



January 26, 2021 (revised report)

Project No.: 1210008C

Mr. Peter Abou Chacra
SUNMODO
14800 NE 65th St
Vancouver, WA 98682

Email: PeterA@sunmodo.com

Subject: Hex Stanchion X TopTile™ Rafter Kit
Universal Standard 9 in. Base Hook mounting systems

Dear Mr. Abou Chacra:

As requested, Applied Materials & Engineering, Inc. (AME) has completed load-testing the Hex Stanchion XTopTile™ Rafter Kit System (Part #K10465-008); see Appendix A, Figure A1. The purpose of our testing was to evaluate the tension (uplift) and shear load capacity of the Hex Stanchion X TopTile™ Rafter Kit System attached to 1/2" Structural I plywood.

SAMPLE DESCRIPTION

Mockup samples were delivered to our laboratory on January 13, 2021. Mockup configuration consisted of a 1/2" Structural I plywood test sample reinforced with a 2"x4" wood frame to minimize the flexing of the plywood. The Hex Stanchion X TopTile™ Rafter Kit System (Part #K10465-008) is attached to the plywood using provided product hardware.

TEST PROCEDURES & RESULTS

1. Tensile (Uplift) Load Test

A total of three tests were conducted for tensile (uplift) load capacity on January 25, 2021 using a United Universal testing machine. Samples were rigidly attached to the testing machine and an uplift (tensile) load was applied to the mount. The samples were loaded in tension at a constant rate of axial deformation of 0.20 in. /min. without shock until failure occurred; displacement at maximum load was recorded.

Based on the above testing, the average maximum uplift load of the TopTile™ Wood Deck Mounting System attached to 1/2" Structural I plywood was determined to be 737 lbf. Detailed results are provided in Table I and Figure 1. Test setup and mode of failure are provided in Appendix B, Figure B1.

The specific gravity and moisture content of the plywood were tested in accordance with ASTM D2395, Method A (oven-dry). The average specific gravity and average moisture content of the three samples were determined to be 0.408 and 9.3%, respectively.

Mr. Peter Abou Chacra
SUNMODO
Hex Stanchion X TopTile™ Rafter Kit
January 26, 2021 (revised report)

2. Shear (Lateral) Load Test Parallel to Rafter

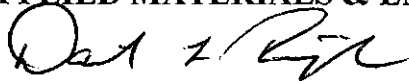
A total of three tests were conducted for shear load capacity on January 26, 2021 using a United Universal testing machine. Samples were rigidly attached to the testing machine and a shear load (parallel to the rafter) was applied to the hook. The samples were loaded in compression at a constant rate of axial deformation of 0.20 in. /min. without shock until failure occurred; displacement at maximum load was recorded.

Based on the above testing, the average maximum shear load of the Hex Stanchion X TopTile™ Rafter Kit System attached to 1/2" Structural I plywood was determined to be 175 lbf. Detailed results are provided in Table II and Figure 2. Test setup and mode of failure are provided in Appendix B, Figure B2.

The specific gravity and moisture content of the plywood were tested in accordance with ASTM D2395, Method A (oven-dry). The average specific gravity and average moisture content of the three samples were determined to be 0.408 and 9.5%, respectively.

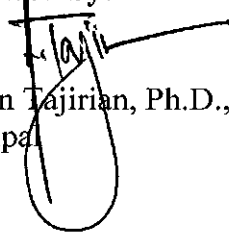
Respectfully Submitted,

APPLIED MATERIALS & ENGINEERING, INC.



Daniel Ringler
Laboratory Manager

Reviewed by:



Armen Tajirian, Ph.D., P.E.
Principal



TABLE I

TENSILE (UPLIFT) LOAD TEST RESULTS

TOPTILE™ WOOD DECK MOUNTING SYSTEM

(PART #K10465-008)

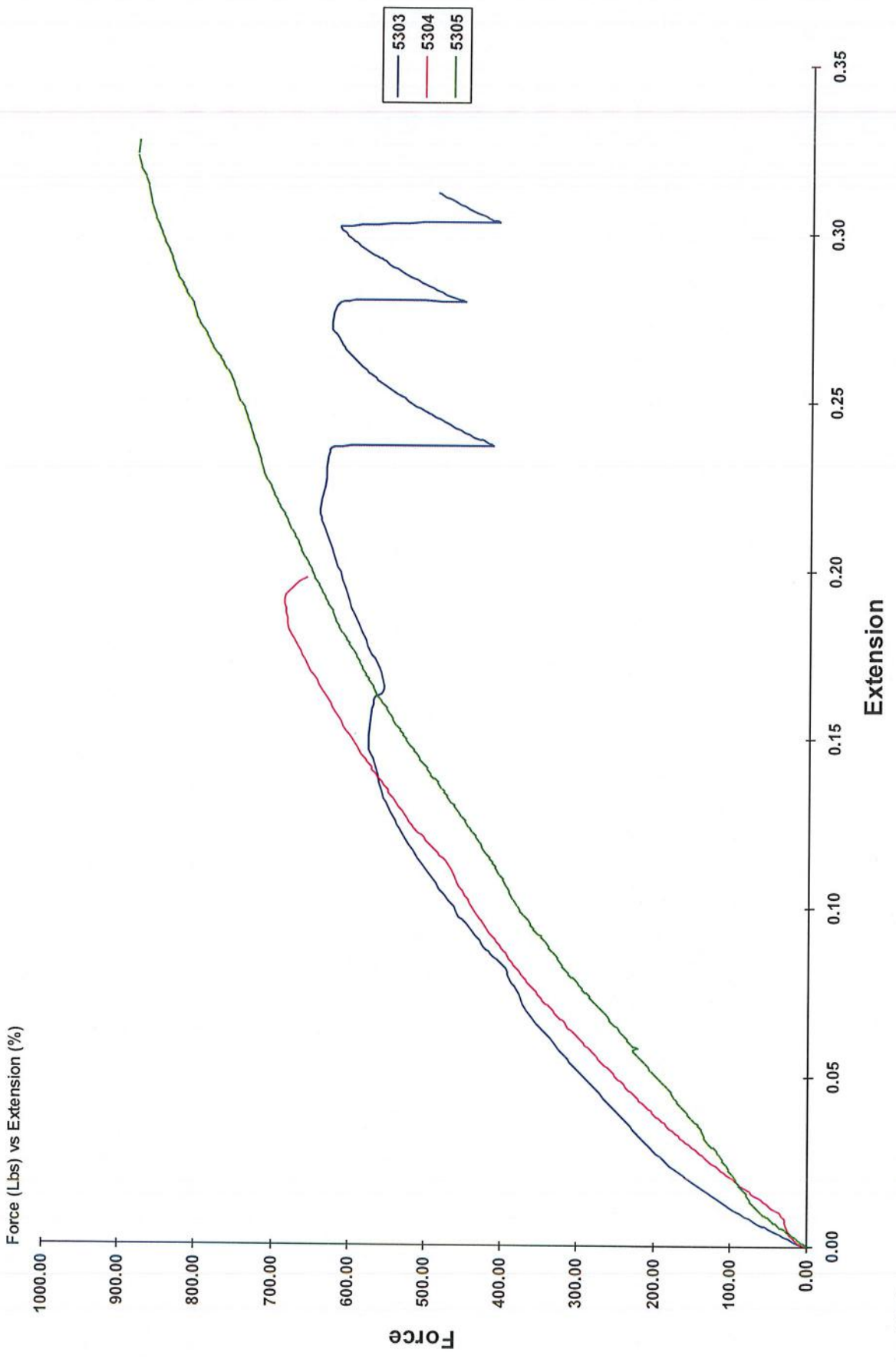
PROJECT NO.: 1210008C

Test No.	Maximum Shear Load (lbs)	Displacement At Maximum Load (in.)	Mode of Failure	Plywood Specific Gravity	Plywood Moisture Content (%)
5306	642	0.22	Wood Screw Pull-out	0.406	9.5
5307	686	0.19		0.412	8.9
5308	883	0.32		0.407	9.6
Average	737	0.24	..	0.408	9.3

TABLE II
SHEAR LOAD TEST RESULTS
TOPTILE™ WOOD DECK MOUNTING SYSTEM
(PART #K10465-008)
PROJECT NO.: 1210008C

Test No.	Maximum Shear Load (lbs)	Displacement At Maximum Load (in.)	Mode of Failure	Plywood Specific Gravity	Plywood Moisture Content (%)
5303	148	0.63	Wood Screw Pull-out	0.410	9.4
5304	201	0.74		0.405	9.7
5305	177	1.00		0.408	9.5
Average	175	0.79	..	0.408	9.5

Report No 1071 Tensile Test - XHD Control

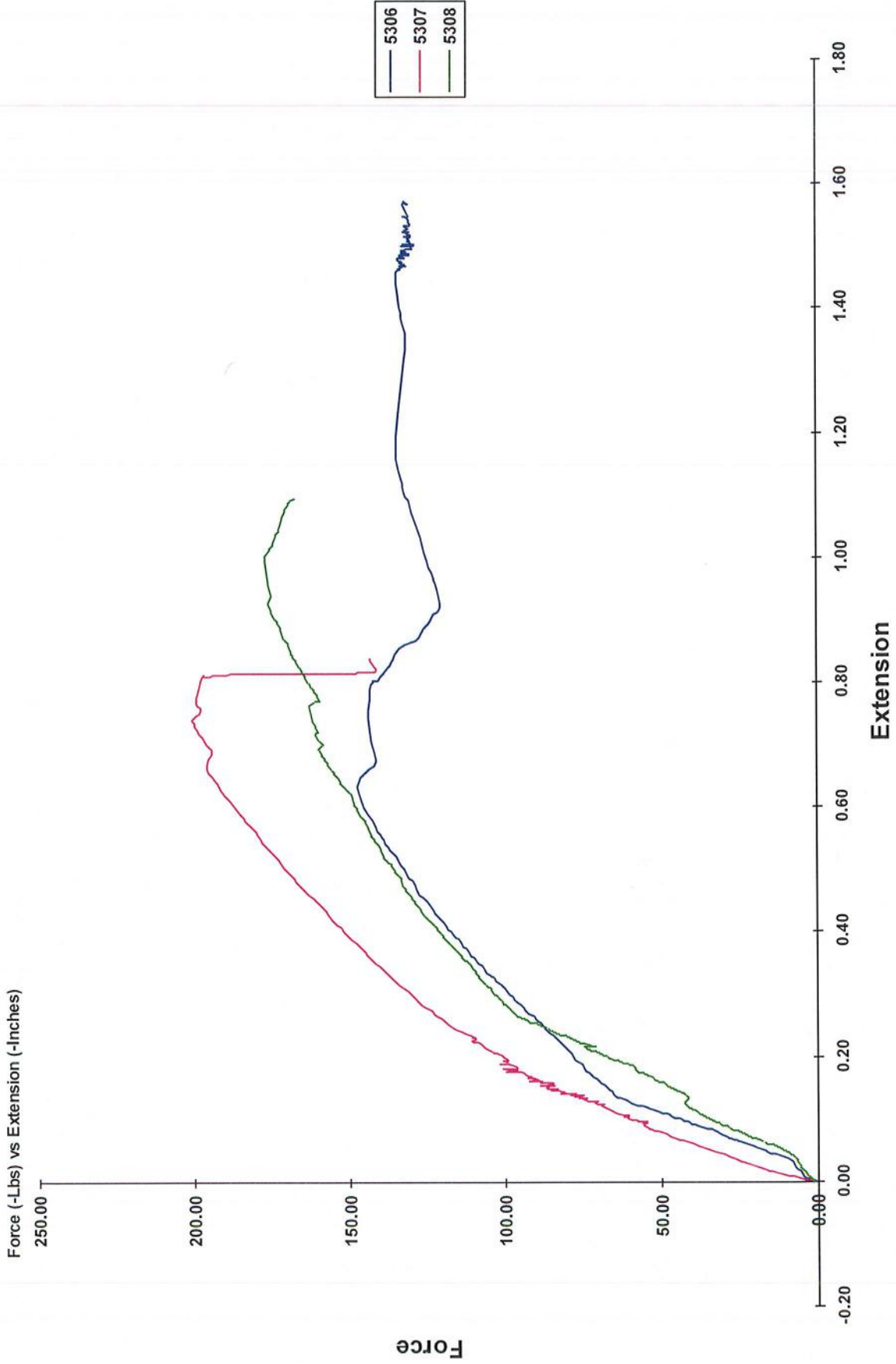


Template 7 Testing Machine SMART Teste

By : _____

Figure 1

Report No 1072 Compression Testing



REFERENCES

AC13-2010, "*Acceptance Criteria for Joist Hangers and Similar Devices*", ICC Evaluation Service.

AC85-2008, "*Acceptance Criteria for Test Reports*", ICC Evaluation Service.

ASTM D1761-2006, "*Standard Test Methods for Mechanical Fasteners in Wood*", ASTM International.

ASTM D2395-2007, "*Standard Test Method for Specific Gravity of Wood and Wood-Based Materials*",
ASTM International.

APPENDIX A

4

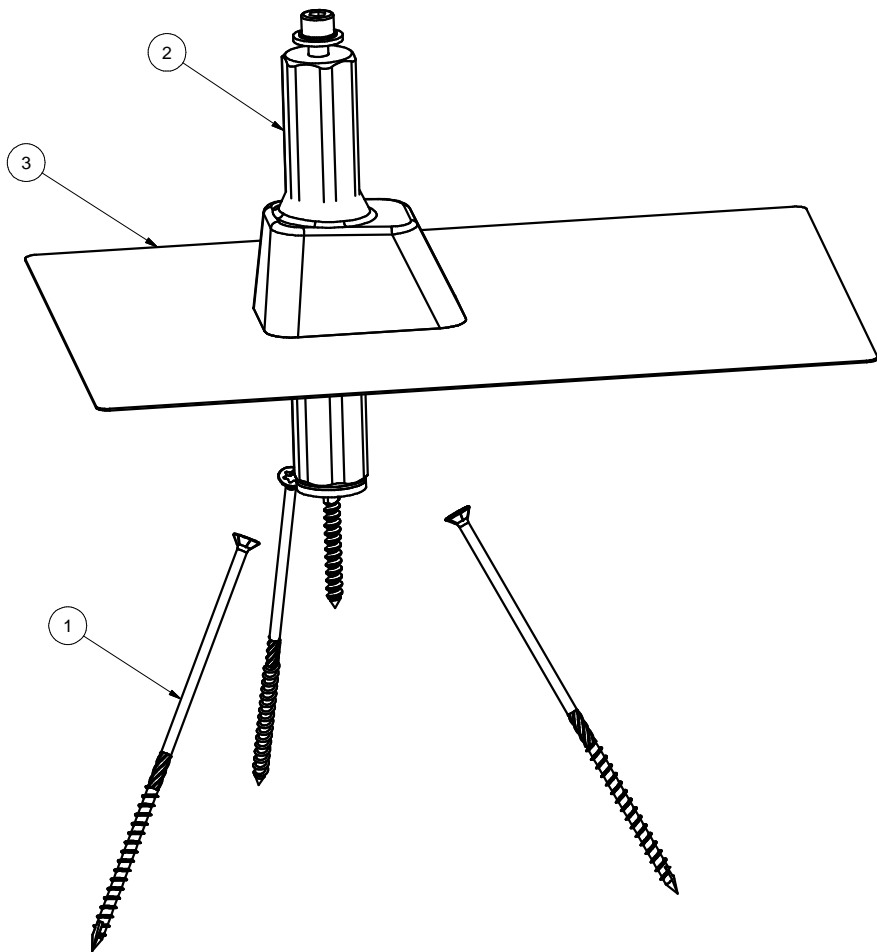
3

2

1

REVISIONS			
REV	DESCRIPTION	BY	DATE
A	INITIAL RELEASE	LWF	11/18/2020

B



A

B

A

KIT WITH WOOD SCREWS	KIT NUMBER	B15058-00X
K10461-105	K10460-005	B15058-005
K10461-107	K10460-007	B15058-007
K10461-108	K10460-008	B15058-008

A

A

3	C10026-002	AL FLASHING WITH EPDM SEALANT COVER	1
2	K10460-00X	HEX STANCHION TOPTILE DECK KIT	1
1	B15058-00X	#14 GENERAL PURPOSE WOOD SCREWS	3
ITEM	PART NUMBER	DESCRIPTION	QTY
MATERIAL		SEE BOM	
Third Angle Projection:			
GENERAL SPECIFICATIONS		SunModo Corp. 14800 NE 65TH STREET, VANCOUVER WA 98682	
Tolerances		TITLE	
XXX ±0.01 (0.25mm) XX ±0.02 (0.50mm) X ±0.03 (0.75mm) Unless otherwise specified		HEX TOPTILE DECK MOUNT KIT	
DRAWN BY		DATE	
LWF		09/15/2020	
CHECKED BY		DRAWING NUMBER	
		B K10461-1XX	
APPROVALS		SCALE: NONE	
		SHEET 1 of 1	

THIS DRAWING IS CONFIDENTIAL PROPERTY OF SUNMODO AND ITS CONTENTS MAY NOT BE DISCLOSED WITHOUT THE PRIOR WRITTEN CONSENT OF SUNMODO CORP.

4

3

2

1



APPENDIX B

FIGURE B1

HEX STANCHION X TOPTILE™ RAFTER KIT SYSTEM
(PART #K10465-008)

TENSILE LOAD TEST SETUP

PROJECT NUMBER 1210008C

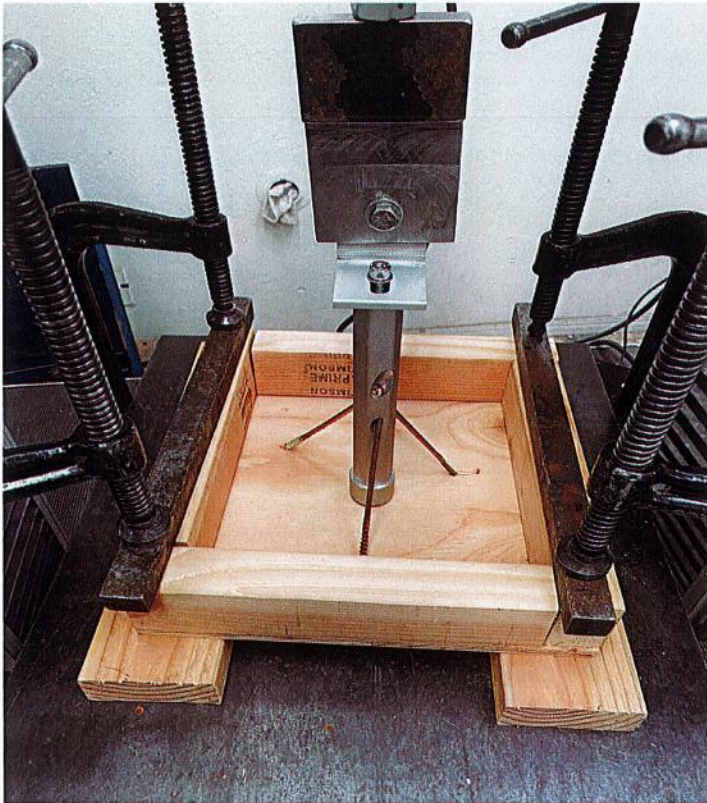


Figure B1a. Test set up.

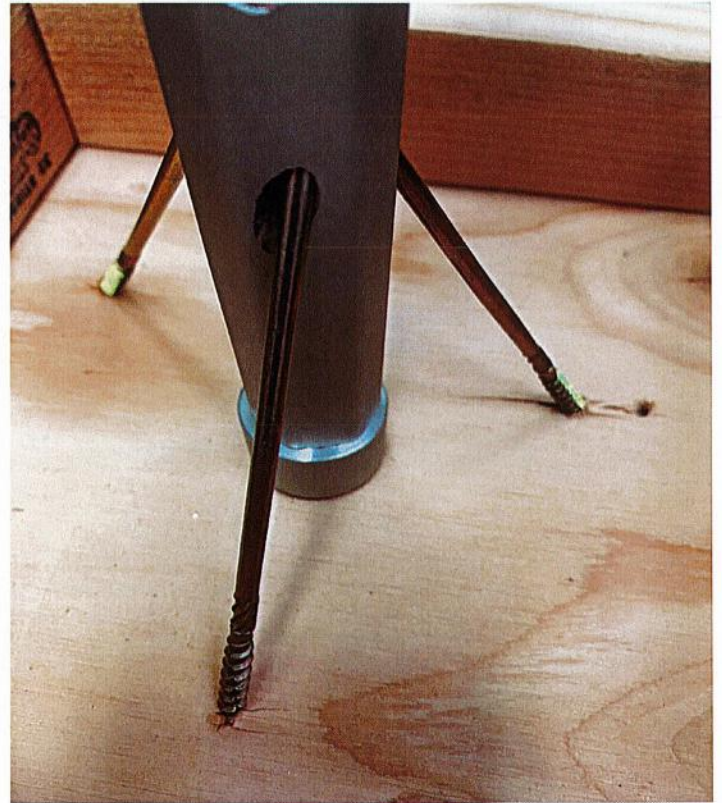


Figure 1b. Typical failure mode.

FIGURE B2
HEX STANCHION X TOPTILE™ RAFTER KIT SYSTEM
(PART #K10465-008)

SHEAR LOAD TEST SETUP

PROJECT NUMBER 1210008C

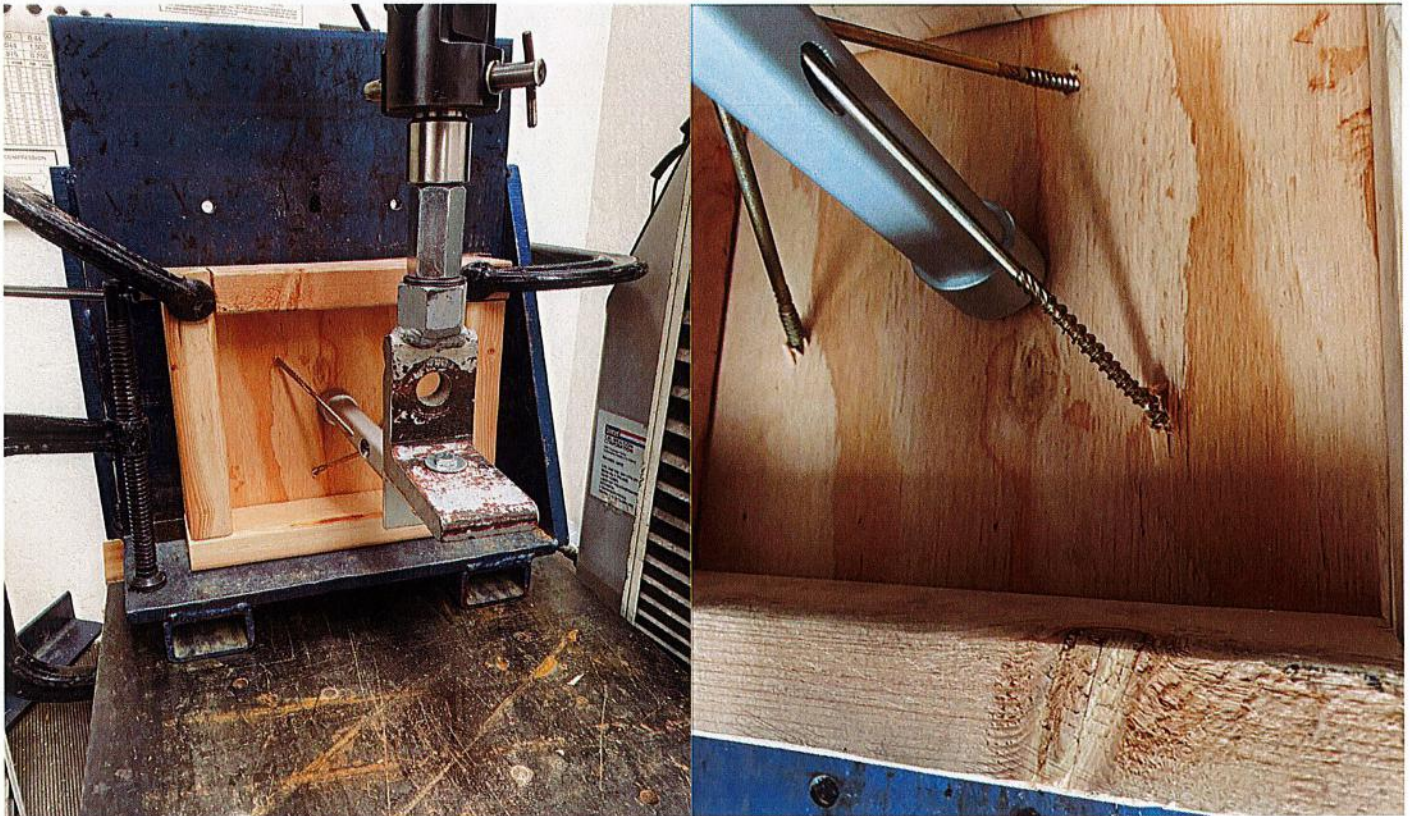


Figure 2a. Test set up.

Figure 2b. Typical failure mode.