

Huppert Remodel/Addition

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Green Home Case Study

Healthy homes for a healthy environment



Photo credits (l to r): Kitchen, VELOCIPEDA architects; atrium, © Michael Moore; exterior, © Michael Moore.

About the project

Name: Huppert Remodel/Addition
Type: Residential remodel, plus new accessory dwelling unit
Square Feet: 1,523 (including 1,000 new)
Location: Seattle's Fremont neighborhood
Completed: March 2003

With careful, selective remodeling and a modest expansion, this 1980s house gained neighbors, a sweeping view across Ballard to the Olympic Mountains, and many energy-efficient and water-thrifty features, including a green roof on the garage. Besides creating space for an accessory dwelling unit, the expansion resulted in an atrium entry shared by the rental and the main house.

Goals of the remodeling were similar to those that propel many home-improvement projects. Besides taking advantage of a view, the owners wanted to connect the kitchen and dining areas, carve a home office and a guest bedroom out of an existing den, update the kitchen, and create a more functional upstairs bathroom. The focus on incorporating energy-efficient, water-thrifty and

healthy features is what turned the project into a Built Green™ award winner. The project also used numerous local, renewable or recycled products. The green focus even extended to the vehicles that the owner and architect used when they made site visits. The owner drove a car fueled by 100 percent biodiesel (a vegetable-oil alternative to petroleum) and the architect bicycled.

Goals/Challenges

Site plan

Seattle permits small second homes, called accessory dwelling units, on residential lots, but requires the two units to be part of the same structure. Meeting that challenge in a way that also provides privacy for both units can be a challenge. Here, the solution was to build an atrium entry that connects the main house and the rental. Residents of both units share the entry, but there are no other shared walls. The smaller unit is nestled against a hillside and a row of trees, so when you're inside looking out, you feel almost as if you were in an isolated retreat in the country.

Ratings & Awards

Remodeler Award,
 2005 Built Green™
 Design Competition

Built Green™ 4-Star
 Certified Project
 (417 points)

The Team

Owner/Developer

Mark & Mollie Huppert

Architect

VELOCIPEDE architects
(206) 529-9356
www.velocipede.net

Builder

Stonewood Builders Inc.
(206) 300-7765

Structural engineer

Coughlin Porter Lundeen
(206) 343-0460
www.cplinc.com

Resources/Products

Green roofs

NW Ecobuilding Guild
c/o Hadj Design
(206) 721-0084
www.hadj.net

Industry resource portal:
www.greenroofs.com

Green roof membrane

W.P. Hickman Company
Local representative
(253) 841-7654 or
(206) 841-7663
pfannin@wa.net

Rastra blocks

Green Depot Inc.
(360) 705-2868
www.greendepotinc.com

SIP panels

Premier Building Systems
(800) 275-7086
www.pbspanel.com

Green tag power

Seattle City Light
(206) 684-3000
www.seattle.gov/light/green/
greenpower/

FSC-certified lumber

Dunn Lumber
(206) 632-2129
www.dunnlum.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/dnpr/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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Adding a second, small home to an existing residential lot helps combat urban sprawl. And when the lot is near shops and restaurants, as this one is, it also encourages people to walk, rather than drive, to do their errands.

Reused materials

When siding on one wall had to be removed for the addition, the construction crew took it off carefully so that the wood could be reused in the new unit. Boards from a cedar fence on the property also were salvaged and reused. Old bleacher seats became strip flooring for the new unit. A slate floor in the main house was salvaged from leftover material that a national chain store didn't want. The builders used the scraps to create a pattern in the entryway floor.

The original plan called for purchasing new kitchen cabinets and donating the existing ones to a local store that would sell them for reuse. But as the construction planning proceeded, the owners decided that the old cabinets weren't so terrible after all. They opted for the easiest type of reuse: leaving them where they were.

Foundation features

Because Portland cement takes a lot of energy to manufacture, the building team minimized its use on this job. They built the foundation stem walls with Rastra blocks, which consist of 85 percent ground polystyrene and just 15 percent cement slip. The blocks contain half the cement of standard concrete blocks, and they use waste plastic foam as aggregate instead of sand and gravel. The builders substituted flyash, a waste product produced by burning coal to make electricity, for 43 percent of the Portland cement needed in the grout and the foundation footings and slab.

SIP construction

To create the additional unit, the builders avoided typical stick-framed construction and instead used structural insulated panels, or SIPs. These factory-made components arrive on the site ready to be lifted into place and fastened down, so there is little waste. The panels also provide stellar energy efficiency because they consist of framing, insulation and siding all sandwiched together, with none of the insulation gaps often found in standard construction. The panels have one-third to half the thermal bridging, or transfer of heat through framing, that typically occurs when walls have insulation only between studs.

All of the new and remodeled rooms now have compact fluorescent or low-voltage incandescent lights, and all new appliances are Energy Star rated.

Green roof

The garage roof is a demonstration site for Seattle's eco-roof project and offers multiple benefits. The lightweight soil and plants absorb a considerable amount of water, which reduces stormwater runoff and allows more of the moisture to evaporate into the sky and recycle back as the clouds and dew that keeps Seattle green. The plant layer also acts as a filter, so whatever water does drip off is cleaner than it would otherwise be. Because the roof is covered with plants, it doesn't heat up as much as standard roofing, which reduces the urban "heat island" effect and extends the life of the underlying waterproof membrane. And the uphill neighbor gets to look down on a pleasant patch of landscaping.

The system chosen for the roof consists of a torched-down membrane with an integral copper root barrier and a gel absorption layer. Without this product, the roofers would have had to install three layers, which would have added to the labor costs.

Lessons learned

Reality check

Owners Mollie and Mark Huppert and architect George Ostrow explored many possibilities that they eventually ruled out. They hoped to avoid PVC pipes for footing drains but found that switching to vitrified clay pipes involved too many roadblocks. Photovoltaic panels would have blown the budget, so they signed up for green-tag power, a system that lets individual homeowners support large projects that generate electricity from the sun or wind. And sustainable harvest lumber certified by the Forest Stewardship Council (FSC) just wasn't readily available at the time, even though they searched for it for three months. "The lesson, I guess, is that you have to temper your dreams with reality," Ostrow says.

But dreaming also has benefits, especially when it involves asking suppliers for products they don't currently carry. Because builders and architects kept asking for it, certified lumber is now much more available in Seattle.

