

CODE CORNER

THE AFTERMATH OF THE HURRICANES New Building Codes Prevent Damage

As the first major storm to hit Florida in several years, Hurricane Charley crashed into the western coast at wind speeds estimated at 140 mph. As a Category 4 storm, damage to the area is estimated in the billions. Just as Floridians were beginning to cope with the destruction, the state was struck in rapid succession by hurricanes Frances, Ivan and Jeanne. While not as intense as Charley in terms of wind speeds, the storms added to the devastating loss of life and property damage.

Recognized for their expertise in building construction and safety, Simpson Strong-Tie was requested to help with assessing structural damage in Florida's affected areas. Immediately following Hurricane Charley, engineers from Simpson's Dallas, Texas, branch were sent as part of two response teams.

The Florida Coastal Monitoring Program sponsored a team of professionals to collect statistical data of damaged homes. Following both Charley and Ivan, Jeremy Gilstrap, P.E., a professional engineer for Simpson Strong-Tie, worked with the team to examine structures throughout the area. Their work included monitoring wind speeds



Simpson Engineer Randy Shackelford (in white shirt) is interviewed by CNN to provide insights on the recent hurricane damage.

during the hurricanes, documenting the dimensional information of homes (width, length, roof configuration, roof slope, etc.), recording structural damage, and surveying the surrounding terrain, which in many cases acted as wind barriers.

Randy Shackelford, P.E., also a professional engineer for Simpson, was contacted by the Federal Alliance for Safe Homes (FLASH) to serve as a technical advisor as they visited residential construction areas from North

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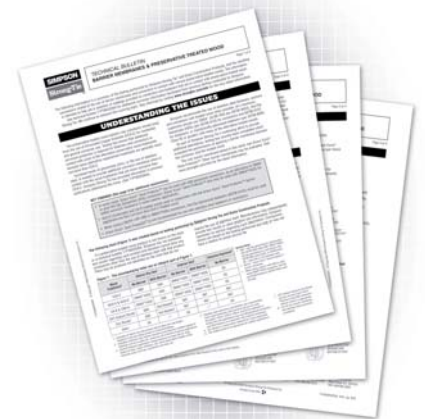
PRODUCT SPOTLIGHT

NEW CORROSION INFORMATION AVAILABLE Barrier Membranes Are Another Alternative

As reported in earlier editions of this publication, effective January 1, 2004, the wood-treatment industry discontinued the manufacturing of Chromated Copper Arsenate (CCA) treated wood for residential applications due to potential negative environmental and health effects. In 2003, Simpson Strong-Tie provided the building industry with connector and fastener recommendations for many of the alternative types of pressure-treated wood that replaced CCA. Test results indicated that many of the alternative preservatives (e.g. ACQ - Alkaline Copper Quaternary, CA - Copper Azole, and ACZA - Ammoniacal Copper Zinc Arsenate) are generally more corrosive to metal connectors and fasteners

than the previously used CCA preservative. As a result, Simpson Strong-Tie recommends its triple zinc, ZMAX™ (G185) connector products as the minimum for use with most types of pressure-treated wood.

Simpson Strong-Tie has recently published a new technical bulletin on the use of barrier membranes as another possible solution for addressing the corrosion issues caused by many of the alternative pressure treated woods. To print a copy of the technical bulletin (T-PTBARRIER04) simply visit www.strongtie.com/info and click on "Corrosion."



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CODE CORNER - THE AFTERMATH OF THE HURRICANES *(continued from page 1)*

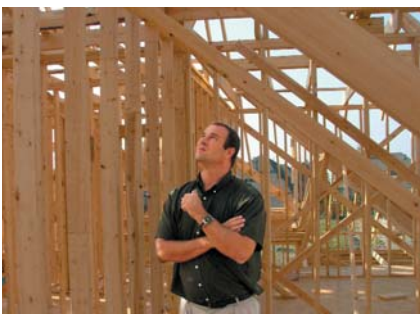
Sanibel Island to Port Charlotte. The group also distributed educational materials to the Federal Emergency Management Agency (FEMA) and Florida disaster relief centers.

As the storms traveled through Florida, both response teams had the task of studying the performance of buildings to determine system failures. Their primary goal was to validate the performance of current design and construction practices, and offer recommendations for improvements that would result in stronger, safer structures.

FINDINGS

Because the level of wind design, construction and inspection in Florida has significantly improved during the last 10 years, newer structures affected by the storms generally fared well. The majority of damaged buildings only sustained what appeared to be minor architectural damage, such as missing roof coverings, broken windows and damaged garage doors. However, seemingly minor damage can allow wind and water into a building, ruining the inside and its contents. "Most of the structural damage displayed on television focused on manufactured homes, which were constructed prior to 1994," says Gilstrap. "Homes properly designed and engineered did very well. After examining more than 500 homes, very few experienced wind-induced structural failure."

Weaker structures without proper load path construction faced the greatest problems. "When wind is allowed inside a building, it can greatly increase the wind uplift on the roof. Proper connector design and installation becomes ever more critical when this occurs," adds Shackelford.



Simpson Engineer Jeremy Gilstrap observes building techniques in Florida.

Shackelford, who was interviewed for CNN's *The Living Lab*, examined two adjacent houses in Punta Gorda Isles – one built in 1960 and the other in 2003. The 1960 home was virtually destroyed while the new home experienced little, if any damage. "This is a perfect example of how improved building

practices can help minimize property damage and loss of life," explains Shackelford.

David G. Stanbra, P.E., a professional engineer in Lee County, Florida, who has designed commercial and residential buildings up and down the Gulf Coast, witnessed Hurricane Charley first hand and its trail of damage. "One realizes that no matter where a Category 4 hurricane strikes, some of your buildings will undergo a true load test."



An example of some of the damage from Hurricane Charley.

Stanbra recently designed a home for builder Bill Slokum on North Captiva Barrier Island. When the eye of Charley passed over the island, resulting in the island being "cut in two", Stanbra immediately contacted the builder. Fortunately, the home survived the storm with just minor water damage. "Without the use of Simpson Strong-Tie products on this residence it would not be standing today," says Stanbra.

As forces of nature push up against a structure, connectors transfer loads from one wood member to another. "You didn't see many roofs blowing off in one piece, which is a direct result of connectors and continuous load path construction," explains Shackelford.

LESSONS LEARNED

As building officials and government leaders begin to assess the damage caused by hurricanes Charley, Frances and Ivan, the next step will be to share the information learned with the building industry. "Fortunately, the hurricanes struck in an area of the country in which most structures were constructed with a well-designed load path to resist high winds," says Gilstrap. "Even with these preventative measures, there were still billions in damage. Hopefully other communities can learn from these disastrous events and recognize how important connection design, good construction and inspection are to the successful performance of structures."

Hurricanes have always been a threat in Florida. However, it wasn't until the state faced the damage and financial burden of Hurricane Andrew in 1992 that more attention was paid to strengthening and enforcing the building code. For many years, Florida followed the Standard Building Code (SBC), which provided basic design principles, but did not include specific prescriptive construction practices to resist hurricane forces.

In 1994, several counties in Florida mandated requirements such as window shutters, reinforced garage doors and specific roofing attachments to improve building construction and safety. In the early '90s, the Southern Building Code Congress also developed its SSTD10, which provided a detailed guide for proper hurricane-resistant construction.

In 2002, the state of Florida adopted a new building code that updated design criteria to the latest engineering wind standards and included specific hurricane requirements. The new code contains simplified wind load requirements that are both technically up-to-date and easy for designers to use. Buildings constructed in wind zones above 100 mph require tie downs and engineered wind protection systems. Window protection or increased roof uplift resistance is also required in windborne debris regions near the coast.

For additional information, visit these web sites:

*The Florida Department of Community Affairs, Building Code Information System
www.floridabuilding.org*

*The Federal Alliance for Safe Homes (FLASH)
www.flash.org*

*The Federal Emergency Management Agency (a branch of the Department of Homeland Security)
www.fema.gov*

*The Institute for Business and Home Safety
www.ibhs.org*

For years Simpson Strong-Tie has provided education to building professionals in an effort to improve the industry's knowledge of load path design, construction and inspection, and to build safer structures. For more information about continuous load path and the uses of connectors and fasteners, visit www.strongtie.com.

To help with the hurricane relief effort in Florida, please visit the American Red Cross at www.redcross.org or the Volunteer Florida Foundation at www.volunteer-floridafoundation.org. ■

CONTINUING EDUCATION & EVENTS

NORTHEAST

Architects, Engineers, Building Officials & Contractors

Morton, Illinois Tuesday, November 2
Appleton, Wisconsin Wednesday, November 10

SOUTHEAST

Building Officials & Inspectors

McKinney, Texas Friday, November 5
Jacksonville, Florida Thursday, November 11

NORTHWEST

General Connector Technology - for All Audiences

Salt Lake City, Utah Wednesday, October 6

Building Officials & Inspectors

Stockton, California Tuesday, October 19

Contractors, Builders & Developers

Stockton, California Tuesday, November 9

Authorized Stocking Dealers

Stockton, California Tuesday, December 7

SOUTHWEST

General Connector Technology - for All Audiences

Bakersfield, California Thursday, December 16

Building Officials & Inspectors

Brea, California Wednesday, November 10

Design Professionals

Brea, California Thursday, October 7

Contractors, Builders & Developers

Brea, California Thursday, December 9

Introduction to Simpson Anchor Systems

Bakersfield, California Wednesday, October 13
Brea, California Thursday, November 18

For more information regarding workshop content and for a complete schedule, visit the Workshops and Training section of our Web site at www.strongtie.com/workshops.

PRODUCT SPOTLIGHT

NEW CORROSION INFORMATION *(continued from page 1)*

Simpson Strong-Tie continues to recommend the use of stainless steel fasteners, anchors and connectors with treated wood when possible. At a minimum customers should use ZMAX (G185 HDG per ASTM A653), Hot-Dip Galvanized (HDG) (per ASTM A123 for connectors and ASTM A153 for fasteners), or mechanically galvanized fasteners (per ASTM B695, Class 55 or greater) with many of the alternative pressure-treated woods.

As part of our continuing efforts to provide customers with additional alternatives, Simpson and Grace Construction Products, conducted testing on the performance of Grace Vycor® Deck Protector™ – a barrier membrane – and found that in some cases, Grace Vycor Deck Protector can be used with G90 galvanized connectors and pressure treated wood, as an alternative

to ZMAX or post Hot-Dip Galvanized (HDG) connectors.

Because this is a complicated issue, it is important to gather all the pertinent information before choosing the most appropriate connectors and fasteners. Using connectors with increased levels of galvanizing (i.e. ZMAX or HDG) is one option. Another option is using a barrier membrane as outlined in our technical bulletin. To find the very latest information on the topic of corrosion and to print out our technical bulletins on the subject, visit www.strongtie.com/info and click on “Corrosion.”

Simpson Strong-Tie continues to research this evolving topic. We will continue to post the very latest information to our Web site and keep you informed through this publication. ■

Structural Report is published by Simpson Strong-Tie Co., Inc. All information is meant to be relevant and useful. Information provided is for general understanding only. All designs or other information should be evaluated by a qualified design professional.

MAILING LIST

To revise your mailing information or to add to the mailing list, sign up on our Web site at www.strongtie.com/newsletter/.

SERVICE UPDATE

SIMPSON OFFERS ARCHITECTURAL AND ENGINEERING SCHOLARSHIPS

Simpson Strong-Tie Company, Inc. is proud to offer each year a scholarship program to assist architecture and structural engineering students. These scholarships are offered at participating colleges and universities in various communities in the United States.

The Structural Engineering/Architecture Student Scholarship Program offers scholarships to support education and encourage the design and building of safer structures in our communities.

- Available to juniors and seniors in full-time undergraduate programs
- 32 colleges and universities participate
- Up to fifty \$1,000 awards given annually
- Application must be submitted by November 1, 2004

ELIGIBILITY

Applicants must be enrolled as juniors (60 semester hours or equivalent) or seniors in a full-time undergraduate course of study in

architecture or structural engineering at one of several colleges or universities throughout the United States. Please visit our Web site for a list of the participating schools.

AWARDS

Up to fifty \$1,000 scholarships will be awarded for the 2004-2005 academic year. Awards are not renewable, but students may reapply to the program each year they meet eligibility requirements. Awards are for undergraduate study only.

The program is administered and recipients are chosen by Scholarship Management Services, a non-profit, objective, third-party scholarship selection group. Scholarships are awarded based on academic record, demonstrated leadership and participation in school and community activities, honors, work experience, a statement of educational and career goals, and an outside appraisal. Financial need, as calculated by Scholarship



America, must be demonstrated for the student to receive an award. Awards are granted without regard to race, color, creed, religion, age, gender, disability, or national origin.

APPLICATION AND DETAILS

Interested students must complete the application and mail it along with a current, complete official transcript of grades to Scholarship America postmarked no later than **November 1, 2004**. Applicants will be notified by mid-December. Not all applicants to the program will be selected as recipients.

For full details on the program, please visit our Web site at www.strongtie.com/scholarships.

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- ▶ ***Simpson Offers Architectural & Engineering Scholarships***