



## HISTORIC PRESERVATION COMMISSION

Marc Elrich  
*County Executive*

Robert K. Sutton  
*Chairman*

Date: July 8, 2024

### MEMORANDUM

TO: Rabbiah Sabbakhan, Director  
Department of Permitting Services

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

SUBJECT: Historic Area Work Permit # 1068720 - 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** at the June 26, 2024 HPC meeting.

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: Chris Perry  
Address: 10115 Grant Ave., Silver Spring

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 301-563-3408 or [dan.bruechert@montgomeryplanning.org](mailto:dan.bruechert@montgomeryplanning.org) to schedule a follow-up site visit.





### SITE PLAN

### SATELLITE VIEW

# Index

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



### Scope of Work:

To install 8.8kW size of solar panels on roof of building.

### CODES:

- NFPA 70
- NEC 2017
- IBC 2018
- CC 2018

BUILDING USE - SINGLE FAMILY DWELLING UNIT

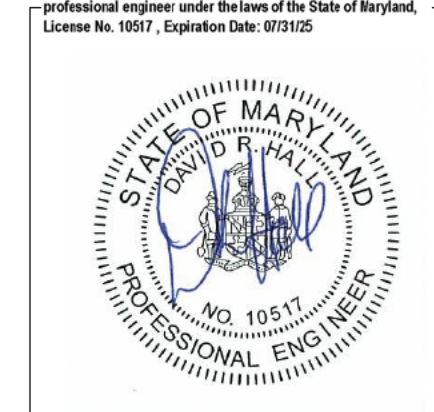
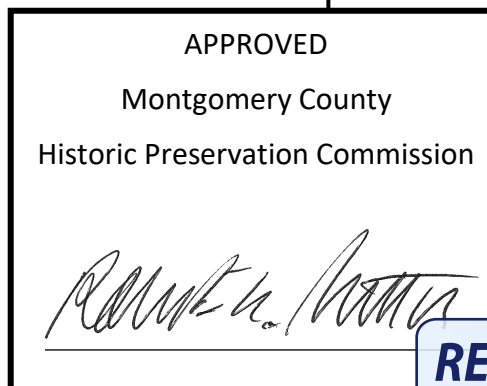
CONSTRUCTION TYPE- III

REQUIRED FIRE CODE OFFSETS - MINIMUM 3 FEET OFFSETS FROM RIDGE AND EAVES

ROOF RATING - CLASS A

ROOF ANGLE- GREATER THAN 2:12 DEGREES (PITCHED)

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: 07/31/25



**REVIEWED**  
By Dan.Bruechert at 1:25 pm, Jul 08, 2024

CLIENT  
Justin Road

5 Montgomery Avenue,  
Takoma Park, MD, USA

PROJECT NO.  
5920

SYSTEM SIZE  
8.8

ISSUE  
04.04.2024

DRAWN BY  
HS



4700 14th ST. NW  
Washington, DC 20011

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 Hyperion Bi 400W Panels (IQ7+)

#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

11 Hyperion Bi 400W Panels (IQ7+)

#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

Enphase IQ Combiner  
40A OCPD  
Rated 80A  
1PH  
240VAC

40A AC Disconnect housed inside Combiner Box

#10 AWG insulated Ground (Typical)

Label 8 → To/From Meter & Grid

Existing 200A  
1PH  
240VAC

Line Side

Existing Ground

Label 11

Label 1

Label 6

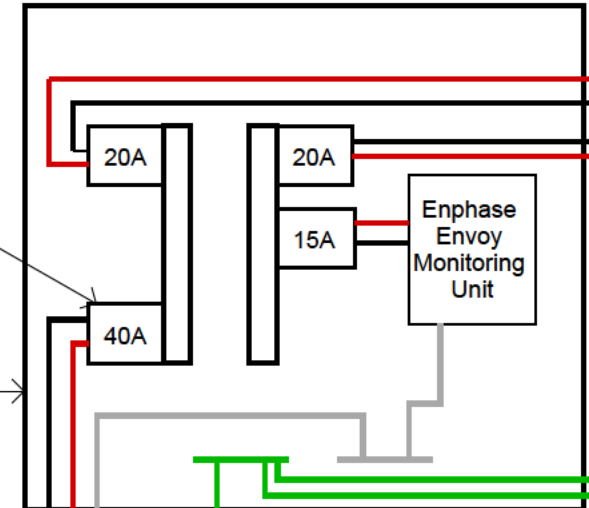
Label 5

Label 4

Label 11

1/2" Conduit  
(3) #8 AWG  
#10 Insulated EGC

40A



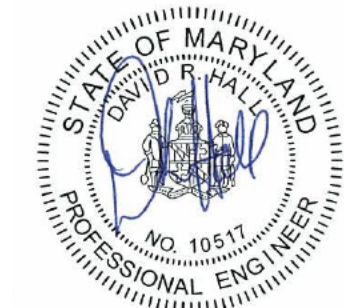
Load Side

"Rapid shutdown is built in enphase microinverters and meet RSS requirements nec 690.12 without any addition equipment" IEEE-1547-2018 AND UL 1741-SB compliant

APPROVED  
Montgomery County  
Historic Preservation Commission

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

Project #5920  
Justin Rood  
5 Montgomery Avenue,  
Takoma Park, MD, USA

Electrical Diagram

Issue Date  
04.04.2024

Revisions:

System Size:  
8.8 kW



**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: 22X 400 W = 8.8kW

PV SOURCE CIRCUIT

PV MODULE ISC = 13.79 A

# OF MODULES IN PARALLEL PER CIRCUIT = 1

MAX ISC = 1 X 13.79 A X 1.25 = 17.23A

OCPD/Ampacity = 17.23A x 1.25 = 21.54 A, 20A OCPD

SOURCE CIRCUIT WIRING

CONDUCTOR = COPPER #10 AWG THWN-2 90°C RATED

CORRECTION FACTORE FOR 60°C AMBIENT = 0.71

CORRECTED AMPACITY: 40 A X 0.71 X 0.8 = 22.72A > 21.54A

**AC Current Calculations**

Total Panels: 22 x 1.21A = 27.83A

String 1: 11 x 1.21A = 13.31A

String 2: 11 x 1.21A = 13.31A

Combiner Box Home Run Current: 22 x 1.21A = 27.83A

OCPD Sizing: 40A

80% of OCPD = 40A x .8 = 32A > 27.83A

Wiring for Combiner Box: 1/2" Conduit #8 AWG & #10 Ground

Conductor for #8 AWG THWN-2 90 C Rated

Correction Factor for 45 C Ambient = 0.87

Corrected Ampacity: 55Ax0.87x0.8 = 38.28A > 27.83A

APPROVED

Montgomery County

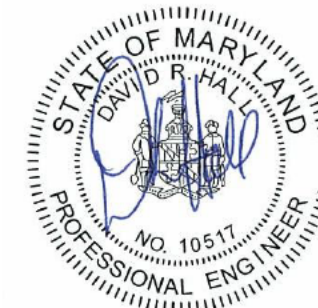
Historic Preservation Commission



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By Dan.Bruechert at 1:25 pm, Jul 08, 2024

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

Project #5920  
Justin Rood  
5 Montgomery Avenue,  
Takoma Park, MD, USA

Electrical  
Calculations

Issue Date  
**04.04.2024**

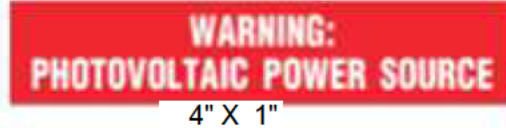
Revisions:

System Size:  
**8.8 kW**


**e**

**102**

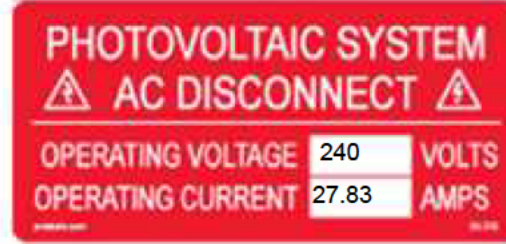
**Solar System Warning Labels Material**  
 Vinyl Material - Flexcon DPM FWS White Vinyl  
 Reflective Material - Avery Dennison T-1500-A Engineering Grade Beaded Retroreflective Film  
 Lamination - Flexcon DPM Clear Gloss Polyester Laminate

Label 1  


Location: (C)(CB)  
 Per code:  
 NEC 690.31.G.3


Label 8  


Location: (POI)  
 Per code:  
 NEC 690.64.B.4

Label 4  


Location: (AC)(POI)  
 Per code:  
 NEC 690.14.C.2  
 NEC 690.54

Label 11  

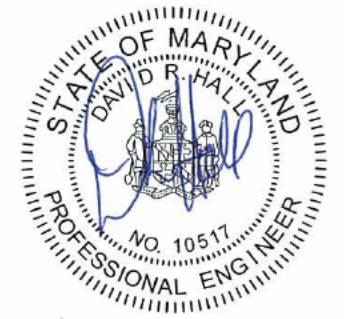

Label 5  


Label 6  


APPROVED  
 Montgomery County  
 Historic Preservation Commission

**REVIEWED**  
 By Dan.Bruechert at 1:25 pm, Jul 08, 2024

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

Project #5920  
 Justin Rood  
 5 Montgomery Avenue,  
 Takoma Park, MD, USA

**Electrical Labels**

Issue Date  
**04.04.2024**

Revisions:

System Size:  
**8.8 kW**



Property Owners Name: JUSTIN ROOD

Property Owners Address: 5 MONTGOMERY AVE, TAKOMA PARK, MD

Address of installation if different than owners address:

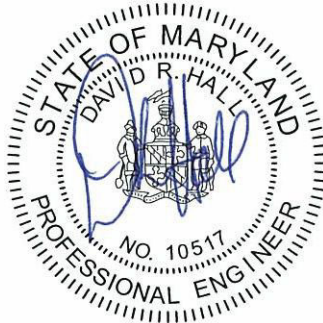
I certify that:

- I prepared or approved the electrical drawings and related documents for the photovoltaic (PV) system at the above location.
- The design of the PV system, and all electrical installations and equipment, meets the standards and requirements of the National Electrical Code as adopted by Montgomery County in COMCOR 17.02.01.

10517  
Maryland PE License Number

Date 04/12/24

Signature 



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

Montgomery County Master Electrician License Number

Date \_\_\_\_\_

Signature \_\_\_\_\_



Must Be Submitted With Plan

**REVIEWED**  
By Dan.Bruechert at 1:26 pm, Jul 08, 2024

[Company Letterhead]

APPROVED  
 Montgomery County  
 Historic Preservation Commission

Project Residential PV Installation Property Owner Justin Rood

Address 5 Montgomery Ave, Takoma Park, MD

**REVIEWED**  
 By Dan.Bruechert at 1:26 pm, Jul 08, 2024

I reviewed the design of the photovoltaic (PV) system, as designed by the manufacturer, and the design criteria utilized for the mounting equipment and panel mounting assembly (rack system) for the installation of (22) panels supported by the rack system, as shown on the drawings prepared for the above referenced address. I certify that the configurations and design criteria meet the standards and requirements of the International Residential Code (IRC) and International Existing Building Code (IEBC) adopted by Montgomery County in COMCOR 08.00.02.

The attachment of the rack system to the building at the above address, including the location, number, and type of attachment points; the number of fasteners per attachment point; and the specific type of fasteners (size, diameter, length, minimum embedment into structural framing, etc.) meets the standards and requirements of the IRC and IEBC adopted by Montgomery County in COMCOR 08.00.02.

I evaluated the existing roof structure of the building at the above address and analyzed its capacity to support the additional loads imposed by the PV system. I certify that no structural modifications of the existing roof structure are required. The existing roof structure meets the standards and requirements of the IRC and IEBC, adopted by Montgomery County in COMCOR 08.00.02, necessary to support the PV system.

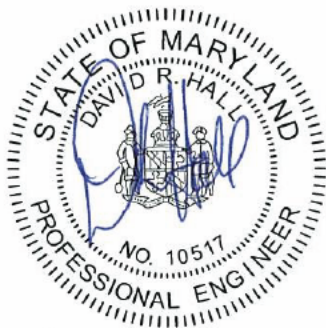
I evaluated the existing roof structure of the building at the above address and analyzed its capacity to support the additional loads imposed by the PV system. Structural modifications of the existing roof structure are required. I certify that the roof structure, as modified on the drawings for this project, will support the additional loads imposed by the PV system. I further certify that design of the modified roof structure meets the standards and requirements of the IRC and IEBC, adopted by Montgomery County in COMCOR 08.00.02.

I prepared or approved the construction documents for the mounting equipment, rack system, roof structure for this project.

10517  
 Maryland PE License Number

Date 04/12/24

Signature



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: 07/31/25

**Must be submitted with plans**

Section: **Rack Mounted Units**

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

**BUILDING AND WIND DATA**

Mean roof height above ground 'h' [ft]	<b>30.0</b>
Parapet height 'h <sub>m</sub> ' [ft]	N/A
Building length 'L' [ft]	<b>70.5</b>
Building width 'B' [ft]	<b>35.0</b>
Roof angle from horizontal 'θ' [deg]	<b>29.1</b>
Wind velocity 'V' [mph]	<b>115</b>
Topographic factor 'K <sub>zt</sub> '	<b>1.00</b>
Wind exposure category	<b>B</b>
Wind directionality factor 'K <sub>d</sub> '	<b>0.85</b>
Velocity pressure exposure coefficient 'K <sub>e</sub> '	0.70
Velocity pressure 'q <sub>h</sub> ' [psf]	20.16
Roof shape determinant 'a <sub>pv</sub> ' [ft]	23.0

**PV PANEL DATA**

Panel width 'b' [ft]	<b>3.59</b>
Panel chord length 'l <sub>p</sub> ' [ft]	<b>5.65</b>
Panel height above roof at low edge 'h <sub>1</sub> ' [ft]	N/A
Self weight of solar panel 'W' [lbs]	<b>49.82</b>
Coefficient of friction 'μ'	N/A

**PV ARRAY LOCATION (see layout)**

Direction	'd <sub>edge</sub> ' [ft]	edge panel	'd <sub>adjacent</sub> ' [ft]
North	<b>2.0</b>	Yes	N/A
East	<b>2.0</b>	Yes	N/A
South	<b>2.0</b>	Yes	N/A
West	<b>2.0</b>	Yes	N/A

Calculation type: **North-East panel design**

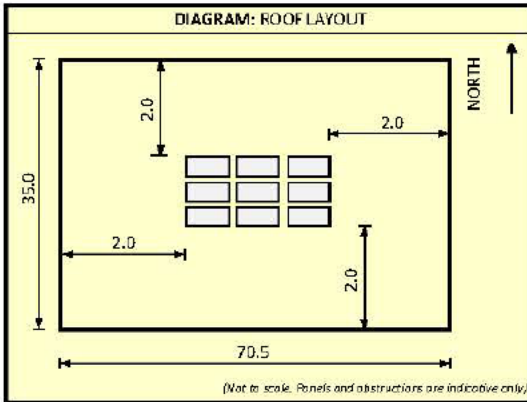
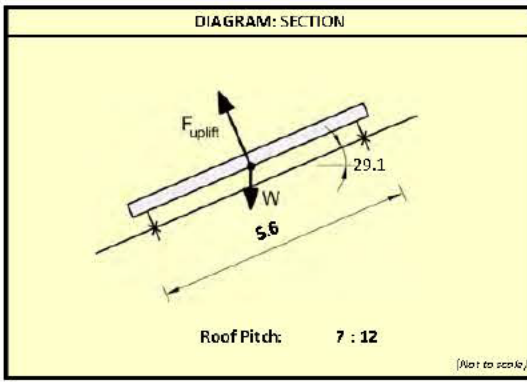
**PV ARRAY ANALYSIS**

Corner	Zone	'h <sub>ex</sub> ' [ft]	'GC <sub>p</sub> '	'G <sub>e</sub> ' (GC <sub>h,non</sub> )	'E' factor
North-East	3	2.30	-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	2.30	-1.2/0.9	N/A	N/A

**CALCULATIONS: WIND PRESSURES**

Dead load of panel over module area 'P <sub>0</sub> ' [psf]	9.8
Panel chord length factor 'γ <sub>c</sub> '	N/A
Parapet height factor 'γ <sub>p</sub> '	N/A
Effective wind area 'A' [sft]	5.1
Normalized wind area 'A <sub>n</sub> ' [sft]	N/A
Tributary area 'A <sub>t</sub> ' [sft]	5.1
Net in-to-roof pressure coefficient 'GC <sub>p</sub> '	0.90
Net uplift suction coefficient 'GC <sub>p</sub> '	-1.20
Design in-to-roof wind pressure 'p <sub>in-to-roof</sub> ' [psf]	18.15
Design uplift wind suction 'p <sub>wind</sub> ' [psf]	-24.19

**SUMMARY**  
Force per fixing per PV panel [lbs] = **104.4 / -111.4**



**CALCULATIONS: WIND FORCES**

Reduction for wind tunnel tests & load sharing	0%
In-to-roof force on PV panel 'F <sub>in-to-roof</sub> ' [lbs]	367.9
Uplift force on PV panel 'F <sub>uplift</sub> ' [lbs]	-490.5
Horizontal 'uplift' force on panel 'F <sub>horiz</sub> ' [lbs]	N/A
Vertical uplift force on panel 'F <sub>vert</sub> ' [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 <sub>ballast,uplift</sub> ' [lbs]	N/A
Required ballast for sliding 'W <sub>ballast,sliding</sub> ' [lbs]	N/A
Required ballast per PV panel 'W <sub>ballast</sub> ' [lbs]	N/A
Force per fixing per PV panel 'F <sub>comp,sliding</sub> ' [lbs]	<b>104.4</b>
Force per fixing per PV panel 'F <sub>ballast,sliding</sub> ' [lbs]	<b>-111.4</b>
Force per fixing per PV panel 'F <sub>ballast,uplift</sub> ' [lbs]	N/A

calculations are based on SEAOC PV2 (2012) and ASCE 7-10 (2010)

**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]	3.7
Misc [psf]	1.5
<b>Total [psf]</b>	<b>8.8</b> < 10psf OK

**PV MODULE PARAMETERS:**

PV Solar Panel Weight [lbs]	49.82
PV Panel area [s.f.]	20.3
PV System Areal Weight [psf]	3.7
Number of PV modules [ea]	<b>22</b>
Total array Area [s.f.]	446
Total Array Weight [lbs]	1624.06
Total uplift on single panel [lbs]	<b>490.5</b>
Force per fixing [lbs]	<b>245.3</b>

Use 5/16" x 2-1/2" min. thread embedment depth fastener; see Table below  
Lumber Species: **SYP**  
Number of Fasteners required = **44**  
Withdrawal Capacity per 1" depth = 307  
Number of Fasteners/panel [ea] = **2.0**  
Total pull out capacity [lbs] = **1535.0** OK 3.1

Lag reference withdrawal (pull out) design capacities [lbs.] Intypical 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

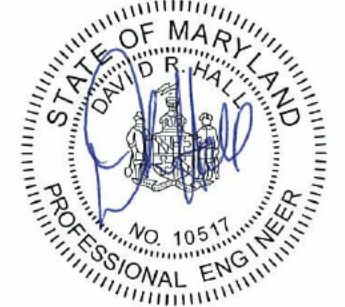
Source: American Wood Council, NDS 2005, Table 11.2A, 11.3.2A

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APPROVED  
Montgomery County  
Historic Preservation Commission

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**GENERAL NOTES:**


1. ALL ROOFTOP EQUIPMENT INSTALLATION WORK, INCLUDING FLASHED AND SEALED PENETRATIONS SHALL BE PERFORMED IN ACCORDANCE WITH CHAPTER 9 SECTION R903 WATHER PROTECTION OF THE 2018 EDITION OF THE IRC.
2. THIS PHOTOVOLTAIC INSTALLATION SHALL BE INSTALLED IN ACCORDANCE WITH THE 2018 EDITION OF THE IBC AS ADOPTED BY , THE 2017 NEC, AND ANY LOCAL BUILDING CODES CURRENTLY BEING ENFORCED BY THE AHJ
3. REQUIRED OFFSETS ARE 3' FROM THE RIDGE AND EAVES IF THE SLOPE IS GREATER THAN 2:12 DEGREES

4. IRONRIDGE QUICKMOUNT HALO ULTRAGRIPGRIP (HUG) INSTALLED ON THE FLAT PART OF THE SHINGLE, LEAVING A MINIMUM OF 2" BELOW THE DRIP EDGE OF THE UPSLOPE SHINGLE. QUICKMOUNT HUG IS ONLY INSTALLED ON ASPHALT AND COMPOSITION SHINGLE TYPE ROOFS WITH SLOPES BETWEEN 2:12 TO 2:12.

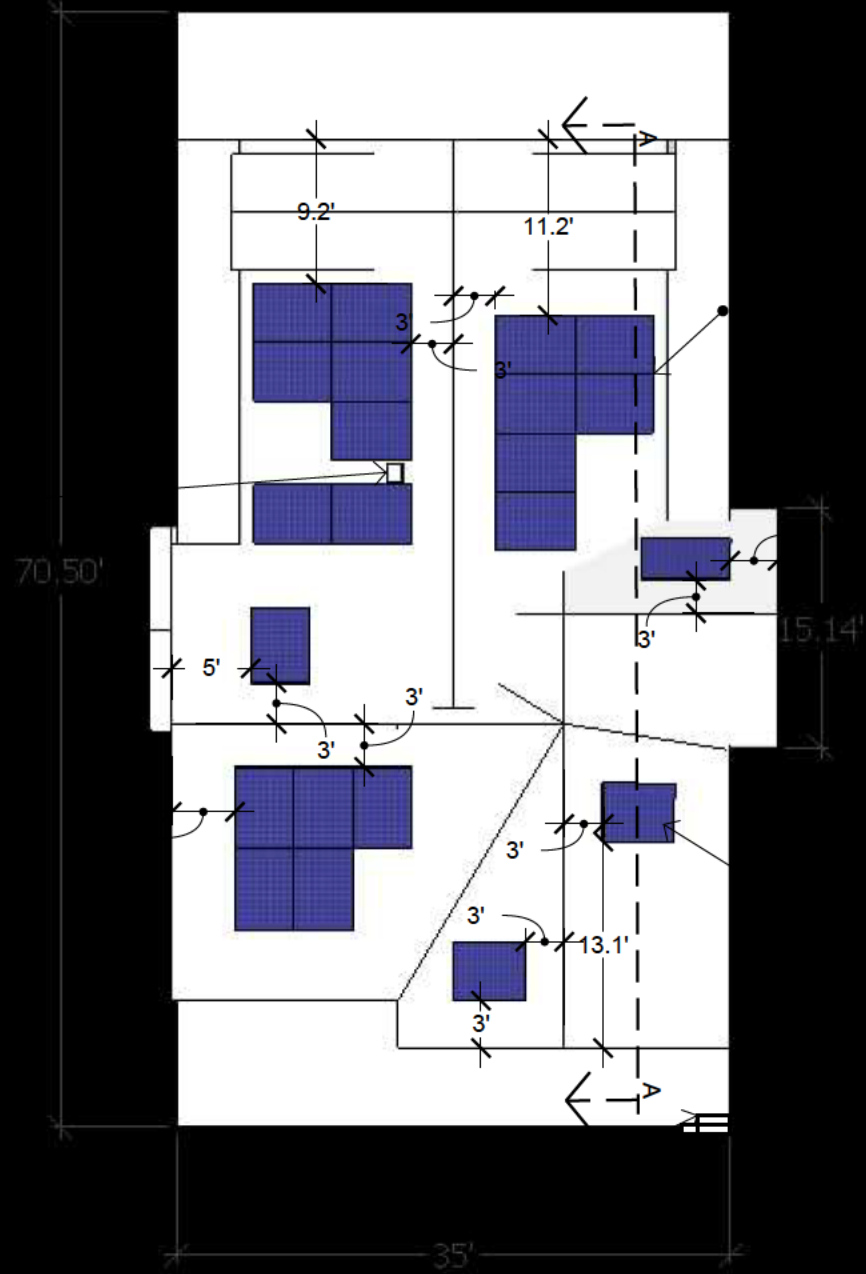
5. ALL RAFTER ATTACHED INSTALLATIONS REQUIRE A MINIMUM OF TWO RD STRUCTURAL SCREWS. FOR DECK ATTACHED INSTALLATION, SIX RD STRUCTURAL SCREWS ARE REQUIRED.

6. IRONRIDGE QUICKMOUNT HUG IS INSTALLED IN ALTERNATING RAFTERS (SEE PVO2) WITH A MAX XR10 RAIL SPAN OF 4'.

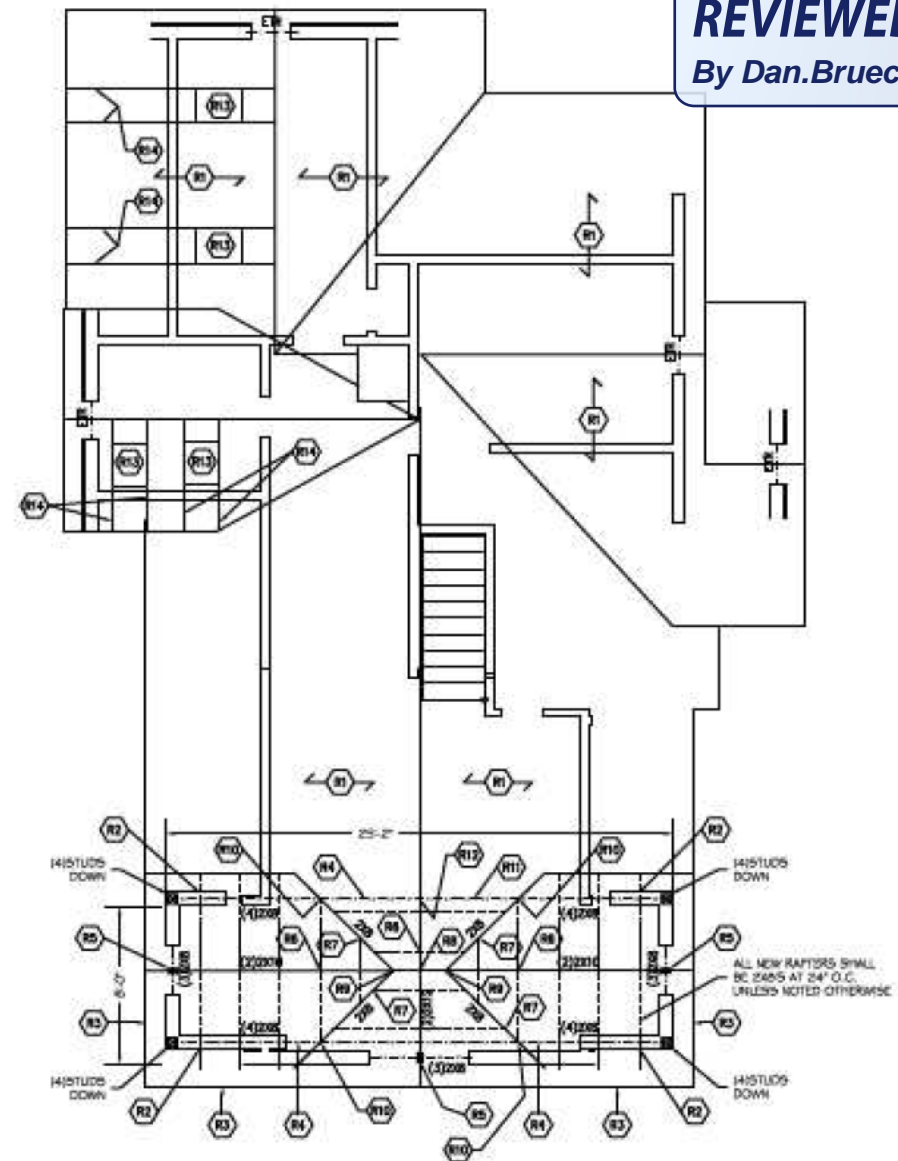
APPROVED  
 Montgomery County  
 Historic Preservation Commission



BUILDING HEIGHT: 30  
 ROOF SLOPE: 29 degrees



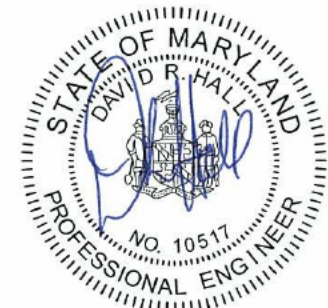
1 Roof Plan  
 PV01 Scale: 1/8" : 1'



1 Roof Framing Plan View of A-A  
 PV02 Scale: 3/8" : 1'

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 By Dan.Bruechert at 1:26 pm, Jul 08, 2024

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 4700 14th ST. NW  
 Washington, DC 20011

Project #5920  
 Justin Rood  
 5 Montgomery Avenue,  
 Takoma Park, MD, USA

**Roof Layout**

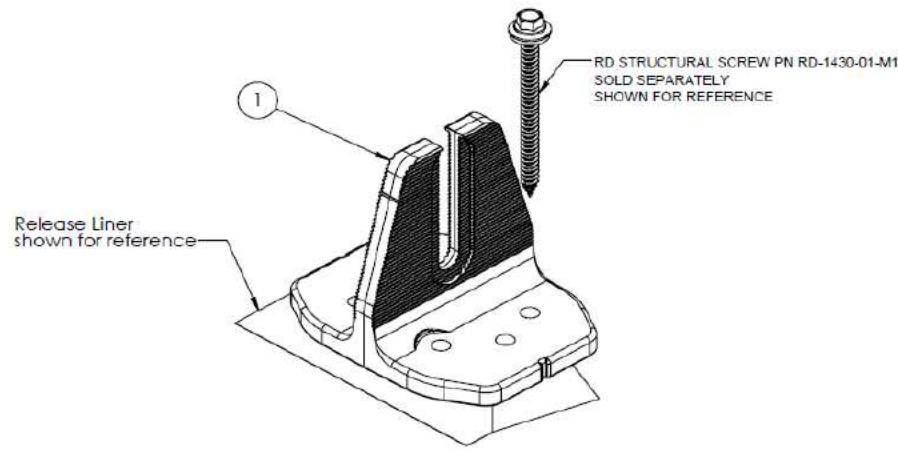
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Revisions:

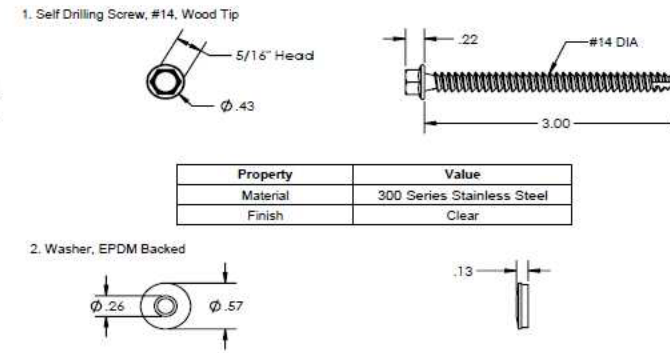
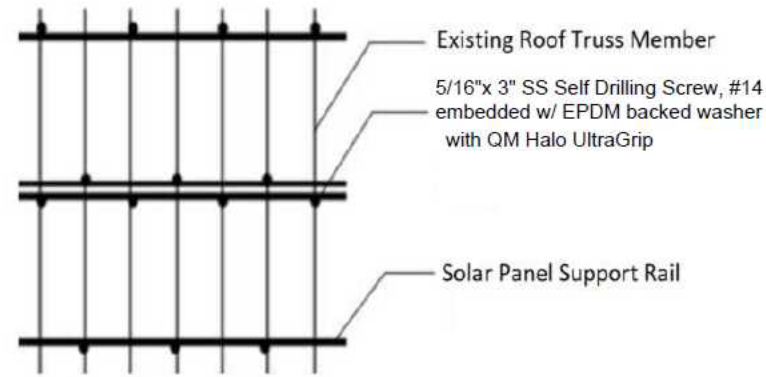
System Size:  
**8.8 kW**

**pv**

**201**



IronRidge QuickMount HUG

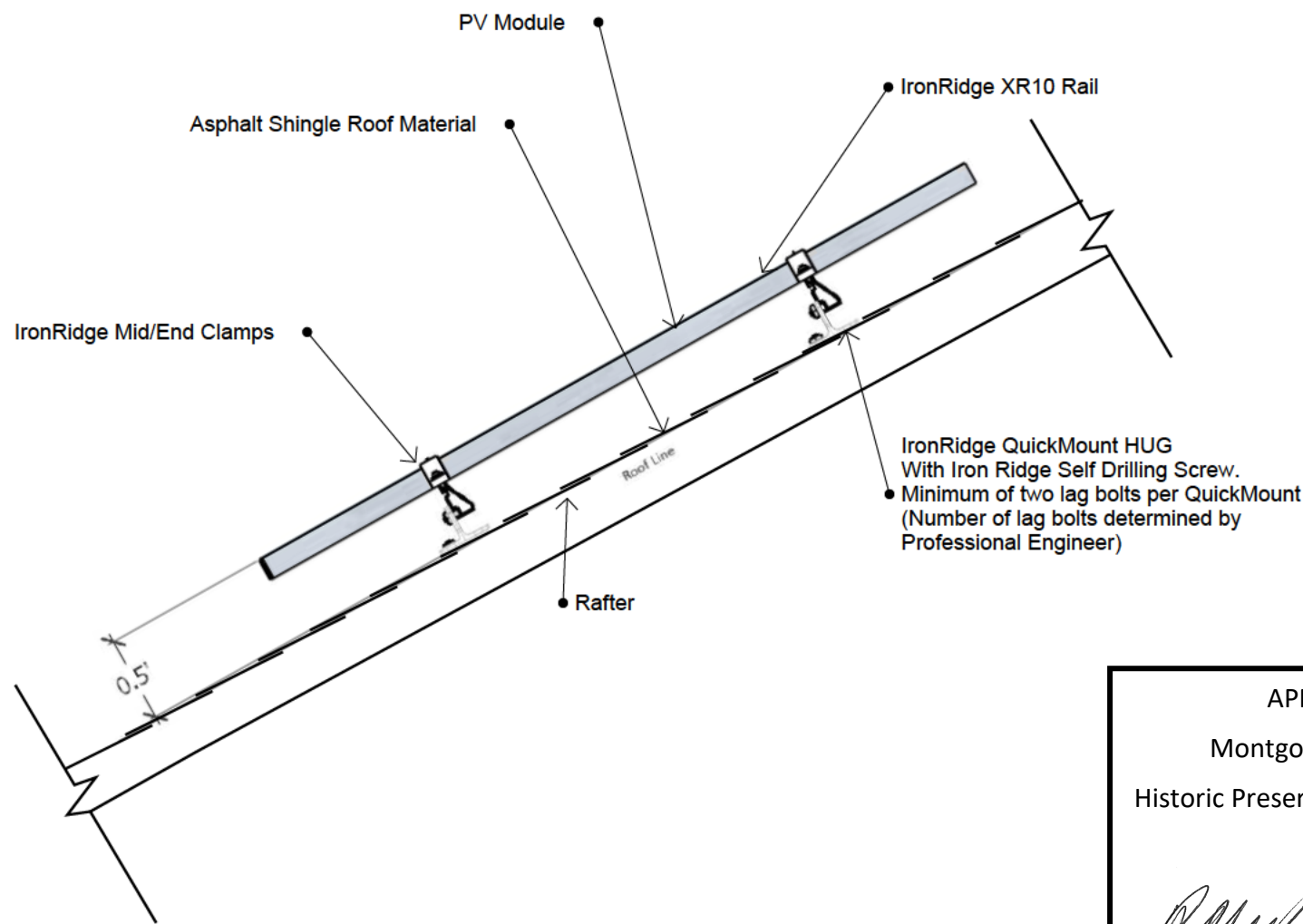


IronRidge QuickMount RD structural screw

### Rail Selection

The following table was prepared in compliance with applicable engineering codes and standards. Values are based on the following criteria: ASCE 7-10, Roof Zone 1, Exposure B, Roof Slope of 7 to 27 degrees and Mean Building Height of 30 ft. Visit IronRidge.com for detailed span tables and certifications.

Load		Rail Span					
Snow (PSF)	Wind (MPH)	4'	5' 4"	6'	8'	10'	12'
None	100						
	120						
	140	XR10		XR100		XR1000	
	160						
10-20	100						
	120						
	140						
	160						
30	100						
	160						
40	100						
	160						
50-70	160						
80-90	160						

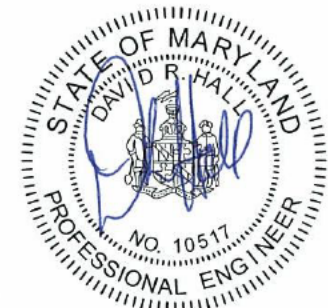


APPROVED  
 Montgomery County  
 Historic Preservation Commission



**REVIEWED**  
 By Dan.Bruechert at 1:26 pm, Jul 08, 2024

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: 07/31/25



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

Project #5920  
 Justin Rood  
 5 Montgomery Avenue,  
 Takoma Park, MD, USA

**Mount Detail**

Issue Date  
**04.04.2024**

Revisions:

System Size:  
**8.8 kW**

**pv**

APPROVED  
Montgomery County  
Historic Preservation Commission

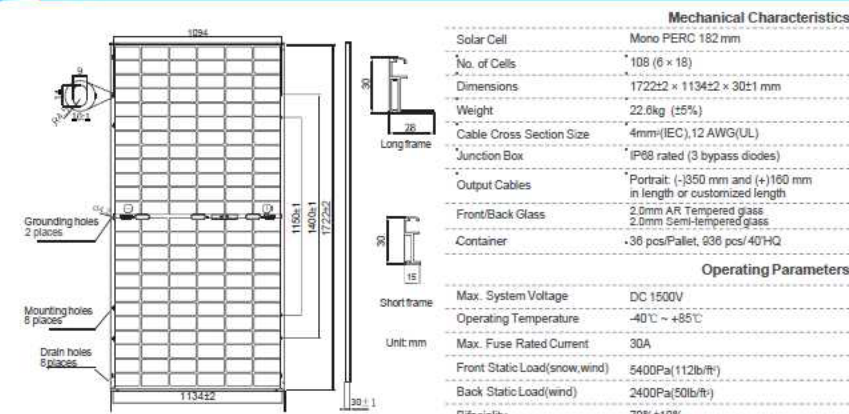


REVIEWED

By Dan Bruechert at 1:26 pm, Jul 08, 2024

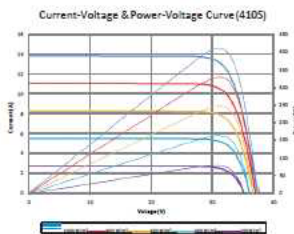


HY-DH108P8 390-410W(B)



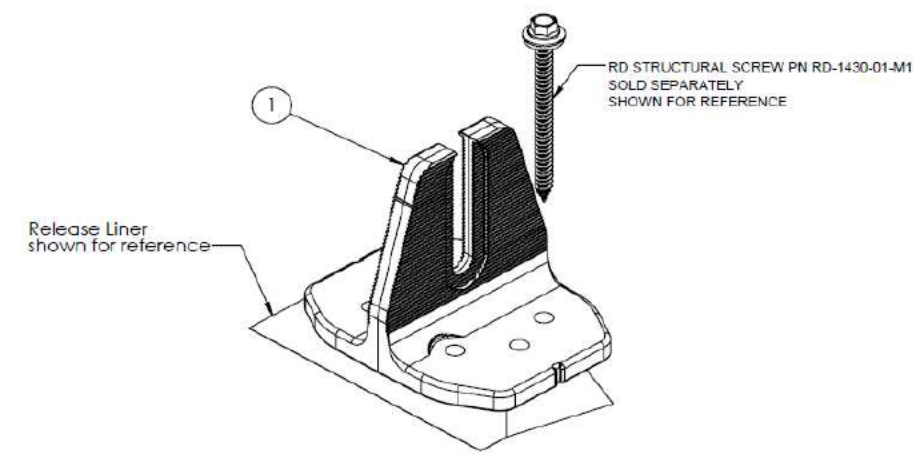
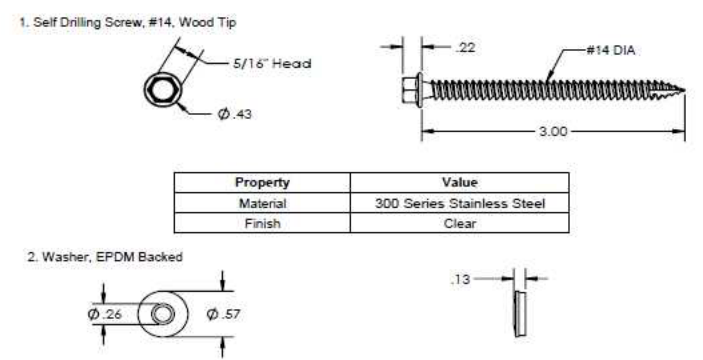
Electrical Characteristics					
Maximum Power at STC (Pmax)	410W	405W	400W	395W	390W
Optimum Operating Voltage (Vmp)	31.45V	31.21V	31.01V	30.84V	30.64V
Optimum Operating Current (Imp)	13.04A	12.98A	12.90A	12.81A	12.73A
Open Circuit Voltage (Voc)	37.32V	37.23V	37.07V	36.98V	36.85V
Short Circuit Current (Isc)	13.95A	13.67A	13.79A	13.70A	13.61A
Module Efficiency	21.0%	20.7%	20.5%	20.2%	20.0%
Operating Module Temperature	-40 °C to +85 °C		Maximum Series Fuse Rating		
Maximum System Voltage	1500 V DC (IEC)		Power Tolerance		

Electrical Characteristics with Different Rearside Power Gain (Reference to 405W Front)			
Rearside Power Gain	5%	15%	25%
Maximum Power at STC (Pmax)	425W	468W	506W
Optimum Operating Voltage (Vmp)	31.41V	31.41V	31.40V
Optimum Operating Current (Imp)	13.56A	14.88A	16.18A
Open Circuit Voltage (Voc)	37.22V	37.23V	37.23V
Short Circuit Current (Isc)	14.48A	15.86A	17.24A
Module Efficiency	21.68%	23.74%	25.81%

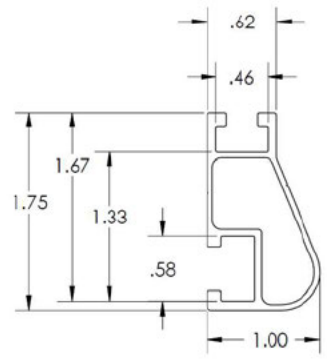


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HY-DH108P8-En-V1.0

IronRidge QuickMount HUG + RD Structural Screw with EPDM washer:



IRON RIDGE XR10 RAIL



Rail Section Properties	
Property	Value
Total Cross-Sectional Area	0.363 in <sup>2</sup>
Section Modulus (X-axis)	0.136 in <sup>3</sup>
Moment of Inertia (X-axis)	0.124 in <sup>4</sup>
Moment of Inertia (Y-axis)	0.032 in <sup>4</sup>
Torsional Constant	0.076 in <sup>3</sup>
Polar Moment of Inertia	0.033 in <sup>4</sup>



Simplified Grounding for Every Application

The UFO® family of components eliminates the need for separate grounding hardware by bonding solar modules directly to IronRidge® XR Rails®. All system types that feature the UFO® family—Flush Mount®, Tilt Mount® and Ground Mount®—are fully listed to the UL 2703 standard.

UFO® hardware forms secure electrical bonds with both the module and the rail, resulting in many parallel grounding paths throughout the system. This leads to safer and more reliable installations.

Only for installation and use with IronRidge products in accord with written instructions. See IronRidge.com/UFO



Universal Fastening Object (UFO®)  
The UFO® securely bonds solar modules to XR Rails®. It comes assembled and lubricated, and can fit a wide range of module heights.

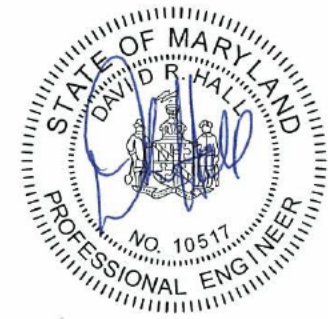


Enphase IQ 7 and IQ 7+ Microinverters

INPUT DATA (DC)	IQ7-60-2-US / IQ7-60-B-US	IQ7PLUS-72-2-US / IQ7PLUS-72-B-US
Commonly used module pairings <sup>1</sup>	235 W - 350 W +	235 W - 420 W +
Module compatibility	60-cell PV modules only	60-cell and 72-cell PV modules
Maximum input DC voltage	48 V	66 V
Peak power tracking voltage	27 V - 37 V	27 V - 42 V
Operating range	16 V - 48 V	16 V - 60 V
Min/Max start voltage	22 V / 48 V	22 V / 60 V
Max DC short circuit current (module Isc)	15 A	15 A
Overvoltage class DC port	II	II
DC port backfeed current	0 A	0 A
PV array configuration	1 x 1 ungrounded array; No additional DC side protection required; AC side protection requires max 70 A per branch circuit	

OUTPUT DATA (AC)	IQ 7 Microinverter	IQ 7+ Microinverter
Peak output power	250 VA	295 VA
Maximum continuous output power	240 VA	290 VA
Nominal (L-L) voltage/range <sup>2</sup>	240 V / 208 V	240 V / 208 V
Maximum continuous output current	1.0 A (240 V) 1.15 A (208 V)	1.21 A (240 V) 1.39 A (208 V)
Nominal frequency	60 Hz	60 Hz
Extended frequency range	47 - 68 Hz	47 - 68 Hz
AC short-circuit fault current over 3 cycles	3.8 Arms	3.8 Arms
Maximum units per 20 A (L-L) branch circuit <sup>2</sup>	16 (240 VAC) 13 (208 VAC)	13 (240 VAC) 11 (208 VAC)
Overvoltage class AC port	III	III
AC port backfeed current	0 A	0 A
Power factor setting	1.0	1.0
Power factor (adjustable)	0.85 leading ... 0.85 lagging	0.85 leading ... 0.85 lagging
EFFICIENCY	@240 V	@208 V
Peak efficiency	97.5 %	97.5 %
CEC weighted efficiency	97.0 %	97.0 %

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: 07/31/25



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

Project #5920  
Justin Rood  
5 Montgomery Avenue,  
Takoma Park, MD, USA

Hardware Specifications

Issue Date  
04.04.2024

Revisions:

System Size:  
8.8 kW

pv

203



Subject: Solar System Justification  
Property: 5 Montgomery Ave Takoma Park MD 20912  
Client: Justin Rood

To Whom It May Concern:

I am writing to provide a comprehensive justification for the installation of solar panels at Justin Rood's property. The proposed solar system has been carefully designed to cover the energy needs of the client, while adhering to all relevant guidelines and considerations.

Please see the attached usage analysis that outlines the client's 2022 and 2023 consumption. The proposed system of 20 panels does not cover the client's annual usage. We would like you to consider the client's renovation in 2023 that resulted in lower-than-average electricity consumption. Despite the reduced energy usage during this period, that proposed solar system only covers 95% of 2023's annual usage. The proposed system covered 70% of the client's consumption in 2022. This client's future energy usage is expected to return to or exceed 2022's levels, making the proposed system's capacity essential.


Solar is a clean and renewable energy source that will reduce our client's carbon footprint and green house gas emissions. Allowing a full installation aligns with broader environmental goals and initiatives.

Given the significant benefits of the proposed solar system, and the client's usage justification, we strongly advocate for the approval of the full solar panel installation. We appreciate your consideration and are available to address further questions or concerns.

Sincerely,

Kathleen dePorter  
COO  
[KdePorter@SolarSolutionDC.com](mailto:KdePorter@SolarSolutionDC.com)  
202-340-2880

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Montgomery County  
Historic Preservation Commission



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**REVIEWED**  
By Dan.Bruechert at 1:27 pm, Jul 08, 2024

Customer Justin Rood  
 Address 5 Montgomery Ave MD

	2022 Usage (kWh)	2023 Usage (kWh)	Solar Production (kWh)
January	1120	360	311
February	640	900	369
March	635	910	619
April	640	1140	887
May	610	940	837
June	1100	1380	958
July	1400	1420	944
August	1560	400	895
September	1440	200	705
October	600	180	633
November	610	180	335
December	760	200	289
<b>Sum</b>	<b>11115</b>	<b>8210</b>	<b>7782</b>

	2022	2023
Solar Offset	70%	95%

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 Historic Preservation Commission



**REVIEWED**  
 By Dan.Bruechert at 1:28 pm, Jul 08, 2024