MONTGOMERY COUNTY HISTORIC PRESERVATION COMMISSION
STAFF REPORT

Address: 5 Columbia Ave., Takoma Park

Meeting Date: 12/4/2019

Resource: Contributing Resource

Report Date: 11/27/2019

Takoma Park Historic District

Public Notice: 11/20/2019

Applicant: Annie Kneedler & Sam Bryson

Tax Credit: n/a

Review: HAWP

Case Number: 37/03-19HHH

Staff: Dan Bruechert

Proposal: Solar Panel Installation

RECOMMENDATION
Staff recommends that the Historic Preservation Commission approve the HAWP application

PROPERTY DESCRIPTION
SIGNIFICANCE: Contributing Resource to the Takoma Park Historic District

STYLE: Vernacular

DATE: c.1880s

The subject house is a two-story, T-shaped house, with shiplap siding, original two-over-two wood sash windows, a brick foundation throughout, and an asphalt shingle roof. The house has been heavily modified including alterations to the front porch, a small addition in the southwest corner of the house and a two-story addition to the south. As the house sits at the intersection of Columbia Ave. and Pine Ave., it is highly visible from two elevations.

Figure 1: 5 Columbia Ave. is located at the southeast corner of Pine and Columbia Aves.
BACKGROUND

The HPC reviewed and approved a comprehensive house rehabilitation and addition to the subject property in January 2019. Once construction began it was discovered that the building, including its windows and principal structural members, had degraded significantly and the applicants returned for revisions later in 2019 to allow for revisions to the HAWP to allow for additional stabilization and rehabilitation work.

PROPOSAL

The applicant proposes to install 24 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 (Design Guidelines) and Montgomery County Code Chapter 24A (Chapter 24A) and the Secretary of the Interior’s Standards for Rehabilitation (The 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.

- 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,
Original size and shape of window and door openings should be maintained, where feasible,

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
3. 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.

**Secretary of the Interior’s Standards for Rehabilitation**

2. The historic character of a property shall be retained and preserved. The removal of historic materials or alteration of features and spaces that characterize a property shall 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 applicant proposes to install 24 roof-mounted solar panels to the house at the corner of Columbia and Pine Avenues. The panels will be on two roof surfaces: the flat-roofed rear addition, and towards the rear of the east slope of the front-facing gable. Staff finds the proposal is compatible with the character of the house and surrounding district and recommends approval.

At the rear of the house, the applicant proposes installing sixteen flat mounted solar panels. These panels will be hidden from view by the cornice and will not be visible from the public right-of-way, even though the house is on a corner lot. Staff finds that the Design Guidelines dictate this portion of the proposal should be approved as a matter of course under lenient scrutiny.

The remaining eight solar panels are proposed for the eastern slope of the front-facing gable. The proposed placement is to the rear of the chimney on this elevation set back more than one bay. These
panels will be installed flat to the roof using a Snapnrack system. Utilizing this system will make the mounting clips virtually invisible, leaving only the solar panels visible. Staff finds the solar panels in the proposed location appropriate. The typical requirement for solar panels on front gable roofs is they need to be set back one bay from the front wall plane. The east elevation of this house is only two bays deep, and the proposed solar panels are set a significant distance from the front bay on this elevation. Staff finds that this proposal will not have a significant impact on the surrounding district (per the Design Guidelines), is clearly new and completely reversible (complying with Standards 9 and 10).

Additionally, Staff would like to recognize that the City of Takoma Park and Montgomery County have issued climate emergencies, determining that it is imperative to restore a safe climate and make strides to eliminate greenhouse gas emissions. Staff finds that under these resolutions, approval of the proposal is additionally supported under 24A-8(b)(6).

Staff recommends approval of this HAWP.

**STAFF RECOMMENDATION**

Staff recommends that the Commission **approve** the HAWP application under the Criteria for Issuance in Chapter 24A-8(b)(1), (2) and (6), having found that the proposal will not substantially alter the exterior features of the historic resource and is compatible in character with the district 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: SAM.BRYSON@GMAIL.COM
Tax Account No.: ____________________________
Contact Person: SAM BRYSON
Daytime Phone No.: 202 - 340 - 2924

Name of Property Owner: SAMUEL BRYSON/ANNE KNEEDOR
Daytime Phone No.: 703-320-2924

Address: 5 COLUMBIA AVE, TAKOMA PARK, MD 20912
City: TAKOMA PARK
State: MD
Zip Code: 20912

Contractor: SOLAR ENERGY SERVICES INC
Phone No.: 410-623-6090
Contractor Registration No.: #3756
Agent for Owner: ____________________________
Daytime Phone No.: _________________________

LOCATION OF BUILDING PREMISE

House Number: 5
Street: COLUMBIA

Town/City: TAKOMA PARK
Nearest Cross Street: WINE AVE

Lot: P13 Block: 1B Subdivision: 0025

PARCELS TO BE ALTERED/REINSTATE/EXTEND

1A. Check all applicable:

☐ Construct ☐ Extend ☐ Alter/Renovate
☐ AC ☐ Stair ☐ Room Addition ☐ Porch ☐ Deck ☐ Shed
☐ Move ☐ Install ☐ Wreck/Raze ☐ Solar ☐ Fireplace ☐ Woodburning Stove
☐ Revision ☐ Repair ☐ Removable ☐ Fence/Wall (complete Section 6) ☐ Other:

B. Construction cost estimate: $ 25,000

1C. If this is a revision of a previously approved active permit, see Permit #

PART TWO: COMPLETE FOR CONSTRUCTION AND EXTENSION 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/assessment

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

__________________________
Date

Approved: ____________________________
For Chairperson, Historic Preservation Commission

Disapproved: ____________________________
Signature: ____________________________
Date: ____________________________

Applications/Permit No.: ____________________________
Data Filed: ____________________________
Date Issued: ____________________________

SEE REVERSE SIDE FOR INSTRUCTIONS
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:
      
      **THE EXISTING STRUCTURE IS AN HISTORIC FARMHOUSE AND IS A CONTRIBUTING RESOURCE IN THE TACOMA PARK HISTORIC DISTRICT.**
      **THE PROPERTY HAS UNDERGONE SIGNIFICANT RENOVATION IN THE LAST 6 MONTHS TO RESTORE IT TO HABITABILITY. THIS SIGNIFICANT RENOVATION IS STILL IN PROGRESS, BUT IS NEARLY COMPLETED.**

   b. General description of project and its effect on the historic resource(s), the environmental setting, and, where applicable, the historic district:
      
      **WE SEEK TO INSTALL AN ARRAY OF SOLAR PANELS ON THE HOUSE IN A MANNER THAT IS CONSISTENT WITH HPC GUIDELINES.**

2. SITE PLAN
   Site and environmental setting, drawn to scale. You may use your plat. Your site plan must include:
   a. the scale, north arrow, and date;
   b. dimensions of all existing and proposed structures; and
   c. 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.
   a. 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.
   b. Elevations (facades), with marked dimensions, clearly indicating proposed work in relation to existing construction and, when appropriate, contact. 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
   a. 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.
   b. 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 8" 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.

PLEASE PRINT IN BLUE OR BLACK INK OR TYPE THIS INFORMATION ON THE FOLLOWING PAGE.
PLEASE STAY WITHIN THE GUIDES OF THE TEMPLATE, AS THIS WILL BE PHOTOCOPIED DIRECTLY ONTO MAILING LABELS.
<table>
<thead>
<tr>
<th>Owner's mailing address</th>
<th>Owner's Agent's mailing address</th>
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<td>5 COLUMBIA AVE</td>
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<tr>
<td>TAKOMA PARK, MD 20912</td>
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<table>
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<th>Adjacent and confronting Property Owners mailing addresses</th>
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<tr>
<td>7 COLUMBIA AVE</td>
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<tr>
<td>TAKOMA PARK, MD 20912</td>
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<tr>
<td>1 PINE AVE</td>
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<tr>
<td>TAKOMA PARK, MD 20912</td>
</tr>
<tr>
<td>7105 CARROLL AVE</td>
</tr>
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<td>TAKOMA PARK, MD 20912</td>
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PROPOSED EAST ELEVATION
Project Overview

not to scale

Vicinity Map

Structural Notes:
1. All work is to be done in a professional manner and in accordance with standard practice and shall be in strict compliance with manufacturers specifications and/or recommendations.

2. The general and sub-contractors shall carefully examine the drawings, inspect the site, and acquaint themselves with all governing ordinances, laws, and otherwise familiarize themselves with all matters that may affect performance of the work.

Data
IBC 2015
Snow design load 30 psf
Wind load 120 mph ultimate @ 3 second gusts
Seismic Category B

Applicable Codes:
- INTERNATIONAL BUILDING CODE / 2015
- INTERNATIONAL FIRE CODE / 2015
- NATIONAL ELECTRIC CODE / 2014

Professional Certification
I hereby certify that these documents were prepared or approved by me, and I am a duly licensed professional engineer under the laws of the State of Maryland.
License Number: 9998
Expiration date: 2/3/2021

Wolfman & Associates, P.C.
8720 Georgia Ave. #908
Silver Spring, MD 20910

System Description

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<tr>
<td>Inverter(s)</td>
<td>SolarEdge 7.6 kW</td>
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REC TWINPEAK 2 MONO SERIES

PREMIUM SOLAR PANELS WITH SUPERIOR PERFORMANCE

REC TwinPeak 2 Mono Series solar panels feature an innovative design with high panel efficiency and power output, enabling customers to get the most out of the space used for the installation.

Combined with industry-leading product quality and the reliability of a strong and established European brand, REC TwinPeak 2 Mono panels are ideal for residential and commercial rooftops worldwide.

NOW WITH NEW WARRANTY!

- MORE POWER OUTPUT PER M²
- IMPROVED PERFORMANCE IN SHADED CONDITIONS
- 100% PID FREE
- REDUCES BALANCE OF SYSTEM COSTS
### ELECTRICAL DATA @ STC

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<td>Nominal Power Current (I_{sc})</td>
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<tr>
<td>Short Circuit Current (I_{sc})</td>
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<td>Panel Efficiency (%)</td>
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### ELECTRICAL DATA @ NMDT

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<tr>
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### CERTIFICATIONS

- CE
- TUV
- IEC 61701
- IEC 61215
- IEC 61700
- ISO 14001
- ISO 9001
- ISO 1090
- IRIS

### WARRANTY

- 20 year product warranty
- 25 year linear power output warranty

### MECHANICAL DATA

- Dimensions: 1675 x 997 x 38 mm
- Area: 1.87 m²
- Weight: 18.5 kg

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**19.2% EFFICIENCY**

**20 YEAR PRODUCT WARRANTY**

**25 YEAR LINEAR POWER OUTPUT WARRANTY**

**GENERAL DATA**

- Cell type: 120 half-cut mono-Si-type PERC cells
- 6 strings of 20 cells in series
- Glass: 3.2 mm solar glass with anti-reflections surface treatment
- Backsheet: Highly resistant polyester polyolefin construction
- Frame: Anodized aluminum
- Junction box: 3-part, 3 bypass diodes, IP67 rated in accordance with IEC 61730
- Cable: 4 mm² solar cable, 1.0 m x 1.2 m in accordance with EN 50618
- Connectors: Staubli MC4 PV-KBT4/PV-KST4 (4 mm²)
- Made in Singapore

**MAXIMUM RATINGS**

- Nominal Module Operating Temperature: 44.9°C (112°F)
- Temperature coefficient of P_{max} = -0.37%/°C
- Temperature coefficient of Voc = -0.29%/°C
- Temperature coefficient of I_{sc} = 0.04%/°C

**TEMPERATURE RATINGS**

- Nominal Module Operating Temperature: 44.9°C (112°F)
- Temperature coefficient of P_{max} = -0.37%/°C
- Temperature coefficient of Voc = -0.29%/°C
- Temperature coefficient of I_{sc} = 0.04%/°C

**SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE**

**REC TWINPEAK 2 MONO SERIES**

Founded in Norway in 1996, REC is a leading vertically integrated solar energy company. Through integrated manufacturing from silicon wafers, cells, high-quality panels and extending to solar solutions, REC provides the world with a reliable source of clean energy. REC's renowned product quality is supported by the longest warranty claim rate in the industry. REC is a leading and European company with headquarters in Norway and operational headquarters in Singapore. REC employs around 2000 people worldwide, producing 15 GW of solar panels annually.
Technical Data Sheet

CHEM LINK
Construction & Maintenance
Telephone: 800-826-1681
Fax: 269-879-4448
353 E. Lyons Street
Schoolcraft, MI 49087
www.chemlink.com

Product Description
E-Curb penetration seals replace old-style metal pitch pans with versatile, precast components and pourable sealants. CHEM LINK's E-Curb system can usually be installed in under 15 minutes and never requires flashing or mechanical attachment.

E-Curbs are designed for use on granulated modified bitumen, asphalt and coal tar B.U.R. (built up roofing).
E-Curbs are specified for PVC, EPDM, PIB, and TPO single ply roofing membranes. TPC Primer is required for use with TPO single-ply roof membrane.

When installed properly, this system forms a durable, waterproof rubber seal around penetrations. An extended manufacturer warranty against leaks is activated with submittal of a completed warranty card.

Special Characteristics
- Rapid installation - "Slip-fit" light weight curb design reduces labor significantly.
- Excellent adhesion to most roofing materials.
- No flashing or mechanical attachment required.
- Service Temperature -40°F to 200°F (-40°C to 93°C)
- 1-Part® accommodates movement and is suggested for use on all granulated membranes and details with excessive movement.
- For sloped roof applications, substitute DuraLink 50™ non-slump adhesive/sealant for 1-Part and M-1®

Restrictions
- Please contact customer service for application guidelines with temperatures below 32°F (0°C).
- Do not apply if rain is anticipated within 4 hours.
- Do not use on Hypalon or smooth APP modified bitumen membrane. For smooth APP, torch down a target of granulated APP before installation.
- TPO Primer must be used for TPO applications.
- Do not prime bonding surfaces with asphalt primer.
- Do not use asphalt cement as a "night sealant". Use M-1 for this purpose.
- E-Curb kits are designed to contain enough 1-Part to fill each curb with displacement in consideration. Refer to our penetration calculator under contractor resources at chemlink.com to verify volumes.

E-Curb System Components
- E-Curb exterior rings, straights, and corners.
- M-1 Structural Adhesive/Sealant used for bonding the E-Curb components, sealing and priming the penetration.
- 1-Part "moisture cure" pourable sealer, used to form a durable, water-tight seal around the roof penetration.

E-Curb precast form components are composed of light weight nylon resin. The E-Curb is 2-inches high and is available in a variety of shapes and sizes. Standard sizes include bisected circular pieces with inside diameters of 3, 4, 5, 6 or 9 inches; corner pieces with a 2-inch radius; straight pieces in 3-inch or 8-inch lengths; and a 4.5" x 3.4" rectangle. The outer surface is impervious to ice, corrosion, UV (ultraviolet) light and ponding water.

M-1 Structural Adhesive/Sealant is a durable, self-fixturing moisture cure mastic. Cartridges of M-1 are supplied in each E-Curb Kit. Components are also sold separately.

1-Part is a highly flexible, self-leveling moisture cure pourable sealer that eliminates mixing. It is also 100% solid rubber, has a very low VOC content, will not melt or shrink, and is resistant to deterioration. It is supplied in 10.1-oz and 28-oz cartridges or 1/2 gallon pouches. Unused sealer can be capped and reused.

Last Revision: 04/22/16
Document No. DS1350S
Step 1
Remove all previously applied caulk, mastic, cement, asphalt, and other contaminants from penetrations with a wire brush. Clean all smooth substrates with isopropyl or denatured alcohol. Brush away all gravel or loose granules. Seal the base of each penetration with M-1. Coat penetrations with M-1 to 3” above the roof line.

Step 2
Hold a section of E-Curb, flat side up, and apply a 1/4” bead of M-1 to the entire bottom perimeter. Apply 1 additional 1/4” bead of M-1 down the center of the section. Do not tool the beads flat. Place the E-Curb section on the roof surface to form a half circle around the penetration(s). Press down firmly until M-1 extrudes from the outside edges.

Step 3
Apply M-1 to the second section of E-Curb as described above. Place the second section of curb on the roof surface to form a circle with the first section. Press firmly in place until excess adhesive extrudes from the outside edges. Apply a bead of M-1 around the outside base of the installed E-Curb, and tool to form a smooth fillet. For non E-Curb penetrations seals, add M-1 to scarf joint surfaces and tool smooth.

Step 4
Cut tip off 1-Part cartridge at widest point on plastic nozzle and pierce the foil seal. Insert into caulk gun and pump E-Curb full. When using a 1-Part pouch, remove cap, pour, squeeze out excess air, and reseal.

Note: To provide an adequate rubber seal, maintain a 1” distance between penetrations and inside edge of the E-Curb.

All properties described in this document are derived from testing conducted in laboratory conditions. Properties and performance will vary depending on environmental conditions and application technique. Test and evaluate to determine appropriate usage. Visit www.chemlink.com for the Safety Data Sheet, Technical Data Guides and full warranty for this product.

LIMITED WARRANTY. CHEM LINK warrants this product's performance, provided it is properly stored and applied within 1 year. If this CHEM LINK material is proved to be defective, return remaining product and purchase receipt for refund or replacement of product exclusive of labor or cost of labor. This is the sole and exclusive remedy for defects or failure of this product. User must read and follow the direction of the current Technical Data Guide and SDS prior to product use. User determines suitability of product for intended use and assumes all risks. Manufacturer shall not be liable for damages (including consequential or incidental damages) in excess of the purchase price, except where such exclusion or limitation is prohibited by state law. THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, WRITTEN OR ORAL, STATUTORY, EXPRESS OR IMPLIED INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE; except for the above express warranty given by manufacturer, the product is sold with all faults. CHEM LINK SHALL NOT BE RESPONSIBLE FOR THE USE OF THIS PRODUCT IN A MANNER TO INFRINGE ON ANY PATENT OR ANY OTHER INTELLECTUAL PROPERTY RIGHTS HELD BY OTHERS. This warranty gives you specific legal rights, and you may also have other rights in the U.S. which vary from state to state. For warranty claim information, call 800-826-1681.
Series 100

The Installers Choice for Residential Solar Mounting

Entire Mounting System from Single Manufacturer under 1 Warranty

Snap-in features make the install process intuitive and fast

Industry Leading Technical Support Services for Every Customer

The Most Comprehensive UL 2703 Listing in the Industry

Start Mounting Solar on Your Roof Today

RESOURCES  snapnrack.com/resources
DESIGN      snapnrack.com/configurator
WHERE TO BUY snapnrack.com/where-to-buy
The SnapNrack Series 100 Roof Mount System is designed to provide the lowest total install cost of any residential mounting system.

The top-of-the-line features of the SnapNrack mounting system reduce install times and labor cost while eliminating the need for service calls creating the lowest install lifecycle cost of any mounting system.

Wire Management
- Products such as the standard rail channel keep wires neatly organized providing a clean finished look to every install
- Industry's largest offering of wire management accessories include snap in junction box, 4-wire and trunk cable clamps, as well as conduit clamps for both composition shingle and tile roofs.

Undeniable Aesthetics
- Render the mounting system invisible by using Universal End Clamps that fasten modules while remaining hidden underneath the array
- Array skirt provides a sleek look and attractive design to the front of the array
- Rail-based system provides rigid structure tucked away underneath array with no unsightly mounts at the top or bottom

SnapNrack solutions are focused on simplifying the installation experience through intuitive products and the best wire management in the industry.

SnapNrack
Solar Mounting Solutions

877-732-2860 www.snapnrack.com contact@snapnrack.com

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Power Optimizer
For North America
P320 / P340 / P370 / P400 / P405 / P505

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

solaredge.com
# Power Optimizer

**For North America**  
P320 / P340 / P370 / P400 / P405 / P505

<table>
<thead>
<tr>
<th>Optimizer model (typical module compatibility)</th>
<th>P320 (for 60-cell modules)</th>
<th>P340 (for high-power 60-cell modules)</th>
<th>P370 (for higher-power 60 and 72-cell modules)</th>
<th>P400 (for 72 &amp; 96-cell modules)</th>
<th>P405 (for thin film modules)</th>
<th>P505 (for higher current modules)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>INPUT</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nom. Input DC Power</td>
<td>320</td>
<td>440</td>
<td>560</td>
<td>480</td>
<td>480</td>
<td>480</td>
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<tr>
<td>Absolute Maximum Input Voltage</td>
<td>480</td>
<td>600</td>
<td>815</td>
<td>125</td>
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<tr>
<td>Maximum Output Current</td>
<td>46</td>
<td>60</td>
<td>80</td>
<td>125 - 135</td>
<td>125 - 135</td>
<td>125 - 135</td>
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<tr>
<td>Maximum Short Circuit Current</td>
<td>11</td>
<td>11</td>
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<tr>
<td>Maximum DC Input Current</td>
<td>480</td>
<td>480</td>
<td>480</td>
<td>480</td>
<td>480</td>
<td>480</td>
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<tr>
<td>Maximum Efficiency</td>
<td>98.5</td>
<td>98.5</td>
<td>98.5</td>
<td>98.5</td>
<td>98.5</td>
<td>98.5</td>
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<tr>
<td>Current-Voltage Category</td>
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<td></td>
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<tr>
<td><strong>OUTPUT DURING OPERATION (POWER OPTIMIZER CONNECTED TO OPERATING SOLAREDGE INVERTER)</strong></td>
<td></td>
<td></td>
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<tr>
<td>Maximum Output Voltage</td>
<td>560</td>
<td>600</td>
<td>720</td>
<td>600</td>
<td>600</td>
<td>600</td>
</tr>
<tr>
<td><strong>OUTPUT DURING STANDBY (POWER OPTIMIZER DISCONNECTED FROM SOLAREDGE INVERTER OR SOLAREDGE INVERTER OFF)</strong></td>
<td></td>
<td></td>
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<tr>
<td>Safety Output Voltage</td>
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<td>1 - 31</td>
<td>1 - 31</td>
<td>1 - 31</td>
<td>1 - 31</td>
<td>1 - 31</td>
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<tr>
<td><strong>STANDARD COMPLIANCE</strong></td>
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<td>FCC</td>
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<tr>
<td>Safety</td>
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<td></td>
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<td>ICES</td>
<td></td>
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<tr>
<td><strong>INSTALLATION SPECIFICATIONS</strong></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Maximum Allowed System Voltage</td>
<td>5000</td>
<td>5000</td>
<td>5000</td>
<td>5000</td>
<td>5000</td>
<td>5000</td>
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<tr>
<td>Compatible inverters</td>
<td>All Solaredge Single Phase and Three Phase inverters</td>
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<td></td>
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<tr>
<td>Dimensions [W x H x D]</td>
<td>138 x 210 x 34 / 138 x 210 x 34 / 138 x 210 x 34 / 138 x 210 x 34 / 138 x 210 x 34</td>
<td>138 x 210 x 34 / 138 x 210 x 34 / 138 x 210 x 34 / 138 x 210 x 34 / 138 x 210 x 34</td>
<td>138 x 210 x 34 / 138 x 210 x 34 / 138 x 210 x 34 / 138 x 210 x 34 / 138 x 210 x 34</td>
<td>138 x 210 x 34 / 138 x 210 x 34 / 138 x 210 x 34 / 138 x 210 x 34 / 138 x 210 x 34</td>
<td>138 x 210 x 34 / 138 x 210 x 34 / 138 x 210 x 34 / 138 x 210 x 34 / 138 x 210 x 34</td>
<td>138 x 210 x 34 / 138 x 210 x 34 / 138 x 210 x 34 / 138 x 210 x 34 / 138 x 210 x 34</td>
</tr>
<tr>
<td>Weight and Optional Package</td>
<td>6.35 / 3.7</td>
<td>7.5 / 4.2</td>
<td>4.15 / 3.4</td>
<td>6.2 / 3.3</td>
<td>6.2 / 3.3</td>
<td>6.2 / 3.3</td>
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<tr>
<td><strong>P R E S S  C O N N E C T I O N S</strong></td>
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<td></td>
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<td></td>
<td></td>
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<tr>
<td>Nom. DC Connection</td>
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<td>6</td>
<td>6</td>
<td>6</td>
<td>6</td>
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<tr>
<td>Output Wire Type / Connector</td>
<td>Double Insulated NC4</td>
<td>Double Insulated NC4</td>
<td>Double Insulated NC4</td>
<td>Double Insulated NC4</td>
<td>Double Insulated NC4</td>
<td>Double Insulated NC4</td>
</tr>
<tr>
<td>Output Wire Length</td>
<td>0.5 / 0.5</td>
<td>0.5 / 0.5</td>
<td>1.2 / 1.5</td>
<td>1.2 / 1.5</td>
<td>1.2 / 1.5</td>
<td>1.2 / 1.5</td>
</tr>
<tr>
<td>Input Wire Length</td>
<td>0.5 / 0.5</td>
<td>0.5 / 0.5</td>
<td>1.2 / 1.5</td>
<td>1.2 / 1.5</td>
<td>1.2 / 1.5</td>
<td>1.2 / 1.5</td>
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<tr>
<td>Protection</td>
<td>IP54 / IP54</td>
<td>IP54 / IP54</td>
<td>IP54 / IP54</td>
<td>IP54 / IP54</td>
<td>IP54 / IP54</td>
<td>IP54 / IP54</td>
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<tr>
<td>Relative Humidity</td>
<td>20 - 90</td>
<td>20 - 90</td>
<td>20 - 90</td>
<td>20 - 90</td>
<td>20 - 90</td>
<td>20 - 90</td>
</tr>
</tbody>
</table>

---

**PV System Design Using a SolarEdge Inverter**

<table>
<thead>
<tr>
<th>PV System Design Using a SolarEdge Inverter</th>
<th>Single Phase HD-Wave</th>
<th>Single phase</th>
<th>Three Phase 208V</th>
<th>Three Phase 480V</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum String Length</td>
<td>4</td>
<td>10</td>
<td>18</td>
<td>18</td>
</tr>
<tr>
<td>Minimum String Length (Per String)</td>
<td>6</td>
<td>13</td>
<td>18</td>
<td>18</td>
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<tr>
<td>Maximum String Length (Per String)</td>
<td>59</td>
<td>59</td>
<td>59</td>
<td>59</td>
</tr>
<tr>
<td>Maximum Power per String</td>
<td>570 (1600W) / 570 (1200W)</td>
<td>570 (1600W) / 570 (1200W)</td>
<td>570 (1600W) / 570 (1200W)</td>
<td>570 (1600W) / 570 (1200W)</td>
</tr>
<tr>
<td>PV System Design Using a SolarEdge Inverter</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

**RoHS** (Restriction of Hazardous Substances)
Single Phase Inverter with HD-Wave Technology for North America

Optimized installation with HD-Wave technology

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

solaredge.com
# Single Phase Inverter with HD-Wave Technology for North America


## OUTPUT

<table>
<thead>
<tr>
<th>Model</th>
<th>3000H</th>
<th>3800H</th>
<th>5000H</th>
<th>6000H</th>
<th>7600H</th>
<th>10000H</th>
<th>11400H</th>
</tr>
</thead>
<tbody>
<tr>
<td>AC Output Power</td>
<td>3000</td>
<td>3800</td>
<td>5000</td>
<td>6000</td>
<td>7600</td>
<td>10000</td>
<td>11400</td>
</tr>
<tr>
<td>Max. AC Input Power</td>
<td>4000</td>
<td>4000</td>
<td>4000</td>
<td>4000</td>
<td>4000</td>
<td>4000</td>
<td>4000</td>
</tr>
<tr>
<td>Maximum AC Input Current (A)</td>
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<td>25</td>
<td>25</td>
<td>25</td>
<td>22</td>
<td>22</td>
<td>22</td>
</tr>
<tr>
<td>Maximum AC Input Current (A)</td>
<td>55</td>
<td>55</td>
<td>55</td>
<td>55</td>
<td>55</td>
<td>55</td>
<td>55</td>
</tr>
<tr>
<td>Efficiency</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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</tbody>
</table>

## INPUT

<table>
<thead>
<tr>
<th>Model</th>
<th>3000H</th>
<th>3800H</th>
<th>5000H</th>
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<th>7600H</th>
<th>10000H</th>
<th>11400H</th>
</tr>
</thead>
<tbody>
<tr>
<td>DC Input Voltage</td>
<td>48V</td>
<td>48V</td>
<td>48V</td>
<td>48V</td>
<td>48V</td>
<td>48V</td>
<td>48V</td>
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<tr>
<td>Maximum DC Input Power</td>
<td>5000</td>
<td>5000</td>
<td>5000</td>
<td>5000</td>
<td>5000</td>
<td>5000</td>
<td>5000</td>
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<tr>
<td>Maximum DC Input Voltage</td>
<td>48V</td>
<td>48V</td>
<td>48V</td>
<td>48V</td>
<td>48V</td>
<td>48V</td>
<td>48V</td>
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<tr>
<td>Maximum Input Current</td>
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<td>15A</td>
<td>15A</td>
<td>15A</td>
<td>15A</td>
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<td>15A</td>
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<tr>
<td>Reverse Polarity Protection</td>
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<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<tr>
<td>Ground Resistance</td>
<td>4kΩ</td>
<td>4kΩ</td>
<td>4kΩ</td>
<td>4kΩ</td>
<td>4kΩ</td>
<td>4kΩ</td>
<td>4kΩ</td>
</tr>
<tr>
<td>Maximum Inverter Efficiency</td>
<td>90%</td>
<td>90%</td>
<td>90%</td>
<td>90%</td>
<td>90%</td>
<td>90%</td>
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</tr>
<tr>
<td>DC Input Current</td>
<td>50%</td>
<td>50%</td>
<td>50%</td>
<td>50%</td>
<td>50%</td>
<td>50%</td>
<td>50%</td>
</tr>
</tbody>
</table>

## ADDITIONAL FEATURES

- Limited accessories included
- Reverse Polarity Protection
- Ground Resistance

## STANDARD COMPLIANCE

- UL/CSA, IEC/EN 61724, EN 62109, Canadian AFOA according to TEMA A-37
- CE mark

## INSTALLATION SPECIFICATIONS

<table>
<thead>
<tr>
<th>Model</th>
<th>3000H</th>
<th>3800H</th>
<th>5000H</th>
<th>6000H</th>
<th>7600H</th>
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</tr>
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<tr>
<td>AC Input Power</td>
<td>3000</td>
<td>3800</td>
<td>5000</td>
<td>6000</td>
<td>7600</td>
<td>10000</td>
<td>11400</td>
</tr>
<tr>
<td>Max. AC Input Power</td>
<td>4000</td>
<td>4000</td>
<td>4000</td>
<td>4000</td>
<td>4000</td>
<td>4000</td>
<td>4000</td>
</tr>
<tr>
<td>Efficiency</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Dimensions</td>
<td>7 x 11 in</td>
<td>7 x 11 in</td>
<td>7 x 11 in</td>
<td>7 x 11 in</td>
<td>7 x 11 in</td>
<td>7 x 11 in</td>
<td>7 x 11 in</td>
</tr>
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<td>Weight</td>
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<td>0.17 lb</td>
<td>0.17 lb</td>
<td>0.17 lb</td>
<td>0.17 lb</td>
<td>0.17 lb</td>
</tr>
</tbody>
</table>

RoHS
SolarEdge provides distributed solar power harvesting and PV monitoring systems. The company's technology maximizes power generation for residential, commercial and large-scale PV systems. The SolarEdge portfolio of products includes power optimizers, highly reliable PV inverters and a web portal for module-level monitoring and fault detection.

Up to 25% more energy
Increased energy yield & faster return on investment through module-level MPPT
- No module power mismatch loss
- No partial shading loss
- No soiling mismatch loss
- No aging mismatch loss

Cost efficient maintenance
Full visibility of system performance & remote troubleshooting
- Module-level performance data
- Presentation of complete system on virtual site map
- Automatic alerts on system issues
- Easy access via web browser from computer or smartphone

SafeDC™ - DC safety
Safety during installation, maintenance, firefighting & other emergencies
- Installation: safe string voltage - until inverter & AC supply are turned on
- Maintenance: safe string voltage - automatic once inverter is turned off
- Emergency: safe string voltage - automatic after grid disconnection

Constraint free design
Maximum space utilization with minimum design time
- Modules on different orientation and tilts in the same string
- Different module types in a single string
- Strings of different lengths connected to same inverter
- Longer strings - up to 25 modules per string

SolarEdge solution overview
About SolarEdge

With more than 1,800,000 units shipped (>450MW) to over 40 countries worldwide, SolarEdge is the established leader in the rapidly growing field of DC power optimization. SolarEdge maintains strategic partnerships across the PV value chain, from module manufacturers to integrators, in Europe, the USA and APAC and employs over 230 people across the globe.
North Elevation