

May 24, 2023

K2 Systems, LLC  
4665 North Ave Suite G  
Oceanside, CA 92056



**RE: K2 Big Foot 6 in Mounting Bracket Evaluation**

To whom it may concern:

Per your request, Moment Engineering + Design has performed a comprehensive structural review of the K2 Flex Foot in Rafter and Deck Mounting scenarios. When installed per the conditions and design criteria described herein, the K2 Big Foot 6 in specified is compliant with the applicable sections of the design reference documents noted below.

**Design Reference Documents**

- ASCE/SEI 7-16 & 7-10 – *Minimum Design Loads for Buildings and Other Structures*
- AA ADM - *2020 Aluminum Design Manual*, by the Aluminum Association
- Load Test Report for K2 America – Big Foot 6 in, Uplift, Downforce, and Shear test report, Report #2023-TRD-2, dated 3-22-23

**Overview**

The purpose of this analysis is to provide allowable shear, compression, and tensile loads for the K2 Systems Big Foot 6 in in various attachment configurations including rafter and deck mounting. K2 Systems has provided in-house load testing data of the K2 Big Foot 6 in in shear, compression, and tension. Fastener analysis by others is required to provide accurate allowable loads for the K2 Big Foot 6 in for any site specific application.

Moment Engineering + Design has reviewed the testing materials and reports provided by K2 Systems as well as applicable design codes and has derived allowable shear, compression and tensile loads per mounting configuration based on the results.

**Methods & Design Parameters**

Calculated allowable loads were based on the following data:

- *Section and materials data provided by K2 Systems*
- *Load/deflection test data provided by K2 Systems*

**Material & Section Properties**

Tested assembly was based the following:

<u>K2 Big Foot 6 in</u>	<u>Properties</u>
6005A-T5 or -T61 Alloy	Fy = 31,000 psi
S <sub>x</sub> (at vertical leg)	0.0521 in <sup>3</sup>
A <sub>net</sub> (though slotted section)	0.29 in <sup>2</sup>
h <sub>max</sub> . (at applied load)	5.5 in

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### Attachment to Structure

The stated capacities in this letter apply to the Big Foot 6 in bracket only and do not consider connection of the assembly to the underlying roof structure or connection to the supported rail system. The capacities are determined based on mechanical load testing or by structural analysis.

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,



Shawn  
Kelley

Exp. 3-31-25

Digitally signed by  
Shawn Kelley  
Date: 2023.05.25 14:25:17  
-04'00'

Shawn P. Kelley, P.E.

**Professional Engineer**

moment ENGINEERING + DESIGN

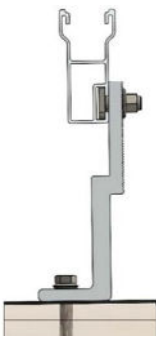
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Attachments:

1. Table 1.1: K2 Big Foot 6 in – Allowable Load Chart

Table 1.1: Big Foot 6 in - Bracket Capacity	
Capacities shown in this table are limited to the Big Foot 6 in bracket as determined by testing in a rigid test assembly. Connections of the bracket to the underlying roof structure have not been evaluated.	
CONFIGURATION	ALLOWABLE LOADS <sup>3,4</sup>
	ALLOWABLE TENSILE LOAD (LBS) <sup>1</sup> :
	650
	ALLOWABLE COMPRESSIVE LOAD (LBS):
	650
	ALLOWABLE HORIZONTAL FORCE (LBS) <sup>2</sup> :
	190
<ol style="list-style-type: none"><li>1. Attachment of the bracket to the structure shall be determined by others</li><li>2. Allowable horizontal force is based on a load applied perpendicular to rail orientation at point of attachment as shown above</li><li>3. Load duration factors (if applicable) have not been applied to table values</li><li>4. Maximum vertical load to bracket shall not exceed 650 lbs including the effect of any load combinations or load duration factors applicable to the connection.</li></ol>	

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