

Vowels Residence

Mike and Karen Vowels possess a combined 30 years of Environmental Stewardship Groundwork and Universal Design work practices, and they have used their property as a case-study for showcasing a home that is contributive to our environment and timeless in its use. Their remodeling company, called Stewardship Remodeling, is aimed toward environmental and social sustainability, and the simple practice of “Designing for All.” Their home exemplifies universal design strategies that accommodate a broad range of people, without sacrificing aesthetics or “green” properties of the home. Mike Vowels was awarded the 2008 Building Industry Association of Washington’s Excellence in Remodeling Award for Universal Design.

Resources

- GreenTools
- Energy Star: www.energystar.gov
- Built Green: www.builtgreen.net
- LEED® for homes
- Stewardship Remodeling
www.universalandgreen.com/home.php
- Adaptive Environments
www.AdaptiveEnvironments.org

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About the project

Project Background

The Vowels’ residence is a uniquely-sited rural project that sits in a nearly six-acre forest. The site includes the main house and an accessory building. This project is an example of how green home improvements can be successfully implemented in rural areas. It has only been in the last two years that the owners have added most of the “green” elements to their home and property. After attending a Built Green conference two years ago, the owners found ways to infuse green design elements with their Universal Design strategies. Their project received a 3-Star rating from Built Green™.

Forest Stewardship Plan

In 1996, Mike Vowels had a Forest Stewardship Plan approved by the Washington State Department of Natural Resources. The plan first outlined the characteristics of the site, describing its size, its drainage (which was only “moderate” at the time), its predominant weather (which was very wet due to its proximity to the Cascades), and its topography—which was mostly flat, and about 500 feet above sea level. Of special note is that this property was logged 15 to 20 years earlier, and a skid road from this logging remained—which provided great access throughout the forest. At its center, the plan aimed to “return the forest in better condition than when [they] borrowed it,” with specific goals to protect and provide better habitat for wildlife, to improve the sensory elements on the property, to improve the economic and personal value of the land for them and their neighbors, and much more. These restoration goals would be carried-out one year at a time in 1/3 acre segments, adhering to the practice of “selectively” clearing inferior trees first, small diameter hardwoods second, and finally

by clearing brush to make room for new seedlings. This aggressive restoration plan typically involved the use and restoration of Cedar, Hemlock, Fir, and Alder trees, and underbrush such as Huckleberry, Salmonberry, Ferns, and Salal. Interestingly, it also incorporated Mike’s Universal Design expertise, with a goal to upgrade the pre-existing skid road for wheelchair access. Finally, in a demonstration of Mike’s values, it outlined general desires for improvements on the property to also aesthetically and economically benefit his neighbors, and for his neighbors to undertake similar restoration efforts, so-as to avoid becoming an “oasis” of healthy forest in their neighborhood.

Ultimately, this plan involved a 20 year goal of fostering a property “lush with trees, vegetation and natural wildlife.” Guided by this plan, the Vowels have built most of their home from trees sustainably harvested on-site, and have since implemented an aggressive reforestation and forest restoration plan, with the replanting of almost 700 trees, as well as the implementation of several other sustainable landscaping features. All of this has centered on Mike’s stated “forest stewardship values,” which include values like “aesthetic enjoyment,” fostering “non-game wildlife,” “satisfaction from owning land,” and “a legacy for [his] children.” Guided by these values and this plan, it is clear from the following case-study that many of Mike’s early goals have been accomplished.

Universal Design Features

- Extra wide hallways and door openings
- A raised-bed graywater-fed bog and a low-hung clothesline
- Wide decks with plenty of turnaround room for wheelchairs
- Ground surfaces that are flush with each other





According to the Center for Universal Design at North Carolina State University, "Universal design is the design of products and environments to be usable by all people, to the greatest extent possible, without the need for adaptation or specialized design. The intent is to simplify life for everyone by making products, communications, and the built environment more usable by as many people as possible at little or no extra cost." Universal Design can be incorporated into sustainable building as a social equity issue and should be part of the original goals for a project.

Water Savings and Management

Graywater bog: Used to catch and filter rainwater from the gutters, and graywater from the washing machine, the bog sits in a raised bed for easier access, and all of its organic elements (soil, plants, rocks, etc.) came from on-site. The associated laundry machine graywater system keeps this water from going into their septic tank and drainfield. Mike and Karen started using biodegradable laundry detergent after installing their washing machine graywater system. A refuge log and stump, as well as wetland plants, help filter water in the basin. Mike stated that this bog has already created an attractive home for small animals.

Captured and diverted rainwater: Stormwater from the roof runs down chains into the bog, onto refuge logs, and into three rain barrels around the property. Stormwater that flows off the concrete driveway and the lawn is diverted into two drain ditches; one is a stone-filled ditch beside the garage and driveway, and the other is an earthen ditch in the backyard next to the large compost pile. All of the captured stormwater on the property ultimately drains into a large earthen basin in the lowest point of his property. From there, it slowly percolates into the soil.

Rain barrels: There are three 220-liter rain barrels around the property; one on the lawn, one on the deck, and one beside their graywater bog. The barrels were purchased from www.seattleinrainbarrels.com. The deck and lawn barrels water the landscaping that is under the overhang of their roof. In addition to helping offset the use of potable water for landscaping, these rain barrels can be used in the event of an emergency or natural

disaster that cuts-off their water supply.

Energy Conservation

Blown-in foam insulation: They replaced thermal batt insulation from the home's floors and utility room with blown-in, expandable spray polyurethane foam insulation that is also rodent and insect resistant. While slightly less insulative than fiberglass batt insulation (with an R-value of 7 for every inch of foam) it is still 90% efficient, and they have found that the lack of air leakages (thanks to the expandable nature of the foam) has made up the difference.

Solar water heater: An on-demand water heater (back-up) offsets the hot water made available from the solar hot water system. When solar-heated hot water runs out, the tankless on-demand water heater kicks-in. The water heating solar panels are located on their highly exposed third floor roof.

Clothesline: When the weather is nice, the Vowels are now able to dry many of their clothes on a wheelchair accessible clothesline that they hung along the outside wall of their home beside the deck. The clothesline is on a very exposed side of the house, located about four feet off the surface of the deck. There are also several hooks around the deck for hanging larger clothes items—all to lessen their use of the clothes dryer.

Energy efficient lighting: Where practical, the Vowels have installed compact fluorescent (CFL) light bulbs in most of their home's light fixtures. They hope to install even more CFL lights once they find the right-fitting light fixtures in the rest of their home.





Interior Fixtures and Air Quality

Foam insulation: Found in the floor and in the utility room walls, this urethane foam is less toxic than fiberglass batt insulation (keeping dangerous fiberglass particles out of the air), and it is rodent and insect resistant. It keeps rodents (and their droppings) out of their floor crawlspace, and blocks air leakages that can bring unclean air into their living area.

Nylon air filters: All of the old, fiberglass filters in their home ventilation system were replaced with nylon filters that are easier to clean, and don't put dangerous fiberglass particles into the air.

Indoor lighting: Their home has many windows that let in a large amount of light, including two sunlights in the bedroom. There is even a window in the utility room that has the sole purpose of providing a way for a totem pole to be able to "look" outside. This decorative totem pole was originally outside, and the utility room was built around it.

Marmoleum® floor: The utility room floor is made from marmoleum, which is composed of 100% natural and organic materials like linseed oil and wood flour. Marmoleum hardens over time, it is very durable, and it has anti-bacterial properties.

On-site harvested woods: Almost all of the home's floor and envelope was sustainably harvested from fir and hemlock trees on site.

Exterior Home and Landscape Features

Forest restoration: Their home is built from hand-hewn logs that came from on-site. After becoming registered Forest Stewards with King County, they have planted around 700 new trees on their property. They have cleared out much of the forest understory to allow these new seedlings to grow, while adding to the duff on the forest floor. They have also created several "habitat piles" made from cleared brush from the forest- intended to attract wildlife.

Creative and decorative reuse of materials: Outside features include a decorative bird's nest made from reclaimed barbed wire, a rustic car door, and the shell of a

"Over the years, Mike Vowels has availed himself of many workshops and resources in-order to keep his property and Forest Stewardship Plan as current as possible with new information that arises, and he loves to try out new techniques on his property when he learns about them. He has a clear enthusiasm and passion for blending his living space with the forested environment around his home, and this shows as you walk with him around his well maintained home and forest."

- Kristi McClelland King County Water and Land Resource Division

once-working farm truck planted in the dirt.

Decorative storage area: The storage area in the front of the home is enclosed by sliding barn doors made entirely out of recycled and reclaimed materials, and it is topped-off with a green roof.

Green Roof: The green roof is found atop a small shed in the front of the home, over a storage area. It contains old growth cedar stumps recovered from the forest on-site, as well as pea gravel and organic dirt from on-site. It also includes a drain pipe that diverts water onto a stump beneath the roof, with the hope that the stump eventually comes alive with plants.

Trex® decking: The ground-level walkway under the green roof, wrapping around the front part of the house, is made from Trex decking material, which is composed of recycled plastic and several sustainable composites. Trex is long-lasting and requires very little maintenance.

Reused tree stumps and forest path: The path for the "gator" farm vehicle that they use in lawn and forest maintenance had already been cleared long ago and used as a skid row when the property was logged. Impressive old-growth cedar stumps dot the access path, and selectively some cedar stumps have been pulled out and reused in the graywater bog, the green roof, and other landscape elements.



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This material will be provided in alternate formats upon request. Toll Free 1-800-325-6165, ext. 6-4466
TTY Relay: 711



King County

Department of
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Sustainably-built shed: The shed holding up the green roof contains posts and beams made from recovered wood, reclaimed sheet metal siding that came from a demolished restaurant in Snoqualmie, and corner corbels that are held together with old railway ties from the Burlington Northern Railroad. Also, the wood used on the top of the shed is Forest Stewardship Council (FSC) certified, and was purchased from Dunn Lumber. The cladding on the shed is made from "Resource Wood Works," which sells reclaimed wood. Lastly, the ground between the walkway beneath the shed and the house contains rubber pellets from old shredded tires—maintaining the permeable ground surface.

Large compost pile: The front of his house features a long compost pile over seven feet high, composed of material cleared from the under-story of the forest on the property— and other landscaping debris. In addition to serving as an effective noise barrier for their home, this prominent compost pile provides an attractive home for small animals.

Back deck: While the large deck in the back of the home is made from wood that is not found on-site, there are many green features on and around the deck, and there is a clear integration of the deck with the forest around the property— so the deck's construction has an organic, "holistic" feel to it, as well as universal design elements.

Challenges

Hot water "cold spot": When the stored solar-provided hot water runs out, there is a few minutes of transition time (hot to cold and back to hot) while waiting for the on-demand tankless water heater to take over and fully kick-in. "It will get your attention" if taking an extended shower and depleting the stored solar hot water.

Misfit light fixtures: Many of the light fixtures in their home were not a suitable size for compact fluorescent lights. Also, they found that compact fluorescent lights do not provide suitable lighting in some areas— like over the desk, or in their bathroom.

Limited graywater system: The Vowels chose not to establish a more comprehensive graywater system (beyond just their laundry machine) because rerouting pipes from their sinks and showers would have been technically impractical and cost restrictive.

Lessons Learned, and Points of Reflection

- Mike didn't feel like they had to make any "major" changes to "go green." He feels like some of the "green" enhancements were for common sense home improvements that needed to be made anyway.
- Many new features of their home involved second-use materials, so they actually saved a lot of money.
- Higher upfront costs of some features, like the solar-powered water heating and foam insulation, will pay-off in the long term, and even save them money.
- In assessing the cost of their remodel, the Vowels also took into account the affects of the living space on quality of life and health— which are really priceless qualities.
- Like most home improvements, the Vowels believe that green remodeling is an investment, and together with their Universal Design strategies and rural location, they make their property a more attractive, marketable, and livable place.

