



Outer Walls of Concrete and Styrofoam

High-performance outer (and Common) walls

...Our homes are to be built around this defining “standard” feature.
(It’s really not even new, just “undiscovered for common use.”)

(Concrete walls for homes were indeed patented by Thomas Edison more than 100 years ago, but he didn’t have styrofoam. It’s a fascinating little story, available in our “Reference” section” near the bottom of the menu.

Three basic facts prevail:

- They perform on a level far above conventional construction, truly a performance class of its own!.....8 times the strength of a wood framed wall....more than twice the “r” factor, with still more energy-saving features.
- They speak directly to safety and long-term cost concerns of the very folks we anticipate as occupants....we’ve so labeled the homes; The “Cozy Fortress”:
 - Ultra-resistance against weather extremes.
 - Extremely low maintenance.
 - Pristine indoor air quality.
 - Utility bills a fraction of usual.
 - Storage and security provided for on the main floor, enabling 1 story living 1 step (into the garage) in the whole home....currently required by code
- Our builder and architect have created a package built around these walls that in the end, cost no more than conventional construction; we’ll show you how as this story proceeds.

Simply, it’s a system of Styrofoam forms into which (reinforced) concrete is poured, where the forms and the concrete stay in place. It creates a unitized sandwich of concrete and foam, a wall of credible strength, durability and energy conservation.



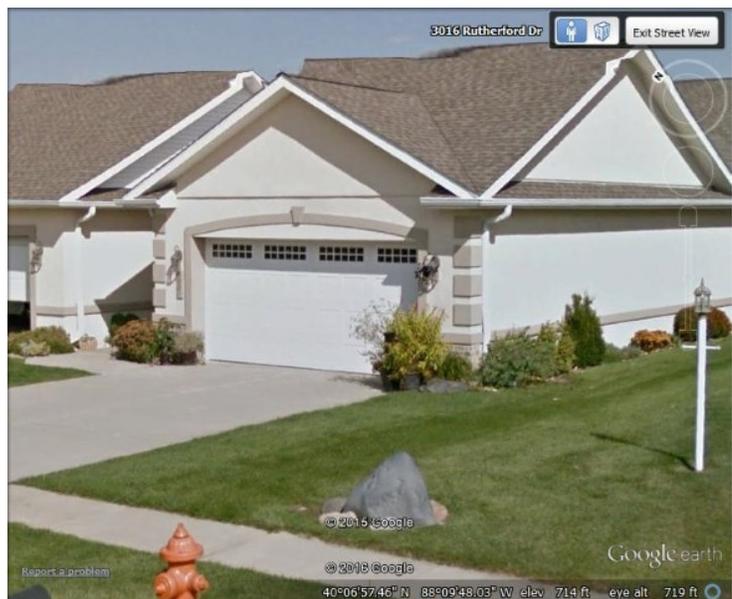
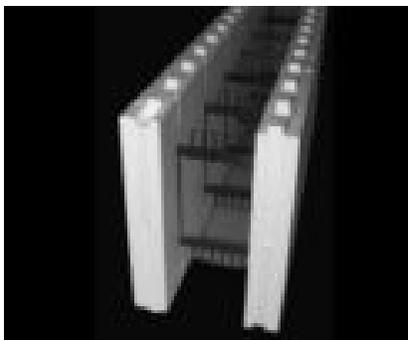
The Idea has been growing steadily continent-wide, and there a few local examples. The purchased blocks have quietly achieved an advanced technical level, at more competitive costs. It's more popular in colder climates and has incredible proven benefits. It's being used increasingly in coastal areas subject to hurricanes, and in colder climates, like in Canada and Alaska. Improved engineering on the blocks has made it more affordable...even more so when we buy in bulk. It's already in all municipal codes, where it's been for years, just waiting for our project and certainly handy for us. It's been featured frequently in "This Old House" and other special TV programs. Thomas Edison even owned a patent on concrete walls, (but he didn't have the Styrofoam to work with); there's a story about that later in this web site, with "Edison" on the tab.

There are even a few such home scattered around Troy, where they were built as custom homes, where price becomes less of a limiting factor. All report great satisfactions. Lynn Sill, our builder, lives in one in Petersburg, Illinois (where New Salem is located), where his own experiences have been most positive...ask him about it sometime.

It surely is the current ultimate in wall construction; It uses manufactured polystyrene "forms" that go together a lot like Legos blocks, where a 6" space is created between two layers of 2.5" foam, into which reinforcing rods are placed and concrete poured. The ideal is to pour a whole floor at one time, therefore creating a monolithic concrete core, with insulation on both sides, each of which is ready to receive a final surface. It literally becomes a one-piece reinforced stone in the shape of a home!

All is simply left in place. Electricity and plumbing can go in raceways easily cut into polystyrene, before surfaces are attached. Hangers are provided for floor joists, holes for essential utilities. It's a bit more difficult than this sounds...a great deal of detail supports a final product that's straight and level, without accidents of bursting or even failing before it's done. After that, it's firm.....forever, needing "no repairs.....forever!"

The final "look" is nearly identical to conventional walls, like this Urbana IL home, except for the thicker window-sills, which everybody likes.
(To the right is an ICF home in Urbana, IL.





Structural Performance of ICF Walls: (More Specifics About How They Perform.)

- Walls have zero infiltration (convection), and greatly reduced conduction of heat.“R” factors are usually more than doubled over ordinary 2 by 4 walls...to around 40, usually.
....the concrete becomes a “*Thermal Mass*”, leveling extremes of outside temperature
....it all contributes to huge savings in utilities...reductions of 60-70% are common.

There are some graphics further down in this website that explain it better, but it induces savings in three ways....

1. lowered conduction (the Styrofoam contribution)
2. lowered convection (no air gets through the concrete) an “R” factor about 40.
3. the “thermal mass” role played by the concrete walls/



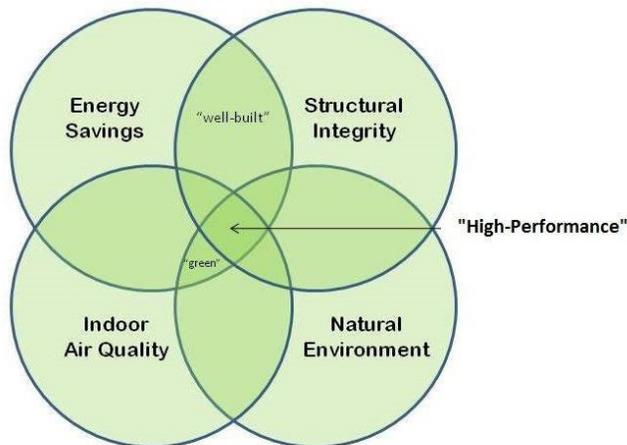
- Non-combustible...concrete will not burn; foam will melt but not support combustion.
- Nearly indestructible by forces of weather, (*) even resistant to earthquakes.
- Outside sounds reduced by 70-80%.
- Exceeds all existing code requirements everywhere.
- Does not rot or support mold, generally water resistant.
- Insect and rodent proof.
- It even saves time in constructing foundations and walls, under roof faster.

Secondary benefits enabled:

- Lower fuel bills by UP TO 60% permantly, passively!!
- Outside sounds reduced by 70-80%, party wall sound non-existent.
- Greatly reduced maintenance...nothing to mold, rot, rust or support insects.

- Enables consideration of all-electric energy; saving gas tap-on fees and distribution expenses, and eliminates the need for combustion air and exhaust ...circulation and filtration of inside air is still recommended.
- The sizing of supplemental conditioning equipment can be reduced by 50-70%.
- Home insurance significantly reduced.
- Overall values are preserved into the future; even resale enhanced.
- The homes qualify for all kinds of “green” awards:

In the face of such enormous benefits, a cost differential could be easy to justify. Achieving this performance with traditional building methods would be impossible, or would be incredibly costly, and still never perform all of the benefits; Our architect and builder however, have managed to create a package accommodating to the differential with trade-offs, (a basement), and other smaller savings....so owners will buy an incredibly superior home, at common prices, where the per square foot prices even match or are better than conventional new home prices; homes that do not need much maintenance of any kind to keep performing (passively) into the future.



Please also see the very next article....”Disaster Resistance” Then a graphic presentation follows that on how energy is conserved so significantly. Nearby, the Better Building institute presents this graphic in an article about their strong preference for ICF (Insulated Concrete Walls), claiming it’s the only high performance wall commonly available, and that it can’t be added later.