AS SEEN IN CHA MAGAZINE

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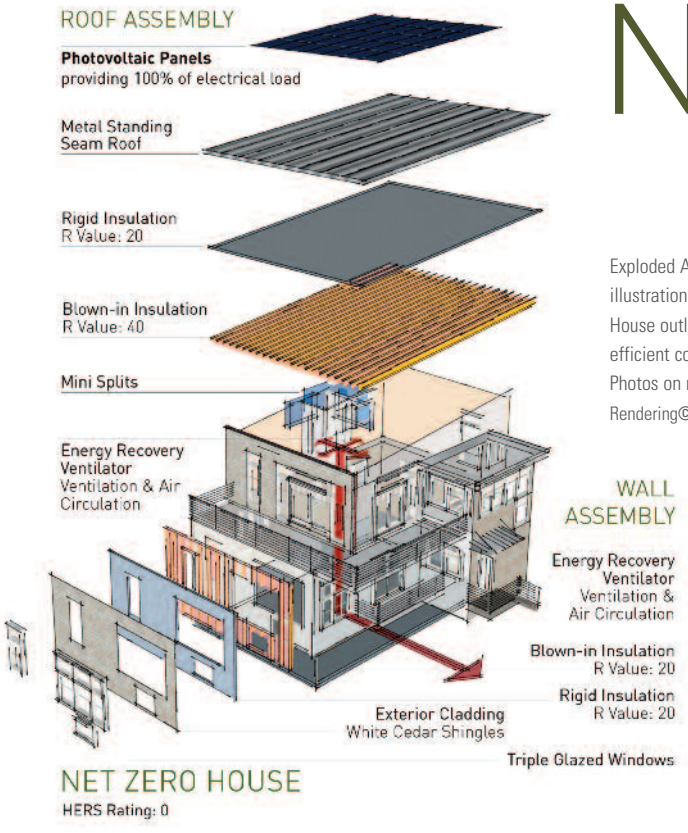
High-performance, low cost, energy-efficient home in South Chatham, MA designed and built by A+E Architects.



Exploded Axonometric illustration of the Net Zero House outlining energy efficient components. Photos on next page. Rendering©A+E Architects

NUTS&BOLTS OF GREEN BUILDING

Written by Susan Spencer

Insulation, windows and ventilation might not be sexy, but sustainable design professionals at A+E Architects in Brewster say that nuts-and-bolts systems are the heart of green building. "For me, being green is about energy efficiency," says Alison Alessi, a LEED-accredited professional architect and principal at the firm. As an example, she says, "We're working on a house that's net zero: a super-insulated home that will produce as much energy as it uses."

From the sleek, airy, net-zero home on Hyannis Harbor to a bright and compact family home in Chatham overlooking Nantucket Sound, to affordable rental-housing clusters tucked in the Harwich woods, A+E Architects brings a practical approach to sustainable design. "You can do this with any style house," says A+E Architects principal and licensed construction supervisor Robert Evans. He's even built energy-efficient homes that had to meet strict local historical commission requirements.

Above: High-performance, low cost, energy-efficient home in South Chatham, MA on Nantucket Sound.
Far Left: Rendering of net zero house in Hyannis, MA
Left: Super-insulation strategy net zero house in Hyannis, MA. Walls will be over R-40 including 2x6s with blown in cellulose insulation with 4" of EPS foam insulation on the exterior.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Above: This net zero upside-down house will produce as much energy as it uses.

"It's more than the insulation: it's the whole envelope," says Evans. "Mechanical standards were written in the '90s. HERS standards are much more adaptable to what's going on now for sustainability."

For Alessi and Evans, the road to forming a green architectural and building firm wound through different cultural and economic perspectives. Evans had designed straw-bale houses and passive-solar developments in New Mexico, but when he moved to Cape Cod in 1999, the focus was on high-end creative architectural design. "Alison and I got hired at the same time (at another firm)," he says. "There really wasn't any emphasis on sustainability."

Adding to the firm's green credentials, Alessi is being certified this spring by the Passive House Institute US, which adopts a comprehensive building model that allows houses to capture solar energy and apply it efficiently. Passive House building cuts heating-energy consumption by 90 percent and overall energy by 60 to 70 percent.

GOOD THINGS COME IN SMALLER PACKAGES

Unlike some of the luxury homes the principals previously worked on, A+E Architects' houses are often built on tight footprints, requiring innovative space planning. The Chatham house on Nantucket Sound, for instance, is only 1,700 square feet. But that's all part of rethinking how we live, according to Alessi. "There's a big movement toward the not-so-big house," she says. "We get people to think whether they could do without a formal dining room."

"It takes time to figure out what's the owner's priority and make it fit their budget. It's a balancing act," Evans says.

PUSHING THE ENVELOPE

Alessi says that all their projects employ Energy Star home standards that are at least 15 percent more efficient than houses built to traditional building code. Energy efficiency is quantified using a HERS (Home Energy Rating System) Index, with houses built to standard code equal to 100. The lower the HERS Index, the better. Most of A+E Architects' buildings have HERS ratings of 65 or lower, including the net-zero Hyannis home with a HERS rating of 0. "On all of our buildings, we test to find out how they're performing and where the leaks are," she says.

> "On all of our buildings, we test to find out how they're performing and where the leaks are." – Alison Alessi

Alessi and Evans found themselves sharing a vision of sustainability and creative design, as well as cost-effectiveness, and set out on their own in 2005. They're now joined by architectural intern and designer Meghan O'Reilly, interior designer Lynda Evans and accounting specialist Dale Goddard.

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Left: Aerial view of affordable rental housing, Harwich MA. Sustainable features include: Passive solar design, renewable energy-photovoltaic panels providing approximately 75% of the electrical load, drought tolerant and native landscaping, ultra water efficient plumbing fixtures, durable finish materials, a high performance thermal envelope including low-e doors & windows, r: 25 walls & r: 40 roof insulation. HERs Index: 29 (performs 70% better than a code built home).

Right: Affordable rental housing, Harwich, MA.

In that sense, Alessi says, sustainable building techniques are an easy sell: "You can show the payback and quantify it with the energy models. You know what your electric bills will be. Look at what oil prices are now - people are definitely motivated."

INSULATION, INSULATION, INSULATION

Alessi and Evan's excitement about energy-saving design is evident when they point out a schematic diagram of a wall. "This is the essence of the green building," Alessi says. The net-zero home in Hyannis, for example, features blown-in and rigid insulation that's twice the building-code standard; an energy recovery ventilator that improves air quality and heats or cools incoming air with recycled energy; and triple-glazed windows. The roof is also double insulated, and holds photovoltaic panels that provide 100 percent of the home's electrical heating and cooling load. The building's orientation on site adds to its efficiency through passive solar heating and affords magnificent waterfront views

Mechanical systems and even photovoltaic arrays can be much smaller with a house designed for efficiency, notes Evans. Tankless hot water heaters, which only heat the water that's used, are another way to save energy and work well in an efficient home.

SUSTAINABLE HOME, SUSTAINABLE LIFE

Site considerations play a role in green building too, especially for LEED certification. At Thankful Chases Pathway, 12 affordable rental units in Harwich designed for Community Development Partnership, A+E Architects incorporated rows of trees between each of the four triplex units, creating shade and a privacy screen. Native plants are used in landscaping and runoff is contained in dry wells. With photovoltaic panels on the roof and Energy Star systems, the LEED Platinum development is sustainable, affordable and will result in lower utility costs to tenants.

Cape Cod homeowners, especially retirees or those who plan to stay a while, may be well suited to A+E Architects' message: With attention to energy-efficient design up front, you can live in a beautiful, comfortable home without burning away your savings – or the planet - in fuel consumption. **cha**