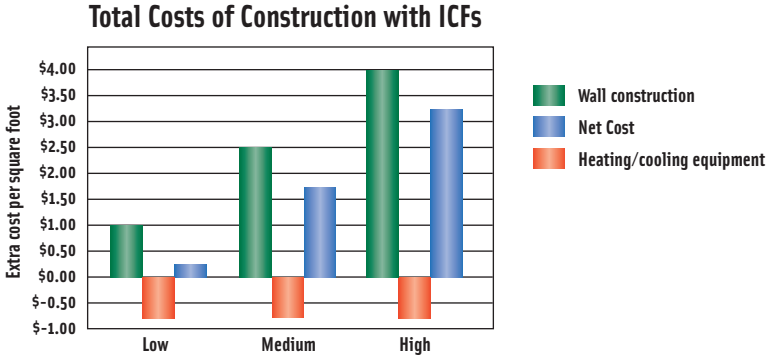
The Quality of Concrete Costs Little More

The many benefits of a concrete house built with insulating concrete forms (ICFs) are available for only slightly more than the cost of ordinary wood frame. ICFs are simple to assemble and they consolidate several construction steps into one. The walls can be economical despite the use of high-quality materials.

How much does an ICF house cost?

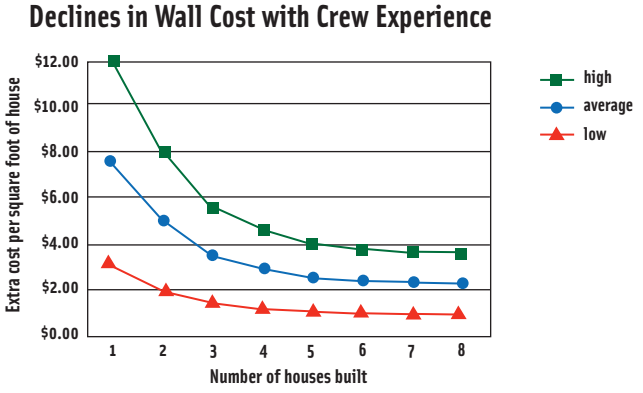
Houses built by experienced contractors cost about 0.5-4% more than wood frame houses of the same design.

Typical new U.S. homes cost $60-100 per square foot. Building walls of ICFs adds $1.00-$4.00 to this figure. But since ICF houses are more energy-efficient, the heating and cooling equipment can be smaller than in a frame house. This can cut the cost of the final house by an estimated $.75 per square foot. So the net extra cost is about $.25-$3.25.



What is an "experienced contractor"?

As with any innovative new construction product, the more a crew works with ICFs the more efficient assembling them becomes. ICF wall-building crews report that their costs drop sharply until they have built 4 or 5 houses. After that they continue to realize savings, but at a slower rate.



Contractors also need experience to size the heating and cooling equipment correctly. Heating and cooling contractors not experienced with homes as energy efficient as an ICF house tend to install equipment sized for a wood frame house. The equipment is larger than necessary, and thus the buyer loses potential initial cost savings, the equipment does not run as efficiently, and excess moisture can build up in the house, causing unsightly and unhealthful problems. Computer software is available for correctly sizing equipment in concrete homes (see references.)

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Why is there such a big range in the costs?

The cost of using any construction product is pushed up or down by dozens of factors that change from house to house. But for experienced crews, the major influences on ICF cost are fairly predictable.

To begin you can assume that your house will cost $2.00 more per square foot to build with ICFs. This is near the middle of the historical range. Then adjust this cost premium according to the particular features of your construction project:

If you can buy ICF forms for $2.00 per square foot	Subtract	$.50
If you buy ICF forms for $3.00 per square foot	Add	$.50
If you will finish the exterior with stucco	Subtract	$.50
If you will finish the exterior with individual shingles	Add	$.30
If you will build the house to resist high winds	Subtract	$.50
If you will build the house to resist earthquake	Add	$.15
If the cost of wood rises to $4 per stud	Subtract	$.20
If the cost of wood falls to $2.25 per stud	Add	$.12
If your design includes cantilevered floors or walls	Consult an engineer	

Why should I pay more?

Each year the number of Americans who choose to have their houses built of concrete and ICFs nearly doubles. They cite several big advantages:

Comfort. ICF houses are far less drafty than frame, have far fewer "cold spots", and maintain a noticeably more even temperature.

Quiet. Only about one-sixth as much noise travels through an ICF wall. Occupants are pleasantly surprised by the reduction in noise that enters from outside.

Strength. Owners of ICF houses feel less flex in their walls and floors. They notice virtually no vibration when they slam a door. Engineering calculations show the walls are much stronger than frame walls in many ways. Field data show they survive many types of natural disaster better.

Energy efficiency. ICF walls cut an estimated 30-40% off the energy used to heat and cool a house. This means lower energy costs, to the tune of $200-300 per year for a typical home.

What's the bottom line?

When planning a new house, you can estimate that building the walls of concrete with ICFs and experienced crews will add $.25-3.25 per square foot to the cost. More precise estimates come from adjusting a mid-range figure (about $2 per square foot) to reflect the specifics of your particular project, or from exact quotes from the contractors and suppliers involved.

Weigh this incremental one-time cost against the range of benefits that ICF walls will add to your house over its lifetime. You will see a house built with the quality of insulating concrete forms is an economical choice.

The following publications are available from the Portland Cement Association.

RP123	National Association of Homebuilders Research Center **"Concrete Homes versus Wood Frame Homes – Installed Cost, Acoustic, and Thermal Performance"**	**$10.00**
CD044	**HVAC Sizing for Concrete Homes** (Application Software)	**$59.95 ND**
LT282	VanderWerf and Panushev **Insulating Concrete Forms Construction: Demand, Evaluation, & Technical Practice**	**$49.95 ND**
EB118	HUD, NAHB Research Center, & PCA **Prescriptive Method for ICFs in Residential Construction** (2nd Edition)	**$25.00**
SN2781	**ICF Construction Cost Study** (PDF only)	**$15.00**

PCA Portland Cement Association

Concrete Homes

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