

The Green Compact

The Green Compact house sold quickly for a premium price. The lot was narrow and small, so the architect and builder focused on a plan that respects neighboring houses and provides good light.

Green Home Case Study

Healthy homes for a healthy environment



About the house

Name: The Green Compact
 Type: New, single family construction
 Square Feet: 1,270
 Location: Seattle's Central District neighborhood
 Completed: January 2005

This open, airy house on a small city infill lot is packed with features that conserve resources and add pizzazz. These include a vegetated roof and rain barrels to keep stress off the city's storm drains, a single tankless water heater to heat the house and supply the taps, and a heat-recovery ventilator to bring in fresh air and warm it with heat from stale air flowing out.

To cut down on materials that went into the house, the two-bedroom, 1 3/4-bath house was designed to fit within 1,270 square feet. The builders used salvaged materials wherever they could. Some are hidden away in the walls, where about 90 percent of the framing lumber is in its second life, but others are showpieces: a vintage stairway balustrade, reclaimed doors and a striking trough sink that came from a school art room. In addition, structural ma-

terials double as finished surfaces in many cases. The building's concrete slab, for example, is also the finished floor for the ground level, while plywood subfloors on the second floor and in the loft got a clear finish and are now the finished flooring.

GreenLeaf Construction, which builds seven to 10 spec homes a year, had incorporated "green" features in earlier projects, but never on the scale done here. The company wanted to get its houses and building practices to the next level and decided to do that by building this house to qualify for Built Green™ 4-Star certification. The house met that goal. GreenLeaf has since incorporated many of the strategies as its standard way of doing business. And the house sold quickly for a premium price, more than making up for the 10-15 percent in added costs.

Goals/Challenges

The right team

The first challenge, according to GreenLeaf President Jim Barger, was to find an architect who could not only come up with a suitable design for the 3,402-square-foot lot but work with the builders as part of a team and help them learn.

Ratings & Awards

Home Builder Award,
 2005 Built Green™
 Design Competition

Built Green™ 4-Star
 Certified Home
 (468 points)

The Team

Builder

GreenLeaf Construction
(206) 786-3521

Architect

David Vandervort Architects
(206) 784-1614
www.vandervort.com

Engineering

Evergreen Design Co.
Lori Brown
(425) 771-7602

Interior Design

Miller & Associates
Keith Miller
(206) 226-7541

Consultants

The Construction Consultants
Diane Glenn
(425) 709-6100

Resource Venture
Karen Price
(206) 389-7304
www.resourceventure.org

Construction Lending

Phoenix Savings Bank
(Pacific Crest Savings Bank)
www.pacificcrestbank.com

Resources/Products

Used building materials

Second Use Building Materials
(206) 763-6929
www.seconduse.com

Earthwise Building Salvage
(206) 624-4510
www.earthwise-salvage.com

The RE Store
(206) 297-9119
www.re-store.org/ballard.htm

Wheat board

Environmental Home Center
(206) 682-7332
www.environmentalhome
center.com

Recycled glass tiles

kitchen backsplash
Bedrock Industries
(206) 283-7625
www.bedrockindustries.com

Heat-recovery ventilator

Broan Nu-Tone LLC
www.broan.com

Vegetated roof

Hadj Design Group
Patrick Carey
(206) 721-0084
www.hadj.net

Radiant heating systems

Advanced Plumbing & Heating
(425) 348-5100
www.advancedplumbing
heating.com

For More Info

Built Green™ – a residential green building program/rating system developed by the Master Builders Association of King and Snohomish Counties in partnership with Seattle. www.builtgreen.net

Energy Star – a government-backed program helping businesses and individuals protect the environment through superior energy efficiency. www.energystar.gov

King County Construction Works – provides free assistance and recognition to builders who recycle, reduce waste and use recycled-content building materials. www.metrokc.gov/dnrp/swd/greenbuilding

Seattle Sustainable Building Program – provides guidelines, incentives, and assistance to increase the environmental performance of buildings in Seattle. www.seattle.gov/dpd/sustainability

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David Vandervort Architects took the lead in designing the site and floor plans, and the builders took the lead in finding finish materials. When they wanted to try something new, such as using wheat board panels instead of hardboard in the kitchen, the architect would say, “Great idea; do it,” or counsel against it based on technical knowledge.

Salvaged materials

Due to the high price of sustainably harvested lumber, the project team switched to reclaimed lumber. GreenLeaf crews partially deconstructed two houses by hand, and they put out word that they would gladly pick up leftovers from other jobs. The added labor costs balanced out with what the company saved. To persuade the building inspector to allow use of wood without a grade stamp, GreenLeaf separated sound wood from pieces with rot or insect damage. The inspector, seeing that the crew was careful, went along but reserved the right to call in a grading inspector if he saw problematic lumber being used.

Tracking down other salvaged materials became sort of a hobby — fun, even if not always strictly cost-effective because of the time it took. At Seattle stores that specialize in selling used building materials, GreenLeaf found a 1970s butcher block to use as a kitchen counter, old school bleacher seats to cut into stair treads, an old ship’s ladder to provide access to a loft, and many other items. The company also salvaged and recycled its own leftover materials through King County’s Construction Works program.

Site issues

As with many infill properties, this lot was narrow and small, and it had existing homes on both sides. The architect and builder focused on finding a plan that would respect the neighboring houses and not make them darker, and yet give the new house good light and air circulation. Locating the house near the rear of the lot, where there is good southern exposure, solved this problem. The eventual buyers love the arrangement, which they say gives the house a secret-garden feel. The neighbors, too, are grateful.

Green roof

Vegetation covers about 20 percent of the roof area, creating a roof area that’s accessible from the loft. Metal roofing on the rest of the structure drains partly into the roof garden and partly into two rain barrels. Overflow goes into an infiltration trench landscaped with plants that thrive where the soil is soggy periodically. This puts all rainwater to good use and keeps it out of storm drains.

Hot water

A single tankless water heater supplies taps and two radiant-heat systems for the house. On the ground floor, hot water circulates in pipes embedded in the concrete slab, which is insulated underneath. Upstairs, hot water flows through wall radiators. Because there are no ducts, the heating system doesn’t blow dusty air through the house. Tankless water heaters cost more than conventional water heaters up front, but save money over time as they save energy. Making the water-heater double as the furnace more than compensated for that.

Energy efficiency

This house should leak 12 percent less heat than houses that merely meet the state energy code. Advanced framing and added insulation bolster places that are weak links in many houses, such as headers, corners and intersections that involve interior and exterior walls. Windows are oriented to bring in free heat from the sun, and south-facing overhangs provide shading when needed. The cooling system consists of ceiling fans and cross ventilation. Appliances are Energy Star rated.

Lessons learned

Know what it means to innovate

Using one piece of equipment to supply both the hot tap water and two radiant-heat systems turned out to be trickier than the builders expected. The systems eventually were brought into balance, but only after considerable tinkering. Barger says the lesson from this is not to get bogged down in trying too many innovative features at once. There will always be a learning curve — you just can’t face too many.

Think like a buyer

About half the potential buyers were drawn to the house by its beauty: the way Vandervort set the house on the lot and the architectural features he incorporated; the builder’s craftsmanship; even the color scheme, which came from a consultant that GreenLeaf hired. These potential buyers also loved the structural materials used as finished surfaces, although the green reasons for choosing this approach weren’t their primary motivator. However, when GreenLeaf built the same basic house a short time later, that buyer considered green features to be crucial. In this evolving market, green features are clearly important, but so are pop and sizzle.

