

May 28, 2024

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



**RE: *Splice Foot XL Metal Roof 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 Metal Deck 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
- ESR-4009 – ICC-ES Evaluation Report: EJOT JF3 Screws
- ESR-3064P – SSMA Product Technical Guide

### **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 metal deck mounting. K2 Systems has provided in-house load testing data of the K2 Splice Foot XL in shear, compression, and tension. Fastener analysis was completed to provide accurate allowable loads for the K2 Splice Foot XL in metal deck mounting configurations.

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*

### **Section Properties**

Tested assembly was based the following:

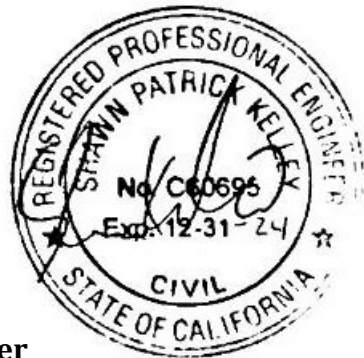
<u>Property</u>	<u>Splice Foot XL</u>
Sx (horizontal axis)	0.354 in <sup>3</sup>
Sy (vertical axis)	0.425 in <sup>3</sup>
A (x-Section)	1.299 in <sup>2</sup>

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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: 12/31/24

Shawn P. Kelley, P.E.

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Attachments:

1. Figure 1.1: Splice Foot XL – Force loading diagram (deck)
2. Table 1.1: Splice Foot XL – Metal Deck Mounting Options

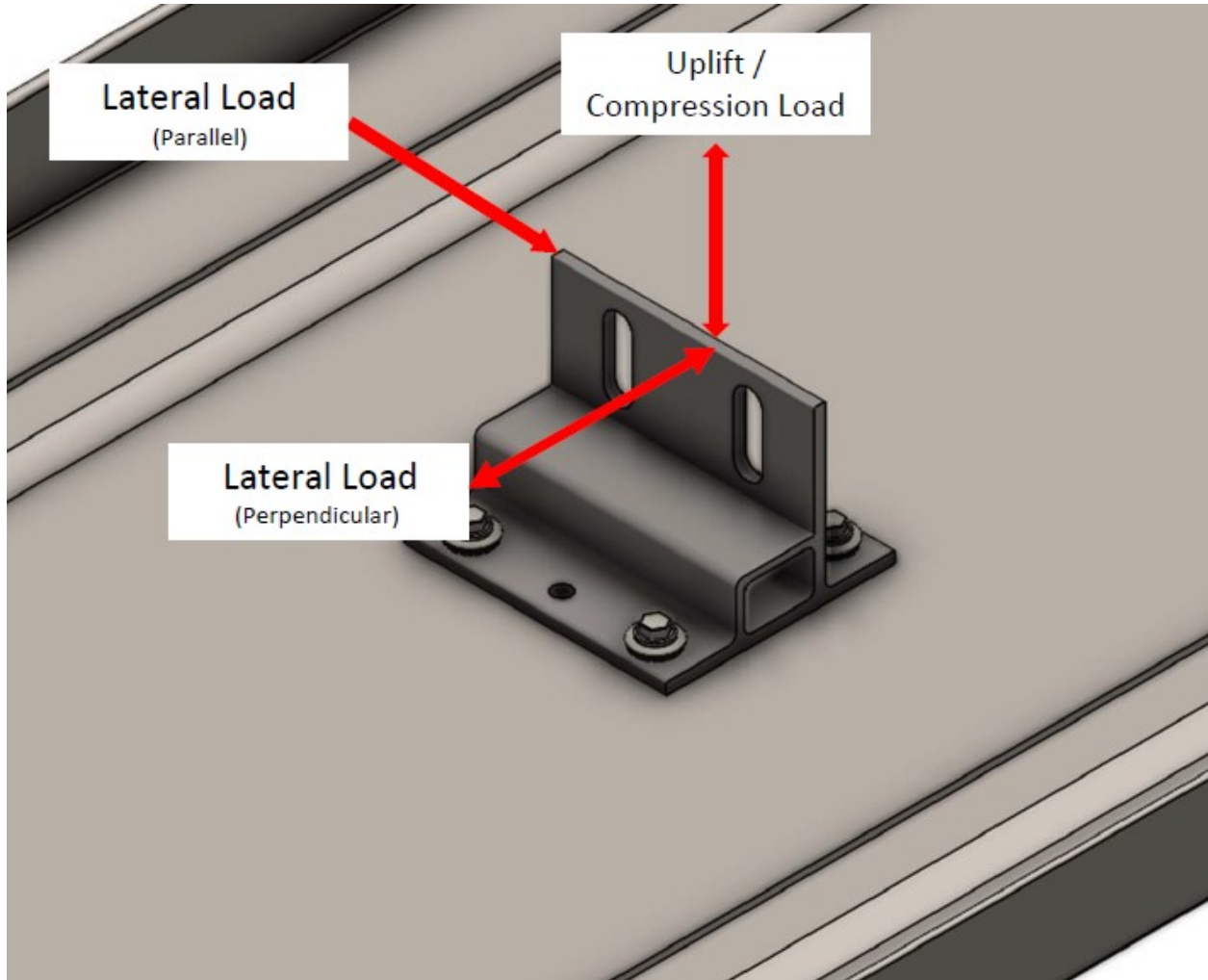





Figure 1.1: Splice Foot XL: Force Loading Diagram (metal deck)

Table 1.1: Splice Foot XL - Metal Deck Mounting Options	
Bracket attached to 26 gauge (0.018" thick) metal roof with (4) #12-18 JF3 self drilling screws from EJOT. Assumes min. 8" distance from all roof panel seams.	
CONFIGURATION	ALLOWABLE LOADS <sup>3,4</sup>
	ALLOWABLE UPLIFT LOAD (LBS) <sup>1</sup> :
	244
	ALLOWABLE COMPRESSIVE LOAD (LBS.) <sup>4</sup> :
	244
	ALLOWABLE LATERAL LOAD (LBS) <sup>1,2</sup> : (PERPENDICULAR)
	125
	ALLOWABLE LATERAL LOAD (LBS) <sup>1,2</sup> : (PARALLEL)
	135
1. Determined using ESR-4009 ICC-ES Evaluation Report on EJOT JF3 fasteners. 2. Determined using ESR-3064P ICC-ES Evaluation Report on Screw Capacities in thin sheet metals. 3. Reference Figure 1.1 for load direction and application. 4. The effect of bolt slippage has not been evaluated.	
Bracket attached to 24 gauge (0.024" thick) metal roof with (4) #12-18 JF3 self drilling screws from EJOT. Assumes min. 8" distance from all roof panel seams.	
CONFIGURATION	ALLOWABLE LOADS <sup>3,4</sup>
	ALLOWABLE UPLIFT LOAD (LBS) <sup>1</sup> :
	424
	ALLOWABLE COMPRESSIVE LOAD (LBS.) <sup>4</sup> :
	424
	ALLOWABLE LATERAL LOAD (LBS) <sup>1,2</sup> : (PERPENDICULAR)
	225
	ALLOWABLE LATERAL LOAD (LBS) <sup>1,2</sup> : (PARALLEL)
	240
1. Determined using ESR-4009 ICC-ES Evaluation Report on EJOT JF3 fasteners. 2. Determined using ESR-3064P ICC-ES Evaluation Report on Screw Capacities in thin sheet metals. 3. Reference Figure 1.1 for load direction and application. 4. The effect of bolt slippage has not been evaluated.	
Bracket attached to 22 gauge (0.033" thick) metal roof with (4) #12-18 JF3 self drilling screws from EJOT. Assumes min. 8" distance from all roof panel seams.	
CONFIGURATION	ALLOWABLE LOADS <sup>3,4</sup>
	ALLOWABLE UPLIFT LOAD (LBS) <sup>1</sup> :
	516
	ALLOWABLE COMPRESSIVE LOAD (LBS.) <sup>4</sup> :
	516
	ALLOWABLE LATERAL LOAD (LBS) <sup>1,2</sup> : (PERPENDICULAR)
	270
	ALLOWABLE LATERAL LOAD (LBS) <sup>1,2</sup> : (PARALLEL)
	285
1. Determined using ESR-4009 ICC-ES Evaluation Report on EJOT JF3 fasteners. 2. Determined using ESR-3064P ICC-ES Evaluation Report on Screw Capacities in thin sheet metals. 3. Reference Figure 1.1 for load direction and application. 4. The effect of bolt slippage has not been evaluated.	