15 Class B, IEC61000-6-2, IEC61000-6-3						
Safety	IEC62109-1 (class II safety), UL1741						
RoHS	Yes						
<b>INSTALLATION SPECIFICATIONS</b>							
Maximum Allowed System Voltage	1000						Vdc
Compatible inverters	All SolarEdge Single Phase and Three Phase inverters						
Dimensions (W x L x H)	129 x 153 x 27.5 / 5.1 x 6 x 1.1			129 x 153 x 33.5 / 5.1 x 6 x 1.3	129 x 159 x 49.5 / 5.1 x 6.3 x 1.9	129 x 162 x 59 / 5.1 x 6.4 x 2.3	mm / in
Weight (including cables)	630 / 1.4			750 / 1.7	845 / 1.9	1064 / 2.3	gr / lb
Input Connector	MC4 <sup>(3)</sup>						
Output Wire Type / Connector	Double Insulated; MC4						
Output Wire Length	0.9 / 2.95		1.2 / 3.9				m / ft
Input Wire Length	0.16 / 0.52						m / ft
Operating Temperature Range	-40 - +85 / -40 - +185						°C / °F
Protection Rating	IP68 / NEMA6P						
Relative Humidity	0 - 100						%

<sup>(1)</sup> Rated STC power of the module. Module of up to +5% power tolerance allowed

<sup>(2)</sup> NEC 2017 requires max input voltage be not more than 80V

<sup>(3)</sup> For other connector types please contact SolarEdge

PV System Design Using a SolarEdge Inverter <sup>(4)(5)</sup>	Single Phase HD-Wave	Single phase	Three Phase 208V	Three Phase 480V	
Minimum String Length (Power Optimizers)	P320, P340, P370, P400 P405 / P505	8	10	18	
Maximum String Length (Power Optimizers)		6	8	14	
Maximum String Length (Power Optimizers)		25	25	50 <sup>(6)</sup>	
Maximum Power per String	5700 (6000 with SE7600-US - SE11400-US)	5250	6000 <sup>(7)</sup>	12750 <sup>(8)</sup>	W
Parallel Strings of Different Lengths or Orientations	Yes				

<sup>(4)</sup> For detailed string sizing information refer to: [http://www.solaredge.com/sites/default/files/string\\_sizing\\_na.pdf](http://www.solaredge.com/sites/default/files/string_sizing_na.pdf)

<sup>(5)</sup> It is not allowed to mix P405/P505 with P320/P340/P370/P400 in one string

<sup>(6)</sup> A string with more than 30 optimizers does not meet NEC rapid shutdown requirements; safety voltage will be above the 30V requirement

<sup>(7)</sup> For SE14.4KUS/SE43.2KUS: It is allowed to install up to 6,500W per string when 3 strings are connected to the inverter (3 strings per unit for SE43.2KUS) and when the maximum power difference between the strings is up to 1,000W

<sup>(8)</sup> For SE30KUS/SE33.3KUS/SE66.6KUS/SE100KUS: It is allowed to install up to 15,000W per string when 3 strings are connected to the inverter (3 strings per unit for SE66.6KUS/SE100KUS) and when the maximum power difference between the strings is up to 2,000W



# SOLAR PV PROJECT, WARD, SONJA 16.695 KW

7420 Maple Avenue, Takoma Park, MD, 20912

JUAN  
UTRERA

Digitally signed  
by JUAN UTRERA  
Date: 2019.12.04  
10:27:27 -05'00'



12/04/2019

Professional Certification: I hereby certify that these documents were prepared or approved by me, and that I am a professional engineer duly licensed under the laws of the State of Maryland.  
License No. 24518      Expiration Date: 9/21/2021

DRAWING INDEX	
G000 COVER Z001 SITE PLAN S001 ARRAY LAYOUT S002 SECTION E001 ONE LINE CUTSHEETS  SCOPE OF WORK: Installing 53 Asphalt Roof Mounted Solar Panels - 16.695 kW	
FINANCING:	SUNNOVA
Sales Person Contact:	
Sam Vinton (202) 427-5464	
APPROVED BY:	
Project Manager:	
Kurt Zwally 240-324-6199	

## BOS DRAWINGS



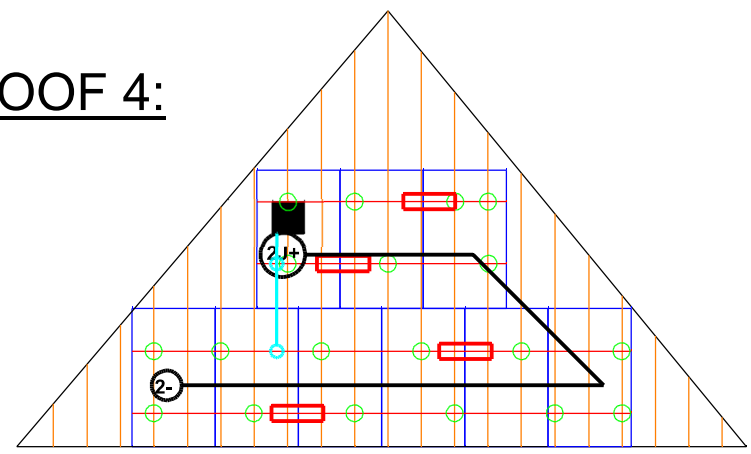
APPROVED  
Montgomery County  
Historic Preservation Commission  
*Sandra L. Heiler*

**REVIEWED**  
By Dan.Bruechert at 3:28 pm, Feb 21, 2020

Roof 1 Specs: Modules : 12 Pitch: 35° Azimuth: 208° Rafter Spacing: 16" O.C.	Roof 2 Specs: Modules : 6 Pitch: 35° Azimuth: 208° Rafter Spacing: 16" O.C.	Roof 3 Specs: Modules : 3 Pitch: 35° Azimuth: 208° Rafter Spacing: 16" O.C.	Roof 4 Specs: Modules : 9 Pitch: 40° Azimuth: 297° Rafter Spacing: 16" O.C.	Roof 5 Specs: Modules : 7 Pitch: 35° Azimuth: 27° Rafter Spacing: 16" O.C.	Roof 6 Specs: Modules : 5 Pitch: 35° Azimuth: 27° Rafter Spacing: 16" O.C.	Roof 7 Specs: Modules : 11 Pitch: 35° Azimuth: 27° Rafter Spacing: 16" O.C.
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APPROVED  
Montgomery County  
Historic Preservation Commission  
*Sandra L. Heiler*

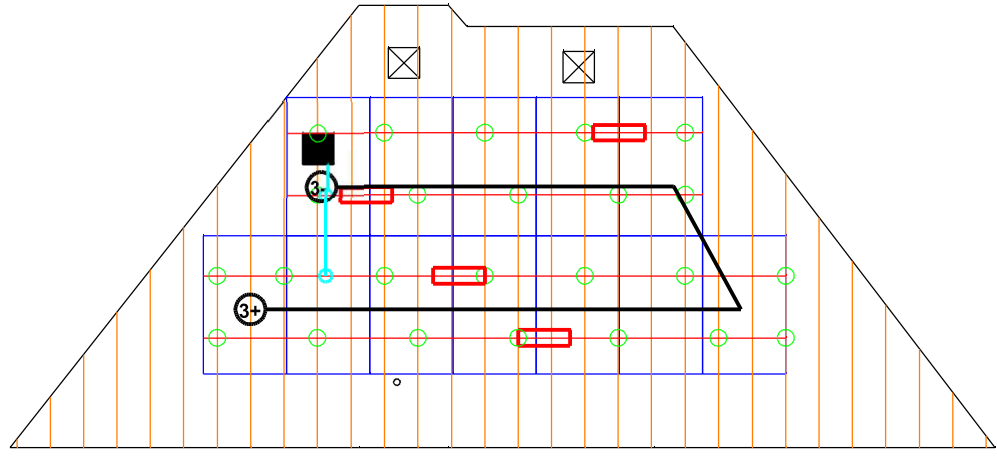
**ROOF 4:**



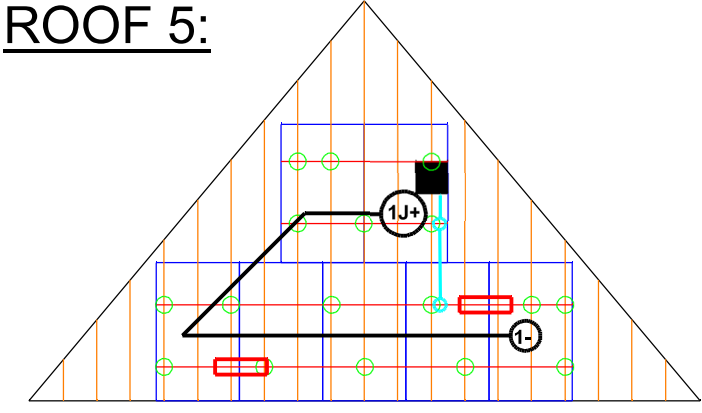
**STRUCTURAL NOTES:**  
1. MOUNTS ARE APPROXIMATE LOCATION BUT ACCURATELY SPACED  
2. MOUNTS SHOULD BE STAGGERED WHEN POSSIBLE TO EVENLY DISTRIBUTE LOAD  
3. DO NOT SPLICE RAILS IN MIDDLE 50% OF SPAN BETWEEN TWO MOUNTS  
4. ON TRUSS ROOF SYSTEMS, KEEP ATTACHMENTS 6" MIN. FROM NAIL PLATES

**REVIEWED**  
By Dan.Bruechert at 3:28 pm, Feb 21, 2020

**ROOF 1:**



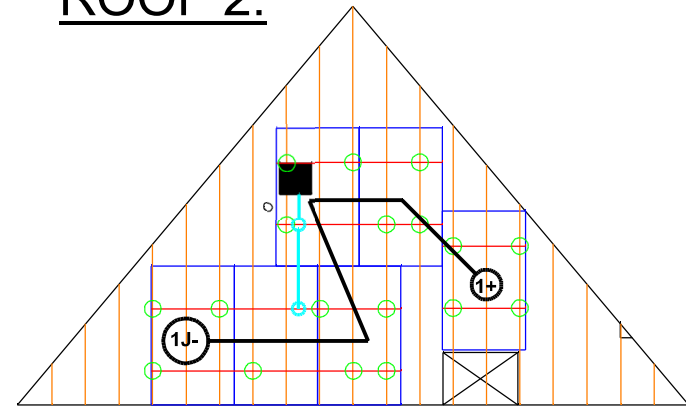
**ROOF 5:**



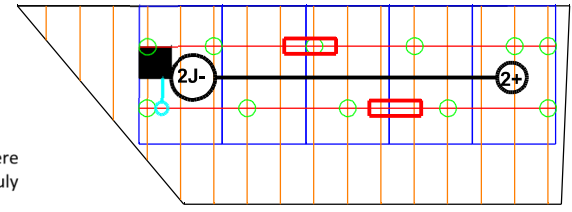
**PV MODULE SPECS:**  
Jinko 315 watt  
Module Weight: 41.9 lbs  
Module Length: 66.3"  
Module Width: 39.45"  
Frame: 1.38" (35mm)

Inverter: (1) SolarEdge SE7600H-US  
String 1- 16 modules  
String 2- 14 modules  
  
Inverter: (2) SolarEdge SE6000H-US  
String 3- 12 modules  
String 4- 11 modules

**ROOF 2:**



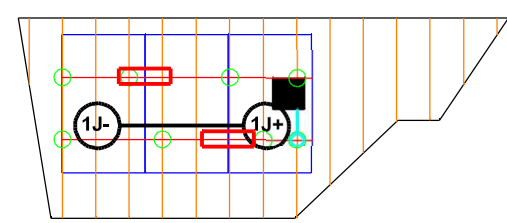
**ROOF 6:**



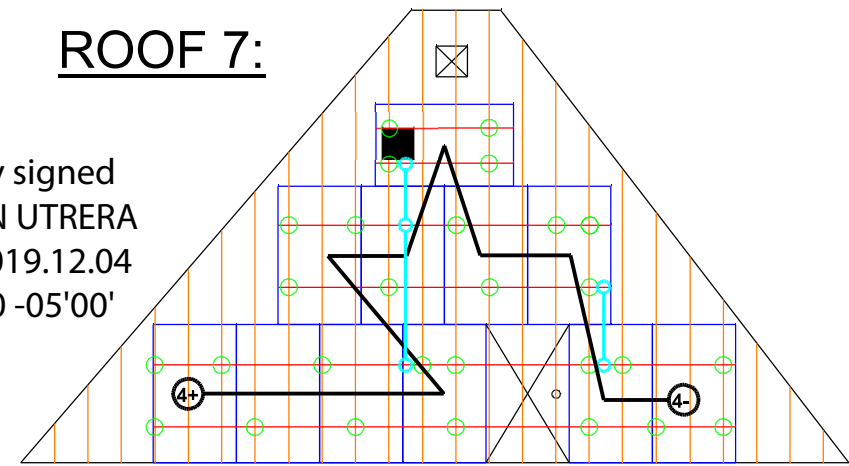
Racking: Everest  
  
Optimizer: SolarEdge P320 (1 per module)

○ Mount: 24+18+8+19+17+11+28=125  
— # of Rails: 27  
— # of Mid Clips: 78      ⊕ String Homerun  
— # of End Clips: 58      ⊕J+ String Jumper  
▭ # of Splices: 14  
● # of Grounding Lugs: 15  
■ J-Box: 7

**ROOF 3:**



**ROOF 7:**



12/04/2019  
Professional Certification: I hereby certify that these documents were prepared or approved by me, and that I am a professional engineer duly licensed under the laws of the State of Maryland.  
License No. 24518      Expiration Date: 9/21/2021

**JUAN UTRERA**  
Digitally signed by JUAN UTRERA  
Date: 2019.12.04 10:27:10 -05'00'

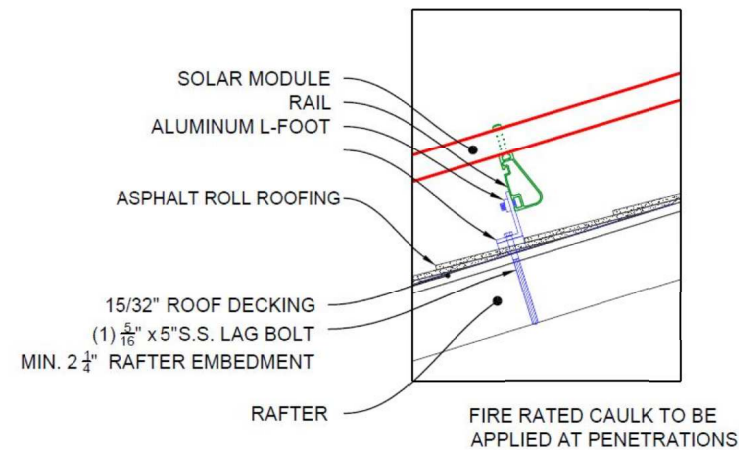
Sonja Ward 16.695 kW  
7420 Maple Avenue  
Takoma Park, MD, 20912  
240-205-6978  
sonprnc@aol.com

Sonja Ward 16.695 kW  
 7420 Maple Avenue  
 Takoma Park, MD, 20912  
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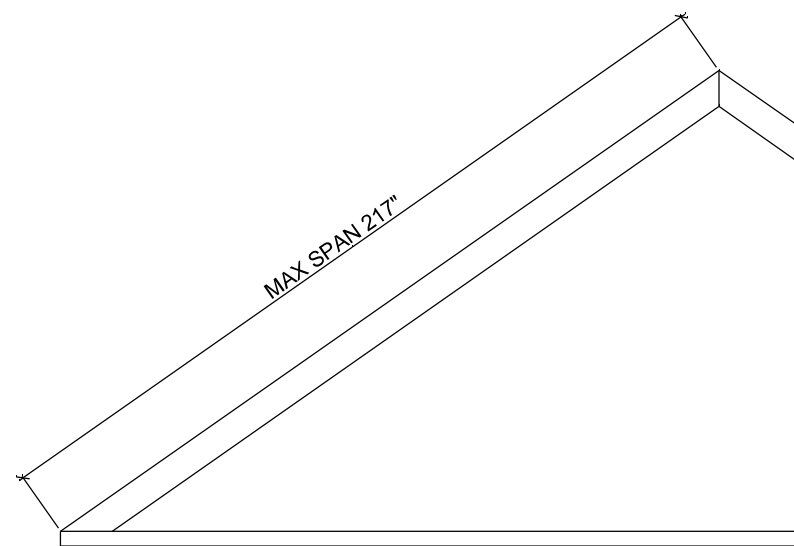
APPROVED  
 Montgomery County  
 Historic Preservation Commission  
*Sandra L. Heiler*

**REVIEWED**  
 By Dan.Bruechert at 3:28 pm, Feb 21, 2020

**PV MODULE SPECS:**  
 Jinko 315 watt  
 Module Weight: 41.9 lbs  
 Module Length: 66.3"  
 Module Width: 39.45"  
 Frame: 1.38" (35mm)



**ROOF :**

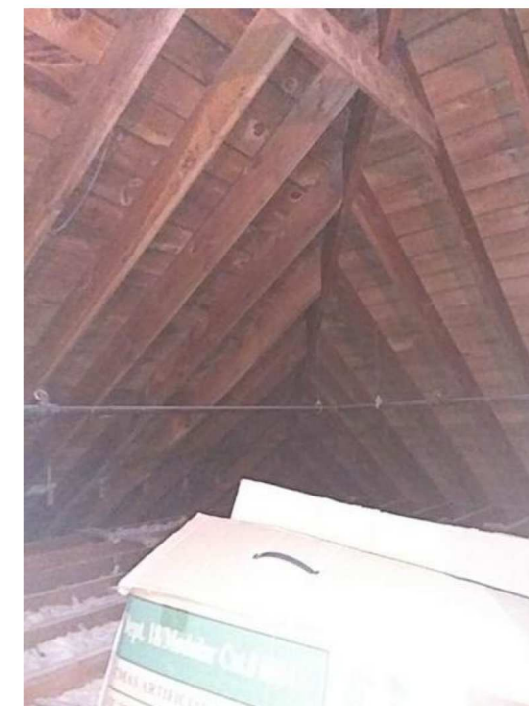


**JUAN UTRERA**  
 Digitally signed by JUAN UTRERA  
 Date: 2019.12.04 10:25:57 -05'00'

**ROOF SPECS :**  
 2 x 8 Rafter  
 Rafter Spacing: 16"  
 Roof Material: Asphalt



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**ARRAY 1 SPECS :**  
 Pitch: 35°  
 Azimuth: 208°  
 # Of Modules: 12  
 Total Module Weight: 502.8 lbs  
 Racking Weight: 70.4 lbs  
 Array Weight: 573.2 lbs  
 Array Area: 218.4 sq.ft.  
 Array Dead Load: 2.6 lbs/sq.ft.  
 Number of Mounts: 24  
 Load Per Mount: 23.9 lbs

**ARRAY 2 SPECS :**  
 Pitch: 35°  
 Azimuth: 208°  
 # Of Modules: 6  
 Total Module Weight: 251.4 lbs  
 Racking Weight: 35.2 lbs  
 Array Weight: 286.6 lbs  
 Array Area: 109.2 sq.ft.  
 Array Dead Load: 2.6 lbs/sq.ft.  
 Number of Mounts: 18  
 Load Per Mount: 15.9 lbs

**ARRAY 3 SPECS :**  
 Pitch: 35°  
 Azimuth: 208°  
 # Of Modules: 3  
 Total Module Weight: 125.7 lbs  
 Racking Weight: 17.6 lbs  
 Array Weight: 143.3 lbs  
 Array Area: 54.6 sq.ft.  
 Array Dead Load: 2.6 lbs/sq.ft.  
 Number of Mounts: 8  
 Load Per Mount: 17.9 lbs

**ARRAY 4 SPECS :**  
 Pitch: 40°  
 Azimuth: 297°  
 # Of Modules: 9  
 Total Module Weight: 377.1 lbs  
 Racking Weight: 52.8 lbs  
 Array Weight: 429.9 lbs  
 Array Area: 163.8 sq.ft.  
 Array Dead Load: 2.6 lbs/sq.ft.  
 Number of Mounts: 19  
 Load Per Mount: 22.6 lbs

**ARRAY 5 SPECS :**  
 Pitch: 35°  
 Azimuth: 27°  
 # Of Modules: 7  
 Total Module Weight: 293.3 lbs  
 Racking Weight: 41.1 lbs  
 Array Weight: 334.4 lbs  
 Array Area: 127.4 sq.ft.  
 Array Dead Load: 2.6 lbs/sq.ft.  
 Number of Mounts: 17  
 Load Per Mount: 19.7 lbs

**ARRAY 6 SPECS :**  
 Pitch: 35°  
 Azimuth: 27°  
 # Of Modules: 5  
 Total Module Weight: 209.5 lbs  
 Racking Weight: 29.3 lbs  
 Array Weight: 238.3 lbs  
 Array Area: 91 sq.ft.  
 Array Dead Load: 2.6 lbs/sq.ft.  
 Number of Mounts: 11  
 Load Per Mount: 21.7 lbs

**ARRAY 7 SPECS :**  
 Pitch: 35°  
 Azimuth: 27°  
 # Of Modules: 11  
 Total Module Weight: 460.9 lbs  
 Racking Weight: 64.5 lbs  
 Array Weight: 525.4 lbs  
 Array Area: 200.2 sq.ft.  
 Array Dead Load: 2.6 lbs/sq.ft.  
 Number of Mounts: 28  
 Load Per Mount: 18.8 lbs

Sustainable Energy Systems, LLC

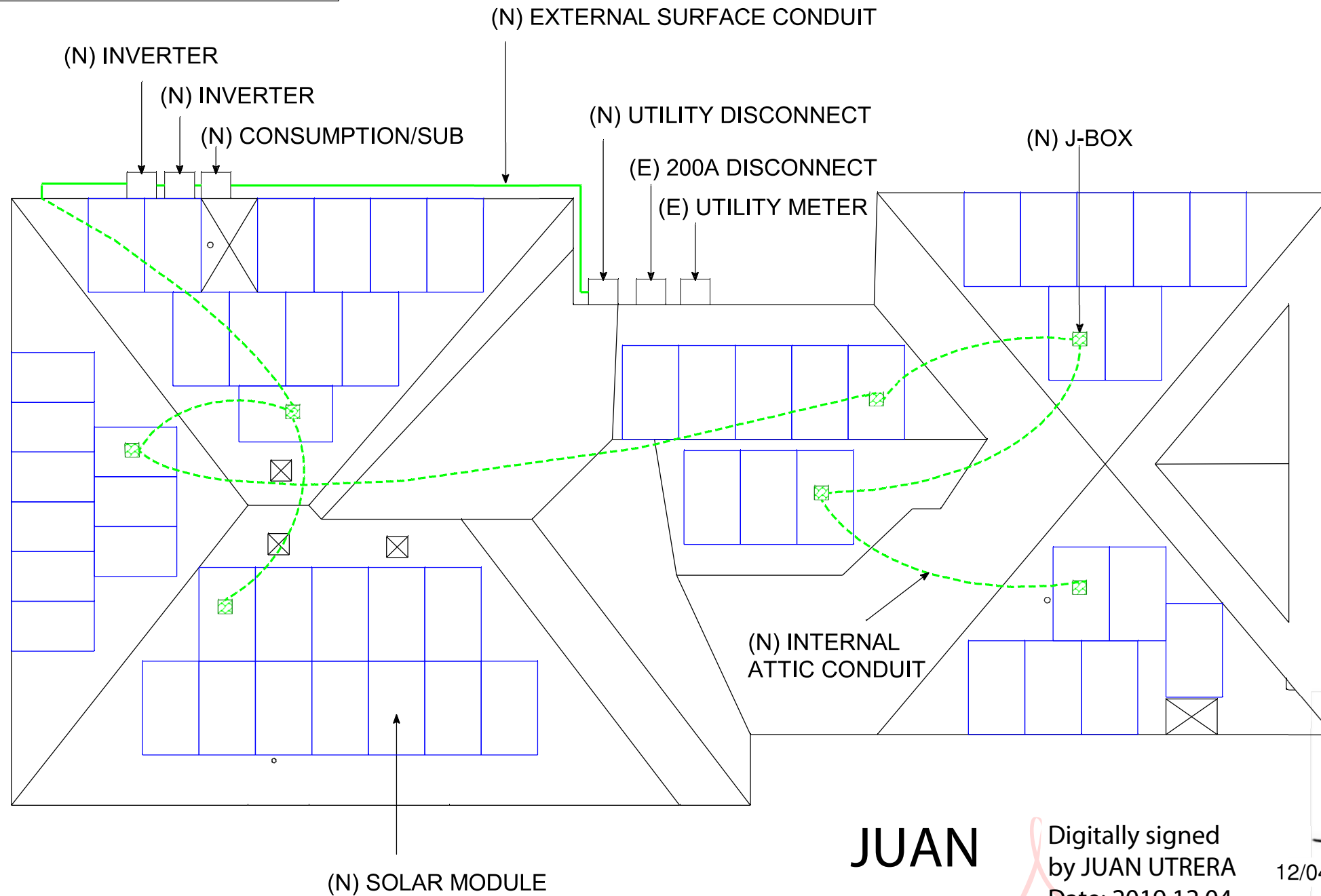
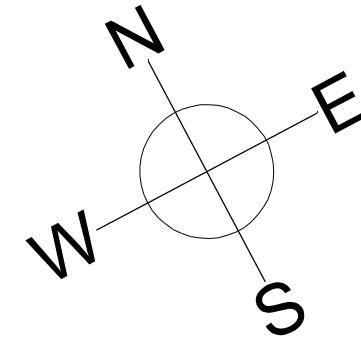
301-788-4003

4509 METROPOLITAN CT, FREDERICK, MD, 21704

JM

S002 SECTION

Sonja Ward 16.695 kW  
 7420 Maple Avenue  
 Takoma Park, MD, 20912  
 240-205-6978  
 sonprnc@aol.com  
 (38.980698, -77.011172)



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 Montgomery County  
 Historic Preservation Commission  
*Sandra L. Heiler*

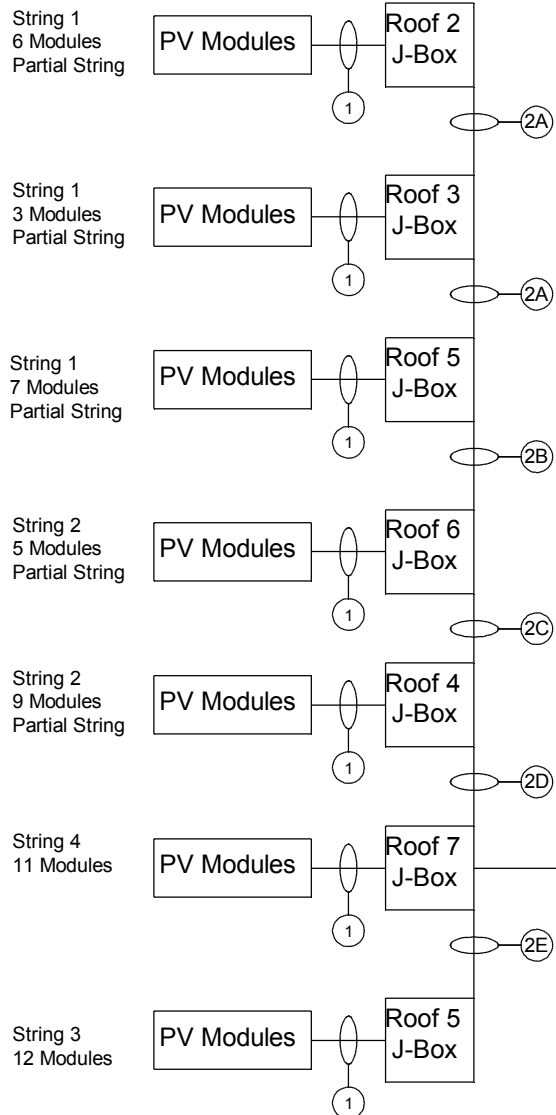
**REVIEWED**  
 By Dan.Bruechert at 3:28 pm, Feb 21, 2020

Maple Avenue

**JUAN UTRERA**  
 Digitally signed by JUAN UTRERA  
 Date: 2019.12.04 10:25:33 -05'00'



Professional Certification: I hereby certify that these documents were prepared or approved by me, and that I am a professional engineer duly licensed under the laws of the State of Maryland.  
 License No. 24518 Expiration Date: 9/21/2021



**PV MODULE SPECS**

Jinko 315 watt  
 Module Weight: 41.9 lbs  
 Module Length: 66.3"  
 Module Width: 39.45"  
 Frame: 1.38" (35mm)

**INVERTER 1 SPECS**

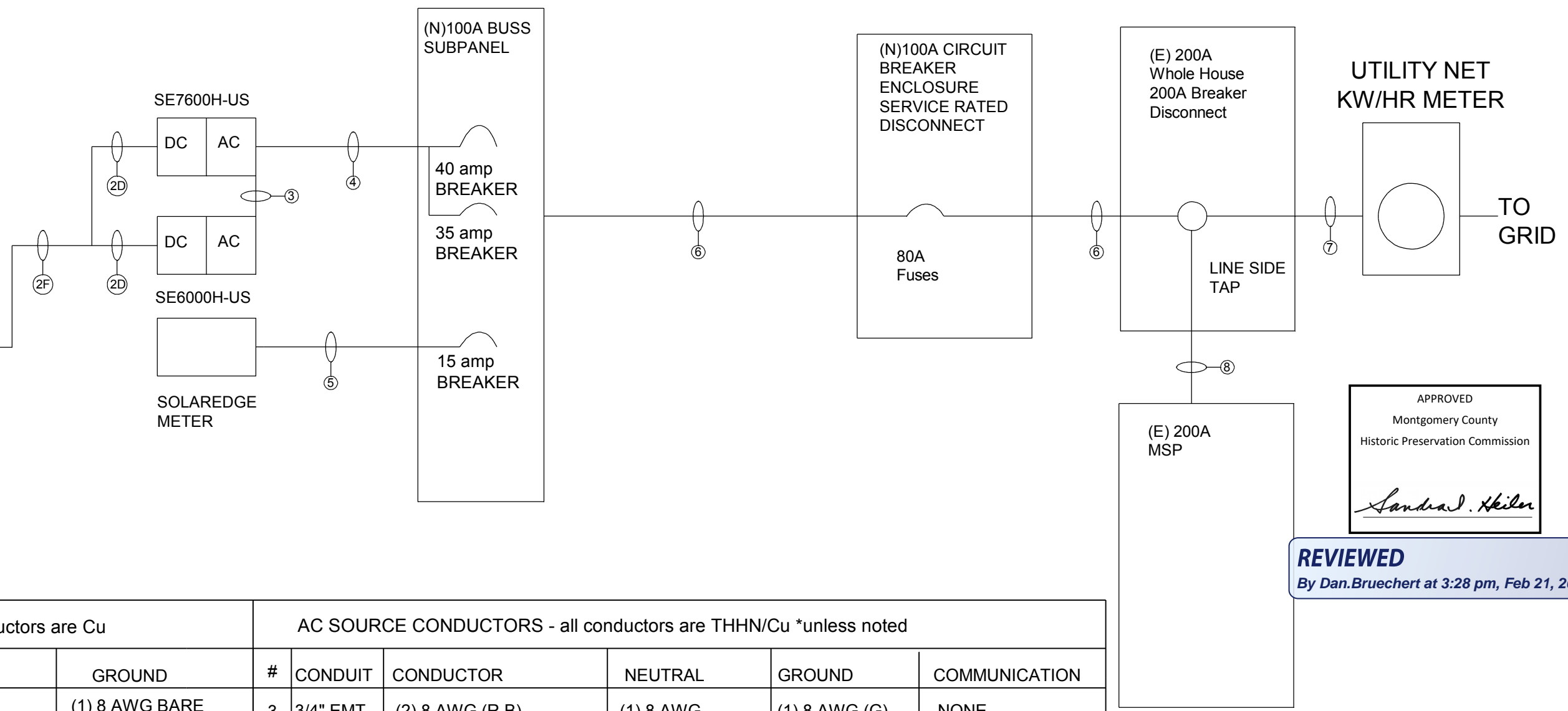
SOLAREDGE SE7600H-US  
 OPERATING CURRENT (IMP): 20A  
 OPERATINGVOLTAGE (VMP): 380VDC  
 MAX SHORT CIRCUIT CURRENT (ISC): 30A  
 MAX SYSTEM VOLTAGE (VOC): 500VDC  
 STRINGS: 1&2  
 OCPD 40A

**INVERTER 2 SPECS**

SOLAREDGE SE6000H-US  
 OPERATING CURRENT (IMP): 13.5A  
 OPERATINGVOLTAGE (VMP): 380VDC  
 MAX SHORT CIRCUIT CURRENT (ISC): 30A  
 MAX SYSTEM VOLTAGE (VOC): 500VDC  
 STRINGS: 3&4  
 OCPD35A

**AC OUTPUT**

SYSTEM VOLTAGE: 240 VAC  
 SYSTEM AMPERAGE: 57 A



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 Historic Preservation Commission  
*Sandra L. Heiler*

**REVIEWED**  
 By Dan.Bruechert at 3:28 pm, Feb 21, 2020

**DC SOURCE CONDUCTORS - all conductors are Cu**

**AC SOURCE CONDUCTORS - all conductors are THHN/Cu \*unless noted**

#	CONDUIT	CONDUCTOR	GROUND	#	CONDUIT	CONDUCTOR	NEUTRAL	GROUND	COMMUNICATION
1	NONE	(2) 10 AWG PV WIRE	(1) 8 AWG BARE	3	3/4" EMT	(2) 8 AWG (R,B)	(1) 8 AWG	(1) 8 AWG (G)	NONE
2A	3/4"	(2) 10 AWG THHN (Y,R)	(1) 8 AWG THHN	4	1" EMT	(4) 8 AWG (2R,2B)	(2) 8 AWG (W)	(1) 8 AWG (G)	NONE
2B	3/4"	(2) 10 AWG THHN (B,R)	(1) 8 AWG THHN	5	3/4" EMT	(2) 14 AWG (R,B)	(1) 14 AWG (W)	(1) 14 AWG (G)	(4) 18 AWG (TP,BW)
2C	3/4"	(2) 10 AWG THHN (Y,B,2R)	(1) 8 AWG THHN	6	1" EMT	(2) 4 AWG (R,B)	(1) 4 AWG (W)	(1) 8 AWG (G)	(4) 18 AWG (TP,BW)
2D	3/4"	(4) 10 AWG THHN (2R,2B)	(1) 8 AWG THHN						
2E	3/4"	(2) 10 AWG THHN (R,B)	(1) 8 AWG THHN						
2F	3/4"	(8) 10 AWG THHN (4B,4R)	(1) 8 AWG THHN	7	(E) SEC	(2) 4/0 (R,B) AI	(1) 4/0 AWG AL	NONE	NONE
				8	(E) SEC	(2) 4/0 (R,B) AI	(1) 4/0 AWG AL	(1) 2/0 AWG AL	NONE

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