



## HISTORIC PRESERVATION COMMISSION

Marc Elrich  
*County Executive*

Robert K. Sutton  
*Chairman*

Date: May 11, 2022

### MEMORANDUM

TO: Mitra Pedoeem  
Department of Permitting Services

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

SUBJECT: Historic Area Work Permit #991929 - Solar Installation

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The Montgomery County Historic Preservation Commission (HPC) has reviewed the attached application for a Historic Area Work Permit (HAWP). This application was **Approved** by the HPC Staff.

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

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

Applicant: Heather Twomey  
Address: 7106 Unit 1 Maple Ave., Takoma Park

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





HISTORIC PRESERVATION COMMISSION

HAWP #: \_\_\_\_\_ at: \_\_\_\_\_
submitted on: \_\_\_\_\_
has been reviewed and determined that the proposal fits into the following category/categories:

- Repair or replacement of a masonry foundation with new masonry materials that closely match the original in appearance;
Installation of vents or venting pipes in locations not visible from the public right-of-way;
New gutters and downspouts;
Removal of vinyl, aluminum, asbestos, or other artificial siding when the original siding is to be repaired and/or replaced in kind;
Removal of accessory buildings that are not original to the site or non-historic construction;
Repair or replacement of missing or deteriorated architectural details such as trim or other millwork, stairs or stoops, porch decking or ceilings, columns, railings, balusters, brackets shutters, etc., with new materials that match the old in design, texture, visual characteristics, and, where possible materials, so long as the applicant is able to provide one extant example, photographic evidence, or physical evidence that serves as the basis for the work proposed;
Construction of wooden decks that are at the rear of a structure and are not visible from a public right-of-way;
Roof replacement with -compatible roofing materials, or with architectural shingles replacing 3-Tab asphalt shingles;
Installation of storm windows or doors that are compatible with the historic resource or district;
Repair, replacement or installation of foundation-level doors, windows, window wells, and areaways, or foundation vents, venting pipes, or exterior grills that do not alter the character-defining features and/or the historic character of the resource;
Construction of fences that are compatible with the historic site or district in material, height, location, and design;
Fence is lower than 48" in front of rear wall plane;

- Construction of walkways, parking pads, patios, driveways, or other paved areas that are not visible from a public right-of-way and measure no more than 150 square feet in size;
Replacement of existing walkways, parking pads, patios, driveways, or other paved areas with materials that are compatible with the visual character of the historic site and district and that are no greater than the dimensions of the existing hardscape;
Construction of small accessory buildings no larger than 250 square feet in size that are not visible from the public right-of-way;
Installations of skylights on the rear of a structure that will not be visible from the public right-of-way, and would not remove or alter character-defining roof materials;
Installation of solar panels and arrays in locations that are not readily visible from the public right-of-way or that are designed so as to have a minimal impact on the historic resource or the historic district (e.g., systems that are ground-mounted in areas other than the front or side yard of a corner lot, located on accessory or outbuildings, on non-historic additions, or on rear facing roof planes);
Installation of car charging stations in any location on a property or in the right-of-way;
Installation of satellite dishes;
Removal of trees greater than 6" in diameter (d.b.h.) that are dead, dying, or present an immediate hazard.
Removal of trees greater than 6" in diameter (d.b.h.) in the rear of the property that will not impact the overall tree canopy of the surrounding district or historic site;
Replacement tree required as a condition; and,
Other minor alterations that may be required by the Department of Permitting Services post-Commission approval that would have no material effect on the historic character of the property.

Staff finds the proposal complies with Chapter 24A, the Secretary of the Interior's Standards for Rehabilitation, and any additional requisite guidance. Under the authority of COMCOR No. 24A.04.01, this HAWP is approved by [Signature] on \_\_\_\_\_. The approval memo and stamped drawings follow.

# Index

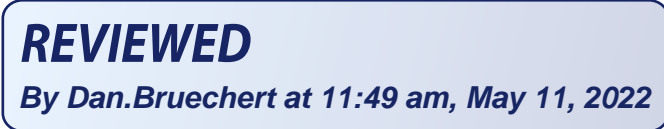
- 00\_Index
- A01\_Overview
- PV01\_Mount Detail
- PV02\_Mount Detail
- PV03\_Hardware Specs
- E01\_Electrical Diagram
- E02\_Electrical Calculations
- E03\_Electrical Labels

## Scope of Work:

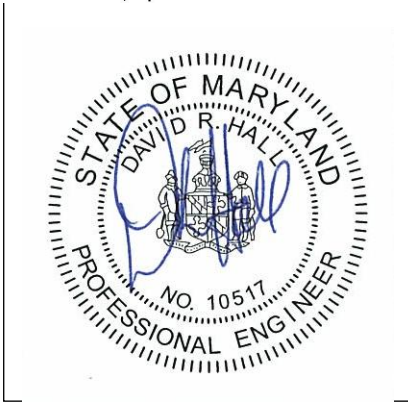
To install 8.01kW size of solar panels with a system height of 1.1 feet on roof of building.

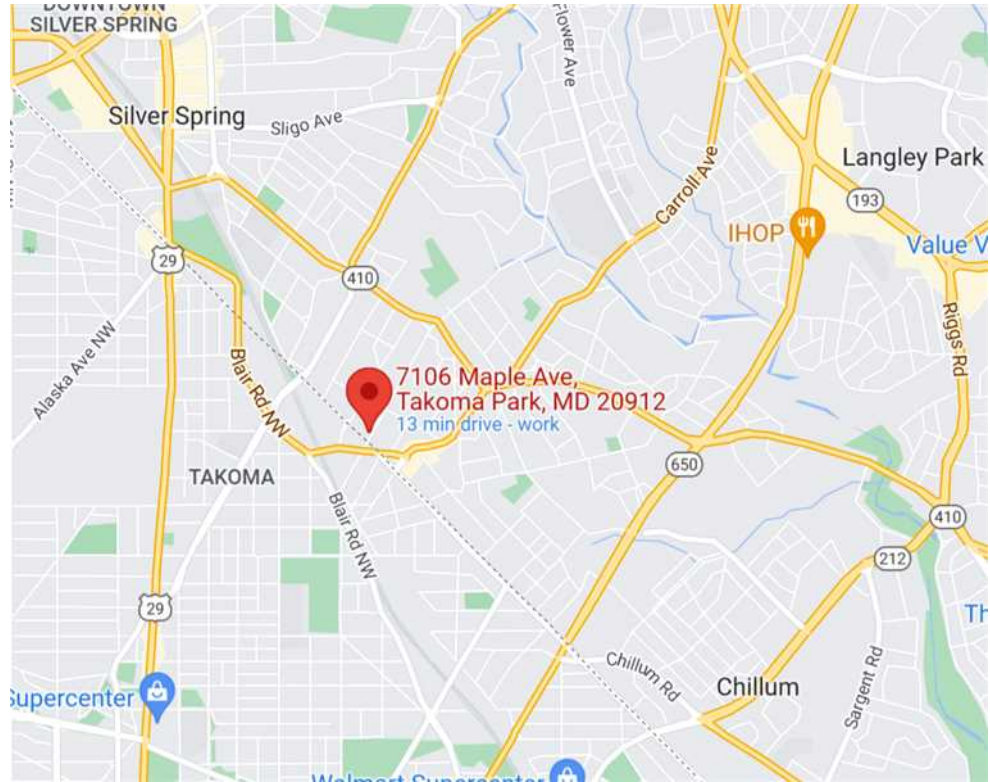
## Codes

- NFPA 70
- NEC 2017
- IRC 2018
- CC 2018



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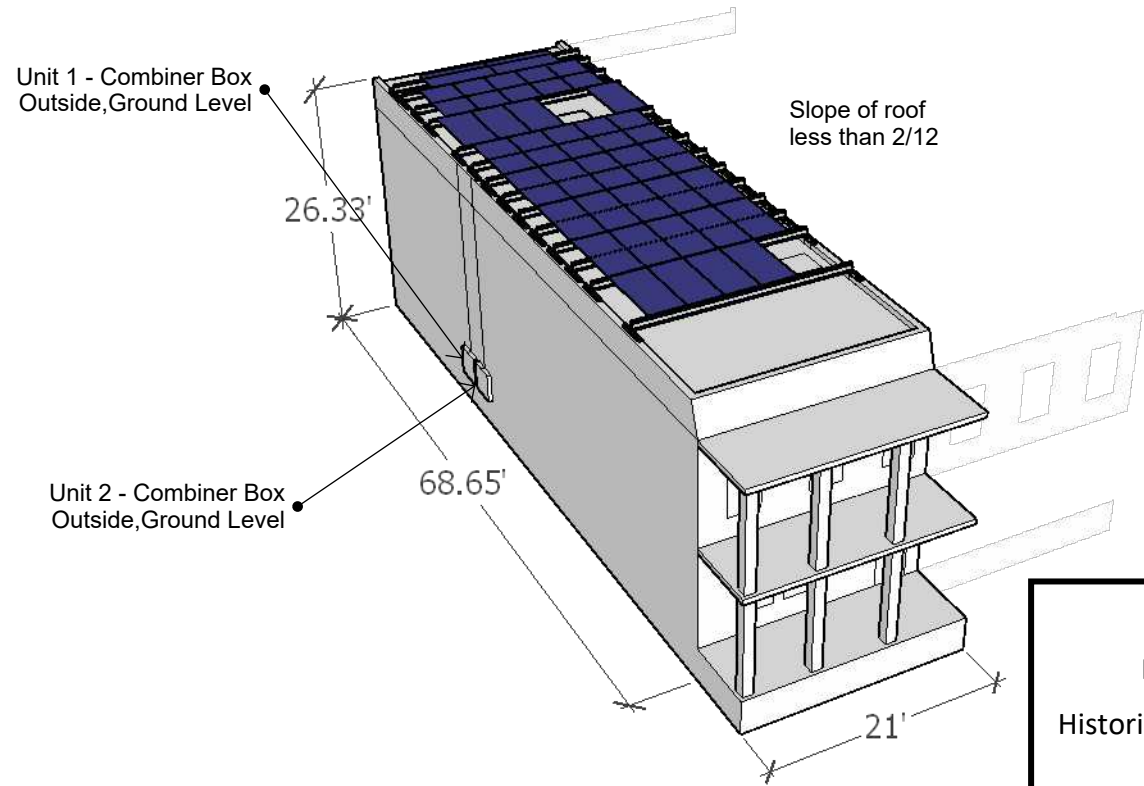




1 Site Plan  
A01

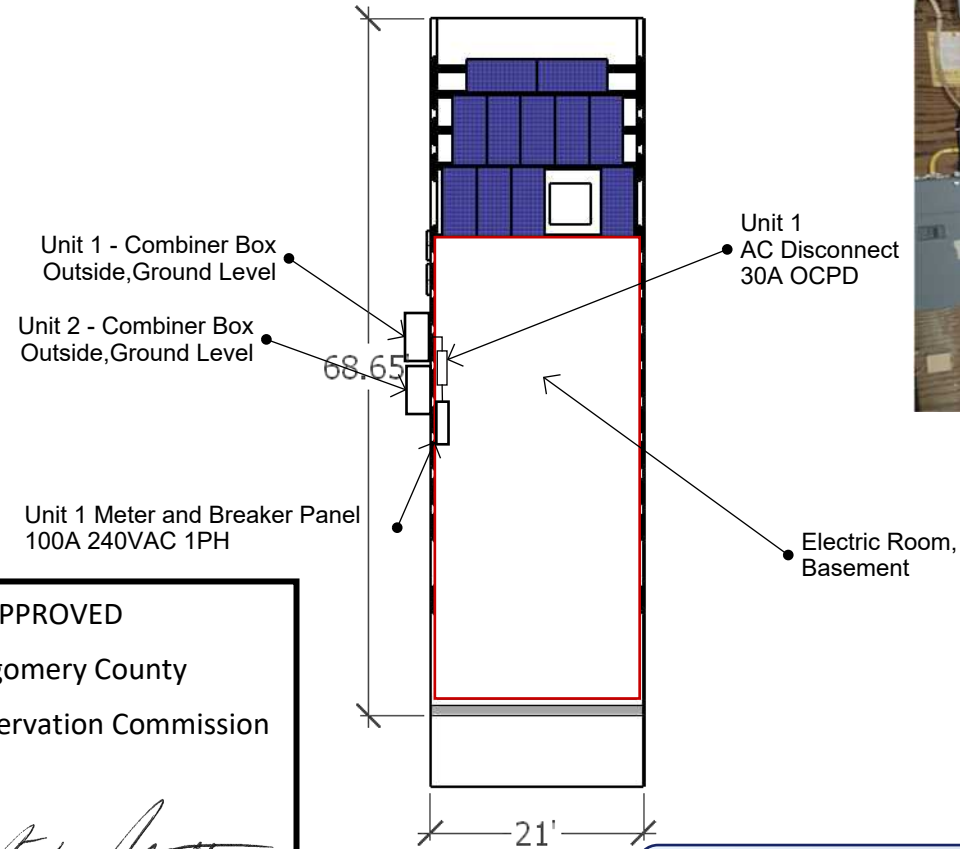


2 Street View of Building  
A01

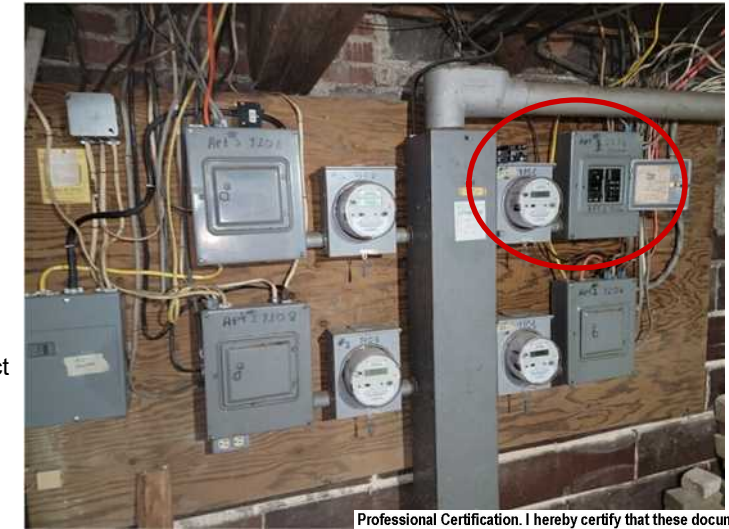


3 Proposed PV Design  
A01

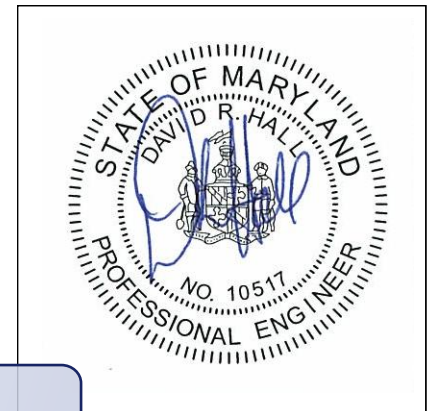
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Montgomery County  
Historic Preservation Commission  
  
*[Signature]*



4 Site Plan  
A01



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**REVIEWED**  
By Dan.Bruechert at 11:49 am, May 11, 2022

**SOLAR SOLUTION**  
4700 14th ST. NW  
Washington, DC 20011

Project #4664  
Heather Twomey  
7106 Maple Ave Unit 1,  
Takoma Park, MD, 20912

**Overview**

Issue Date  
04.08.2022

Revisions:

System Size:  
8.01 kW

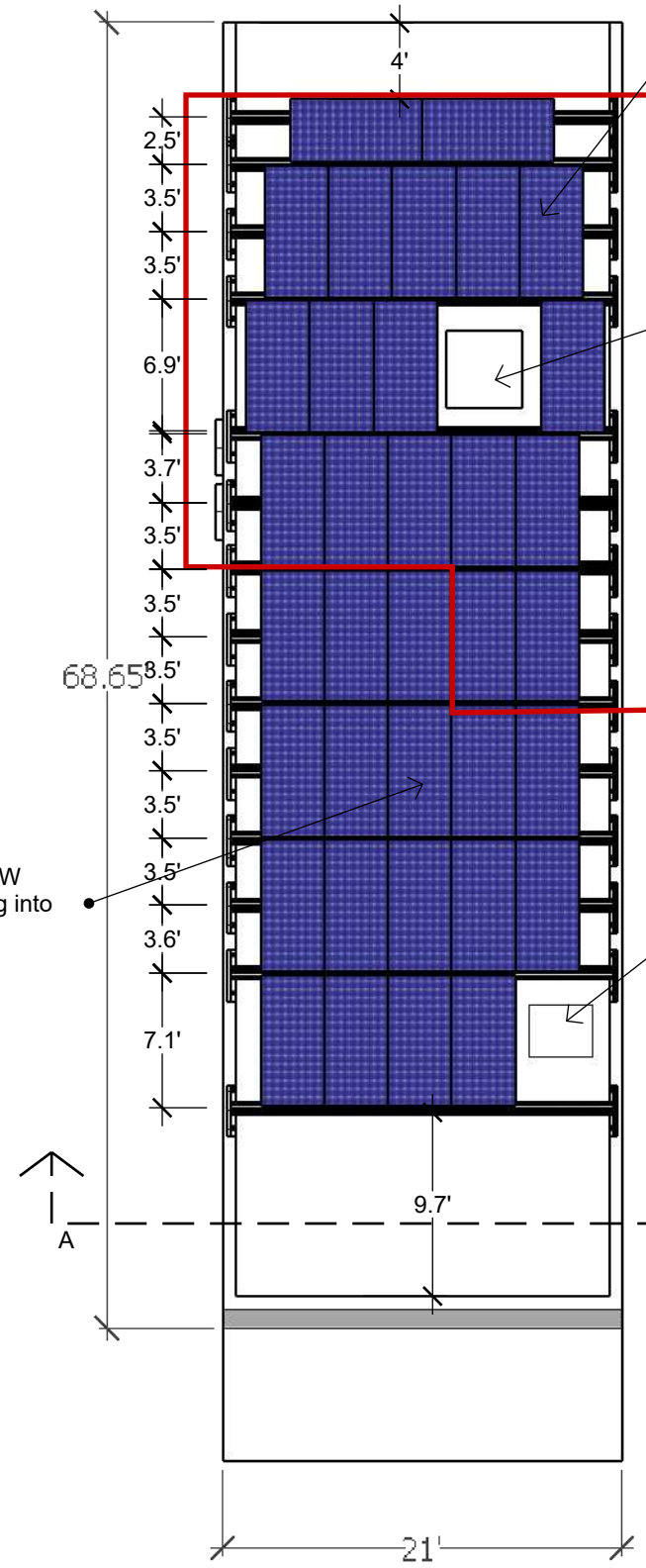


18 Boviet 445W Modules going into Unit 1

AC Unit

17 Boviet 445W Modules going into Unit 2

Hatch

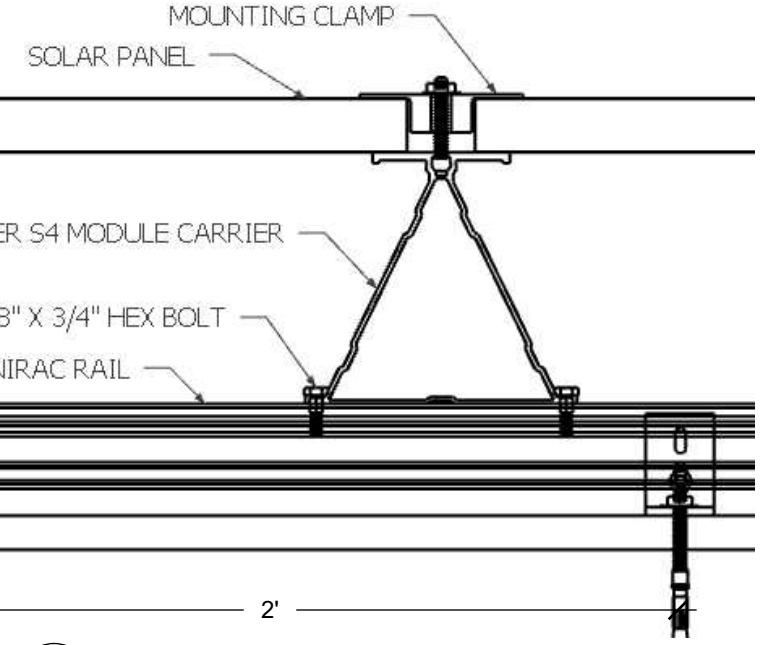


1 Roof Plan  
PV01 Scale: 1" = 10'

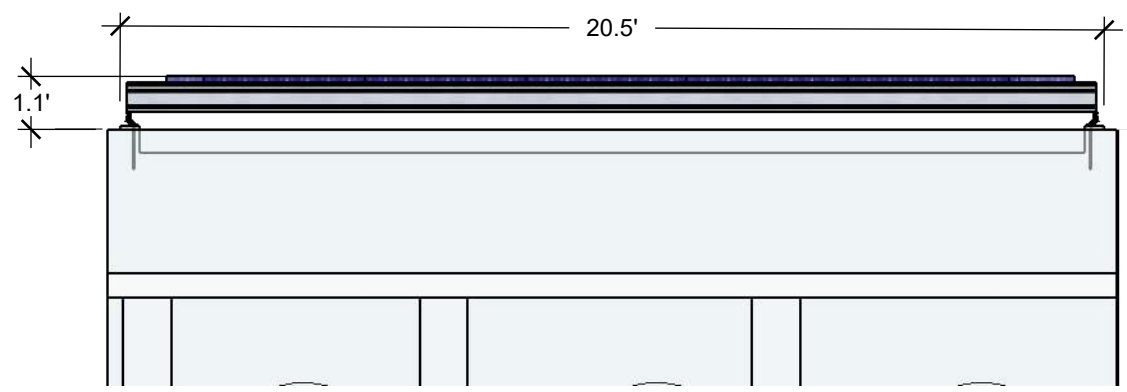
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*[Signature]*

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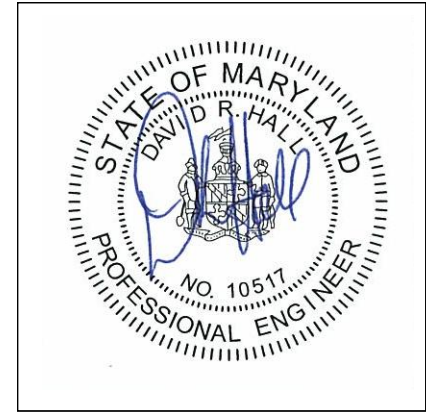


2 Mount Details  
PV01



3 Cross Section A-A  
PV01 Scale: 1/4" = 1'

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**Mount Detail**

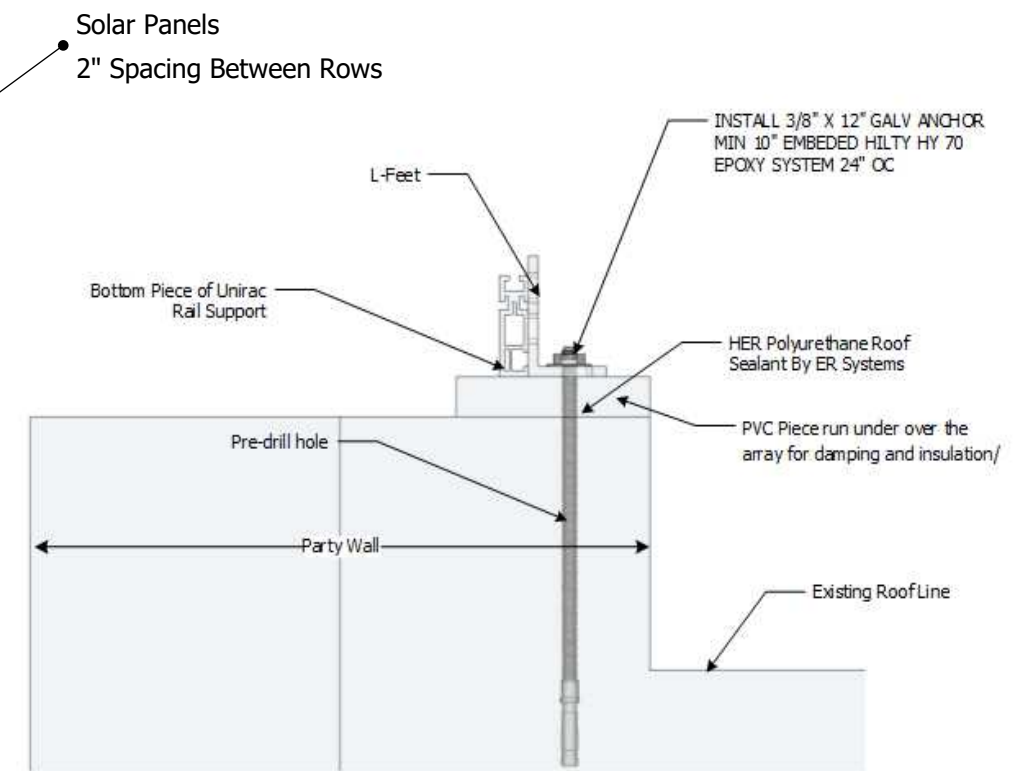
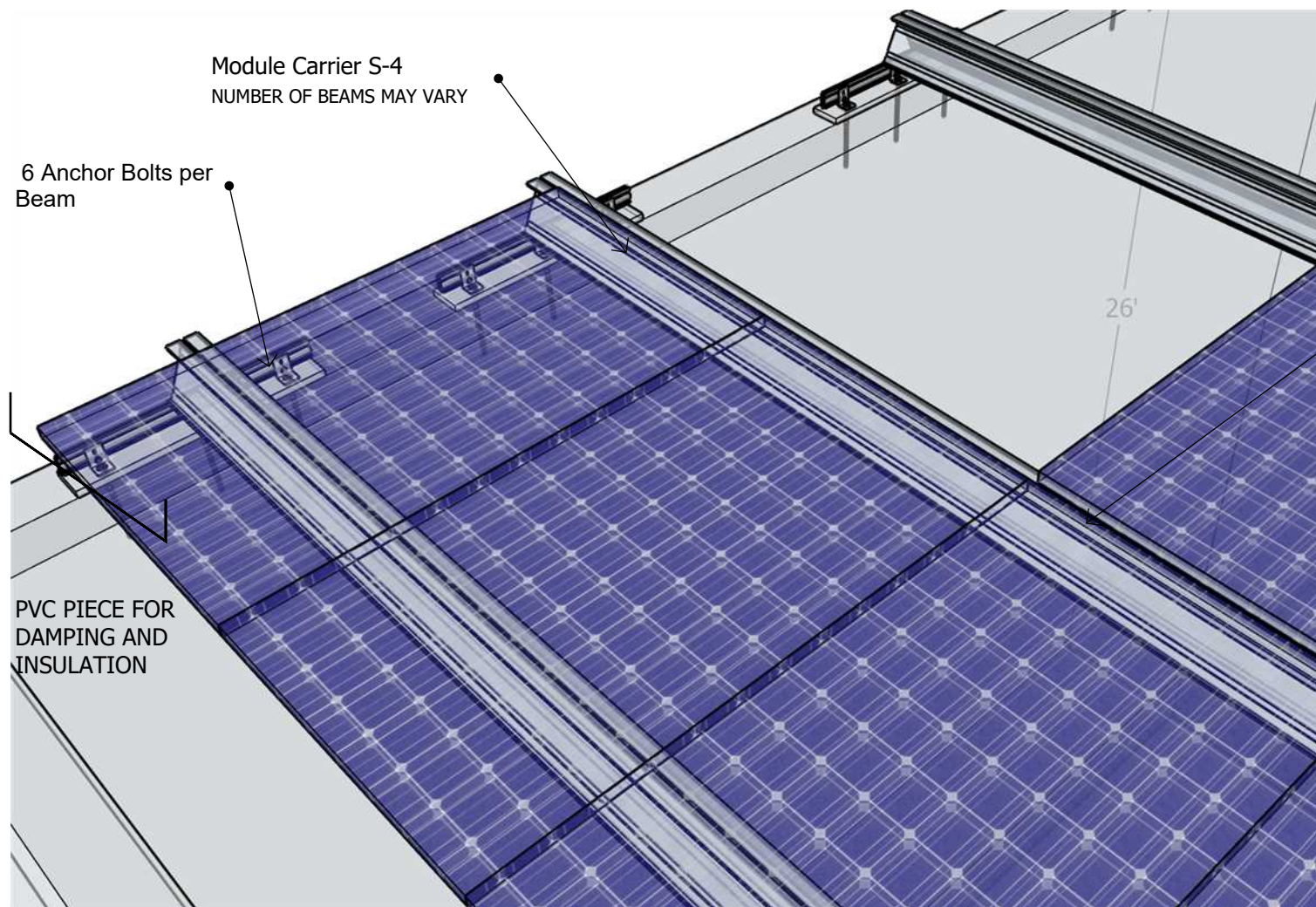
Issue Date  
04.08.2022

Revisions:

System Size:  
8.01 kW

**pv**

**01**



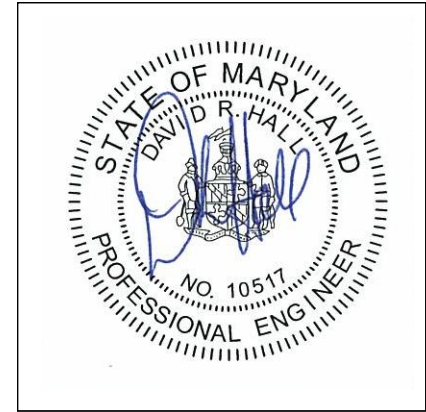
1 Mount Detail  
PV02

2 Section Cut  
PV02

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Historic Preservation Commission

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**Mount Detail**

Issue Date  
04.08.2022

Revisions:

System Size:  
8.01 kW

**pv**

**02**



Boviet 445W

Boviet Solar USA high efficiency monocrystalline modules are perfect for space-limited applications in which the desired power output must be guaranteed in a limited space.

**Electrical Data/STC**

Nominal Power [Wp]: 445W  
 Operational Voltage [Vmp]: 40.50V  
 Operational Current [Imp]: 10.99A  
 Open-Circuit Voltage [Voc]: 48.80V  
 Short-Circuit Current [Isc]: 11.55A

**Component Materials**

Cells per Module: 72  
 Cell Type: Monocrystalline

- Comprehensive Certificates for Products and Management
- UL 61730, IEC 61215, IEC 61730, CEC listed, MCS and CE
  - ISO 9001 for Quality Management Systems
  - ISO 14001 for Environmental Management Systems
  - OHSAS 18001 Occupational Health and Safety Systems



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Enphase IQ 7+

**Input Data (DC)**

Recommended Input Power (STC): 235-440W  
 Maximum Input DC Voltage: 60V  
 Peak Power Tracking Voltage: 27V-45V  
 Operating Range: 16-60V  
 Min/Max Start Voltage: 22/60V  
 Max DC Short Circuit Current: 15A

**Output Data (AC)**

Max Output Power: 290W  
 Nominal Output Current: 1.21A  
 Nominal Voltage Range: 211-264V  
 Nominal Frequency/Range: 60Hz  
 Extended Frequency/Range: 47-58Hz  
 Power Factor: 1  
 Maximum Units per Branch: 13

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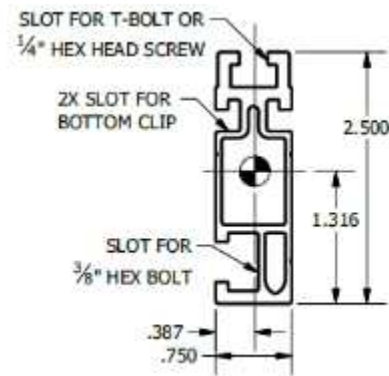
**Hardware Specifications**

Issue Date  
 04.08.2022

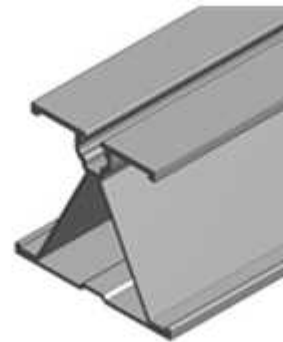
Revisions:

System Size:  
 8.01 kW

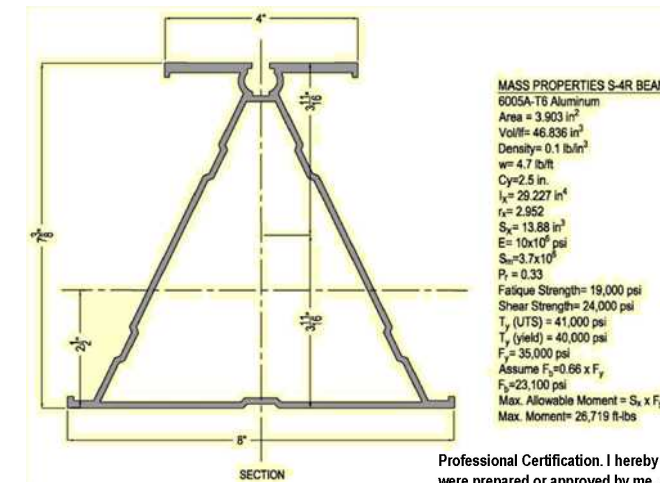
**pv**  
**03**



The universal SolarMount rail system has three options which can be assembled into a wide variety of PV mounting structures to accommodate any job site. Unirac provides a technical support system complete with installation and codecompliance documentation.



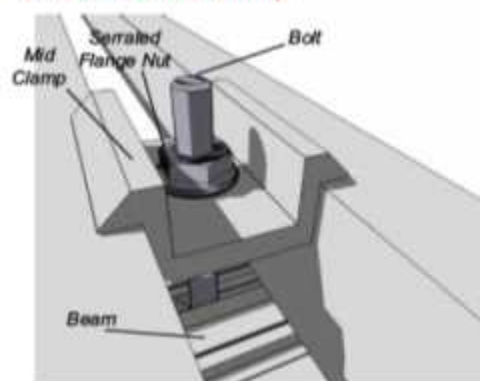
The S4 is manufactured from extruded aluminum to maximize spans while minimizing weight for improved handling. The S4 carrier has a side slot to enable the option of bottom mounting. Optimized features for large span length in Free Field systems.



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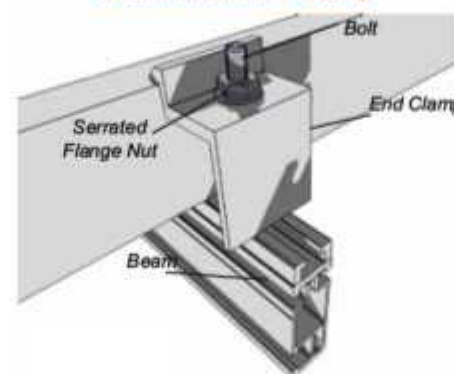
**Product Certificate UL2703**

**SolarMount Mid Clamp**

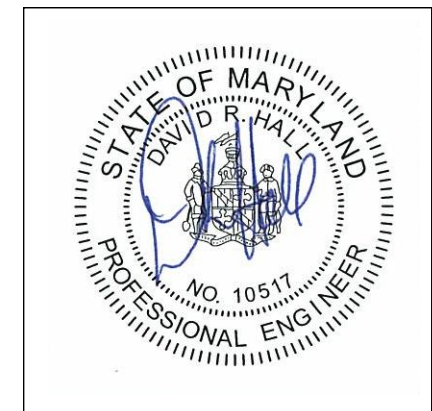


- Mid clamp material: One of the following extruded aluminum alloys: 6005-T5, 6105-T5, 6061-T6
- Ultimate tensile: 38ksi, Yield: 35 ksi
- Finish: Clear or Dark Anodized
- Mid clamp weight: 0.050 lbs (23g)
- Allowable and design loads are valid when components are assembled according to authorized UNIRAC documents
- Values represent the allowable and design load capacity of a single mid clamp assembly when used with a SolarMount series beam to retain a module in the direction indicated
- Assemble mid clamp with one Unirac 1/4"-20 T-bolt and one 1/4"-20 ASTM F594 serrated flange nut
- Use anti-seize and tighten to 10 ft-lbs of torque
- Resistance factors and safety factors are determined according to part 1 section 9 of the 2005 Aluminum Design Manual and third-party test results from an IAS accredited laboratory

**SolarMount End Clamp**



- End clamp material: One of the following extruded aluminum alloys: 6005-T5, 6105-T5, 6061-T6
- Ultimate tensile: 38ksi, Yield: 35 ksi
- Finish: Clear or Dark Anodized
- End clamp weight: varies based on height: ~0.058 lbs (26g)
- Allowable and design loads are valid when components are assembled according to authorized UNIRAC documents
- Values represent the allowable and design load capacity of a single end clamp assembly when used with a SolarMount series beam to retain a module in the direction indicated
- Assemble with one Unirac 1/4"-20 T-bolt and one 1/4"-20 ASTM F594 serrated flange nut
- Use anti-seize and tighten to 10 ft-lbs of torque
- Resistance factors and safety factors are determined according to part 1 section 9 of the 2005 Aluminum Design Manual and third-party test results from an IAS accredited laboratory
- Modules must be installed at least 1.5 in from either end of a beam



NOTE: The IQ 7 Micro, IQ 7+ Micro and the IQ 7X Micro have integrated ground and double insulation. The inverter does not require a EGC, other EGC requirements remain unchanged. The DC circuit is isolated and insulated from ground and meets the requirements of NEC 690.35.

Notes:

Modules are clamped with mid/end clamps.  
#6 bare copper Ground Wire in contact with all modules and rails/beams/trays

Mid and End Clamps with integrated Grounding

11 Boviet 445W Panels

#6 Bare Copper connected to all rails/beams with Lugs. Mid and end clamps with integrated ground

Enphase Q Cable (Portrait)  
Two (2) #12 AWG Wire  
THWN-2  
L1-Black  
L2-Red

Junction Box

1/2" Conduit  
(4) #12 AWG Conductors  
(2) #10 Insulated EGC

String 1

7 Boviet 445W Panels

#6 Bare Copper connected to all rails/beams with Lugs. Mid and end clamps with integrated ground

Enphase Q Cable (Portrait)  
Two (2) #12 AWG Wire  
L1-Black  
L2-Red

1/2" Conduit  
(2) #12 AWG Conductors

String 2

Label 2

Label 1

Label 8 To/From Meter & Grid

Unit 1: **NXA112135695**

Line Side Tap via KUP-L-TAP® (IPC) IPC-4/0-6

Tap is < 10' From AC Disconnect

Existing 100A 1PH 240VAC

Line Side

Existing Ground

30A OCPD 60A Rated AC Disconnect

30A OCPD AC Disconnect housed inside Combiner Box

Enphase IQ Combiner  
30A OCPD  
1PH  
240VAC

Rated for 60A

20A  
10A  
30A

Enphase Envoy Monitoring Unit

#10 AWG insulated Ground (Typical)

Label 10 Label 9 Label 1 Label 8

Line Side Tap Installation done inside line side of main service panel. Sufficient room for installation.

Line Side Tap via KUP-L-TAP® (IPC) IPC-4/0-6

Load Side

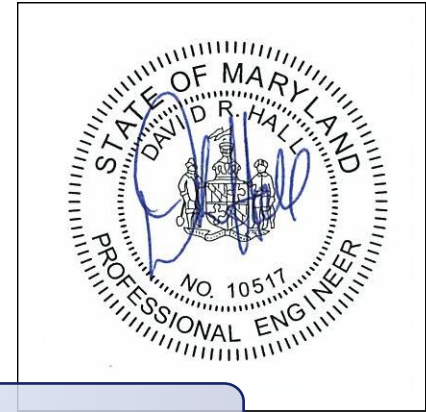
Label 4

1/2" Conduit (3) #6 AWG #10 Insulated EGC

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Montgomery County  
Historic Preservation Commission

*[Signature]*

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**REVIEWED**  
By Dan.Bruechert at 11:50 am, May 11, 2022

**SOLAR SOLUTION**  
4700 14th ST. NW  
Washington, DC 20011

Project #4664  
Heather Twomey  
7106 Maple Ave Unit 1,  
Takoma Park, MD, 20912

**Electrical Diagram**

Issue Date  
04.08.2022

Revisions:

System Size:  
8.01 kW



**01**



**CODE REFERENCE:**

ART 690.8 (A)

1. The maximum current shall be the sum of parallel module rated short - circuit currents multiplied by 125%.

3. The maximum current shall be the inverter continuous output current rating.

ART 690.8(B)(1)

1. CONDUCTION MUST HAVE 30 C AMPACITY > 125% OF CONTINUOUS CURRENT PER 690.8(A)
2. CONDUCTOR MUST HAVE (AFTER CORRECTIONS FOR CONDITIONS OF USE) GREATER THAN OR EQUAL TO CONTINUOUS CURRENT PER TABLE 310.15
3. EVALUATE CONDUCTOR TEMPERATURE AT TERMINATION PER ART 110.14(C). AMPACITY OF WIRE DERATED FOR CONDITIONS OF TERMINATION MUST BE > CONTINUOUS CURRENT X 1.25.

**DC CALCULATIONS**

SYSTEM SIZE: 18X 445 W = 8.01kW

PV SOURCE CIRCUIT

PV MODULE ISC = 11.55 A

# OF MODULES IN PARALLEL PER CIRCUIT = 1

MAX ISC = 1 X 11.55X 1.25 = 14.4A

OCPD/Ampacity = 14.4A x 1.25 = 18A, 20A OCPD

SOURCE CIRCUIT WIRING

CONDUCTOR = COPPER #12 AWG THWN-2 90°C RATED

CORRECTION FACTORE FOR 60°C AMBIENT = 0.71

CORRECTED AMPACITY: 30 A X 0.71 X 0.8 = 17.0A > 14.4A

**AC Current Calculations**

Total Panels: 18 x 1.21A = 21.78A

String 1: 11 x 1.21A = 13.31A

String 2: 7 x 1.21A = 8.47A

Combiner Box Home Run Current: 18 x 1.21A = 21.78A

OCPD Sizing: 30A

80% of OCPD = 30A x .8 = 24A > 21.78A

Wiring for Combiner Box: 1/2" Conduit #6 AWG & #10 Ground

Conductor for #6 AWG THWN-2 90 C Rated

Correction Factor for 45 C Ambient = 0.87

Corrected Ampacity: 75Ax0.87x0.8 = 52.2A > 21.78A

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Montgomery County

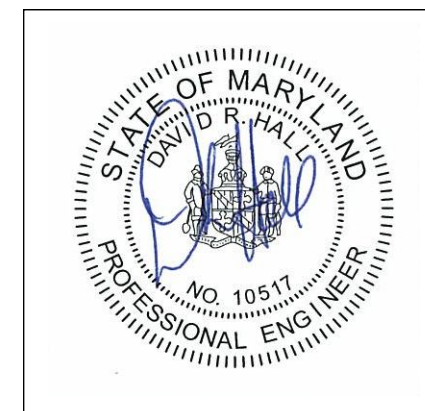
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**Electrical Calculations**

Issue Date  
04.08.2022

Revisions:

System Size:  
8.01 kW



**Solar System Warning Labels Material**  
 Vinyl Material - Flexcon DPM FWS White Vinyl  
 Reflective Material - Avery Dennison T-1500-A Engineering Grade Beaded Retroreflective Film  
 Lamination - Flexcon DPM Clear Gloss Polyester Laminate

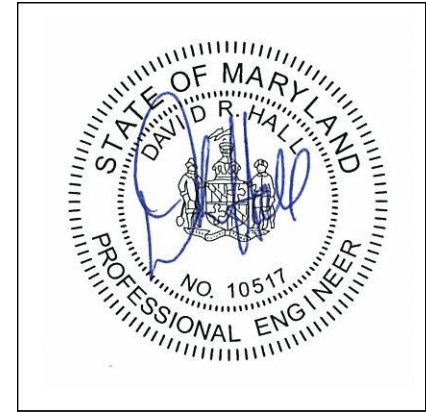
Label 1		Location: (C)(CB) Per code: NEC 690.31.G.3	Label 6		Location: (AC)(POI) Per code: NEC 690.17.E
Label 2		Location: (DC)(INV) Per code: NEC 690.5 (C)		Label 7	
Label 3		Location: (DC)(CB) Per code: NEC 690.17 (4)	Label 8		Location: (POI) Per code: NEC 690.64.B.4
Label 4		Location: (AC)(POI) Per code: NEC 690.54	Label 9		Location: (D)(POI) Per code: NEC 690.64.B.4
Label 5		Location: (AC) Per Code: NEC 690.52	Label 10		Location: (POI) Per code: NEC 690.64.B.7

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**Electrical Labels**

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