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## RAY KAPPE PREFAB GOES GREEN

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# PREFAB GOES GREEN

By Andrea Truppin  
Photographs by Grant Mudford

A house in harmony with the land and the climate that envelopes it; beautiful, functional and affordable. This elusive goal challenged modernist architects through the last century and continues to do so in this one. Now legendary California architect Ray Kappe and entrepreneur Steve Glenn, through Glenn's development company LivingHomes, have joined forces to fulfill an updated version of that quest: a modular, prefabricated house that marries Kappe's overlapping, floating planes and open plans with the latest in green technology and materials. Part of a pilot program organized by the United States Green

Building Council, the Santa Monica model house is the first residence to receive a Platinum rating — the highest — in the LEED (Leadership in Energy and Environmental Design) rating system. Eight more LivingHomes houses are either in the planning stages or in progress, including a small development in the desert town of Joshua Tree, California.

Green design, which long suffered from a reputation as earnest but clunky, is becoming not merely mainstream, but chic, with an increasing number of innovative architects embracing at least some of its key tenets, such as energy efficiency and sustainable,

**Above** The prefabricated, modular LivingHomes model house in Santa Monica, designed by Ray Kappe, is the first private residence to be awarded the top rating by the United States Green Building Council.

**Opposite** The hillside lot allowed for a variety of floor levels in the two-story home that enliven the open floor plan and provide for discrete functional areas.



## SPACES



recycled and non-toxic materials. While this activity highlights the growing public concern about environmental degradation and its attendant health risks, it also demonstrates how far green technology has come. With a plethora of energy efficient glass, insulation products and heating and cooling systems; attractive and durable recycled materials; paints, adhesives, carpeting and furniture free of volatile organic compounds; and affordable solar energy systems, aesthetics need no longer be sacrificed on the green altar.

The entrance of an architect of Kappe's stature into the field augurs well. Founder, in 1972, of the influential Southern California Institute of Architecture (Sci-Arc) in Los Angeles, Kappe has been

**Above** The galvanized steel fireplace and chimney provide a focal point for the open space. The dining area and kitchen are on the far side of the fireplace, with a sitting area in the foreground. Built-in planter borders the raised platform of the sitting area.

**Left** The master bedroom on the second level, overlooking the downstairs living area, can be closed off with sliding screens. Freestanding wardrobes define the dressing area. Stairs in the background lead to the rooftop garden.

designing since the early 1950s (see "Ray Kappe's Enduring Modernism," *Modernism*, Vol. 7, No. 3). His own home, built in the mid '60s, with its intersecting open floor plates, natural materials and virtually no interior walls, was designated a Cultural Heritage Monument by the City of Los Angeles in 1996. Kappe's first job out of architecture school at Berkeley was working with the firm of Anshen + Allen during the postwar building boom on an Eichler development, whose well-designed modernist homes are still prized today. "I was always interested in multiple housing systems that would be more affordable," he says. In the 1960s, he designed modular, prefabricated student housing for Sonoma State University, never built, for which he projected an off-site construction system. Since then, many of his custom homes, including his own, have been based on the ideas he developed for that project. Throughout his career, he says, he has been exploring "how to get diversity using a simple idea like modules. The goal is not to have it feel like a box."

The two-story, 2,500 square foot LivingHomes house, on a steep incline on a small lot in Santa Monica, is composed of 12-by-8 foot steel framed modules, faced on the exterior with floor-to-ceiling sliding glass doors or horizontal cedar boards, with smaller wooden modules at either side. About 200 square feet of additional outdoor living space is provided by decks that jut out from the floor plates on both levels, shaded with Kappe's signature pergolas. A rooftop garden (not yet installed because of ongoing building code issues) will provide additional outdoor living space and help insulate the roof. Freestanding wood wardrobes serve as space dividers, while various functional spaces, such as the upstairs bedrooms, can be closed off with sliding partitions. The steep lot allowed Kappe to create several additional levels in the house by stepping the concrete foundation up the hill, contributing, along with a mezzanine and walkways that overlook the lower levels, a sense of abundant and varied space.

**Below** Green materials and products include interior woodwork of sustainably harvested cedar, "paperstone" kitchen counters of bonded post consumer recycled paper, LED lightbulbs and low VOC paints. All furniture is from Design Within Reach.



## SPACES

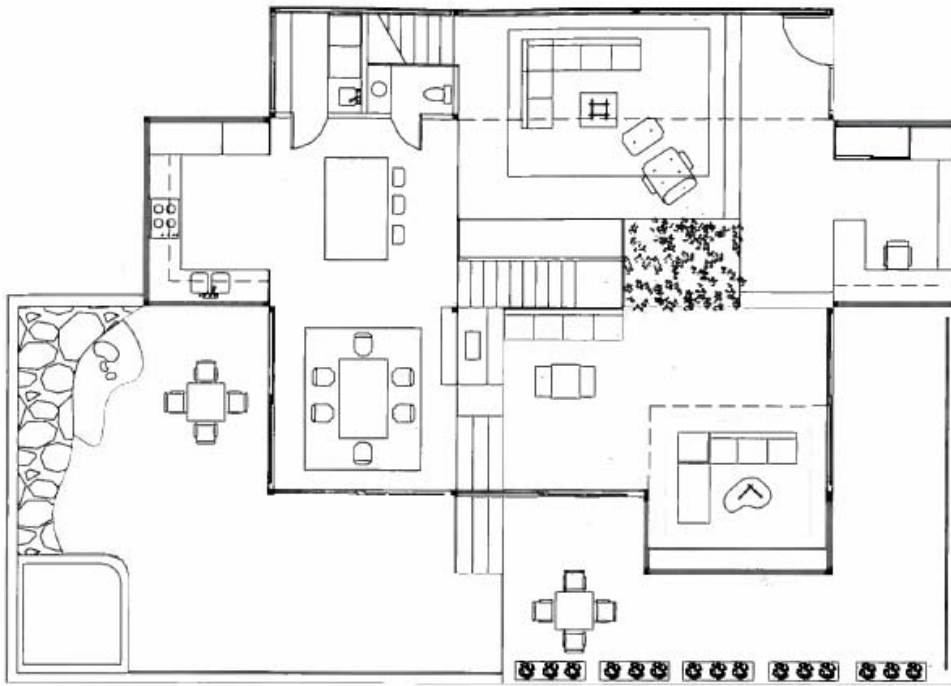
The modules were fabricated, and the house assembled and disassembled at a remote site, then transported and craned into place in one day. While the glass and cabinets were installed on site, they are projected to be in place before delivery on future projects.

Developer Steve Glenn, a former high technology entrepreneur who has finally found a way to meld his business savvy with his love of architecture, has identified a new niche market that is likely to grow: people who buy organic food, avoid noxious chemicals, worry about global warming and prefer modern design, but "don't have the time or the stress tolerance," he says, to organize building an architect-designed, green home. He is also counting on his homes' attractive economics: in comparison to a steel frame, custom home designed by a prominent architect and constructed on site, LivingHomes is about 20 to 40 percent less expensive per square foot, says Glenn. The savings are due to the fact that the house can be built in half the time, and parts, materials, tools and processes are standardized.

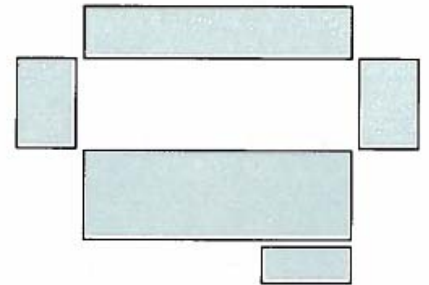
So what makes the house so green? Glenn's stated goals are a bit idealized — "zero energy," "zero water," "zero carbon" and "zero emissions" — but the house comes close. Every detail was considered. First, since on-site construction generates a huge amount of waste, including toxic substances — most of which ends up in landfills — building in a factory conserves material and produces less pollution. Photovoltaic panels on the roof will generate about three-quarters of the house's electricity; LED (light-emitting diode) bulbs, which draw less current than fluorescents and typically last twice as long, are used in the downlights and in some lamps; and all appliances have the highest efficiency rating. Energy efficient double pane glass or Polygal, a translucent plastic that mimics sandblasted glass, enabled windows and sliding doors to comprise a whopping 72 percent of the exterior, while still insulating the interior from heat and cold. Air conditioning was not necessary in the moderate year-round climate of the beachfront community, but an exhaust fan at the top of the

**Below** Kappe's design, with its open second floor living area and mezzanine with clear glass railings, and decks that jut out from both levels, provides an exhilarating sense of spaciousness. Highly efficient glass lowers the need for heating or cooling.

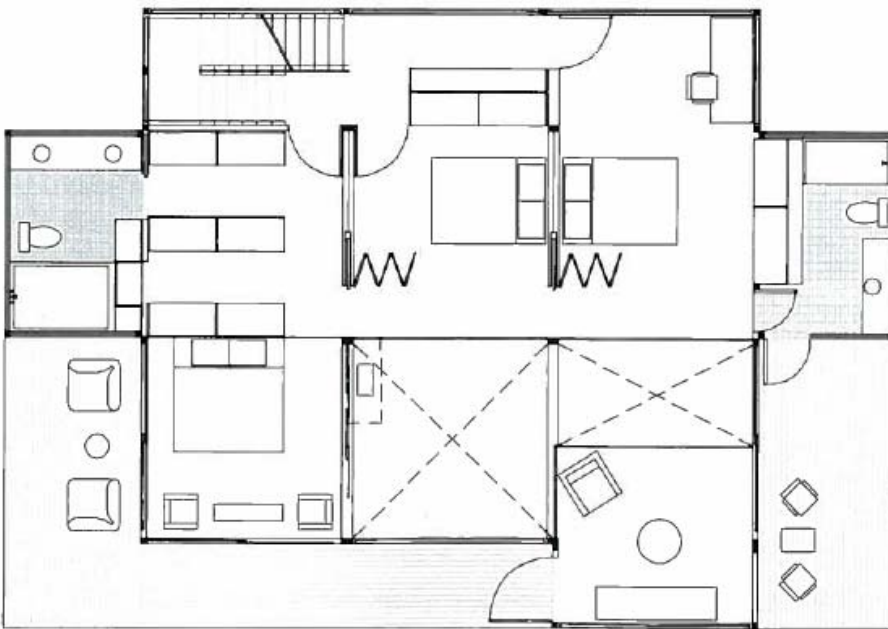




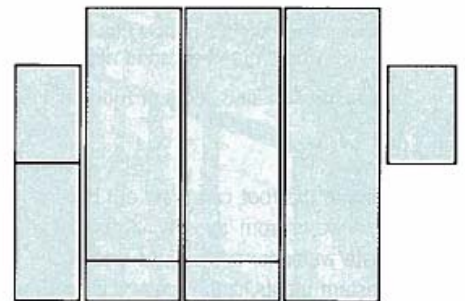
First Floor



Modular Plan



Second Floor



Modular Plan

**Above** The two-story house was assembled from rectangular steel modules, most 12-by-8 feet, some smaller. The house's structural system can be understood by visually superimposing the modules at right over the floor plans.



**Above** Photovoltaic panels that will provide about three-quarters of the house's electricity are on a frame above the stairwell. The soil and drought resistant native California plants will catch stormwater and help insulate the roof.

**Opposite** Shaded decks provide outdoor living space and pergolas help keep the hot summer sun from the interior.

stairs to the roof can draw out hot air. While the house does use fresh water from the city, a "gray water" system, which recycles waste water from the sinks and showers to irrigate the drought-resistant plants in the garden, is awaiting approval. Storm runoff, caught in an underground cistern in the subterranean garage, will supplement the gray water. Many materials are recycled, including tiles made from recycled glass or porcelain; a "paperstone" kitchen counter, which resembles matte black granite, and is made from bonded post-consumer recycled paper; the wall insulation, made from fibers from blue jeans; and ceiling insulation of blown-in cellulose. All the wood — the exterior and interior cedar paneling and the tigerwood decks — is certified by the Forest Stewardship Council, which promotes sustainable forestry. There is also a radiant heat system, which warms the floor with solar heated water. In addition,

the concrete floor retains heat from the low winter sun that enters under the pergolas. Permeable paving materials were used around the house and the landscaping relies on non-toxic pest control methods.

The only concession to form over function is the stark black form of the massive galvanized steel fireplace that anchors the open space; come winter, it will host no roaring fires. Instead, it will burn a little pot of denatured alcohol whose modest blue flame produces mainly moisture.

Ultimately, what is most striking — and encouraging — about Kappe's design is that it so closely resembles his prior work. With environmentally responsible products and technologies ever more readily available and affordable, there is no longer any excuse for not building green. ■

