

SunShield™ Awning Installation & Engineering Guidelines

Design Reference Documents

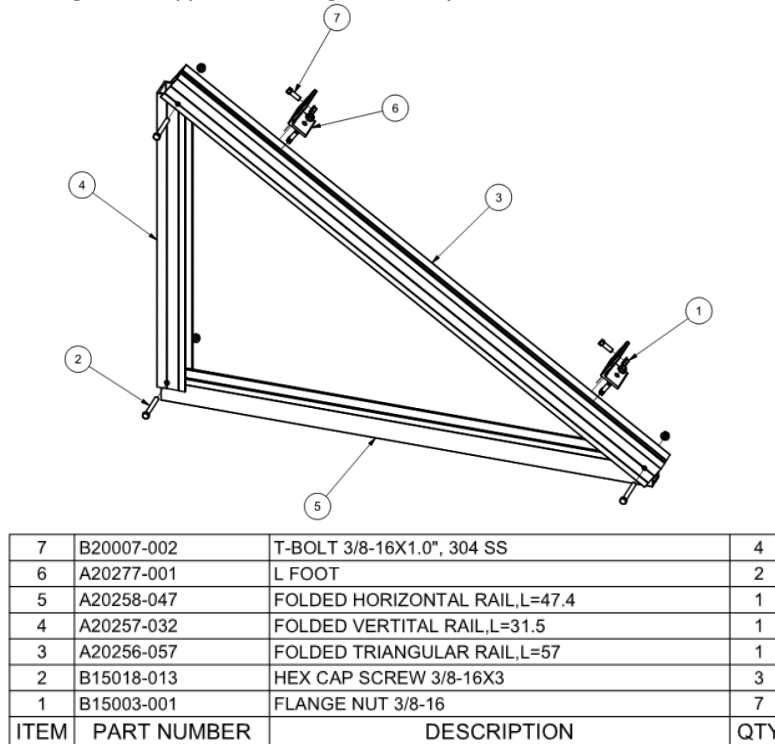
SunModo has performed a structural review of the SunShield™ Awning system. When installed per the conditions and design criteria described herein, the SunShield™ Awning system specified is compliant with the applicable sections of the design reference documents:

- ASCE/SEI 7-10 – Minimum Design Loads for Building and Other Structures
- ADM1 – 2010 Aluminum Design Manual, by the Aluminum Association

Overview

The SunShield™ Awning system is a wall-mounted solar PV collector that doubles as an awning shade structure. The system consists of SunModo standard HelioRail™ (HR250) mounted on multiple triangular truss brackets. The truss brackets are spaced at regular intervals along the length of the desired array to provide adequate support for the HelioRail™, which are secured to the brackets using two L-Foot adaptors and stainless steel hardware. The PV modules are secured to the HR250 Rail with SunModo End Clamps and Mid Clamps

Figure 1: Typical Awning Assembly (P/N: K10267-002RevA)



Methods & Design Parameters

Note that connections to an existing structure are not included in this analysis and should be analyzed by a registered design professional where required by the authority having jurisdiction. For reference, an anchor reaction load table is provided in this document to assist in the design of attachments and reinforcement of the existing structure. Designer should note eccentricity of applied loads in anchorage consideration.

Table 1: Awning Maximum Anchor Reaction Loads at 4'-0" Spans, Exp. B

ASCE Design Parameters		Reaction Loads		
Wind Speed (mph) (Exposure B)	Snow Load (psf)	Max Shear (Vert., lbs.)	Max Pull-Out (Horiz., lbs.)	Max Compression (Horiz., lbs.)
115	0	395	485	485
	30	780	655	825
	60	1230	1380	885
140	0	535	670	630
	30	885	950	655
	60	1325	1470	905
170	0	815	1410	720
	30	1045	1410	815
	60	1505	1635	1080

INSTALLATION NOTES

- Span between SunShield™ Awning brackets shall be no greater than 4'-0" O.C.
- SunShield™ maximum install height shall be 30 ft.
- Principal anchors are not to be located more than 3" from the extreme top or bottom of the awning's vertical folded rail (item [4] in the parts list diagram above). Additional anchors can be installed at other portions of the vertical folded rail.
- A minimum of (2) principal anchor attachments is required, one at the top and one at the bottom of the vertical awning member.
- SunShield™ Awning system shall be used for the sole purpose of supporting framed PV modules no greater than 80" long, 42" wide and 50mm thick.
- Only SunModo parts or approved equivalent shall be used to assemble the SunShield™ Awning system.
- Contractor shall employ the services of a qualified structural engineer to design the anchorage/attachment system and ensure suitability of the existing structure to withstand applied loading.
- Performance of the PV module is excluded from the scope of this evaluation.

Analysis

Structural Analysis of the SunShield™ Awning system and calculated reaction loads were based on the following product data:

- Material: Aluminum 6005-T5 (ASTM-B221)
 - Fy (Yield Stress) = 35 ksi
 - Fu (Ultimate Stress) = 38 ksi
- Member Section Properties

<i>Part Name</i>	<i>Part Number</i>	<i>Sx (in³)</i>	<i>Sy (in³)</i>	<i>A (in²)</i>
Folded Triangular Rail	A20256	1.392	0.626	1.729
Folded Vertical Rail	A20257	1.002	0.594	1.298
Folded Horizontal Rail	A20258	1.155	0.854	1.516

Summary

When the SunShield™ Awning system is installed as outlined in this letter and in concordance with the engineering parameters shown in this document, its structure will be able to withstand the environmental loads specified herein. For all other configurations or applications of this product, please contact SunModo directly for guidance.