

Sustainable Home: Going Green at the Beach

by Robin Rogers LEED AP

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A beachfront home employs geothermal heat, solar power and a sustainable landscape after getting a makeover.



Though more than 100-years-old, this ocean-front property is a beacon of sustainability. All photos by Northwest Property Imaging.

Anna and Dave Porter were like so many others inspired by the green movement, making efforts but falling short of their ideal personal values to help end global warming and its deleterious effects. For years, Dave, a senior executive with Countrywide Home Loans, has spoken on sustainable building topics at national home building conventions, and he's well-known in Seattle's builder community for promoting energy-efficient homes and "green" mortgages. The couple recycled, used green cleaning products, salvaged "beautiful junk" for "art," ate organic food and taught their kids the meaning of conservation. But three years ago, they had an epiphany: "We can do even more on a personal level." This awakening led them to leave behind their "McMansion," purchase a smaller fixer-upper beachfront home, exchange their Jaguar for a Toyota Prius hybrid, and resolve to not only green their beach house, but to share with the others how they were achieving a more sustainable living environment.

They started with the existing ramshackle home, which sat on a 31.5-foot-by-125-foot lot on the shore of Puget Sound and had reached the end of its useful life. Rotting wood, dangerously antiquated wiring, toxic vermiculite ceilings and other problems made it prudent to rebuild, yet there was usable material in the old structure. With assistance from a salvage expert, the couple diverted 80 percent of the house from the landfill, integrating into the new home such valuable materials as wood wainscoting, doors, cabinets, light fixtures, decking (which was used to make wine racks) and a large piece of the frame that became a new fireplace mantel.

Because of its proximity to Puget Sound's sensitive waters, the site and its landscaping were integral to the home's long-term viability as a sustainable project. The Porters began by maintaining the original footprint of the house and garage and vowing to not only "do no harm," but to actually improve the site's existing ecology.

Now, pervious concrete walkways, permeable pavers in the driveway and crushed rock all allow water to percolate naturally. Food plants mingle with natives, while a hanging basket insectary attracts beneficial insects and provides integrated pest management rather than chemical pest control. Salvaged and recycled elements also dot the landscaping in whimsical artistic ways, such as an artful pathway that leads to a constructed rock channel through the terraced garden. In turn, this garden is irrigated by rooftop runoff stored in a 900-gallon cistern, and two modular vegetated roofs cover 364 square feet, two strategies that slow and treat runoff into the sea.

Efficiency and IAQ



The balance struck between old and new by the Porter's residence gives it modern functionality without disturbing the local aesthetic.

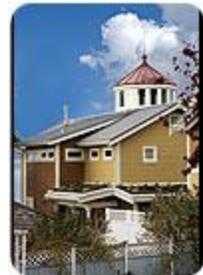
Living in the Pacific Northwest also required rethinking the heating and cooling systems. The Porters decided on a geothermal system that pulls heat from the earth into an efficient radiant floor-heating system, eliminating the use of fossil fuels and keeping pollutants from entering the Sound. To achieve this, they used sonic drilling technology to place two 300-foot vertical wells with sealed circulating loops that distribute the nearly constant ground temperature into the home. Meanwhile, a heat-recovery ventilator transfers waste heat to the fresh air while expelling stale air.

The site's very design encourages passive heating and cooling as well. High-efficiency windows facilitate daylighting but are shaded to protect from overexposure to the sun. An advanced framing system allowed studs to be spaced farther apart to accommodate more and thicker insulation. And a 1.2 kW photovoltaic system produces active power that is net-metered so energy is supplied to the local utility, effectively spinning the Porters' meter backwards.

To promote a healthy indoor environment, the Porters chose non-toxic, low-VOC and no-formaldehyde products whenever possible for their paints, wood finishes and insulation. They bolstered the air quality via an efficient ventilation system and the total absence of carpet, which catches and holds allergens and pollutants. Responsible water use was also addressed, as the Porters installed such water-conservation tools as dual-flush toilets, water-saving fixtures and appliances, and a tankless water-heating system. And conservation and responsible resource use, two tenets of sustainable living, were reinforced through the use of recycled glass tile, long-life siding and metal roof, FSC-certified wood products and cork flooring produced from leftover materials from wine-cork production.

For the Future

The one element left intact during this "going green" process was the bulkhead, a mainstay of thousands of homes along the Sound. Bulkheads are generally not considered friendly to the natural sea habitat, and the Porters considered removing theirs, even though most sites include them to defend coastal land and home sites from erosion. But removing only one bulkhead among hundreds of thousands lining the shore would destabilize the site and effect little change to the overall shoreline. Instead, the Porters view this as a potential future project in which all the neighbors are mobilized into action to re-create a more naturalized shoreline.



This goal actually seems somewhat realistic, considering the project's reception. The couple's enthusiasm spilled over into a huge, supportive community of team members, sponsors, and neighbors. The project's heavily trafficked website has been devoted to telling their stories and sharing their observations, and even the couple's "salvaged" dog, Skipper, donned a hardhat and carpenter's belt to become the online spokesdog. By making the project fun and proving that building green offers many possibilities for imposing less harm than conventional building, the Porters' home could effect change well beyond the Washington coast. Washington may be the "Evergreen State," but the green-building example set by the Porters provides applicable lessons for homeowners — and homebuilders — nationwide.

To read about the Porters' journey towards a greener lifestyle, visit the extensive website at www.goinggreenatthebeach.com.

GREEN BEACH HOUSE

LOCATION: STANWOOD, WASH.

DATE OF COMPLETION: SEPTEMBER 2007

OWNERS: DAVE AND ANNA PORTER

ARCHITECT: GMS ARCHITECTURAL GROUP

STRUCTURAL ENGINEER: DCI ENGINEERS

BUILDER: CHAFFEY HOMES

INTERIOR DESIGN: MILLER & ASSOCIATES, LLC

GREEN BUILDING: CONSTRUCTION CONSULTANTS OF WA

CONSULTING: OTAK

FINANCING: COUNTRYWIDE HOME LOANS

GREEN CERTIFICATIONS

THE PORTERS ARE PURSUING SIX DIFFERENT GREEN CERTIFICATIONS:

- ENERGY STAR HOMES NORTHWEST
- HEALTH HOUSE/AMERICAN LUNG ASSOCIATION
- ENVIRONMENTS FOR LIVING
- LEED FOR HOMES
- NAHB MODEL GREEN HOME BUILDING GUIDELINES
- BUILT GREEN

DECONSTRUCTION

DECONSTRUCTION AND SALVAGE: RE-USE CONSULTING

LANDSCAPE + SITE

LANDSCAPE ARCHITECTURE: OTAK, INC.

LANDSCAPE INSTALLATION: FROG ON A LOG PARKS

GREEN ROOF: TRIAD ASSOCIATES

GREEN ROOF MODULAR SYSTEM: GREEN GRID

CONCRETE STAMPING: FIRST IMPRESSION CONCRETE

PERVIOUS CONCRETE: PERVIOUS CONCRETE, INC.

PERMEABLE PAVING: MUTUAL MATERIALS

SOIL AMENDMENTS: CEDAR GROVE COMPOSTING

WATER DIVERSION SYSTEM: DEK DRAIN

SYSTEMS + APPLIANCES

GEOHERMAL WELL DRILLING: BOART LONGYEAR

GEOHERMAL COMFORT SYSTEM: EARTHHEAT

SOLAR INVERTER: OUTBACK POWER SYSTEMS

SOLAR PANELS + SYSTEM DESIGN: AMERICAN COMMUNITY ENERGY

GEOHERMAL HEAT PUMP: HYDRON MODULE
RADIANT SUBFLOOR: WARMBOARD RADIANT SUBFLOOR
TANKLESS WATER HEATERS: RINNAI
PLUMBING FIXTURES: KOHLER
INDOOR AIR SYSTEM: LIFE BREATH
VENTILATING FANS: PANASONIC VENTILATING FANS
CEILING FANS: HUNTER
KITCHENAID APPLIANCES: WHIRLPOOL CORPORATION

ENVELOPE

SPRAY-FOAM INSULATION: ICYNENE
METAL ROOFING: LAST-TIME METAL PRODUCTS
WINDOWS: MILGARD
WEATHERPROOFING: DUPONT TYVEK

FLOORING

FSC-CERTIFIED TEAK FLOORING: TOUCAN TEAK
BAMBOO FLOORING: TERAGREN
SPIRAL CUPOLA STAIRS: GEORGE'S SPIRAL STAIRS

LIGHTING

BEACH-GLASS CHANDELIER: RUSS MORGAN CHANDELIERS
PERIOD LIGHTING FIXTURES: REJUVENATION
MOSAIC BACKLIGHTING: E-LITE TECHNOLOGIES

FINISHES

SUSTAINABLE MATERIALS: ECOHAUS
CABINETS: NEIL KELLY CABINETS
ARCHITECTURAL FINISHES: VC STUDIO
MOSAICS: ACAPPELLA DESIGN
TILE: AMBIENTE TILE
COUNTERTOP: CAESARSTONE QUARTZ
SHOJI SCREENS: SHAKTI SHOJI
GLASS SHOWER DOORS: AAA KARTAK GLASS
HIDDEN DOOR: HIDE-A-DOOR
ART CONSULTING: BILINEAR ART
DISAPPEARING SCREENS, RETRACTABLE AWNING AND MOULDINGS: ATLAS

Author: Robin Rogers LEED AP, May 2002

Robin Rogers is the sustainability advisor for Otak, Inc., an architecture, engineering and planning firm that employs nearly 500 professionals in 12 offices in the western United States. Otak provided sustainability and landscape consulting on the Going Green at the Beach project. For more information, visit www.otak.com.