HOUSING SCENE

Green house effect

Lew Sichelman
September 12, 2004

AUSTIN, Texas – Forget recycled composite lumber, low-emissivity glass, bamboo floors and all those other so-called "green" building products.

If you want an environmentally friendly house, one that's easy on the pocketbook as well as Mother Nature, it must be sited properly on the building lot, constructed to keep moisture from entering and conditioned correctly to draw moisture out.

John Durant
The award-winning DeRenouard residence near Jamul is one of the few green-built houses in San Diego County. Designed by Hubbell & Hubbell architects, the 1,945-square-foot home was completed in 2001. exposure to the sun in winter.

- Green construction conference Friday

Pay strict attention to those three things – orientation, infiltration and air conditioning – and you'll be 90 percent of the way home, according to architect Peter Pfeiffer, who specializes in sustainable design and says green building products are "only a drop in the bucket" when it comes to producing a truly green house.

"I've never met anyone who didn't want to own a green-built house. Even when you are on a tight budget, there are things you can do," says Pfeiffer, who has spent the better part of the past 20 years developing pragmatic methods to mainstream green building.

The problem, though, is that "people get too wrapped up in aesthetics and don't think about practicality," the architect says. "You have to keep things in perspective. The first time you use a chemical spray, you've polluted the house more than out-gassing ever will."

Green building techniques are different for different parts of the country. But some approaches are universal, and orientation is one of them. The home's orientation to the sun is "extremely important," perhaps the "single most important thing a builder can do" to make it energy efficient, Pfeiffer says.

How vital is positioning the structure on the building site?

Results will vary, depending on the climate. But here in the Texas capital area, the home of the nation's first (and now 15-year-old) green building program and where Barley and Pfeiffer Architects is headquartered, simply turning a house on its lot so it faces toward the southwest is enough to cut energy usage in half, Pfeiffer says.

What is green building?

The Green Building Alliance says "the design, construction and operation of green projects minimize the use of energy, water and materials while cutting waste and improving health and air quality. Reduce, reuse, and recycle are key strategies for green building." Below are three of the most important considerations.

ORIENTATION

Solar design is important, too. Big roof overhangs on windows and doors – 3 to 4 feet as opposed to the 6 to 12 inches found in most houses - will block the sun in summer and help keep moisture from infiltrating the building envelope, for example. "Shading windows is more effective than $20,000 worth of glass," says Pfeiffer.

Rooms that are occupied most of the day should be on the breezy side of the house, too. Placing stairways opposite the side facing prevailing breezes is also a good trick because it forms a thermal chimney that will help draw heat out of the house. Even something as basic as a light-colored roof will pay big dividends, because dark roofs absorb heat.

But orientation is paramount if you want your house to be comfortable. The return on investment in, say, something like a tankless water heater would be a mere pittance in comparison, the architect says.

"Proper orientation is the biggest choice you can make to make your house most comfortable," he says. "Half your energy savings results from proper orientation."

Ideally, the house should be sited to maximize solar heat gain in the winter and minimize solar gains on hot summer afternoons. For the most part, that means the longest sides should face north and south.

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Designed by Hubbell & Hubbell architects, the 1,945-square-foot home was completed in 2001. exposure to the sun in winter. High ceilings and transom windows that take advantage of natural air flow.

The structure also should be positioned to take advantage of prevailing breezes in the spring, summer and fall. That way, you can throw open your windows and let nature cool your home.

Unfortunately, most builders and planners pay more attention to how their houses will look when lined up on the street than which way they should be facing.

Despite huge strides made by the green building movement in recent years, the majority of production builders – and many custom builders – still don't realize how much of an impact solar heat gain and prevailing breezes will have on comfort and energy bills. And if that's the case, you can bet their salespeople don't even have a clue.

That leaves it up to buyers to pick the right floor plan for their

A green-built house should be sited to maximize solar heat gain in the winter and minimize solar gains on hot summer afternoons. For the most part, that means the longest sides should face north and south. "Proper orientation is the biggest choice you can make to make your house most comfortable. Half your energy savings result from proper orientation," said architect Peter Pfeiffer.

INFILTRATION

To stop the infiltration of outside air, the building must be tight. To ensure this, stay away from recessed lights that puncture the drywall at the edge of the building's thermal envelope. Also avoid light switches and electrical outlets that are on outside walls. Metal ducts with slick interior surfaces are best for delivering clean air. And they should be well sealed.

AIR CONDITIONING

Air conditioning's job is to dehumidify the house. If the system is too big, it won't cycle properly. The house will be cool but not properly dehumidified because the system isn't running long enough to pull out the humidity. And that means condensation will build up inside the wall cavity," said architect Peter Pfeiffer.

favorite lot, or, conversely, the right lot for their preferred plan.

For starters, Pfeiffer warns against choosing a model or a lot in which the majority of windows face west. "You'll have a lot of discomfort," the architect says.

Another option is to reverse the plan you like best so the garage is on the west side of the lot you have in mind. That way, it can act as a buffer against the summer sun and winter winds. Laundry rooms, bathrooms and closets also are good at blocking the sun's rays.

If the plan can't be flipped because the lot slopes the wrong way, then try to pick an exterior elevation with a porch or overhangs that protect the first-and second-floor windows.

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The black-bottom pool also is passively heated. Walls are plaster and flooring is slate over concrete slab. Wood is used throughout in windows and doors and the landscaping is low-maintenance native vegetation.

To determine prevailing breezes, look up climatological data for your area or call your local airport to find out where the winds generally come from.

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Your builder can do other things, too. Metal ducts with slick interior surfaces are best for delivering clean air, for example. And, of course, they should be well sealed.

But perhaps above all else, the builder – and you – should be absolutely certain that the heating, ventilation and air conditioning (HVAC) system is sized properly for the house. If it is not, it can wreak havoc with your comfort and possibly even your health.

Pfeiffer grew up in New Jersey during a time when air conditioning was still an expensive option most home buyers couldn't afford. Now, almost every house is built with A/C, and many to excess.

The HVAC system is designed to keep you cool in summer, and it does that by sucking the humidity out of the house.

"Air conditioning's job is to dehumidify the house," Pfeiffer explains. "If the system is too big, it won't cycle properly. The house will be cool but not properly dehumidified because the system isn't running long enough to pull out the humidity. And that means condensation will build up inside the wall cavity."

With proper windows and shading, most houses should require no more than one ton of cooling capacity for every 600 to 700 square feet of living area. But the real test is to make sure that the HVAC contractor or the local utility company has done a load calculation, and that the builder does not exceed the recommended size of the heating and air conditioning system.

Another test: Sit down in a model home and listen to how often the HVAC system goes off and on. If it starts and stops frequently, chances are it's too large. A properly sized system will run for long periods and then shut down for equally long periods. Short bursts means that it is oversized.

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SMOKESTACKS AND GERANIUMS

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Roger M. Showley

With the recent opening of the 56 freeway from Interstate 5 to 15, it's time to come up with a name for that swath of real estate lying between Carmel Valley and Rancho Santa Fe on the west and Rancho Bernardo and Peñasquitos on the east.