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Cash Cushion

Concrete-foam insulation helps to lower energy bills

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Here's a concrete solution for those shocking energy bills that fried North Texas this summer: a foam home.

There's no cooler option, according to Matt McCoy, a Wimberly resident who lives in one.

"I live in a 3,500-square-foot house," he said. "I pay the same for electricity that I paid two years ago in a 1,400 square-foot house."

That's an eye-opener to folks who still aren't over the effects of near-record temperatures and TXU's 24 percent residential-rates increase over the last five quarters.

McCoy is chilling, courtesy of insulating concrete form construction, or ICF as it's known in the building trades. Instead of the typical stick-and-brick construction used in his previous house, his new home's walls are a 6-inch layer of steel-reinforced poured concrete, between two thick layers of high-insulation polystyrene foam.



Larry Smith's 4,000-square-foot north Arlington home was built with insulated concrete form, or ICF, construction.

It's like a conventional poured-concrete wall, except that the foam forms stay in place to provide insulation. Once the concrete is cured, the foam also becomes the backing for exterior and interior finishes, such as brick and drywall. The forms combine a vapor barrier, nailing surface and insulator in a single unit. And ICF buildings can come in virtually any architectural style, exterior and interior.

As of 2005, the technology accounted for 5.7 percent of residential construction nationwide, up from only 0.2 percent in 1995, according to the Insulating Concrete Form Association of Glenville, Ill. Residential ICF construction has risen 73 percent in the last five years; commercial applications are up a whopping 172 percent, according to Vera Novak, the association's technical services manager.

Business doubling

"Our business has doubled every year in the last six years," said McCoy, president of South River Construction in Wimberly. "We come out with these giant Styrofoam forms. It's like Legos. You just stack 'em up and pour concrete in 'em."

Tom Misfeldt and his wife were spending \$500 to \$700 per month on utilities to heat and cool their 4,000-square-foot house in Fort Worth's historic Ryan Place neighborhood south of downtown. Then they built a 2,900-square-foot, ICF structure south of Fort Worth.

The Misfeldts' most recent utility bill was a little over \$300, and that's counting the electricity they use to pump water out of their well, which provides for lawn watering and household use.



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Smith shows the ICF used to form his home's exterior walls. He also designed the house to preserve trees on his lot.

Larry Smith has almost finished an ICF home in the Double Y neighborhood near Randol Mill Road and Interstate 30 in Arlington. Without heating or air conditioning, temperatures should only fluctuate 4 degrees per 24 hours, he said.

"It's like a cave," Smith said.

Most of Smith's interior walls are conventional wood framing, but there's no wood in the roof. It's a flat, 4,000-square-foot ICF party deck. He figures that a roof that's impervious to hail and high winds will net him a nice homeowner's policy saving.

Bernie Henyon, a Fort Worth Allstate insurance agent, said owners of ICF houses save from 10 percent to more than 50 percent in premiums in some cases.

ICF also reduces noise and offers fire and wind resistance. Experts estimate that ICF buildings are up to 8.5 times stronger than wood-framed buildings.

Texas Tech University's Debris Impact Testing Facility has confirmed ICF's resistance to tornado-level winds: In tests, 15-pound, 2-by-4 studs were fired from a pneumatic cannon at ICF walls at speeds of 100 mph. The concrete was unscathed.

Steve Kissell, project manager for Fort Worth-based G.L. Barron Co., said his firm plans to use the ICF technology in designs for a kindergarten-through-eighth-grade school at Our Mother of Mercy Catholic Church in Fort Worth and for another school at Crown of Life Lutheran Church in Colleyville.

Construction costs are a bit more, Kissell said. But on the Fort Worth project, his firm was able to decrease the air-conditioning unit from 38 tons to 27 tons, which reduces the cost.

Research by the Insulating Concrete Form Association shows that houses built with ICF exterior walls need an estimated 44 percent less energy to heat and 32 percent less energy to cool than comparable wood-frame houses.

"I'm going to be putting a lot of money in the bank," said Smith, who calculates that he'll recoup the 5 percent extra it cost to use ICF in three years.

Long-term savings

Randy McGuffee is vice president of FutureStone, the Texas distributor for an ICF brand of building product called Nudura. He estimates that ICF adds 5 percent to 7 percent to building costs. But he says it's cheaper in the long run when saving on energy, insurance, and heating and air-conditioning costs.

His business partner, Cameron Ware, is building an ICF house in southwest Fort Worth. Energy Wise Structures engineers in Arlington calculated that the 5,989-square-foot building can be heated and cooled for \$189 per average month; conventional costs are about \$563.

McGuffee said the only drawback is the "tiny" interior square footage lost to the thick walls.

Contractor Rick Urbanovsky, who owns Advanced Construction in Cleburne, has been erecting ICF buildings for about three years and said that although ICF buildings won't keep out high waters like those that batter Texas' coasts during hurricanes, it makes sense from just about every other standpoint.

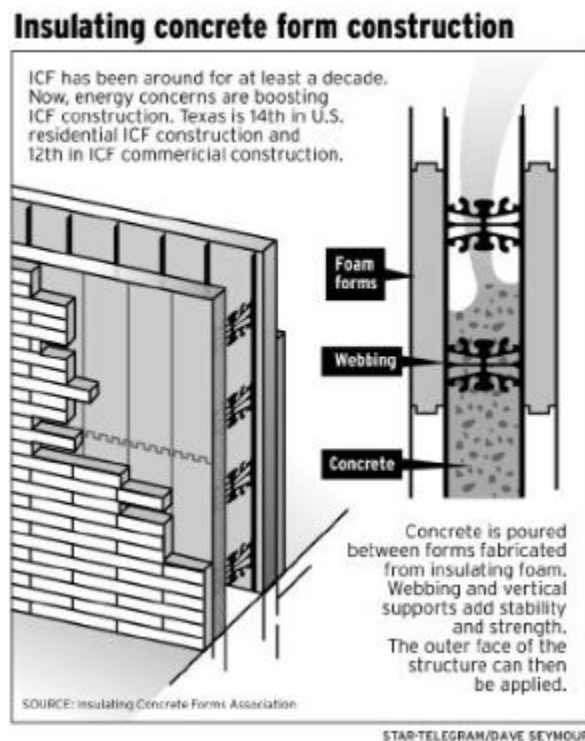
Urbanovsky said the extra cost -- he estimates that ICF costs 5 percent to 10 percent more -- makes sense for houses of selling for \$170,000 and up.

"A smaller home, you're going to save \$50, \$100 a month," Urbanovsky said. "You're not going to stay more than four or five years. It's going to cost you more than it's worth."

However, Lubbock began mandating ICF in all of its federally subsidized affordable housing in 1998. The city has since had about 100 houses, ranging from about 1,200 square feet to 1,600 square feet, built.

Brad Reed, Lubbock's inspection coordinator for community development, says the city typically contracts 20 to 25 HUD-funded ICF houses per year.

"It's mainly high-end and us," said Reed, referring to the city's affordable houses. "Spec house [contractors] are trying to build 'em as cheap as possible."



But that's a false economy, at least for buyers, Urbanovsky said.

"People look at the upfront costs, but they forget what the monthly outlay will be," Urbanovsky said.

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