

Passive pioneers | G·O Logic sets a new bar for energy-efficient building

By REBECCA GOLDFINE, Mainebiz Magazine, October, 31, 2011



Photo/Rebecca Goldfine

Matt O'Malia of G·O Logic

In Belfast, a little red house at the edge of a small field of milkweed has been causing a stir since it was built in 2010. It's been on the cover of *Maine Home and Design*, was featured on the TV show "This New House" on the DIY network and been the subject of many news stories. It also recently won the U.S. Green Building Council's 2011 project of the year. The object of all this attention is small and neat, with a pitched roof topped with shimmering blue solar panels. It's painted the bright red of a classic New England barn — a deliberate decision by its two creators to attract attention to an innovative home design for Maine and the rest of the country.

"Passive houses are a huge paradigm shift," says Matt O'Malia, who with Alan Gibson in 2008 founded G·O Logic, an architecture and building company in Belfast that specializes in passive structures. To illustrate the extent of this shift, O'Malia holds up two fingers a couple inches apart to indicate how much the updated — and highly contested — conventional building code in Maine improves energy efficiency. Then he stretches his arms wide to show how much a passive design enhances a home's energy performance.

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“We’re going to build a house 90% better,” he says, meaning a passive house uses 10% of the heating energy that a standard, code-compliant home uses. Passive homes meet the highest international standard for energy efficiency.

Passive homes, which are highly insulated and sealed tight, have no need for furnaces, stoves or fireplaces; in fact, the heat produced by one of these devices would have inhabitants sweltering. In a passive house, blow-drying your hair, working on a computer or cooking a meal can provide enough heat to keep it toasty all winter. Gibson claims passive homes will forever end the suffering of those accustomed to living in drafty Maine houses. “You get used to not feeling cold air blow across your feet,” he says. O’Malia says the little red house on Cedar Street, which he calls the GOHome, cost \$225,000 to build and costs \$275 to heat a year with a bit of electric baseboard heat (the house is 1,500 square feet). When G·O Logic had its office located there, the combined heat from the eight computers made it so hot that a window was cracked open in the winter, O’Malia says.

Although the passive-building sector is tiny — there are just 25 certified passive structures in this country — they represent the cutting edge in energy-efficient building and are attracting customers who want to reduce their carbon footprint and stop paying high heating bills. Unity College opened the first passive dorm in North America this fall, built and designed by G·O Logic. And G·O Logic will build 36 passive homes in a new cohousing community that in early October broke ground in Belfast. (See “Ecovillage under way,” page 21.) The company is also building homes in North Yarmouth, Falmouth, Bath and Deer Isle to the passive-house standard, and is designing Michigan’s first certified passive house, O’Malia says. Despite occupying just a sliver of the building market, the passive-building sector has strong potential for growth. G·O Logic in 2009 had negative income, but in 2010, grossed \$750,000 and is on track to earn \$2.5 million this year, according to Gibson.



Photo/Rebecca Goldfine

G·O Logic cofounder Alan Gibson says his company will retrofit an old Masonic hall in Belfast in exchange for free office space

The company, which started with four builders as well as Gibson and O’Malia, now includes four full-time architects, six carpenters and an office manager. To accommodate its staff, G·O Logic this fall moved into an ornate, abandoned Masonic hall in downtown Belfast that has

murals adorning a high-ceilinged ballroom, a tall door with stained-glass windows and furniture that looks more appropriate for Louis XIV's court than a modern architecture firm. Gibson says in exchange for two years' rent, G·O Logic has promised to replace the old, single-pane windows with double-pane windows to improve insulation and reduce overheating in the summer, and add insulation to the attic and walls. It'll also install two propane space heaters for zoned heating.

Gibson says the deal is a good investment for the landlord, who was paying bills on a building that sat empty for a couple of years, and for G·O Logic, because the company now has two spacious floors to expand into that will be reasonable to heat. "It's a good model for other under-utilized buildings in downtown Belfast," he says.

Starting small

O'Malia and Gibson are both from Michigan, but they didn't meet until they were living in midcoast Maine. O'Malia is a trained architect, and before starting G·O Logic was working for Elliott and Elliott Architecture in Blue Hill. He and his wife, a physician, moved to Belfast in 2000 when she began her residency in Bangor. Gibson and his wife, Sanna McKim, moved to the region in 1989 when Gibson apprenticed on organic farms before starting his own farm in Waldo. He started work as a builder in 1990, and met O'Malia when they were working on a project in Belfast in 2004.

O'Malia says he wanted to launch his own company to have more freedom to design high-performance buildings. Gibson says he was already constructing energy-efficient buildings, and both were enticed by the idea of combining this with beautiful design. Plus, it made sense to them. "We looked around, we're in Maine, the climate is cold and we have to use a lot of energy to keep people warm," O'Malia says.

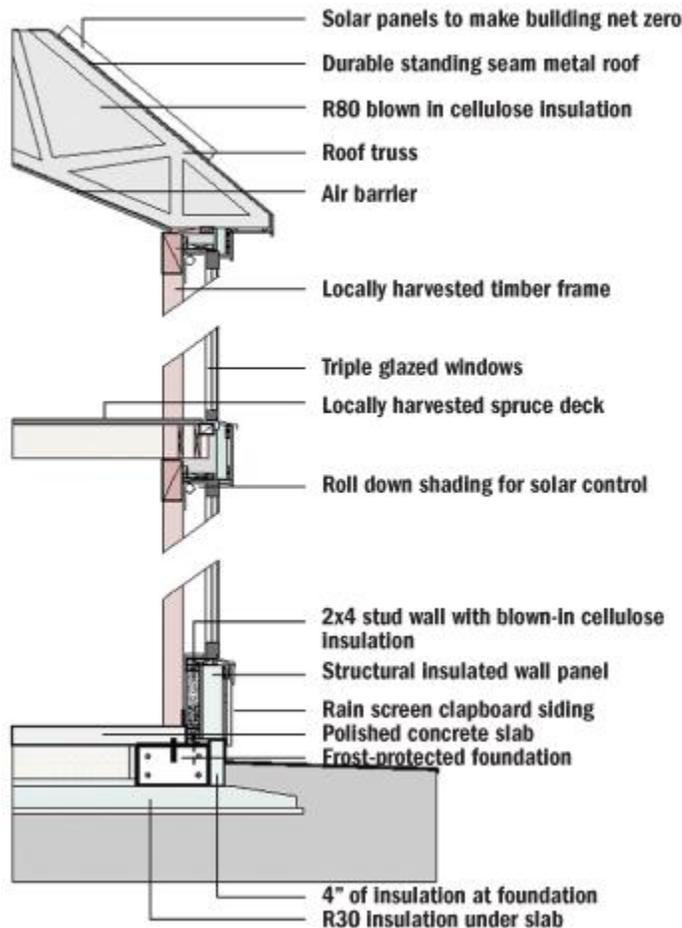
Gibson adds, "We hit the niche at the right time because traditional architecture is a hard sell right now. First off, no one is building anything and secondly, people are more aware of energy issues."

According to the Passive House Institute U.S., which began certifying passive homes in the United States in 2008, the number of passive buildings has doubled every year, and an additional 50 homes are close to being certified (on top of the current 25). Although the majority are homes, the institute says it's certified three commercial buildings: a school, a community center and a small office building, and is reviewing two more office buildings.

O'Malia has a background in passive-house construction because he studied architecture in Germany, which is where the passive house, or passivhaus as it's called there, was invented in the early 1990s. O'Malia says Germany is 30 years ahead of the United States in green building design, and is gaining on us because of its aggressive agenda to have all new buildings built with passive design by 2020. Its progressive stance is propelled by its high energy costs, and this culture of necessity is fostering innovation, O'Malia says. G·O Logic buys all its triple-pane windows from German companies because they're the best in the market and reasonably priced, O'Malia says. Triple-pane windows are an important feature for passive houses because they

maintain interior temperatures by locking in heat during the winter and keeping out heat in the summer.

Components of a passive house



O'Malia and Gibson express frustration with the lack of federal or state incentives in the United States for passive construction, and criticize a building environment that they say has largely been resistant to change. During the last week of October, they traveled to Washington, D.C., for a national passive-house conference, and were scheduled to meet with staff from U.S. Sens. Susan Collins and Olympia Snowe's offices to talk about passive design and possible tax credits, which they say could help boost an industry that addresses some of our most urgent environmental and energy crises.

G-O Logic's financial argument for passive houses is similar to other energy-efficient buildings. What you spend in extra upfront costs to build a super-insulated, airtight home — with a ventilation system — will be made up in savings from your heating bill. (One of the most crucial components of a passive house design is its ventilation system. Without the air leaks omnipresent in most homes, passive house interiors could get stale quickly. O'Malia says he installs ventilation systems that complete a full air change every three hours, with the hot outgoing air warming the cooler incoming air through a heat exchanger.)

O'Malia says a passive home costs \$30,000 more than a similarly-sized house built to code. Improved insulation costs \$17,000; air sealing costs \$2,200; windows cost \$8,000; and a heat-recovery ventilation system costs \$3,000. But he points out that a passive house owner also saves \$15,000 on a traditional heating system, spending just about \$500 on a passive house's simplified system. And over 30 years, he's calculated that a 1,500-square-foot home will save a homeowner \$170,000.

Expanding the market

Unity College, an environmental school with under 600 students, tore down two old cottages that used to house eight students and built a new passive residence hall for 10 students, which it opened this fall. Called the TerraHaus, it's the first passive dorm in the country, and was funded with two grants and a small construction loan, according to the college. The 2,186-square-foot building cost \$470,000 to build, a figure that Doug Fox, a professor of landscape horticulture at the college, says is more than what a typical house would have cost because it needed extra amenities, such as a sprinkler system, and had to be ADA compliant.

Fox, who maintains a blog about TerraHaus, says prior to building the passive dorm, the college was buying 156 gallons of oil per student to heat the two former cottage dorms. Unity is now anticipating it will need just eight gallons of oil per student (80 gallons in total) to maintain it at 70 degrees Fahrenheit. Fox adds that a more typical home of the same size that's considered energy efficient might burn 900 gallons of oil.

And the college doesn't want to stop there. "It is really just a start," Unity College President Stephen Mulkey says. "We've got a significant amount of infrastructure and rebuilding that will take place over the next few years, and we'll rebuild completely green as we do that."

In particular, the college wants to build a small cluster of passive dorms, which it will call SonnenHaus Village, combining the Latin word for solar, since they'll face south for solar gains, and the German word for house. The plan is in its early stages, but would include two more passive dorms near TerraHaus, which could be designed as a duplex. Mulkey says the school also needs a new student activities building. In 2009, the school built a net-zero home for the president.

Fox says the college is pursuing a green-building agenda as an educational example, both for its students and for the public. "We believe students learn as much from what we do as what we say. You have to have consistency between what you're teaching in the classroom and what you're providing for a lifestyle on the campus."

G·O Logic is benefiting from all the publicity of Unity College's dorm and Belfast's cohousing community — not to mention growing alarm over oil and rising interest in energy efficiency. O'Malia and Gibson say they've talked about establishing an office in southern Maine, or even Boston, to reach new clients, but they will always maintain a base in Belfast. Midcoast Maine, after all, is where all the passive action seems to be.

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“It’s a cool success story about what’s happening in this state that’s going way beyond what’s happening nationally,” O’Malia says, about working with Unity College. “Instead of waiting for it to happen, here in rural Maine, we’re just going for it.”

Ecovillage under way



Almost five years after seeing the farmland for sale that would become the Belfast Cohousing and Ecovillage, the founders of this idealistic community have acquired the property, found participants, raised money and, in early October, finally broken ground.

The village is based on a cohousing structure pioneered in Denmark. Cohousing communities typically consist of 20 to 40 houses built in a dense cluster, freeing communal land around them for farming, recreation and wildlife. The houses tend to be small, because the residents share a common house for shared amenities such as lawnmowers, bikes and kayaks, kitchens, libraries, offices and studios, root cellars, playrooms for kids, laundry facilities and guestrooms.

Belfast Cohousing's original visionaries include G·O Logic's Alan Gibson and his wife, Sanna McKim, as well as Gibson's partner, Matt O'Malia. McKim and Gibson plan to live in the community. In 2007, when this group first fell in love with the 175-acre former dairy farm, they put down \$25,000 with an agreement that in nine months they'd come up with \$1 million to buy it outright, explains McKim.

"It was all farmland, but prime development land," McKim says, just a mile or so from Belfast's shopping area off of Tufts Road. "And that's what we were concerned with. We'd seen a lot of land broken up."

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Luckily, McKim says she came into some money within the timeframe, and she and Gibson bought the property. Of the 175 acres, 42 have been set aside for the cohousing community. Interested families pay a down payment of \$25,000 to participate in the community's LLC. These equity contributions from members paid for project development fees, including engineering studies, design work and permitting, McKim says.

"All members of that company are in it because they want to buy a house," McKim explains. At the time of this interview, 20 families had signed a purchase agreement for a home, including a fiddle teacher, dentist, boat builder, teacher, store owner, nonprofit director and others.

The plan is to build on just five of the 42 acres. The 36 houses will range from 500 square feet to 1,700 square feet, and cost between \$150,000 and \$330,000. They will be duplexes and triplexes - and all will be passive houses, designed and built by G·O Logic.

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