Lots of indirect sunlight, warm colors and a tile floor help keep the living room of this designer house at even temperatures, bright and easy to clean year-round.

PHOTOS BY MIKE THOMPSON

A Green Jewel

BY MICHAEL WATKINS

Unknown to residents of the Village of Oak Creek just outside Sedona, Arizona, lies one of the best examples of green home design and construction. It can be found at the home of visionary Environmental Architect Carl Ramsey, founder of Architectural & Environmental Associates (AEA).

Carl Ramsey's home is a marvelous representation of how design, construction, interior furnishings and retrofitting can be applied to make a green structure that blends in with the style of other homes in the neighborhood. In fact, Carl's purpose for his home was to showcase, not just in theory but also in practice, some of the tools and techniques he applies in his quest to help green Northern Arizona.

The design and layout of the Ramsey house is crucial to ensure the best use of natural (and free) heating and cooling processes. This process is called passive solar. Passive solar heating and cooling is able to rely on the natural tendencies of the sun's position to heat and light a home. The architecture of the building is aligned in an East-West direction, with a long wall of windows that face in a southerly direction. The combined use of deep roof overhangs, a thermal mass, clerestory windows, super-insulated walls and insulated window shades create a "chimney effect" to draw hot air up away from the living space. This automated window venting helps to moderate the ambient temperatures naturally for both summer and winter climates.

continued on pg. 17

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For instance, upon entering the Ramsey house, a visitor notices two distinct features of its design. First, the living room, dining room and kitchen—areas where homeowners spend most of their time—are situated in the northeast corner of the house. Big picture windows in the corner offer a fantastic view of Bell Rock. With the deep roof overhang, the view can be preserved while minimizing direct summer sunlight and heat into the house. As a result, in the hot summers this area tends to be the coolest part of a house. Which works out well, because most people spend the bulk of their time in these living areas.

Another unique feature of the home's green design is its long corridor with a cathedral ceiling and an attractive rock wall along the north side. The ceiling is high and acts as a chimney in the summer, drawing hot air up. Then in the evening, when the clerestory windows are opened the hot air moves out of the house. In the wintertime, the south-facing windows allow the sun's rays to directly hit the rock wall, which is the thermal mass. This creates a long-term, moderating heat source. The process is much like a wood stove or massive stone fireplace that absorbs heat from a fire, and then dissipates slowly over time to heat the home. In this case, however, the sunlight and its heating effect are free.

With a south facing roof, Carl also takes advantage of active solar, or the use of photovoltaics (solar panels), to generate electricity for the home. AEA Associates is a licensed contractor for the installation of photovoltaics and the Arizona Public Service (APS) is now offering rebates to residents within its region to buy and install systems.

continued on pg. 19

ABOVE: Clerestory windows allow constant, indirect light yet keep the heat of the sun out of the home.
BELOW: A split window shade provides privacy while also allowing both task and ambient lighting at the kitchen sink.

The stone covered masonry wall absorbs heat from the sun during winter days and radiates heat back out into the house during the nighttime. The wall is also an attractive visual focal point for the home.

RIGHT: Photovoltaic panels nestle unobtrusively into the south roof, helping generate some of the electrical needs of the residents.

Carl's system generates an average of 2.4 kwh, enough for most of his typical electrical needs. Even with an air filtration and conditioner system, his monthly electric bill averages $30 for his 1600 square foot home with 3 bedrooms and 2 baths. Solar panels now available to homeowners are also much different in appearance than in the 70's, when they first hit the mainstream. Today's panels are very low profile, some are only one-half inch thick. They can be mounted either directly onto a metal roof or integrated into asphalt shingles, or even lain at varying angles, even flat on a roof. So from street level they become very unobtrusive, if not invisible.

For many homeowners, indoor air quality is becoming more and more of an issue. Allergens, dust and blowing dirt, even gasses from building materials and furnishings can, literally, force someone out of their home. Carl understands this—he's also a licensed industrial hygienist and can help pinpoint problems and identify solutions for troubled homeowners. There are both technical and non-technical solutions readily available to homeowners. Carl has integrated some of them into his model home. For those with central air conditioners, a HEPA-approved filtration system and humidifier installed in conjunction with the conditioner is a very good step to make a home more livable. The use of a HEPA central vacuum cleaner is also an excellent step. Portable models tend to clog their filters within five minutes of use and then end up simply blowing dust and allergens around the house. Less technical solutions include: the use of low-VOC (volatile organic compound) paints, cabinets, building material, carpeting and furniture.

In his house, Carl has used, and it shows off very nicely, a clay-based American Clay plaster for his interior walls. The natural earth plaster is offered in very warm colors and has a wonderful texture due to its clay ingredient. It is also longer-lasting than traditional plasters and low in VOC's. Carl has also avoided carpeting, most of which gives off lots of noxious gases, and has instead opted for tile floors with throw rugs (both easier to clean).

continued on pg. 21

A garden pool is an attractive option to collecting water runoff from the roof.

RIGHT: A small waterfall helps provide a soothing ambience and serves as a buffer for traffic noise.

The kitchen cabinets are also made with low-VOC plywood and adhesives, rather than the high-VOC materials that comprise most traditional cabinets. Also, much of his furniture is made from reclaimed hardwoods rather than newer materials and other composites that include formaldehydes.

Carl built his showcase house to highlight the advantages of using proper techniques and materials to make a home durable, comfortable, easy to maintain and a higher quality investment than most traditionally produced houses. Exterior stucco walls include expansion joints around windows and doors to ensure no cracks appear at a later date that must be repaired. The stucco also does not touch the ground—a common problem for many local homeowners who must then deal with moisture and mold problems that are expensive to fix.

The spatial design of the house considers the human element. That is, proper space and room are provided where people use it most, and wasted space is minimized. The concept and application of feng shui is definitely incorporated into the home, as well. Upon entering, one immediately feels it is a comfortable place to live. Both technical and design-based features of the home make it easy to clean—a huge timesaver. The passive and active elements of the house, from free heating and cooling to the photovoltaic system coupled with the quality materials and craftsmanship, make the resale value of this home much higher than a similar-sized and produced house. Making this special home a very valuable Green Jewel.

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