

# STRUCTURAL CERTIFICATION & SPAN TABLES FOR STANDARD (STD) MOUNTING SYSTEMS

for State of Colorado

Prepared for: SolaRack

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Prepared By:

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Worst case loading conditions were based on the following two load combinations per section 2.4 of ASCE 7-10:

1.  $D + 0.6W$
2.  $D + 0.75L + 0.4W + 0.75S$  ( $L=0$ )

Where D is the dead load of the panels and racking equipment, W is the wind uplift loads at the anchors and S represents the ground snow load value. The tabulated results of the maximum rail span according to the worst case loading conditions are provided in this report (See Figure 3).

### **Design Criteria**

The following parameters were considered in determining the values of the allowable span charts of the railing:

- Maximum Building Height Considered = 30 ft
- Exposure Categories Considered: B & C
- Wind Pressure Based on Section 30.4 (Method 1)
- Gust Factor,  $G = 0.85$
- Topography Factor,  $K_{zt} = 1.0$
- Directionality Factor,  $K_d = 0.85$
- Importance Factor,  $I = 1.0$
- Gable & Flat Roofs Type Considered
- Zone 2 Pressures Only Considered
- Minimum 2 Rails Per Panel
- Maximum Cantilever of Railing from Anchor = 12 inches
- Tilt Angles Considered: 0 to 30 degrees
- Performance Not Limited to Deflection
- Adequacy of Attachments Based on Evaluation Report By Others



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## **Design Code References**

The following engineering references were considered in determining the values of the wind load conditions and material properties of the aluminum railing:

- IBC 2015
- ASCE 7-10 (Wind & Snow Loading)
- Aluminum Design: Aluminum Design Manual 2015

The structural verification and installation of the STD rails shall be subject to the following qualification and conditions.

- There shall be a minimum of 2 rails provided per solar panel.
- Panels shall be considered slippery surface for accumulation of snow.
- All other components such as clamps and splices shall be installed per installation manual
- The deflection of the railing has not been controlled in the design. If deflection has to be limited, then spacing shall be reduced as advised by a practicing structural engineer.
- Building is not a special occupancy structure such as a public school, public safety building or assembly building.
- The installation of the framing shall conform to relevant Building Codes, Manufacturer's specifications and good building practice.
- The cantilever span of the railing shall not exceed 12 inches.
- Attachment of lag screws shall be installed per the requirements of 2015 National Design (NDS).

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- Structural verification of the existing roof frame members and solar panels are excluded in this report.
  - Proper attachment to roof frame member shall be verified a qualified inspector or building official.
  - Dissimilar metals shall be separated with a suitable inert material to prevent galvanic corrosion.
  - The installation and fixings shall be periodically inspected and maintained.

Please feel free to contact us with any questions or concerns regarding the information provided in this report.

Respectfully Submitted,



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