



# ICFs, Termites and the Code

Protecting a structure from the elements can be complex and the solutions conflicting. Termites pose a particularly difficult problem. Buildings should be insulated for energy savings, yet termites can infiltrate through any insulation and penetrate all but the strongest materials. Insulating Concrete Forms (ICFs) would seem to provide a good solution, as the foam offers no food source, and concrete provides a protective barrier to termite infiltration.

However, even ICF houses have gaps in the concrete wall, in the form of windows and doors. In spite of the fact that ICFs have no nutritional value for termites, the foam can provide a path for the termites to access openings in the wall and seek food sources elsewhere in the structure. To combat the possibility of structural damage from termites, the International Code has specific provisions for construction in high termite areas.

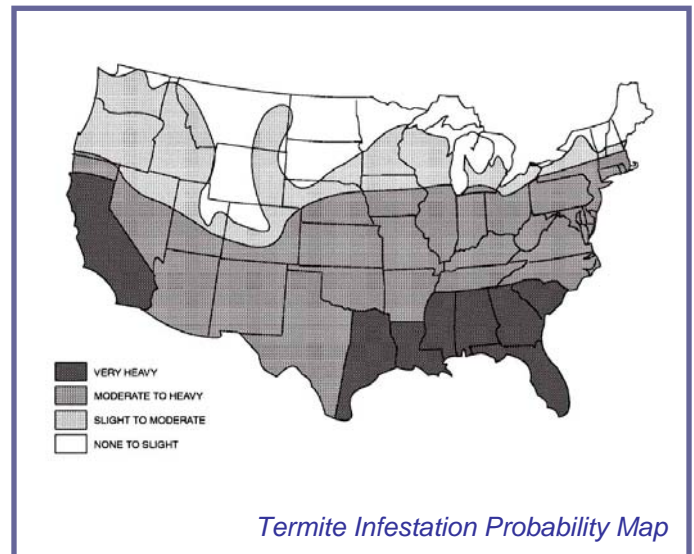
## **Termite Protection Required by Code**

Code provisions for termite protection are based on the Termite Infestation Probability Map<sup>1</sup> which was developed by the U.S. Forest Service and is published in the Code. Code officials consider the information on this map, along with the history of local subterranean termite damage, to determine the level of need for local termite protection.<sup>2</sup> Protection methods include chemical termiticides, termite baiting systems, preservative or naturally treated wood, and/or physical barriers. Each one of these methods is defined in the International Residential Code (IRC). The commercial code, the International Building Code (IBC), is less descriptive, indicating naturally durable or preservative-treated wood or an approved method of termite protection.<sup>3</sup>

## **ICFs Below Grade**

If the authority having jurisdiction (AHJ) has determined an area is not subject to termite damage, ICFs are permitted below grade without additional termite protection. When ICFs are used in areas designated on the termite infestation probability map as “very heavy”, foam plastics are prohibited for use below grade, with specific exceptions.<sup>4</sup>

The Code further specifies that the clearance between foam plastics installed above grade and exposed earth shall be at least 6” (152 mm). The intent of this provision is to cut off any undetected pathway termites might have to travel from the soil and into the building structure. The strip is intended to force them to the surface, where they can be controlled.



*Termite Infestation Probability Map*

## **Exceptions for Foam Below Grade**

The Code provides for exceptions to the below-grade foam ban in “very heavy” termite infestation areas. Foam may be used below grade if it is placed on the interior side of a basement wall. While this does protect the foam from termites, it is not optimal from an energy standpoint.

The second exception requires that structural members of walls, floors, ceilings and roofs be entirely of noncombustible materials or pressure preservative treated wood. This is accomplished by combining ICF construction with steel, concrete or treated wood structural members, which can offer additional advantages such as fire, storm, and seismic protection.

A final exception allows foam below grade when, in addition to the requirements in Section R320.1, an **approved** method of protecting the foam plastic and structure from subterranean termite damage is provided. The Code defines **approved** as acceptable to the building official, code official or authority having jurisdiction.

Guidance tools available to Code officials are found in ICC-ES evaluation reports of either the foam plastic products or of the products which provide protection for the foam plastic. Foam plastic products are evaluated in accordance with the ICC-ES “Evaluation Guideline for Termite-Resistant Foam Plastics” (EG 239). The foam plastic in compliance with this guideline will be considered termite-resistant.

Other products qualifying as foam plastic protection fall under the physical barrier provisions in IRC Section R320.4. Physical barriers are defined as metal or plastic sheeting or collars specifically designed for termite prevention, to be installed in a manner to prevent termites from entering the structure.

### **ICF Window Construction**

Though ICFs hold no nutritional enticement for termites, the temptation of food can be entirely removed by choosing equally unappetizing or inedible materials for all the exterior envelope components. Window and door bucks can be made of vinyl or pressure treated lumber. Window selections include vinyl, aluminum or fiberglass.

Penetrations through the ICF for utilities lines or even conduit for an outdoor electrical receptacle should always be sealed. Special termite proof cement or metal mesh can protect the openings. If using a conventionally formed concrete stem wall or foundation, all cracks and joints should be sealed with a cementitious mortar.

### **Best Practices**

In addition to the Code provisions, the National Pest Management Association offers some recommendations to discourage termites:

- Remove the conditions that termites need to survive: food and water.
- Divert water by grading the landscape away from the house, install properly functioning downspouts, gutters and splash blocks.
- Reduce humidity in crawl spaces with moisture barriers and proper ventilation.
- Prevent shrubs, vines and other vegetation from growing over and covering vents.
- Remove old wood boards and grade stakes that were used during building construction.
- Remove old tree stumps and roots around and beneath the building.
- Separate the soil and wood portions of the building by a minimum of an 18-inch gap.
- Routinely inspect the foundation for signs of termite activity or damage.



*Termites Cause \$5 Billion Damage Each Year*

### **The ICF Solution**

While it is clear that termites would not penetrate a concrete wall, the Codes and ICC Evaluation Reports are set up to ensure protection of all the structural components. ICF construction in very heavy termite infestation areas is well defined in the Code, with several options for compliance.

Overall, ICF construction offers a relatively straightforward solution to the very complex task of providing protection from termites, while also providing protection from moisture, high temperatures and severe storms such as tornados, and hurricanes.

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<sup>1</sup> IRC Figure R301.2(6) and IBC Figure 2603.8

<sup>2</sup> IRC Table 301.2(1)

<sup>3</sup> IBC 2304.11.1 and IBC 2603.8; IRC Section R320

<sup>4</sup> IRC R314.7, R320.5, R404.4.7; IBC Section 2603.8.

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