January 11, 2019

Everest Solar Systems, LLC
3809 Ocean Ranch Blvd, Suite 111
Oceanside, CA 92056
Attn: Andy Neshat

RE: ***AddOn System – Structural Evaluation***

To whom it may concern:

Per your request, Moment Engineering + Design has performed a comprehensive structural analysis of the Everest Solar "AddOn System" for typical roof-mounted PV installations in the State of California. When installed per the conditions and design criteria described herein, the AddOn System is compliant with the sections of the design reference documents noted below.

Design Reference Documents

- *2016 Triennial Edition of Title 24, California Code of Regulations*
  Based on 2015 International Building Code & 2015 International Residential Code
- ASCE/SEI 7-10 – *Minimum Design Loads for Buildings and Other Structures*
- *2010 Aluminum Design* Manual, by the Aluminum Association
- Section and materials data provided by Everest Solar Systems
  - Rail section properties appear in the appendix to this report

Overview

The AddOn System is a shared-rail PV-panel roof mounting system consisting of extruded aluminum support rails, panel clamps, and associated fasteners. Proprietary fiber-reinforced polymer (FRP) AddOn brackets provide bearing points for panels and enable the shared-rail configuration. This analysis is limited to capacity of the rail, AddOn, and associated components only; review of roof mounting hardware is not included in this scope of work. Attachment of the AddOn System to the existing roof structure shall be the responsibility of the installer, and should be analyzed by a registered design professional where required by the local authority having jurisdiction.

Methods & Design Parameters

Applicable combinations of dead, wind, snow, and seismic loads were evaluated in accordance with current code requirements to determine allowable rail span lengths, based on assumptions of single-span, shared-rail conditions and allowable deflection of L/60.

Design wind pressures were determined using Components and Cladding calculations in Chapter 26-30 of ASCE 7-10, using the loading parameters listed below. Configurations not conforming to these parameters will require additional analysis. Calculation of applicable roof snow load should be based upon ground snow load maps and equations and factors of ASCE 7-10, Chapter 7 and

applicable sections of the 2016 CBC. For designated Case Study areas noted in the 2016 Triennial Edition of Title 24, California Code of Regulations, refer to local jurisdiction requirements for snow and wind load determination. Seismic criteria were considered per provisions of ASCE 7-10 Chapter 13 with parameters specified below. While seismic effects did not appear to govern the capacity of this system, applicable seismic detailing requirements should be satisfied when installed per the manufacturer instructions and additional installation notes specified herein.

Loading Parameters:

General:

Structural risk category: II
Panel orientation: Portrait or Landscape
Panel slope: Flush with roof deck
Rail configuration: Shared between panels
Roof slope (θ): 0-55°

Wind/Snow:

Wind speed, V (Ultimate): 110-200 mph
Roof mean height, h: 30 ft. or less
Roof wind pressure region: Zone 1 - Zone 3
Wind exposure: B, C
Roof snow load = 0-70 psf

Seismic:

Seismic site class: D
Seismic design category: A through E
S_S: Not to exceed 2.000
S_1: Not to exceed 1.250
Component importance factor, I_p: 1.0
Amplification factor, a_p: 1.0
Response modification factor, R_p: 1.5

Design Results

The allowable span lengths of the system are principally controlled by applicable wind and snow loads to the structure. Refer to the AddOn System span tables in the appendix to this document for recommended rail configurations based on combinations of these loading parameters. Note that reaction loads provided in the attached tables are only applicable when used with the corresponding span length recommendations provided therein. These reactions may be scaled linearly when shorter spans are used.

Installation Notes

The following guidelines apply to all installations using the AddOn System:

- Tables assume aluminum support rails are shared between rows or columns in array.
- Panel orientation corresponds to layout relative to extruded aluminum support rails.
- Maximum end cantilever of aluminum support rail shall not exceed one-third (1/3) of allowable span in the roof wind pressure zone of the cantilever.
- Rails shall be continuous (not spliced) over a minimum of two supports unless using an approved Everest Solar structural splice.
- Installation over roof overhangs or within 10” of any roof edge is not advised.
- Extreme distance of panel surface from roof covering shall not exceed 10”.
- Observe all local jurisdictional requirements regarding roof setback requirements.

- Ensure that actual span length does not exceed capacity of roof attachment.

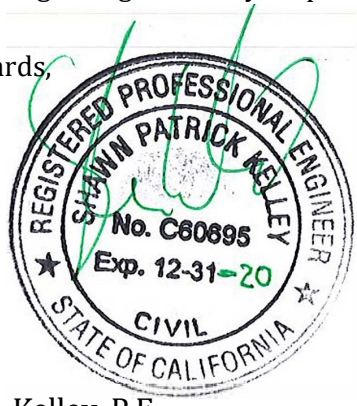
Summary

This assessment has provided design validation for code-compliant installations of the Everest Solar AddOn System in the State of California. For the configurations and design loadings noted previously, the attached span tables represent maximum span lengths based on allowable stresses and deflection criteria. For all other configurations, refer to Everest Solar Systems for engineering support.

This report does not provide analysis of roof attachment hardware, nor of any existing structures, as may be required by the local authority having jurisdiction.

We appreciate the opportunity to have assisted you with this project. Should you have any further questions regarding this analysis, please feel free to contact us by phone or email.

Best Regards,



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Attachments:

1. Span Tables – Portrait Orientation
2. Span Tables – Landscape Orientation
3. Section properties and materials data