

February 29, 2024

K2 Systems, LLC
4665 North Avenue
Suite I
Oceanside, CA 92056



RE: *Splice Foot XL Rafter Mounting Evaluation*

To whom it may concern:

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

Design Reference Documents

- ASCE/SEI 7-22 & 7-16 – *Minimum Design Loads for Buildings and Other Structures*
- AA ADM - *2015 Aluminum Design Manual*, by the Aluminum Association
- AAMA TIR A9-91 – *Metal Curtain Wall Fasteners*
- National Design Specification for Wood Construction – *2018 Edition*

Overview

The purpose of this analysis is to provide allowable shear, compression and tensile loads for the K2 Systems Splice Foot XL in various attachment configurations including rafter mounting. K2 Systems has provided load testing data completed by Applied Materials & Engineering, Inc. (AME) of the Splice Foot XL in rafter mounting configurations.

Moment Engineering + Design has reviewed the testing materials and reports provided by K2 Systems 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*

Section Properties

Tested assembly was based the following:

<u>Property</u>	<u>Splice Foot XL</u>
Sx (horizontal axis)	0.354 in ³
Sy (vertical axis)	0.425 in ³
A (x-Section)	1.299 in ²

K2 Systems, LLC

4665 North Avenue, Suite I • Oceanside, CA 92056 • Phone: 760-301-5300 • Web: www.k2-systems.com

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,



Expires: 11/30/2025

Shawn P. Kelley, P.E.

Professional Engineer

moment ENGINEERING + DESIGN

14101 Parke Long Ct #205

Chantilly, VA 20151

spkelley@msegllc.com

Attachments:

1. Figure 1.1: Splice Foot XL – Force Loading Diagram
2. Table 1.1: Splice Foot XL – Rafter Mounting Options

Figure 1.1: Splice Foot XL: Force Loading Diagram

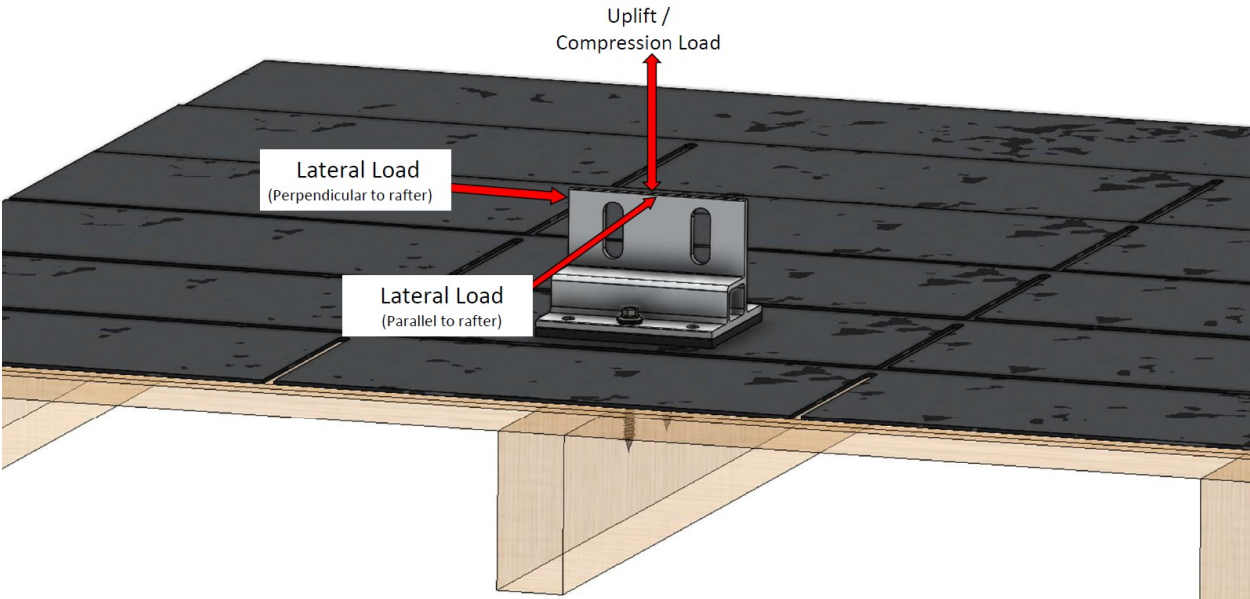
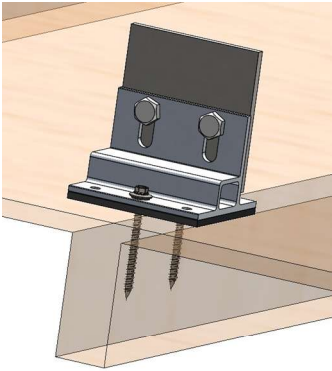


Table 1.1: Splice Foot XL - Rafter ⁵ Mounting Options	
Note: Rafter attached with (2) #14 x 3" long self-drilling wood screws through 7/16" OSB directly into the rafter (fully threaded, 2.5" of embedment into rafter)	
CONFIGURATION	ALLOWABLE LOADS ^{3,6}
	ALLOWABLE UPLIFT LOAD (LBS) ^{1,4} :
	1020
	ALLOWABLE COMPRESSIVE LOAD (LBS.) ⁴ :
	1020
	ALLOWABLE LATERAL LOAD (LBS) ² :
	(PERPENDICULAR TO RAFTER)
	185
	ALLOWABLE LATERAL LOAD (LBS) ² :
	(PARALLEL TO RAFTER)
	345
<div>1. Determined using NDS Eq. 12.2-2 with 2.5" minimum thread length</div> <div>2. Allowable lateral load assumes worst case loading at top of slots, with allowable shear values based on Table 12M (NDS) with appropriate reduction factors</div> <div>3. Allowable uplift load includes a 1.6 load duration factor for wind. Allowable shear load includes a 1.15 load duration factor for snow. No additional increases are permitted.</div> <div>4. The effect of bolt slippage has not been evaluated</div> <div>5. Assumes a minimum specific gravity G=0.43</div> <div>6. Reference Figure 1.1 for load direction and application</div>	