



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 #991501 - 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: David Eisner
Address: 7010 Westmoreland 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.

Index

- 00_Index
- A01_Overview
- PV01_Roof Layout
- PV02_Roof Layout
- PV03_Mount Detail
- PV04_Hardware Specs
- E01_Electrical Diagram
- E02_Electrical Calculations
- E03_Electrical Labels

Scope of Work:

To install 10.235kW size of solar panels on roof of building.

Codes

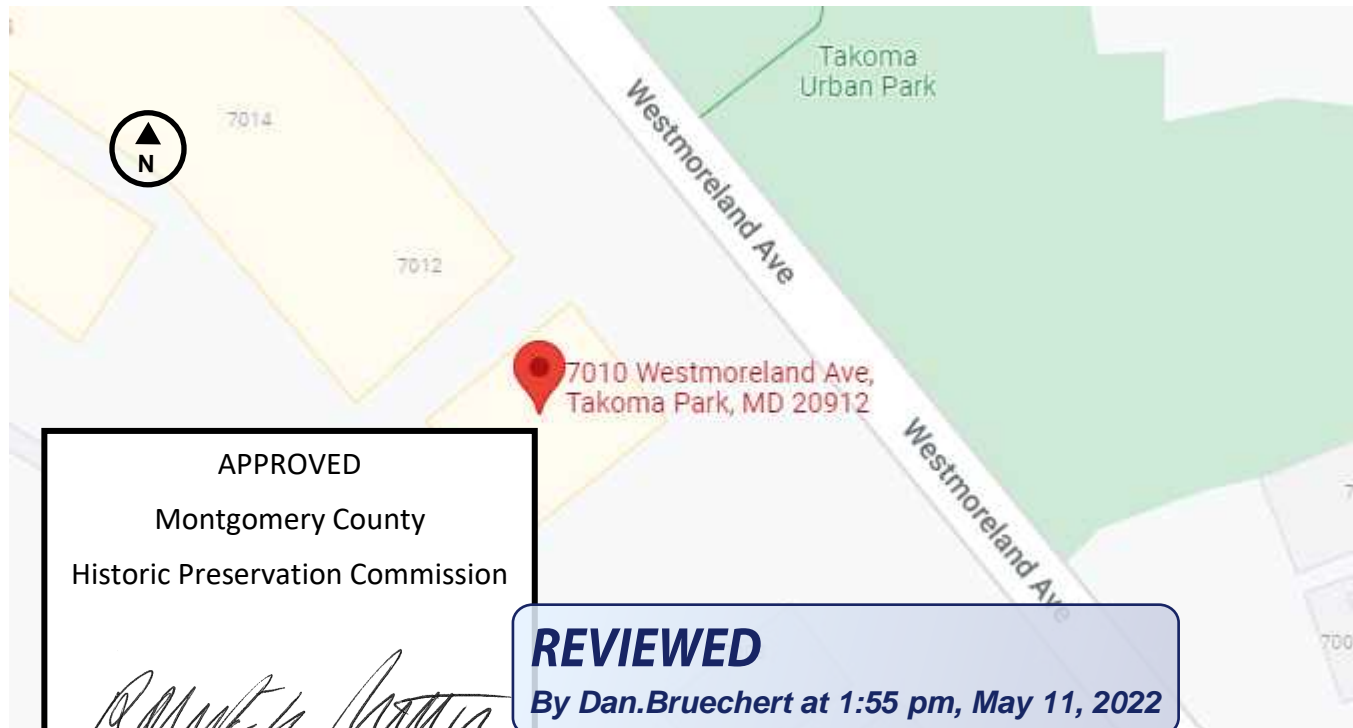
- NFPA 70
- NEC 2017
- IRC 2018
- CC 2018



REVIEWED
By Dan.Bruechert at 1:55 pm, 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





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 Montgomery County
 Historic Preservation Commission

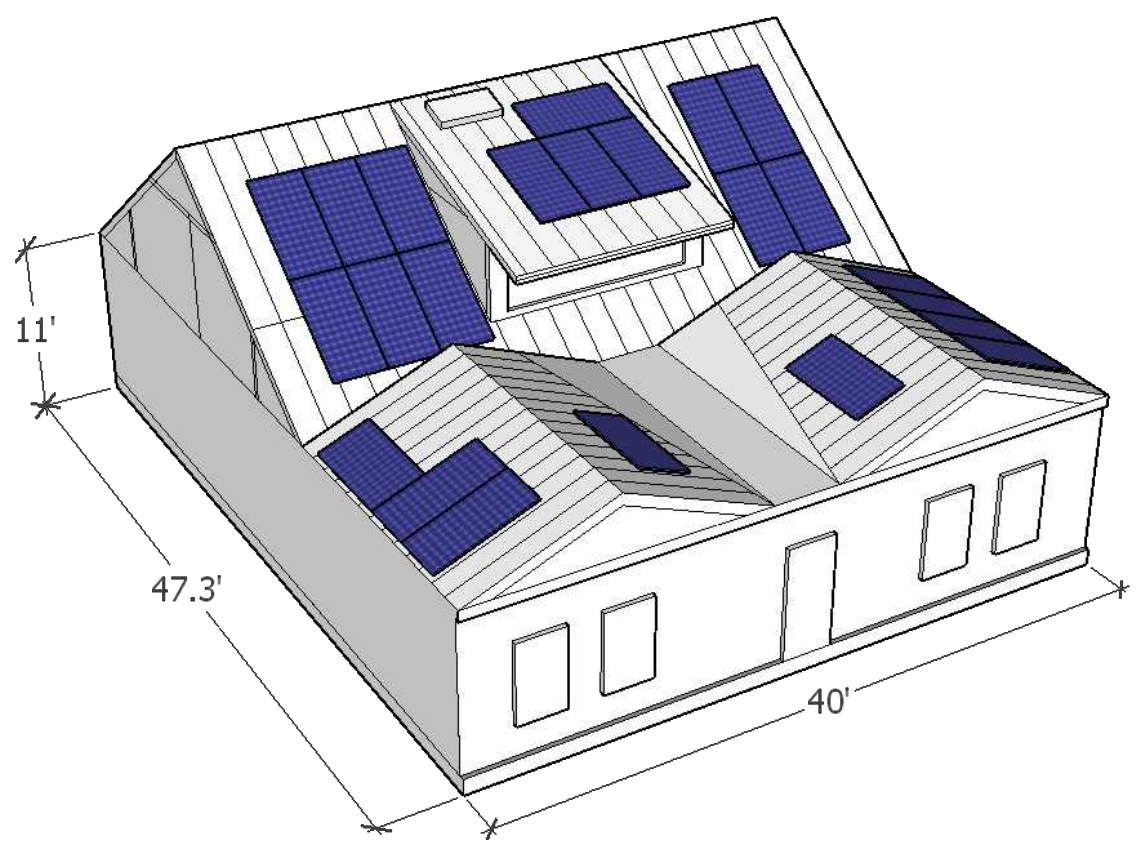
[Signature]

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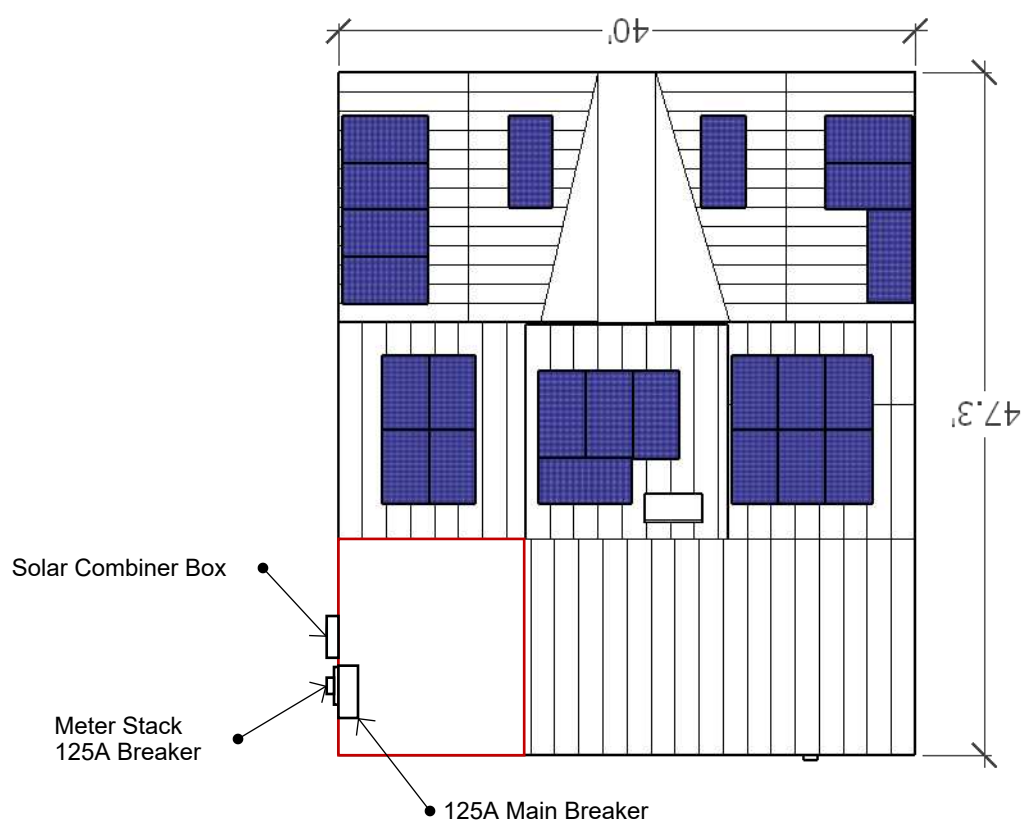


1 Site Plan
 A01

2 Street View of Building
 A01

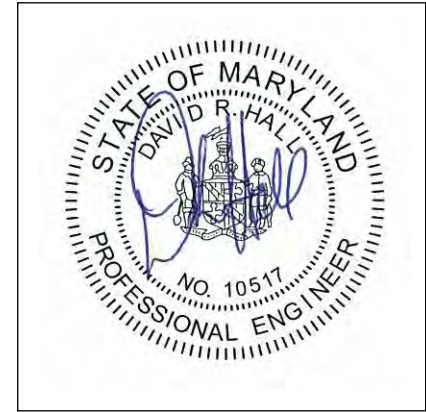


3 Proposed PV Design
 A01



4 Electrical Layout
 A01

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

Project #4543
 David Eisner (House of Musical Traditions)
 7010 Westmoreland Ave,
 Takoma Park, MD 20912

Overview

Issue Date
 02.04.2022

Revisions:

System Size:
 10.235 kW

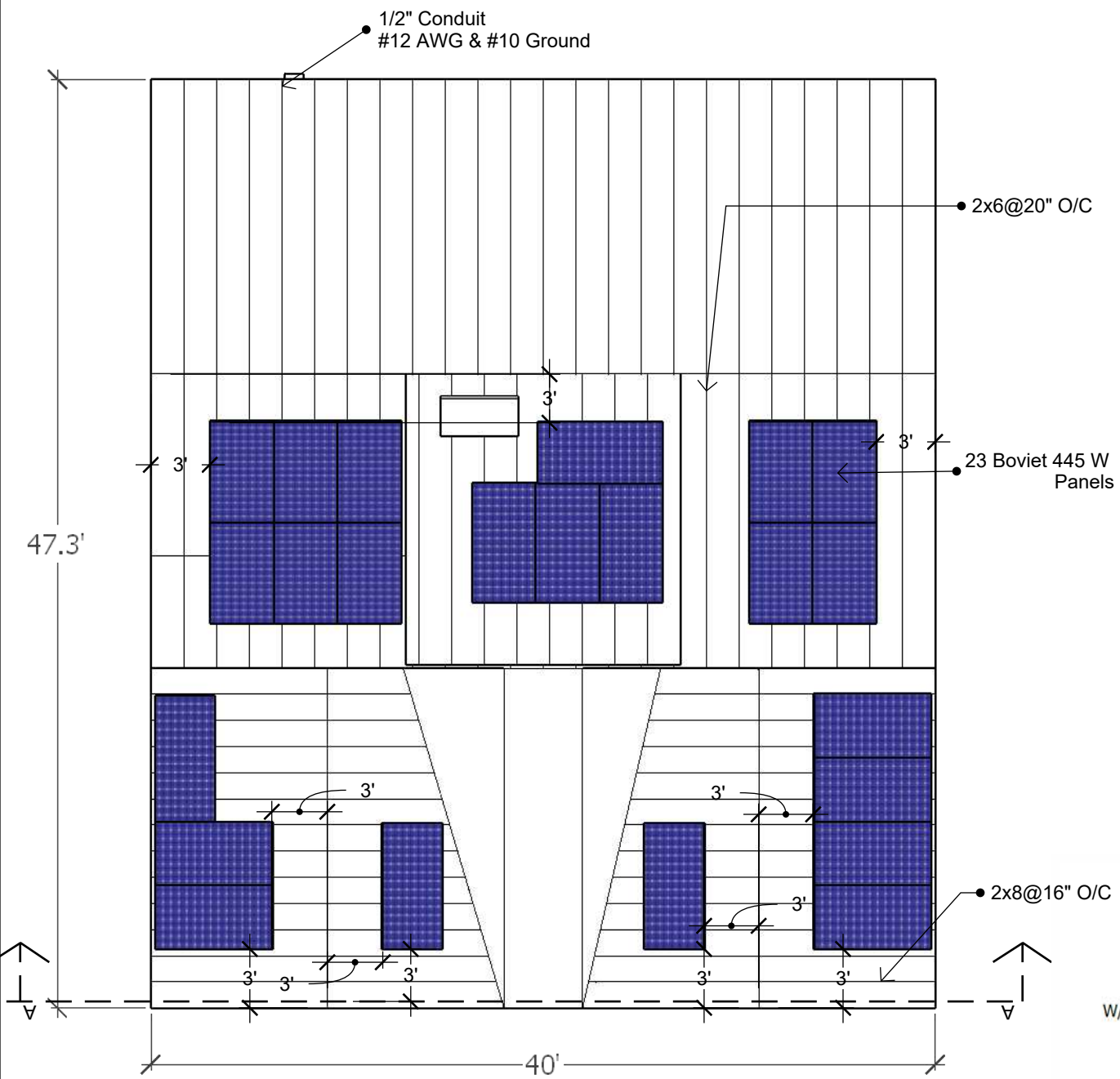


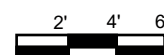
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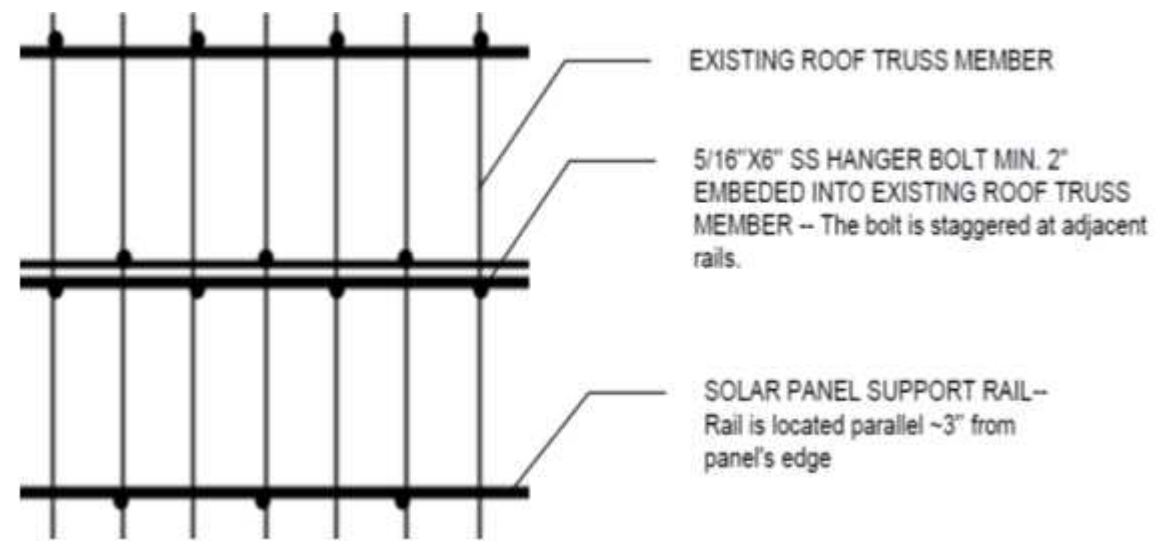


Panels are Flush against Roof with a height of .6 ft.

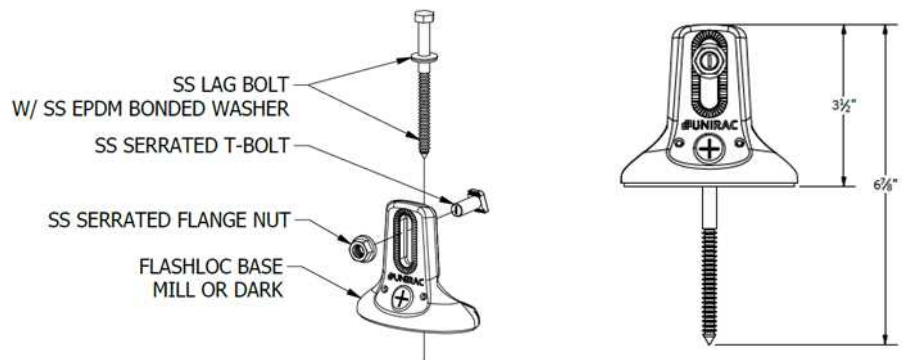
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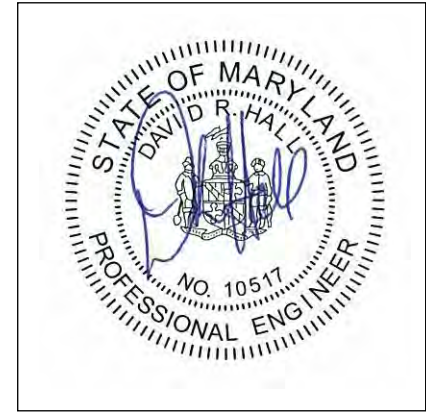
1 Roof Plan
 Scale: 1/8" = 1'




2 Mount Details
 PV01



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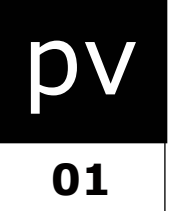
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Roof Layout

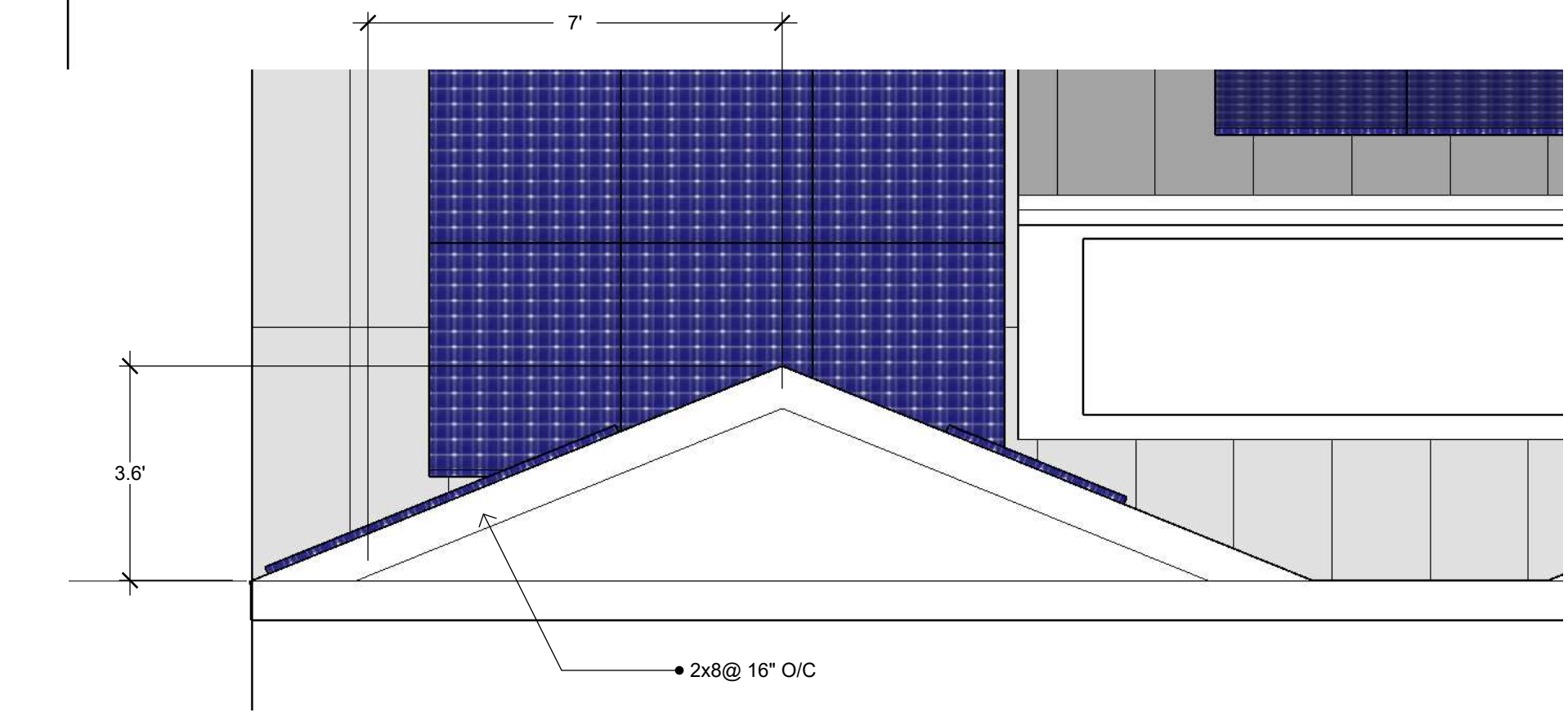
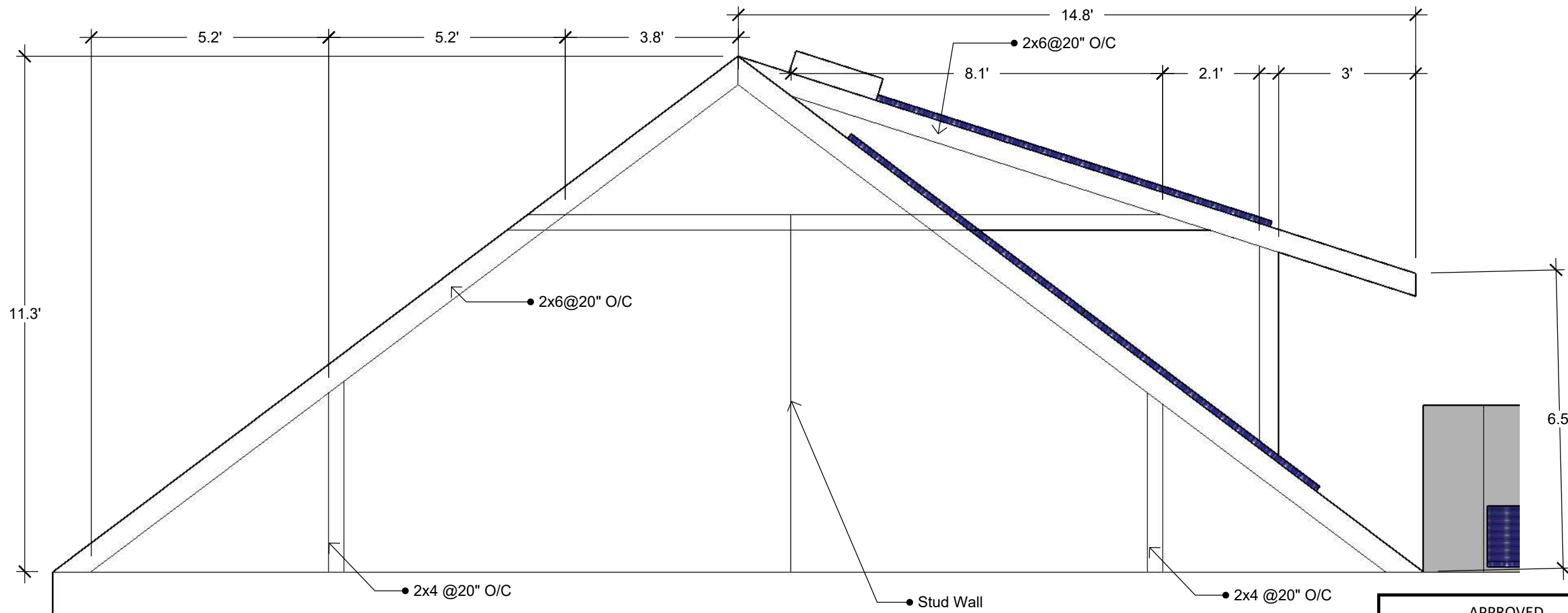
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TO BE INSTALLED PER FIRE CODE 2015. SECTION 605.11

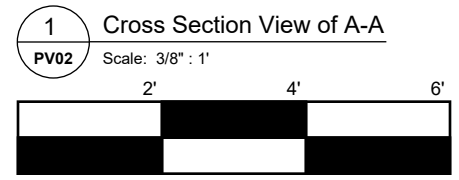
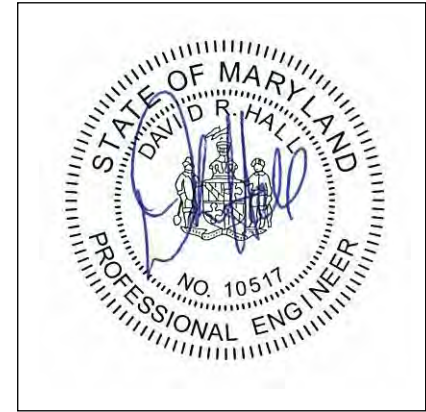


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Robert H. [Signature]

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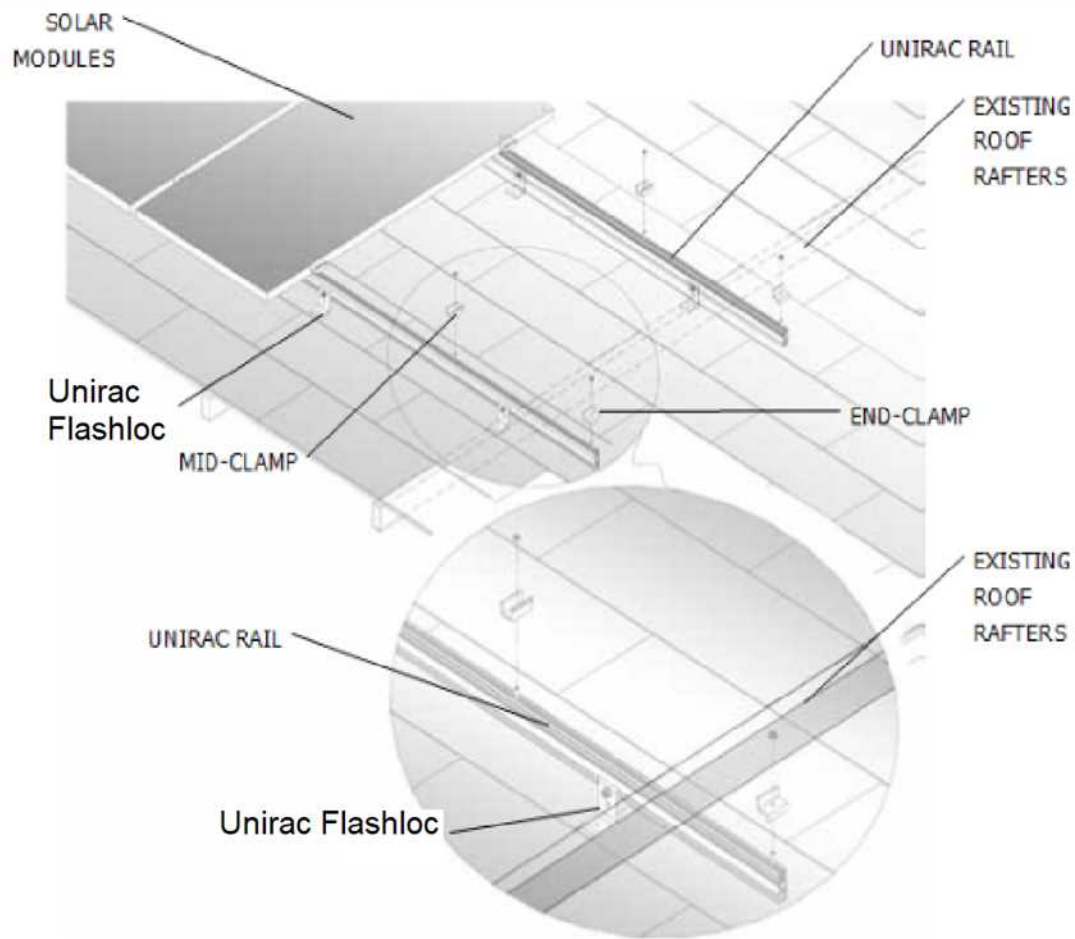
Issue Date
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Revisions:

System Size:
 10.235 kW

pv

02



Unirac Flashloc



TESTED TO TAS-100 WIND DRIVEN RAIN TEST AND UL441 RAIN TEST



PROTECT THE ROOF
Install a high-strength waterproof attachment without lifting, prying or damaging shingles.



LOCK OUT WATER
With an outer shield **1** contour-conforming gasket **2** and pressurized sealant chamber **3** the Triple Seal technology delivers a 100% waterproof connection.



HIGH-SPEED INSTALL
Simply drive lag bolt and inject sealant into the port **4** to create a permanent pressure seal.

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Mount Detail

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Revisions:

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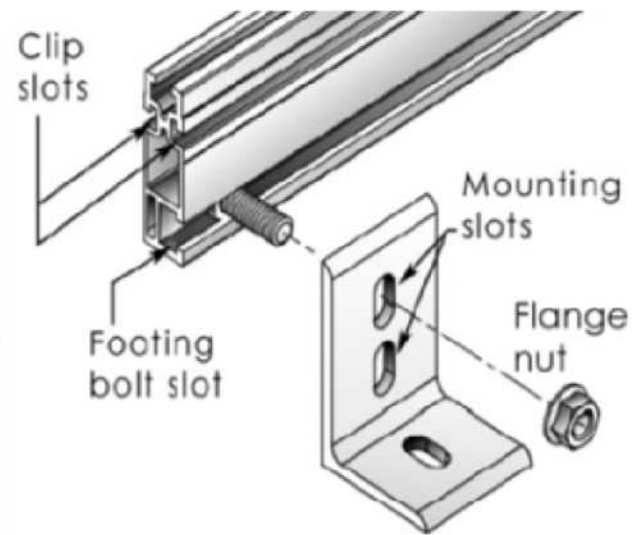
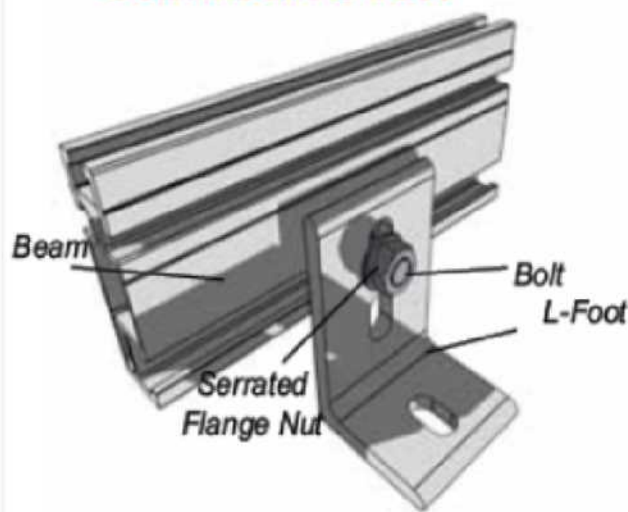
pv

03

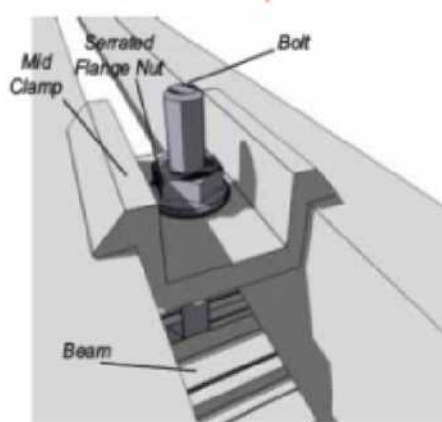
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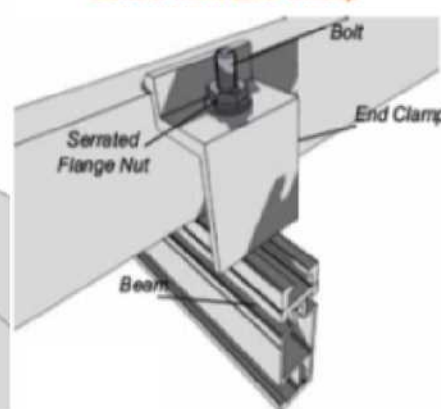
SolarMount L-Foot



SolarMount Mid Clamp



SolarMount End Clamp



1 Mount Detail
PV03



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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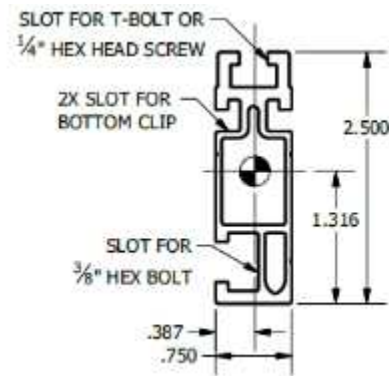
Hardware Specifications

Issue Date
 02.04.2022

Revisions:

System Size:
 10.235 kW

pv
04



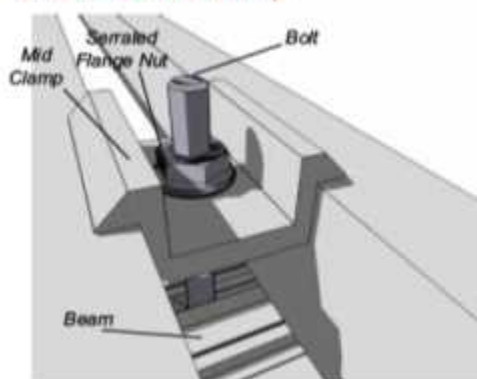
The universal SolarMount rail system has three options which can be assembled into a wide variety of PV mounting structures to accommodate any job site. Unirac provides a technical support system complete with installation and codecompliance documentation.

Properties	SOLARMOUNT Light	SOLARMOUNT Rail Profile 2	SOLARMOUNT HD	Units
BEAM HEIGHT	1.70	2.57	3.00	in
APPROX WEIGHT	0.491	0.728	1.271	plf
CROSS SECTION AREA	0.409	0.625	1.059	in ²
SECTION MODULUS (X-AXIS)	0.15	0.363	0.898	in ³
SECTION MODULUS (Y-AXIS)	0.067	0.113	0.221	in ³
MOMENT OF INERTIA (X-AXIS)	0.13	0.467	1.45	in ⁴
MOMENT OF INERTIA (Y-AXIS)	0.026	0.045	0.267	in ⁴
RADIUS OF GYRATION (X-AXIS)	0.564	0.865	1.17	in
RADIUS OF GYRATION (Y-AXIS)	0.254	0.269	0.502	in

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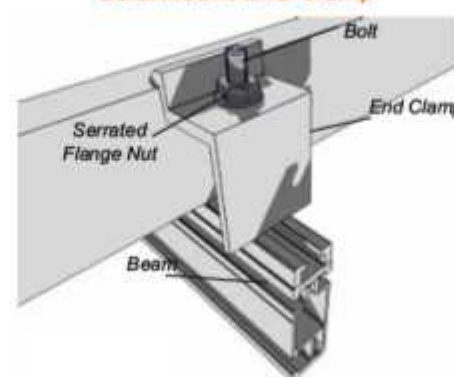
Product Certificate UL2703

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

String 1

12 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 2

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
L1-Black
L2-Red

Label 2

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

Label 1

Tap is < 10' From AC Disconnect

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

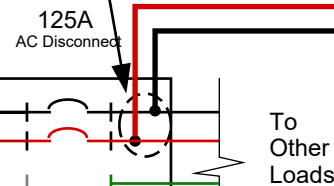
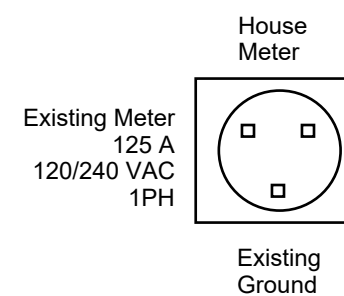
Line Side Tap via KUP-L-TAP® (IPC) IPC-4/0-6

Label 10 Label 9 Label 5

60A AC Disconnect housed inside Combiner Box

Enphase IQ Combiner
60A
1PH
240VAC

#10 AWG insulated Ground (Typical)



Label 4

1" Conduit
(3) #8 AWG
#10 Insulated EGC

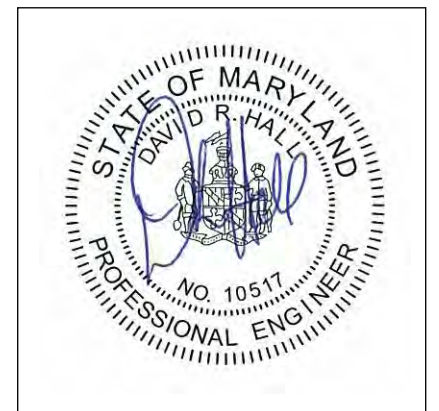
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Project #4543
David Eisner (House of Musical Traditions)
7010 Westmoreland Ave,
Takoma Park, MD 20912

Electrical Diagram

Issue Date
02.04.2022

Revisions:

System Size:
10.235 kW

e

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: 23X 445 W = 10.235kW

PV SOURCE CIRCUIT

PV MODULE ISC = 11.55A

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: 23 x 1.21A = 27.83A

String 1: 12 x 1.21A = 14.52A

String 2: 11 x 1.21A = 13.31A

Combiner Box Home Run Current: 23 x 1.21A = 27.83A

OCPD Sizing: 60A

80% of OCPD = 60A x .8 = 48A > 27.83A

Wiring for Combiner Box: " Conduit #8 AWG & #10 Ground

Conductor for #8 AWG THWN-2 90 C Rated

Correction Factor for 45 C Ambient = 0.87

Corrected Ampacity: 75Ax0.87x0.8 = 52.2A > 27.83A

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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

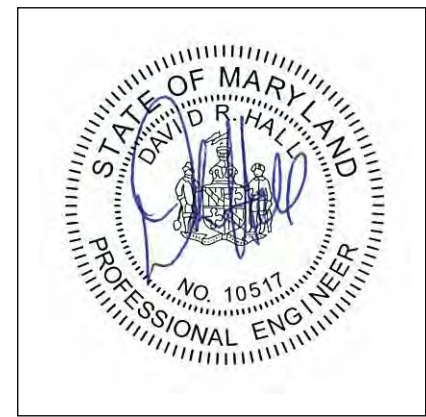
Label 1		Location: (C)(CB) Per code: NEC 690.31.G.3	Label 6		Location: (AC)(POI) Per code: NEC 690.17.E
Label 2		Location: (DC)(INV) Per code: NEC 690.5 (C)	Label 7		Location: (POI) Per code: NEC 690.17.4
Label 3		Location: (DC)(CB) Per code: NEC 690.17 (4)	Label 8		Location: (POI) Per code: NEC 690.64.B.4
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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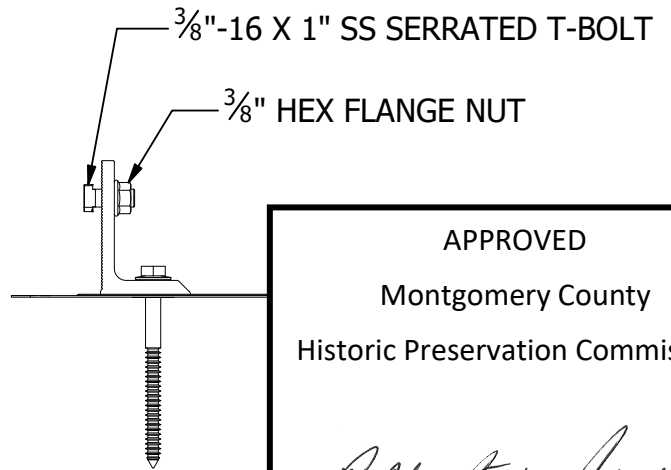
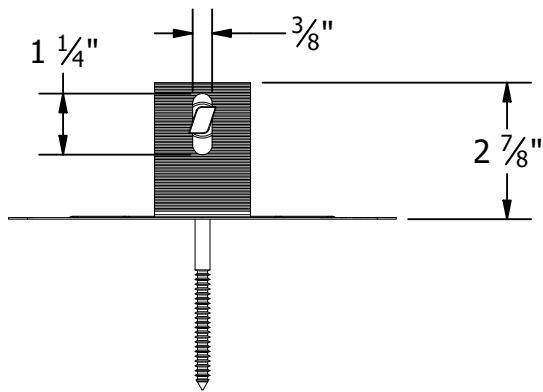
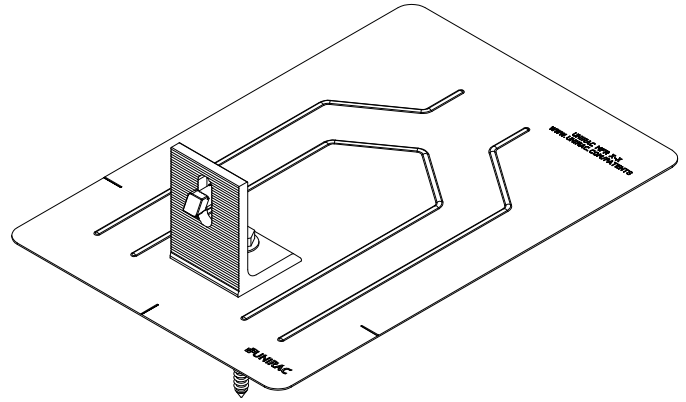
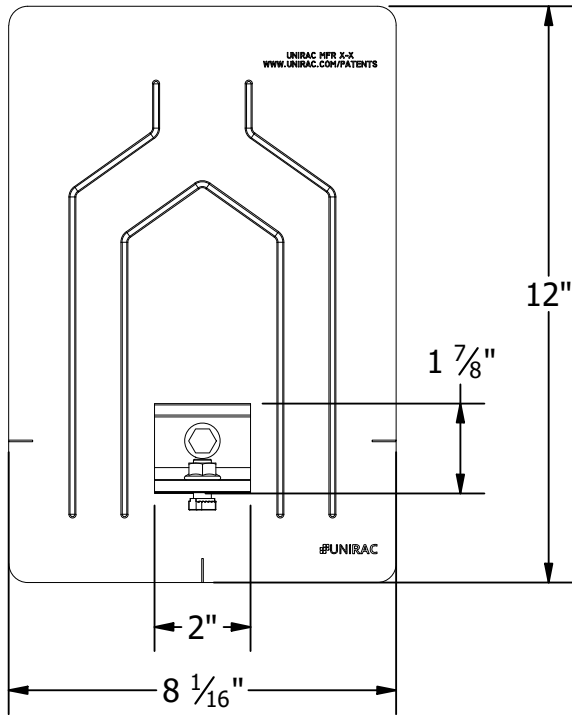
Revisions:

System Size:
10.235 kW



NOTES:

1. INSTALLATION TO BE COMPLETED IN ACCORDANCE WITH MANUFACTURER'S WRITTEN SPECIFICATIONS AND INSTALLATION INSTRUCTIONS.
2. PACKAGING: KITS OF 10



APPROVED
 Montgomery County
 Historic Preservation Commission

[Signature]

PART # TABLE	
P/N	DESCRIPTION
004055M	FLASHKIT PRO MILL
004055D	FLASHKIT PRO DRK

REVIEWED
 By Dan.Bruechert at 1:58 pm, May 11, 2022

UNIRAC
 1411 BROADWAY BLVD. NE
 ALBUQUERQUE, NM 87102 USA
 PHONE: 505.242.6411
 WWW.UNIRAC.COM

PRODUCT LINE:	SOLARMOUNT
DRAWING TYPE:	KIT DETAIL
DESCRIPTION:	FLASHKIT PRO
REVISION DATE:	9/24/2018

DRAWING NOT TO SCALE
 ALL DIMENSIONS ARE
 NOMINAL

PRODUCT PROTECTED BY
 ONE OR MORE US PATENTS

LEGAL NOTICE

SM-A03
 SHEET

DRH ENGINEERS, PLC
CIVIL - STRUCTURAL - FORENSIC

SOLAR SOLUTION 4543 **DAVID EISNER**

Design Criteria: ASCE 7-10; NDS2005; Allowable Stress Design Method Used (ASD)

Average PV array mounted height: 16.5 feet above ground (see plans)

Job No: 2220114 Page: C/01 Revision: Date: 02/06/22

Roof Framing System: 2x6 RAFTERS WITH KNEE WALLS

Roof Slope from plans: Run [ft]= 14.20 Rise [ft]= 11.30 Panel Type: BOVIET 445

Section: Rack Mounted Units Prepared By: drh

PHOTOVOLTAIC (PV) PANEL TYPE
PV panels mounted on or above pitched roof

BUILDING AND WIND DATA
Mean roof height above ground 'h' [ft] = 16.5
Parapet height 'h_{pa}' [ft] = N/A
Building length 'L' [ft] = 47.3
Building width 'B' [ft] = 40.0
Roof angle from horizontal 'θ' [deg] = 38.5
Wind velocity 'V' [mph] = 115
Topographic factor 'K_t' = 1.00
Wind exposure category = B
Wind directionality factor 'K_d' = 0.85
Velocity pressure exposure coefficient 'K_e' = 0.59
Velocity pressure 'q_s' [psf] = 17.00
Roof shape determinant 'a_{rs}' [ft] = 14.0

PV PANEL DATA
Panel width 'b' [ft] = 3.43
Panel chord length 'l_p' [ft] = 6.93
Panel height above roof at low edge 'h_l' [ft] = N/A
Self weight of solar panel 'W' [lbs] = 57.32
Coefficient of friction 'μ' = N/A

PV ARRAY LOCATION (see layout)
Direction: 'd_{dir}' [ft]: edge panel: 'd_{adj}' [ft]:
North: 2.0 Yes N/A
East: 2.0 Yes N/A
South: 2.0 Yes N/A
West: 2.0 Yes N/A
Calculation type: North-East panel design

PV ARRAY ANALYSIS
Corner: Zone: 'h_c' [ft]: 'GC_p': 'K_e'*(GC_p)_{rim}: 'E' factor:
North-East: 3 1.40 -1.2/0.9 N/A N/A
South-East: 3 0.50 -1.2/0.9 N/A N/A
South-West: 3 0.50 -1.2/0.9 N/A N/A
North-West: 3 1.40 -1.2/0.9 N/A N/A

CALCULATIONS: WIND PRESSURES
Dead load of panel over module area 'P_d' [psf] = 9.6
Panel chord length factor 'C_{dc}' = N/A
Parapet height factor 'C_{dp}' = N/A
Effective wind area 'A' [sqft] = 5.9
Normalized wind area 'A_n' [sqft] = N/A
Tributary area 'A_t' [sqft] = 5.9
Net in-to-roof pressure coefficient 'GC_p' = 0.90
Net uplift suction coefficient 'GC_p' = -1.20
Design in-to-roof wind pressure 'P_{in-to-roof}' [psf] = 15.30
Design uplift wind suction 'P_{uplift}' [psf] = -20.39

CALCULATIONS: WIND FORCES
Reduction for wind tunnel tests & load sharing = 0%
In-to-roof force on PV panel 'F_{in-to-roof}' [lbs] = 363.6
Uplift force on PV panel 'F_{uplift}' [lbs] = -484.8
Horizontal 'uplift' force on panel 'F_{horizontal}' [lbs] = N/A
Vertical uplift force on panel 'F_{vertical}' [lbs] = N/A

RESULTS
Building mean height less than 60ft: OK
Building mean height less than min L, B: OK
Required ballast for uplift 'W_{ballast,uplift}' [lbs] = N/A
Required ballast for sliding 'W_{ballast,sliding}' [lbs] = N/A
Required ballast per PV panel 'W_{ballast}' [lbs] = N/A
Force per fixing per PV panel 'F_{comp,fixing}' [lbs] = 105.2
Force per fixing per PV panel 'F_{form,fixing}' [lbs] = -108.3
Force per fixing per PV panel 'F_{shear,fixing}' [lbs] = N/A

DIAGRAM: SECTION
Roof Pitch: 10 : 12

DIAGRAM: ROOF LAYOUT

LIVE LOADS:
Wind Speed [mph]: 115
Ground Snow Load [psf]: 30

DEAD LOADS: (From ASCE 10 Table C3-1)
Roofing [psf]: 2.0
Sheathing [psf]: 1.6
PV System [psf]: 3.4
Misc [psf]: 2.0
Total [psf]: 9.0 < 10psf OK

PV MODULE PARAMETERS:
PV Solar Panel Weight [lbs] = 57.32
PV Panel area [s.f.] = 23.8
PV System Areal Weight [psf] = 3.4
Number of PV modules [ea] = 23
Total array Area [s.f.] = 547
Total Array Weight [lbs] = 1845.704
Total uplift on single panel [lbs] = 484.8
Force per fixing [lbs] = 193.9

Use 5/16" x 2-1/2" min. thread embedment depth fastener; see Table below
Lumber Species = SYP
Number of Fasteners required = 58
Withdrawal Capacity per 1" depth = 307
Number of Fasteners/panel [ea] = 2.5
Total pullout capacity [lbs] = 1918.8 OK 4.0

Lag reference withdrawal (pull out) design capacities [lbs.] in typical lumber:	5/16" Shaft per 1" thread depth	5/16" Shaft per 2-1/2" thread depth
Douglas Fir, Larch	266	665
Douglas Fir, South	235	588
Engelmann Spruce, Lodgepole Pine (MSR 1650 f & higher)	235	588
Hem, Fir (north)	212	530
Hem, Fir	235	588
Southern Pine	307	768
Spruce, Pine, Fir	205	513
Spruce, Pine, Fir (E of 2 million psi and higher grades of MSR and MEL)	266	665

Source: American Wood Council, NDS 2005, Table 11.2 A, 11.3.2 A

PASS Page 1

DATE: 2/6/2022 COMPANY: DRH Engineers, PLC
VITRUVIUS BUILD: Base DESIGNED BY: David Hall
CUSTOMER: SOLAR SOLUTION REVIEWED BY: David Hall
PROJ. ADDRESS: WASHINGTON, DC 20001 PROJECT NAME: SOLAR SOLUTIONS

LEVEL: Roof LOADING: ASD
MEMBER NAME: 4543 RAFTER CHECK CODE: 2018 International Building Code
MEMBER TYPE: ROOF RAFTER NDS: 2018 NDS
MATERIAL: Solid Sawn

Douglas Fir-Larch No 2 (1) 1.5 X 5.5 19.2(in) O.C. DRY

4543 RAFTER CHECK DIAGRAM

BEAM PROPERTIES
Start (ft): 0 End (ft): 14.2 Member Slope: 10/12 Actual Length (ft): 18.48 Roof Pitch: 10/12 O.C. Spacing (in): 19.2
Area (in²): 8.25 I_x (in⁴): 20.8 I_y (in⁴): 1.55 BSW (lb/ft): 1.88 Lams: 1 G: 0.5 K_{cr} Creep Factor: 1

STRENGTH PROPERTIES

	F _b (psi)	F _t (psi)	F _v (psi)	F _c (psi)	F _{c⊥} (psi)	E (psi) x10 ³	E _{min} (psi) x10 ³
Base Values	900	575	180	1350	625	1600	580
Adjusted Values	1346	748	180	1485	625	1600	580
C _M	1	1	1	1	1	1	1
C _T	1	1	1	1	1	1	1
C _i	1	1	1	1	1	1	1
C _F	1.3	1.3	1	1.1	1	1	1

Bending Adjustment Factors C_{fu} = 1 C_F = 1.15

BEAM DATA

Span	Length (ft)	Unbraced Length (ft)		Beam End				
		Top	Bottom	Elev. Diff (ft)	CL(Top)	CL(Bottom)	CL(Left)	CL(Right)
1	5.2	0	5.2	4.333333	1.00	0.97	1.00	1.00
2	5.2	0	5.2	4.333333	1.00	0.99	1.00	1.00
3	3.8	0	3.8	3.166667	1.00	0.99	1.00	1.00

PASS-FAIL

	PASS/FAIL	MAGNITUDE	STRENGTH	LOCATION (ft)	LOAD COMBO	DURATION FACTOR CD
Shear Stress Y (psi)	PASS (84.4%)	32.3	207.0	5.11	D+S	115
Bending Stress Y (psi)	PASS (71.4%)	350.0	1525.8	5.25	D+S	115
Deflection (in)	PASS (52.4%)	0.022 (-L/3760)	0.338 (-L/240)	2.27	S	
Compressive Stress (psi)	PASS (88.8%)	16.1	1633.0	5.25	D+S	115
Tensile Stress (psi)	PASS (97.8%)	18.0	859.6	5.11	D+S	115
Bearing Stress (psi)	PASS (92.7%)	50.5	692.0	5.2	D+S	115
Bending-Compression (Unit)	PASS (78.2%)	0.22	1.00	5.25	D+S	115
Bending-Tension (Unit)	PASS (77.5%)	0.22	1.00	5.11	D+S	115

PROJECT: SOLAR SOLUTIONS 2018 International Building Code ASD

APPROVED
Montgomery County
Historic Preservation Commission

Robert A. ...

REVIEWED
By Dan.Bruechert at 1:58 pm, 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