HOMES THAT TAKE A PUNCH

TAX CREDITS LIMITED TIME OFFER

THE HOUSE THAT STRAW BUILT

Bamboo from fencing to flooring
Who could resist an invitation to see a high velocity 2 x 4 board prove that a home can withstand the full fury of nature? When Dukane Precast of Naperville, Ill., told ecoLogical Home Ideas they were going to shoot 2 x 4s through a house with a cannon, I was there. I was also happy to hear that this is the first “Fortified…for safer living” home built in the Midwest. The insurance industry’s non-profit Institute for Business and Home Safety’s national “Fortified…for safer living” program provides builders and inspectors with guidelines for better building techniques that resist extreme weather damage.
While the cannon test may sound a bit extreme, it's the best way to duplicate tornado force winds and their ability to pick up available debris and hurl it through anything in its path, like your home. They are commonly associated with the heartland, but have been recorded in all 50 states, with more occurrences in Florida than Oklahoma. Tornadoes in Florida are usually less than 100 mph, considered weak by tornado standards. On the other hand, the killer tornado that struck Oklahoma in 1999 had winds reaching 320 mph just above the ground. Weak tornadoes commonly last around 10 minutes or less and travel short distances, while violent tornadoes can last for hours, traveling up to 100 miles. Either way, the damage is devastating and the experience frightening.
The Proof Is In The Pictures
Hence, a test that shoots a 2 x 4 at a series of typical — and not so typical — house walls. Dukane Precast ran the test at their new Bolingbrook, Ill., community, Heritage Knolls. These proverbial "pictures worth a thousand words" demonstrate, rather dramatically, what happens in a controlled test environment. Take a look at the photos and judge the success of their test for yourself.

Precast Makes It Possible
Dukane's Precast homes are built with concrete walls that are two layers of concrete with an insulating foam center making an exterior wall that's eight inches thick. Technically, it's called a double-wall precast concrete panel. To create these double-wall panels, concrete is poured into a form. These forms can have a variety of patterns for the exterior walls; they used a brick pattern for the test wall panel shown here. The panels are then fired in a kiln under factory conditions, making these panels an

Here is the actual cannon used. We even got to touch the 2 x 4 to confirm the authenticity. In the distance are the panels ready to be tested with the safety wall behind. Photos courtesy of Susan Leider.

In test one, the 2 x 4 went through this vinyl sided, wood frame wall panel like a hot knife through butter. Notice the entry hole, and the exit hole. Not only are they clean holes, but they didn't even slow the projectile down. Note as well the significant hole in the safety wall behind the panel in the photo to the right.

I test two shot the 2 x 4 through a brick wall with wood frame. Surprisingly, it's not all that much safer than siding. What you don't see are the pieces of brick that went flying through the back side of the panel. So this wall introduced even more projectiles into the house.

Test three smashed a 2 x 4 through a brick home with steel framing. This damage is still rather significant, but in this test the projectile did not travel through the wall. Imaging at the back side shows it would take only a little more force to push all the way through.
extremely consistent and strong product. Finally, the insulating foam is added to the panels, and they're off to your work site.

Since these panels are factory-built and delivered to the site ready for assembly, the bulk of the architectural planning goes on before the first panels are cast. The panels are formed complete with window and door openings, along with electrical wiring, plumbing and radiant floor tubing. This reduces onsite construction time and waste, since so much of the work is done in the factory under controlled conditions.

Once the exterior walls and roof are up, your house is safe in many ways. There are few if any off-gassing construction materials to deal with, no air or water leaks, no pest or mold food — and don't overlook the fantastic side benefit of a 2½-hour fire rating. I always picture concrete as having an uneven, rough texture, but these precast concrete panels are absolutely smooth and ready to finish however you desire (as long as the finish contains low or no volatile organic chemicals). You may want to consider a concrete drill bit for hanging pictures, but think of all the drywall you won't need.

In part 2 of this story, coming in the Summer 2007 issue, ecological Home Ideas will review the systems that add to the energy efficiency of these homes, the windows and roofing that meet the "Fortified...for safer living" program criteria, and how this all affects your life — especially if you live in an area prone to violent weather. Even if you don't, the reasons to build your home out of precast concrete outnumber the reasons not to.

By Susan Leader