

PRESS RELEASE

California's First Passive House Remodel Moves Towards Completion

Project team thinks this kind of construction could be the state's answer to meeting its greenhouse gas reduction goals.

Athens, OH March 10, 2010—UltimateAir supports Passive House U.S. and is proud to have been chosen to provide the industry's highest rated ERV on California's first Passive House remodel project.

Early next week, precertification of the first California house being remodeled to meet Passive House Institute standards should be completed. The first air-exchange test of this U-shaped, 2,400-square-foot home, which was built in the 1960s, is scheduled in three weeks. The project is on target to be finished by July.

The home, a single-family one-story structure located on a 73.5- by 100-foot lot in the city of Sonoma, will retain its original foundation and about 40% of its walls, says Graham Irwin, a principal with Essential Habitat in Fairfax, Calif., and a certified Passive House consultant. He's working on this project with builder Rick Milburn, who owns Solar Knights Construction in Napa, Calif.; and Jarrod Denton, an architect with Lail Design Group in St. Helena, California.

A "passive house" is an airtight structure constructed to retain as much "free" heat created inside of a house as possible. Its distinguishing characteristic is its promise to reduce energy consumption by up to 90% without relying on expensive equipment such as solar panels. The concept mostly dispenses with conventional HVAC systems in favor of a heat exchanger that uses heat generated from its occupants, appliances, electronic devices, pets and so forth, to warm fresh air coming in from outside that's circulated through vents.

Passive house construction has a 20-year track record in Europe, but only recently has been introduced in the United States. The Sonoma homeowner initially wanted the remodeling to meet LEED standards established by the U.S. Green Building Council. That was before she became enamored of passive houses after reading about them in The New York Times last year. Milburn and Denton were receptive to the switch, partly because they believe that LEED has become too "bureaucratic." Denton admits, though, that he was at first skeptical about

building to Passive House Institute's performance levels. "When I read the requirement of 0.6 air exchanges per hour at 50 Pascals, I thought it was a typo," he says. "But that's also what's most impressed me about this construction."

(Another remodeled house in Berkeley, Calif., to which architect Nahib Tahan applied these standards, has yet to meet the Institute's air-exchange requirements.)

Denton notes that he recently completed the first LEED Gold winery in California, "and that doesn't even come close to Passive House in energy efficiency."

The supplemental HVAC source for the Sonoma home is an air-to-water heat exchange that works in tandem with an energy recovery ventilator. There is also a small backup cooling system. At peak, these systems will need to generate only 6,800 BTUs per hour of heat and less than 4,000 BTUs per hour of cool air. "These are incredibly small [systems]; less than half a ton," says Irwin.

The remodeling, which began last fall, is transforming an oddly configured 1,800-square-foot house that was built in the 1960s. Denton says that making an existing home passive poses some design challenges because its living space is "so spread out." (He believes Passive House construction and remodeling might be even more adaptable to multifamily.) The redesign connects two buildings with a breezeway that leads into a courtyard. There is also an attached garage.

When completed, the house's efficiency will extend beyond its four walls. The roofing is made from recycled content. And the yard will feature dryscaping that's nourished by rainwater catchment tanks built under a driveway with a permeable surface.

The partners in this project see no reason why more houses in California shouldn't be built and remodeled to Passive House standards, given the state's relatively temperate climate. Much of the heat for the Sonoma house will derive from passive "solar gain" through triple-pane windows and tighter construction. While the windows and glazing must still be bought from German suppliers, 75% of the products being used to remodel the Sonoma house have domestic sources. (For example, Milburn says the tapes and sealants are now available from American suppliers.) Irwin believes it's only a matter of time before windows that meet Passive House standards are widely available to U.S. builders, remodelers, and architects.

As more of these homes emerge, pricing should come down. Milburn tells BUILDER that the cost estimates for the Sonoma retrofit "will be between 10% and 15% higher than if we did this project without Passive House [certification]."

The partners also believe that building and remodeling to Passive House standards might be the most practical way for California to achieve its mandated goal of reducing its greenhouse gas emissions to 1999 levels by 2020, and for all new residential buildings to be net zero energy by 2020.

Sonoma is in an area of the country where solar panels for residential power have proliferated. But Irwin points out that a 1,500-square-foot house would need 1,300 square feet of photovoltaic cell panels to meet its electricity demands. “Before we start applying renewables, we need to work on the house itself,” he says.

Milburn says that the Sonoma house gets three or four curious visitors per week, and Denton anticipates an “explosion” in demand for Passive Houses within the next year. The team is already negotiating for their next retrofit project, a 6,500-square-foot home along the Monterey Peninsula.

Milburn and Denton add that as builders and architects get more comfortable with Passive House’s requirements, the designs of these homes—which in the United States at least have been pretty basic—are bound to get more aesthetically pleasing. They point specifically to a Passive House that’s been built on Martha’s Vineyard in Massachusetts as an example. “In Germany, the most appealing houses are the Passive House ones, and these don’t need to look like Frankenstein’s child,” Milburn says.

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