

MODERN GREEN HOMES

Five leading architects and designers present their concepts for sustainable, energy-efficient living.

By Larry W. Garnett, FAIBD, House Review Lead Designer

Those of us who were around for the green movement in the 1970's might recall the OPEC oil embargo, standing in line for gasoline, and recognizing Earth Day. The energy crisis at that time introduced us to the notion that our quality of life was directly tied to our dwindling natural resources. Unfortunately, most of us soon forgot the seriousness of the problem. The price of gasoline dropped and we once again started driving the gas guzzlers and constructing homes with minimal attention paid to energy efficiency.

So, here we are, 41 years later, confronted with even more serious concerns regarding our environment and our economy. Fortunately, consumers are much better educated this time around. Although research shows that many of our potential clients are still cautious about investing in sustainable design, there's no doubt

that we must move forward rapidly to create homes that address the public's growing awareness and concern. We must strive to design houses that are efficient and frugal, and, more importantly, houses that will be appreciated now and well into the future. After all, that's the real definition of sustainability — buildings that continue to be appealing and practical for years to come. In other words, we must build homes that will always be worth saving.

This month, our House Review design team presents five cutting-edge concepts in energy-efficient green design, from an award-winning traditional home with innovative energy-saving features to several fresh designs, each with very simple and straightforward elements.

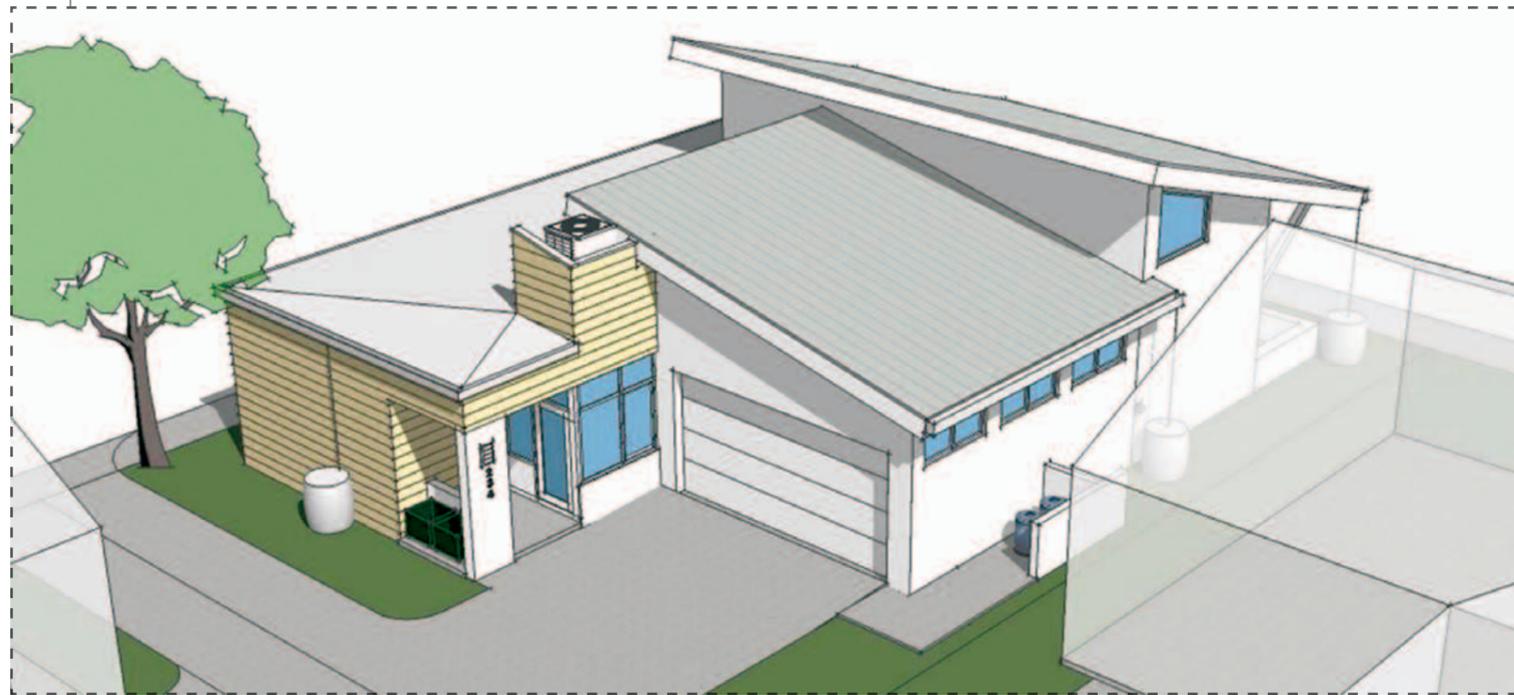
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MODERN GREEN PLAN

ARCHITECT
 Don Evans
 The Evans Group
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PLAN SIZE
 First floor: 1,264 sf
 Loft: 96 sf
 Garage: 381 sf
 3 bedrooms, loft, 2 baths,
 2-car garage
 Width: 40 feet
 Depth: 48 feet



ARCHITECT'S ESSAY

This home is right-sized for today's buyers that demand a home that is socially responsible, affordable, and easy to maintain. Appealing to Generation X, the Millennials, and Generation Z or the Internet Generation, this design features modern, simple forms that are clean and speak to their function; every part and piece serves a purpose while exuding a fun and energetic spirit.

This home was designed utilizing a precast concrete sandwich panel for the walls and roof with concrete on both sides and a foam insulation board in the middle. This type of construction provides a uniquely strong, energy-efficient, environmentally sustainable, element-resistant, quiet, and maintenance-free structure. The energy efficiency and sustainability of the home is furthered with the use of state-of-the-art solar film applied to the sloped metal roof to power the home, as well as a rainwater catchment system from the

flat roof into rain barrels for irrigation, car washing, etc.

The modern, clean style continues inside the home with finished concrete floors and walls, exposed air-conditioning ducts, metal stairs, and volume spaces. The home's interior spaces are organized around a central spine or two-story gallery space with operable windows that allow for natural ventilation and a plethora of natural light.

There is no wasted space in this home; each square foot is utilized to its optimal potential. For example, loft/storage spaces above the closets are accessed by ladder elements on the wall in each bedroom. And the "living garage" provides additional square footage for family activities and comes complete with a dedicated, in-wall air-conditioning unit, double-door entry into the home, and large windows for daylight and ventilation.

[GREEN DESIGN]

996 WILLOW ROAD

ARCHITECT

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PLAN SIZE

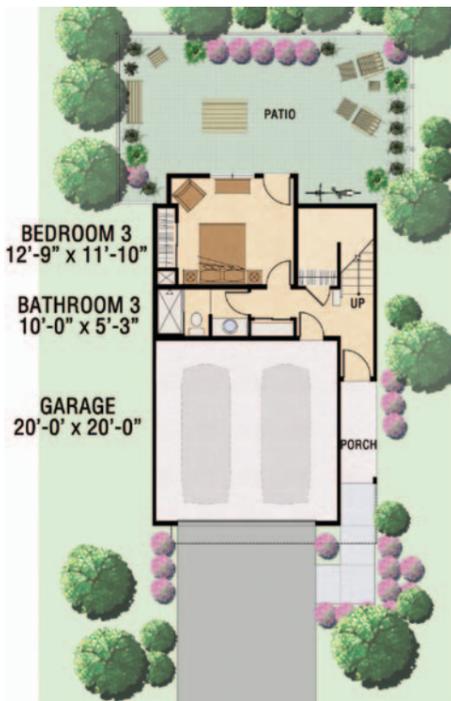
Overall size: 1,880 sf
 Width: 24 feet, 8 inches
 Depth: 39 feet
 3 bedrooms, 3 bathrooms, 2-car garage



ARCHITECT'S ESSAY

The 12 identical homes are designed to appeal to the green-conscience market, as well as the demands of the city planners. The best way to build green is to build small — small footprints equal small roofs, which equal savings in material. The three-story stacking of walls and plumbing also conserves material. The design includes recognizable green features such as high-efficiency lighting and insulation, Energy Star-rated appliances, radiant roof sheathing, dual-flush toilets, structured plumbing with re-circulating pumps, and formaldehyde-free cabinetry. Tankless water heaters and attic HVAC units were used both as a way to be green and to save precious floor space. Where practical, local and recycled materials were utilized.

The compact design allowed a single-family density of 13.5 units per acre. The single-family aspect appealed to the buyers, while the density met the city's goals and the developer's pro forma. The contemporary style fit the profile of the young professional target market.



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THE EVERGREEN COTTAGE



DESIGNER

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PLAN SIZE

Living area: 1,779 sf
 3 bedrooms, 2 bathrooms, flex room
 Width: 42 feet
 Depth: 79 feet, 3 inches



DESIGNER'S ESSAY

This flexible design recently received a first-place award in the second-annual Energy Star/The House Designers design competition. Both active and passive energy-saving technologies have been considered, with such features as 6-inch SIP

exterior walls, a rainwater capture and storage system, and photovoltaic and water-heating panels.

Concealed in the traditionally detailed cupola is either a Gale vertical-axis wind generator or a Wind-Finder, which automatically rotates to direct air flow throughout the home for selectable living space or attic ventilation.

The intent of the narrow, multi-living-area design is to maximize the livable space, both inside and out, while minimizing the disturbance of the natural landscape. Covered porches provide shade and abundant outdoor living space. A large retractable awning provides additional shade, further reducing energy demands. A permeable tile field manages drainage within the outdoor living area and provides easy access to supplemental field lines for a sealed water-source heat-pump system. A "breathable" roof underlayment system allows air to flow between roof tiles and decking to keep the attic cooler.

Finally, a 20-square-foot grass roof tile system allows custom layout of "The Green" atop the garage. A hidden roof cistern provides irrigation for the grass tile, while overflow is directed to the garage water reservoir.



[GREEN DESIGN]

GREEN HOUSE

ARCHITECT

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PLAN SIZE

Living space: 1,750 sf
 Width: 27 feet
 Depth: 42 feet



ARCHITECT'S ESSAY

At 1,750 square feet, this two-story home is an example of a home design geared for today's neighborhoods. Designed to meet the requirements for LEED-Platinum certification, the goal was to create a home that incorporates sustainable building practices to reduce construction costs and energy consumption, while creating a healthy living environment inside the home.

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PETITE COTTAGE, TNH-PC-15

DESIGNER

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PLAN SIZE

First floor: 665 sf
 Second floor: 334 sf
 Width: 24 feet, 6 inches
 Depth: 44 feet
 2 or 3 bedrooms



DESIGNER'S ESSAY

Our litmus test for true green is how buildings live green. Do they service the occupants? Do they service the community? Do they service the Earth? Every building project has a responsibility to reduce energy consumption for the short and long term. Opportunities include: building for centuries of service, not decades; designing for climate appropriateness so HVAC can be turned off at least three months of the

year; providing food production, processing, and composting on site; recycling; building life-sustaining systems on site or building in close enough proximity to daily needs to eliminate the need for at least one vehicle. The example featured, our Petite Cottage, TNH-PC-15, illustrates an infill cottage court organized around food-production gardens, poultry, and orchards.