MONTGOMERY COUNTY HISTORIC PRESERVATION COMMISSION
STAFF REPORT

Address:	7214 Spruce Avenue, Takoma Park	**Meeting Date:**	4/12/2023
Resource:	Contributing Resource **Takoma Park Historic District**	**Report Date:**	4/5/2023
		Public Notice:	3/29/2023
Applicant:	Ryan Doyle (Agent)	**Tax Credit:**	N/A
Review:	HAWP	**Staff:**	John Liebertz
Permit Number:	1021913		
PROPOSAL:	Solar panel installation.		

STAFF RECOMMENDATION

Staff recommends that the Historic Preservation Commission (HPC) **approve with (2) conditions** the HAWP application with final approval of all details delegated to staff.

1. The final set of drawings shall show the removal of three solar panels from the southern slope of the front-gable roof on the original one-story house for a total of thirty-two (32) panels. The solar panels shall be father setback from the rake (edge) of the roof as illustrated in staff's model on page 8, *Figure 7*, of the staff report.
2. Approval of up to sixteen (16) solar panels on the northern slope of the two-story addition is hereby delegated to staff if the applicant submits a revision to this HAWP or a separate HAWP.

ARCHITECTURAL DESCRIPTION

SIGNIFICANCE:	Contributing Resource within the Takoma Park Historic District
STYLE:	Bungalow
DATE:	c. 1916-1925

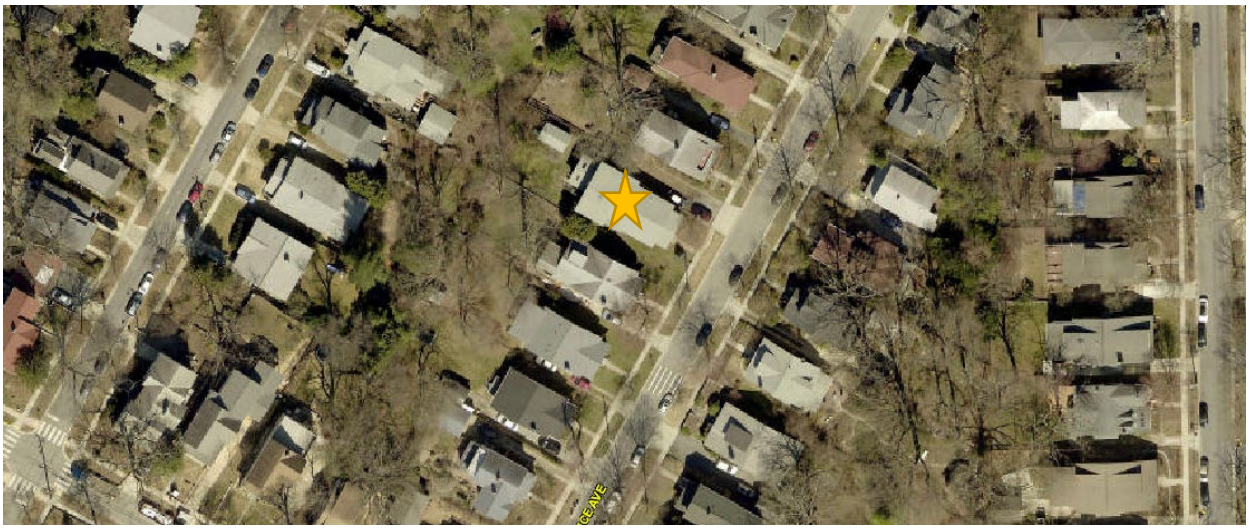


Figure 1: The subject property at 7214 Spruce Avenue (noted with the yellow star).

PROPOSAL

The applicant proposes to install thirty-five (35) roof-mounted solar panels in three arrays. Two of the arrays are located on a non-historic two-story addition (ca. 1993). The arrays on the northern and southern roof slope consists of six (6) and twelve (12) panels, respectively. A third array consisting of seventeen (17) panels is located on the southern slope of the original one-story house.

APPLICABLE GUIDELINES

The Historic Preservation Office and Historic Preservation Commission (HPC) consult several documents when reviewing alterations and new construction within the Takoma Park Historic District. These documents include the historic preservation review guidelines in the approved and adopted amendment for the *Takoma Park Historic District (Guidelines)*, *Montgomery County Code Chapter 24A (Chapter 24A*), and *the Secretary of the Interior's Standards for Rehabilitation (Standards),* and the HPC's *Policy No. 20-01 ADDRESSING EMERGENCY CLIMATE MOBILIZATION THROUGH THE INSTALLATION OF ROOF-MOUNTED SOLAR PANELS.* The pertinent information in these four documents is outlined below.

Takoma Park Historic District Guidelines

There are two broad planning and design concepts which apply to all categories. These are:

- The design review emphasis will be restricted to changes that are all visible from the public right-of-way, irrespective of landscaping or vegetation (it is expected that the majority of new additions will be reviewed for their impact on the overall district), and

- The importance of assuring that additions and other changes to existing structures act to reinforce and continue existing streetscape, landscape, and building patterns rather than to impair the character of the historic district.

A majority of the buildings in the Takoma Park Historic District have been assessed as being "Contributing Resources." While these buildings may not have the same level of architectural or historical significance as Outstanding Resources or may have lost some degree of integrity, collectively, they are the basic building blocks of the Takoma Park district. They are important to the overall character of the district and the streetscape due to their size, scale, and architectural qualities, rather than for their particular architectural features.

Contributing Resources should receive a more lenient level of design review than those structures that have been classified as Outstanding. This design review should emphasize the importance of the resource to the overall streetscape and its compatibility with existing patterns rather than focusing on a close scrutiny of architectural detailing. In general, however, changes to Contributing Resources should respect the predominant architectural style of the resource.

The following guidance which pertains to this project are as follows:

- All exterior alterations, including those to architectural features and details, should be generally consistent with the predominant architectural style and period of the resource and should preserve the predominant architectural features of the resource; exact replication of existing details and features is, however, not required.

- Minor alterations to areas that do not directly front on a public right-of-way such as vents, metal stovepipes, air conditioners, fences, skylights, etc. – should be allowed as a matter of course;

alterations to areas that do not directly front on a public way-of-way which involve the replacement of or damaged to original ornamental or architectural features are discouraged, but may be considered and approved on a case-by-case basis.

- Alterations to features that are not visible from the public right-of-way should be allowed as a matter of course.

- All changes and additions should respect existing environmental settings, landscaping, and patterns of open space.

Montgomery County Code, Chapter 24A-8

The following guidance which pertains to this project are as follows:

(b) The commission shall instruct the director to issue a permit, or issue a permit subject to such conditions as are found to be necessary to ensure conformity with the purposes and requirements of this chapter, if it finds that:

(1) The proposal will not substantially alter the exterior features of an historic site or historic resource within an historic district; or

(2) The proposal is compatible in character and nature with the historical, archeological, architectural or cultural features of the historic site or the historic district in which an historic resource is located and would not be detrimental thereto or to the achievement of the purposes of this chapter;

Secretary of the Interior's Standards for Rehabilitation

The Secretary of the Interior defines rehabilitation as "the act or process of making possible a compatible use for a property through repair, alterations, and additions while preserving those portions or features, which convey its historical, cultural, or architectural values." The applicable *Standards* are as follows:

2. The historic character of a property shall be retained and preserved. The removal of historic materials or alteration of features and spaces that characterize a property shall be avoided.

9. New additions, exterior alterations, or related new construction shall not destroy historic materials that characterize the property. The new work shall be differentiated from the old and shall be compatible with the massing, size, scale, and architectural features to protect the historic integrity of the property and its environment.

10. New additions and adjacent or related new construction shall be undertaken in such a manner that if removed in the future, the essential form and integrity of the historic property and its environment would be unimpaired.

Historic Preservation Commission Policy No. 20-01: Addressing Emergency Climate Mobilization Through The Installation of Roof-Mounted Solar Panels

Now, THEREFORE:

WHEREAS, Historic Area Work Permit decisions are guided by the criteria in Section 24A, The Secretary of the Interior's Standards for Rehabilitation, and pertinent guidance from applicable master plan amendments and/or site or district-specific studies;

WHEREAS, The Secretary of the Interior's Standards for Rehabilitation as interpreted by the National Park Service limit the placement of rooftop solar panels under Standards 2, 9, and 10 to less conspicuous locations;

WHEREAS, the County Council has established a Climate Emergency;

WHEREAS, the Historic Preservation is a body established by the County Executive and County Council;

WHEREAS, Section 24-8(b)(6) states, "In balancing the interest of the public in preserving the historic site or historic resource located within an historic district, with the interests of the public from the use and benefit of the alternative proposal, the general public welfare is better served by granting the permit;"

WHEREAS, the widespread use of solar panels, both for hot water and for electricity production, will reduce greenhouse gases in the county, in accordance with the aims of the Emergency Climate Mobilization resolution (Resolution No.: 18-974), it shall be the policy of the Historic Preservation Commission that:

1. The preferred locations for solar panel installation(s) on a designated historic site or an historic resource located within an historic district is a) on the rear of the property, b) on non-historic building additions, c) on accessory structures, or d) in ground-mounted arrays;

2. If it is not feasible to install solar panels in one of the identified preferred locations due to resource orientation or other site limitations; and,

3. The roof is determined to be neither architecturally significant, nor a character-defining feature of the resource, nor is it a slate or tile roof, that unless it can be demonstrated that the solar array will be installed without damaging the historic character of the resource or historic fabric; then

4. The public welfare is better served by approving a Historic Area Work Permit for solar panels on all visible side or front roof slopes under Section 24A-8(b)(6).

5. A Historic Area Work Permit (HAWP) is required for all work referenced in this policy.

STAFF DISCUSSION

The subject property is a Contributing Resource to the Takoma Park Historic District and features a one-story, Craftsman-influenced house constructed ca. 1916-1925. The house has undergone numerous alterations since its construction. In 1988, the former property owners constructed a one-story addition to the rear. In 1993, the Historic Preservation Commission approved 37/3-93Y which allowed for the construction of a second story on the existing addition and resulted in the present-day building form.[1]

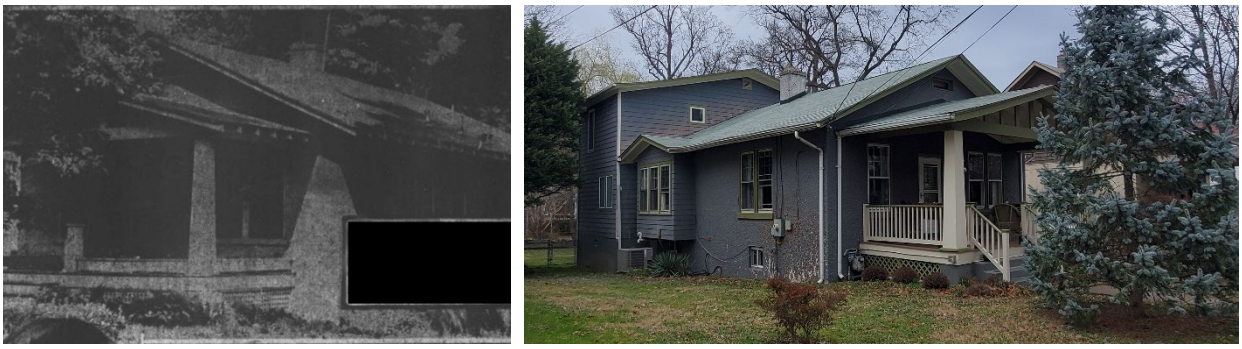


Figure 2: View of the subject house from Spruce Avenue, 1926 (left) and 2023 (right).
Source: Washington Times (left) and Montgomery Planning (right).

Figure 3: Aerial view, 2022. The red arrow points to the locations of the three proposed arrays.
Source: Eagleview, ConnectExplorer.

The applicant proposes to install thirty-five (35) roof-mounted solar panels in three arrays. Two of the arrays are located on a non-historic two-story addition (ca. 1993). The arrays on the northern and southern roof slope consists of six (6) and twelve (12) panels, respectively. A third array consisting of seventeen

[1] For more information, https://mcatlas.org/tiles/06_HistoricPreservation_PhotoArchives/Padlock/HAR60640006/Box044/37-3-93Y_Takoma%20Park%20Historic%20District_7214%20Spruce%20Avenue_08-18-1993.pdf.

(17) panels is located on the southern slope of the original one-story house. The utility disconnect will be installed on the southeast corner of the building (towards the front porch) at the location of the existing utility meters.

Staff recommends approval of the proposal on the condition that three (3) of the seventeen (17) panels are removed from the southern slope of the historic section of the front-gable house.

The HPC and staff utilize *Policy Guidance #20-01: Solar Technology (2021)* as the baseline for their review and to articulate their findings in the review of solar technology. The policy outlines the most to least preferred locations for solar arrays in suburban historic districts. The most preferred location for solar systems is a freestanding array in the rear yard, but this location is not feasible at the subject property due to the size of the lot and existing tree canopy. The second preferred location is a roof-mounted array on an accessory or non-historic building. There is a garage in the northwest corner of the subject property, but the applicants dismissed this option due to the small roof area and existing tree canopy (*Figure 4)*.

Figure 4: View of the rear of the property, 2023.
Source: Montgomery Planning.

The third preferred location is a roof-mounted array on a non-historic addition of the main house. The applicant proposed eighteen (18) panels— more than half of the panels—to be placed on the non-historic, two-story addition constructed in 1993. The solar panels would not be visible from the public rights-of-way due to the height of the addition, shallow pitch of the gable roof, the addition's location towards the rear of the property, and the array matching the slope of the roof. Therefore, staff recommends approval of these eighteen (18) panels as they would not adversely affect the character of the historic house or streetscape and comply with *Policy Guidance #20-01: Solar Technology (2021)*.

The least preferred location is a roof-mounted array on the historic house. The applicant proposes to install seventeen (17) panels on the southern slope of the one-story, front-gable house. The roof is highly visible from Spruce Avenue, but the asphalt shingle material is not a character defining feature of the dwelling. Therefore, the HPC should approve solar arrays on this roof slope in accordance with the installation guidance described in *Policy Guidance #20-01: Solar Technology (2021)*. Relevant guidance includes that traditional roof-mounted solar panels should: 1) have a low-profile and be mounted less than or equal to six inches above the surface of the roof (to the face of the panel); 2) be consistent with the existing slope of the supporting roof; 3) be setback from the edges and ridge of the roof; and 4) be

arranged in an organized configuration and avoid disjointed or multi-roof solutions. While the proposed array on the southern slope of the historic house has a low-profile, is consistent with the slope of the roof, and arranged in an organized configuration, the array is setback just 6-inches from the rake (edge) of the roof on the east elevation (façade) and to the valley created by the square bay on the south (side) elevation (*Figure 5*).

Figure 5: Solar panel layout submitted by the applicant. The green square shows the proposed location of the seventeen (17) panels on the southern slope of the historic house.
Source: Solar Energy World.

Staff finds that the proximity of the panels to these roof elements to be inconsistent with the installation guidance noted in *Policy Guidance #20-01: Solar Technology (2021).* In order preserve the character defining form and design of the house and overall streetscape, staff recommends that the applicant removes three (3) panels from this array. *Figures 6 and 7* show illustrative models of the applicant's proposed array and staff's recommended array, respectively. Staff's recommendation provides greater relief from the roof's rake and from the gable bay, is compatible with the house and overall character of the historic district, and complies with the installation guidance noted in *Policy Guidance #20-01: Solar Technology (2021)*.

The applicant noted that 31 or 32 panels would support the household's current rate of energy consumption and that 3 or 4 panels are proposed to slightly oversize the system. Therefore, the removal of these three panels complies with the HPC's policy to address climate change while balancing the goal of historic preservation. Staff would support the applicant placing additional panels on the northern slope of the two-story addition. Based on the configuration of the southern slope, the northern slope could hold an additional six (6) panels that would not be visible from the public rights-of-way.

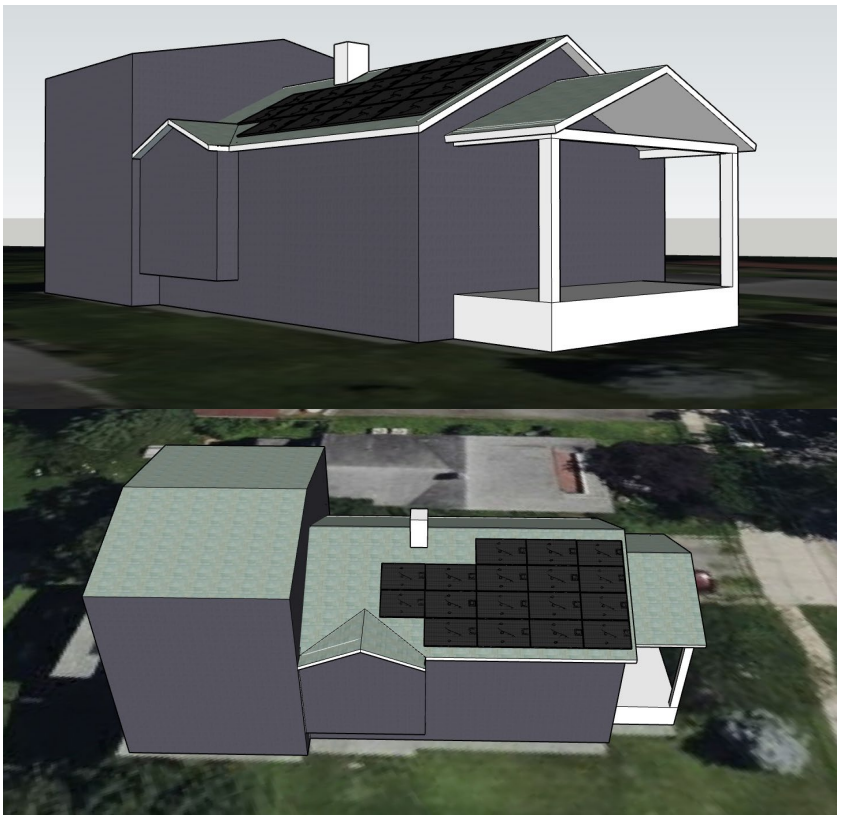


Figure 6: Illustrative model showing the applicant's proposed seventeen (17) panel array on the southern slope of the historic house. Note, the drawing does not include the solar arrays on the two-story addition.
Source: Montgomery Planning.

Figure 7: Illustrative model showing staff's reccomended fourteen (14) panel array on the southern slope of the historic house. Note, the drawing does not include the solar arrays on the two-story addition.
Source: Montgomery Planning.

While there are two Outstanding Resources with views of the subject property *(Figure 8)*, there would be limited to no visibility of the solar arrays. The house at 7215 Spruce Avenue is located to the northeast and would have no visibility of the proposed array on the southern slope of the historic house. The house at 7209 Willow Avenue would have limited views from its rear yard due to the placement of the solar panels on the shallow roof of the subject property's two-story addition. Staff finds that the panels will not adversely affect the streetscape

Figure 8: Two Outstanding Resources (called out in red) in proximity to the subject propery (noted in blue). Source: Montgomery Planning.

Staff finds that all conduits are located within the attic. While the inverter is placed within view of the public right-of-way on the eastern extent of the south elevation (near the front porch), it is adjacent to an existing utility meter and will not further diminish the integrity of the resource. The property owner (current or future) could remove the proposed solar panels at a later date without impairing the integrity of the historic house or district.

After full and fair consideration of the applicant's submission, staff finds the proposal, as modified by the condition, consistent with the Criteria for Issuance in Chapter 24A-8(b), (1), (2), and (d), having found the proposal is consistent with the *Secretary of the Interior's Standards for Rehabilitation #2*, *#9*, and *#10*, and *Takoma Park Historic District Guidelines,* and the HPC's Policy No. 20-01 as outlined above.

STAFF RECOMMENDATION

Staff recommends that the Commission **approve with two (2) conditions** the HAWP application with final approval delegated to staff:

1. The final set of drawings shall show the removal of three solar panels from the southern slope of the front-gable roof on the original one-story house for a total of thirty-two (32) panels. The solar panels shall be father setback from the rake (edge) of the roof as illustrated in staff's model on page 8, *Figure 7*, of the staff report.
2. Approval of up to sixteen (16) solar panels on the northern slope of the two-story addition is hereby delegated to staff if the applicant submits a revision to this HAWP or a separate HAWP.

under the Criteria for Issuance in Chapter 24A-8(b), (1), (2), and (d), having found that the proposal, as modified by the condition, is consistent with the *Takoma Park Historic District Guidelines*, and therefore will not substantially alter the exterior features of the historic resource and is compatible in character with the district and the purposes of Chapter 24A;

and in conformance with HPC *Policy No.20-01*;

and with the *Secretary of the Interior's Standards for Rehabilitation #2*, *#9*, and *#10.*

and with the general condition that the applicant shall present an electronic set of drawings, if applicable, to Historic Preservation Commission (HPC) staff for review and stamping prior to submission for the Montgomery County Department of Permitting Services (DPS) building permits;

and with the general condition that final project design details, not specifically delineated by the Commission, shall be approved by HPC staff or brought back to the Commission as a revised HAWP application at staff's discretion;

and with the general condition that the applicant shall notify the Historic Preservation Staff if they propose to make any alterations to the approved plans. Once the work is completed the applicant will contact the staff person assigned to this application at 301-563-3400 or john.liebertz@montgomeryplanning.org to schedule a follow-up site visit.

FOR STAFF ONLY:
HAWP# 1021913
DATE ASSIGNED_____

APPLICATION FOR HISTORIC AREA WORK PERMIT

HISTORIC PRESERVATION COMMISSION
301.563.3400

APPLICANT:

Name: Ryan Dayle E-mail: permitting@solarenergyworld.com

Address: 7214 Spruce Avenue City: Takoma Park Zip: 20912

Daytime Phone: 410-579-5172 Tax Account No.: 01063035

AGENT/CONTACT (if applicable):

Name: Ryan Doyle E-mail: permitting@solarenergyworld.com

Address: 5681 Main Street City: Elkridge Zip: 21075

Daytime Phone: 410-579-5172 Contractor Registration No.: MHIC 127353

LOCATION OF BUILDING/PREMISE: MIHP # of Historic Property_____

Is the Property Located within an Historic District? ☑Yes/District Name Takoma Park
☐No/Individual Site Name_____

Is there an Historic Preservation/Land Trust/Environmental Easement on the Property? If YES, include a map of the easement, and documentation from the Easement Holder supporting this application.

Are other Planning and/or Hearing Examiner Approvals /Reviews Required as part of this Application? (Conditional Use, Variance, Record Plat, etc.?) If YES, include information on these reviews as supplemental information.

Building Number: 7214 Street: Spruce Avenue

Town/City: Takoma Park Nearest Cross Street: Tulip Avenue

Lot: 35 Block: 8 Subdivision: 0025 Parcel: N/A

TYPE OF WORK PROPOSED: See the checklist on Page 4 to verify that all supporting items for proposed work are submitted with this application. Incomplete Applications will not be accepted for review. Check all that apply:

- ☐ New Construction
- ☐ Addition
- ☐ Demolition
- ☐ Grading/Excavation
- ☐ Deck/Porch
- ☐ Fence
- ☐ Hardscape/Landscape
- ☐ Roof
- ☐ Shed/Garage/Accessory Structure
- ☑ Solar
- ☐ Tree removal/planting
- ☐ Window/Door
- ☐ Other:_____

I hereby certify that I have the authority to make the foregoing application, that the application is correct and accurate and that the construction will comply with plans reviewed and approved by all necessary agencies and hereby acknowledge and accept this to be a condition for the issuance of this permit.

Ryan Doyle 2/16/2023

Signature of owner or authorized agent Date

HAWP APPLICATION: MAILING ADDRESSES FOR NOTIFING
[Owner, Owner's Agent, Adjacent and Confronting Property Owners]

Owner's mailing address	**Owner's Agent's** mailing address
Ormond Seavey 7214 Spruce Avenue Takoma Park MD 20912	Ryan Doyle 5681 Main Street Elkridge MD 21075

Adjacent and confronting Property Owners mailing addresses

Yuri Zelinsky 7212 Spruce Avenue Takoma Park MD 20912 Adjacent	Casey Callister 7216 Spruce Avenue Takoma Park MD 20912 Adjacent
Sue Wheaton 7211 Spruce Avenue Takoma Park MD 20912 Backyard Confronting	Bruce Sidwell 7209 Spruce Avenue Takoma Park MD 20912 Backyard Confronting
7209 Willow Avenue, Takoma Park 20912 7213 Spruce Avenue, Takoma Park 20912	7213 Willow Avenue, Takoma Park 20912 7211 Willow Avenue, Takoma Park 20912

Description of Property: Please describe the building and surrounding environment. Include information on significant structures, landscape features, or other significant features of the property:

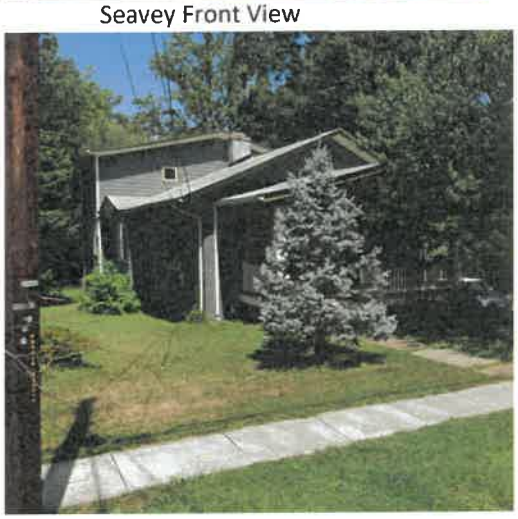
Single Family Dwelling built in 1923

Description of Work Proposed: Please give an overview of the work to be undertaken:

- Install (35) roof mounted solar panels
- Micro-Inverters to be installed under each panel.
- Utility disconnect to be installed next to utility meter.
- Galvanized Steel conduit to run from equipment along and tucked into attic.

Historical Area Work Permit Application for Roof Mounted Solar
Nora & Ormand Seavey, 7214 Spruce Avenue 20912

Seavey Front View



Seavey East View

Seavey West View

Seavey Utility Side Before Installation

Seavey Utility Side Example After Installation

NOTE: Conduits are located in the attic and puncture the eve.

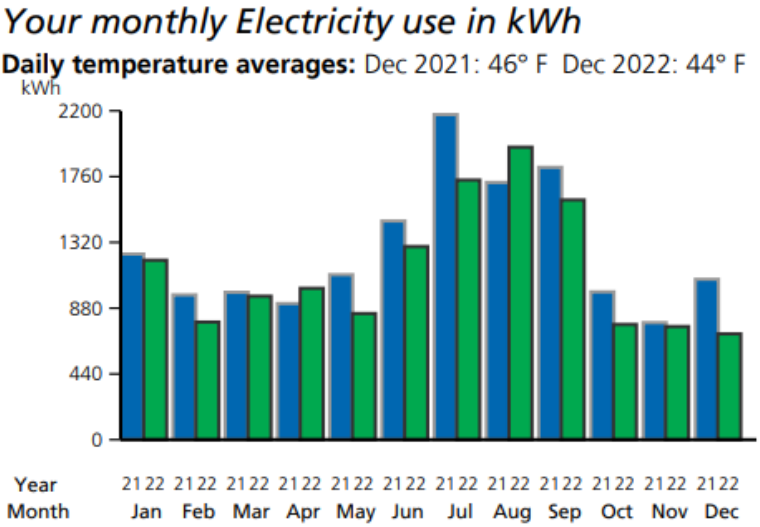
SolarEnergyWorld
Because Tomorrow Matters

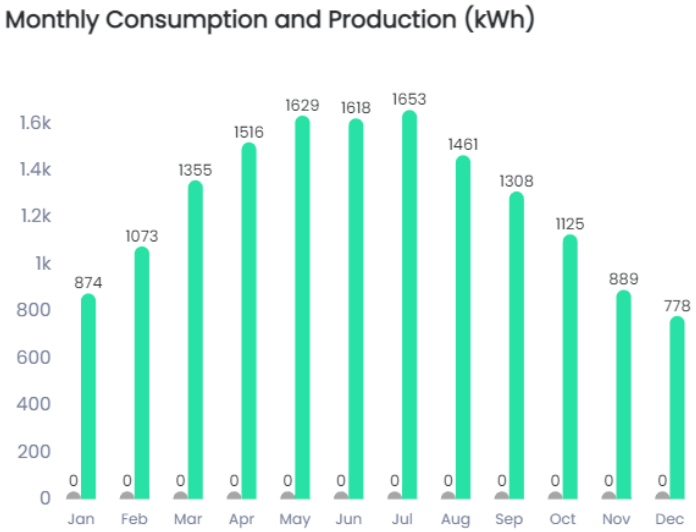
3/6/2023

To whom it may concern,

- **Explain how many solar panels are required to support the home vs. how many are there to sell power back to the grid.**

  Monthly energy consumption for 7214 Spruce Ave, Takoma Park, MD 20912 vs the proposed system monthly production.





- The home had an annual usage of roughly 13,670 kWh in 2022. Our proposed system is estimated to have 15,281 kWh in annual production.

  The panels will vary in production based on their location on the structure, but this estimated production for a 35-panel system breaks down to roughly 437 kWh per panel annually. The system production estimate of 15,281 kWh is 1611 kWh larger than the consumption for the household. This means that a 31 or 32 panel system (depending on the placement of the panels) would be enough to support the household's current rate of energy consumption.

  To state as asked – 31 or 32 panels are required to support the home while the remaining 3 or 4 panels are there to slightly oversize the system.

- **Include a written justification on the 35 panels and the location of the panels. For example, why are there not more panels on the north elevation (where there are six on the north slope of the rear gable addition). Why are the panels very close to the front of the house (what is the setback of those panels from the edge of the roof). Can the panels be moved more towards the rear? Could the panels be split between both roof slopes (north and south)?**
  - The south facing roof planes are maxed out because these roof planes offer the highest rates of production; this is why 29 of the panels are designed to go on these roof planes.
  - Of the two north facing roof planes, the roof of the rear gable addition offered better production than the north facing roof of the main gable. This is due to the roof planes' higher elevation off the ground and flatter pitch.
  - As the drawings now indicate, the setback from the rake on the south facing roof plane of the main gable is 6 inches. From a production standpoint the array was pushed as far towards the front of the house in an effort to minimize the impact of the shade from the trees southwest of the house. In the interest of aesthetics and ease of installation, the array of 17 panels was designed in one block of panels, all in the same orientation, while also accounting for the chimney and small dormer on the southwest edge of the roof plane.

- If the array was kept in one block of panels, moving the array further towards the rear would result in a loss of panels as the chimney and dormer would get in the way. If the array were split up and a mixed orientation was chosen, we could keep the same number of panels, however they would be arranged in a much less aesthetic fashion. There would also be a minor drop in production due to the higher shade coverage from the aforementioned trees to the southwest.
- Splitting the panels to the north facing plane would result in a large drop in production and is not recommended.

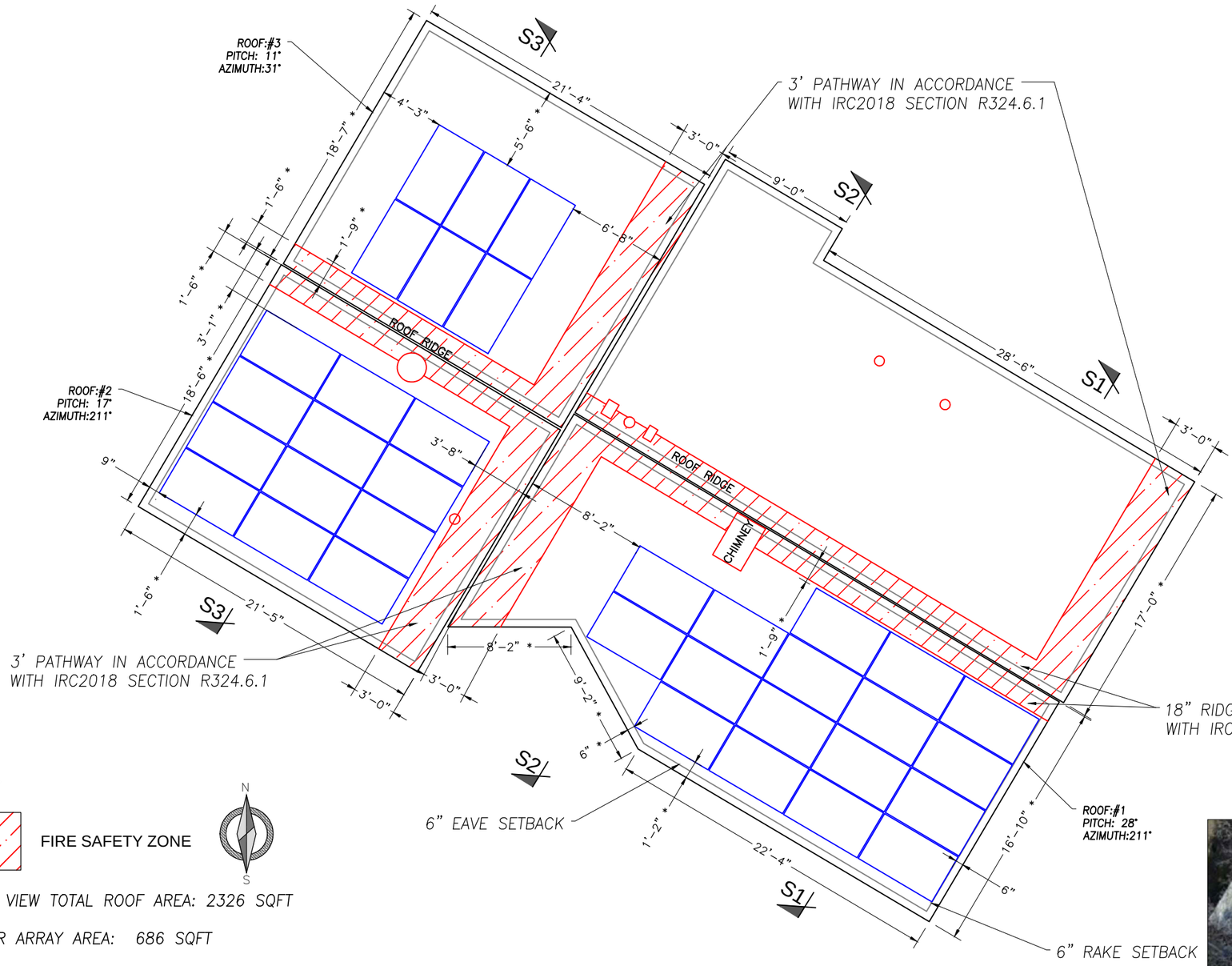
- **Include justification about why no panels were placed on the garage at the rear of the property.**
  - This option was not considered for multiple reasons. Due to the small roof area, as well as its location on the property being more directly surrounded by trees, it was determined to not be an ideal spot to design on. Any panels placed here would not produce at an efficient rate due the excess shade coverage caused by the roof planes proximity to the ground in combination with the large trees directly south and west of the structure. Furthermore, because this is a detached structure, underground conduit would have to be run from the structure to the main home to tie into the grid, increasing costs and installation time.

Thank you,

Xander Fowler
Design Engineer

Scanifly

IQ7+



KEY

FIRE SAFETY ZONE

N

S

PLAN VIEW TOTAL ROOF AREA: 2326 SQFT

SOLAR ARRAY AREA: 686 SQFT

THE SOLAR ARRAY IS 29.4% OF THE PLAN VIEW TOTAL ROOF AREA

NOTES:

1. THE SYSTEM SHALL INCLUDE [35] HANWHA Q.PEAK DUO BLK-G10+ 365W MODULES.
2. SNAPNRACK UR-40 RAIL WILL BE INSTALLED IN ACCORDANCE WITH SNAPNRACK INSTALLATION MANUAL.
3. DIMENSIONS MARKED (*) ARE ALONG ROOF SLOPE.
4. REFER TO STRUCTURAL DRAWING FOR SECTIONS MARKED AND ADDITIONAL NOTES.
5. PANELS MOUNTED TO FOLLOW SLOPE OF THE ROOF

SOLAR PANEL LAYOUT

Scale: 1/8" =1'-0"

PROPOSED PV ARRAY LOCATION

Solar Energy World
Because Tomorrow Matters

Solar Energy World LLC.
5681 Main Street
Elkridge, MD 21075
(888) 497-3233

Stamp

STATE OF MARYLAND
JAMES A. CLANCY
No. 31585
PROFESSIONAL ENGINEER

DocuSigned by:
74454BC12527459...

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. 31585, expiration date: JULY 18, 2023. Stamped and signed for structures only

*STAMPED AND SIGNED FOR STRUCTURES ONLY

Revisions

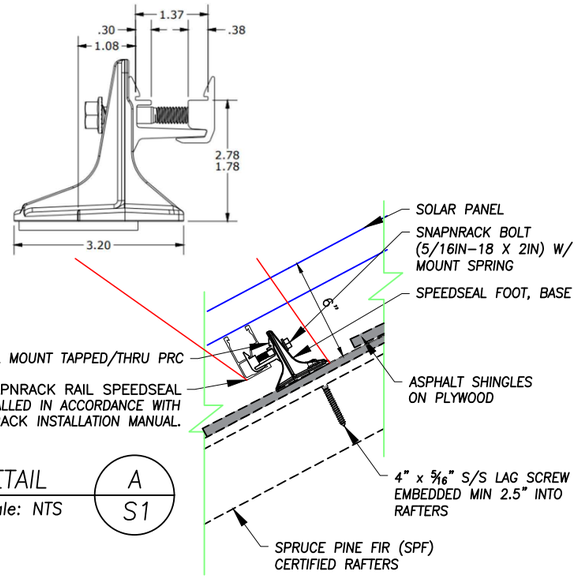
REV	DESCRIPTIONS	BY	DATE
01	--------	--	--

Plotted By: Xander Fowler on 3/6/2023 9:08 AM

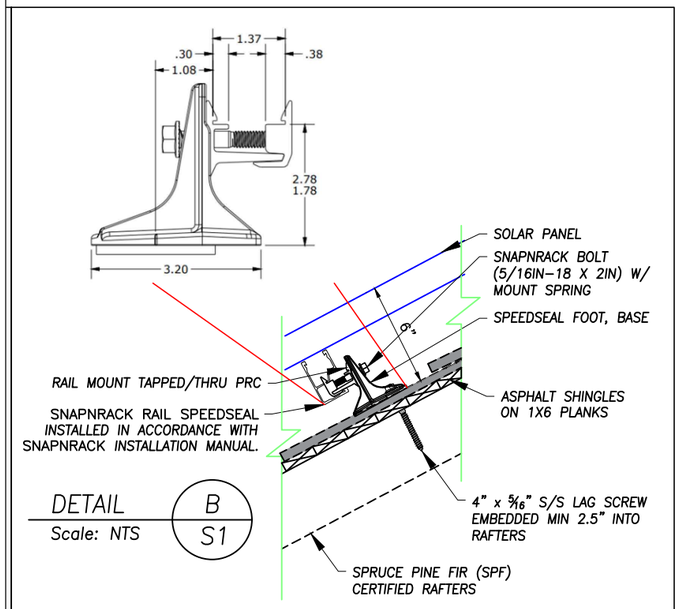
Project Name and Address

Nina & Ormond Seavey
7214 Spruce Ave
Takoma Park, MD 20912
12.775 kW
MD13822

Drawn by: Cody Brehm	Sheet: A001
Date: 25-JAN-2023	
Scale: AS NOTED	

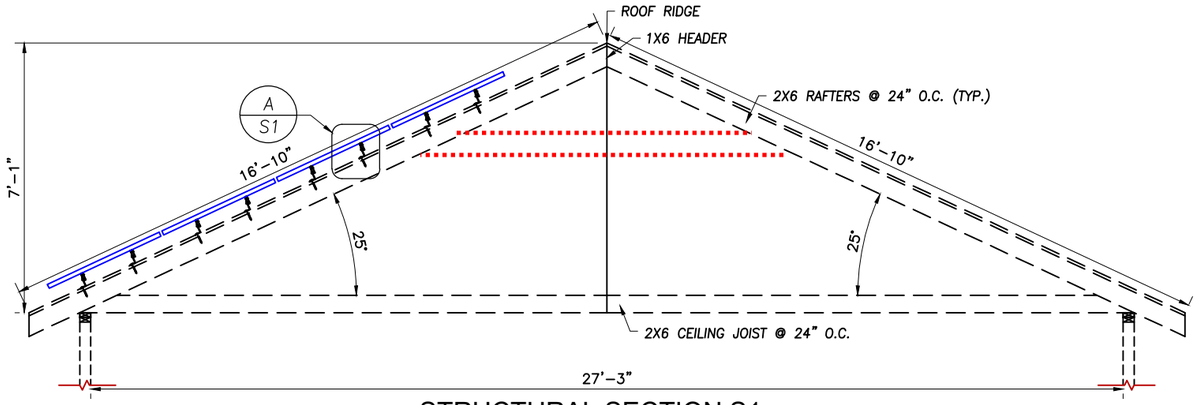


DETAIL A / S1
Scale: NTS



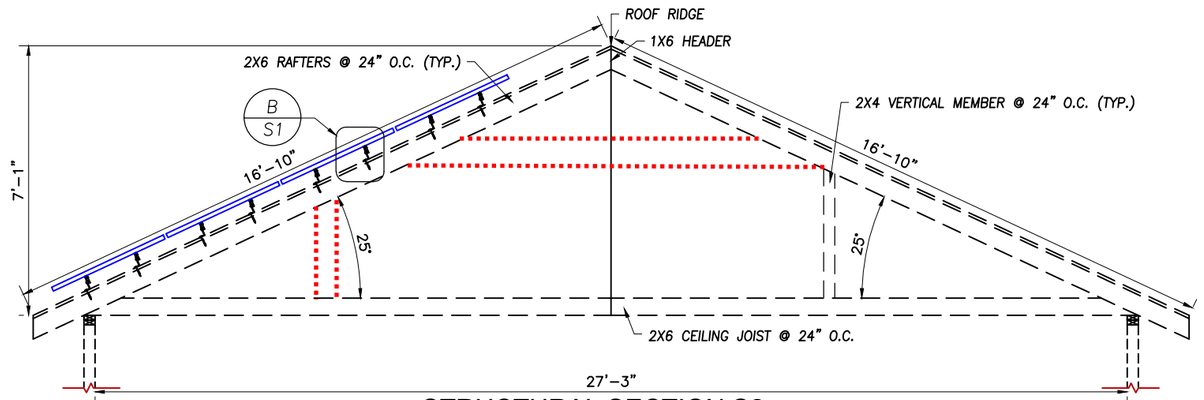
DETAIL B / S1
Scale: NTS

Add 2x6 collar ties @ 16" o.c. to all affected rafters
@ 1/3 span below the ridge (attached with 5x10d nails at each end)



STRUCTURAL SECTION S1

Scale: 1/4" =1'-0"



STRUCTURAL SECTION S2

Scale: 1/4" =1'-0"

Add 2x6 collar ties @ 16" o.c. to all affected rafters
@ 1/3 span below the ridge (attached with 5x10d nails at each end)

Add 2x4 knee walls @ 2/3 span below the ridge (attached with
5x10 d nails at each end) @ 2/3 span below the ridge

NOTES:

1. ALL WORK SHALL COMPLY WITH REQUIREMENTS OF INTERNATIONAL RESIDENTIAL CODE (IRC 2018), LOADING CODE (ASCE 7-16), WOOD DESIGN CODE (NDS 2015), AND LOCAL REQUIREMENTS.
2. LOAD CRITERIA PER :
   - EXPOSURE CATEGORY "B"
   - GROUND SNOW LOAD, Pg = 30 PSF
   - LATERAL LOAD RISK CATEGORY "II"
   - ULTIMATE DESIGN WIND SPEED = 115 MPH
3. SOLAR PANELS AND RACKING SYSTEMS SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATION.
4. FOLLOW ALL LOCAL AND FEDERAL SAFETY REQUIREMENTS.

Solar Energy World
Because Tomorrow Matters

Solar Energy World LLC.
5681 Main Street
Elkridge, MD 21075
(888) 497-3233

Stamp

STATE OF MARYLAND
JAMES A. CLANCY
No. 31585
PROFESSIONAL ENGINEER

DocuSigned by:
74454BC12527459...

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. 31585, expiration date: JULY 18, 2023.
Stamped and signed for structures only
*STAMPED AND SIGNED FOR STRUCTURES ONLY

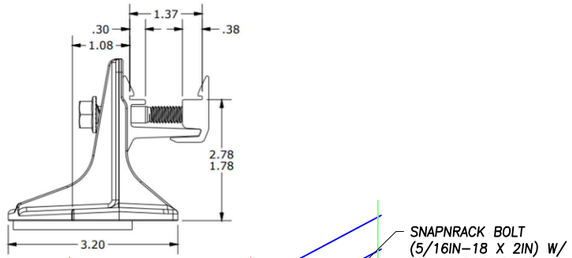
Revisions

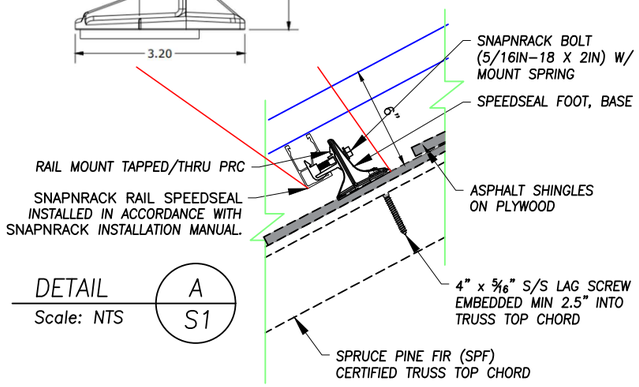
REV	DESCRIPTIONS	BY	DATE
01	--------	--	--

Plotted By: Garrett Connors on 2/13/2023 6:46 AM

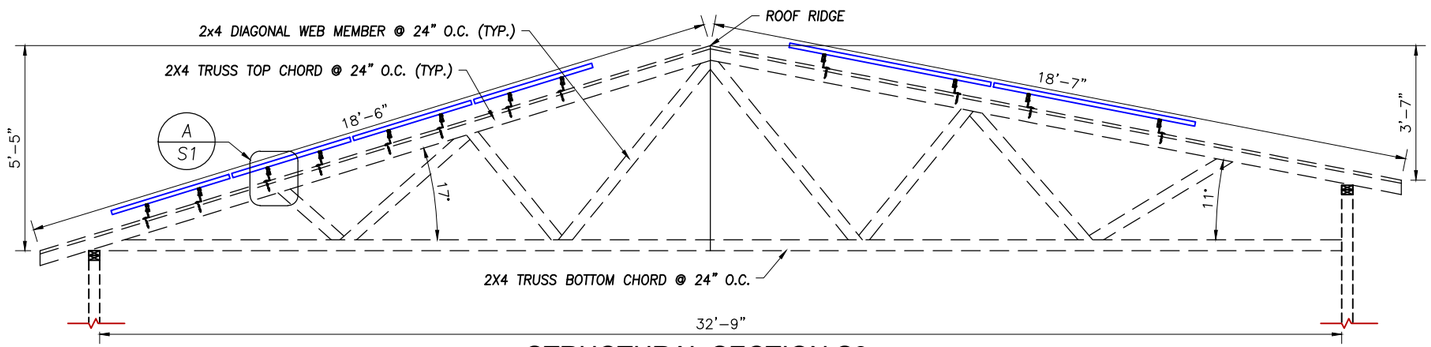
Project Name and Address
Nina & Ormond Seavey
7214 Spruce Ave
Takoma Park, MD 20912
12.775 kW
MD13822

Drawn by: Cody Brehm
Date: 25-JAN-2023
Scale: AS NOTED
Sheet: S001





DETAIL A / S1
Scale: NTS



STRUCTURAL SECTION S3

Scale: 1/4" =1'-0"

NOTES:

1. ALL WORK SHALL COMPLY WITH REQUIREMENTS OF INTERNATIONAL RESIDENTIAL CODE (IRC 2018), LOADING CODE (ASCE 7-16), WOOD DESIGN CODE (NDS 2015), AND LOCAL REQUIREMENTS.
2. LOAD CRITERIA PER :
   - EXPOSURE CATEGORY "B"
   - GROUND SNOW LOAD, Pg = 30 PSF
   - LATERAL LOAD RISK CATEGORY "II"
   - ULTIMATE DESIGN WIND SPEED = 115 MPH
3. SOLAR PANELS AND RACKING SYSTEMS SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATION.
4. FOLLOW ALL LOCAL AND FEDERAL SAFETY REQUIREMENTS.

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Scale: AS NOTED
Sheet: S001

powered by Q.ANTUM DUO Z

PRELIMINARY

Q.PEAK DUO BLK-G10+
350-370

ENDURING HIGH PERFORMANCE

TÜVRheinland CERTIFIED
Quality Controlled PV
www.tuv.com
ID 1111232615

ntv GERMANY'S MOST POPULAR PROVIDER Life & Living Award 2021 1st Place Solar Technology Customer rating from 11 brands www.disq.de DEUTSCHES INSTITUT FÜR SERVICE-QUALITÄT GmbH & Co. KG

25 YR Warranty Product & Performance

EUPD RESEARCH TOP BRAND PV MODULES EUROPE 2021

Q CELLS Yield Security

BREAKING THE 20 % EFFICIENCY BARRIER
Q.ANTUM DUO Z Technology with zero gap cell layout boosts module efficiency up to 20.9 %.

THE MOST THOROUGH TESTING PROGRAMME IN THE INDUSTRY
Q CELLS is the first solar module manufacturer to pass the most comprehensive quality programme in the industry: The new "Quality Controlled PV" of the independent certification institute TÜV Rheinland.

INNOVATIVE ALL-WEATHER TECHNOLOGY
Optimal yields, whatever the weather with excellent low-light and temperature behaviour.

ENDURING HIGH PERFORMANCE
Long-term yield security with Anti LID Technology, Anti PID Technology[1], Hot-Spot Protect and Traceable Quality Tra.Q™.

EXTREME WEATHER RATING
High-tech aluminium alloy frame, certified for high snow (5400 Pa) and wind loads (4000 Pa).

A RELIABLE INVESTMENT
Inclusive 25-year product warranty and 25-year linear performance warranty[2].

[1] APT test conditions according to IEC / TS 62804-1:2015, method A (–1500 V, 96 h)
[2] See data sheet on rear for further information.

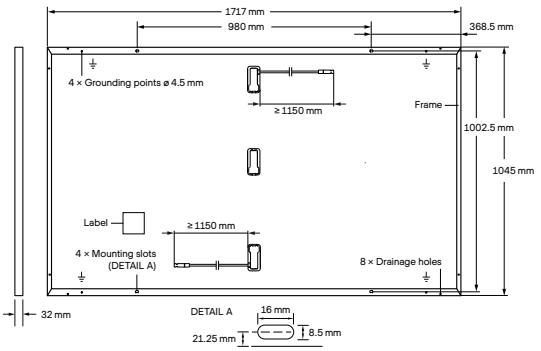
THE IDEAL SOLUTION FOR:
Rooftop arrays on residential buildings

Engineered in Germany

Q CELLS

MECHANICAL SPECIFICATION

Format	1717 mm × 1045 mm × 32 mm (including frame)
Weight	19.9 kg
Front Cover	3.2 mm thermally pre-stressed glass with anti-reflection technology
Back Cover	Composite film
Frame	Black anodised aluminium
Cell	6 × 20 monocrystalline Q.ANTUM solar half cells
Junction box	53-101 mm × 32-60 mm × 15-18 mm Protection class IP67, with bypass diodes
Cable	4 mm² Solar cable; (+) ≥1150 mm, (–) ≥1150 mm
Connector	Stäubli MC4; IP68

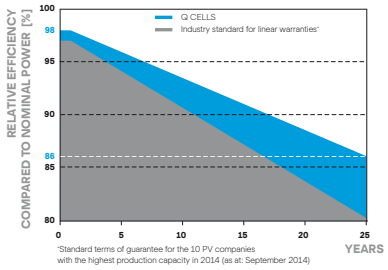


ELECTRICAL CHARACTERISTICS

POWER CLASS				350	355	360	365	370
MINIMUM PERFORMANCE AT STANDARD TEST CONDITIONS, STC[1] (POWER TOLERANCE +5 W / –0 W)								
Minimum	Power at MPP[1]	P_{MPP}	[W]	350	355	360	365	370
	Short Circuit Current[1]	I_{SC}	[A]	10.97	11.00	11.04	11.07	11.10
	Open Circuit Voltage[1]	V_{OC}	[V]	41.11	41.14	41.18	41.21	41.24
	Current at MPP	I_{MPP}	[A]	10.37	10.43	10.49	10.56	10.62
	Voltage at MPP	V_{MPP}	[V]	33.76	34.03	34.31	34.58	34.84
	Efficiency[1]	η	[%]	≥19.5	≥19.8	≥20.1	≥20.3	≥20.6
MINIMUM PERFORMANCE AT NORMAL OPERATING CONDITIONS, NMOT[2]								
Minimum	Power at MPP	P_{MPP}	[W]	262.6	266.3	270.1	273.8	277.6
	Short Circuit Current	I_{SC}	[A]	8.84	8.87	8.89	8.92	8.95
	Open Circuit Voltage	V_{OC}	[V]	38.77	38.80	38.83	38.86	38.90
	Current at MPP	I_{MPP}	[A]	8.14	8.20	8.26	8.31	8.37
	Voltage at MPP	V_{MPP}	[V]	32.24	32.48	32.71	32.94	33.17

[1]Measurement tolerances P_{MPP} ±3%; I_{SC}; V_{OC} ±5% at STC: 1000 W/m², 25±2 °C, AM 1.5 according to IEC 60904-3 • [2]800 W/m², NMOT, spectrum AM 1.5

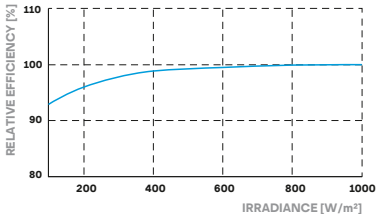
Q CELLS PERFORMANCE WARRANTY



At least 98 % of nominal power during first year. Thereafter max. 0.5 % degradation per year. At least 93.5 % of nominal power up to 10 years. At least 86 % of nominal power up to 25 years.

All data within measurement tolerances. Full warranties in accordance with the warranty terms of the Q CELLS sales organisation of your respective country.

PERFORMANCE AT LOW IRRADIANCE



Typical module performance under low irradiance conditions in comparison to STC conditions (25 °C, 1000 W/m²).

TEMPERATURE COEFFICIENTS

Temperature Coefficient of I_{SC}	α	[%/K]	+0.04	Temperature Coefficient of V_{OC}	β	[%/K]	–0.27
Temperature Coefficient of P_{MPP}	γ	[%/K]	–0.34	Nominal Module Operating Temperature	NMOT	[°C]	43±3

PROPERTIES FOR SYSTEM DESIGN

Maximum System Voltage	V_{SYS}	[V]	1000	PV module classification	Class II
Maximum Reverse Current	I_R	[A]	20	Fire Rating based on ANSI / UL 61730	C / TYPE 2
Max. Design Load, Push / Pull		[Pa]	3600 / 2660	Permitted Module Temperature on Continuous Duty	–40 °C - +85 °C
Max. Test Load, Push / Pull		[Pa]	5400 / 4000		

QUALIFICATIONS AND CERTIFICATES

Quality Controlled PV - TÜV Rheinland;
IEC 61215:2016; IEC 61730:2016.
This data sheet complies with DIN EN 50380.
QCPV Certification ongoing.

TÜVRheinland CERTIFIED
www.tuv.com
ID 1111220277

CE

Note: Installation instructions must be followed. See the installation and operating manual or contact our technical service department for further information on approved installation and use of this product.

Hanwha Q CELLS GmbH
Sonnenallee 17-21, 06766 Bitterfeld-Wolfen, Germany | **TEL** +49 (0)3494 66 99-23444 | **FAX** +49 (0)3494 66 99-23000 | **EMAIL** sales@q-cells.com | **WEB** www.q-cells.com

Engineered in Germany

Q CELLS

SnapNrack™

Solar Mounting Solutions

Ultra Rail

Residential Roof Mount System
Installation Manual

snapnrack.com

Installing and Leveling Rails

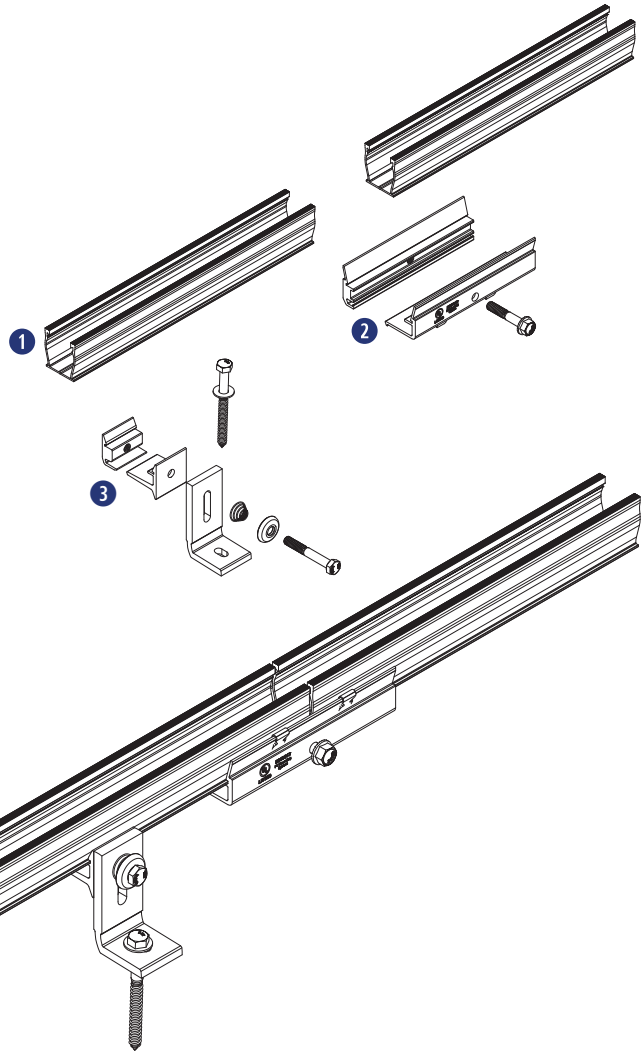
Required Tools

- Level
- String Line or Spare Rail
- Pitch Meter
- Torque Wrench
- Socket Wrench
- 1/2” Socket

Materials Included - Installing and Leveling Rails

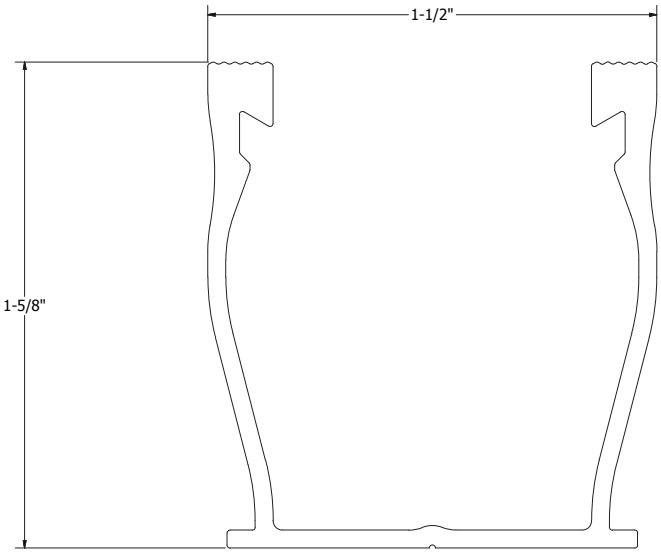
1. SnapNrack Ultra Rail
2. SnapNrack Ultra Rail Splice
3. Pre-Installed SnapNrack Roof Attachments

   (L Foot Mount, Tile Replacement, etc.)

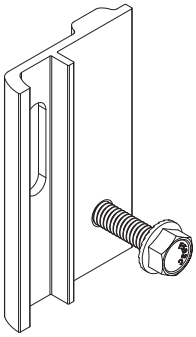


Other Materials Required - *Not Shown*

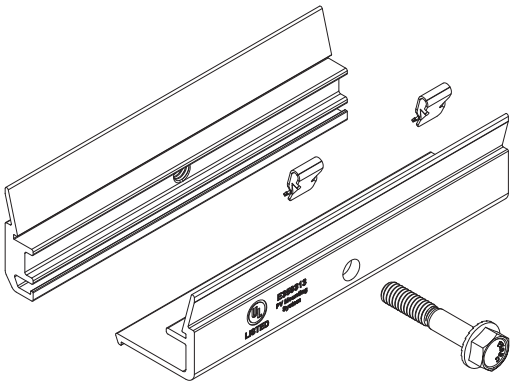
① SnapNrack L Foot Extension



UR-40 Rail Profile



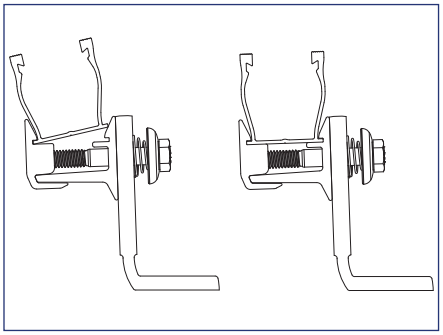
L Foot Extension



Ultra Rail Splice

Installing and Leveling Rails

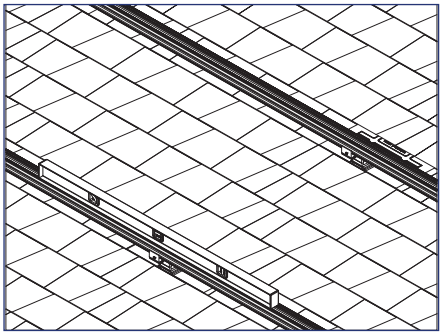
INSTALLATION INSTRUCTIONS



1) Set rails into the attachments by dropping and snapping into the mounts. Connect multiple lengths of rail end to end using the SnapNrack Ultra Rail Splice (see "Ultra Rail Splice" section).

Install Note:

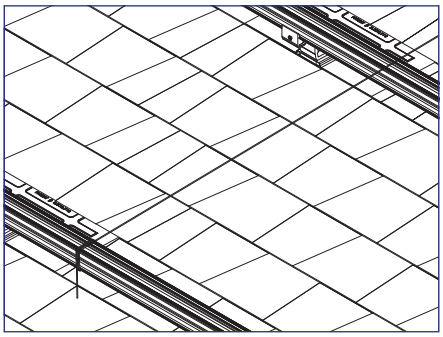
Slightly rocking rail into mounts can ease installation, leading first with side of rail furthest from mount.



2) Level the bottom rail of the array to the roof and tighten attachment points.

Best Practice:

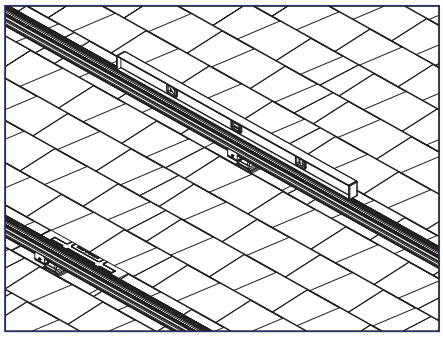
Set attachments in the middle of available leveling range to start.



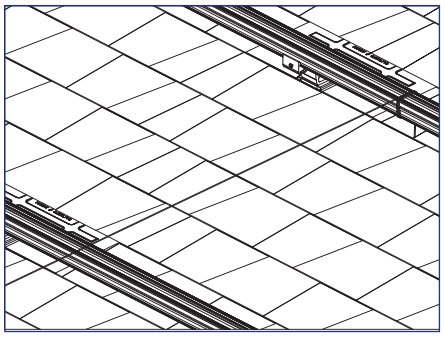
3) Run a string line or spare rail from the bottom rail to the top rail and set desired pitch of the array by adjusting the top rail, add L Foot Extension if needed.

Install Note:

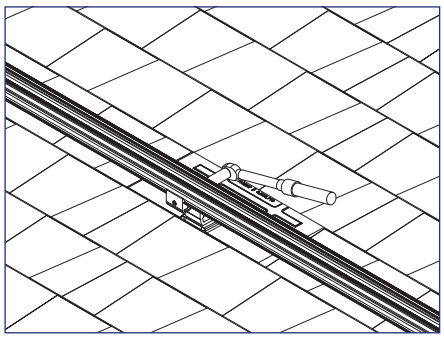
See "Leveling Components" section for installation instruction and restrictions.



4) Level the top rail by moving the string line down the length of the rail, matching pitch over the entire length of the array.



5) Level the remaining rails to the string line by working out from the middle rail, add L Foot Extensions or spacers if needed.



6) Tighten all racking hardware to 12 ft-lbs.

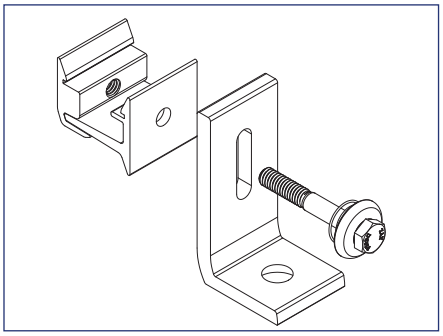
Note:

The minimum standoff height between the modules and roof is as follows:

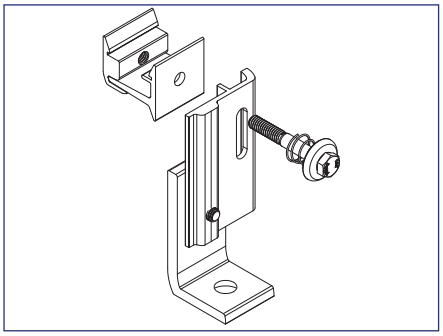
- REC Solar, Yingli, and Suniva modules: 4.00"
- ReneSola modules: 3.93" (100 mm)
- Trina Solar modules: 4.53" (115 mm)

INSTALLATION INSTRUCTIONS

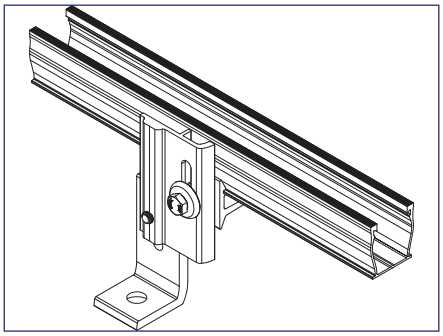
SnapNrack L Foot Extension



1) Remove Ultra Mount components from roof attachment, taking note of their installation order and orientation.



2) Remove bolt from L Foot Extension and install onto pre-installed roof attachment, then set desired height and tighten hardware to 12 ft-lbs.



3) Re-install Ultra Rail Mounting Hardware components onto L Foot Extension in the following order:

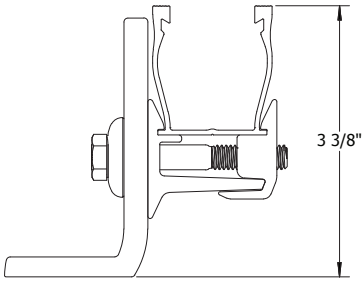
Ultra Mount (tapped) – Ultra Mount (thru-hole) – L Foot Extension – spring – washer – bolt

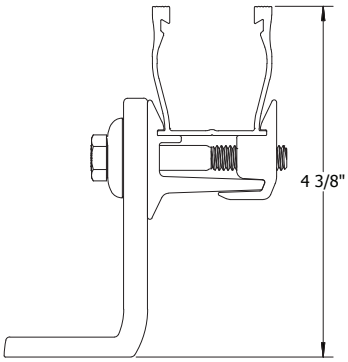
Install Note:

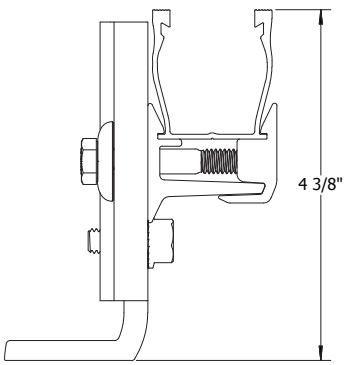
See exploded view in "Ultra Rail Mounting Hardware" section for clarification.

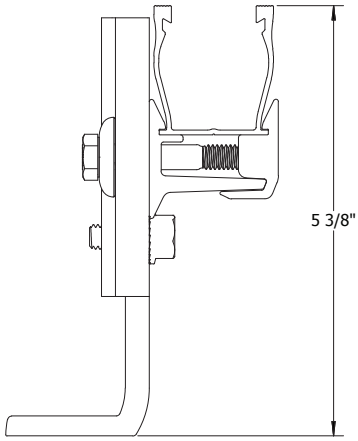
Best Practice:

Ensure bolt is threaded into mount, but leave assembly loose for rail installation.

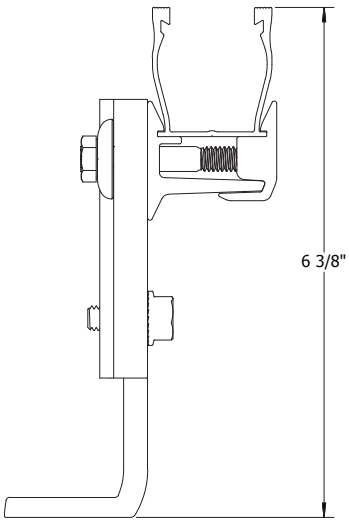






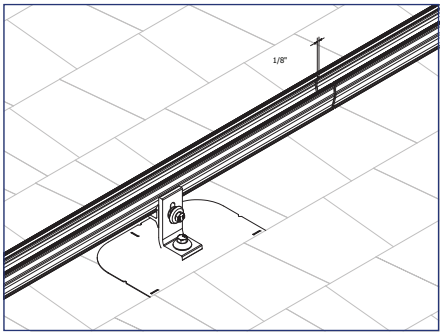


Use a single L Foot Extension on no more than 30% of attachment points.



L Foot Extension Provides Up To 3" of Height Adjustment

INSTALLATION INSTRUCTIONS

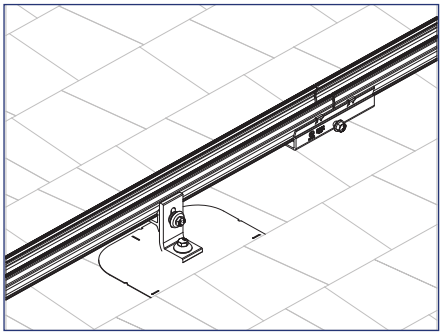


1) Align sections of rail so that ends butt up to each other.

Install Note:

Leave approximately 1/8" gap between rails to allow for thermal expansion of rail.

Any section of rail that is spliced will need to be supported by a roof attachment on both sides. Splices are not allowed to be installed on rail cantilevers.



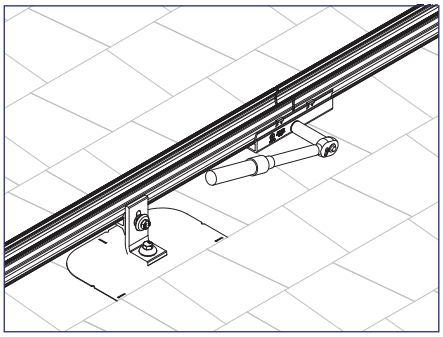
2) Install rail splice assembly onto bottom of rail, making sure both rails are seated in grooves of splice and that the splice is centered.

Install Note:

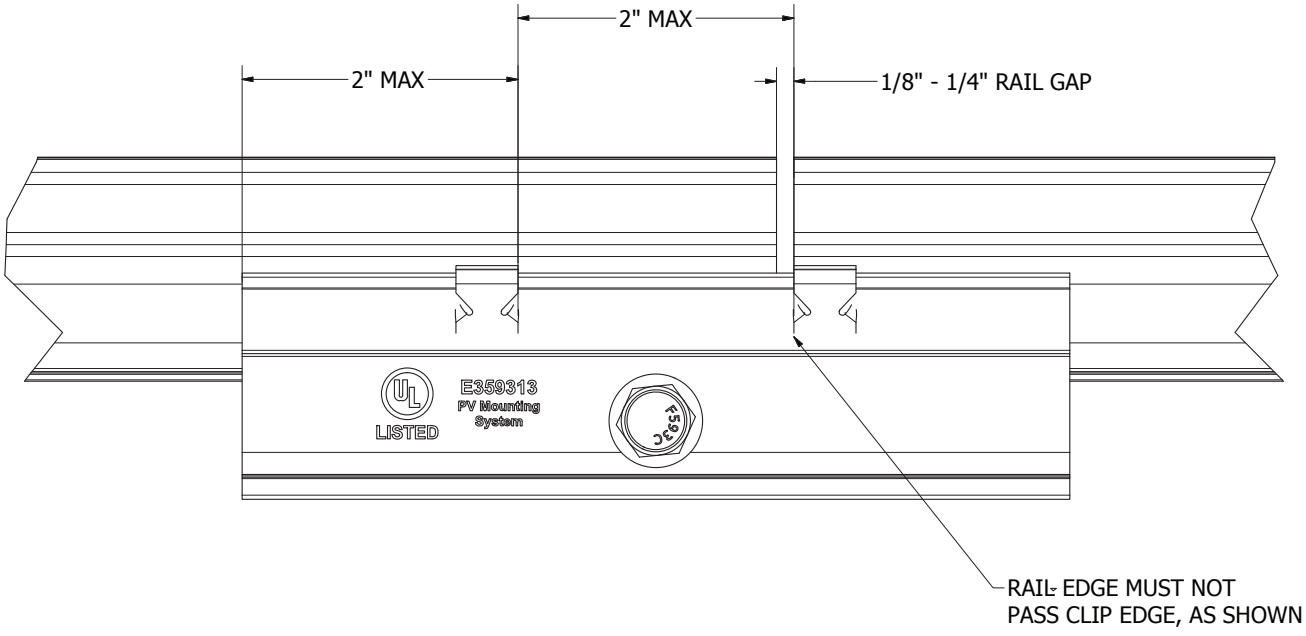
Gap between rails must land between bonding clips on splice.

Best Practice:

Hold sides of splice together on rails with one hand and tighten with the other.



3) Tighten splice hardware to 12 ft-lbs.



Splice Installation Limitations

SnapNrack SpeedSeal™ Foot

Patent Pending Lag Driven Sealant Solution for Ultra Rail

A New Generation of Roof Attachments

- Innovative design incorporates flashing reliability into a single roof attachment
- 100% waterproof solution
- Sealing cavity with compressible barrier secures sealant in place & fills voids

Maintain the Integrity of the Roof by Eliminating Disruption

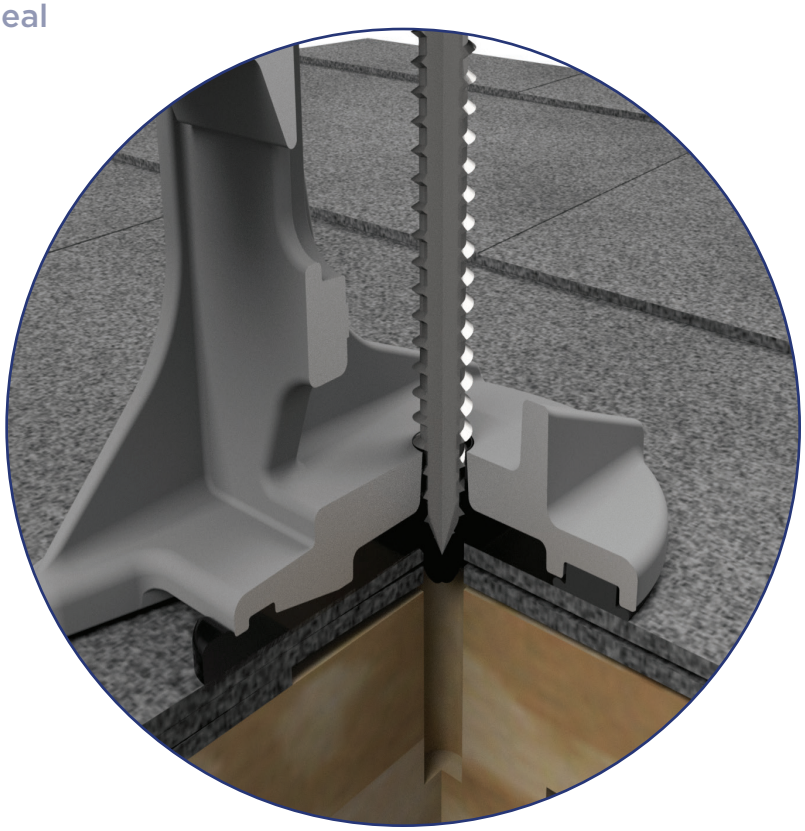
- Zero prying of shingles
- Zero removal of nails leaving holes in the roof
- Roof remains installed the way manufacturer meant it to be

Lag Driven Sealant Waterproofing

- Time Tested Roof Sealant provides lasting seal
- Sealant is compressed into cavity and lag hole as attachment is secured to rafter
- Active sealant solidifies bond if ever touched by liquid
- Technology passes UL 2582 Wind Driven Rain Test and ASTM E2140 Water Column Testing standards. Patent Pending.

Single Tool Installation

- SnapNrack was the first in the industry to develop a complete system that only requires a single tool. That tradition is continued as a ½" socket is still the only tool necessary to secure the mount as well as all other parts of the system.



Note: Sealant shown in white for illustration purposes only.

SnapNrack SpeedSeal™ Foot

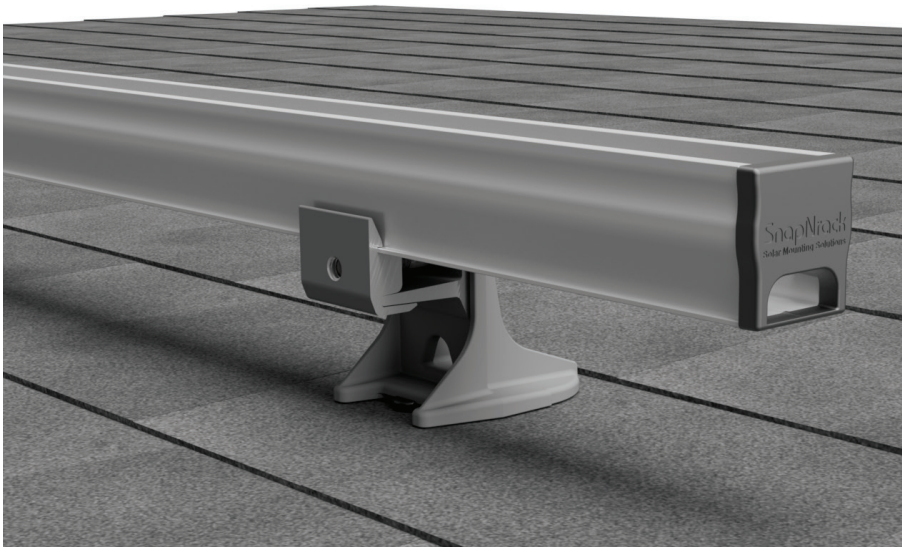
Fastest Roof Attachment in Solar

- Lag straight to a structural member, no in-between components such as flashings or bases.
- Simply locate rafter, fill sealant cavity & secure to roof. *It's that simple!*

Integrated Flashings. No Questions.

- Sealant fills around lag screw keeping roof and structure sealed and intact
- No added holes from ripping up nails, staples and screws holding shingles on roof

Less Time. Less Parts. Less Tools.



- No more need for a pry bar to rip up shingles
- No more proprietary lag screws
- Single Tool installation with ½" socket

Total System Solution

One Tool. One Warranty.

- SnapNrack Ultra Rail is a straightforward intuitive install experience on the roof without compromising quality, aesthetics & safety, all supported by a 25 year warranty.
- Built-in Wire Management & Aesthetically pleasing features designed for Ultra Rail result in a long-lasting quality install that installers and homeowners love.

Certifications

SnapNrack Ultra Rail System has been evaluated by Underwriters Laboratories (UL) and Listed to UL/ANSI Standard 2703 for Mechanical Loading and Fire. Additionally it is listed to UL 2582 for wind-driven rain and ASTM 2140.

SnapNrack™
Solar Mounting Solutions

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

DESCRIPTION:

SNAPNRACK, ULTRA RAIL SPEEDSEAL™ FOOT

PART NUMBER(S):

242-02163, 242-02167

DRAWN BY:

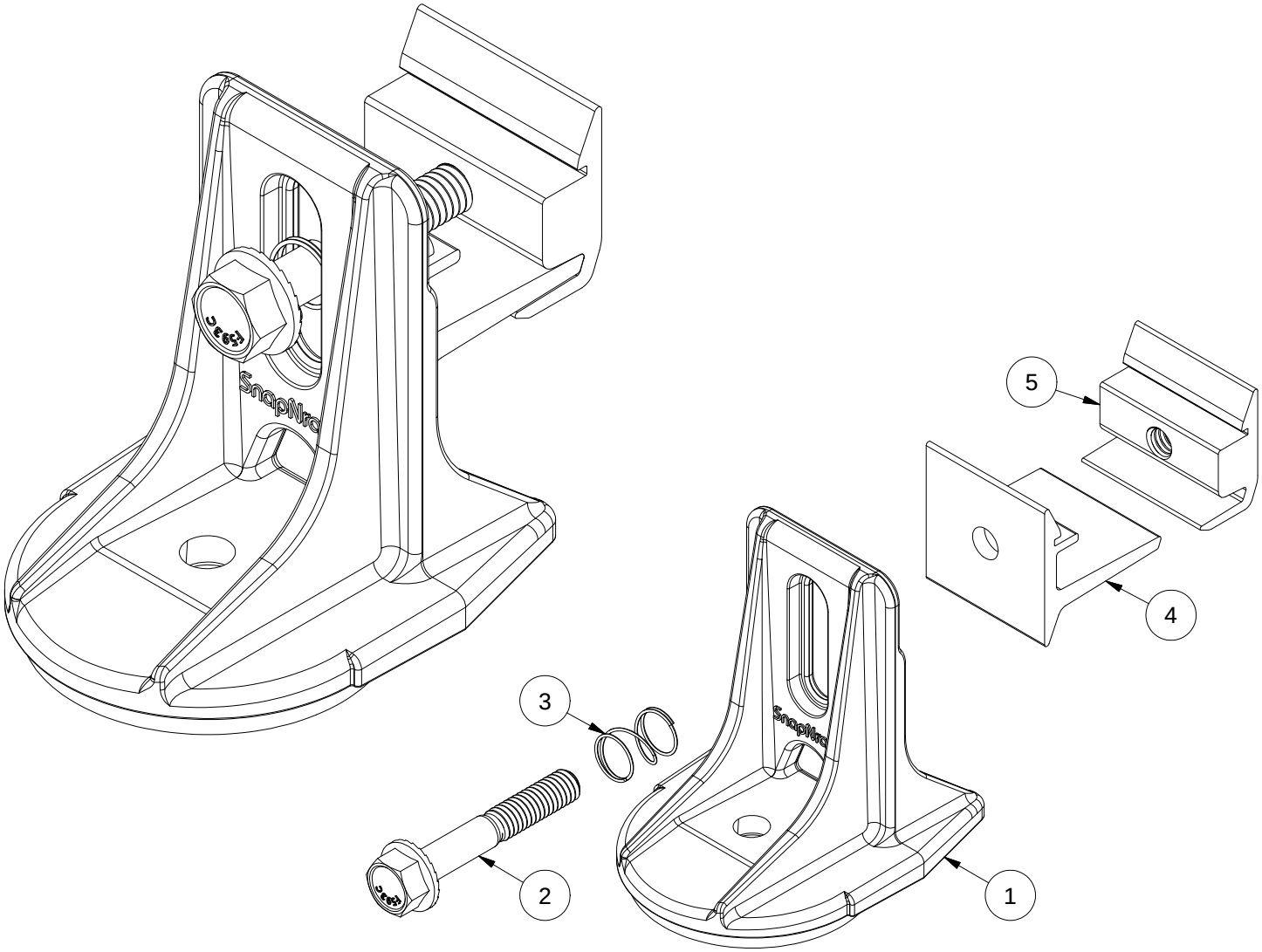
mwatkins

REVISION:

A

SnapNrack™
Solar Mounting Solutions

595 MARKET STREET, 29TH FLOOR • SAN FRANCISCO, CA 94105 USA
PHONE (415) 580-6900 • FAX (415) 580-6902



PARTS LIST		
ITEM	QTY	DESCRIPTION
1	1	SNAPNRACK, SPEEDSEAL FOOT, BASE, SEALING, SILVER / BLACK
2	1	BOLT, FLANGE, SERRATED, 5/16IN-18 X 2IN, SS
3	1	SNAPNRACK, RL UNIVERSAL, MOUNT SPRING, SS
4	1	SNAPNRACK, ULTRA RAIL MOUNT THRU PRC, CLEAR / BLACK
5	1	SNAPNRACK, ULTRA RAIL MOUNT TAPPED PRC, CLEAR / BLACK

MATERIALS:	DIE CAST A380 ALUMINUM, 6000 SERIES ALUMINUM, STAINLESS STEEL	
DESIGN LOAD (LBS):	802 UP, 1333 DOWN, 357 SIDE	OPTIONS:
ULTIMATE LOAD (LBS):	2118 UP, 4006 DOWN, 1331 SIDE	CLEAR / BLACK
TORQUE SPECIFICATION:	12 LB-FT	
CERTIFICATION:	UL 2703, FILE E359313; WIND-DRIVEN RAIN TEST FROM SUBJECT UL 2582	
WEIGHT (LBS):	0.45	

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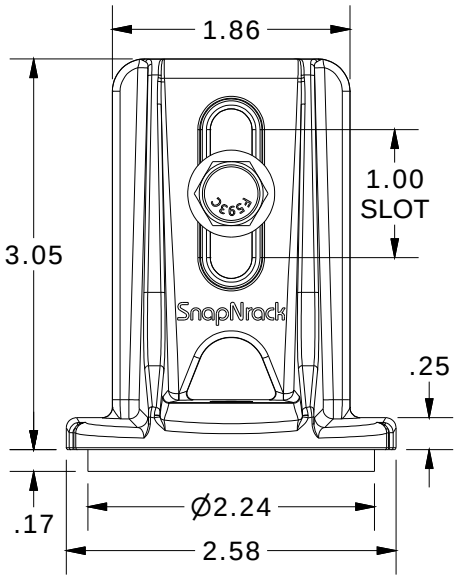
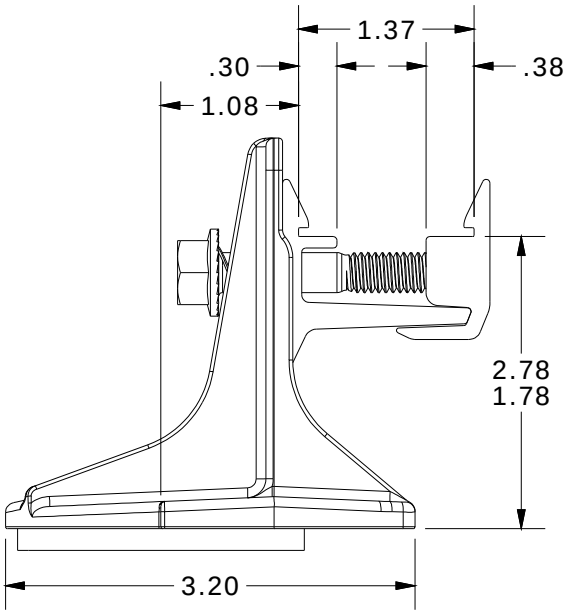
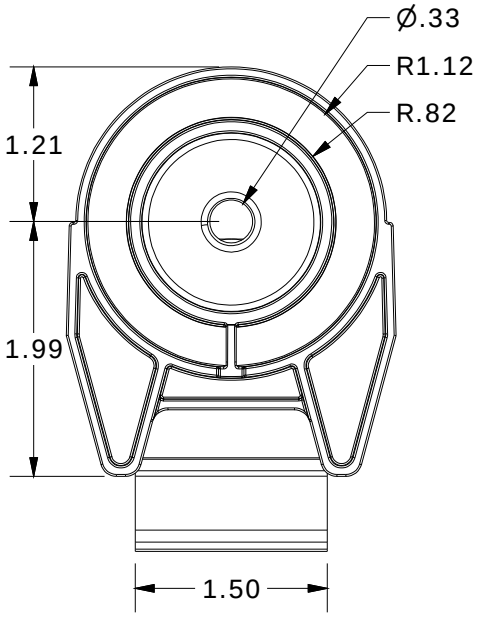






ALL DIMENSIONS IN INCHES

SpeedSeal™ Foot Training Guide – Standard Composition

Overview

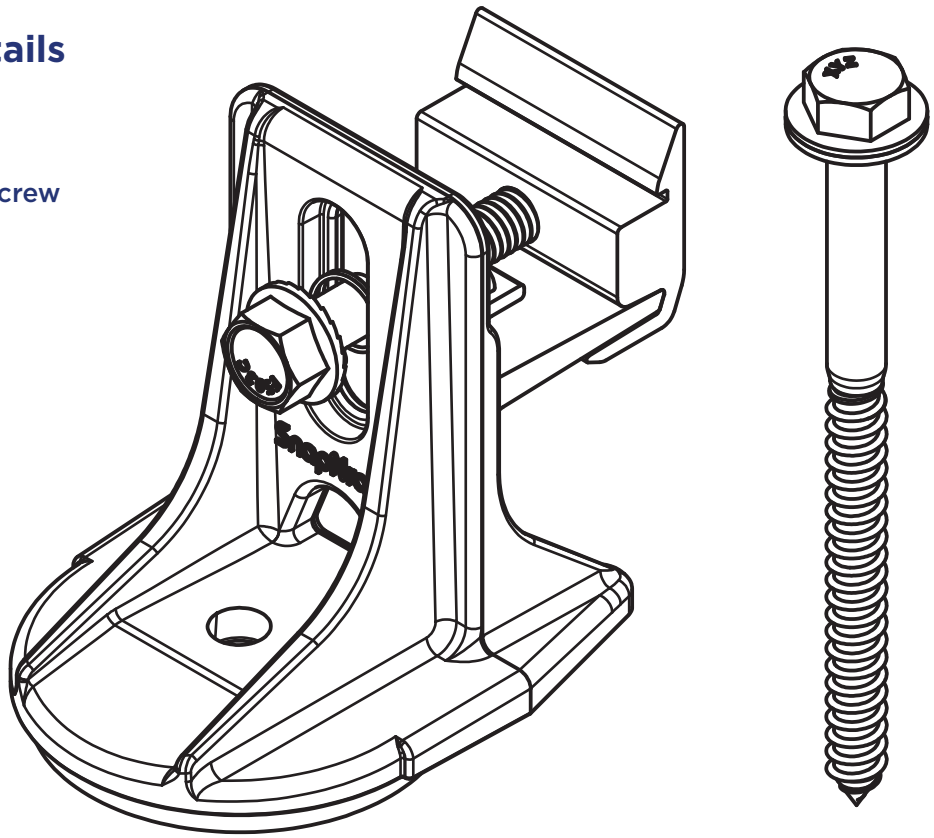
- This training guide outlines best practices for installing the SpeedSeal™ Foot flashless sealing L Foot on composition shingle roofs. This Guide is meant to supplement the Ultra Rail Installation Manual and provide detailed instructions on installation practices that produce high quality systems and maintain construction efficiency. The target audience of this guide is experienced rooftop solar installers with a strong understanding of solar construction best practices, and a basic understanding of the Ultra Rail mounting system.

Required Tools

- Drill with 3/16" Pilot Drill Bit
- Caulking Gun with approved Roof Sealant
- Impact Driver with 1/2" Socket

Component Details

- SpeedSeal™ Foot
- 5/16" Sealing Lag Screw



SpeedSeal™ Foot Installation

1. Layout SpeedSeal™ Foot locations on roof and mark locations for fasteners using a marking crayon or chalk based on rafter location and these rules:
   1) Pilot hole should be located 1.5-3” from the bottom edge of shingle course above
   2) SpeedSeal™ Foot should never be installed across two shingle courses

   SpeedSeal™ Foot may be installed over the vertical seam between singles in the same row.

2. Using locations drawn on roof during system layout, drill a 3/16” pilot hole into roof framing member.

3. Remove any dirt or debris from roof surface and properly seal any missed pilot holes with a flashing card before SpeedSeal™ Foot is installed.

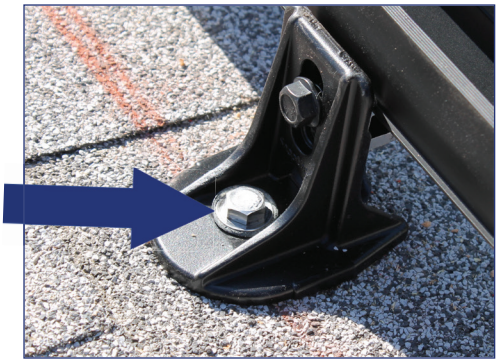
4. Turn SpeedSeal™ Foot over and apply roof sealant, filling the cavity formed by the sealant ring.

SpeedSeal™ Foot Installation

5. Attach SpeedSeal™ Foot to roof using a 5/16” sealing lag screw. Drive the lag screw into the pilot hole and rafter for a recommended minimum 2-1/2” embedment.

6. As the lag screw is being driven into the roof, watch rubber gasket on underside of sealing washer for compression. Stop driving the lag screw when the gasket becomes visible around the edge of the washer

Over tightening the lag screw will damage the rubber gasket.



7. As SpeedSeal™ Foot is tightened to the roof sealant will ooze from the lower cavity of the L Foot as an indicator of proper sealing. If no sealant is seen, remove SpeedSeal™ Foot from roof and add more sealant before reinstalling.

SpeedSeal™ Foot is now ready for the remaining Ultra Rail and module installation.

Notes: