18-January-2024

Unirac
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Tel: 505 242 6411

Attn.: Engineering Department

Subject: Engineering Certification for the Unirac SunFrame MicroRail (SFM) Infinity to Support Photovoltaic Panels.

The Unirac SunFrame MicroRail (SFM) is a rail-less, fully integrated solar racking system for residential sloped roofs and installed parallel to the roof surface.
We have reviewed the SunFrame MicroRail (SFM) Infinity, a proprietary mounting system for rooftop solar photovoltaic (PV) panels installation, and the U-Builder 2.0 Online tool. This U-Builder 2.0 software includes analysis for SFM Microrail 2", SFM Attached Splice 8", SFM Splice 6.5", and SFM Trimrail. All information, data, and analysis are in compliance with the following codes, city ordinances, and typical specifications:

Codes:

1. 2014-2022 Oregon Structural Specialty Code.
2. 2017-2023 Oregon Residential Specialty Code.
3. ASCE/SEI 7-10 & 7-16 Minimum Design Loads for Buildings and other Structures.
4. International Building Code, 2012-2021 Edition w/ Provisions from SEAOC PV-2 2017.
5. International Residential Code, 2015-2021 Edition w/ Provisions from SEAOC PV-2 2017.
6. AC428, Acceptance Criteria for Modular Framing Systems Used to Support Photovoltaic (PV) Panels, November 1, 2012 by ICC-ES.

The following are typical specifications to meet the above code requirements:

Design Criteria:
Ground Snow Load = 0 - 100 (psf)
Basic Wind Speed = 95 - 190 (mph)
Roof Mean Height = 0 - 60 (ft)
Roof Pitch = 0°-45°
Exposure Category = B, C & D

Attachment Spacing: Per U-Builder 2.0 Engineering report.

Cantilever: Per U-Builder 2.0 Engineering report.

Clearance: 2" to 10" clear from the top of the roof to the top of the PV panel.

Tolerance(s): 1.0" tolerance for any specified dimension in this report is allowed for installation.

Installation Orientation: See SFM Installation Guide.
Landscape - PV Panel long dimension is parallel to ridge/eave line of the roof and the PV panel is mounted on the long side.
Portrait - PV Panel short dimension is parallel to ridge/eave line of the roof and the PV panel is mounted on the short side.
Attachment shall be staggered where ground snow load exceeds 10 PSF.

Components and Cladding Roof Zones:
The Components and Cladding Roof Zones shall be determined based on ASCE 7-10 & 7-16 Component and Cladding design.

Notes:

1. U-Builder 2.0 Online tool analysis is only for Unirac SFM Infinity and do not include roof capacity check.
2. Risk Category II per ASCE 7-16.
3. Topographic factor, kzt is 1.0.
4. Array Edge Factor $Y_E = 1.5$
5. Average parapet height is 0.0 ft.
6. Wind speeds are LRFD values.
7. Attachment spacing(s) apply to a seismic design category E or less.

Design Responsibility:
The U-Builder 2.0 design software is intended to be used under the responsible charge of a registered design professional where required by the authority having jurisdiction. In all cases, this U-Builder 2.0 software should be used under the direction of a design professional with sufficient structural engineering knowledge and experience to be able to:

- Evaluate whether the U-Builder 2.0 Software is applicable to the project, and
- Understand and determine the appropriate values for all input parameters of the U-Builder 2.0 software.

This letter certifies that the Unirac SFM Infinity, when installed according to the U-Builder 2.0 engineering report and the manufacture specifications is in compliance with the above codes and loading criteria.

This certification excludes evaluation of the following components:

1) The structure to support the loads imposed on the building by the array; including, but not limited to: strength and deflection of structural framing members, fastening and/or strength of roofing materials, and/or the effects of snow accumulation on the structure.
2) The attachment of the SFM Microrail 2” or SFM Attached Splice 8” to the existing structure.
3) The capacity of the solar module frame to resist the loads.

This requires additional knowledge of the building and is outside the scope of the certification of this racking system.

Please feel free to call for any questions or clarifications.

Prepared By

Engineering Alliance, Inc
Sugar Land, TX

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