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Concrete Homes Technology Brief No. 9: *Side by Side Comparison: A Quality Concrete Home for Only 3% More*

Building a new house with concrete exterior walls will add roughly 3 percent to the sale price, compared to the same house built with conventional wood framing. Research results showed this modest increase during the monitoring of the construction of three homes, built side by side by the same crew. The exterior walls of two homes were built with concrete, but the third was built entirely with wood framing.

What was studied?

Three homes were built on adjacent lots in a development near Chestertown, Maryland. The exterior walls of two homes were built with insulating concrete forms (ICFs) and the third was built with wood framing based on standard building practices presently used in the region. Each home was approximately 1,100 square feet.

The National Association of Home Builders' Research Center observed the same contractors build each house. The framing crew that erected the exterior walls was experienced with both wood and concrete homebuilding, having built numerous wood frame and over 40 ICF homes in the past.

For one of the ICF homes, they used the same ICF system they had used previously, a screen-grid block system, with modular 48 in. long by 12 in. high molded foam blocks. These units stack and interlock like toy building blocks. For the second ICF home, the crew used a flat wall system, consisting of narrow 96 in. long and 8 in. high foam planks, with flat edges that are wired together as the units are stacked.

The time and labor data presented here is not suitable for general estimating purposes, since not all components of each assembly is included in the figures. Only the work impacted by the change in the materials used to build the exterior walls of the homes was compared.

How much labor was required?

The total productive labor hours used for each portion of each house related to use of ICFs and their assumed cost are identified below:

Total Labor Hours:

Screen Grid Block ICF System	Flat Wall Plank ICF System	Wood
68.28 total labor hours	96.91 total labor hours	60.70 total labor hours
12.49% longer than wood frame	59.65% longer than wood frame	

Total Labor Cost:

Screen Grid Block ICF System	Flat Wall Plank ICF System	Wood
$1,970.05 total cost	$2,838.34 total cost	$1.730.91 total cost
$1.32 per square foot of wall	$1.91 per square foot of wall	$1.09 per square foot of wall
$1.80 per square foot floor area	$2.59 per square foot floor area	$1.58 per square foot floor area
$.22 per sf flr. area higher	$1.01 per sf flr. area higher	

Because homes in the Chestertown area are typically sub-contracted on a lump sum or piecemeal basis, actual hourly rates for home construction for this region did not exist. Instead, hourly rates were obtained from *RSMeans Residential Cost Data.*

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The higher labor costs for the house built with the Plank ICF System reflects the learning curve for the crew building their first home with this system. Experience has shown a crew will typically require a three home learning curve to become familiar and efficient with ICF systems. Far lower labor rates for the second ICF house demonstrate the greater efficiency the same crew had working with the ICF system they had used numerous times in the past.

What were the material costs?

The cost of materials to construct the exterior walls are identified below:

Above Grade Wall Material Costs:

Screen Grid Block ICF System	Flat Wall Plank ICF System	Wood
$3,572.75	$3,148.73	$1,249.74
$2,323.01 higher than wood	$1,898.99 higher than wood	

What's the total cost difference?

The total cost of labor and materials related to the use of ICFs for foundation and above-grade exterior walls are identified below. The increase in cost between the ICFs and the wood frame home amounted to 3.5% of the sale price of the home, and 7.2 to 8.4% of the construction cost of the home.

Foundation and Above-Grade Exterior Wall Labor and Material Costs:

Screen Grid Block ICF System	Flat Wall Plank ICF System	Wood
$6,552.52 total	$7042.72 total	$3,760.52 total
$2,792.00 higher than wood	$3,282.20 higher than wood	
3.0 % of $94,000 sale price higher	3.5% of $94,000 sale price higher	
7.2% of $39,000 construction	8.4% of $39,000 construction	
cost higher	cost higher	
$4.40 per square foot of wall total	$4.73 per square foot of wall total	$2.37 per square foot of wall total
$5.97 per square foot floor area total	$6.41 per square foot floor area total	$3.42 per sf flr. area total
$2.55 per sf flr. area higher	$2.99 per sf flr. area higher	

What's the bottom line?

The developer of this subdivision realized the greater value he could offer homebuyers by switching to ICFs. His contractors were able to make the transition easily while adding modest additional cost to the new homes.

You can build a high quality concrete home for only slightly more than conventional wood frame. The small additional cost is a small price to pay for added comfort, quiet, disaster resistance, and greater energy efficiency.

Additional Related Resources

Additional Resources can be found in the PCA Bookstore or in the PCA Reference Library. For More Information, contact the Library at library@cement.org or 847.972.9174.

RP123 National Association of Home Builders Research Center, *Concrete Homes versus Wood Frame Homes—Installed Cost, Acoustic, and Thermal Performance.*

This publication reports on the results of testing and monitoring done on three identical homes built in Chestertown, Maryland. Two of the homes were built with insulating concrete forms (ICFs), the third with conventional wood framing. Results from extensive cost and material analysis, acoustic testing, and energy usage are described.

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5420 Old Orchard Road Skokie, Illinois 60077-1083
Phone: 847.966.6200 Web: www.cement.org
IS308