

Getting started with ICFs

To accelerate your learning curve when building homes with insulating concrete forms, follow these 10 basic tips

BY KIM BASHAM

With the increasing demand for concrete homes, more builders are opting to use insulating concrete forms (ICFs) rather than traditional wood-frame construction. But to achieve success with ICF construction, as with any new building technology, you must first learn the tricks of the trade. The following tips will help you climb the learning curve for ICFs as quickly and painlessly as possible, says Wayne Fenton, marketing director of Lite-Form Interna-



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To ensure proper wall alignment, brace walls and wall corners according to the form supplier's recommendations. Check wall dimensions and alignment every few courses and after walls are erected.



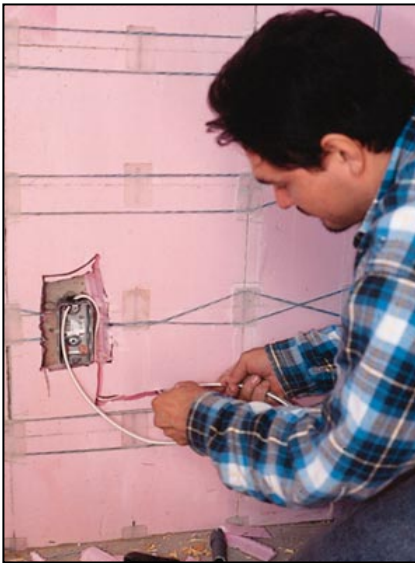
Lite-Form International

After erecting the forms and before placing concrete, correct any alignment and bracing deficiencies. Never exceed the recommended concrete placement rate, typically 4 feet per hour.

tional, Sioux City, Iowa. These tips apply to both extruded and expanded polystyrene foam forms and to different system types, including flat, grid, and post and beam.

1. Obtain approval from local building officials. Since building codes do not specifically address ICF construction, visit with local building officials before submitting ICF plans and filing for a building permit. Find out what code provisions apply and the requirements for obtaining code approval. Also, identify any questions and concerns the officials may have, and resolve these issues before submitting plans and requesting approval.

2. Build a flat, level footing. To avoid trimming and shimming the first course of foam forms, start with a flat, level footing surface. If not corrected, elevation errors in the footing surface will be telegraphed to the top of the wall, leading to wall alignment problems. Take extra care when placing, striking off, and finishing the footing to maintain an elevation tolerance of $\pm\frac{1}{2}$ inch, as measured from the specified elevation to the top of the footing.



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Schedule meetings with electricians and other subcontractors before the job begins to discuss installation procedures and resolve questions.

3. Handle foam forms with care. Rough handling can damage foam forms, so use a light touch when moving them around the jobsite. When you store the forms onsite, secure them with tarps or tie-downs to prevent high winds from tossing them about. Rain or light snow will not harm foam forms, so coverings aren't essential.

4. Check dimensions and alignment often. As the wall goes up, maintain horizontal and vertical alignment by checking wall dimensions and making any necessary corrections every few courses. When the forms must be cut to make ad-

justments or to form blockouts, be sure to measure the required cuts for each course of the wall. Measuring the first two courses and merely cutting the forms to fit for subsequent courses will lead to alignment problems requiring time-consuming adjustments or repairs. Maintain a vertical alignment tolerance of $\frac{3}{8}$ inch in 10 feet (or about $\frac{5}{16}$ inch for an 8-foot-high wall).

5. Brace walls and wall corners properly. Begin bracing the forms when the walls reach a height of about 4 feet, following the form manufacturer's bracing recommendations. Bracing will support the forms in high winds and keep corners and walls properly aligned during concrete placement. Since corners are erected first, pay special attention to corner alignment and bracing details. Wall alignment will be thrown off if corners move or shift during wall erection or concrete placement.

6. Brace all window and door blockouts securely. Before placing



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Window and door blockouts require temporary bracing so the frames will remain square during concrete placement.

the concrete, install diagonal bracing according to the form manufacturer's recommendations to keep blockouts square and secure. Installing bracing will take much less time than fixing out-of-square or misaligned windows and doors after the concrete has been placed.

Other resources

For more information about building homes with ICFs, check out these other useful resources:

- "Meeting Design Requirements for ICF Homes," *Concrete Construction*, July 1998, pp. 597-601.
- "Tips for Placing Concrete into Insulating Wall Forms," *Concrete Construction*, December 1996, pp. 925-930.
- *Building with Insulating Concrete Forms*, a five-part video training series produced by the Portland Cement Association. (To order, call The Aberdeen Bookstore at 800-323-3550. The cost of the five-tape set is \$67.50, plus shipping and handling.)
- *InsulatingConcreteForm.com*, a news and information Web site for contractors, designers, and ICF distributors. It provides an overview of ICF systems and accessories, an online construction manual for builders, and a discussion forum where participants can share tips and techniques.


7. Check wall alignment and bracing before placing concrete. After the forms are erected and before the concrete arrives, perform a thorough and final recheck of wall alignment and bracing. Be sure bracing is adequately attached and securely staked. Also, inspect for the correct placement of anchor bolts and other inserts, electrical and plumbing blockouts, and pipe sleeves.

8. Use the recommended concrete mix design and placement rates. To facilitate concrete placement and consolidation and to avoid blowouts, be sure to use the concrete mix design and placement rate speci-

fied by the ICF supplier. Typically, a pea-gravel mix (½-inch maximum aggregate size) with five to six sacks of cement per cubic yard and a compressive strength of 3000 psi at 28 days is required. Because high concrete slumps and placement rates can contribute to floating or blowout of the forms, most ICF manufacturers recommend a 4- to 6-inch slump and a maximum placement rate of 4 feet per hour.

9. Have a form repair kit on hand. Even if ICFs are properly braced, blowouts can occur if concrete pressures become too great. Place concrete at the recommended rate, and have a repair kit on hand in case a blowout occurs. The form

supplier's construction manual will describe how to assemble these kits, which usually consist of plywood or 2x4s that are secured to each side of the damaged wall section to brace it.

10. Educate subcontractors before construction begins. Subcontractors not familiar with ICFs also need time to learn new procedures and prepare for an ICF project. To avoid job delays and extra charges, provide subcontractors with the form supplier's recommendations on how to attach drywall, install electrical and plumbing lines, and finish the wall exterior. Questions and concerns can usually be answered by studying the ICF manual or contacting the form supplier directly. 

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