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SunBeam™ Flush Mounted Maximum Recommended Spans & Guidelines

SunModo has performed an internal structural review of the SunBeam™ SB2500 (SunBeam), SB3500 (Triangular Beam) and SB5000 (Box Beam) rail profiles. When installed per the conditions and design criteria described herein, the profiles specified are compliant with the applicable sections of the design reference documents noted below.

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 SunBeam™ SB2500, SB3500, and SB5000 profiles are versatile products designed for long span installations. These beams generally act as a supporting sub-structure for an overlying lattice of SunModo HelioRail™ or other SunBeam™ profiles. The SB2500, 3500, and SB500 are generally spaced at regular intervals along the length of the desired array to provide adequate support for the overlying rail, which are secured to the SB2500, SB3500, or SB5000 using adaptors and stainless steel hardware designed or selected to withstand the attachment loads. These attachments are not addressed in the scope of this letter.

Fig. 1 Beam Profiles, Part Numbers, & Descriptions

		
A20143-XXX	A20243-XXX	A20175-XXX
SB2500 SunBeam	SB3500 Triangular Beam	SB5000 Box Beam

Methods, Parameters, & Recommended Installation

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, a maximum span table for each profile is shown below for varying wind speeds and snow loads. Designer should note eccentricity of applied loads in anchorage consideration.

The following design assumptions are in place. For installations outside these specific conditions, contact SunModo or a qualified design professional:

- ASCE 7-10 Wind Speeds, Snow Loads, & Procedures (Components & Cladding)
- Flat Roof Installation (<5 degree pitch)
- Maximum Permissible Beam Cantilever = lesser of 1/3 X Maximum Span or 1/2 X Installed Span
- Beam to beam spacing assumed to be 96" (8'-0") O.C.
- Building Occupancy Category = II
- Importance Factor = 1 or 2
- Exposure Category = B
- Max Building Height = 30 ft.
- Roof Wind Pressure Zone 1

SB2500 MAXIMUM RECOMMENDED SPANS			
Wind Speed	Ground Snow Load		
	0 PSF	30 PSF	60 PSF
110	13'-6"	10'-6"	8'-6"
120	12'-0"	10'-0"	8'-6"
140	11'-6"	9'-0"	8'-0"
160	10'-6"	9'-0"	8'-0"
180	9'-0"	8'-6"	NR*
200	8'-6"	8'-0"	NR*

SB2500 Installation Notes

*NR Indicates that this product is not recommended for this application

*Max Deflection = L/60

SB3500 MAXIMUM RECOMMENDED SPANS			
Wind Speed	Ground Snow Load		
	0 PSF	30 PSF	60 PSF
110	27'-0"	22'-0"	19'-0"
120	26'-0"	21'-0"	19'-0"
140	24'-0"	21'-0"	18'-0"
160	23'-0"	20'-0"	18'-0"
180	21'-0"	19'-0"	17'-0"
200	20'-0"	18'-0"	17'-0"

SB3500 Installation Notes

*NR Indicates that this product is not recommended for this application

*Max Deflection = L/120

SB5000 MAXIMUM RECOMMENDED SPANS			
Wind Speed	Ground Snow Load		
	0 PSF	30 PSF	60 PSF
110	32'-0"	25'-0"	21'-0"
120	30'-0"	25'-0"	21'-0"
140	28'-0"	24'-0"	21'-0"
160	26'-0"	23'-0"	21'-0"
180	24'-0"	22'-0"	20'-0"
200	23'-0"	21'-0"	19'-0"

SB5000 Installation Notes

*NR Indicates that this product is not recommended for this application

*Max Deflection = L/120

Structural Analysis of the SunBeam™ beam profiles were based on the following product data:

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

<i>Part Name</i>	<i>Part Number</i>	<i>S_x (in³)</i>	<i>S_y (in³)</i>	<i>A (in²)</i>
SB2500	A20143	2.183	1.313	1.909
SB3500	A20243	16.643	5.292	6.742
SB5000	A20175	23.715	7.964	7.122

Custom Designs & Beam Maximum Performance

Note that performance of these products may exceed the information shown here in certain ideal installations. Such installations will require the analysis of a qualified design professional on a project-specific basis.

Conclusions

When the SunBeam™ profiles are installed as outlined in this letter and in concordance with the engineering parameters shown in this document, they 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.