

SBCCI PUBLIC SAFETY TESTING AND EVALUATION SERVICES INC.

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a Participating Member of the NES, Inc.

Evaluation Reports are the opinion of the Committee on Evaluation, based on the findings, and do not constitute or imply an approval or acceptance by any local community. The Committee, in review of the data submitted, finds that in their opinion the product, material, system, or method of construction specifically identified in this report conforms with or is a suitable alternate to that specified in the Standard and International Codes,

SUBJECT TO THE LIMITATIONS IN THIS REPORT.

The Committee on Evaluation has reviewed the data submitted for compliance with the *Standard Building Code*, the *SBCCI Standard for Hurricane Resistant Residential Construction SSTD 10-99*, and the *Florida Building Code* and submits to the Building Official or other authority having jurisdiction the following report. The Committee on Evaluation, SBCCI PST & ESI and its staff are not responsible for any errors or omissions to any documents, calculations, drawings, specifications, tests or summaries prepared and submitted by the design professional or preparer of record that are listed in the Substantiating Data Section of this report.
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REPORT NO.: 2247

EXPIRES: See current SBCCI PST & ESI EVALUATION REPORT LISTING

CATEGORY: DOORS AND WINDOWS

SUBMITTED BY:

PlyFASTner, LLC
1951 TEAKWOOD ROAD
CHARLESTON, SOUTH CAROLINA 29414
(843) 766-8199

1. PRODUCT TRADE NAME

PlyFASTner™ - Protective Panel Connector

2. SCOPE OF EVALUATION

Structural

3. USES

The PlyFASTner™ - Protective Panel Connector is a system which includes a PlyFASTner™ bracket and a stainless steel lag. These connectors are used to hold structural plywood over windows and doors during a high wind storms such as hurricanes. See Figure 1.

4. DESCRIPTION

PlyFASTner™ - Protective Panel Connector system is made up of 6 PlyFASTner™ brackets and 6 stainless steel lag bolts per protective panel. The maximum panel size is 4 feet by 8 feet over an opening 3 ft. 4 inch. by 7 ft. 4 inch. The structural panel shall be minimum ½ inch thick, 3 ply. See Figure 2.

The PlyFASTner™ connectors have been tested to withstand a negative pressure on 4 ft by 8 ft. structural panels as great as 52 psf. However, the design load on the panel may not exceed the smaller of two loads, 52 psf or the load as indicated in Table 602A1, 602A2, and 602A3 in Chapter 6 of SSTD 10-99.

5. INSTALLATION

The manufacturer's published installation instructions and this report shall be strictly adhered to and a copy of these instructions shall be available at all times on the job site during installation. The instructions within this report govern if there are any conflicts between the manufacturer's instructions and this report.

The elements supporting the connectors shall be designed by a registered professional engineer for the wind loads shown in the codes.

Table 1 and Figure 2 indicates the spacing between fastener using ½ inch thick structural panels.

5.1 Mounding to Wood

When mounting into wood for a wood or vinyl veneer construction, the stainless steel lag bolt must be embedded a minimum of 2-1/2 inches into jack stud for the window or door which has a specific gravity of 0.50.

When mounting into wood for a brick veneer construction, a hole must be drilled through the veneer so the stainless steel lag bolt can be embedded directly into the jack stud a minimum of 2-1/2 inches. The jack stud must have a specific gravity of 0.50.

5.2 Mounding to Solid Concrete Masonry Construction

When mounding into solid concrete masonry construction, the stainless steel lag bolts are to be embedded a minimum of 3 inch into the solid concrete masonry using AC5.5Plus Powers Adhesive.

When installing into solid CMU, the owner or the registered design professional in responsible charge acting as the owner's agent shall employ a special inspectors to provide inspections during construction. The special inspector shall be a qualified person who shall demonstrate competence, to the satisfaction of the building official, for inspection of the particular type of construction or operation requiring special inspection.

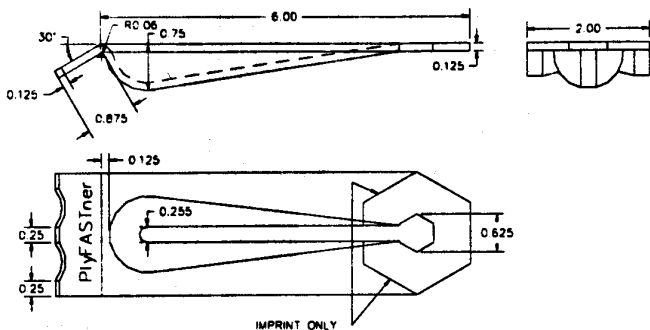
**TABLE 1
WINDBORNE DEBRIS PROTECTION FASTENER SCHEDULE
FOR WOOD STRUCTURAL PANELS USING PLYFASTNER CONNECTORS**

Fastener Type	Fastener Spacing (in.)			
	Panel Span ¹ ≤ 2 ft.	2 ft < Panel Span ¹ ≤ 4 ft.	4 ft < Panel Span ¹ ≤ 6 ft.	6 ft < Panel Span ¹ ≤ 8 ft.
PlyFASTner	30	30	15	15

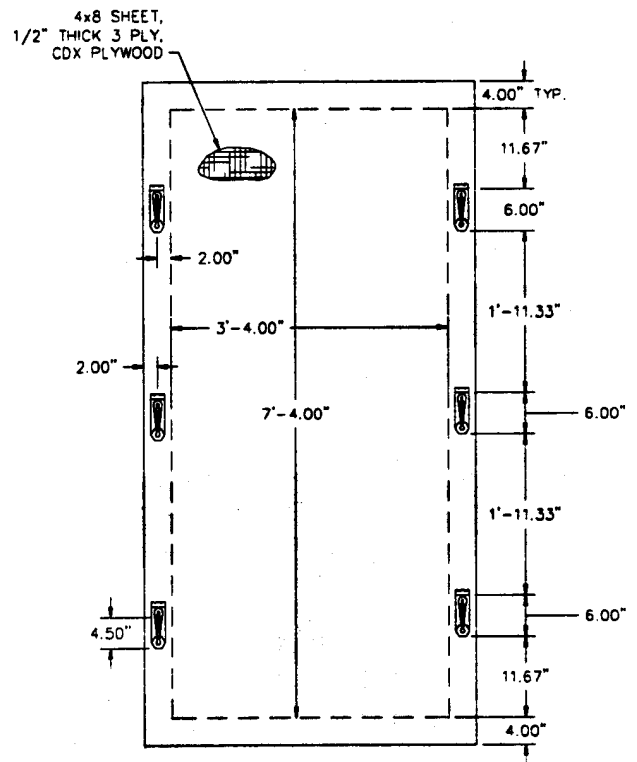
Note:

"Panel Span" is defined as horizontal distance between PlyFASTners on opposite sides of an opening.

**FIGURE 1
PlyFASTner Connector Details**



**FIGURE 2
PlyFASTner System**



Showing Largest Permissible Spacing

6. SUBSTANTIATING DATA

- 6.1 Manufacturer's specifications, and installation drawings:
 6.2 Negative wind load test according to ASTM E-330, prepared by Hurricane Engineering & Testing, Inc., Report No. HETI-02-1137, dated February 14, 2002, signed by Syed Waqar Ali, Ph. D..
 6.3 Cyclic pressure loading test according to SSTD 12-99 & ASTM E-1886-97, prepared by Hurricane Engineering & Testing, Inc., Report No. HETI-02-1138, dated February 14, 2002, signed by Syed Waqar Ali, Ph. D..
 6.4 Anchor test according to ASTM E-488-90, prepared by Hurricane Engineering & Testing, Inc., Report No. HETI-02-6007, dated September 18, 2002, signed by Syed Waqar Ali, Ph. D..
 6.5 Tensile test according to ASTM E-8, prepared by Hurricane Engineering & Testing, Inc., Report No. HETI-02-T007, dated February 25, 2002, signed by Syed Waqar Ali, Ph. D..
 6.6 Engineering Calculations and titled "PlyFASTner Design and Detailing Report" dated April 22, 2002 and signed by Timothy Wayne Ways, Ph.D., E.I.T., and signed and sealed by Charles Lindbergh, Ph.D., P.E.
 6.7 Engineering Letter dated November 7, 2002, signed and sealed by Maurice Harlan, P.E.

7. CODE REFERENCES

Standard Building Code© - 1999 Edition

Section 103.7	Alternate Materials and Methods
Section 1606	Wind Loads
Chapter 17	Structural Tests and Inspections
Section 1707.4	Exterior Window and Door Assemblies
Appendix I	Wood Hurricane Shutter Design and Installation
Appendix J	Special Requirements for Buildings Constructed in Hurricane-Prone Regions

SBCCI Standard for Hurricane Resistant Residential Construction © SSTD10-99

Section 101.3	Integrity of Building Envelope
Section 101.4	Alternate Materials and Methods
Section 101.6	Design Concepts
Section 104	Design Criteria
Section 104.1	Wind Loads
Chapter 6	Windows and Doors
Appendix B	Design Load Assumptions

Florida Building Code© - 2001 Edition

Section 103.7	Alternate Materials and Methods
Section 1606	Wind Loads
Chapter 17	Structural Tests and Inspections
Section 1707.4	Exterior Window and Door Assemblies

8. COMMITTEE FINDINGS

The Committee on Evaluation in review of the data submitted finds that, in their opinion, the PlyFASTner™ - Protective Panel Connector System as described in this report conforms with or is a suitable alternate to that specified in the *Standard Building Code*©, the *SBCCI Standard for Hurricane Resistant Residential Construction*© SSTD 10-99, and the *Florida Building Code*© or Supplements thereto.

9. LIMITATIONS

- 9.1 This Evaluation Report and the installation instructions, when required by the building official, shall be submitted at the time of permit application.
 9.2 The connectors shall not be used in brick veneer.
 9.3 The structural elements supporting the connectors shall be designed by a registered professional engineer for the wind loads shown in the codes. The calculations shall be signed, sealed, and dated and submitted to the building official when applying for a permit.
 9.4 This report is limited to maximum 110 mph fastest mile wind zones or 130 mph 3 sec. gust wind zone.
 9.5 The center of gravity for the bracket shall be below the head of the lag bolt when installed.
 9.6 When installing into solid CMU, the owner or the registered design professional in responsible charge acting as the owner's agent shall employ a special inspectors to provide inspections during construction. The special inspector shall be a qualified person who shall demonstrate competence, to the satisfaction of the building official, for inspection of the particular type of construction or operation requiring special inspection.

10. IDENTIFICATION

Each PlyFASTner™ - Protective Panel Connector covered by this report shall be labeled with the manufacturer's name and/or trademark, the SBCCI Public Safety Testing and Evaluation Services Inc. seal or initials (SBCCI PST & ESI), and the number of this report for field identification.

11. PERIOD OF ISSUANCE

SEE CURRENT SBCCI PST & ESI EVALUATION REPORT LISTING FOR STATUS OF THIS EVALUATION REPORT.

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