

Beyond Blocks and Bricks

Number Four

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Will the Roof Blow Off?

Actually the roof didn't blow off.

During the testing reported in the article reproduced below, the entire house was pulled from the floor platform when the nails attaching the floor plates to the floor platform pulled out. Once the house began sliding across the test chamber, the remainder disintegrated. Watch the video:

http://construction.com/video/?fr_story=f3c1bea3939433651686fb45d53ba03db793038f&rf=bm

Remember the testing of the full-sized house on the earthquake platform? When the veneer fell from the framing it was because the nails holding the ties pulled from the studs. As a result, wall ties must be attached with screws or ring-shank nails in higher seismic zones. A likely solution for the failure in the video is to require the use of screws or ring-shank nails in high wind zones, or special metal straps or ties to fasten the studs, the plates, and the platform or foundation together

Consider this statement from the article: *Both houses remained standing after two tests of less than 10 minutes each, so researchers opened the front door on each house and the conventional house collapsed in less than 10 minutes.* Opening the door allows the inside of the structure to become pressurized, creating outward—up, down, and sideways—forces. The test method breached the building envelope. Once the envelope is breached, it is much easier to damage a structure. In an attempt to avoid this outward force, the Florida building code specifies that windows and doors must sustain certain impact forces. This is why windows and doors for use in Florida are tested with the 2x4 cannon. If a flying 2x4 cannot break a tested window (and the window is installed properly...), it is less likely that the envelope will be breached, thus allowing air to get inside and pressurize the interior.

Note, however...that the house that failed was a house designed for wind loadings in the Midwest, not coastal hurricane loadings. An uncharitable person might decide that the results are "deceptive." It appears that there is an intermediate level of design—the

current coastal house, perhaps—that should also be tested to fairly assess the usefulness of \$5K in additional materials.

Wind-test Lab Huffs and Puffs and Blows the House Down

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Associated Press/AP Online

By PAGE IVEY

RICHBURG, S.C. - Researchers used more than 100 giant fans to create hurricane-force winds in an experiment Tuesday that crumpled an ordinary home within minutes but left a better-built home standing at its side. Authorities said the experiment conducted in the cavernous Insurance Center for Building Safety illustrated the superiority of fortified building materials against materials and methods used in conventional home-building. "This is an opportunity to create demand for better construction," said Tim Reinhold, the center's chief engineer. The Richburg facility was built by insurance companies in a bid to find ways to reduce damages and losses from natural disasters.

The conventional home took minutes to collapse in 96-mph winds similar to those of a Category 2 hurricane; once the house began to shake, the end came seconds later. Reinhold said the stronger house cost about \$5,000 more to build but suffered only cosmetic damage in the same winds. Reinhold said builders normally won't use higher-end materials unless those are required by building codes or requested by homeowners. He hopes the images of one house left standing while another lay in ruins is persuasive.

The giant fans simulated the wind profile of three actual storms with gusts up to 100 mph or higher. Both houses remained standing after two tests of less than 10 minutes each, so researchers opened the front door on each house and the conventional house collapsed in less than 10 minutes. "You saw how quickly it went once it started to go," said Julie Rochman, president of the Institute for Business and Home Safety. "The bottom line question you have to ask yourself is which house would you rather be living in?"

"We want to build better going forward," Rochman added, noting metal straps in the stronger house secured the building on its foundation - and the roof atop the walls. The conventional house in the test was built to the standard required in the Midwest. Houses in coastal areas would typically have more reinforced construction, Reinhold said.

Even with its front door open and the wind buffeting all its walls and the roof, the fortified house had no structural damage, researchers said. In contrast, the conventional house suffered significant damage to its roof, siding and a window in the first two storm simulations. Even if the conventional house wasn't completely blown away, it would have needed significant repairs, experts said.

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