

## Can we protect ourselves?

### If you replace your shingles, check your sheathing

Stripping the roof of old shingles also is a good time to check the stability of the deck below them.

**Replace deteriorating sheathing** — the exterior boards beneath the roof surface that support it and serve as the roof deck. If you lose even a few pieces of sheathing, your home's interior and contents may get soaked and ruined.

**Use thick plywood.** Oriented strand or particle board is permitted under the building code, but retrofit experts say you should use plywood, at least five-eighths of an inch thick.

**Space nails or preferably screws** no more than 6 inches apart on sheathing; 4 inches along panel edges. Adding more connections between sheathing and the rafters improves a roof's ability to withstand wind uplift.

**Apply a quarter-inch bead of wood adhesive** caulking on the roof underside, at the intersection of the sheathing and the trusses or rafters.

**Place waterproof tape over the joints** between the sheathing boards to seal gaps and keep the interior of your house dry in case your sheathing gets wet. The tape should be at least 4 inches wide.



UMA SANGHVI/Staff Photographer

**TIME TO INSPECT SHEATHING:** Contractors strip a roof in Royal Palm Beach after Hurricane Frances and days before Jeanne hit. Experts say

deteriorated sheathing, the plywood that supports the shingles, should be replaced before new shingles are put on.

# More nails, longer screws work better in wind lab

By LARRY KELLER  
Palm Beach Post Staff Writer

Someday soon, Florida International University will be home to the "Wall of Wind."

That's not the name of a proposed new theme park, but rather an addition to the Miami-Dade County school's International Hurricane Research Center, where 18 fans with 7-foot propellers will blast a wall of wind up to 150 mph. With mock-ups of houses built in front of it, researchers hope to determine how homes behave in hurricane-force winds and how to build them better.

The Wall of Wind is a new generation of lab equipment to find ways to lessen the damage of hurricanes. FIU's arsenal also includes compressed air cannons that can fire roofing tiles and lumber against windows and doors. There also is a trailer-mounted vacuum chamber that simulates wind pressures from winds boring down on roof panels.

"We want to make as few assumptions as possible about how low-rise structures perform in hurricane winds," said engineering Professor Forrest Masters, director of FIU's wind engineering research lab.

FIU is working with researchers at the University of Florida, Clemson University and nonprofit groups backed by the insurance industry to learn more about how homes stand up to hurricanes. One such effort is the Florida Coastal Monitoring Project sponsored by the Florida Department of Community Affairs. It uses 32 houses scattered along Florida's coast to measure the wrath of hurricanes and has been collecting data since 1999. The houses — about half of them lie between Homestead and Melbourne on Florida's east coast — have frying pans perched on their roofs. The sturdy pans, without handles, are an inventive way to protect and cover sensors and other gadgets used to monitor wind speed and pressure during hurricanes.

What researchers have learned thus far is that a number of relatively cheap steps can be taken to increase a home's chances of withstanding these winds.

Some of their recommendations are as simple as using more nails or longer screws when installing shingles or tiles. Another simple step: placing waterproof tape over the joints between plywood panels on the roof to help keep the interior dry when shingles or tiles blow off.

Others are more complicated, such as anchoring sheathing to trusses with hurricane straps or clips, a step that uses the weight of a house to anchor the roof against the uplift of hurricane winds. In houses with two or more stories, each floor should be connected to the floor below with straps.

These retrofits are of particular interest to insurers that have paid out billions in hurricane-related claims. And state law requires insurance companies to offer homeowners discounts "for construction techniques that reduce damage and loss in wind-

### Other precautions

Whatever changes you make, consider exceeding building code requirements. They are minimum construction practices.

- Have adequate protection for your windows and doors.
- Don't apply new shingles over old shingles. The Florida Building Code allows this except when the roof is water-soaked or deteriorating. But retrofit experts contend that driving nails through an extra layer of material may not grab the decking as firmly or miss it altogether.
- Asphalt shingles have a self-seal tab that is supposed to adhere one layer to another. 'We recommend you buy roofing cement and lift up each of those tabs and add a dab,' said Scott Schiff, a civil engineering professor at Clemson University.
- Buy shingles with the longest warranty that you can afford. Florida's intense heat almost certainly will sap your shingles before the warranty expires, but the longer the warranty, the greater their thickness and durability.
- Attach tiles with two screws in addition to adhesive. This makes them less likely to become flying projectiles that smash into neighbors' homes.

#### For information, contact:

- Institute for Business and Home Safety, (813) 286-3400; [www.ibhs.org](http://www.ibhs.org).
- Federal Alliance for Safe Homes, (877) 221-7233; [www.flash.org](http://www.flash.org).
- Clemson University's Wind Load Test Facility; [www.clemson.edu/special/hugo/home.htm](http://www.clemson.edu/special/hugo/home.htm).
- Federal Emergency Management Agency; [www.fema.gov](http://www.fema.gov).

storms."

"That's what is driving a lot of these things," said FIU's Masters.

The Institute for Business and Home Safety in Tampa is an insurance industry-supported group that works with university researchers in studying hurricane winds and methods of retrofitting structures to minimize damage. The Federal Alliance for Safe Homes in Tallahassee has a similar mission. Insurance commissioners from 10 states and several insurance companies are among its partners.

The FIU lab's money comes from sources such as the Florida Department of Community Affairs and the National Oceanographic Atmospheric Administration, Masters said.

FIU is becoming a bigger player among universities and private organizations studying ways to reduce property damage from hurricanes. Clemson University is years ahead. In the aftermath of Hurricane Hugo,

the Federal Emergency Management Administration bankrolled the creation of the Wind Load Test Facility at that South Carolina university in 1991.

Clemson has a wind tunnel that is 100 feet long, 10 feet wide and 7 feet tall, said David Prevatt, a professor who directs the facility. Engineers gauge the effects of laboratory-created winds on low-rise structures to study where they are most vulnerable.

Researchers are trying to replicate the turbulence of hurricanes and other elusive wind behavior. They also try to determine how much pressure is exerted on houses when various components fail. The simulations aren't perfect.

"Some of these tests don't quite simulate the gustiness of a natural wind," Prevatt said.

Clemson engineers are working with colleagues at FIU and UF as they study such esoteric subjects as "wind loads" and "pressure coefficients."

The Florida Coastal Monitoring Program's 32 test houses also have sensors attached that measure wind pressures if hurricane winds breach the house through a door or window. These interior sensors, coupled with those outside a house, can give researchers insights into what forces increase or reduce the odds of a roof lifting off a low-rise house or business.

There also are four portable towers of 16 feet and 33 feet in height collecting data on wind velocity, barometric pressure, rate of rainfall and relative humidity when a hurricane strikes.

Researchers evaluate the data and try to gauge the effectiveness of retrofits they have installed at each of the houses.

"Between the towers and the houses, we get a good look at the gustiness of the winds and the pressure on the houses," said Kurt Gurley, a UF associate engineering professor.

Some of the researchers also made damage assessment field trips around Florida following each of the four hurricanes that hit the state this year.

They expect to make more retrofit recommendations and hope to get some of the millions of dollars Congress allocated this year when it passed the National Windstorm Impact Reduction Act. That program is aimed at reducing the impacts of hurricanes, tornadoes and thunderstorms by, among other things, conducting engineering research on improving new structures and retrofitting existing ones, just what the Florida and Clemson researchers are doing.

And as grueling as it was for Floridians to endure four hurricanes this year, the storms produced a wealth of data that is still being analyzed. That bodes well for researchers.

"Florida is going to benefit from being at the center of everything," Prevatt said.

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## Higher costs may slow changes in the code

*Lawmakers may be resistant to change because of concerns over the rising costs of new homes.*

By LARRY KELLER  
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Don't expect the state legislature to beef up the Florida Building Code in 2005.

The Florida Building Commission can enact changes to the code only with the legislature's consent. But legislative leadership will be listening to the powerful home building industry, which opposes any regulation that would boost the price tags of new homes.

Who's in charge? Senate President Tom Lee — a Hillsborough County builder. And House Speaker Allan Bense — a real estate developer, and a partner in a contracting company in the Panhandle.

Lawmakers might offer suggestions on how to fine-tune the code, but not until the Florida Department of Community Affairs weighs in on the code's performance, said Lee, R-Brandon, vice president of Sabal Homes of Florida.

"It's best to wait and not to be too knee-jerk as a legislature," said Lee, who, along with the rest of the building industry, is concerned about increasing home prices. "I'd be willing to look at a cost-benefit analysis."

Bense, R-Panama City, has designated St. Petersburg Republican Leslie Waters to chair a hurricane preparedness work group. But its focus is on emergency management.

"We don't have anything specific right now on anything to do with building codes," Waters said.

Gov. Jeb Bush also created a hurricane housing work group last month to "develop interim and long-term strategies to mitigate the impact of the hurricanes on the people and communities of this state." Bush has been critical of insurance companies that saddled homeowners with the cost of second and third storm deductibles on their policies for damage from two or more hurricanes. But spokeswoman Alia Faraj said Bush's hurricane discussions won't cover the building code.

Individual lawmakers are calling for code changes, but Lee and Bense decide whether they'll be heard.

Sen. Ron Klein, D-Delray Beach, said he favors changing the code so tough rules and restrictions in Broward and Miami-Dade counties — the state code's so-called High Velocity Hurricane Zone — apply across the state. Doing so would help ease the state's homeowner insurance crisis by reducing the potential for hurricane damage.

"It's all over the state that we need to be planning for," said Klein, a lawyer. "The less payout they have, the more likely they will want to write insurance" policies, he said.

Klein said he's heard legislators talk about changing the statewide building code in the 2005 session. But he stopped short of saying he would sponsor a bill. He acknowledged that opponents likely will argue that such a measure would increase the cost of building homes, which would in turn increase the purchase price of homes, pricing some buyers out of the market.

"It will be a struggle," he said.

State Sen. Dave Aronberg, D-Greenacres, also would like to strengthen the building code throughout the state, "especially now that we've seen that no part of Florida is immune from hurricanes."

He, too, is concerned about the cost. "I'm not there yet, but I'm listening," said Aronberg, a lawyer. "I want to balance safety with the ability to buy a new home. You can price people out of the market if you set the bar too high."

Aronberg, whose constituents include mobile-home owners, said he would like to provide tax credits or other ways to pay for better protecting older mobile homes.

Sen. D. Lee Constantine, R-Altamonte Springs, has urged the building commission to help him make some changes. Constantine said he has heard reports from South Florida that the building code may need to be strengthened to keep concrete and clay roof tiles from breaking loose and becoming projectiles in a storm.

"The quality of the product is no better than its installation," Constantine said. But addressing problems like that will be challenging, the real estate broker said: "Distinguishing between product failure and installation failure is sometimes difficult."

He also doesn't think the state building commission should need legislative approval to adopt new regulations. That creates unnecessary delays, he said.

"If it's based on science, why do they have to wait for us to approve it?" he asked.

Staff writer Pat Beall contributed to this story.

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