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## Steel popular in new homes, but may not be best

By Jan TenBruggencate  
 ADVERTISER SCIENCE WRITER

Most new homes in Hawai'i, especially those in large developments, are being framed in steel. But are they any easier on the environment than alternatives such as wood framing or concrete?

Carpenter Scott Keogh, swinging a nail gun on a wood-frame home in the Molokoa subdivision in Lihue, Kaua'i, doesn't see much difference.

"All those materials are environmentally sound. To me, wood is more flexible from a design standpoint," Keogh said.

By a significant margin, wood is the most energy-efficient of common framing materials, meaning less energy is required to produce it than concrete and steel. One of steel's primary environmental selling points is that it's endlessly recyclable. Concrete makers argue that their product stabilizes interior temperatures so that heating and cooling costs are reduced and it's less likely to be destroyed in a hurricane.

Contractor Ken Souza of Ken Do Repairs and Remodeling on Kaua'i said he likes concrete for its hurricane survivability, and wood for its ease of workmanship. There's nothing wrong with steel, he said, but the labor costs may be higher until crews get accustomed to it.

Hawai'i builders say environmental concerns are not the primary reason for choosing home framing materials. But the industry is sensitive to the issue.

The Hawai'i Building Industry Association holds regular conferences and training sessions through its Hawai'i BuiltGreen program. The next, April 22 to 23, is its 2004 Build and Buy Green Conference at the Waikiki

Beach Marriott.

"Hawai'i leads the nation in steel framing in new residential communities. Especially in master-planned communities, it's 60 to 70 percent," said Karen Nakamura, chief executive officer of the Hawai'i Building Industry Association.

The main reason is fluctuating wood prices that can make it difficult to budget.

"With wood, it was kind of hard to control the cost," said Wayne Kawano, president of the Cement and Concrete Products Association.

But wood framing is still a major player, particularly in Neighbor Island building, reconstruction and remodeling. The wood framing industry insists it has whipped the termite problem and offers several advantages over steel.

"In the replacement market, I think the percentage of wood is quite big," Nakamura said. But she said there are no good statistics on how much of each product is being used.

Concrete, the other major home-building material, is far back in third place, hampered in large part by higher costs. But its supporters insist it's the best of the three for durability, noise and temperature control.

From an environmental friendliness standpoint, the preferable building material is not easy to identify.

Wood is the "greenest" building product, according to Hap Person, president of the Hawai'i Lumber Products Association. The Canadian Wood Council says wood wins out on the production of less greenhouse gases, air pollution and solid waste.

There were concerns with the banning of arsenic-based wood treatment that termites

## Steel: Strength, ability to recycle touted

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would eat their way through new homes, but Person, who runs Honolulu Wood Treating, said new borate treatment techniques are dramatically less toxic to mammals, soak more into the wood than old copper arsenate compounds, and carry a 20-year guarantee.

The main difference between new and old treatment techniques is that borate-treated wood can't be used in contact with the ground or a constant moisture supply, since it's water-based and can leach out. But Person minimizes the risk: "The only way you're going to lose significant termite protection is if you store your lumber in a swimming pool," he said.

The steel industry, while conceding that it takes a lot of energy to mine and process the raw materials for new steel, says its product is

endlessly recyclable, fire-resistant, termite-proof and strong. There is also less waste at the job site when steel is cut to length at the factory.

Light steel framing is fairly easy for traditional wood-frame builders to adopt, since steel members can be swapped one-for-one where wood framing studs would be used. The main difference is the need for screw guns instead of nail guns.

Concrete can cost a homebuilder 3 percent to 8 percent more than the other products, the concrete industry's Kawano said. And it can be recycled, he said. While half or more of the material on construction and demolition landfills is concrete, it doesn't need to be. The stuff can be ground up for use as aggregate in new concrete and can be used as fill.

"It's a sustainable product," Kawano said.

One of the big issues with all three is at the source. For steel, miners scour the earth for iron ore. For the cement in concrete, limestone is mined. For wood, forests are logged, although Person said that virtually all U.S. framing lumber now comes from sustainable pine forests.

At the other end of the use curve, wood and concrete waste can be, but tend not to be, recycled. Steel does get recycled.

"I think Hawai'i is just beginning to catch on to the recyclability and renewability of building materials," Nakamura said.

Ultimately, the homeowner and design and construction advisers must make the decision, and it's not easy. At the Web site of BuildingGreen.com, a comparison of the environmental issues for steel and wood concludes: "There are no perfect materials. Wood and steel

each have their drawbacks, both in terms of environmental impacts and performance as framing members."

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### On the Web:

Building Industry Association of Hawai'i — [www.bia-hawaii.com](http://www.bia-hawaii.com).

National Association of Home Builders — [www.nahb.org](http://www.nahb.org).

Concrete Homes Council — [www.concretehomescouncil.org](http://www.concretehomescouncil.org).

Steel Framing Alliance — [www.steel framing alliance.com](http://www.steel framing alliance.com).

American Wood Council — [www.awc.org](http://www.awc.org).

BuildingGreen.com — [www.buildinggreen.com](http://www.buildinggreen.com).

Energy and Environmental Building Association — [www.eeba.org](http://www.eeba.org).