The Committee on Evaluation has reviewed the data submitted for compliance with the Standard Building Code® SBCCI Standard for Hurricane Resistant Residential Construction® SSTD 10-99, the International One and Two Family Dwelling Code, and the Florida Building Code 2001 - Building 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. Portions of this report were previously included in Evaluation Report #2139. Copyrighted © 2002 SBCCI PST & ESI

REPORT NO.: 2139A

EXPIRES:  See current SBCCI PST & ESI EVALUATION REPORT LISTING

CATEGORY:  DOORS AND WINDOWS

SUBMITTED BY:

COLLIER
A DIVISION OF SYSTEM DESIGN & MFG. INC.
48 DALKEITH DRIVE
BRANTFORD, ONTARIO, CANADA N3P 1N6
1-800-567-1647

1. PRODUCT TRADE NAME

Collier/Fortress Garage Doors:
1.1 Collier/Fortress Level 1 Wind Load Hardware Package
1.2 Collier/Fortress Level 2 Wind Load Hardware Package
1.3 Collier/Fortress Level 3 Wind Load Hardware Package

2. SCOPE OF EVALUATION

2.1 Structural - Transverse Wind Loads
2.2 Impact Resistance under SSTD 12

3. USES

Collier/Fortress Garage Doors are used as garage doors with specified allowable wind load pressures.

4. DESCRIPTION

4.1 General

Collier/Fortress Garage Doors are steel panel doors, both insulated sandwich panels and single skin non-insulated panels.

The doors that are produced as single skin non-insulated panels are constructed of 25 gauge (0.019 inches) and 24 gauge (0.021 inches) galvanized steel minimum G 40 per ASTM A 653 with a minimum yield of 30,000 psi.

The doors that are produced as insulated sandwich panels are constructed of 26 gauge (0.015 inches) steel skin on the exterior side and a 26 gauge (0.014 inches) steel skin on the interior side with polystyrene minimum 1 pcf density core sandwiched in-between the two skins. The steel panels are galvanized steel minimum G 40 per ASTM A 653 with a minimum yield of 30,000 psi. The panels have a minimum thickness of 1-3/8 inches and maximum of 2 inches.

The doors are reinforced internally with vertical stiles, 20 gauge (0.035 inch) galvanized steel. The doors are reinforced externally with rolled-formed galvanized steel braces 2-1/4 inch by 19 gauge (0.044 inches) Collier Struts installed horizontally on the back of the door panels. The horizontal struts are attached with 1/4 inch x 3/4 inch self tapping screws to the vertical internal struts and glued to the door skin. The struts are galvanized steel minimum G 40 per ASTM A 653 with a minimum yield of 30,000 psi. Doors with widths of 10 feet or greater are also reinforced with vertical posts. The vertical post is a 3 inch C-Channel designated as a Fortress Aluminum C-Channel No. 200 or No. 205 (6061-T6) which is activated when there is a Hurricane Warning. See Figure 1, Hurricane Activation Label. The doors were tested and Engineering Calculations were performed to establish specified Allowable Wind Loads. See Table 1 for Allowable Transverse Wind Loads.

4.2 Models

4.2.1 Collier/Fortress Level 1 Wind Load Hardware Package:  Doors 10 feet or greater in width are provided with one vertical Fortress Aluminum C-Channel No. 200 post and mounting hardware.
4.2.2 Collier/Fortress Level 2 Wind Load Hardware Package: Doors 10 feet or greater in width are provided with two vertical Fortress Aluminum C-Channel No. 200 posts and mounting hardware.

4.2.3 Collier/Fortress Level 3 Wind Load Hardware Package: Doors are provided with one, two or three vertical Fortress Aluminum C-Channel No. 205 posts and mounting hardware. Based on door width.

4.3 Wind Loads

Collier/Fortress Garage Doors were subjected to Transverse Load testing under ASTM E 330. Allowable Transverse Wind Loads are given in Table 1.

4.4 Impact Resistance Under SSTD 12

Collier/Fortress Garage Doors were tested and passed the SSTD 12 Large Missile Impact Criteria, missile weight of 9 lbs (+/- 1/4 lb), missile length of 9 feet (+/- 1 foot), missile speed of 50 fps (+/- 1 fps) which qualifies for a wind speed of greater than or equal to 110 mph, fastest mile. The equivalent basic wind speed for 3 second gust is 130 mph or greater, for use with ASCE 7-98 or the Florida Building Code 2001 - Building.

<table>
<thead>
<tr>
<th>Model</th>
<th>Door W (Max) Ft-In</th>
<th>Door H (max) Ft-In</th>
<th>Drawing Number</th>
<th>Design Load Positive (PSF)</th>
<th>Design Load Negative (PSF)</th>
<th>Reinforcing</th>
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<tr>
<td>Level 1 - 25 GA⁴ Uninsulated</td>
<td>16-0</td>
<td>8-0</td>
<td>CFL1WLP-168</td>
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<td>33</td>
<td>Horizontal Struts² and 1 Vertical Post³</td>
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</table>

Notes Table 1:
1. SI Units Conversion: 1 in. = 25.4 mm, 1 ft. = 0.3 m, 1 psf = 48 Pa
2. Horizontal struts are roll-formed galvanized steel braces 2-1/4 inch by 19 gauge (0.044 inches) Collier Struts that have a minimum yield strength of 30,000 psi. The number of horizontal struts is shown on the engineering drawings.
3. Vertical Posts is a Fortress Aluminum C-Channel No. 200 for Levels 1 and 2 and No. 205 for Level 3, which must be activated to achieve the Allowable Loads noted above. See Hurricane Activation Label Figure 1 in this report.
4. View panels are not permitted. Only solid steel panels were tested and evaluated for the allowable pressures listed above.
5. Doors not tested for impact resistance under SSTD 12, see section 4.4 above.
Figure 1
Hurricane Activation Label

WARNING
POST MUST BE ENGAGED FOR GARAGE DOOR TO WITHSTAND DESIGNED WIND LOADS

1. Close garage door
2. Disconnect power to opener. (If equipped)
3. Lock door in the closed position.
4. Install your Storm Post by inserting the Top Latch into the Top Latch Receiver Bracket, (A) and lowering the post into place, mating the Male Pins into the Pin Receiver Clips (B) and the Bottom Latch into the the Bottom Strike Plate. (C)

The garage door is now in the secure position, DO NOT attempt to operate.
5. To return to normal operation, disengage & store post, unlock garage door, and restore power to opener. Be sure to store post in an easily accessable place.
5. INSTALLATION

5.1 General

Collier/Fortress Garage Doors are installed in accordance with the manufacturer’s published installation instructions, engineering drawings, and this report.

The manufacturer’s published installation instructions and this report shall be strictly adhered to and a copy of these 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.

5.2 Allowable Transverse Wind Loads

The Design Wind Loads on the garage doors shall be determined in accordance with Section 1606 of the Standard Building Code©, ASCE 7-98 or Section 1606 of the Florida Building Code 2001 - Building as applicable and shall not exceed the Allowable Transverse Wind Loads shown in Table 1.

6. SUBSTANTIATING DATA

6.1 Manufacturer’s descriptive literature, specifications and installation instructions.

6.2 Test reports on load testing under ASTM E330, Hurricane Test Laboratory, Inc., signed and sealed by Vinu J. Abraham, P.E.:

6.2.1 Job # 0238-0315-01, Specimen #1, 3/15/01, Collier/Fortress Level 1, 16 feet x 8 feet, 1 vertical post.

6.2.2 Job # 0238-0315-01, Specimen #3, 3/16/01, Collier/Fortress Level 2, 16 feet x 8 feet, 2 vertical posts.

6.2.3 Job # 0238-0315-01, Specimen #5, 3/19/01, Collier/Fortress Level 1, 9 feet x 8 feet, no vertical posts.

6.2.4 Job # 0238-0315-01, Specimen #6, 3/20/01, Collier/Fortress Level 2, 9 feet x 8 feet, no vertical posts.

6.2.5 Job # 0238-0802-00, Specimen #2, 8/9/00, Collier/Fortress Level 3, 18 feet x 8 feet, 3 vertical posts.

6.2.6 Job # 0238-0802-00, Specimen #3, 8/11/00, Collier/Fortress Level 3, 16 feet x 8 feet, 2 vertical posts.

6.2.7 Job # 0238-0802-00, Specimen #5, 8/14/00, Collier/Fortress Level 3, 9 feet x 8 feet, 1 vertical post.

6.2.8 Report # 0238-0918-01, Specimen #1-3, 12/8/01, Collier/Fortress Level 3, 18 feet x 8 feet, 3 vertical posts, Dwg. S-CFL3WLP-199-N.

6.2.9 Report # 0238-0918-01, Specimen # 5, 12/8/01, Collier/Fortress Level 3, 9 feet x 8 feet, 0 vertical posts, Dwg. S-CFL3WLP-98-IN.

6.2.10 Report # 0238-0918-01, Specimen # 6, 12/8/01, Collier/Fortress Level 3, 16 feet x 8 feet, 2 vertical posts, Dwg. S-CFL3WLP-168-IN.

6.2.11 Report # 0238-0918-01, Specimen # 7, 12/8/01, Collier/Fortress Level 2, 16 feet x 8 feet, 1 vertical post, Dwg. S-CFL2WLP-168-IN-35.

6.2.12 Report # 0238-0918-01, Specimen # 8, 12/8/01, Collier/Fortress Level 1, 16 feet x 8 feet, 1 vertical post, Dwg. S-CFL1WLP-168-30.

6.2.13 Letter report on panel gauge thickness and struts used in testing, HTL Inc., December 26, 2001, signed by Jose E. Colon, E.I and signed and sealed by Vinu J. Abraham, P.E.

6.2.14 Report # 0238-0320-02, Specimen #2, 03/27/02, Collier/Fortress Level 3, 16 feet x 8 feet, 2 vertical posts, 25 ga steel panels, Dwg. S-CFL3WLP-168-SES.

6.3 Engineering Drawings, Collier/Fortress Wind Load Hardware Package, prepared by Collier, signed and sealed by Frank A. Fore, P.E.:

6.3.1 CFL1WLP-168, Level 1, 3/26/01, Sheet Nos. 1 and 2, sealed 4/9/01.

6.3.2 CFL2WLP-168, Level 2, 3/26/01, Sheet Nos. 1 and 2, sealed 4/9/01.

6.3.3 CFL1WLP-98, Level 1, 3/26/01, Sheet Nos. 1 and 2, sealed 4/9/01.

6.3.4 CFL2WLP-98, Level 2, 3/26/01, Sheet Nos. 1 and 2, sealed 4/9/01.

6.3.5 CFL3WLP-188, Level 3, Sheet Nos. 1 and 2, sealed 3/21/01.

6.3.6 CFL3WLP-168, Level 3, Sheet Nos. 1 and 2, sealed 3/21/01.

6.3.7 CFL3WLP-98, Level 3, Sheet Nos. 1 and 2, sealed 3/21/01.

6.3.8 S-CFL3WLP-188-IN, Sheet Nos. 1 and 2, sealed 12/3/01.

6.3.9 S-CFL3WLP-98-IN, Sheet Nos. 1 and 2, sealed 12/3/01.

6.3.10 S-CFL3WLP-98-IN, Sheet Nos. 1 and 2, sealed 12/3/01.

6.3.11 S-CFL2WLP-168-IN-35, Sheet Nos. 1 and 2, Sealed 12/3/01.

6.3.12 S-CFL1WLP-168-30, Sheet Nos. 1 and 2, sealed 12/3/01.

6.3.13 S-CFL3WLP-168-SES, Sheet Nos. 1 and 2, sealed 3/28/02.

6.4 Mill Order Certificates:

6.4.1 Steel Coils, Mechanical Properties Venture Steel Inc., 136298, Cust. Order 402549, Sales order 837200, 8/23/00.

6.4.2 Steel, Nova Steel Processing Centre, 24/11/2000, 83790.

6.4.3 Steel, Nova Steel Processing Centre, 09/12/2000, 83790.

6.4.4 Aluminum Alloy 6061 T6, Western Extrusions, February 20, 2001, 142053.

6.4.5 Aluminum Alloy 6061 T6, ASTM B 221, Aluminum Shapes, L.L.C., 3/15/01, 227781.

6.4.6 Hemmed Strut, steel, Titian Winston Steel, 6/19/01.

6.4.7 Inspection Reports, Metallurgical, Inc., ASTM E 8:

- QCM Job# 1JM-1470, November 15, 2001, 4 Samples, Job#0238-0918-01 Inside Skin, Outside Skin, Strut & Track.
- QCM Job# 1KM-1535, November 13, 2001, 1 sample Job#0238-0918-01 Specimen #8.
- QCM Job# 1FM-873, June 27, 2001, 1 sample Job#0238-0820-00.

6.5 Engineering calculations, analysis for door height and panel configurations not tested, EAS Engineering Analysis & Solutions inc., EAS Job No. 01ENG033, signed and sealed by Frank A. Fore, P.E. 6/30/01.
7. CODE REFERENCES

- 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
- Chapter 22 Steel
- Section 2204 Cold-Formed Steel Construction
- Chapter 24 Glass and Glazing
- Section 2405.3 Wind, Snow, and Dead Loads
- Appendix J Special Requirements for Buildings Constructed in Hurricane-Prone Regions

**SBCCI Standard for Hurricane Resistant Residential Construction**© SSTD 10-99
- Section 101.4 Alternate Materials and Methods
- Section 101.3 Integrity of Building Envelope
- Section 101.6 Design Concepts
- Section 104 Design Criteria
- Section 104.1 Wind Loads
- Chapter 6 Windows and Doors
- Appendix B Design Load Assumptions

**International One and Two Family Dwelling Code** - 1998 Edition
- Section 108 Alternate Materials and Systems
- Section 301 Design Criteria
- Section 308.5 Glazing - Wind Loads

**Florida Building Code 2001 - Building**
- 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
- Chapter 22 Steel
- Section 2204 Cold-formed Steel Construction
- Chapter 24 Glass and Glazing
- Section 2405.3 Wind, Snow, and Dead and Impact Loads

8. COMMITTEE FINDINGS

The Committee on Evaluation in review of the data submitted finds that, in their opinion, the Collier/Fortress Garage Doors as described in this report conform with or are suitable alternates to that specified in the **Standard Building Code**©, the **SBCCI Standard for Hurricane Resistant Residential Construction**© SSTD 10-99, the **International One and Two Family Dwelling Code**, and the Florida Building Code 2001 - Building or Supplements thereto.

9. LIMITATIONS

9.1 This Evaluation Report and the installation instructions, when required by the code official, shall be submitted at the time of permit application.

9.2 The doors shall be installed in accordance with the installation instructions in this report and the manufacturer’s published installation instructions.

9.3 The structural elements supporting door track brackets shall be designed by a registered professional engineer for the wind loads shown on the drawings. The calculations shall be signed, sealed, and dated, and submitted to the code official when applying for a permit.

9.4 The doors shall not be installed in areas where the Transverse Wind Loads exceed the Allowable Loads shown in Table 1.

9.5 Fire performance of the doors is outside the scope of this Evaluation Report.

9.6 The doors have not been evaluated for use in High Velocity Hurricane Zones (Broward and Dade Counties) as covered in the **Florida Building Code 2001 - Building**.

10. IDENTIFICATION

Each Collier/Fortress Garage Door 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.

For information on this report contact:
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205/599-9800
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