



The Green Door

February 2005



The Green Door is a monthly newsletter of sustainable living and real estate geared to present and future homeowners.

"We are called to assist the Earth to heal her wounds and in the process heal our own - indeed, to embrace the whole creation in all its diversity, beauty, and wonder. This will happen if we see the need to revive our sense of belonging to a larger family of life." -Wangari Maathai

Green Roofs-What's That Garden Doing On Your Roof?

A green roof may seem like a bizarre concept, but it is not a new one. It is only in the last century that we have so successfully separated ourselves from the natural environment with newer, better, more high-tech, air-tight, moisture-proof homes. The homes we live in now are often independent of nature, utilizing none of the gifts that are offered by our environment. In fact, we do everything possible to keep our environment from getting in or taking over. Green roofs actually date back thousands of years and have been used across the world, in some form or another, for centuries. As one of the seven wonders of the ancient world, the Hanging Gardens of Babylon, covered immense areas of Babylon and were successfully cultivated for decades. In US frontier times, across the great plains, sod was commonly used on roofs and exterior walls. In Seattle, the popular practice of letting moss grow over our roof shingles is not a form of a green roof!! The contemporary green roof has been developed in Europe-primarily in Germany-over the last 35 years. As a response to serious regional ecological challenges, European government incentives have encouraged careful research and a flourishing green roof industry. Between 1989 and 1999, German roofing companies installed nearly 350 million square feet of green roofs and the rate is increasing.

Green roofs also called "**ecoroofs**" or "**vegetated roofs**", have begun to sprout up across our continent on residential and commercial buildings alike. Many people say that the flurry of green roof construction has as much to do with the roof's practical benefits as with their aesthetic appeal. Made of part garden, part improved insulation system and part sponge, green roofs absorb storm water (reducing need for storm water infrastructure), outlast conventional roofs and help make buildings more energy efficient. Conventional shingle roofs are carbon and oil based and are essentially junk after just 20 years, though asphalt can be recycled. Environmentally, green roofs act like any other vegetative material-absorbing pollutants, releasing oxygen, combating urban heat island effect, filtering water and increasing natural habitat. A green roof is not about getting a bang for your buck in regards to any one issue, such as energy savings, but when all the benefits are added up, a green roof can really pay off.



Here is the U.S. **Chicago's City Hall** has one, as does the **Gap Headquarters** in San Bruno, CA, the **Javitts Center** in Manhattan (22 acres), the **Boston World Trade Center Podium Buildings**, the **Howard Hughes Medical Institute** in Dulles, TX, the **Ford Motor Company** in Dearborn, Michigan and the **Point Defiance Zoo and Aquarium Hospital** in Tacoma, WA-to name a few. Here in Seattle, the old Public Safety Building is being replaced by the **Justice Center Building** which has a green roof included in its design. For more projects go to: http://www.greenroofs.com/north_american.htm

Portland, Oregon now has a green roof incentive program which gives grants up to \$5,000 for green roof installation. This incentive was brought about by a state mandate to decrease raw sewage contamination of storm water runoff. Other kinds of zoning incentives are also offered which allow builders to either build bigger or taller, if they include a green roof, thus making the land more valuable.

Introduction To Green Roof Construction

If you are curious about how green roofs work or are seriously interested in exploring the possibility of a green roof on your house, this workshop is a great start. The presenter is Patrick Carey, the principle of Hadj Design and director of the Northwest Ecobuilding Guild's **Green Roof Project**. Patrick is also a certified North American trainer through **Green Roofs for Healthy Cities**.

The Guild project has designed and installed 20 green roofs in the Seattle area. Hadj Design completed its 8th green roof this fall. This workshop is on Saturday, March 19th, 2005, from 10am to 2pm, and is \$28 per person. **Please call 206.386.4236 to preregister.**

Interesting Fact:

I have been told that the traditional Scandinavian green roof have the turf installed up side down, that's right green side down. This is done so that the grass will grow back thru the roots creating a root reinforced soil.

"The system of nature, of which man is a part, tends to be self-balancing, self-adjusting, self cleansing. Not so with technology". - E.F. Schumacher, *Small is Beautiful*, 1973

The typical composition of a green roof starts with a roofing membrane system on top of which goes a drainage matt, which is a porous system used to allow water to drain off the roof. Most of the green roofs in the U.S. use an "egg crate" type of plastic (hopefully recycled) for the drainage system. On top of this drainage matt goes a filter fabric that will keep the soil from penetrating and clogging the drainage system. In some roofs, a root barrier is also put on top of the filter fabric to keep roots from getting under the drainage system and into the roof membrane. On top of the filter fabric is a layer of soil, usually a special lightweight soil. The thickness of the soil varies by roof types and can be as little as 3" if you don't plan on walking on it, 6" or more if you do. Green roofs are divided into two types; **Extensive**, which include soil depths between 2"-4" and **Intensive**, which requires soil depths of 6" or more for larger plants such as bushes and even trees.

The weight of soil is a major factor in the design of green roofs. You need to have a structural engineer confirm that your roof is designed to carry the load. Structural analysis is critical in that it may affect structural sheathing and other aspects of the building design. A cubic foot of saturated soil weighs 120lbs. By using light weight soils composed of pumice, perlite, styrofoam or other such media, you can reduce the weight by almost half, but even this is heavy. In some commercial applications roofs can have up to 30" of soil to accommodate trees. The type of plants that will work on green roofs are primarily selected by the depth of the soil and the environment i.e. native or adapted vegetation. The EcoBuilders Guild's Ecoroof website provides information on local plants, like sedums and grasses, as well as exotic moss gardens.

There are several planting methods for green roofs including install plugs, seeding or rolling out a prepared soil plant matt or nature mat. Systems are available that use special "flats" which provide all the components of a green roof except the roof membrane, which is easily installed, and moveable pieces.

It is possible to replace your existing roof (when its lifespan is over) with a green roof, with careful planning and professional help. The cost is no longer prohibitive but factors such as slope, underlying structural support and access do come into play. Contact Patrick Carey at (206) 721-0084 or pkc@hadi.net if you are interested in participating in the Ecobuilder's Guild Eco-roof project.

A Greener Seattle Highlight-

Greenworks Realty Introduces CHED!! A Green Home Assessment Package. * Comfort, Health, Energy Efficiency and Durability *

Welcome to CHED, a green home assessment for improved comfort, health, energy efficiency and durability in your home. CHED is designed to educate homeowners about choices that can increase quality of life by improving indoor air quality, reducing water and energy costs and providing information on green products and services. <http://greenworksrealty.com/services/ched.html>

Our CHED assessment is conducted by Atmosphere Inc, formerly Energy Options Northwest, a residential environmental management firm specializing in diagnosis and remediation of building problems related to indoor air quality, energy use and more. <http://www.myatmosphere.biz/>

CHED can be purchased as an independent service by homeowners, but is also given to all homebuyers working with Greenworks Realty. **Call 206.283.8181 for more information.**

The Green Door is brought to you by Cally Fulton and Danielle Johnson, both Real Estate Associates with GreenWorks Realty, Seattle and is written by JR Fulton, Architect and LEED Accredited Professional. To save trees and expand the opportunity to share information, please provide us with your e-mail address and the address of others interested in making their homes more sustainable. If you or someone you know would appreciate our real estate services please call- **Cally Fulton(206)786-5061** or **Danielle Johnson(206)679-0185**
To be added or deleted from our subscription list please contact
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February Websites

<http://www.djc.com/news/co/11138820.html>
Seattle Green Roof News

<http://www.portlandonline.com/bes/index.cfm?c=34663>
Portland's Green Roof Project

<http://www.greenroofs.com>
Green Roof Info Galore

<http://www.ecobuilding.org/proj/ecoroof/factsheet.htm>
Eco Building Guild Project

<http://www.roofmeadow.com/intro.html>
Planting Specifics

Seattle Sustainable Residence Diary-Entry #7 "Our Green Roof"

First the City didn't like the roof membrane I proposed, so we found another, used in Europe, that is fairly inexpensive and great for small roofs. Then my structural engineer sized the structure based on the weight of fully saturated regular soil. That had to be revised based on lightweight soil, but the structural savings will pay for the roof. Now we are looking for approximately 900 sedum starts and other appropriate plant plugs for a roof of about 400 square feet. We also hope to have some grasses in some areas. Our roof will be 6" so I plan on taking naps out there in the future or gazing at Mt Rainier on any of the 7 clear days/year.

- JRF

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