Engineering Alliance, Inc

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08-August-2024

Unirac
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Attn.: Engineering Department

Subject: Engineering Certification for the Unirac SOLARMOUNT Flush Rail System to Support Photovoltaic Panels.

The Unirac SOLARMOUNT Flush-to-Roof is an extruded aluminum rail system that is engineered to hold most framed solar modules to a roof structure and installed parallel to the roof.

We have reviewed the SOLARMOUNT system, a proprietary mounting system constructed from modular parts which are intended for rooftop installation of solar photovoltaic (PV) panels; and have reviewed the U-Builder 2.0 Online tool. This U-Builder 2.0 software includes analysis for the SOLARMOUNT rails (SM LIGHT rail, SM STANDARD rail, and SM HEAVY DUTY rail) with Standard, Universal AF, and Pro Series hardware. All information, data, and analysis are in compliance with the following codes, city ordinances, and typical specifications:

Codes:

1. ASCE/SEI 7-05, 7-10, & 7-16 Minimum Design Loads for Buildings and Other Structures
2. 2015 Michigan Building Code
3. International Building Code, 2006-2018 Edition w/ Provisions from SEAOC PV-2 2017
4. International Residential Code, 2006- 2018 Edition w/ Provisions from SEAOC PV-2 2017
5. AC428, Acceptance Criteria for Modular Framing Systems Used to Support Photovoltaic (PV) Panels, November 1, 2012, by ICC-ES
6. Aluminum Design Manual, 2015 & 2020 Edition

Following are typical specifications to meet the above code requirements:

Design Criteria:
Ground Snow Load = 0 - 100 (psf)
Basic Wind Speed = 85 - 190 (mph)
Roof Mean Height = 0 - 60 (ft)
Roof Pitch = 0 - 45 (degrees)
Exposure Category = B, C & D

Attachment:
Shingle Roof:
L-Foot, Flashkit Pro, Flashloc Comp, Flashloc Duo, Flashkit Pro SB
Metal Roof:
Standing Seam attachments, PM-9000S, PM Adjust Slotted
Tile Roofs:
Solar Hooks, Tile Replacement

Attachment Spacing: Per U-Builder 2.0 Engineering report.
Cantilever: The maximum cantilever length is L/3, where “L” is the span noted in the U-Builder 2.0 online tool.
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 SOLARMOUNT Rail Flush Installation Guide.
Landscape - PV Panel long dimension is parallel to the ridge/eave line of the roof and the PV panel is mounted on the long side.
Portrait - PV Panel short dimension is parallel to the ridge/eave line of the roof and the PV panel is mounted on the short side.

Components and Cladding Roof Zones:
The Components and Cladding Roof Zones shall be determined based on ASCE 7-05, ASCE 7-10, & 7-16 Component and Cladding design.

Notes:

1. U-Builder 2.0 Online tool analysis is only for Unirac SM SOLARMOUNT Rail Flush systems 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 SM SOLARMOUNT Rails Flush, when installed according to the U-Builder 2.0 engineering report and the manufacturer specifications are in compliance with the above codes and loading criteria.

This certification excludes the 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 SM SOLARMOUNT Rails 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 or email for any questions or clarifications

Prepared By:
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