

Style



WORKERS CUT AND assemble the large blocks that make up the walls of the energy-efficient home, being built in Fullerton.

Breakthrough in block

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A FULLERTON HOME SHOWCASES THE LATEST ADVANCES IN ENVIRONMENTALLY FRIENDLY CONSTRUCTION.

A revolutionary custom home rising from a 1.4-acre site in Fullerton combines a bit of traditional California design with the newest techniques in environmentally savvy building.

The home sports the latest advances in recycling material and conserving water and energy. The most noticeable part of the structure so far is the walls. They are formed with large blocks made of concrete and polystyrene, a form of Styrofoam.

The large Lego-like pieces are up to 8 feet long, 3 feet wide and 14 inches thick. Two floors have been erected so far of the main house and one floor of the pool house a short distance away. On the main house, an enclosed courtyard is visible between the front walls.

The building technique, popular in Arizona and New Mexico, is just making its way to California. With the block walls going up so fast, it may not seem like the rest of the house should take several more months. But there are so many environmental aspects to its building that not all subcontractors may be familiar with them.

"It's taking longer to build than it would a conventional house," said chief contractor David Neilson of Neilson Construction. "We've got to train just about all of the subcontractors in these new methods of building this way." He estimates it will take a year to install all the systems.

Even though the owners will save money over the long term on energy and water, among other things, it is costing Crispin and Clementina Eley more to build such a

house.

"I'd estimate it will be about 20 to 25 percent more to build this house than one of similar size built conventionally," said Richard Hofmeister, the project's principal architect.

What will the house look like?

"The owners wanted to have a classic design with contemporary lines," Hofmeister said.

While the walls right now just have that

concrete look, they will have a plaster finish. Designed for a family of five, the house will have two floors around a central courtyard, Hofmeister said.

"The proportions of the courtyard are reminiscent of the classic California courtyard homes constructed in and around Los Angeles in the 1920s, '30s and '40s," he added. The estate will also include an entry gate and trellis, gardens with fountains, a swimming pool with pavilion and patios, and a separate carport with agricultural buildings for pet livestock.

"The owners wanted to live in a home that will last for generations," he said. "But they also wanted to use the traditional and modern elements of 'green' design."

"More power to the people building this home," said Stephanie Barger, an executive



THE FULLERTON HOME will include a classic California courtyard, depicted in this rendering.



THE LARGE, LEGO-LIKE blocks are made of concrete and polystyrene, a form of Styrofoam. The building technique, popular in Arizona and New Mexico, is just gaining ground in California.

with the Earth Resource Foundation, a group that promotes environmental solutions. "Home builders could have been using environmental methods and products a long time ago. It's a shame there are so few that do now. These people deserve a lot of credit, and we should all learn from them."

Some of the energy-saving methods the

house will use are "passive" techniques, such as providing natural ventilation and orienting the structure to take advantage of sunshine and shade. The home also employs "active" techniques such as using engineered lumber and the latest technological advances to collect solar energy.

Here are some of the passive and active "green" features Hofmeister outlined:

COURTYARD DESIGN. This allows natural cross-ventilation in all rooms and solar access to interior parts of the residence.

ORIENTATION. Rooms, windows and shading elements (such as overhangs and porches) are designed to take advantage of daylight hours for light, for solar energy and views. The second floor is situated mostly on the north side of the courtyard to allow the best access of light in the winter.

INSULATION. These values are well above code minimums. That is largely due to the special type of building block and the 14-inch thickness of the walls.

Because of the building materials and design, it will take only 25 percent of the power that normally would be required to heat and cool a home of this size, Hofmeister said.

RADIANT FLOOR HEATING. Most homes in Southern California are heated with natural gas from a forced-air furnace. The floors in this home will be heated with panels that will distribute heat through a network of tubing. The heat will flow into a specially designed aluminum layer below the finished floor. Heated floors are not uncommon in the Midwest and East, but they are fairly rare in Southern California, going into mostly high-end homes along the coast.

Hofmeister said that not only is radiant floor heating much more comfortable and efficient than forced-air heating, it's environmentally friendly because it uses less energy.

"The air blowing around from a forced-air furnace has to be a lot hotter than you'd think, because moving air actually cools," he said. "So, you have to make it a lot hotter just to compensate. That extra heat means more energy to produce it."

"Radiant heat requires very little energy by comparison, and the heat moves of its own accord."

SOLAR ENERGY. This will be used for hot water and electricity.

GRAY WATER. The home will have two sets of plumbing pipes. The second will allow leftover "gray" water from the bathroom sinks, showers, tubs and laundry to be reused to irrigate the yard.

Engineered lumber will be used extensively. This lumber, like a sandwich of glued and compressed wood chips, is very strong.

The home also will have a metal-shingle roof that allows for ventilation.

And, when it's eventually time to replace it, it can be recycled.

The environmentally aware thinking extends to the home's interiors. Carpet

glues are avoided, and interior paints are chosen from those that do not contain volatile organic compounds, Hofmeister said. When "real" wood is used, it is from species selected from sustainable harvesting sources or from existing stockpiles.

Here are some other "green" materials and building systems that will be used in the home, according to Hofmeister:

- > Concrete with fly-ash content (fly ash normally is a waste product from utility plants.)
- > Mesquite wood flooring (harvested from waste wood)
- > Cork flooring
- > Stone flooring
- > Ceramic tile (made from recycled glass)
- > The roof insulation panel below the roofing material is vented from the eaves to the ridge. This increases the effective insulation and allows heat to dissipate during the hottest months.
- > Aluminum-clad, highly efficient insulated windows
- > Highly energy-efficient mechanical equipment
- > Energy-efficient appliances
- > A recirculating pump for insulated hot water lines and a high-efficiency boiler fed with solar-preheated water
- > Solar thermal and solar electric panels feeding hot water to a storage tank
- > Excess heat will be transferred to heat the swimming pool. Excess electricity generated will go back into the electrical grid and be applied toward credit on each month's electrical bill.
- > Besides the gray water generated for irrigation, reservoirs under the lawn will also collect storm-water seepage during rains.

RESOURCES

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WORKERS LIFT ONE of the large sections into place on the wall. Below, they check alignment before adding mortar to solidify the sections.



"The owners wanted . . . to use the traditional and modern elements of 'green' design."

— Richard Hofmeister, principal architect