

LEED Project Case Study #2: McCormick Woods, City of Capitola, Santa Cruz County

Project History

McCormick Woods is a four-unit spec house development located in the City of Capitola in Santa Cruz County. The homeowners are often met with surprise when visitors learn that these luxurious homes are also environmentally friendly. When they think of an eco-home, they visualize something like the straw-bale and mud house that initially inspired the developers of McCormick Woods, Steve and Paddy Graves. The Graves wanted to capture the “earthy feeling” of the mud house in a luxury home that was more amenable to the average homeowner; they decided the best way to do so was to build green.

Steve Graves is an environmental land-use planner; his wife, Paddy, is a health professional. Together, they had designed and built several houses in the past, but McCormick Woods was to be their first green project. Their goal was to create something “beautiful, livable, healthy and sustainable,” establishing a neighborhood of conscious people and inspiring other developers to take a step forward into responsible building. Their project is one of 40 taking part in the LEED for Homes pilot project nationwide.

McCormick Woods was registered for LEED certification in the spring of 2006. The permits took about six months to acquire, and construction of all four homes took only eight months. The Graves encountered some trepidation at the very beginning of the approval process—Council members were unsure about McCormick Woods as it was the only green spec project in the Santa Cruz/Capitola area—but their apprehensions were put to rest with ample support from the Monterey Bay Branch of the United States Green Building Council (USGBC) and Sharon Sarris, its co-founder, in particular. Ultimately, the development garnered public support because the landmark effort in green building put Capitola on the map. City Council and the Planning Commission were in favor of the green development, and the LEED certification process went smoothly for the Graves.

Three of the four homes are certified LEED Silver; efficient landscaping would easily carry them to Gold, but Steve and Paddy wanted to leave this to the individual homeowners. The fourth home, occupied by the Graves, is not rated, but was built to exactly the same specifications as the other three. They decided to hold off on having their own home certified due to the cost; they will have it certified later on when it will be cheaper to do so, likely before they sell it. All of the homes exceeded Title 24 (The Energy Efficiency Standards for Residential and Nonresidential Buildings) even before the new codes were enacted in 2007.

Green Building Features

The process of green building on McCormick Woods began with green demolition. FERMA Corporation, which specializes in the reuse and recycling of old building materials, transported the remnants to a recycling facility where 100% of the waste was

recycled. Due to the increased costs of dumping, this demolition cost the same as the more conventional, wasteful method carried out by other demolition companies.

The homes feature a radiant floor heating system from Santa Cruz Radiant that is more energy efficient and heats the home more evenly than a traditional forced-air system. The radiant system circulates hot water through a Takagi TM-1 on-demand tankless water heater, which also supplies hot water for domestic use and reduces natural gas consumption by only heating water when it is needed. The tubing for the radiant system was laid in the cement foundation for the ground floor and installed in plyboard on the second floor. In addition to keeping everyone's feet warm, one of the major benefits of radiant flooring is that it does not blow dust, dust mites and airborne bacteria throughout the home like a forced-air system.

Lots 1 and 2 feature FSC-certified (Forest Stewardship Council), low-VOC (volatile organic chemicals) Forbo American cherry and beech flooring. Lots 3 and 4 feature FSC-certified Lyptus, a hardwood hybrid of two types of eucalyptus that is farm-grown in Brazil. The Lyptus tree grows to 140 feet in just 10 to 14 years and has a considerably higher yield than Brazilian cherry or mahogany, making it a more ecological alternative to other widely used hardwoods. Tuplex hardwood underlayment was selected for its extended usability and low R-value, which makes it ideal for use with radiant floors. All four of the homes feature 100% all-natural wool Weave-Tuft carpets over Healthier Choice low-VOC closed-cell memory foam pads.

Each of the McCormick Woods homes contains spray-on cellulose insulation composed of recycled newspaper. This type of insulation is 30% more energy efficient than fiberglass, fire retardant, non-toxic and capable of insulating tight areas around framing and pipes in a way thick fiberglass sheets cannot. The cellulose keeps the homes cool in the summer—residents reported feeling about a 15° difference from outside temperatures—and warm in the winter, even when heating sources are not in use. Cellulose insulation has the additional benefit of being nearly soundproof, which is particularly important for households with children or musicians, as well as those located near high-traffic areas. The insulation lines the perimeter of the foundation, retaining additional heat and decreasing gas use. High-efficiency wood window frames also contribute to temperature control throughout the house, except in the bathrooms, where traditional vinyl frames were determined to be more suitable for excessive moisture. Additionally, each home has two sealed-combustion, high-efficiency gas fireplaces that offer a hit of warmth on colder days.

Each home features all available Energy Star appliances, including refrigerators, dishwashers, washers and electric dryers. The California Energy Commission donated can lights, which are installed throughout the houses. Super high-energy efficiency bulbs are located in most rooms; other lighting fixtures are incandescent lights set on dimmers to control the amount of light used, which maintains both ambience and functionality. The houses also take advantage of passive solar light with large south-facing windows and numerous skylights.

Water-efficient fixtures include high-efficiency Hansgrohe showerheads and faucets (less than 1.5 gallons per minute), and dual-flush Caravelle 270/305 toilets (less than 1.1 gallons per flush) donated by Caroma because of the project's LEED status. All the water at McCormick Woods is filtered, which benefits the residents' health and also cuts down on the expenses and waste that come with bottled water.

The homes are topped with EcoStar Majestic Slate roofing, made of 100% recycled rubber and plastic. This type of roofing is 67% lighter than natural slate, has a Class A fire rating and carries a 50-year warranty. The material is non-toxic, and unlike standard asphalt comp roofs, it does not leach benzene and other chemicals into the environment. Each roof also bears twenty-four 130-watt Kycoera solar panels, which produce a minimum of 4,500 kilowatt hours per year. This eliminates the production of 200,000 lbs of CO₂ and the consumption of 20 million cubic ft of natural gas *per home* over 30 years. A major benefit to the homeowner is an electric bill under \$25 each month, about \$10 of which is administrative fees.

EMF (electromagnetic field) breakers are located throughout the homes, allowing residents to switch off sections of the EMFs when they're not in use—this goes a step beyond turning off the lights when a room is not being used. This capability increases overall energy efficiency and may also yield health benefits in the form of decreased exposure to EMFs.

Green building principles are put to use outside the homes as well, with “Evergreen” recycled decking behind each house and a 40 foot-deep percolation pit located at the corner of each parcel, which filters rainwater and transfers it to the groundwater supply.

Current Challenges

For many, the initial costs associated with green building for materials and certification are still prohibitive. According to Steve and Paddy, the cost of LEED certification has decreased in the years since McCormick Woods went through the process, and prices for green products like carpets, floors and paints have dropped drastically as demand has increased.

The Graves met several challenges in procuring environmentally friendly materials for McCormick Woods. The roofing cost a bit more and was difficult to find locally since it's usually only used in high-end housing areas such as Carmel—at the time, it was not widely advertised, so they had to ask for it in the right places. Ultimately they found it more cost-effective to order the materials directly from EcoStar and have them delivered from New York. The kitchen cabinets are non-LEED custom alder, which cost half as much as the LEED-approved cabinets. The cabinets are at least made locally, but exemplify some of the sacrifices that had to be made to keep the houses affordable. One expense that could not be avoided was the use of FSC-certified framing wood, which is 15% more expensive than conventional wood. Furthermore, Steve and Paddy had to weigh liability with costs—for instance, all the houses were prepped for rooftop solar hot water heaters, but the tanks were not installed due to liability concerns.

Benefits

The Graves take pride in the fact that “everybody wins” with green building—nearly every element of the homes has a positive environmental impact. They also take comfort in knowing that their homes are healthy, contributing as much to the well-being of their residents as to the surrounding environment. The cost savings over the life of the houses certainly benefits the residents as well.

In terms of construction, it was more efficient to have the contractors come in and build all four houses at the same time. The Graves had no trouble convincing the contractors to learn about green building techniques and products because it was in their own best interest to do so, now that green building is becoming a competitive business opportunity.

Down market, green home buyers will get all the health, environmental and economic benefits without any additional costs above buying a “conventional” home—it will, in fact, be the less expensive option for them due to energy savings and longer-lasting building materials. This is an advantage for the developers as well, because they have a unique, competitive product on the market.

The Next Step

The Graves are currently busy sharing information with curious parties from all sectors, including government officials, contractors and homeowners. They are helping others to build green that ordinarily wouldn't because of a lack of information or a model to follow. They are also passing on information about “little things” that people can do to reduce their carbon footprint, such as shifting to hybrid vehicles. When it becomes cost-efficient, each house at McCormick Woods will be equipped with plug-ins for electric cars, which will be included in the cost of the home. As it stands, they are already almost off the grid.

Steve and Paddy are honored to be setting a new standard for builders and homeowners in the Monterey Bay region. The Davis Energy Group conducted an energy test using infrared technology, and reported that there was “no precedent” for the level of energy efficiency achieved at McCormick Woods. The fifth house in the development, which is under construction by one of the current McCormick Woods residents, is taking the Graves' example to the next level and aiming for LEED Platinum certification. The Graves have certainly made a great deal of progress in their quest to “create a bridge between familiar and comfortable”; Paddy plans to carry this ideal over into other typically “un-green” ventures, especially golf courses. She and Steve know that people generally want to do the right thing, and all they need is someone who has been through the process to show them how.

Written by Trisha Bury, Association of Monterey Bay Area Governments, May 2008