



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 #991947 - Solar Installation

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: 7108 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 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 T. Brueckert on _____. The approval memo and stamped drawings follow.

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- E02_Electrical Calculations
- E03_Electrical Labels

Scope of Work:

To install 7.565kW 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

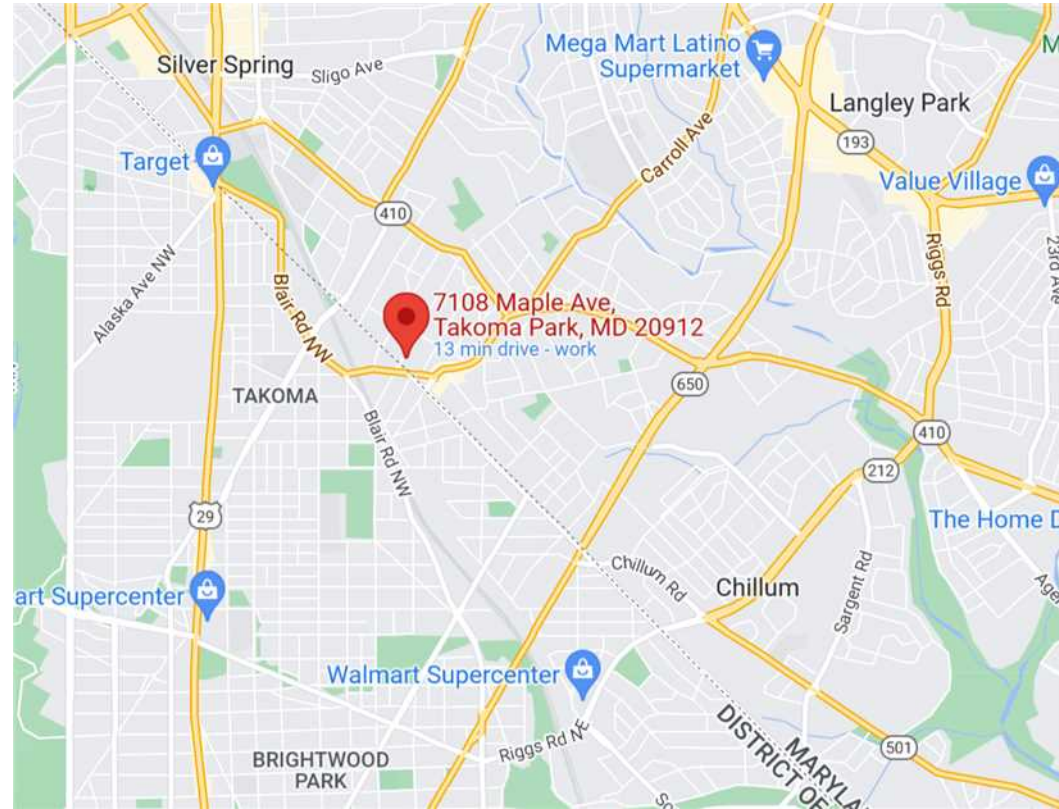
APPROVED
Montgomery County
Historic Preservation Commission



REVIEWED
By Dan.Bruechert at 11:54 am, May 11, 2022

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 10517, Expiration Date: 07/31/23

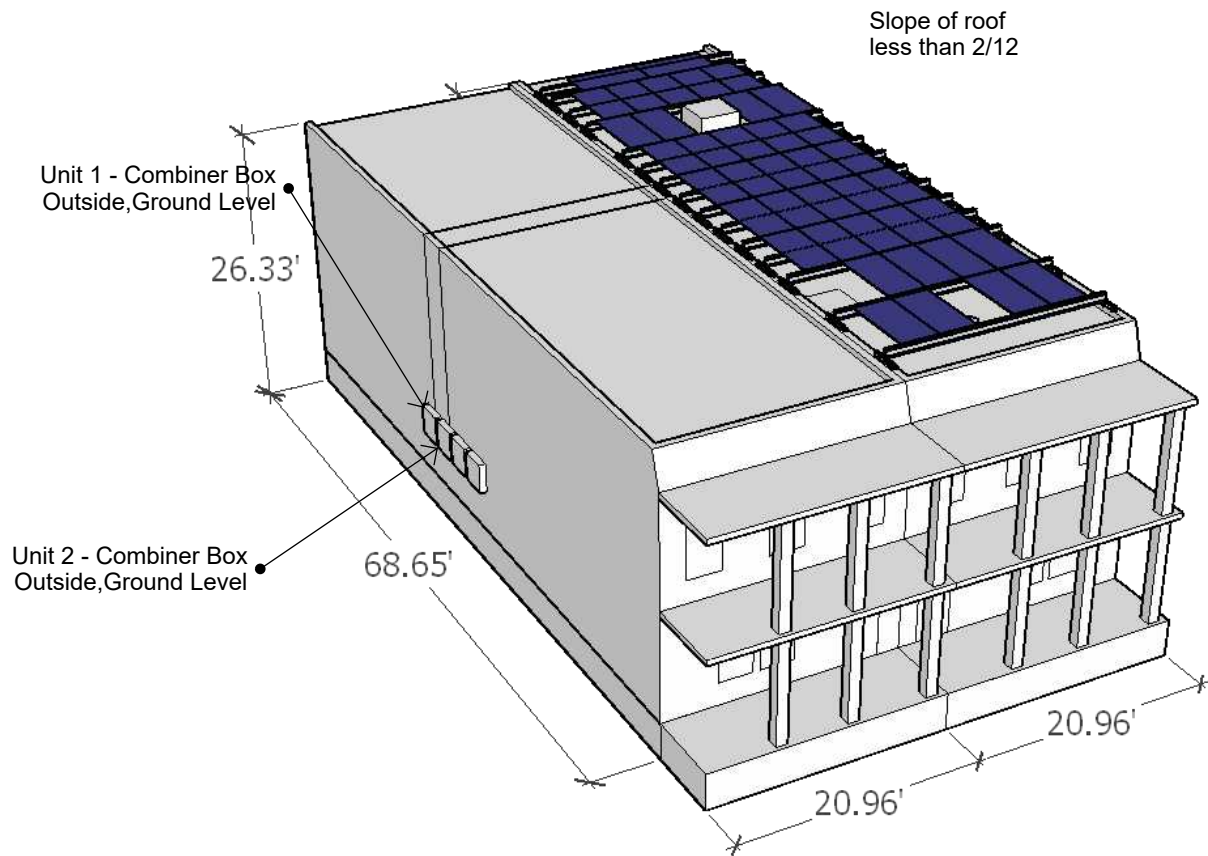




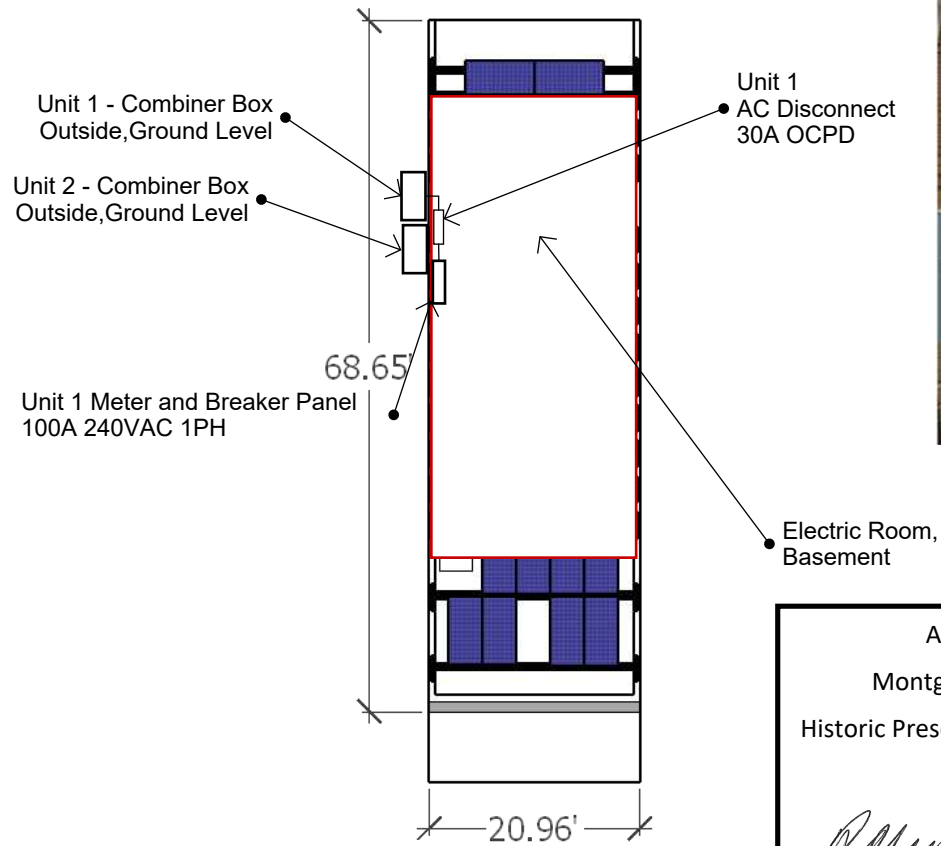
1 Site Plan
A01



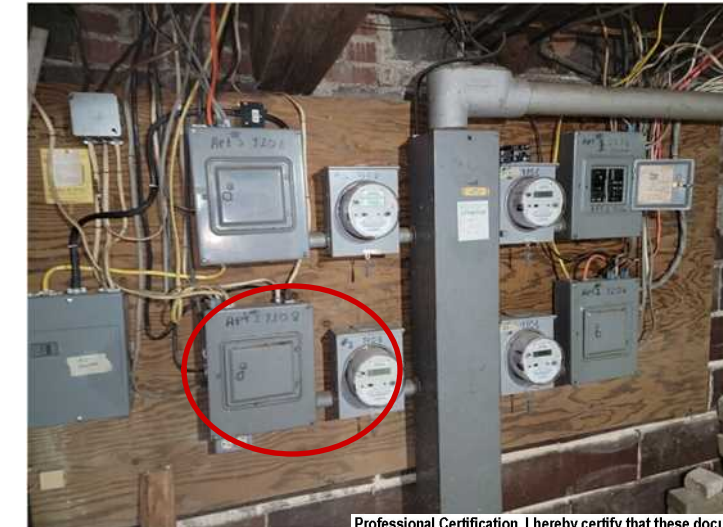
2 Street View of Building
A01



3 Proposed PV Design
A01

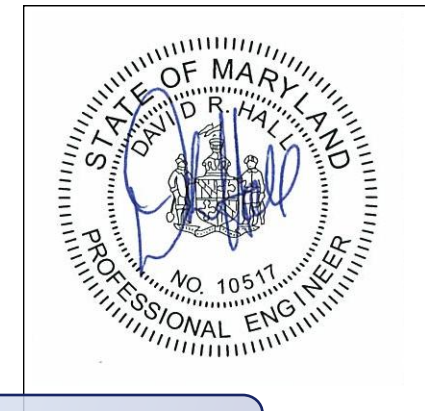


4 Site Plan
A01



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

Project #4664
Heather Twomey
7108 Maple Ave Unit 1,
Takoma Park, MD, 20912

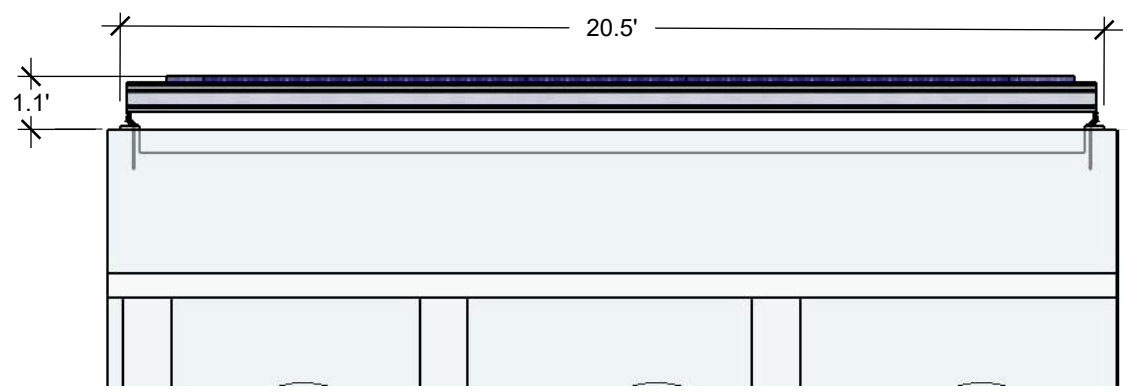
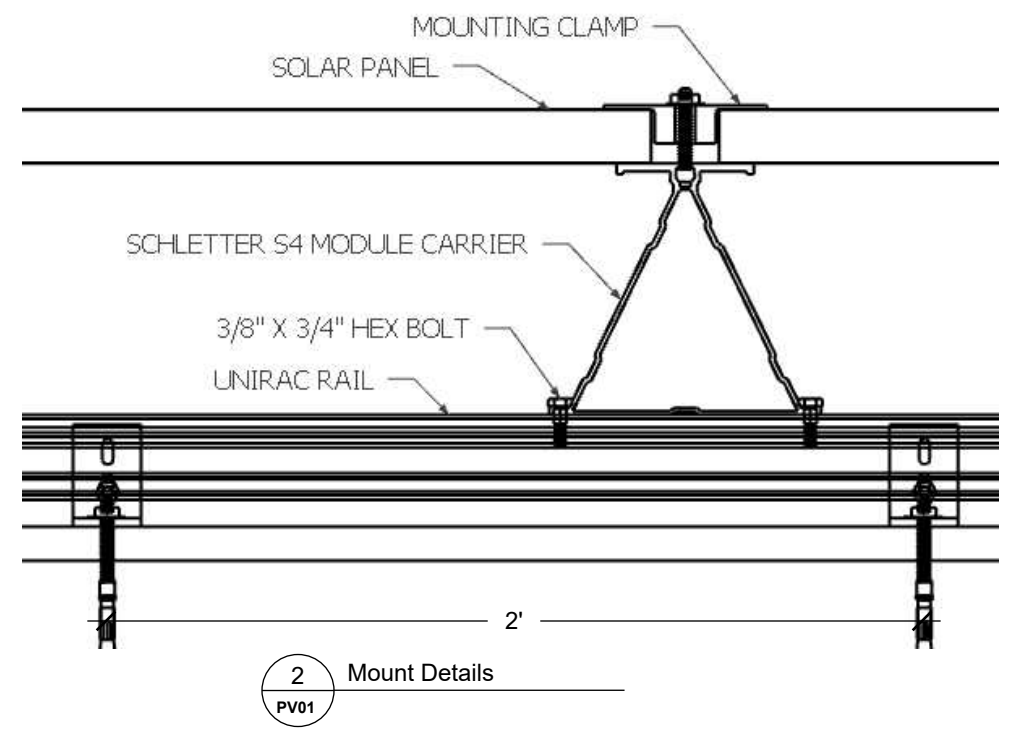
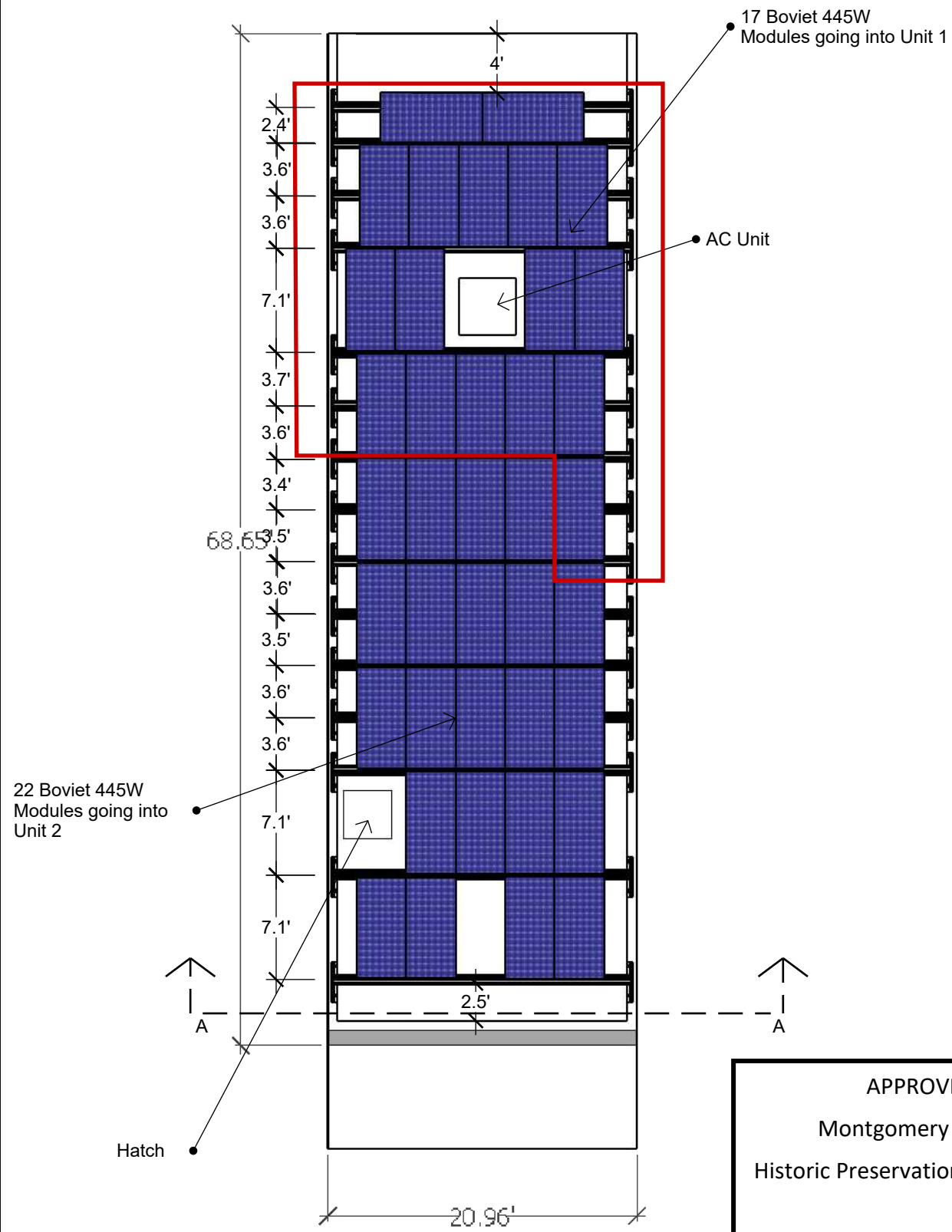
Overview

Issue Date
04.13.2022

Revisions:

System Size:
7.565 kW



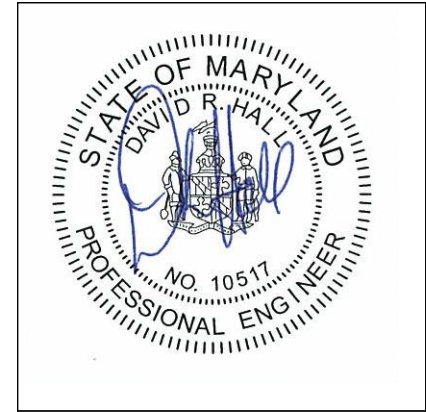


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[Signature]

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Mount Detail

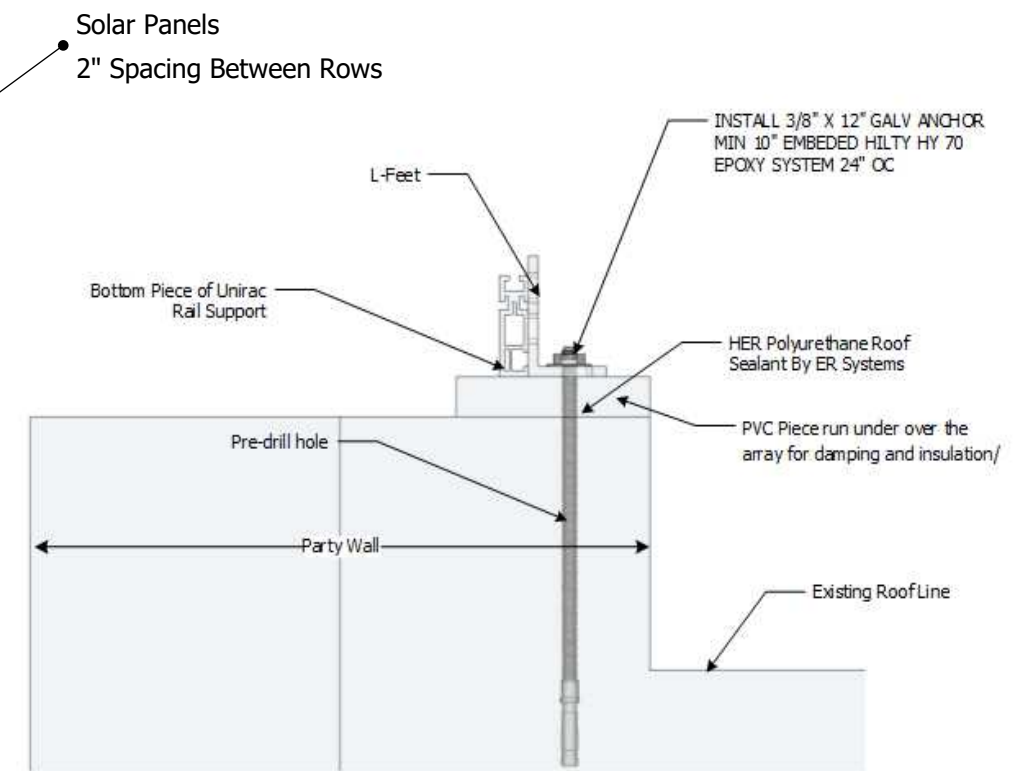
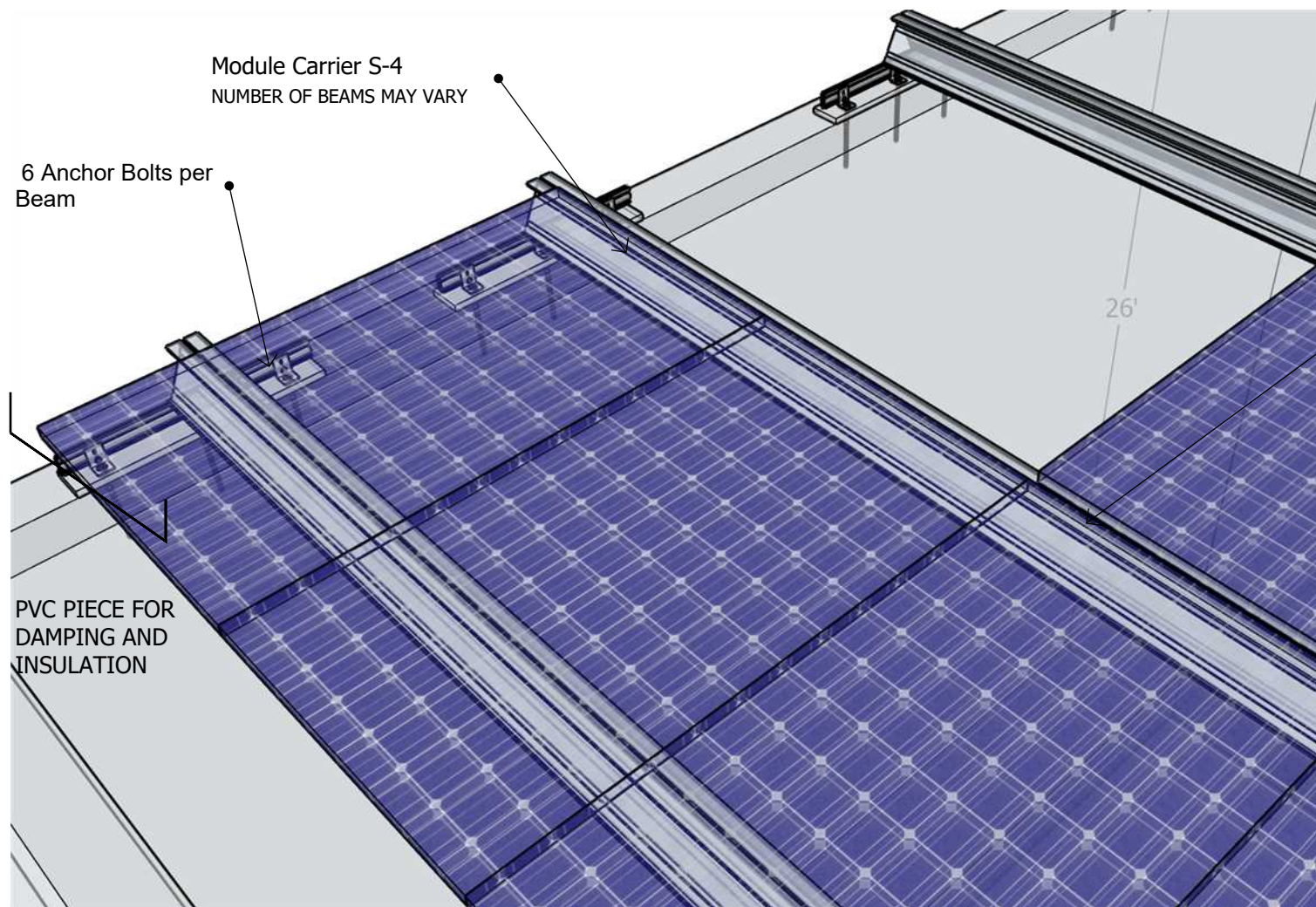
Issue Date
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Revisions:

System Size:
 7.565 kW

pv

01



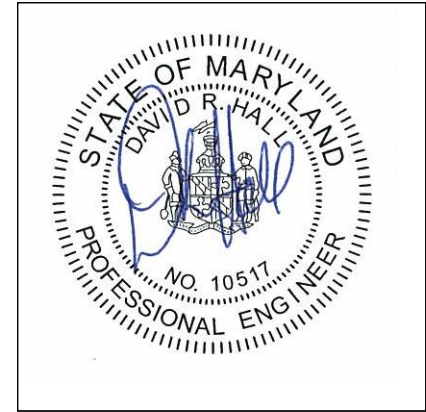
1 Mount Detail
PV02

2 Section Cut
PV02

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Mount Detail

Issue Date
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Revisions:

System Size:
7.565 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

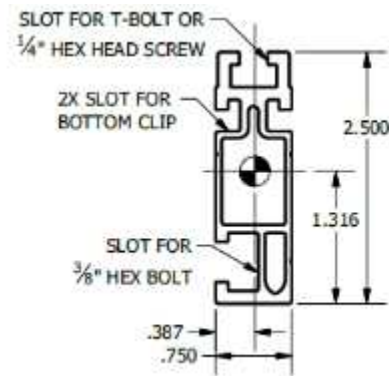
Issue Date
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Revisions:

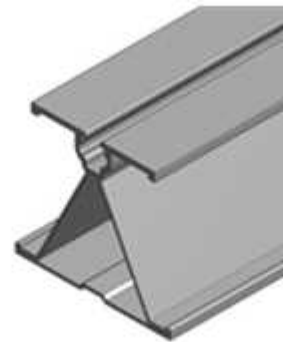
System Size:
 7.565 kW

pv

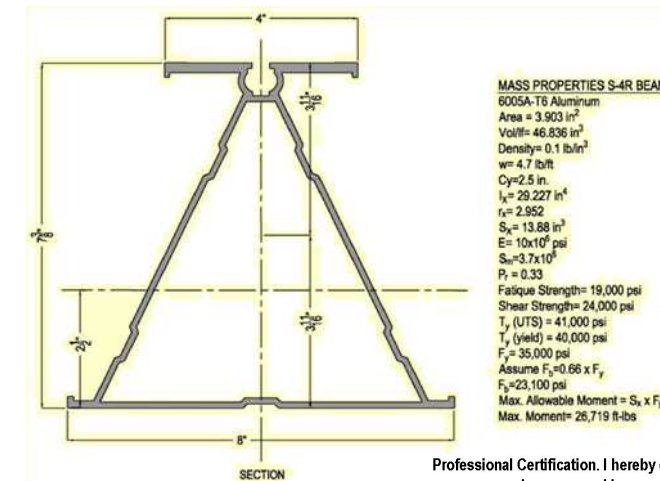
03



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.



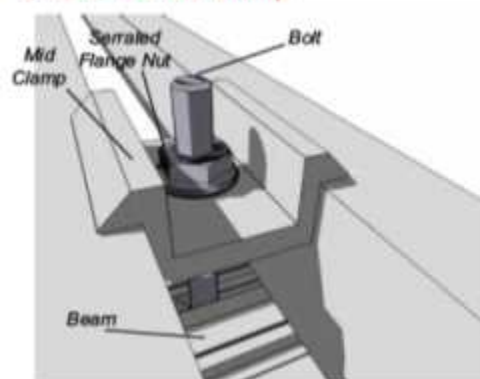
The S4 is manufactured from extruded aluminum to maximize spans while minimizing weight for improved handling. The S4 carrier has a side slot to enable the option of bottom mounting. Optimized features for large span length in Free Field systems.



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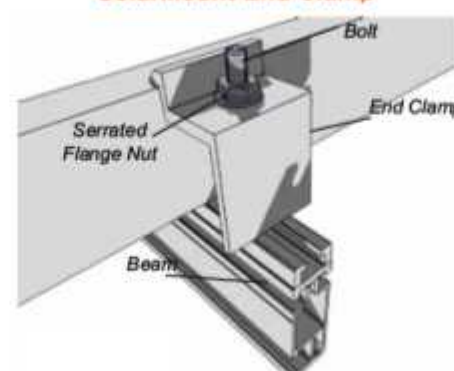
Product Certificate UL2703

SolarMount Mid Clamp

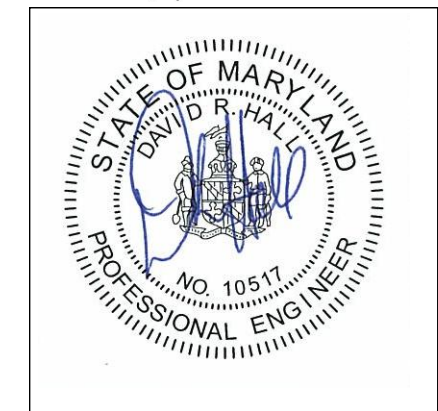


- Mid clamp material: One of the following extruded aluminum alloys: 6005-T5, 6105-T5, 6061-T6
- Ultimate tensile: 38ksi, Yield: 35 ksi
- Finish: Clear or Dark Anodized
- Mid clamp weight: 0.050 lbs (23g)
- Allowable and design loads are valid when components are assembled according to authorized UNIRAC 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

6 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: **NXA112135697**

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

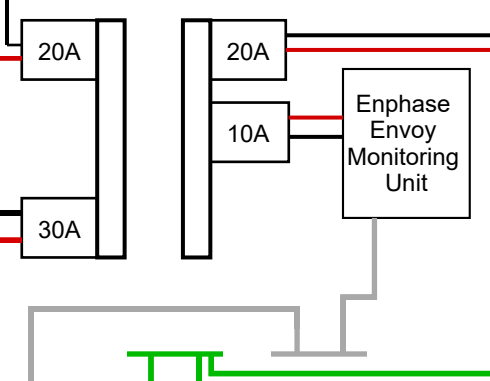
30A OCPD 60A Rated AC Disconnect

Label 4

30A OCPD AC Disconnect housed inside Combiner Box

Enphase IQ Combiner
30A OCPD
1PH
240VAC
Rated for 60A

Label 10 Label 9 Label 5



#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

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

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SOLAR SOLUTION
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Project #4664
Heather Twomey
7108 Maple Ave Unit 1,
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Electrical Diagram

Issue Date
04.13.2022

Revisions:

System Size:
7.565 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: 17X 445 W = 7.565kW

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: 17 x 1.21A = 20.57A

String 1: 11 x 1.21A = 13.31A

String 2: 6 x 1.21A = 7.26A

Combiner Box Home Run Current: 17 x 1.21A = 20.57A

OCPD Sizing: 30A

80% of OCPD = 30A x .8 = 24A > 20.57A

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 > 20.57A

APPROVED

Montgomery County

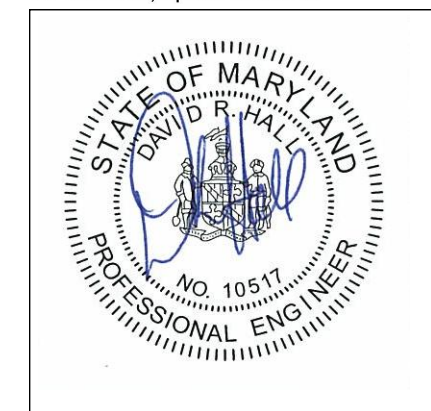
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Electrical Calculations

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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



Location: (POI)
 Per code:
 NEC 690.17.4

Label 3



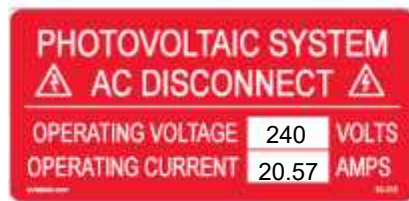
Location: (DC)(CB)
 Per code:
 NEC 690.17 (4)

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

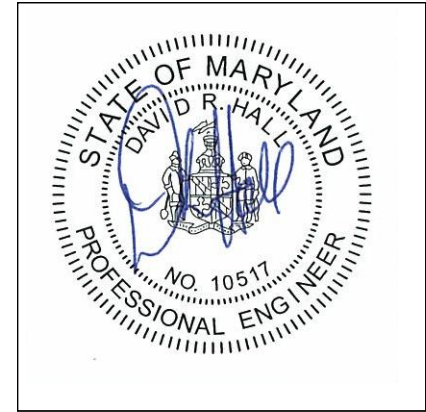


Location: (POI)
 Per code:
 NEC 690.64.B.7

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Electrical Labels

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03