

**Pei Evaluation Service** is an accredited ISO Standard 17065 Product Certifier, accredited by the IAS. This **Product Evaluation Report** represents a product that **Pei ES** has Evaluated and this product has a Follow-up Service / Inspection Agreement. This **Product Evaluation Report** in no way implies warranty for this product or relieves **Aerosmith Fastening Systems** of their liabilities for this product. This **PER** is an official document if it is within one year of the initial or re-approval date.

**Initial Approval**  
September, 2006

**Re-Approved**  
June, 2016

See all **Pei ES** Listings at: [www.p-e-i.com](http://www.p-e-i.com)

### Report Owner

#### **Aerosmith Fastening Systems**

5621 Dividend Road  
Indianapolis, IN 46241

### Product

#### **VersaPin Gripshank® & Helical® Pneumatic Fasteners**

### Approved Manufacturing Locations

**Pei ES** has on file a list of each approved manufacturing location and which product is approved to be manufactured at each location.

### For Evaluation Report Questions

[www.aerosmithfastening.com](http://www.aerosmithfastening.com)

**Aerosmith** Contact: Lisa Beally, Business Operations Manager  
Phone: 317-243-5959

### General Details

The **VersaPin Gripshank** and **Helical** Fasteners are manufactured by approved independent companies. Any company manufacturing product for **Aerosmith**, that is intended to be listed by this **Product Evaluation Report**, has an agreement in place with **Progressive Engineering Inc.** to monitor their Quality Control Program and finished product on a scheduled time frame.

### Listing Details

**VersaPin Gripshank** and **Helical Fasteners** are pneumatically driven steel pins used to attach siding and sheathing materials to steel stud framing. The pins pierce the steel framing while the specially designed shank grips the steel framing. The threaded portion of the shank must penetrate completely through the stud steel thickness.

### Product Description

The **VersaPin Gripshank Fasteners** are manufactured from AISI C 1060 steel, heat treated to a Rockwell C hardness between 52 and 55, have a minimum tensile strength of 240 ksi and a bending yield strength of 250 ksi. The pins are electro-zinc plated with a chromate rinse, mechanically zinc plated ASTM B633 Type 1 SC, ASTM B695 Type 1 Class 5 or a nickel metal alloy. The plating is a minimum thickness of .0002" thick.

The **VersaPin Helical Fasteners** are manufactured from AISI C 1060 steel, heat treated to a Rockwell C hardness between 52 and 55, have a minimum tensile strength of 240 ksi and a bending yield strength of 250 ksi. The pins are electro-zinc plated with a chromate rinse, mechanically zinc plated per ASTM B633 Type 1 SC, ASTM B695 Type 1 Class 5 or a nickel metal alloy. The plating is a minimum thickness of .0002" thick.

The pins are manufactured with a nominal finished shank dia. of .100" and a nominal head dia. of .250" or .312". The shank has a proprietary thread and the point is ballistic shaped. The pins are identified by the **Aerosmith** logo head stamp as shown on page 4 of this **Product Evaluation Report**. The pins are collated for powered installation tools.

### Steel Framing

The steel framing shall comply with ASTM A 653 SS (33 ksi) with the following minimum steel thickness for each nominal gage size.

Gage	Minimum Thickness	Gripshank Ultimate Withdrawal Values	Helical Ultimate Withdrawal Values
14	.071"	596 lbs.	351 lbs.
16	.055"	449 lbs.	330 lbs.
18	.045"	337 lbs.	235 lbs.
20	.037"	284 lbs.	--

### Approved Siding Material

James Hardie Building Products 5/16" Hardipanel® Vertical Siding & 5/16" Hardiplank® Lap Siding or equivalent. The siding is to be installed using the siding manufacturer's installation instructions and **Gripshank** Fasteners. The minimum steel thickness to be used is 20 gage.

### Approved Exterior Sheathing

DensGlass Gold Exterior Sheathing 1/2" and 5/8" Fireguard Type X. The sheathing is to be installed using the sheathing manufacturers Installation Instructions and **Gripshank** Fasteners. The cold-formed steel studs shall have a minimum 20 gauge thickness.

The Sure-Board Series 200W Structural Panel 5/8" or 1/2" thick Type X gypsum board adhered to 22 ga. Steel. **Aerosmith** pins shall be installed in compliance with manufacturers Installation Instructions. The minimum steel thickness to be used is 20 gage.

**Approved Plywood Sheathing**

Plywood sheathing complying with USDC Product Standard PS-1 or PS2-92 (UBC Standards 23-2 or 23-3). **Aerosmith** pins shall be installed in compliance with manufacturers Installation Instructions. The cold-formed steel studs shall have a minimum 20 gauge thickness.

**Approved Structural Cement Panel**

USG Structural Panel Concrete Subfloor and Concrete Roof Deck 3/4" Structural Cement Panel reinforced with fiberglass strands. See **Pei ES** PER-13067 and PER-14076. The sheathing is to be installed using the sheathing manufacturers Installation Instructions and **Gripshank** Fastener 2385A (0.100" x 1-1/2") only. Applies to installation on 16 gauge, 50 ksi cold-formed steel only.

**Approved Gripshank Pins & Helical Pins**

2191Z	2381Z	2192Z	2351AG	2382Z	2501SG	2631SG	2635Z	3329R
2351Z	2631Z	2352Z	2359Z	2389Z	2502Z	2635SBG	2325A	2385Z

**Tested to**

- ASTM B 117** - 192 Hour Salt Spray Test (2325A) (*Reference 2011-1679 Test Report for 2635G & 5573G*)
- ASTM C 1513** - Specification for Steel Tapping Screws for Cold Formed Steel Framing Applications (*Provisions Apply\**)
- ASTM D 1037** - Fastener Withdrawal Test
- ASTM E 72** - Wall Racking Test
- ASTM E 330** - Standard Test Method for Structural Performance of Exterior Windows, Curtain Walls and Doors by Uniform Static Air Pressure Differences
- ASTM E 564** - Static Load Test for Shear Resistance of Framed Walls for Buildings
- ASTM E 2126-07A** - Cyclic Load Test for Shear Resistance of Vertical Elements
- AISI TS-5-052** - Test Methods for Mechanically Fastened Cold-Formed Steel Connections

**Code Compliance**

<b>1997 Uniform Building Code</b>	<b>2015 International Building Code</b>
<b>2009 International Building Code</b>	<b>2015 International Residential Code</b>
<b>2009 International Residential Code</b>	<b>2010 Florida Building Code</b>
<b>2012 International Building Code</b>	<b>2010 National Building Code of Canada</b>
<b>2012 International Residential Code</b>	

**2012/2015 IRC**

Section R104.11 - VersaPin fasteners meet the intent of the IRC when installed in accordance with the manufacturer's installation instructions and this **PER**.  
 Section R301.1.3 - The fasteners may be used in Structures regulated under the IRC when an engineered design is submitted in accordance with Section R301.1.3  
 Section R603.5 - Method of attachment for exterior wall covering materials to cold-formed steel stud wall framing shall conform to manufacturers installation instructions.

**2012/2015 IBC**

Section 104.11 - VersaPin fasteners meet the intent of the IBC when installed in accordance with the manufacturer's installation instructions and this **PER**.  
 Section 1405.16 Fiber Cement Siding - Unless otherwise specified in manufacturers installation instructions fasteners used to fasten the siding to wood stud should be corrosion resistant round head smooth shank and long enough to penetrate the metal framing. The VersaPin **Gripshank** Fasteners are limited to use in resisting wind and seismic forces in this **PER**. Fire Rated assemblies are outside of the scope of this **Product Evaluation Report**.

**2010 NBC**

Section 9.24.1.4 Screws - Screws for the application of cladding, sheathing or interior finish materials to steel studs, runners and furring channels shall conform to a) ASTM C 954, "Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs from 0.033 in. (0.84 mm) to 0.112 in. (2.84 mm) in Thickness. Note: Please reference Opinion Letter dated April 10, 2008 for conformance with this standard. Copies can be made available to parties upon request.  
 Section 9.241.5 Cladding, Sheathing and Interior Finish Required - Cladding or sheathing and interior finish shall be installed on steel stud framing and shall be fastened with screws spaced at appropriate spacing described in Section 9.29 and penetrating not less than 10mm through the metal.  
 Section 9.27.5.4 Size and Spacing of Fasteners - Note Table 9.27.5.4 Attachment of Cladding - Panel or sheet type cladding up to 7mm thick.  
 Section 9.27.5.5 For Corrosion Resistance - Nails or staples for the attachment of cladding and wood trim shall be corrosion-resistant and shall be compatible with the cladding material.  
 Section 9.27.5.7 Penetration of Fasteners - 1.) Fasteners for shakes and shingles shall penetrate through the nail-holding base or not less than 19mm into the framing 2.) Fasteners for cladding other than that described in sentence 1) shall penetrate through the nail-holding base or not less than 25mm into the framing.

**Note: These standards are developed using processes that may differ from those used by Canadian standards development organizations; nevertheless; these standards have been reviewed by the relevant standing committees and found to be acceptable. The ASTM standards referenced herein are referenced in the NBC.**  
**Pei** as an IAS (ILIAAC MRA Signatory Accreditation Body) accredited Testing Laboratory, is a recognized testing laboratory by the Standard Council of Canada.

**Product Documentation**

A Quality Control Manual for **Aerosmith Fastening Systems** - Dated: March 15, 2014.

A Quality Control Manual from each Approved Manufacturer.

An Agreement between **Product Evaluation Report** owner (**Aerosmith**) & each Approved Manufacturer.

An Evaluation Follow-up Service Agreement between **Pei Evaluation Service** and **Aerosmith Fastening Systems**.

An Inspection Agreement between **Progressive Engineering Inc.** and **Aerosmith Fastening Systems**.

**VersaPin Gripshank** Fastening Guidelines for Cement Fiber Board

Georgia Pacific Letter for DensGlass Gold Sheathing Application- July 22, 2003.

James Hardie Letter for Fastening Requirements - Dated: March 27, 2007.

A **Pei** test report No. 2003-784 - Fastener Withdrawal Test using Gripshank and Helical Shank Fasteners - Dated: 6/9/2003, Stamped by a professional engineer.

A **Pei** test report No. 2007-1149 - ASTM E72 Wall Racking Test with 19/32" APA Rated Sheathing and Aerosmith Gripshank Pins with Studs Spaced 4" o.c. - Dated: 8/15/2007.

A **Pei** test report No. 2007-985(A) - ASTM E330 Test with 5/8" DensGlass Gold FireGuard Type X and Aerosmith Gripshank Pins with Studs Spaced 16" o.c. - Dated: 9/06/07, Stamped by a professional engineer.

A **Pei** test report No. 2007-985(B) - ASTM E330 Test with 5/8" DensGlass Gold FireGuard Type X and Aerosmith Gripshank Pins with Studs Spaced 16" o.c. - Dated: 9/06/07, Stamped by a professional engineer.

A **Pei** test report No. 2006-349(A) - ASTM E330 Test with Hardipanel and Aerosmith Gripshank Pins with Studs Spaced 16" o.c. - Dated: 2/28/2006, Stamped by a professional engineer.

A **Pei** test report No. 2006-349(B) - ASTM E330 Test with Hardipanel and Aerosmith Gripshank Pins with Studs Spaced 24" o.c. - Dated: 3/1/2006, Stamped by a professional engineer.

A **Pei** test report No. 2006-349(C) - ASTM E330 Test with 6-1/4" Wide Hardiplank Face Nailed using Aerosmith Gripshank Pins - Dated: 2/28/2006, Stamped by a professional engineer.

A **Pei** test report No. 2006-349(D) - ASTM E330 Test with 7-1/4" Wide Hardiplank Face Nailed using Aerosmith Gripshank Pins - Dated: 2/28/2006, Stamped by a professional engineer.

A **Pei** test report No. 2006-349(E) - ASTM E330 Test with 8-1/4" Wide Hardiplank Face Nailed using Aerosmith Gripshank Pins - Dated: 3/1/2006, Stamped by a professional engineer.

A **Pei** test report No. 2006-349(F) - ASTM E330 Test with 6-1/4" Wide Hardiplank Blind Nailed using Aerosmith Gripshank Pins - Dated: 2/27/2006, Stamped by a professional engineer.

A **Pei** test report No. 2006-349(G) - ASTM E330 Test with 7-1/4" Wide Hardiplank Blind Nailed using Aerosmith Gripshank Pins - Dated: 2/28/2006, Stamped by a professional engineer.

A **Pei** test report No. 2006-349(H) - ASTM E330 Test with 8-1/4" Wide Hardiplank Blind Nailed using Aerosmith Gripshank Pins - Dated: 3/1/2006, Stamped by a professional engineer.

A **Pei** test report No. 2006-349(I) - ASTM E330 Test with 6-1/4" Wide Hardiplank Blind Nailed Over 15/32" Plywood using Aerosmith Gripshank Pins - Dated: 5/10/2006, Stamped by a professional engineer.

A **Pei** Allowable Wind Speed Calculation, project No. 2006-1268, for Hardipanel & Hardiplank using Aerosmith Gripshank Pins - Dated: 8/8/2006, Stamped by a professional engineer.

A **Pei** test report No.2003-509(A) - ASTM E330 Test with 5/8" DensGlass and 18 Gauge Steel framing Gripshank Fasteners at 8"o.c. - Dated: 5/2/2003, Stamped by a professional engineer.

A **Pei** test report No.2003-509(B) - ASTM E330 Test with 5/8" DensGlass and 22 Gauge Steel framing Gripshank Fasteners at 8"o.c. - Dated: 5/5/2003, Stamped by a professional engineer.

A **Pei** test report No.2003-509(D) - ASTM E330 Test with 1/2" DensGlass and 22 Gauge Steel framing Gripshank Fasteners at 8"o.c. - Dated: 5/6/2003, Stamped by a professional engineer.

DH Brown Associates Test Report No. B95-216 - Not Dated.

A DH Brown Associates test report No. B95-216 Wood Structural Panel Diaphragms and shear walls fastened with Aerosmith Pins (Tables ONLY).

A DH Brown Associates test report No. B95-216 Wood Structural Panel Diaphragms and shear walls fastened with Aerosmith Pins.

Test Report RAD-3766, Negative Structural Performance Tests on 1/2" and 5/8" GLASROC SHEATHING using Aerosmith Fasteners in Accordance with ASTM E330-02 - Dated: 11/15/2005.

A Specialized Testing report No.- STQA50095 Sure-Board Series 200 Structural Panels racking shear tests and shear walls - Dated: 11/21/2006.

Test Report 2008030126A, Salt Spray Test in Accordance with ASTM B117 - Dated: 3/24/2008.

A **Pei** Opinion Letter - Dated: April 2, 2008; Aerosmith Pin Evaluation to ASTM C954 and ASTM C1513

A **Pei** Opinion Letter - Dated: April 5, 2008; Aerosmith Pin Evaluation under ASTM C954 and ASTM C1513 for Screws

A **Pei** Opinion Letter - Dated: April 10, 2008; Aerosmith Pin Evaluation under ASTM C954 and ASTM C1513 for Screws

A **Pei** Opinion Letter - Dated: September, 2009, sealed by a professional engineer.

A **Pei** test report No.2010-1023 - Fastener Lateral Load Test on a Steel Pin P/N 2385A thru 3/4" Fortocrete™ into a 16 Gauge Steel Joist - Dated: 9/13/2010.

A Opinion letter for equivalency interpretation of Pin Fastening - Dated: October, 13, 2010.

A **Pei** test report No.2011-427 - ASTM E330 Test with 5/8" Securock and 18 Gauge Steel framing & Gripshank Fasteners at 6"o.c. - Dated: 3/22/2011.

A **Pei** test report No.2010-765A - ASTM E 2126-07A Test with 15/32" Plywood on 16 Gauge Steel framing & Gripshank Fasteners at 2"o.c. Perimeter & 12" o.c. Field Studs - Dated: 7/20/2011.

A **Pei** test report No.2010-765B - ASTM E 2126-07A Test with 15/32" Plywood on 16 Gauge Steel framing & Gripshank Fasteners at 6"o.c. Perimeter & 12" o.c. Field Studs - Dated: 7/20/2011.

A **Pei** test report No.2010-765C - ASTM E 2126-07A Test with 7/16" OSB Structure 1 on 16 Gauge Steel framing & Gripshank Fasteners at 2"o.c. Perimeter & 12" o.c. Field Studs - Dated: 7/20/2011.

A **Pei** test report No.2010-765D - ASTM E 2126-07A Test with 7/16" OSB Structure 1 on 16 Gauge Steel framing & Gripshank Fasteners at 6"o.c. Perimeter & 12" o.c. Field Studs - Dated: 7/20/2011.

**Product Documentation Continued**

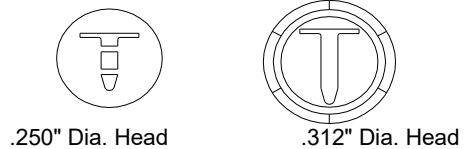
A **Pei** test report No.2010-765E - ASTM E 2126-07A Test with 7/16" OSB Structure 1 on 18 Gauge Steel framing & Gripshank Fasteners at 4"o.c. Perimeter & 12" o.c. Field Studs - Dated: 7/20/2011.  
 A **Pei** test report No.2010-765G - ASTM E 2126-07A Test with 7/16" OSB Structure 1 on 14 Gauge Steel framing & Gripshank Fasteners at 2"o.c. Perimeter & 12" o.c. Field Studs - Dated: 7/20/2011.  
 A **Pei** test report No.2010-766A - ASTM E 564-06 Test with 7/16" OSB Structure 1 on 14 Gauge Steel framing & Aerosmith Gripshank Pins at 6"o.c. Perimeter & 12" o.c. Field Studs - Dated: 2/16/2011.  
 A **Pei** test report No.2010-766B - ASTM E 564-06 Test with 15/32" Plywood on 16 Gauge Steel framing & Aerosmith Gripshank Pins at 6"o.c. Perimeter & 12" o.c. Field Studs - Dated: 2/16/2011.  
 A **Pei** test report No.2010-766C - ASTM E 564-06 Test with 15/32" Plywood on 16 Gauge Steel framing & Aerosmith Gripshank Pins at 2"o.c. Perimeter & 12" o.c. Field Studs - Dated: 2/16/2011.  
 A **Pei** test report No.2010-766D - ASTM E 564-06 Test with OSB, Structure 1 on 18 Gauge Steel framing & Aerosmith Gripshank Pins at 4"o.c. Perimeter & 12" o.c. Field Studs - Dated 2/17/2011.  
 A **Pei** test report No.2010-766E - ASTM E 564-06 Test with OSB, Structure 1 on 16 Gauge Steel framing & Aerosmith Gripshank Pins at 6"o.c. Perimeter & 12" o.c. Field Studs - Dated: 8/31/2010.  
 A **Pei** ICC-ES & ESR Report - AC230 Calcs - Dated: 7/14/2011 - Stamped by a Professional Engineer.  
 A **Pei** test report No.2011-0427A - ASTM E 330 Negative Windload Test on Dry 5/8" USG Securock Firecode X Glass-Mat Sheathing Vertical on 24" o.c. 18 Ga. Steel Framing Using a Steel Pin P/N 2385A - Dated: 3/17/2011.  
 A **Pei** test report No.2011-0427B - ASTM E 330 Negative Windload Test on Dry 5/8" USG Securock Firecode X Glass-Mat Sheathing Vertical on 24" o.c. 16 Ga. Steel Framing Using a Steel Pin P/N 2385A - Dated: 3/22/2011.  
 A **Pei** test report No.2011-1679 - ASTM B117 Corrosion Resistance Testing of Aerosmith Brand Fasteners and Cold Formed Steel Framing.

**Product Labeling**

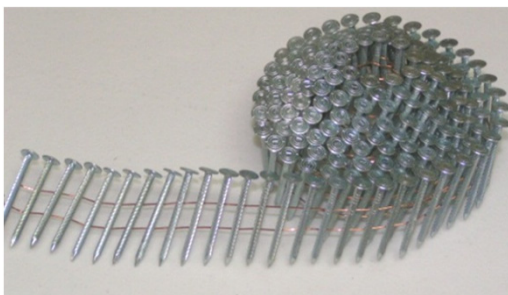
Each Box of fasteners shipped, that are covered by this **Product Evaluation Report**, must have a label attached with at least the following information:

1. **Aerosmith Fastening Systems** Name, Address or Website.
2. Fastener designation
3. This **Product Evaluation Report** number & **Pei ES** logo
4. The Catalog Number
5. A Lot Number & Mfg. Plant Identification/Traceability
6. A Trademark head stamp by **Aerosmith** as shown
7. Florida Building Code (FBC) - FL#14885-R2
8. ICC-ES Report ESR-1641 (as applicable)
9. ICC-ES Report ESR-3145 (as applicable)

Head Stamps



**Acceptable Evaluation Marks**



Gripshank Pins in collated form



Boxes of Gripshank Pins as shipped

**Table 1a - James Hardie Siding Fastened with Gripshank Fasteners**

Maximum Allowable Wind Speed (mph-3 second gust) Based on 2009 IBC section 1609.1.1 (ASCE 7 - 05)										
Siding Type & Dimensions	Diameter	Nailing Method	Stud Spacing	Zone	Exposure					
					B		C		D	
					<30'	15'	30'	15'	30'	
48" x 96" Hardipanel Vertical Siding	.250"	Face	16"	4	120	110	100	100	100	
				5	110	100	90	90	90	
48" x 96" Hardipanel Vertical Siding	.250"	Face	24"	4	110	100	90	90	90	
				5	100	90	85	85	-	
5/16" tk. x 6-1/4" wide Hardiplank Lap Siding	.250"	Face	24"	4	170	150	150	140	130	
				5	150	140	130	130	120	
5/16" tk. x 7-1/4" wide Hardiplank Lap Siding	.250"	Face	24"	4	150	140	130	120	120	
				5	130	120	110	110	100	
5/16" tk. x 8-1/4" wide Hardiplank Lap Siding	.250"	Face	24"	4	130	120	110	110	100	
				5	120	110	100	100	90	
5/16" tk. x 5-1/4" wide Hardiplank Lap Siding	.312"	Blind	24"	4	140	-	-	-	-	
				5	125	-	-	-	-	
5/16" tk. x 6-1/4" wide Hardiplank Lap Siding	.312"	Blind	24"	4	120	110	100	100	90	
				5	110	100	90	90	85	
5/16" tk. x 7-1/4" wide Hardiplank Lap Siding	.312"	Blind	24"	4	90	85	-	-	-	
				5	85	-	-	-	-	
5/16" tk. x 8-1/4" wide Hardiplank Lap Siding	.312"	Blind	24"	4	85	-	-	-	-	
				5	-	-	-	-	-	
5/16" tk. x 6-1/4" wide Hardiplank Lap Siding with 15/32" Plywood Underlayment	.312"	Blind	24"	4	120	110	100	100	100	
				5	110	100	90	90	90	

**Table 1b - James Hardie Siding Fastened with Gripshank Fasteners**

Maximum Allowable Wind Speed (mph-fastest mile) Based on 1997 UBC										
Siding Type & Dimensions	Nominal Head	Nailing Method	Stud Spacing	Zone	Exposure					
	Diameter				B		C		D	
	<30'				15'	30'	15'	30'		
48" x 96" Hardipanel Vertical Siding	.250"	Face	16"	4	110	100	90	80	80	
				5	100	80	80	70	70	
48" x 96" Hardipanel Vertical Siding	.250"	Face	24"	4	100	90	80	70	70	
				5	90	80	70	70	-	
5/16" tk. x 6-1/4" wide Hardiplank Lap Siding	.250"	Face	24"	4	130	130	120	120	110	
				5	130	120	110	100	100	
5/16" tk. x 7-1/4" wide Hardiplank Lap Siding	.250"	Face	24"	4	130	110	110	100	90	
				5	120	100	90	90	80	
5/16" tk. x 8-1/4" wide Hardiplank Lap Siding	.250"	Face	24"	4	120	100	90	90	80	
				5	110	90	80	80	70	
5/16" tk. x 6-1/4" wide Hardiplank Lap Siding	.312"	Blind	24"	4	110	90	90	80	80	
				5	100	80	80	70	70	
5/16" tk. x 7-1/4" wide Hardiplank Lap Siding	.312"	Blind	24"	4	80	70	-	-	-	
				5	70	-	-	-	-	
5/16" tk. x 8-1/4" wide Hardiplank Lap Siding	.312"	Blind	24"	4	70	-	-	-	-	
				5	-	-	-	-	-	
5/16" tk. x 6-1/4" wide Hardiplank Lap Siding with 15/32" Plywood Underlayment	.312"	Blind	24"	4	110	100	90	80	80	
				5	100	80	80	70	70	
5/16" tk. x 8-1/4" wide Hardiplank Lap Siding	.312"	Blind	24"	4	70	-	-	-	-	
				5	-	-	-	-	-	
5/16" tk. x 6-1/4" wide Hardiplank Lap Siding with 15/32" Plywood Underlayment	.312"	Blind	24"	4	110	100	90	80	80	
				5	100	80	80	70	70	

1. For Vertical Siding, pins were set 8" o.c. in the field, 4" o.c. around the perimeter, 3/8" from panel edge & 2" from corners.
2. For Lap siding, butt joints were placed at 1/3 and 2/3 of wall height, siding was overlapped 1-1/4", and pins were set at 3/8" from siding end and 3/4" up from bottom edge.
3. All siding used Gripshank fasteners, 20ga x 33ksi CWN C-studs (depth = 1-3/8", flange = 3-5/8", and a return = 3/8"), wall heights for the above values = 30ft or less.
4. Zone 4 is the interior section of the wall between Zone 5s & Zone 5 is the section within a minimum of 3 ft. of all corners.



**Table 1c - Glass-mat Sheathing & James Hardie Siding Fastened with Gripshank Fasteners**

Maximum Allowable Wind Speed (mph-3 second gust) Based on the 2012/2015 IBC section 1609.1.1(ASCE 7 - 10) & 2010 FBC									
Siding Type & Dimensions	Nominal Head	Nailing Method	Stud Spacing	Zone	Exposure				
					B	C		D	
					<30'	15'	30'	15'	30'
5/8" Densglass Fireguard Gold Type X	.312"	Face	16"	4	140	128	118	115	109
				5	126	115	106	104	98
5/8" Densglass Fireguard Gold Type X	.312"	Face	24"	4	144	131	121	118	112
				5	129	118	109	107	100
5/8" USG Securock Firecode Glass-mat Type X	.312"	Face	24"	4	130	118	109	107	101
				5	117	106	99	96	91
5/8" USG Securock Firecode Glass-mat Type X	.312"	Face	24"	4	135	123	114	111	104
				5	121	111	102	100	94
4'x4'x5/16" Hardipanel	.244"	Face	16"	4	130	118	110	107	101
				5	117	107	99	96	91
4'x4'x5/16" Hardipanel	.244"	Face	24"	4	106	96	89	87	82
				5	95	87	80	78	74
6-1/4" Wide Plank Hardiplank	.244"	Face	24"	4	179	164	151	148	139
				5	161	147	136	133	125
7-1/4" Wide Plank Hardiplank	.244"	Face	24"	4	155	142	131	128	120
				5	140	127	118	115	108
8-1/4" Wide Plank Hardiplank	.244"	Face	24"	4	135	124	114	112	105
				5	122	111	103	100	95
6-1/4" Wide Plank Hardiplank	.285"	Face	24"	4	128	116	108	105	99
				5	115	105	97	95	89
7-1/4" Wide Plank Hardiplank	.285"	Face	24"	4	97	89	82	80	75
				5	87	80	74	72	68
8-1/4" Wide Plank Hardiplank	.285"	Face	24"	4	86	78	72	71	67
				5	77	70	65	64	60
6-1/4" Wide Plank Hardiplank	.285"	Face	24"	4	130	118	110	107	101
				5	117	107	99	96	91
6-1/4" Wide Plank Hardiplank	.285"	Face	24"	4	129	118	109	106	100
				5	116	106	98	96	90
7-1/4" Wide Plank Hardiplank	.285"	Face	24"	4	86	78	72	71	66
				5	77	70	65	64	60
8-1/4" Wide Plank Hardiplank	.285"	Face	24"	4	111	101	94	91	86
				5	100	91	84	82	78
6-1/4" Wide Plank Hardiplank	.285"	Face	24"	4	112	102	94	92	87
				5	100	92	85	83	78

**Table 2 - Allowable Design Pressure Based on ASTM E330 Tests**

Siding Type & Dimensions	Nominal Head Diameter	Fastener Spacing	Gage - Tensile Strength	Stud Size	Stud Spacing	Design Load
5/8" Densglass Fireguard Gold Type X	.312"	8" o.c. Perimeter 8" o.c. Field	16 ga. - 50 KSI	1-3/8" x 3-5/8"	16"	38.1 psf
5/8" Densglass Fireguard Gold Type X	.312"	8" o.c. Perimeter 8" o.c. Field	16 ga. - 33 KSI	1-3/8" x 3-5/8"	24"	40.3 psf
5/8" Densglass Fireguard Gold Type X	.312"	8" o.c. Perimeter 8" o.c. Field	18 ga. - 33 KSI	1-3/8" x 3-5/8"	24"	25.5 psf
5/8" Densglass Fireguard Gold Type X	.312"	8" o.c. Perimeter 8" o.c. Field	22 ga. - 33 KSI	1-3/8" x 3-5/8"	24"	24.7 psf
5/8" GlasRoc Sheathing Panels	.312"	8" o.c. Perimeter	22 ga.	--	24"	21.6 psf
5/8" GlasRoc Sheathing Panels	.312"	8" o.c. Perimeter	18 ga.	--	24"	21.8 psf
5/8" GlasRoc Sheathing Panels	.312"	8" o.c. Perimeter	16 ga.	--	24"	21.5 psf
5/8" GlasRoc Sheathing Panels	.312"	8" o.c. Perimeter	16 ga.	--	16"	34.2 psf
5/8" GlasRoc Sheathing Panels	.312"	6" o.c. Perimeter	16 ga.	--	24"	25.6 psf
5/8" USG Sheetrock Type X Gypsum	.312"	8" o.c. Perimeter 8" o.c. Field	22 ga. - 33 KSI	1-3/8" x 3-5/8"	24"	22.9 psf
5/8" USG <b>Securock</b> Firecode X Glass-Mat Sheathing	.312"	6" o.c. Perimeter 6" o.c. Field	18 ga. - 33 KSI	1-1/2" x 5-3/4"	24"	32.7 psf
5/8" USG <b>Securock</b> Firecode X Glass-Mat Sheathing	.312"	6" o.c. Perimeter 6" o.c. Field	16 ga. - 50 KSI	1-1/2" x 5-3/4"	24"	35.0 psf
1/2" Densglass Gold	.312"	8" o.c. Perimeter 8" o.c. Field	22 ga. - 33 KSI	1-3/8" x 3-5/8"	16"	23.3 psf
1/2" GlasRoc Sheathing Panels	.312"	8" o.c. Perimeter	22 ga.	--	16"	21.7 psf
5/8" USG <b>Securock</b> Firecode X Glass-Mat Sheathing	.312"	6" o.c. Perimeter 4" o.c. Center of Field Stud	18 ga.	1-5/8" legs	24"	32.6 psf
5/8" USG <b>Securock</b> Firecode X Glass-Mat Sheathing	.312"	6" o.c. Perimeter 4" o.c. Center of Field Stud	16ga.	1-5/8" legs	24"	35.3

1. Pins were installed 3/8" from panel edge & 2" from corners.

2. The values in this table are based on testing per ASTM E330, and represent the capacity of the sheathing to resist flexural failure or fastener pull-through using a 2.5 Safety Factor. Framing design is the responsibility of the Designer of record.

Table 2 shows Seismic and Wind Shear Wall values using Aerosmith Brand Pin Fasteners in Cold Formed Steel Framing. The maximum aspect ratio considered is 2:1. A Simpson Strong-Tie model HTT4 Tension Tie (or equivalent) is required at both ends of the wall and must be installed per manufacturer's installation instructions. All steel must be a minimum of 50 ksi.

**Table 3 - Plywood/OSB Shear Wall Wind & Seismic Design Capacity (Based on Cyclic Testing)**

Sheathing	Minimum Sheathing Thickness	Framing Spacing	Minimum Steel Thickness	Minimum Head Diameter	Pin Spacing	Occupancy Category	Unit Shear			
							V <sub>ASD</sub> Seismic	V <sub>ASD</sub> Wind	V <sub>LRFD</sub> Seismic	V <sub>LRFD</sub> Wind
(4 ply) Plywood "Rated Sheathing"	15/32"	24"	16 ga., 54 mils	.305"	2" around Perimeter 12" in Field	I or II	602.0 plf	819.0 plf	903.0 plf	1065.0 plf
						III	655.0 plf		982.0 plf	
						IV	661.0 plf		991.0 plf	
(4 ply) Plywood "Rated Sheathing"	15/32"	24"	16 ga., 54 mils	.305"	4" around Perimeter 12" in Field	I or II	462.0 plf	623.0 plf	693.0 plf	809.5 plf
						III	498.0 plf		747.0 plf	
						IV	501.0 plf		751.5 plf	
(4 ply) Plywood "Rated Sheathing"	15/32"	24"	16 ga., 54 mils	.305"	6" around Perimeter 12" in Field	I or II	322.0 plf	427.0 plf	483.0 plf	554.0 plf
						III	341.0 plf		512.0 plf	
						IV	341.0 plf		512.0 plf	
APA Rated OSB "Structural 1"	15/32"	24"	16 ga., 54 mils	.305"	2" around Perimeter 12" in Field	I or II	611.0 plf	804.0 plf	916.0 plf	1045.0 plf
						III	643.0 plf		964.0 plf	
						IV	643.0 plf		964.0 plf	
APA Rated OSB "Structural 1"	7/16"	24"	16 ga., 54 mils	.305"	4" around Perimeter 12" in Field	I or II	464.0 plf	604.5 plf	696.0 plf	786.0 plf
						III	483.5 plf		725.0 plf	
						IV	483.5 plf		725.0 plf	
APA Rated OSB "Structural 1"	7/16"	24"	16 ga., 54 mils	.305"	6" around Perimeter 12" in Field	I or II	317.0 plf	405.0 plf	476.0 plf	527.0 plf
						III	324.0 plf		486.0 plf	
						IV	324.0 plf		486.0 plf	
APA Rated OSB "Structural 1"	7/16"	24"	18 ga., 43 mils	.305"	4" around Perimeter 12" in Field	I or II	405.0 plf	506.0 plf	607.0 plf	657.0 plf
						III	405.0 plf		607.0 plf	
						III or IV	405.0 plf		607.0 plf	
APA Rated OSB "Structural 1"	7/16"	24"	14 ga., 68 mils	.305"	2" around Perimeter 12" in Field	I or II	765.0 plf	956.0 plf	1147.0 plf	1243.0 plf
						III	765.0 plf		1147.0 plf	
						III or IV	765.0 plf		1147.0 plf	

- The .100" dia. pins were installed 3/8" from panel edge & 2" from corners.
- Values based on wall testing per ASTM E 2126-07a, Method C and ASTM E 564-06.
- ASD and LRFD calculations based on AISI S213-07-S1-09, Section C.
- CFSF shall comply with ICC AC 230, Nov. 1, 2010; Section 3.3 for grades, dim, yield & tensile strength.
- The 4"/12" spacing values are interpolated from the actual tested values for 2"/12" and 6"/12" results.
- The sheathing is to be installed vertically with a double stud at each sheathing seam. (48"o.c.)

**Table 4 - Unadjusted Shearwall Static Test Results Using Gripshank Pins**

Maximum Allowable Shear for Plywood Shear Walls using .100" Pins (lbs. per foot)								
Plywood Grade	Framing Spacing	Minimum Steel Gauge	Minimum Panel Thickness	Pin Spacing				
				6" on Edge 6" in Field	4" on Edge 6" in Field	3" on Edge 6" in Field	2" on Edge 6" in Field	4" on Edge 8" in Field
Structural I	24"	20 ga., 33 mils	3/8"	155	235	310	395	---
	24"	20 ga., 33 mils	7/16"	170	255	340	435	---
	24"	20 ga., 33 mils	15/32"	205	305	410	520	---
Grades other than Structural I	24"	20 ga., 33 mils	3/8"	140	210	280	360	---
	24"	20 ga., 33 mils	7/16"	155	230	310	390	---
	24"	20 ga., 33 mils	15/32"	185	275	370	470	---
APA Rated Sheathing	16"	16 ga., 54 mils	19/32"	---	---	---	---	551.9 using 3x safety factor

- Values listed are test values and have not been changed by wind or seismic adjustment factors.
- The minimum panel edge distance for pin placement is 3/8 inch
- The track-to-stud connection is permitted to be any means of one .100" diameter by 3/4" long Aerosmith pin at each track-to stud connection, for a total of two at each end to each stud.
- Nominal head diameter is .250".



**Table 5 - Aerosmith .100" Dia. VersaPins Ultimate Shear Values (Steel to Steel)<sup>3</sup>**

Layers	(Gauge) Inches/ksi	(Gauge) Inches/ksi	# of Tests <sup>1</sup>	Coupon Size <sup>2</sup>	Average Load (lbs.)	Knurled Pin	Fastener Point
	Top Layer	Bott. Layer					
2	(16).060/50	(15).068/50			1,129.7	Helical	Balistic
2	(15).068/50	(15).068/50			1,345.1	Helical	Balistic
2	(18).046/33	(16).057/50			920.5	Helical	Balistic
2	(18).045/33	(18).046/33			571.5	Helical	Balistic
2	(19).041/50	(19).041/50			202.7	Helical	Balistic
2	(19).041/50	(16).060/50			508.7	Helical	Balistic
2	(18).047/33	(18).046/33			331.8	Helical	Balistic
2	(14).073/50	(16).058/50			778.0	Helical	Balistic
2	(14).071/50	(16).058/50			777.9	Helical	Balistic
2	(16).058/50	(16).058/50			828.3	Helical	Balistic
2	(16).059/50	(16).057/50			828.3	Helical	Balistic
2	(15).071/50	(16).057/50		Steel Stud	1,088.5	Helical	Balistic
2	(15).072/50	(16).057/50		Steel Stud	1,097.1	Helical	Balistic
2	(15).072/50	(16).057/50		Steel Stud	1,079.3	Helical	Balistic
1	(20).036/50		20	Hat-Section	331.0	Gripshank	Super Sharp
1	(20).036/50		10	Hat-Section	329.6	Gripshank	Super Sharp
1	(18).0428/43		10	Steel Channel	512.0	Gripshank	Super Sharp

Notes:

1. Three (3) tests were recorded for each coupon combination unless otherwise noted.
2. Coupon Sizes are 4" x 8" unless otherwise noted.
3. Applications include (but are not limited to) stud-to-track, pack studs, built-up headers, and walls with strapping.

**Table 6 - Sure-Board Series 200 Structural Panel Racking Resistance (Gripshank Pins)**

Fasteners <sup>1</sup>	Studs	Sheathing	Hold Downs	Peak Force	Mean Drift (In.)
Screw = No. 8 x 1-3/4" / Aerosmith 1-3/8" x 1/4-in. diameter head.	16 ga., 54 mils / 16" o.c.	4ft. X 9ft. Sure-Board Series 200 - 1/4" Magnesium Board	SHD15	9981 lbs.	1.238"
Screw = No. 8 x 1-3/4" / Aerosmith 1-3/8" x 1/4-in. diameter head.	18 ga., 43 mils / 16" o.c.	4ft. X 9ft. Sure-Board Series 200 - 1/4" Magnesium Board	SHD15	8803 lbs.	1.196"
Screw = No. 8 x 1-3/4" / Aerosmith 1-1/4" x 5/16-in. diameter head.	16 ga., 54 mils / 16" o.c.	4ft. X 9ft. Sure-Board Series 200 - 5/8" Densglass Gold	(2)SHD10 (1) SHD15	11301 lbs.	1.606"
Screw = No. 8 x 1-3/4" / Aerosmith 1-1/4" x 5/16-in. diameter head.	18 ga., 43 mils / 16" o.c.	4ft. X 9ft. Sure-Board Series 200 - 5/8" Densglass Gold	(2)SHD10 (1) SHD15	9797 lbs.	1.505"

Notes:

1. The spacing for the Grabber Screws and Aerosmith pins are as follows: Vertical Perimeter Fasteners Screws are 12" on-center (o.c.); five(5) Aerosmith pins installed between screws at approximately 2" o.c. Vertical Field Fasteners Screws were 12" o.c.; Aerosmith Pins 12" o.c. (installed between self drilling screws) Horizontal Perimeter Fasteners Screws 2" o.c. in top and bottom plate members; no pins.

**Table 7 - Ultimate Test Values from ASTM E 2126-07a Testing using  
Aerosmith Brand pin Fasteners in Cold Formed Steel Framing**

Sheathing	Framing Spacing	Minimum Steel Thickness	Nomimal Pin Dia. & Min. Head Dia.	Pin Spacing	Ultimate Load
15/32" (4 ply) Plywood <b>"Rated Sheathing"</b>	24" o.c.	16 ga., 54 mils	.100" dia. x .305" dia. head	2" around Perimeter 12" in Field	1721.0 plf
				4" around Perimeter 12" in Field	*1304.9 plf
				6" around Perimeter 12" in Field	888.9 plf
7/16" APA Rated OSB <b>"Structural 1"</b>	24" o.c.	14 ga., 68 mils	.144" dia. x .295" dia. head	2" around Perimeter 12" in Field	1911.5 plf
		16 ga., 54 mils	.100" dia. x .305" dia. head	2" around Perimeter 12" in Field	1674.9 plf
		16 ga., 54 mils	.100" dia. x .305" dia. head	4" around Perimeter 12" in Field	*1259.9 plf
		16 ga., 54 mils	.100" dia. x .305" dia. head	6" around Perimeter 12" in Field	844.9 plf
		18 ga., 43 mils	.100" dia. x .305" dia. head	4" around Perimeter 12" in Field	1011.4 plf

Notes:

1. A Simpson Strong-Tie model HTT4 Tension Tie (or equivalent) is required at both ends of the wall and must be installed per manufacturer's installation instructions.
2. CFSF shall comply with ICC AC 230, Nov. 1, 2010; Section 3.3 for grades, dim, yield & tensile strength. 50 ksi minimum steel.
3. \*The 4"/12" spacing value using Plywood or OSB was interpolated from the actual tested values for 2"/12" and 6"/12" results.
4. The maximum aspect ratio is 2:1.
5. The sheathing is to be installed vertically with a double stud at each sheathing seam. (48"o.c.)
6. ASTM E2126 under ICC-ES AC230 standard deviation +/- 10% before additional testing.

**Table 8 - Ultimate Test Values from ASTM E 564-06 Testing using  
Aerosmith Brand pin Fasteners in Cold Formed Steel Framing**

Sheathing	Framing Spacing	Minimum Steel Thickness	Nomimal Pin Dia. & Min. Head Dia.	Pin Spacing	Ultimate Load
15/32" (4 ply) Plywood <b>"Rated Sheathing"</b>	24" o.c.	16 ga., 54 mils	.100" dia. x .305" dia. head	2" around Perimeter 12" in Field	2193 plf
				4" around Perimeter 12" in Field	*1597 plf
				6" around Perimeter 12" in Field	1002 plf
7/16" APA Rated OSB <b>"Structural 1"</b>	24" o.c.	14 ga., 68 mils	.144" dia. x .295" dia. head	6" around Perimeter 12" in Field	1007 plf
		16 ga., 54 mils	.100" dia. x .305" dia. head	6" around Perimeter 12" in Field	997 plf
		18 ga., 43 mils	.100" dia. x .305" dia. head	4" around Perimeter 12" in Field	1327 plf

Notes:

1. A Simpson Strong-Tie model HTT4 Tension Tie (or equivalent) is required at both ends of the wall and must be installed per manufacturer's installation instructions.
2. CFSF shall comply with ICC AC 230, Nov. 1, 2010; Section 3.3 for grades, dim, yield & tensile strength. 50 ksi minimum steel.
3. \*The 4"/12" spacing value using 15/32" Plywood was interpolated from the actual tested values for 2"/12" and 6"/12" results.
4. The maximum aspect ratio is 2:1.
5. The sheathing is to be installed vertically with a double stud at each sheathing seam. (48"o.c.)
6. ASTM E564 standard deviation +/- 15% before additional testing.

Exposure: B Structure Class: II		<b>Basic Wind Speed</b>							
		85	90	100	110	120	130	140	150
<b>Basic Pressure (<math>P_{net30}</math>)</b>		16.2	18.2	22.5	27.2	32.4	38.0	44.0	50.5
Building Ht. (ft.)	Ht & Exp. Factor	<b>Design Wind Pressure (PSF)</b>							
0-15	1.00	16.2	18.2	22.5	27.2	32.4	38.0	44.0	50.5
20	1.00	16.2	18.2	22.5	27.2	32.4	38.0	44.0	50.5
25	1.00	16.2	18.2	22.5	27.2	32.4	38.0	44.0	50.5
30	1.00	16.2	18.2	22.5	27.2	32.4	38.0	44.0	50.5
35	1.05	17.0	19.1	23.6	28.6	34.0	39.0	46.2	53.0
40	1.09	17.7	19.8	24.5	29.6	35.3	41.4	48.0	55.0
45	1.12	18.1	20.4	25.2	30.5	36.3	42.6	49.3	56.6
50	1.16	18.8	21.1	26.1	31.6	37.6	44.1	51.0	58.6

**Note:**  $K_{zt} = 1.0$ ,  $K_d = 1.0$ ,  $GC_p = 1.8$ ,  $GC_{pi} = 0.18$  (Per ASCE 7-10, Method 1)

Design Wind Pressure = Net Pressure

		$K_z$								
Building Ht. (ft.)	Exp B	Exp C	Exp D	$K_{zt}$	$K_d$	I	Zone 4 $GC_p$	Zone 5 $GC_p$	$GC_{pi}$	
0-15	0.70	0.84	1.03	1	0.85	1	1.1	1.4	0.18	
20	0.70	0.90	1.08	1	0.85	1	1.1	1.4	0.18	
25	0.70	0.94	1.12	1	0.85	1	1.1	1.4	0.18	
30	0.70	0.98	1.16	1	0.85	1	1.1	1.4	0.18	
35	0.73	1.01	1.19	1	0.85	1	1.1	1.4	0.18	
40	0.76	1.04	1.22	1	0.85	1	1.1	1.4	0.18	
45	0.78	1.06	1.24	1	0.85	1	1.1	1.4	0.18	
50	0.81	1.09	1.27	1	0.85	1	1.1	1.4	0.18	

Building Ht. (ft.)	q (Zone 4)			q (Zone 5)		
	Exp B	Exp C	Exp D	Exp B	Exp C	Exp D
0-15	0.001950	0.002340	0.002869	0.002407	0.002888	0.003541
20	0.001950	0.002507	0.003008	0.002407	0.003094	0.003713
25	0.001950	0.002618	0.003120	0.002407	0.003232	0.003851
30	0.001950	0.002730	0.003231	0.002407	0.003369	0.003988
35	0.002033	0.002813	0.003314	0.002510	0.003472	0.004091
40	0.002117	0.002897	0.003398	0.002613	0.003576	0.004194
45	0.002173	0.002952	0.003454	0.002682	0.003644	0.004263
50	0.002256	0.003036	0.003537	0.002785	0.003748	0.004366