



Today's Concrete Homes By Greg Wayman, CRI

Most homes today are made with concrete or concrete block foundations. But have you ever been in one that has concrete walls that run all the way up to the peak? If you have, you may not have realized it until the owner filled you in on the secret. These ICF (Insulating Concrete Forms) homes look the same as traditional stick-built homes. The exterior and interior are finished using the same materials you see on all traditional homes. They can have vinyl siding, hardboard siding, synthetic stucco, brick veneer, or concrete fiberboard on the exterior and drywall hung on the interior. The difference is that ICF homes are much more structurally sound, energy efficient, and faster to construct than stick-built homes. ICF homes were introduced in the US in the late 1970's. With over 50 different types of ICF products on the market today, ICF homes represent approximately 3% of the homes being built today with projections nearing 20% within the next 5 years.

What is ICF?

Insulating Concrete Form walls come in 2 basic types: flat wall or waffle grid. The flat wall design produces an end product similar to that of what you normally see on concrete foundation walls. The waffle grid design produces a solid concrete wall in the shape of cylindrical columns and beams. This design uses less concrete but does not reduce the overall structural integrity of the wall. Both types are encased in an interior and exterior insulating polystyrene foam that is approximately 2.5" thick. ICF walls can be used for curtain walls or load bearing walls.

Benefits of ICF homes

Reduction in heating & cooling costs

The average ICF home sees a 50-80% reduction in heating & cooling costs. The walls have an R-value of 30-50. Because of this increase in energy efficiency, HVAC systems can be downsized.

Reduction of sound transmission

For those properties that are difficult to sell because they are in the path of flight patterns such as areas in Bellevue, Papillion, LaVista, and Council Bluffs, ICF homes are your answer. They reduce sound transmission by 80%! Most airport hotels are now being constructed with ICF's for that very reason.

Cleaner air

Compared to stick-built homes, ICF homes have a 75% reduction in air infiltration. That equates to less mold spores such as allergens penetrating the home. Because the walls are solid concrete, there is no need for vapor barriers.

Excellent Fire Rating

With a 2-4 hour fire rating, ICF walls are extremely fire resistant. The foam insulation covering is flame resistant and simply melts if a flame touches it. The foam will not likely spread a fire. The flame-spread index of ICF walls is zero. ICF walls significantly reduce the hazards from fires by having extremely low toxicity levels, flame spread, and smoke development. In addition, the air-tightness of ICF walls reduce the oxygen flow needed for a fire.

PolySteel® resists termites

“It’s not a matter of if your home has termites, it’s a matter of when.” This statement rings loud in the Omaha Metro/Council Bluffs area from all of the pest control companies. The foam insulation used by PolySteel does not attract termites here in the Midwest and may be an exception to the age-old rule.

Reduction of manpower & labor

Because ICF walls do not have any heavy forms to install nor have any forms to tear down, there is a reduction in the crew size needed. There is no heavy lifting or any need for heavy transport equipment. With the additives available for pouring concrete, the Builder is able to extend the building season well past the restrictive timeframes of stick-built homes.

Cost comparison

With the increase of the price of concrete, steel, and wood products due to the housing boom both in the US and China, one might think the cost of a concrete home would be so outrageous that one could not afford one. The reality is that ICF homes cost only 5% more than your traditional stick-built homes. With all these benefits, 5% seems like a good deal.

Can your home withstand tornado strength winds?

In the US alone, there are over 900 tornado touchdowns per year. The Portland Cement Association has produced a video titled “Concrete Homes Built in Safety” that depicts Dr. Ernst Kiesley at Texas Tech University testing various wall types under extreme tornado/hurricane strength winds using their “tornado cannon.” Dr. Ernst Kiesley’s test simulated tornados and hurricanes with 250 mph winds. This accounts for 90% of the tornados and 100% of the hurricanes that have occurred in the US. Stick-built walls, steel frame walls, and ICF walls were tested for their strength and durability under simulated debris from tornado/hurricane strength winds. The test included shooting 15 lb 2”x4”s out of their “tornado cannon” at speeds over 100 mph at the various walls. The result was concrete walls were the only wall product that could withstand simulations of tornado/hurricane flying debris and not be damaged. The 2”x4”s shot straight through the stick-built and steel frame walls with almost no resistance. However, the ICF walls stayed in tact and obliterated the 2”x4”s. There was damage to the exterior siding covering, but not to the concrete wall itself.

Many thanks to John Rotella and Mike Donovan of Rotella’s Custom Builders Supply for presenting at our NAHI Chapter meeting and sharing their knowledge on ICF’s. They can be reached at 402-330-2266 or on the web at www.rotellassupply.com.

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