

MONTGOMERY COUNTY HISTORIC PRESERVATION COMMISSION
STAFF REPORT

Address:	7420 Maple Avenue, Takoma Park	Meeting Date:	2/12/2020
Resource:	Contributing Resource Takoma Park Historic District	Report Date:	2/5/2020
Applicant:	Sonja Prince	Public Notice:	1/29/2020
Review:	HAWP	Tax Credit:	n/a
Case Number:	37/03-20I	Staff:	Dan Bruechert
PROPOSAL:	Solar Panel Installation		

RECOMMENDATION

Staff recommends the HPC **approve** the HAWP application.

ARCHITECTURAL DESCRIPTION

SIGNIFICANCE: Contributing Resource within the Takoma Park Historic District
STYLE: Craftsman
DATE: c.1910-1920



Figure 1: 7420 Maple Ave. is at the corner of Maple and Old Philadelphia Ave.

PROPOSAL

The applicant proposes to install 53 (fifty-three) roof-mounted solar panels.

APPLICABLE GUIDELINES

When reviewing alterations and additions for new construction to Contributing Resources within the Takoma Park Historic District, decisions are guided by the Takoma Park Historic District Design Guidelines (*Guidelines*) and Montgomery County Code Chapter 24A (*Chapter 24A*), and the Secretary of the Interior's Standards for Rehabilitation (*Standards*).

Takoma Park Historic District Design Guidelines

There are two very general, broad planning and design concepts which apply to all categories. These are:

The design review emphasis will be restricted to changes that are at all visible from the public right-of-way, irrespective of landscaping or vegetation (it is expected that the majority of new additions will be reviewed for their impact on the overall district), and,

The importance of assuring that additions and other changes to existing structures act to reinforce and continue existing streetscape, landscape, and building patterns rather than to impair the character of the district.

Contributing Resources should receive a more lenient review than those structures that have been classified as Outstanding. This design review should emphasize the importance of the resource to the overall streetscape and its compatibility with existing patterns rather than focusing on a close scrutiny of architectural detailing. In general, however, changes to Contributing Resources should respect the predominant architectural style of the resource. As stated above, the design review emphasis will be restricted to changes that are *at all visible from the public right-of-way*, irrespective of landscaping or vegetation.

Some of the factors to be considered in reviewing HAWPs on Contributing Resources include:

All exterior alterations, including those to architectural features and details, should be generally consistent with the predominant architectural style and period of the resource and should preserve the predominant architectural features of the resource; exact replication of existing details and features is, however, not required

Minor alterations to areas that do not directly front on a public right-of-way such as vents, metal stovepipes, air conditioners, fences, skylights, etc. – should be allowed as a matter of course; alterations to areas that do not directly front on a public way-of-way which involve the replacement of or damaged to original ornamental or architectural features are discouraged, but may be considered and approved on a case-by-case basis

Major additions should, where feasible, be placed to the rear of existing structures so that they are less visible from the public right-of-way; additions and alterations to the first floor at the front of a structure are discouraged, but not automatically prohibited

While additions should be compatible, they are not required to be replicative of earlier architectural styles

Some non-original building materials may be acceptable on a case-by-case basis; artificial siding

on areas visible to the public right-of-way is discouraged where such materials would replace or damage original building materials that are in good condition

Alterations to features that are not visible from the public right-of-way should be allowed as a matter of course

All changes and additions should respect existing environmental settings, landscaping, and patterns of open space.

Montgomery County Code, Chapter 24A Historic Resources Preservation

(b) The commission shall instruct the director to issue a permit, or issue a permit subject to such conditions as are found to be necessary to insure conformity with the purposes and requirements of this chapter, if it finds that:

(1) The proposal will not substantially alter the exterior features of an historic site or historic resource within an historic district; or

(2) The proposal is compatible in character and nature with the historical, archeological, architectural or cultural features of the historic site or the historic district in which an historic resource is located and would not be detrimental thereto or to the achievement of the purposes of this chapter; or

(6) In balancing the interests of the public in preserving the historic site or historic resource located within an historic district, with the interests of the public from the use and benefit of the alternative proposal, the general public welfare is better served by granting the permit.

(d) In the case of an application for work on an historic resource located within an historic district, the commission shall be lenient in its judgment of plans for structures of little historical or design significance or for plans involving new construction, unless such plans would seriously impair the historic or architectural value of surrounding historic resources or would impair the character of the historic district. (Ord. No. 9-4, § 1; Ord. No. 11-59.)

Secretary of the Interior's Standards for Rehabilitation

2. The historic character of a property will be retained and preserved. The removal of distinctive materials or alteration of features, space and spatial relationships that characterize a property will be avoided.
9. New additions, exterior alterations, or related new construction will not destroy historic materials, features, and spatial relationships that characterize the property. The new work shall be differentiated from the old and will be compatible with the historic materials, features, size, scale and proportions, and massing to protect the integrity of the property and its environment.
10. New additions and adjacent or related new construction will be undertaken in such a manner that, if removed in the future, the essential form and integrity of the historic property and its environment would be unimpaired.

STAFF DISCUSSION

The subject property is a two-story Foursquare with Craftsman details and a large two-story addition to the rear. Based on information in the tax records the addition was constructed in 1942. The addition is larger than the historic house. The house has a low-sloped hipped roof which is visible from both the east and north.

The applicant proposes installing 53 (fifty-three) solar panels in 7 arrays on the north, south, and western roof slopes. No panels are proposed for the front-facing, east roof slope. The black panels will be attached to the roof using a CrossRail system that will project approximately 5" (five inches) above the roof surface.

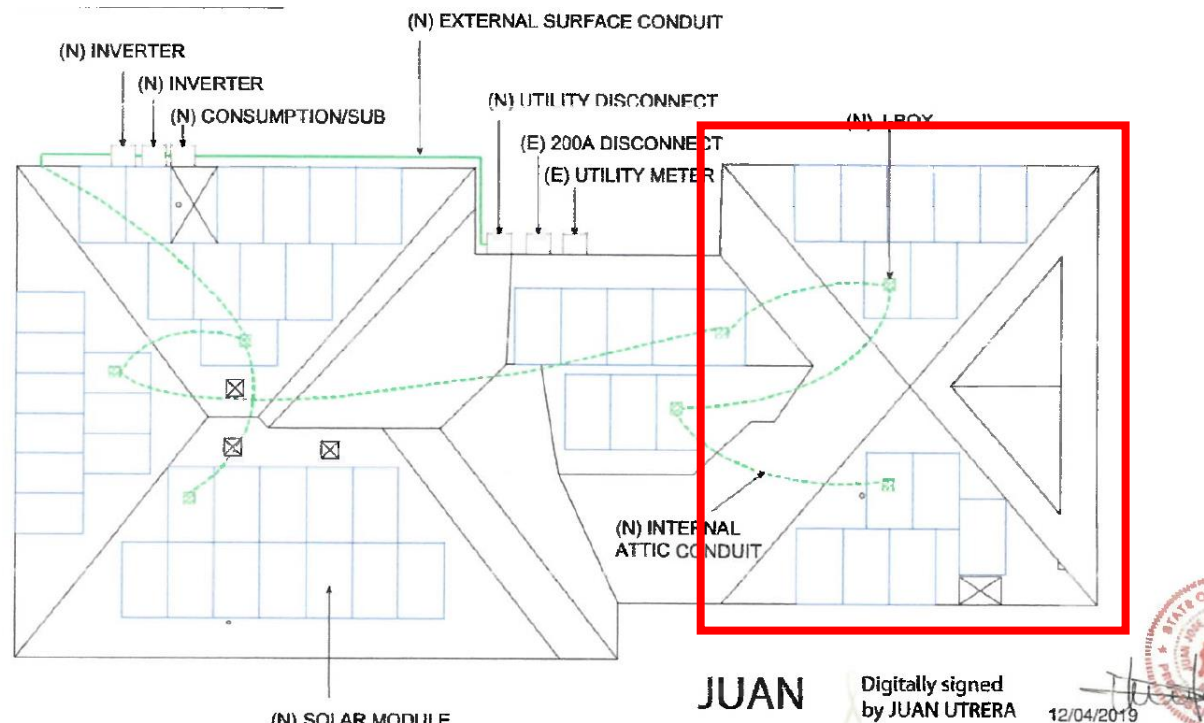


Figure 2: Roof plan showing the placement of the 53 solar panels. The historic roof form is outlined by the red box.

On the historic roof, the applicant proposes installing two arrays, one with six panels on the south slope and a seven-panel array on the north roof slope. The south array will only be visible from an oblique angle from Maple Ave. The array on the north roof slope will be more visible from Old Philadelphia Ave. However, neither of these arrays will detract from the foursquare form that makes the subject property architecturally significant to the surrounding district, per 24A-8(b)(2). The CrossRail system employed to mount the solar arrays will penetrate the asphalt shingle roof, but Staff does not find this roofing to be historically significant, per Standards 9 and 10.

On the 1942 addition, the applicant proposes installing five arrays; two on the hyphen, and one each on the north, south, and west slopes of the rear addition. As these roof sections are not historic and do not substantially contribute to the character of the surrounding district, a more lenient review should be granted under 24A-8(d). Staff finds that the two arrays on the south-facing roof slopes will not be at all visible from the right-of-way and should be approved as a matter of course under the *Design Guidelines*. Staff further finds the array on the west-facing roof slope is the rear of the house which is the least architecturally significant elevation. Staff does not find that a solar array in this location would impair the historic character of the surrounding district (24A-8(d)). The final two arrays are on the north-facing roof slopes. This will be visible from the Takoma Park Memorial Park across Philadelphia Ave., but will have only a minimal impact on the historic character of the subject property or surrounding historic district.

STAFF RECOMMENDATION

Staff recommends that the Commission **approve** the HAWP under the Criteria for Issuance in *Chapter 24A-8(b)(2)* and *(d)* having found that the proposal will not substantially alter the exterior features of the historic resource and is compatible in character with the district, the *Takoma Park Historic District Guidelines*, and the purposes of *Chapter 24A*;

and with the *Secretary of the Interior's Standards for Rehabilitation* #2, #9, and #10,

and with the general condition that the applicant shall present the **3 permit sets of drawings, if applicable, to Historic Preservation Commission (HPC) staff for review and stamping** prior to submission for the Montgomery County Department of Permitting Services (DPS) building permits;

and with the general condition that final project design details, not specifically delineated by the Commission, shall be approved by HPC staff or brought back to the Commission as a revised HAWP application at staff's discretion;

and with the general condition that the applicant shall notify the Historic Preservation Staff if they propose to make **any alterations** to the approved plans. Once the work is completed the applicant will contact the staff person assigned to this application at 301-563-3400 or dan.bruechert@montgomeryplanning.org to schedule a follow-up site visit.



HISTORIC PRESERVATION COMMISSION

301/563-3400

APPLICATION FOR HISTORIC AREA WORK PERMIT

Contact Email: permittng@sustainableenergysystems.net Contact Person: Sylvia Akbar
Daytime Phone No.: 301 788-4003
Tax Account No.: 13-01060938
Name of Property Owner: Sonja Prince Daytime Phone No.: 240 265 6979
Address: 7420 Maple Ave, Takoma Park Maryland 20912
Street Number City State Zip Code
Contractor: Sustainable Energy Systems Phone No.: 301 788 4003
Contractor Registration No.: EB203185
Agent for Owner: Contractor Daytime Phone No.: "

LOCATION OF BUILDING/PREMISE

House Number: 7420 Street: Maple Ave
Town/City: Takoma Park Nearest Cross Street: Philadelphia Ave
Lot: 7A Block: 90 Subdivision: Petty Est
Liber: _____ Folio: _____ Parcel: _____

PART ONE: TYPE OF PERMIT ACTION AND USE

1A. CHECK ALL APPLICABLE:

- ☐ Construct ☐ Extend ☒ Alter/Renovate
☐ Move ☐ Install ☐ Wreck/Raze
☐ Revision ☐ Repair ☐ Revocable

CHECK ALL APPLICABLE:

- ☐ A/C ☐ Slab ☐ Room Addition ☐ Porch ☐ Deck ☐ Shed
☒ Solar ☐ Fireplace ☐ Woodburning Stove ☐ Single Family
☐ Fence/Well (complete Section 4) ☐ Other: _____

1B. Construction cost estimate: \$ 33,340

1C. If this is a revision of a previously approved active permit, see Permit # not an issued permit yet, pending this app
BUILD-898507

PART TWO: COMPLETE FOR ANY CONSTRUCTION AND EXTEND/ADDITIONS

2A. Type of sewage disposal: 01 ☒ WSSC 02 ☐ Septic 03 ☐ Other: _____
2B. Type of water supply: 01 ☒ WSSC 02 ☐ Well 03 ☐ Other: _____

PART THREE: COMPLETE ONLY FOR FENCE/RETAINING WALL

3A. Height _____ feet _____ inches

3B. Indicate whether the fence or retaining wall is to be constructed on one of the following locations:

- ☐ On party line/property line ☐ Entirely on land of owner ☐ On public right of way/easement

I hereby certify that I have the authority to make the foregoing application, that the application is correct, and that the construction will comply with plans approved by all agencies listed and I hereby acknowledge and accept this to be a condition for the issuance of this permit.

Signature of owner or authorized agent

12/31/19 Date

Approved: _____ For Chairperson, Historic Preservation Commission

Disapproved: _____ Signature: _____ Date: _____

Application/Permit No.: _____ Date Filed: _____ Date Issued: _____

900839

**THE FOLLOWING ITEMS MUST BE COMPLETED AND THE
REQUIRED DOCUMENTS MUST ACCOMPANY THIS APPLICATION.**

1. WRITTEN DESCRIPTION OF PROJECT

- a. Description of existing structure(s) and environmental setting, including their historical features and significance:

Installing 53 roof mounted solar panels, 16.695 kW
on an existing single family dwelling located
in Takoma Park's historical district.
The home is located at
7420 Maple Ave.

- b. General description of project and its effect on the historic resource(s), the environmental setting, and, where applicable, the historic district:

The effect of the panels will be mainly
on the roof other than the equipment
to connect to the existing electrical service.
Our plan set reflects that no panels will go
on the roof that is street facing to Maple Avenue.

2. SITE PLAN

Site and environmental setting, drawn to scale. You may use your plot. Your site plan must include:

- the scale, north arrow, and date;
- dimensions of all existing and proposed structures; and
- site features such as walkways, driveways, fences, ponds, streams, trash dumpsters, mechanical equipment, and landscaping.

3. PLANS AND ELEVATIONS

You must submit 2 copies of plans and elevations in a format no larger than 11" x 17". Plans on 8 1/2" x 11" paper are preferred. *

- Schematic construction plans, with marked dimensions, indicating location, size and general type of walls, window and door openings, and other fixed features of both the existing resource(s) and the proposed work.
- Elevations (facades), with marked dimensions, clearly indicating proposed work in relation to existing construction and, when appropriate, context. All materials and fixtures proposed for the exterior must be noted on the elevations drawings. An existing and a proposed elevation drawing of each facade affected by the proposed work is required.

4. MATERIALS SPECIFICATIONS

General description of materials and manufactured items proposed for incorporation in the work of the project. This information may be included on your design drawings.

5. PHOTOGRAPHS

- Clearly labeled photographic prints of each facade of existing resource, including details of the affected portions. All labels should be placed on the front of photographs.
- Clearly label photographic prints of the resource as viewed from the public right-of-way and of the adjoining properties. All labels should be placed on the front of photographs.

6. TREE SURVEY

If you are proposing construction adjacent to or within the dripline of any tree 6" or larger in diameter (at approximately 4 feet above the ground), you must file an accurate tree survey identifying the size, location, and species of each tree of at least that dimension.

7. ADDRESSES OF ADJACENT AND CONFRONTING PROPERTY OWNERS

For ALL projects, provide an accurate list of adjacent and confronting property owners (not tenants), including names, addresses, and zip codes. This list should include the owners of all lots or parcels which adjoin the parcel in question, as well as the owner(s) of lot(s) or parcel(s) which lie directly across the street/highway from the parcel in question.

HAWP APPLICATION: MAILING ADDRESSES FOR NOTIFYING
 [Owner, Owner's Agent, Adjacent and Confronting Property Owners]

Owner's mailing address

7420 Maple Avenue
 Takoma Park MD 20912

Owner's Agent's mailing address

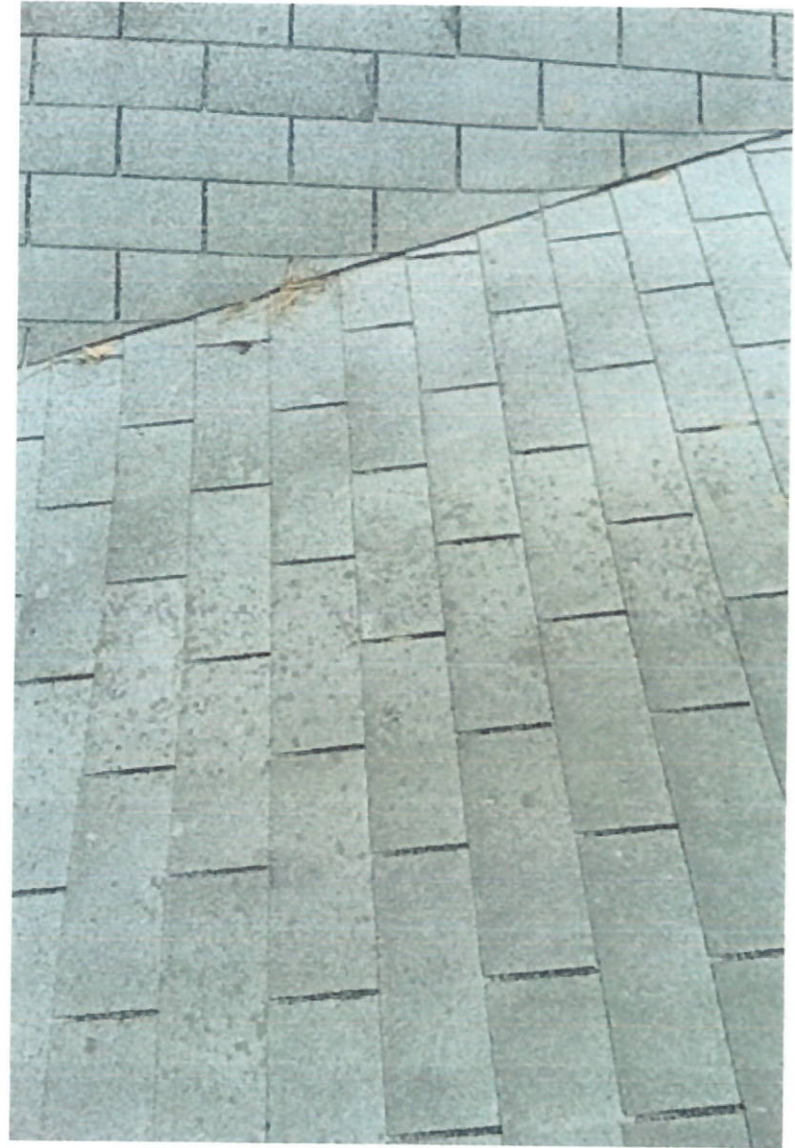
Sustainable Energy Systems
 4509 metropolitan Ct Suite H
 Frederick MD 21704

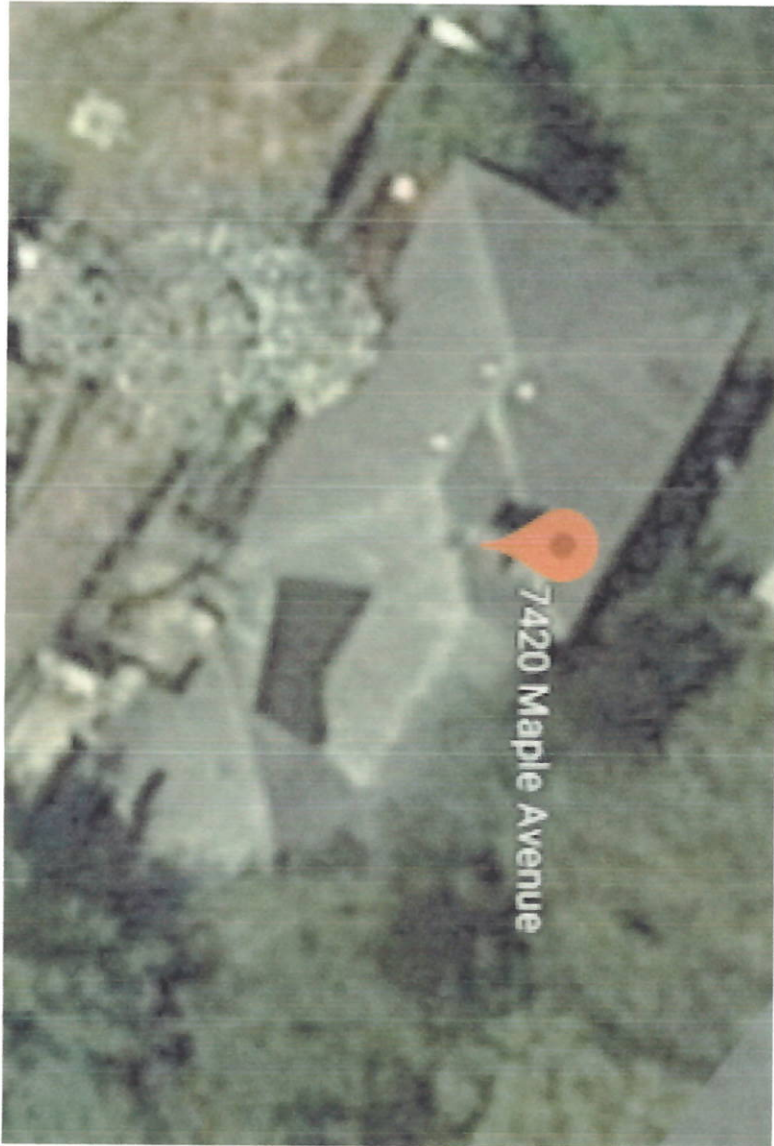
Adjacent and confronting Property Owners mailing addresses

106 Philadelphia Ave

7418 Maple Avenue

7417 Maple Avenue





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	BOS DRAWINGS
<p>G000 COVER Z001 SITE PLAN S001 ARRAY LAYOUT S002 SECTION E001 ONE LINE CUTSHEETS</p> <p>SCOPE OF WORK: Installing 53 Asphalt Roof Mounted Solar Panels - 16.695 KW</p> <p>FINANCING: SUNNOVA</p> <p>Sales Person Contact: Sam Vinton (202) 427-5464</p> <p>APPROVED BY:</p> <p>Project Manager: Kurt Zwally 240-324-6199</p>	 <p>Hopefully 100a disco fits next to 200a Main disco. If not, locate it to the front corner and maintain clearance. Line side tap out side in 200a whole house disco.</p>  <p>Hopefully soffit penetration is possible. If not, run conduit over gutter to 1st j-box, but keep all other conduits in connecting attic space.</p> <p>enter bottom of inverter with conduit body and weep hole</p>

SUSTAINABLE ENERGY SYSTEMS, LLC

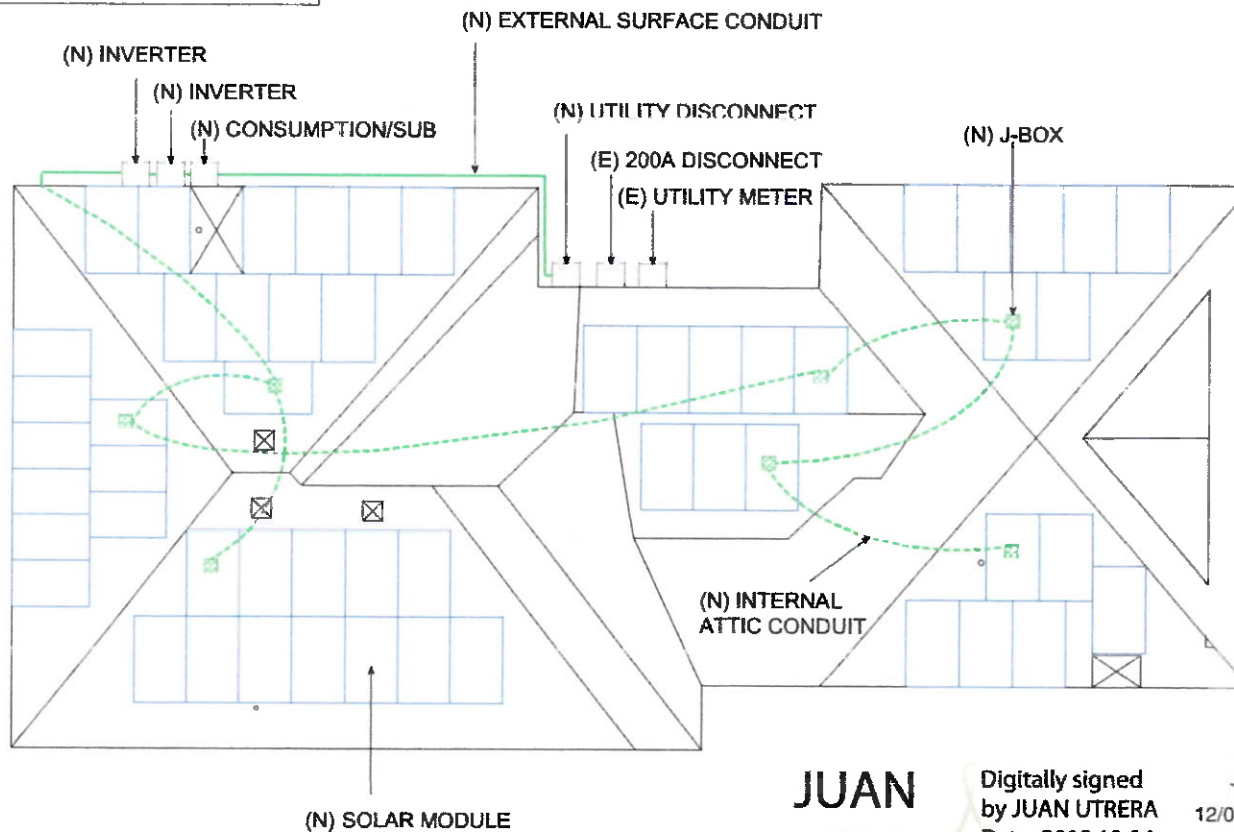
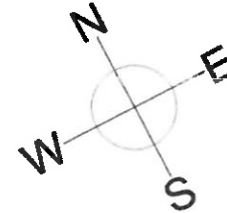
301-788-4003

4509 METROPOLITAN CT, FREDERICK, MD 21704

JM

G000

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

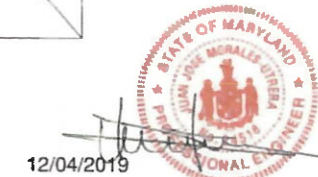


Maple Avenue

**JUAN
UTRERA**

Digitally signed
 by JUAN UTRERA
 Date: 2019.12.04
 10:25:33 -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. 74518 Expiration Date: 6/31/2021

SUSTAINABLE ENERGY SYSTEMS, LLC

301-788-4003

4509 METROPOLITAN CT, FREDERICK, MD 21704

JM

Z001 SITE PLAN

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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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 8" MIN. FROM NAIL PLATES

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

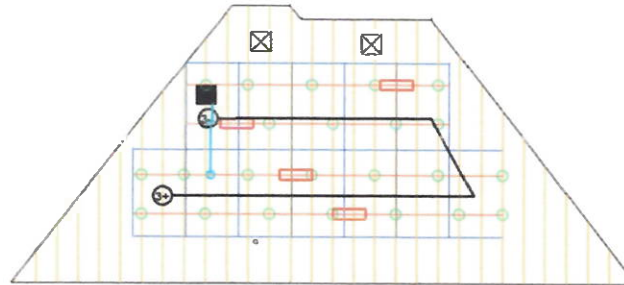
Racking: Everest

Optimizer: SolarEdge P320 (1 per module)

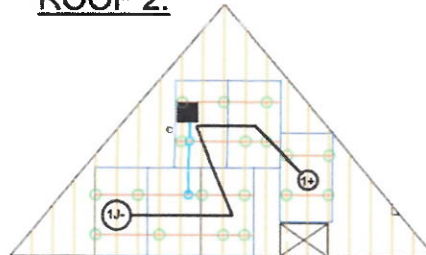
- Mount: 24+18+8+19+17+11+28=125
 - # of Rails: 27
 - # of Mid Clips: 78
 - # of End Clips: 58
 - # of Splices: 14
 - # of Grounding Lugs: 15
 - J-Box: 7
- (1) String Homerun
 (1J) String Jumper

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

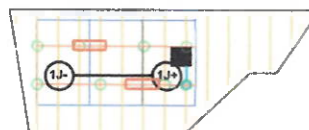
ROOF 1:



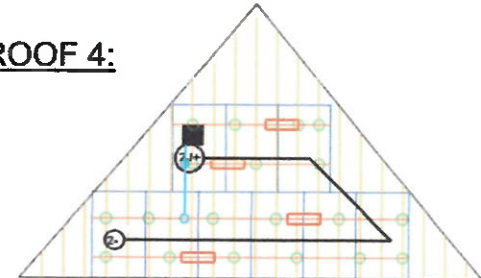
ROOF 2:



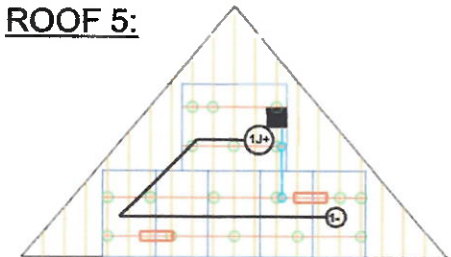
ROOF 3:



ROOF 4:



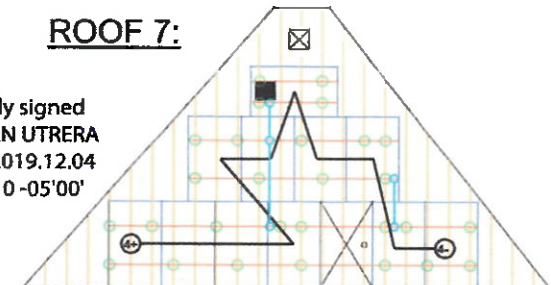
ROOF 5:



ROOF 6:



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: 4518 Expiration Date: 9/21/2021

JUAN
UTRERA

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

SUSTAINABLE ENERGY SYSTEMS, LLC

301-788-4003

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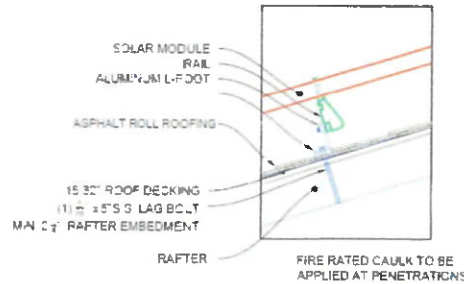
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S001

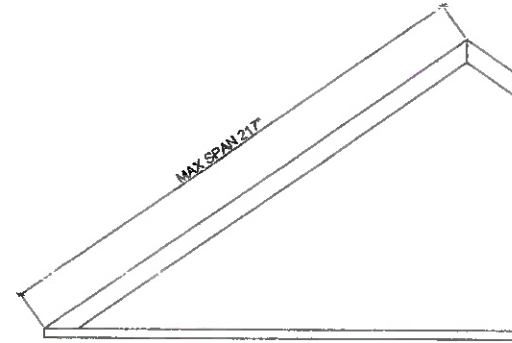
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 240-205-6978
 sonprnc@aol.com

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

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



ROOF :



**JUAN
 UTRERA**

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 by JUAN UTRERA
 Date: 2019.12.04
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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

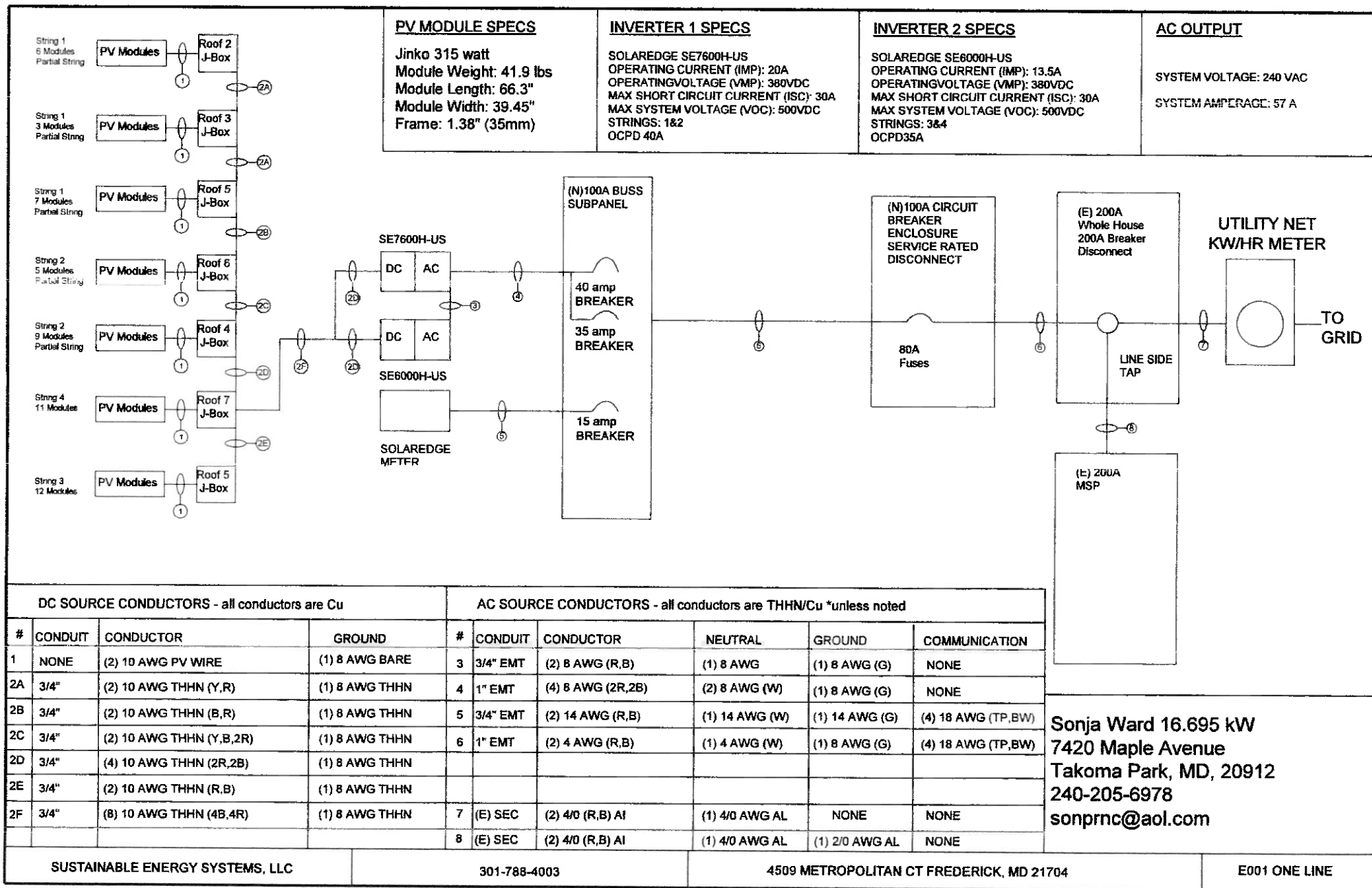
Sustainable Energy Systems, LLC

301-788-4003

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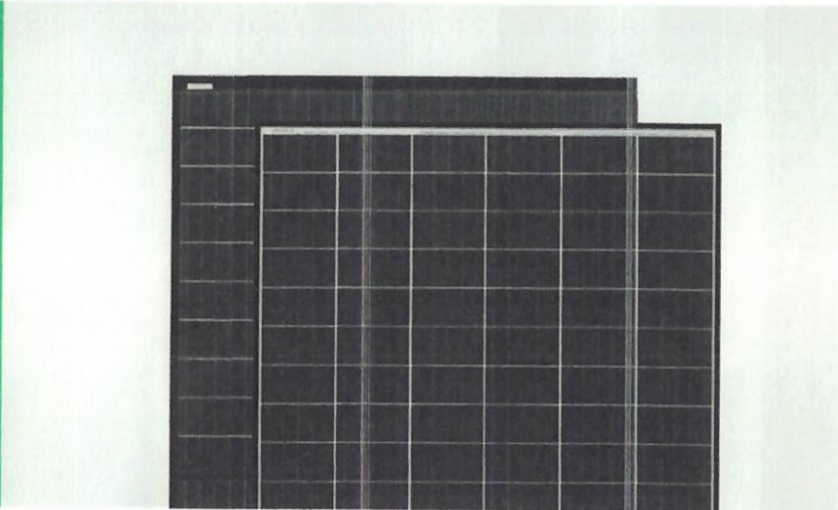
S002 SECTION



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 (5400 Pa) 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

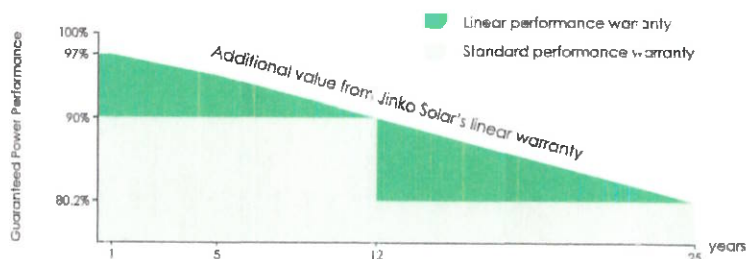
JKM335M-60HBL

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

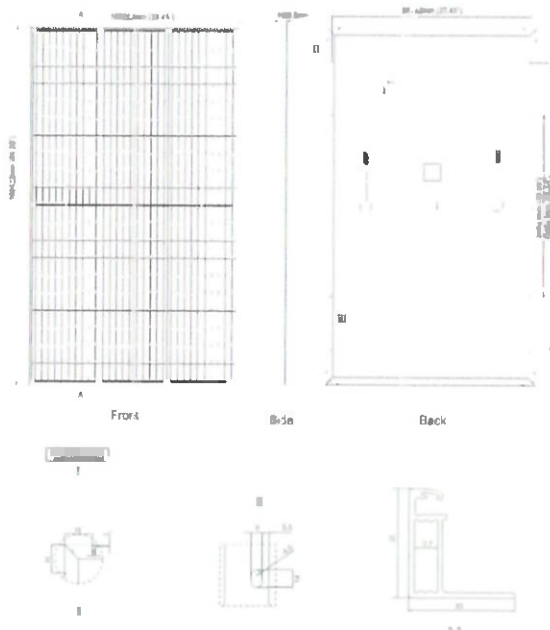


LINEAR PERFORMANCE WARRANTY

10 Year Product Warranty • 25 Year Linear Power Warranty



Engineering Drawings



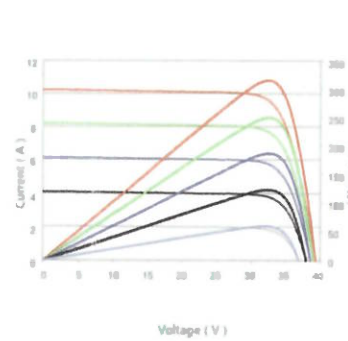
Packaging Configuration

(Two pallets = One stack)

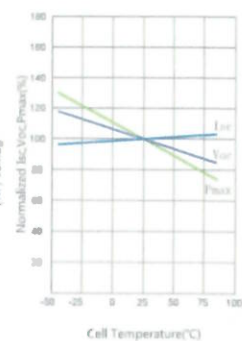
30pcs/pallet, 60pcs/stack, 780pcs/40 HQ Container

Electrical Performance & Temperature Dependence

Current-Voltage & Power-Voltage Curves (315W)



Temperature Dependence of Isc, Voc, Pmax



Mechanical Characteristics

Cell Type	Mono PERC Diamond Cell (158.75 × 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%		18.95%		19.25%		19.55%		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	0.049%/°C									
Nominal Operating Cell Temperature (NOCT)	45±2°C									

STC: Irradiance 1000W/m² Cell Temperature 25°C AM=1.5

NOCT: Irradiance 800W/m² Ambient Temperature 20°C AM=1.5 Wind Speed 1m/s

* Power measurement tolerance: ± 3%

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)	✓	✓	✓	✓	✓	✓	✓	V _{ac}
AC Output Voltage Min.-Nom.-Max. (183 - 208 - 229)	-	✓	-	✓	-	-	✓	V _{ac}
AC Frequency (Nominal)	59.3 - 60 - 60.5 ⁽¹⁾							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							V _{dc}
Nominal DC Input Voltage	380				400			V _{dc}
Maximum Input Current @240V ⁽²⁾	8.5	10.5	13.5	16.5	20	27	30.5	A _{dc}
Maximum Input Current @208V ⁽²⁾	-	9	-	13.5	-	-	27	A _{dc}
Max. Input Short Circuit Current	45							A _{dc}
Reverse-Polarity Protection	Yes							
Ground-Fault Isolation Detection	600k Ω 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 ⁽³⁾							
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.L. M-07							
Grid Connection Standards	IEEE1547, Rule 21, Rule 4 (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 ⁽⁴⁾ (-40°F / -40°C option) ⁽⁵⁾							°F / °C
Protection Rating	NEMA 4X (Inverter with Safety Switch)							

⁽¹⁾ For other regional settings please contact SolarEdge support

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

⁽³⁾ Revenue grade inverter P/N: SExxxxH-US000NNC2

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

⁽⁵⁾ -40 version P/N: SExxxxH-US000NNJ4

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)	
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INPUT

Rated Input DC Power ¹⁾	320	340	370	400	405	505	W
Absolute Maximum Input Voltage (V _{oc} at lowest temperature)	48		60	80	125 ²⁾	83 ³⁾	V _{dc}
MPPT Operating Range	8 - 48		8 - 60	8 - 80	12.5 - 105	12.5 - 83	V _{dc}
Maximum Short Circuit Current (I _{sc})		11		10.1		14	A _{dc}
Maximum DC Input Current		13.75		12.63		17.5	A _{dc}
Maximum Efficiency				99.5			%
Weighted Efficiency			98.8			98.6	%
Overtolerance Category				II			

OUTPUT DURING OPERATION (POWER OPTIMIZER CONNECTED TO OPERATING SOLAREGE INVERTER)

Maximum Output Current			15				A _{dc}
Maximum Output Voltage		60			85		V _{dc}

OUTPUT DURING STANDBY (POWER OPTIMIZER DISCONNECTED FROM SOLAREGE INVERTER OR SOLAREGE INVERTER OFF)

Safety Output Voltage per Power Optimizer			1 ± 0.1				V _{dc}
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STANDARD COMPLIANCE

EMC	FCC Part 15 Class B, IEC61000-6-2, IEC61000-6-3	
Safety	IEC62109-1 (class II safety), UL1741	
RoHS	Yes	

INSTALLATION SPECIFICATIONS

Maximum Allowed System Voltage		1000				V _{dc}
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 ⁴⁾				
Output Wire Type / Connector		Double Insulated, MC4				
Output Wire Length	0.9 / 2.95		1.2 / 3.9			m / ft
Input Wire Length		0.6 / 0.52				m / ft
Operating Temperature Range		-40 - +45 / -40 - +185				°C / °F
Protection Rating		IP66 / NEMA6P				
Relative Humidity		0 - 100				%

- ¹⁾ Rated STC power of the module. Module of up to +5% power tolerance allowed.
²⁾ NEC 2017 requires max input voltage be not more than 80V.
³⁾ For other connector types please contact SolarEdge.

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

⁴⁾ For detailed string sizing information refer to: http://www.solar-edge.com/sites/default/files/string_sizing_nw.pdf

⁵⁾ It is not allowed to mix P405/P505 with P320/P340/P370/P400 in one string.

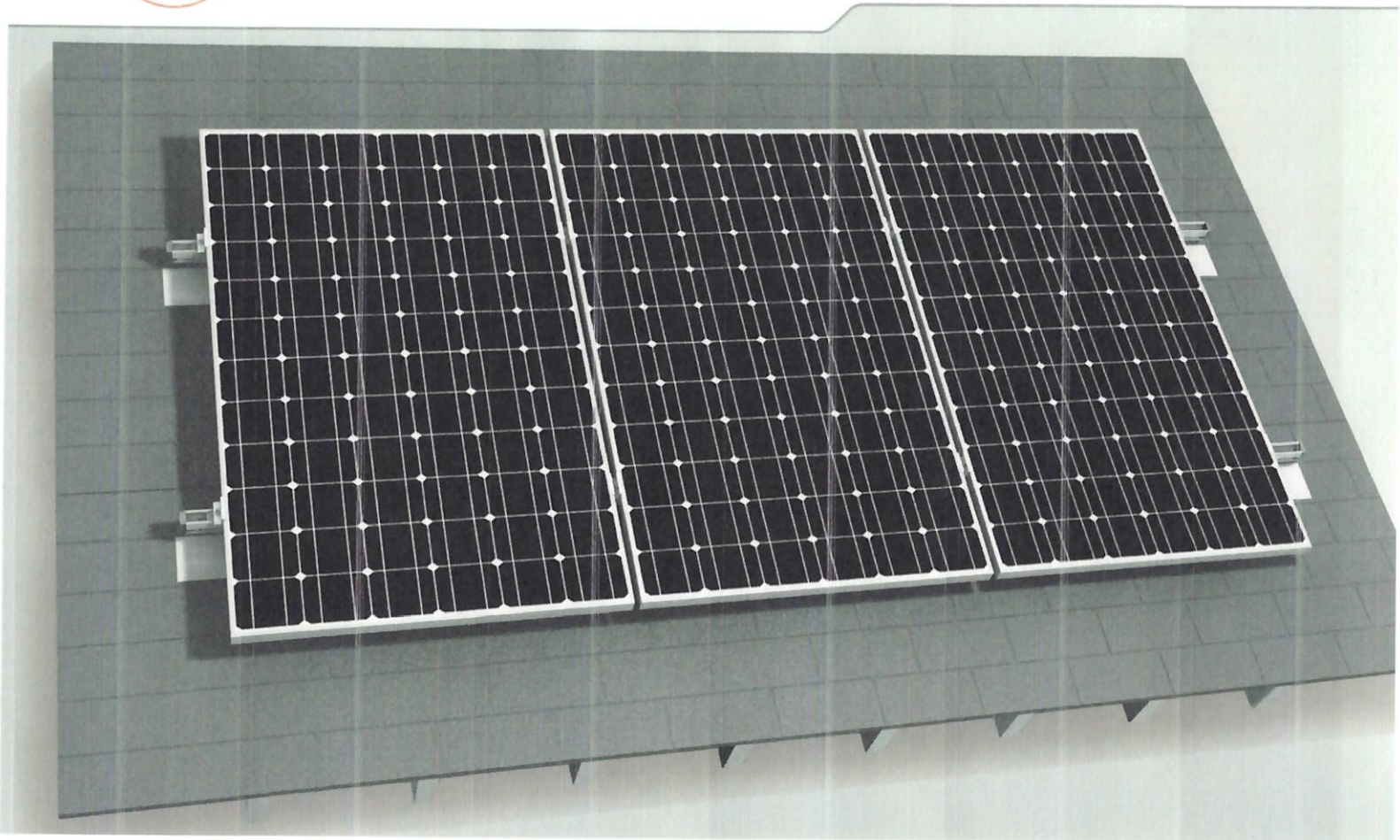
⁶⁾ A string with more than 30 optimizers does not meet NEC rapid shutdown requirements, safety voltage will be above the 30V requirement.

⁷⁾ 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.

⁸⁾ 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.



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



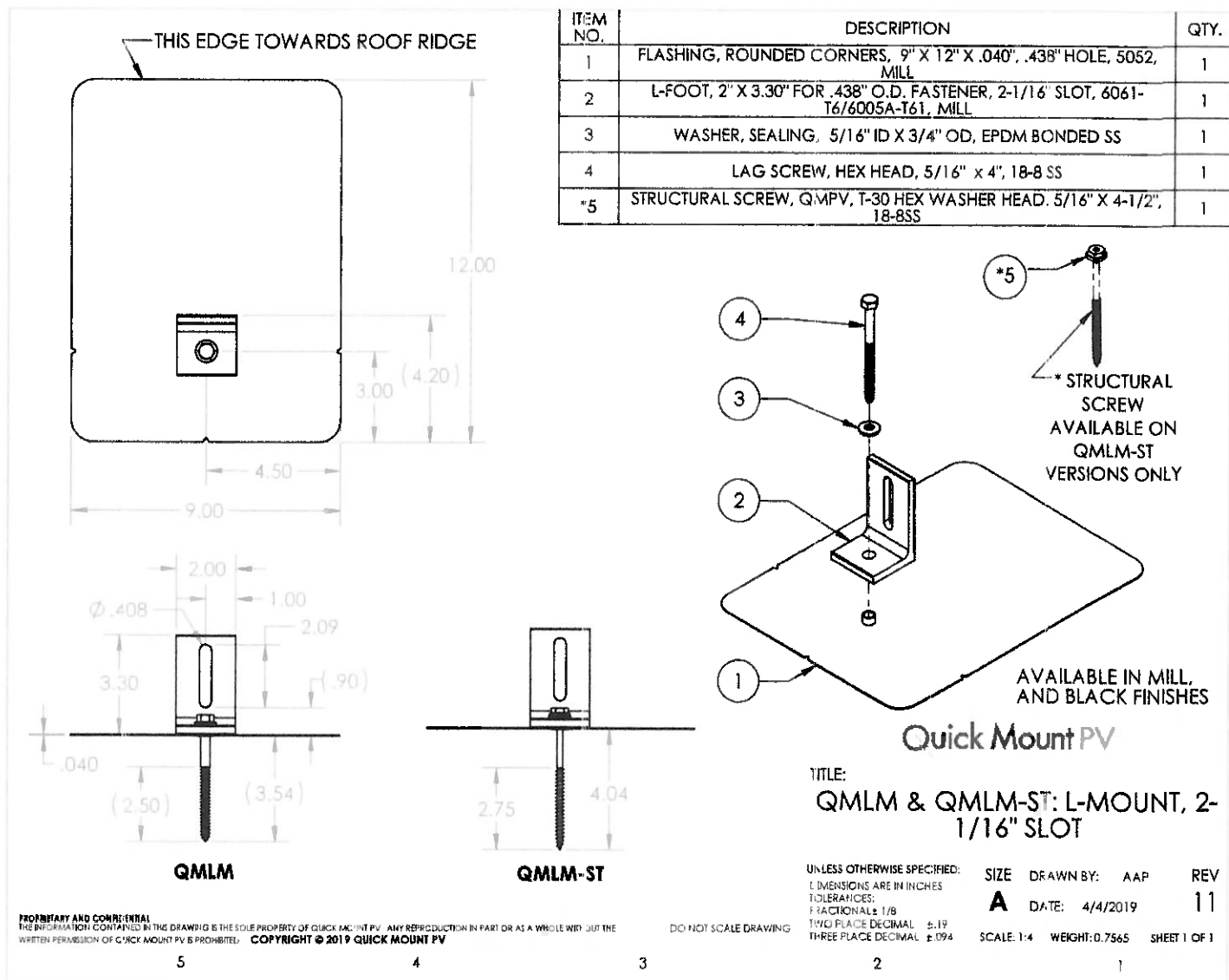
Flat Tile Hook

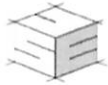


Standing Seam PowerClamp

L-Mount | QMLM / QMLM-ST

Elevated Water Seal Technology®





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

City of Takoma Park

Housing and Community Development Department

Main Office 301-891-7119
Fax 301-270-4568
www.takomaparkmd.gov



7500 Maple Avenue
Takoma Park, MD 20912

MUNICIPALITY LETTER

December 4, 2019

To: Sonja Prince Ward sonprnc@aol.com

To: Department of Permitting Services
255 Rockville Pike, 2nd 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 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

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.

SUSTAINABLE ENERGY SYSTEMS, LLC

PHOTOVOLTAICS | SOLAR WATER HEATING | DESIGN | INSTALLATION | SERVICE



PO BOX 1340

FREDERICK, MD 21702-0340 (301)788-4003 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

Montgomery County Master Electrician License Number: **ME203184**

Date: **12/11/2019**

Signature: 



PO BOX 1340
FREDERICK, MD 21702-0340 (301)788-4003 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

Project: Ward Solar Project Property Owner: Sonja Prince Ward

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

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☒ 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