

Alternative Building Materials

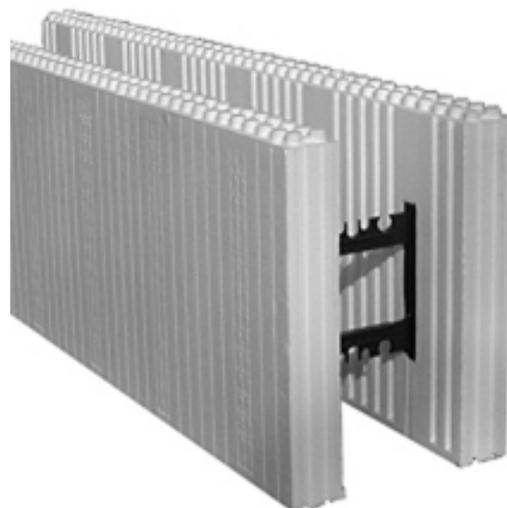
The use of alternative building materials can improve the energy efficiency of our homes, businesses and schools as well as help to conserve natural resources.

95% of all homes in the United States use wood as the main structural component. Most of this wood comes from old growth forests, much of which have been harvested during the past 100 years. Building homes with wood is relatively fast and efficient from the standpoint of labor. Framed construction does not however make the most energy efficient buildings. All the individual parts used in the construction make it very difficult to insulate the building effectively. The same goes for commercial buildings that use cement block for construction. Concrete masonry unit (CMU) construction is very common but not very energy efficient. In each of these cases, the energy efficiency of the building is less than it could be if other materials were used. Lower energy efficiency means higher energy costs for the life of the building.

There are alternative building materials available that can dramatically increase the energy efficiency of a new home as well as greatly reduce the amount of wood used in its construction. None of these alternative building materials will eliminate wood from home construction, but they will greatly reduce its use.

There are two common alternative building materials available that meet most building codes, are more energy efficient, and are economically feasible: insulated concrete forms (ICFs) and structural insulated panels (SIPs).

Insulated concrete forms are basically foam blocks with large cavities in the middle. These blocks are assembled at the building site to form walls. Concrete reinforcing bar is placed within the cavities according to local building codes for reinforcement. The cavity is then filled with concrete. Once the concrete has hardened, you have a very strong wall system with a high insulation value and a very low air infiltration rate.



ICFs are an option for both residential and commercial construction. ICF construction does cost about 5% more than typical residential wood frame construction and has a very similar cost to commercial CMU construction. ICFs are more energy efficient than either frame or CMU construction.

The other option, structural insulated panels (SIPs) are basically large sheets of foam sandwiched between a sheathing material such as oriented strand board. These panels are generally manufactured and cut to size at the factory, then shipped to the building site where they are set in place to form walls. SIPs can also be used to build floor and roof systems. SIPs also create a very strong wall system with a high insulation value and a low air infiltration rate.

SIPs are easily adapted to residential use. It does cost more to build a house using SIPs than to build a frame house. SIPs may also be applicable for commercial construction in some cases.

There are several other alternative building methods/materials available. Examples of these are: modular or panelized (stick-framed with wood in a factory), straw bale, timber framed, logs, adobe, rammed earth, cobb, cord wood, automobile tires, etc... These alternatives all have issues that may include economic feasibility, social acceptability, applicability in only some climates, or may not be acceptable according to local building codes. All of these alternatives may be more energy and resource efficient than standard building practices.

By using alternative building materials/methods, we can build a more energy efficient and environmentally responsible homes, but it is important that you check with your local building department to ensure that your choice is acceptable in your area.

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