Green Marketing

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Built Green Conference
Everett, Washington
13 March 2007

Patti Southard
King County Green Tools
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Robin Rogers
Otak Architecture & Engineering
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What's Happening?

Sent by Martha Rose Construction

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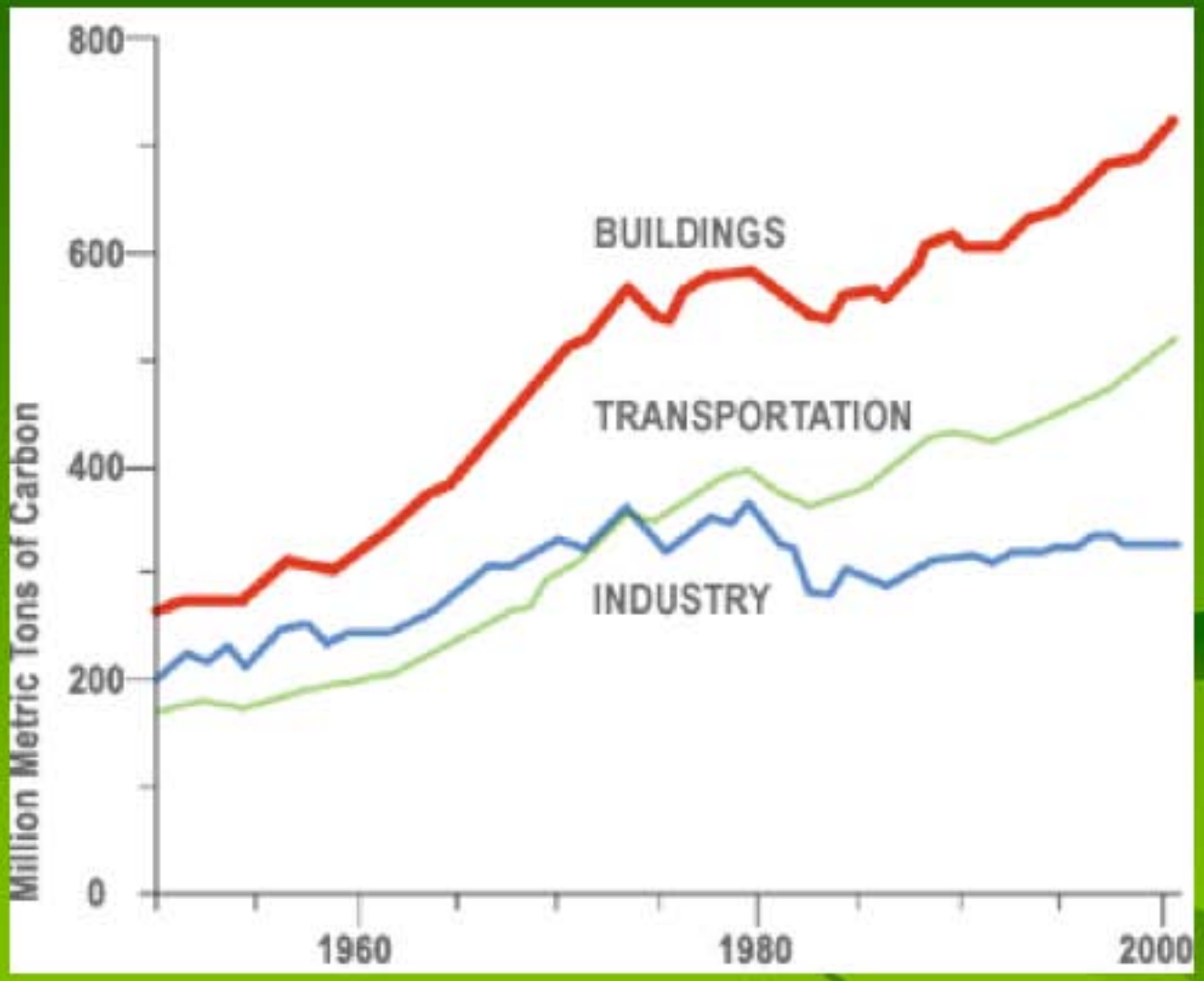
Energy Consumption

"Combining the annual energy required to operate residential, commercial, and industrial buildings along with the embodied energy of industry-produced building materials like carpet, tile, glass, and concrete exposes buildings as the largest energy consuming and greenhouse gas emitting sector."



2030: Source: U.S. Energy Information Administration statistics

http://www.metrokc.gov/exec/news/2007/pdf/climateplan.pdf

Reasons for Green

- Economic
- Social
- Environmental
- Political
- Ethical
- Ontological
- Health

The 2030 °Challenge*

- All new buildings, developments and major renovations designed to use 50% of the regional (or country) average for fossil fuel, greenhouse gas (GHG) emissions and energy consumption

- Existing buildings renovated annually to use 50% of the regional (or country) average for fossil-fuel, greenhouse gas (GHG)-emissions and energy-consumption through innovative design strategies, renewable technologies and/or the purchase - 20% maximum - of renewable energy

- Fossil fuel reduction standard for all new buildings be increased to:
  - 60% in 2010
  - 70% in 2015
  - 80% in 2020
  - 90% in 2025
  - Carbon-neutral by 2030 (using no fossil-fuel GHG-emitting energy to operate)

* www.architecture2030.org/open_letter/index.html

The 2030 °Challenge

U.S. Average Site Energy Use and 2030 Challenge Energy Reduction Targets by Space/Building Type (CBECS 2003)[1]

From the Environmental Protection Agency (EPA). Use this chart to find the site fossil-fuel energy targets.

Primary Space/Building Type [2]	Available in Target Finder [3]	Average Source EUI [4] (kBtu/Sq.Ft./Yr)	Average Percent Electric	Average Site EUI [4] (kBtu/Sq.Ft./Yr)	2030 Challenge Site EUI Targets (kBtu/Sq.Ft./Yr)				
					50% Target	60% Target	70% Target	80% Target	90% Target
Residential Space/Building Type [5]									
Single-Family Detached		-	-	44.7	**22.4**	17.9	13.4	8.9	4.5
Single-Family Attached		-	-	45.6	**22.8**	18.2	13.7	9.1	4.6
Multi-Family, 2 to 4 units		-	-	56.1	**28.1**	22.4	16.8	11.2	5.6
Multi-Family, 5 or more units		-	-	48.5	**24.3**	19.4	14.6	9.7	4.9
Mobile Homes		-	-	72.0	**36.0**	28.8	21.6	14.4	7.2

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Reasons for Marketing Green *

Reasons for increased use of Green Marketing:

- Can be used to achieve objectives (sales)
- Moral obligation to be more socially responsible
- Government forcing firms to become more responsible (requirements, regulations)
- Competitors' environmental activities
- Cost factors force firms to modify their behavior (waste disposal, materials usage)

* Michael Jay Polonsky, Univ. Newcastle, Australia 1994

FTC Regulations Compliance

- Clearly state environmental benefits
- Explain environmental characteristics
- Explain how benefits are achieved
- Ensure comparative differences are justified
- Ensure negative factors considered
- Use only meaningful terms and pictures

Reasons Builders Go Green*

- Good for the environment
- Homebuyers have requested green materials
- Increases profits by enabling them to build a differentiated, premium home
- Higher sale price

Image Martha Rose Construction
by Northwest Property Imaging

* McGraw-Hill Construction/National Association of Home Builders (NAHB) survey

Homebuilders' Survey*

- 50%+ report that buyers will pay 11-25 percent more for green-built homes
- Average green homebuyer is between the ages of 35-50 with a college degree and fair understanding of green products
- 96 percent intend to incorporate more green building materials and processes into their business in 2007
- 60 percent of those surveyed currently market some of the homes they build as green homes

* McGraw-Hill Construction/National Association of Home Builders (NAHB) survey

Moving Forward

- By 2010, residential green building is expected to grow to $19 - $38 billion for 5%-10% of residential construction activity (it's $7.4 billion or 2% now)
- 2006 to 2007 -- the builder population will move from a majority less involved to more involved with green building

* McGraw-Hill Construction/National Association of Home Builders (NAHB) survey

Obstacles Perceived by Builders*

- Starting costs
- Unwillingness of consumers to pay additional costs for a green home
- Uneducated consumers
- Codes, ordinances and regulations
- Lack of awareness among consumers of green products
- Only 39% said that the *perception* of green building as a fad and not something here to stay was a significant obstacle

* McGraw-Hill Construction/National Association of Home Builders (NAHB) survey

Marketing Considerations

- Builders
  - Lower upfront costs – products, technologies
  - Sales premiums – higher ROI
- Homebuyers
  - Savings in operating costs – utilities, maintenance
  - Durability – long-term
- Internal
  - Management buy-in – sell the idea to decision-makers
  - Staff education

HIGHLIGHT YOUR DIFFERENCES

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Essential Elements

- What are the essential elements in a Built Green home, project, product or company?
- How are green features effectively incorporated into a project for maximum benefit to the builder and homeowner?
- How do these strategies translate into better margins for builders and better operating costs for homeowners?
- Know Your Customer

www.cottagecompany.com

Differentiate Your Company

- Based on green achievements/products
- Choose category
- Or choose specific items (FSC, for example)
- Use the Built Green checklist
- What's your strength?

www.camwest.com

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Energy: Did You Know?

- The average American house consumes nearly $1,500 per year in utility costs
- Buildings consume approximately 40% of the energy and 70% of the electricity in the U.S. annually

You can promote:

- Operating cost savings - energy efficient heating and cooling
- Renewable power (daylight, solar heating and wind energy)
- Testing for leaks (blower door or duct blast)
- Purchase green power
- Better insulation
- Build to Energy Star criteria
- Reduced fossil fuel use

Source: Earth Advantage **www.earthadvantage.org**

High Performance Benefits

Components:

- Energy Star certification
- Wiring and electronics
- Basement systems technology to prevent moisture and mold
- High-performance windows
- Non-toxic and sustainable construction materials
- Solar electric systems
- Geothermal heating and cooling systems

Benefits to Homebuyer

- Saves money through lower utility bills
- Increased comfort with efficient windows, heating systems and increased insulation in walls and attics and around pipes and ducts
- Robust structure using durable construction practices that increase the home's life
- Healthier indoor air by careful use of vapor barriers and conscious ventilation to improve moisture control and indoor air quality.

Healthy Lifestyle

www.issaquahhighlands.com

- Walking & biking trails
- Open space
- Non-toxic landscaping
- Mixed-use

www.quadranthomes.com

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Transit: Did You Know?

- Vehicle use in America has nearly tripled from 1 to 2.85 trillion since 1970
- Passenger vehicles are responsible for approximately 20% of U.S. carbon emissions
- The infrastructure required to support vehicle travel increase the consumption of land and non-renewable resources, alter storm water flow and absorb heat energy, exacerbating heat island affect

You can promote:

- Location near public transportation
- Car pooling, hybrid car use
- Connect to existing trails and walkways or create trails
- Provide bike racks
- Higher-density housing

Existing Site Considerations

- Existing infrastructure
- Reuse or recycle existing
- Deconstruct buildings and reuse
- Preserve existing vegetation

Reusing Materials

- Assess existing structures
- Deconstruct
- Salvage anything useful
- Reuse in your project or donate
- Promote!

Going Green at the Beach:
Re-Use Consulting at www.re-use.us

Pesticides: Did You Know?

- In the US, pesticides poison 110,000 people each year -- More than one-third of calls to animal poison control centers result from pets exposed to pesticides
- The volatile organic compounds (including pesticides) found indoors are believed to cause 3,000 cases of cancer a year in the US
- According to the New York State Attorney General's office, 95 percent of the pesticides used on residential lawns are considered probable carcinogens by the EPA
- 2,4-D—a component of Agent Orange—is used in about 1,500 lawn care products

Source: David Johnston **www.greenbuilding.com**

Non-Toxic Indoors & Out

You can promote:

- Organic landscaping
- Soil amendments - compost
- Native plantings that are more pest-resistant
- Walk-off mats at home or building entrances
- Integrated pest management

IN HARMONY

www.inharmony.com

CEDAR GROVE COMPOSTING 100% NATURAL

www.cedar-grove.com

Design Considerations

- House size
  - Smaller uses less of everything
  - See new house matrix for Built Green
- Density of neighborhood or development
- Orientation of homes
  - Windows for passive heating/cooling

Low Impact Stormwater Design

- Natural stormwater strategies for neighborhoods
- Reduces infrastructure
- Beautifies streetscapes
- Cooler in hot weather

SEA Streets in Seattle: Two years of monitoring show that reduced total volume of stormwater leaving the street by 98% for a 2-year storm event

Natural Stormwater Design

- Pervious paving
- Rain gardens
- Bioswales
- Large trees
- Native vegetation

Materials: Did You Know?

- Construction and demolition waste constitute 40% of the total solid waste stream in the U.S.
- LEED buildings use less material and generate less waste through measures such as reusing existing buildings, developing a construction waste management plan, salvaging materials, using materials with recycled content, using local materials and implementing an on-site recycling plan
- Using fewer materials in a building lowers the overall embodied energy of the building, which directly impacts the building's carbon footprint

King County Solid Waste

Project:	King County		
Excluding Seattle	January 01, 2006 to December 31, 2006		
Total Volume Received in 2006		Total Tons	Total Pounds
		8,564.97	17,129,940
Finished Products Shipped	%	Product Tons	Product Pounds
Wood Derived Fuel (1)	67.557%	5,786.21	11,572,427
Alternate Daily Cover (2)	18.528%	1,586.93	3,173,856
Processed Planting Medium (3)	2.725%	233.42	466,837
Aggregate Feedstock, (4)	2.998%	256.80	513,598
Bulk Steel to be processed (5)	2.626%	224.93	449,854
Prepared Steel (6)	1.286%	110.11	220,212
Scrap Aluminum (7)	0.047%	3.99	7,977
Scrap Copper Wire & Pipe (8)	0.051%	4.41	8,814
Mixed Plastic - (9)	0.561%	48.07	96,132
P.V.C. - Plastic Siding (10)	0.038%	3.21	6,429
L.D.P.E. - Plastic Film (11)	0.168%	14.37	28,742
H.D.P.E. - Plastic, (12)	0.132%	11.28	22,569
Carpeting, (13)	0.115%	9.82	19,638
Carpet Pad, (14)	0.008%	0.71	1,414
Cardboard, (OCC) (15)	0.673%	57.61	115,210
Gypsum Rock (16)	0.257%	22.00	43,991
Designer Mulch (17)	0.564%	48.33	96,660
Pulp Furnish (18)	1.268%	108.63	217,262
CHEP Pallets for Reuse (19)	0.066%	5.62	11,244
Electronics and Fluorescent Lights (20)	0.004%	0.34	687
Non-Recyclable Residuals (21)	0.329%	28.19	56,385
Year End 2006 Recycling Rate:	99.671%	(Everything accept non-recyclable residuals.)	
less up to 10% of the ADC:	1.853%	(Amount that may not actually be used as ADC)	
Potential LEED Recycling Rate:	97.818%		

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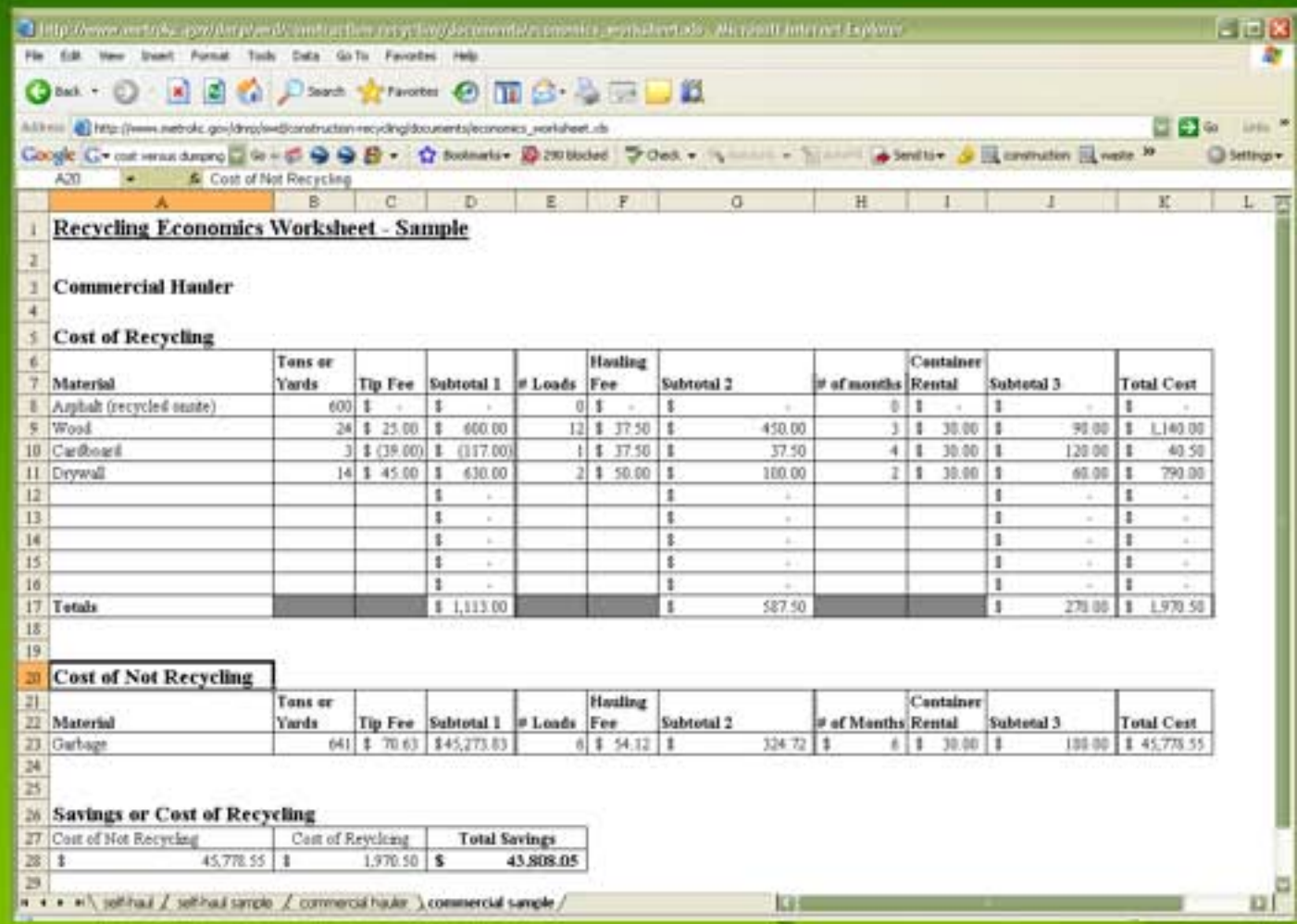
Recycling versus Dumping

- Calculate costs
- Use savings to justify other green measures
- Promote your efforts!



Recycling Economics Worksheet - Sample

Commercial Hauler

Cost of Recycling

Material	Tons or Yards	Tip Fee	Subtotal 1	# Loads	Hauling Fee	Subtotal 2	# of months	Container Rental	Subtotal 3	Total Cost
Asphalt (recycled onsite)	600	$ -	$ -	0	$ -	$ -	0	$ -	$ -	$ -
Wood	24	$ 25.00	$ 600.00	12	$ 37.50	$ 450.00	3	$ 30.00	$ 90.00	$ 1,140.00
Cardboard	3	$ (39.00)	$ (117.00)	1	$ 37.50	$ 37.50	4	$ 30.00	$ 120.00	$ 40.50
Drywall	14	$ 45.00	$ 630.00	2	$ 50.00	$ 100.00	2	$ 30.00	$ 60.00	$ 790.00
			$ -			$ -			$ -	$ -
			$ -			$ -			$ -	$ -
			$ -			$ -			$ -	$ -
			$ -			$ -			$ -	$ -
			$ -			$ -			$ -	$ -
Totals			$ 1,113.00			$ 587.50			$ 270.00	$ 1,970.50

Cost of Not Recycling

Material	Tons or Yards	Tip Fee	Subtotal 1	# Loads	Hauling Fee	Subtotal 2	# of Months	Container Rental	Subtotal 3	Total Cost
Garbage	641	$ 70.63	$45,273.83	6	$ 54.12	$ 324.72	$ 6	$ 30.00	$ 180.00	$ 45,778.55

Savings or Cost of Recycling

Cost of Not Recycling	Cost of Recycling	Total Savings
$ 45,778.55	$ 1,970.50	$ 43,808.05

www.metrokc.gov/dnrp/swd/construction-recycling/calculate.asp

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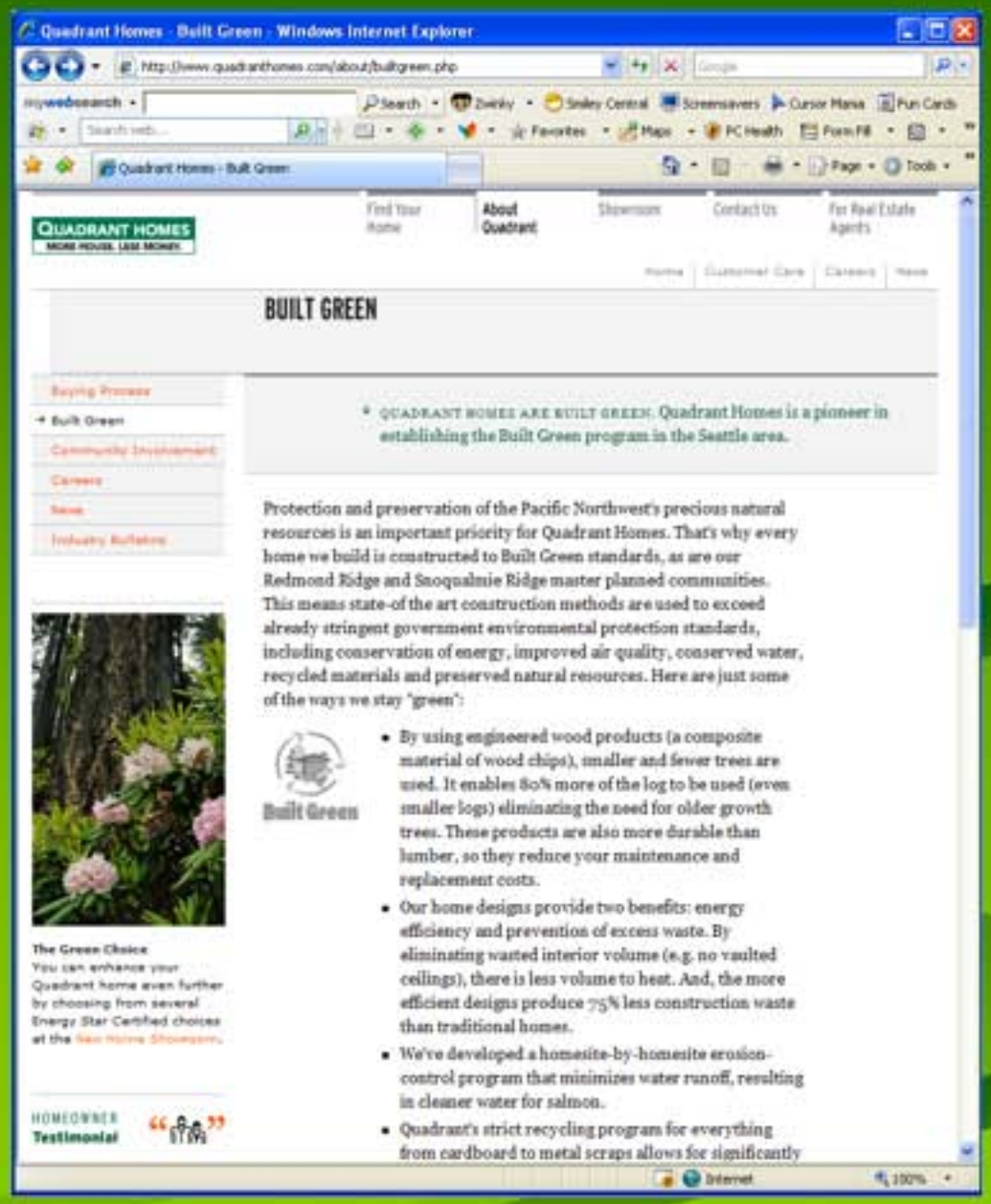
Less Construction Waste

- Assembly methods such as SIPs or advanced framing
- Smaller footprint
- Use structural materials as finish such as concrete flooring
- Engineered wood products



www.quadranthomes.com

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Not-So-Big

- Small footprint
- Clustered on site
- Shared open space

The Cottage Company: www.cottagecompany.com

Jim Barger: Greenleaf Construction

Using Wood

www.cottagecompany.com

- Sustainably produced
  - FSC certified
  - Local
- Using less –
  - Smaller footprint
  - Finger-jointed studs
  - Engineered products

Wood: Did You Know?

- Although the US is home to only 4.5 percent of the global population, it is responsible for over 15 percent of the world's consumption of wood *
- A typical 1,700 square-foot wood-frame house requires the equivalent of one acre of forest timber °

You can promote:

- Improved structural quality and saving old-growth wood by using composite floor joists, engineered lumber and finger-jointed studs
- FSC-certified wood products

* Source: David Johnston **www.greenbuilding.com**

Source: Earth Advantage **www.earthadvantage.org**

Local Products

- Save on transportation costs
- Reduces associated pollution
- Promotes local economy

EcoDeals.org

www.ecodeals.org

Water: Did You Know?

- *Older* toilets use 3.7-7 gallons per flush
- Dishwashers use 8-14 gallons per cycle
- Top-loading washers use 45 gallons/load
- A dripping faucet wastes 15-21 gallons per day
- US water users withdraw enough water to fill a line of Olympic-size swimming pools reaching around the world *EVERY DAY* (300 billion gallons)
- Although our planet is 71 percent water, humans depend on a mere .65 percent of the water for survival – much of which is polluted
- About a quarter of the nation's largest industrial plants and water treatment facilities are in serious violation of pollution standards at any one time
- An estimated 7 million Americans are made sick annually by contaminated tap water; in some rare cases this results in death

Source: David Johnston **www.greenbuilding.com**

Improved Water Use

You can promote:

- Efficient or no irrigation or irrigation using collected rainwater
- Rainwater harvesting,
- Low-flow toilets)less than code)
- Aerators on faucets

Envelope

- Moisture control
- Flashings over doors and windows and other openings
- Siding
- Windows
- Roofing
- Insulation

Image: www.martharoseconstruction.com
by Northwest Property Imaging

Energy Star

- One ENERGY STAR home can keep 2,070 pounds of greenhouse gasses out of the air each year -- equivalent to not driving 2,244 miles or planting 200 trees

www.northwestenergystar.com

SPECIALIZED HOMES LLC

www.specializedhomes.com

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Renewable Energy

- Photovoltaics – net-metered with utility
- Solar water heating
- Daylighting

Testing

- Blower door
- Duct blast
- Energy Star

Guaranteed Heating & Cooling Bills

HOUSING AWARD 2001 Winner

IDEAL HOMES
ANYTHING ELSE IS LESS THAN IDEAL

www.ideal-homes.com

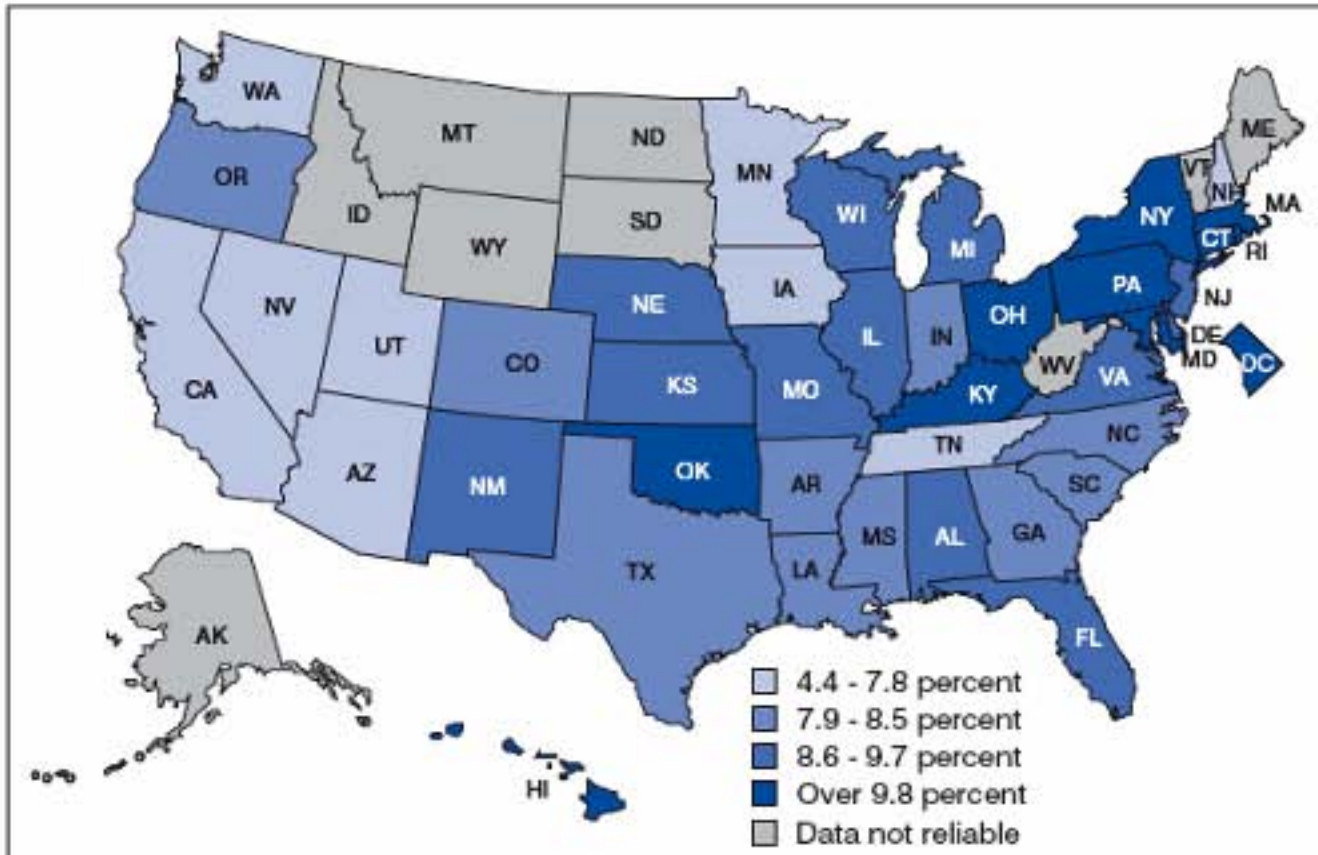
www.ideal-homes.com

Reduce Fossil Fuel Use

- Patriotic – lessens dependency on foreign oil
- Local economic benefits
- Less pollution
- More renewables

Puget Sound Energy's Wild Horse Wind Power Generation Facility

Childhood Asthma Rates



NOTES: Ranges are based on approximate quartiles among states with available estimates. Differences portrayed in this map should be interpreted with caution. The 95 percent confidence intervals for many states overlap. Current asthma prevalence estimates are based on the questions "Has a doctor or other health professional ever told you that {child's name} had asthma?" and "Does {child's name} still have asthma?" Estimates for Delaware, the District of Columbia, Mississippi, Nebraska, Nevada, and New Hampshire have a relative standard error greater than 30 percent and less than or equal to 50 percent and should be interpreted with caution as they do not meet the standard of reliability or precision. The estimates for Alaska, Idaho, Maine, Montana, North Dakota, South Dakota, Vermont, West Virginia, and Wyoming have a relative standard error greater than 50 percent and therefore are not represented in this figure.
SOURCE: CDC/NCHS, National Health Interview Survey.

Figure 1. Current asthma prevalence among children 0–17 years of age, by state, annual average for the period 2001–2005

Source: www.cdc.gov/nchs/data/ad/ad381.pdf

Indoor Air: Did You Know?

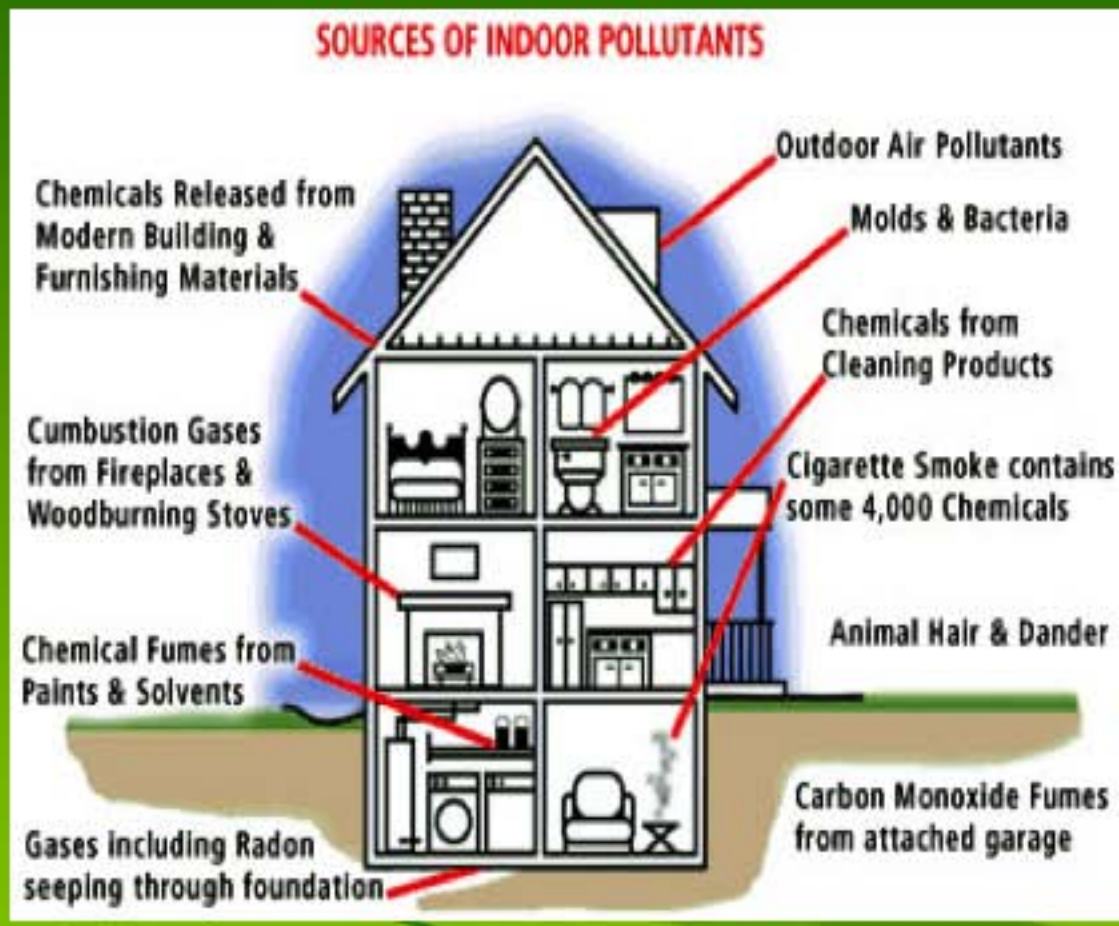
- US EPA ranks indoor air pollution among top five environmental risks
- Unhealthy air is in up to 30% of new and renovated buildings
- Indoor air levels of many pollutants may be two to five times, and occasionally more than 100 times higher than outdoor levels
- W.H.O. reports that indoor air pollution causes 14 times more deaths than outdoor air pollution (2.8 million lives)
- Of hundreds of EPA-regulated chemicals, only ozone and sulfur dioxide are more prevalent outdoor than indoors
- 20 percent of all housing in the US has too much lead dust or chippings (causes kidney and red blood cell damage, impairs mental and physical development, may increase high blood pressure)

Source: David Johnston **www.greenbuilding.com**

Indoor Air Quality

EPA lists a few indoor air pollutants:

- combustion sources such as oil, gas, kerosene, coal, wood
- tobacco products
- building materials and furnishings such as asbestos-containing insulation, wet or damp carpet
- cabinetry or furniture made of certain pressed wood products
- household cleaning and maintenance, personal care, or hobbies products
- central heating and cooling systems and humidification devices
- outdoor sources such as radon, pesticides, and outdoor air pollution



Most people spend 90% of their time indoors. (USEPA & USCPSC, 1995)

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Improved Indoor Air Quality

You can promote:

- Low- or no-VOC paints
- Airing out house *if* using VOC-containing paints, varnishes or carpeting (fumes and toxins may linger long after the walls have dried)
- Low- or no-VOC carpets and pads
- Formaldehyde-free cabinets and flooring underlayment
- Proper ventilation (the same advances that seal the weather out can seal toxins in)

Source: Earth Advantage **www.earthadvantage.org**

CASE STUDIES

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King County Green Tools

www.greentools.us

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Custom Home Case Study

The Built Green Home at Suncadia

Suncadia Resort

This lodge-style resort home was built to the Five-Star or highest level of Built Green certification. It was a demonstration project for green building methods and technologies during its construction. Upon completion, the home was open to the general public for two months in the summer of 2005 where thousands of visitors learned about its sustainable features.

About the project

Project Background
The house was conceived as a green home demonstration project for Central Washington where there was not an established green home building program. Located on the eastern slope of the Cascade Mountains in Roslyn, WA, this home became the first Built Green-certified home in Kittitas County and achieved the highest rating of Five-Stars from the King County Built Green Program. Many of the contractors and suppliers operate out of adjacent King County Washington, and share eco-systems that transcend the boundaries between counties. The rating was verified by a third party as also achieving Energy Star and will operate at 68 to 78 percent greater energy efficiency than an average conventional home.

Pre-Design Steps Taken
A volunteer steering committee was formed that included representatives from all facets of the home building industry: the builder, developer, resort representatives, home builders associations members, Energy Star, Built Green, products and materials suppliers, consultants, the local energy provider. This team helped shape the project and its educational mission. Sponsorships were accepted as a means of defraying costs; all proceeds were donated to the non-profit Built Green rating program that certified the home.

Energy Saving Technologies
Insulated Concrete Forms: Stronger, quieter, thermal, nontoxic walls prevent mold growth and offgassing; energy efficient with minimal air infiltration; easy to install.

Sealed Crawl Space: Less heat loss in ducts and pipes; freeze protection; reduces contaminates, mold and allergens; ductwork, piping and systems are contained in clean, conditioned space.

Windows & Doors: Energy efficient, rated R3 to R4; provide sunlight reduction on west and south; made of pressure treated wood that is wind and rain resistant.

On-Demand Tankless Water Heater: Up to 50 percent more energy efficient than traditional gas and 70 percent more than electric; heats water as needed, shuts off automatically; 35 year life span; system is partnered with recirculating control for switch- or motion sensor-activation; runs one cycle then shuts off.

Ground Source GeoThermal Heat Pump: Heating, cooling without conventional electricity using renewable energy source; no outdoor condensing unit; up to 9060 percent reduction in energy cost.

Radiant Floor Heating: Even distribution of heat for comfort; quiet in operation.

Heating & Air Conditioning System: High velocity improves indoor air quality while fitting in tighter spaces; combine with ground source geothermal heat pump; condensing/combustion boilers are 90 percent efficient; improved dehumidification; sealed hard pipe duct work; fan uses one-fifth the energy use.

Heat Recovery Ventilator: Improved indoor air quality; continuous fresh air filtered from outside; recovers heat from exhaust air in winter and cools incoming air in summer; controls excess humidity.

Catalytic Air Purification: Electrostatic Merv11 filter removes allergens electrostatically; while ultraviolet light kills germs; "PhotoCatalytic Oxidation" eliminates odors & destroys toxic chemicals.

Foam Insulation: Prevents air infiltration; provides up to 50 percent energy savings vs. traditional insulation; insulated headers & corners (framing); breathable and water based; no offgassing and prevents mold growth; reduces HVAC equipment size requirements; provides superior pipe & sound insulation.

Energy Star Certified: Third party verified to be 60 percent more efficient with reduced electricity consumption; Energy Star-certified appliances; lower water and energy use; installed compact florescent light fixtures; lighting controls; timers or dimmers on incandescent fixtures; performance duct test and blower door tests to confirm operational objectives.

> "I believe that more people would embrace green building if they knew they couldn't it without sacrificing style or comfort; especially if it also means a healthier indoor environment."
>
> – Brenda Hunes, Project Owner/Developer

Resources
- Energy Star: www.energystar.gov
- Built Green: www.builtgreen.net
- Project Web site: www.thebuiltgreenhome.com
- King County's Green Building Program: www.metrokc.gov/dnrp/swd/greenbuilding

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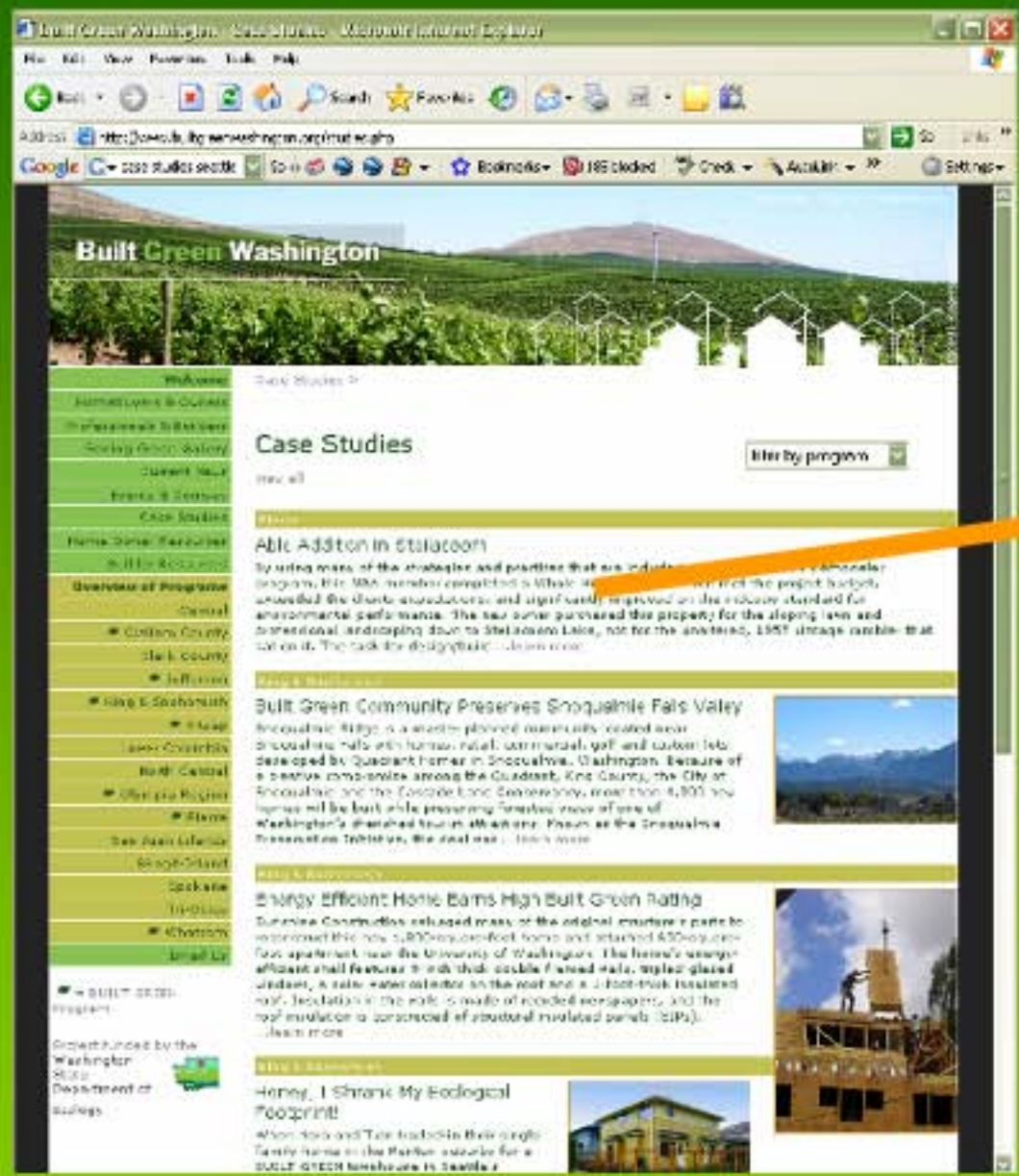
Built Green Washington



www.builtgreenwashington.org

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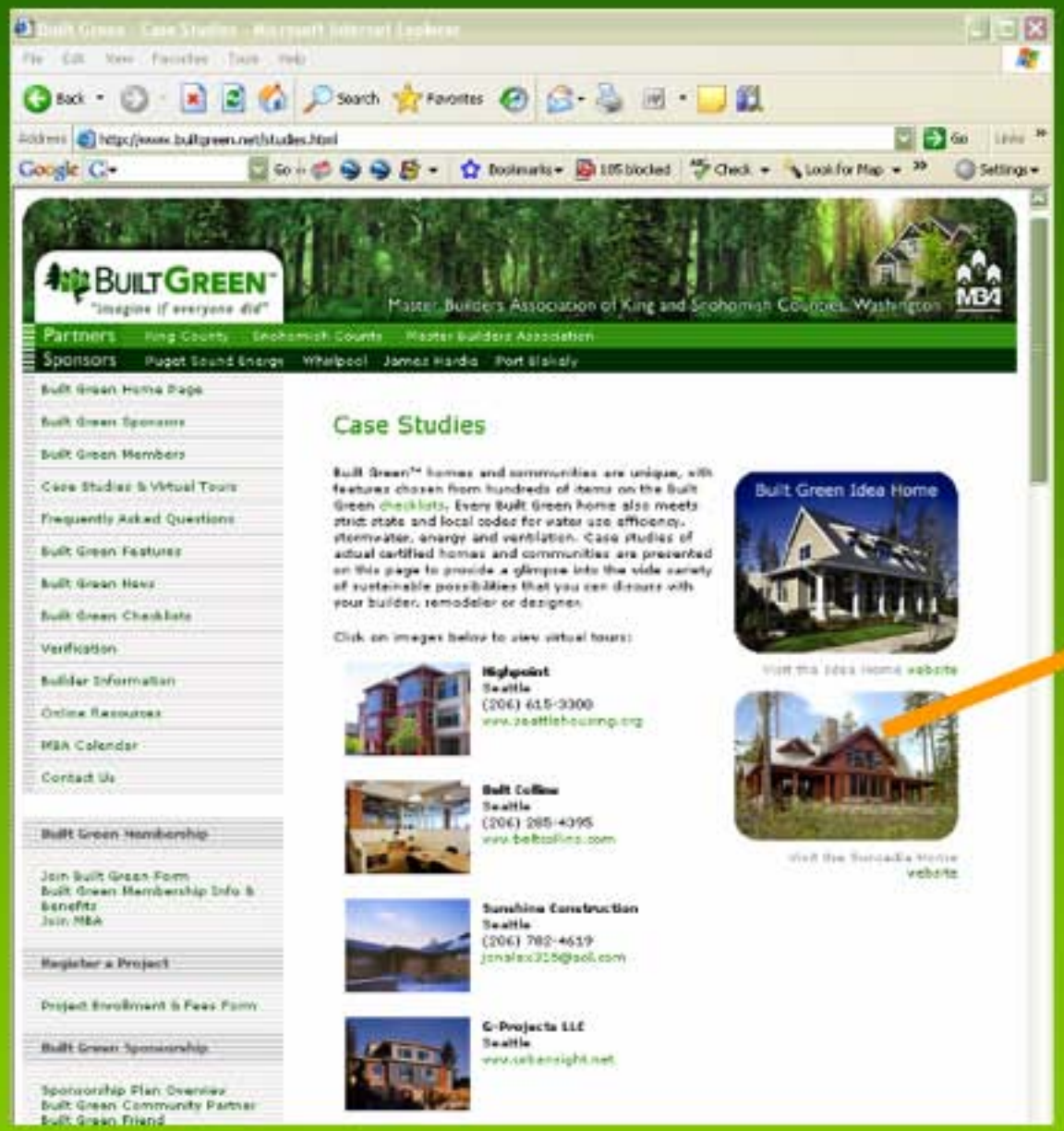
Built Green Website

www.builtgreen.net/newsletter.html



www.builtgreen.net

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Built Green News

www.builtgreen.net/newsletter.html

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Snohomish County

Residential Case Study

Cottage Werks - A Sustainable Residential Community

Site Water Materials IAQ Energy

Location: Tenth Street, Mukilteo, WA
Developer: Chris Chase, Cottage Werks
Completion Date: Work in Progress

"We can promote building that goes with the land. And we can build better and smarter."
Chris Chase, Developer

The Cottage Werks

community, located five minutes from State Route 525, has a bucolic quiet that developer Chris Chase aims to keep. The undeveloped property started as an urban wooded area near traditional housing developments at the end of Tenth Street. This medium-density development feels private and intimate and features a smaller than average foundation or footprint for each house, around 22 x 36 feet. At an average size of 2000 square feet, houses are built up rather than out to maximize space.

www.snoedc.org/ssc

Indoor Air Quality Features

Optimum air quality is maintained indoors by specifying maple wood floors throughout the living room, kitchen, and hallways, while short cut, 100% wool Berber carpeting is used in the bedrooms and the recreation room.

The two-car garage and basement are completely finished, insulated, and equipped with a polyvinyl alcohol (PVA) barrier for carbon monoxide reduction, maximizing the versatility of the space.

Addressing the Challenges to Preserving Natural Site Features

The Cottage Werks site presents two challenges: a need for superior stormwater drainage to protect Puget Sound from polluted runoff and a loss of trees during the December 2006 windstorm that Chris Chase planned to keep for drainage and ambience.

Stormwater management for the project includes new bio-swales and retention of a few tree stumps felled by the storm for soil stability. The remaining windfall was ground up and used to help condition the soil for greater stormwater absorption. To make stormwater drainage and mitigation as natural as possible, mature ferns and other native plants on the site were removed during construction and stored for later replanting. Though the need for a full-scale retention pond is minimized, a small retention pond has been created that blends subsurface drainage with natural landscaping. A berm built around the perimeter of the development site helps manage sediment runoff and supports native vegetation, including trees and vine maple, planted for rainwater drainage and privacy. Interlocking pavers, laid on a bed of pervious materials, make up the driveways, walkways and patios to achieve a high level of infiltration and drainage.

Chris Chase was counting on the now felled trees for drainage, shade, soil stability and privacy. Before the windstorm, the developments north and west of the site were not as visible as they are now. To restore privacy Chris Chase uses a combination of home placement and native vegetation, including new trees to replace those lost. Native trees planted include cedars, which like wet soil, Douglas fir and pine, and deciduous maples and birches to provide summer shade and winter light. The new trees are 20 feet or taller so that new homeowners are able to enjoy their benefits immediately.

"I love having the drought resistant plants and not having to water grass."
Cottage Werks Home Owner

Sustainable Development Task Force

Sustainable Development Task Force of Snohomish County

www.snoedc.org/ssc/

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Austin Energy

austinenergy.com

Energy Efficiency

Case Study: Benavides Residence

Z Works Design Build

Project Goals

In the summer of 2005, Willow and Cesar Benavides commissioned Z Works Design Build to design and build a 2,000 square foot home located in theUniversity Hills subdivision, near the old airport. With three generations living under the same roof, the owners wanted a 2 bedroom/2 bath home with a separate, self-sufficient and fully ADA accessible 1 bedroom/1 bath unit for an aging relative. A home office, with a separate entry, and a small study completed the space requirements for the couple. All these spaces are arranged around a central courtyard, which provides privacy for the apartment as well as the office and study.

The V-shaped courtyard design serves several purposes. It creates a large private outdoor living area, part of which is a covered porch. The courtyard is open on south side to catch the breeze and enhance cross ventilation in the house. The shape of the home and the clerestory windows allow every room to receive natural light from two directions.

Although durability and energy efficiency were the main goals for this project, and the highest priorities for the homeowners, they had no idea that their house would become the most highly rated green home in Austin. The home earned 239 points on the Green Building Program's Single-Family Rating 7.2.

Project Name/Location	Rating	Completion Date	Cost/ft² (excludes land)
Northwest Austin Infill Home Austin, Texas	★★★★★ 5-Star	May 2006	$140/sqft

Project Team	Company Name	
Architect	Z Works Design Build	(512) 584-4004 E-mail Web Site NBP Member Directory
Subcontractor	Meridian Energy Systems (Solar Energy System)	(512) 477-5000 E-mail Web Site GBP Member Directory
Subcontractor	PWPS Construction (ICF Wall system)	(512) 970-1300 E-mail Web Site

- 1st green building rating program in the U.S.

www.austinenergy.com

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Whole Building Design Guide

WBDG: Case Studies - Windows Internet Explorer

http://www.wbdg.org/references/casestudies.php

Home / About / Contact / Site Map / Search:

Design Guidance
Building Types
Space Types
Design Disciplines
Design Objectives
Products & Systems

Project Management
Delivery Teams
Planning & Development
Building Commissioning
Delivery & Controls

Operations & Maintenance

Mandates / References
Federal Mandates
Publications
Case Studies
Participating Agencies
Industry Organizations
Related Links

Tools

WBDG Services

productguide

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Case Studies

Submit Case Studies to WBDG!

The WBDG is seeking case study examples that demonstrate the Whole Building Design process. The template below has been developed to get at information specific to that process so that others may learn and implement these concepts into future projects:

Case Study Template (MS Word 48 KB)

To submit a project to WBDG, please insert text in all sections as requested. Maximum words counts have been provided. If information is not available or not applicable to the project, simply type N/A in the space. Send the completed template to the WBDG Site Manager with any additional information you feel would be pertinent. The site manager will review the template and forward it to the appropriate committee for consideration.

Center for Neighborhood Technology
Project Size: 13,800 ft²
Building Type: Institutional
Project Type: Renovation/Modernization

The Center for Neighborhood Technology purchased an abandoned light industrial building that dates back to the 1920s when it originally served as a textile factory. CNT planned the green renovation as a model template and educational program to demonstrate to industry specialists, building professionals, and the general public that green renovation can be achieved, economically, efficiently, and without compromising aesthetics. Rather than pursuing state-of-the-art techniques and materials (which are often costly), CNT chose to integrate "state-of-the-shelf" technologies to affordably reduce the building's energy costs and to demonstrate to the community that simple choices can have substantial energy savings.

EPA New England Regional Laboratory
Project Size: 72,000 ft²
Building Type: Single story laboratory and administrative office office and support space, with hazardous materials storage building and boat storage
Project Type: New construction

Home / About / Contact / Site Map / Search:

Case Study: Center for Neighborhood Technology

Case Studies Index > Center for Neighborhood Technology

Print Email

GENERAL INFORMATION

Building Name: Center for Neighborhood Technology

Building Location:
- **City:** Chicago
- **State:** Illinois
- **Country:** USA

Project Size (ft², m²): 13,800 square feet

Building Type(s): Institutional

Project Type: Renovation

Front entry of the CNT on North Avenue

Delivery Method: Building contractor working with Project Team consisting of LEED® Accredited Professional and Engineer, Architect, Center for Neighborhood Technology

Total Building Costs: $993,600 +/-
- **Cost/ft²:** $72 per square foot

Owner: Center for Neighborhood Technology

Building Architect/Project Team: Jonathan Boyer, AIA, Farr Associates Architecture and Urban Design

Project Contact Person: Elizabeth Lindau, Marketing Coordinator

DESCRIPTION

The Center for Neighborhood Technology (CNT) has a unique mission: to invent and implement new tools and methods that create livable urban communities for everyone. For more than 20 years, CNT has been working at the cutting edge of sustainable development, long before the term was coined. In cooperation with its partners, CNT invents programs and strategies that simultaneously achieve environmental goals and build strong communities. The CNT promotes livable, sustainable communities where the undervalued resources and inherent advantages of the urban environment, both built and natural, are captured to benefit everyone–individuals, communities and regions. Such programs include I-GO Car-Sharing, the Location Efficient Mortgage, and the Community Energy Cooperative.

Place, the built and natural environments that shape and sustain our lives, has always been an important idea for CNT for over 25 years, and it is in the context of urban places that CNT understands assets. Even the most outwardly

www.wbdg.org/references/casestudies.php

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Energy Star

- National recognition
- Promotion on website

CHANGE FOR THE BETTER WITH ENERGY STAR

Products that earn the ENERGY STAR® prevent greenhouse gas emissions by meeting strict energy efficiency guidelines set by the U.S. Environmental Protection Agency and the U.S. Department of Energy. www.energystar.gov

D.R. Horton Stays Ahead of the Competition with ENERGY STAR® – *An ENERGY STAR Advanced Lighting Project*

For D.R. Horton, entering the extremely competitive Sacramento, California market was challenging at first. But D.R. Horton quickly created a simple strategy for success: distinguish themselves from the competition by building the most energy efficient homes in the area. Rich Coyle, the division purchasing director, accomplished this by partnering with ENERGY STAR to include value-added features like the ENERGY STAR Advanced Lighting Package (ALP).

D.R. Horton was able to quickly attract interested home buyers to its newest development, Sierra Valley Oaks, by offering new home buyers an "environmentally friendly" package including the ENERGY STAR ALP. Rich comments that buyers "immediately recognize ENERGY STAR," and choose D.R. Horton homes for their ENERGY STAR features that lead to both energy savings and environmental protection. D.R. Horton

> "Using the Advanced Lighting Package is the right thing to do for our customers, the environment, and our business."
> —Rich Coyle, D.R. Horton Sacramento, CA Division

promotes the ENERGY STAR Advanced Lighting Package because of increased profitability, quick home sales, environmental protection, staying ahead of the competition, and high quality products.

The Bottom Line Advantage

For Rich, the ENERGY STAR Advanced Lighting Package, a standard feature in all homes built in the Sierra Valley Oaks development, has definitely had a positive effect on the sales of the Sierra Valley Oaks community. Within three weeks of opening the model homes, 100 percent of the phase one houses were sold. In the second month, all phase two homes also sold pre-construction. Additionally the ENERGY STAR qualified lighting was an easy sale. "We haven't had to 'sell' the ENERGY STAR lighting to customers, the lights sell

EPA

themselves! The fixtures are very attractive and the lighting quality is very good. Using the Advanced Lighting Package is the right thing to do for our customers, the environment, and our business. You can do the right thing and make a profit" remarks Rich Coyle.

Not only does D.R. Horton offer a 100 percent ENERGY STAR qualified fixtures as standard in every home, Rich is happy to report that they also offer three "luxury" ENERGY STAR qualified upgrade options. The standard package features polished brass fixtures, while the "luxury" upgrades offer fixture packages from the Serenity or Brandywine families, all manufactured by Sea Gull Lighting.

All Sierra Valley Oaks homebuyers visit D.R. Horton's design center to select their lighting fixtures. The new homeowners are so pleased with the ENERGY STAR qualified lighting that a majority have selected one of the higher-priced, "luxury" ENERGY STAR qualified lighting upgrade packages. For Rich Coyle, "selling these popular upgrades is a great profit opportunity."

According to Rich, the ENERGY STAR Advanced Lighting Package has been such a positive selling point for the Sierra Valley Oaks homes that they are currently in planning stages to "offer the ALP to buyers in a number of future Northern California developments."

> *Sierra Valley Oaks at a Glance:*
> Price Range: $400,000 to $500,000
> Description: 71 homes, 2190 to 3380 sq. ft.
> Standard Lighting: 100% ENERGY STAR Qualified fixtures standard in every home
> Lighting Upgrade: Three ENERGY STAR qualified "Luxury" lighting upgrade packages.

Northwest Energy Star: www.northwestenergystar.com

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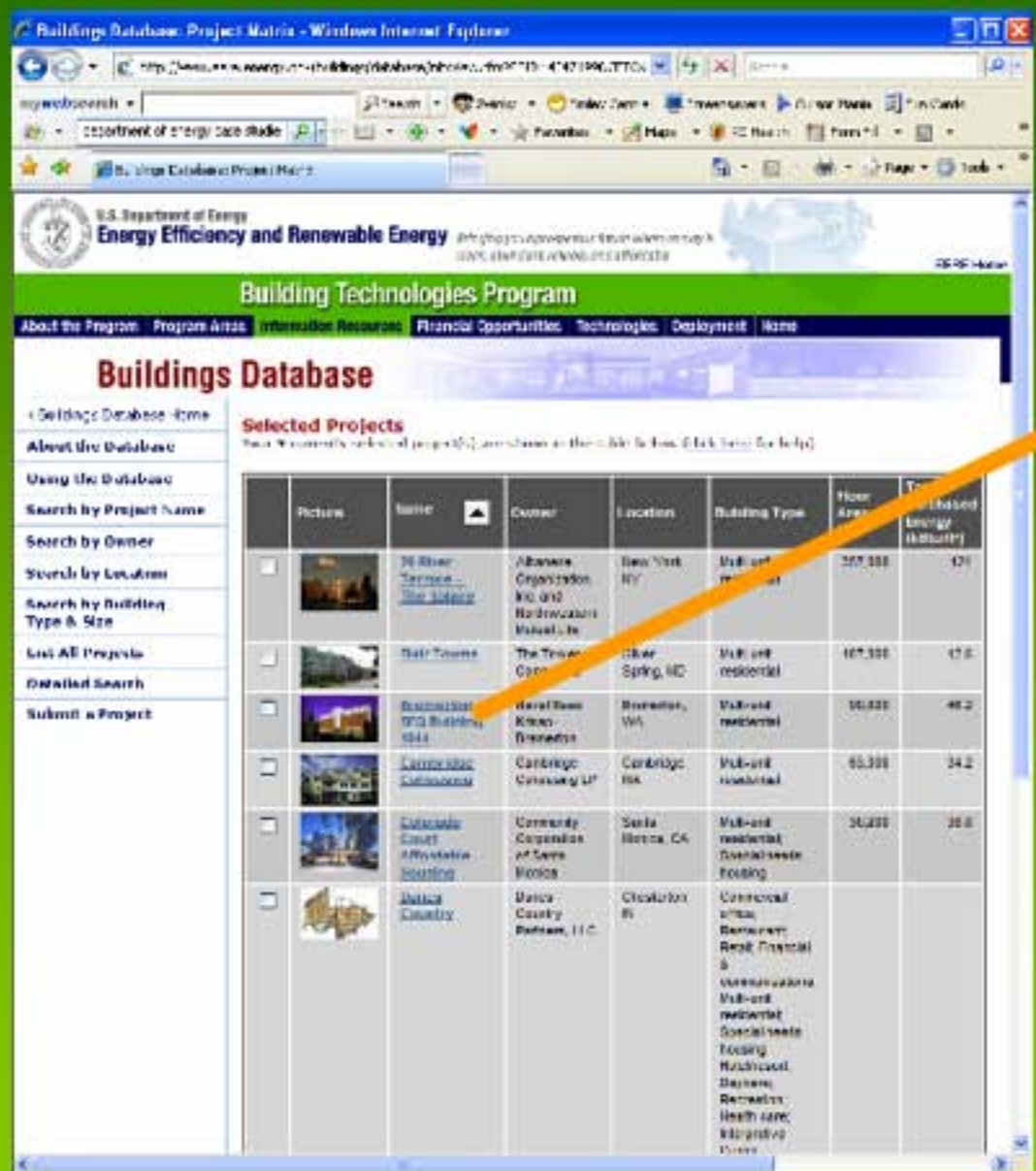
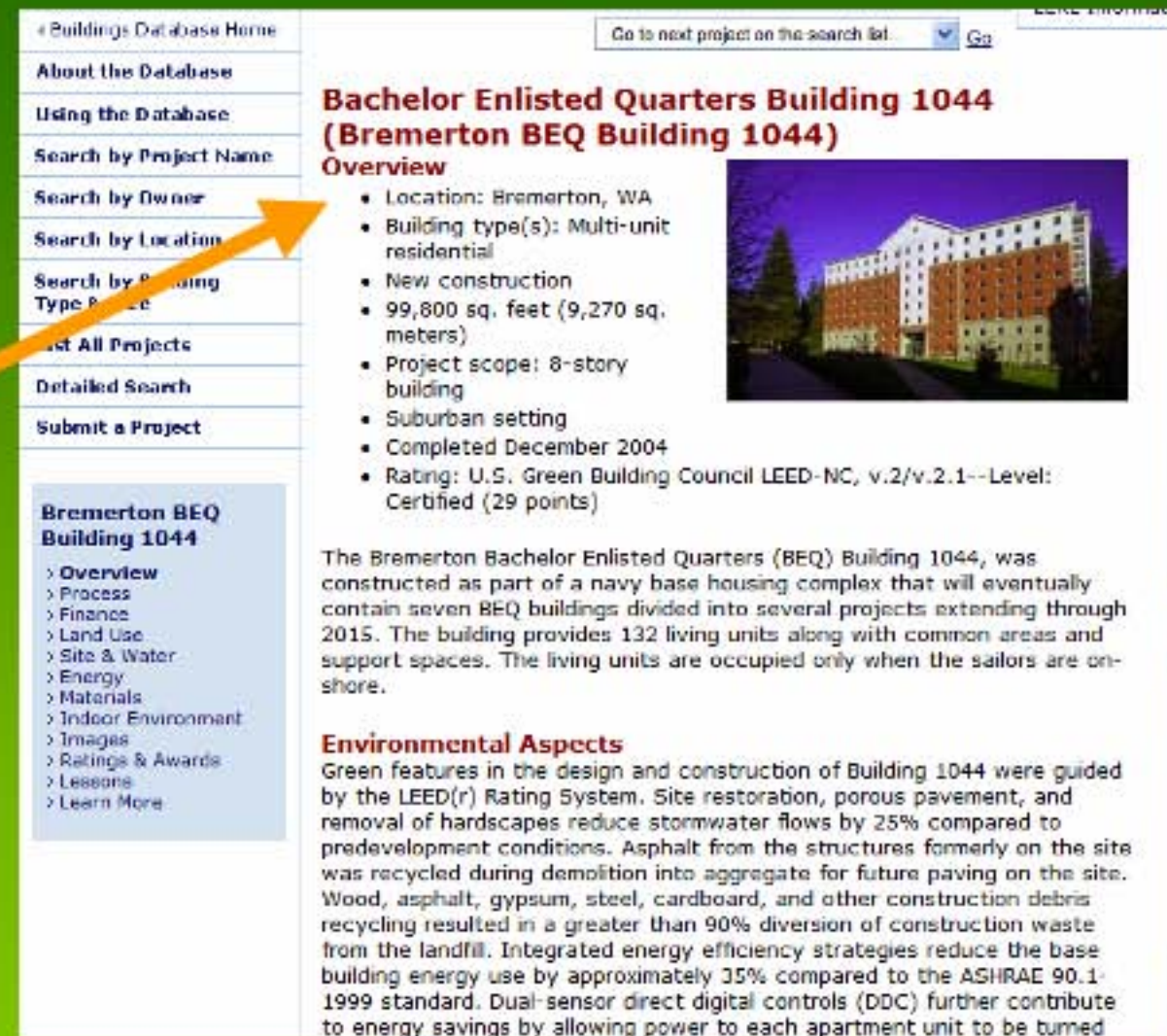
Department of Energy





www.eere.energy.gov/buildings/database/index.cfm

Funding Opportunities

Bank of America's $20 Billion Environmental Investment, funding:

- Commercial Real Estate
- Creation and implementation of environmentally sustainable products, services and technologies
- Mortgages to homebuyers for reduced interest rate or $1,000 back for each home-purchase mortgage meeting ENERGY STAR
- Environmental Home Equity Program that provides annual donation to environmental non-profit

http://www.pueblo.gsa.gov/cic_text/housing/energy_mort/energy-mortgage.htm

Create Yours

- Customized to your project

Case Study Template Adapted from
The Whole Building Design Guide
http://www.wbdg.org/index.php

CASE STUDY TEMPLATE INSTRUCTIONS: Case studies can help your company, homebuyers and the general public understand the sustainability and other features of your project(s). This template has been developed to help you organize relevant information specific to your building process so that you can submit it to a website, with certification applications, to apply for awards programs, or use in marketing and promotion of your company. It could be shared with others to help them learn how to implement these concepts into future projects. Text can be inserted as applicable to your projects. Approximate word counts have been provided. If information is not available or not applicable to the project, simply type N/A in the space. For case study examples, please see http://www.wbdg.org/references/casestudies.php.

GENERAL INFORMATION

Building Name:
Building Location: City State:
Project Size (ft^2, m^2):
Building Type(s):
Project Type:
Total Building Costs: Cost/ft^2
Owner:
Building Architect/Project Team:
Project Contact Person:

DESCRIPTION
1. Enter a short description of this project including the scope of buildings, history and completion date, site conditions/context, and community.
(~250 words)

2. Enter a description of the significant aspects of the project including a synopsis of project goals that address each of the following topics: accessibility, aesthetics, cost-effectiveness, functionality, historic preservation, safety, and sustainability.
(~500 words)

Overall Project Goal/Philosophy:

Safety Goal:

Sustainable Goals:

The Value of Great Images

- Marketing collateral
- Media/publications
- Awards submissions
- Website
- Displays

Cheri Westphal
Northwest Property Imaging

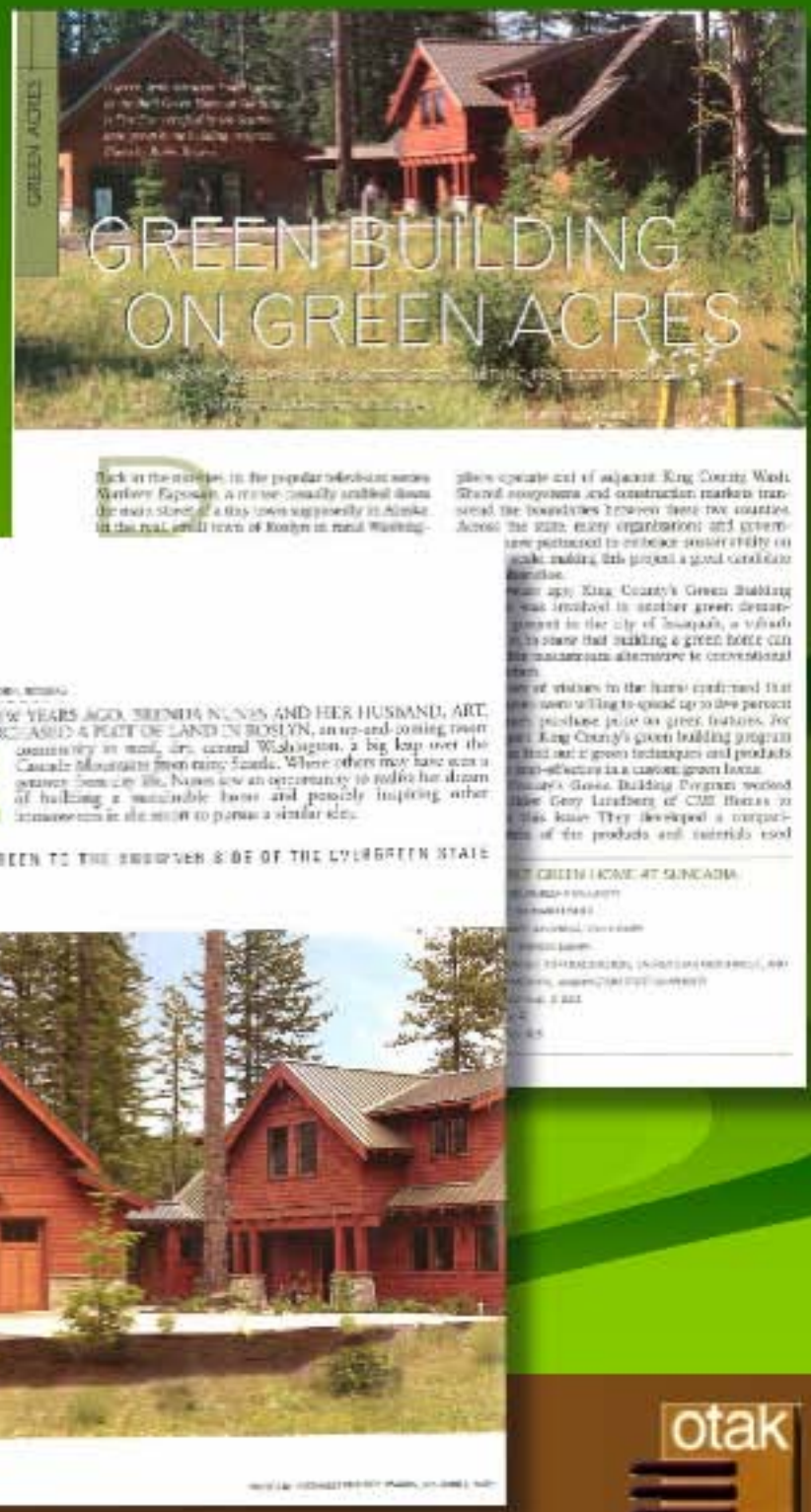
http://nwpimaging.com/

Wide Selection

Still Images

Click on an image to enlarge

Opportunities



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Comparisons

The Built Green Home at Suncadia
www.thebuiltgreenhome.com

COMPARISON
Green Custom versus Conventional Custom Home

The Built Green™ Home at Suncadia is a custom home that highlights the fiscal benefits, as well as the environmental and health benefits, of utilizing "green" materials and building techniques. The King County Solid Waste Division (Washington State) provides this comparison of the environmentally-friendly features of this home against comparable conventional materials to show estimated cost increases or decreases of these green products as well as their potential benefits.

BUILT GREEN
Built Green Program
www.builtgreen.net

King County
King County, WA, Green Building Program Website
http://www.metrokc.gov/dnrp/swd/greenbuilding/index.asp

PRODUCT or ITEM	COMPANY	WEBSITE	R = Recycled or Salvaged % L = Locally Produced I = Indoor Air Quality E = Energy Efficient C = Conserves Water D = Durable S = Sustainable Harvest A = Aesthetics	COST + Green = more - Green = less • No difference	LIFE-TIME SAVINGS	ENVIRONMENTAL ADVANTAGES OF GREEN PRODUCTS & BUILDER'S COMMENTS (BOLD)
EXTERIOR SITE						
Trees milled on-site	CMI Homes milled trees on-site for various uses	http://www.cmihomes.com/	100% R, L	N/A	N	Saves on transportation costs and associated air pollution. No pesticide impact from wood to water tables. **Excellent feel good factor. Historical reference to site. Size and quantity of logs will determine cost effectiveness. Mill needs to be close to site, or have a portable mill, to be cost effective. Should have eight weeks drying time for logs before use.**
Landscaping Timber	CMI Homes milled trees on-site	http://www.cmihomes.com/	100% R, L	N/A	N	Saves on transportation costs and associated air pollution. No pesticide impact from wood to water tables. **Excellent feel good factor. Historical reference to site. Size and quantity of logs will determine cost effectiveness. Mill needs to be close to site, or have a portable mill, to be cost effective. Should have eight weeks drying time for logs before use.**
Stone veneer retaining wall	Montana Rockworks	http://www.montanarockworks.com/	D	33% more than cultured stone, 40% less than full dimension stone.	Y	**Much lighter weight of this green product lowers the transportation costs. More sustainable than cultured stone alternative. True 90 degree corners look like natural stone. Non-green cultured stone's color will fade over time, and is not as long-lasting or as durable.**
Native plants			L, C	•	Y	Native plants will not require pesticides, fertilizers or irrigation. Will help to counter invasive species.
Drought tolerant landscaping			L, C	•	Y	No need for irrigation. Drought tolerant plants will save on water usage.
Topsoil retained	CMI Homes stockpiled topsoil for reuse	http://www.cmihomes.com/	L, E, C - Saves on use of water for irrigation	-	N	Transportation costs and associated air pollution associated with bringing in topsoil was eliminated. Also, soil export costs were eliminated and the native seeds in the soil will quickly bring back native seeds and plants.
Driveway pavers	Eco-Stone provided by Mutual Materials	http://www.mutualmaterials.com/default.asp	L, C, D	N/A	N	**Eliminates the need and cost for a drainage system. A truly pervious surface. Water retention capabilities of the land are retained. Water perks into the ground naturally. Also, this is an attractive paving alternative. Installs like traditional pavers but requires additional aggregate layer subgrade. Requires heavier aggregate between pavers. Requires some upkeep to keep fine material from filling up the voids in the aggregate. Costs are less than some, equal to some, and more than others.**

LOCAL EXAMPLES

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Site Signage

- Good neighbor
- Educate passersby
- Promote your green business
- Acknowledge your staff
- Inexpensive!

Self-Promotion

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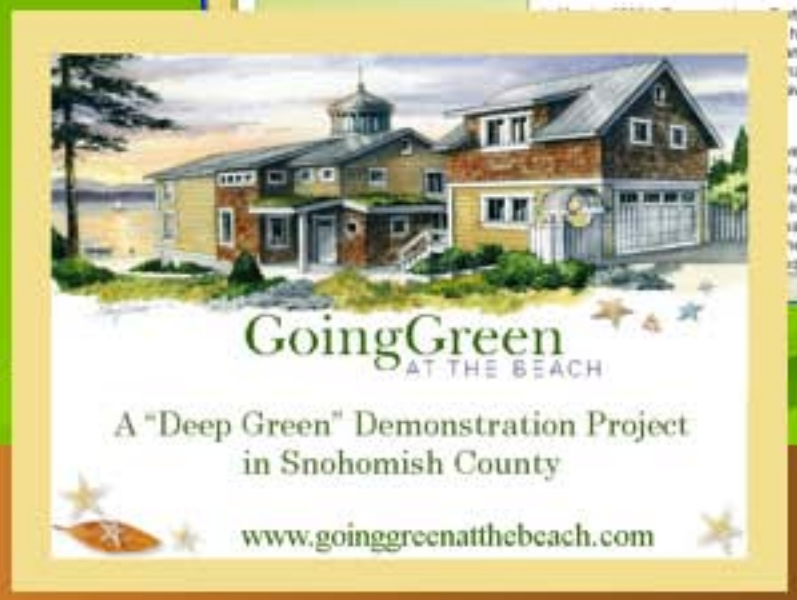
Suite of Materials

Website

Fact Sheets

Spokesdog

Slideshow



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Sponsorships

- Networking
- Cooperative advertising
- Collaborative design and building
- Share the costs
- Exposure

www.thebuiltgreenhome.com

www.goinggreenatthebeach.com

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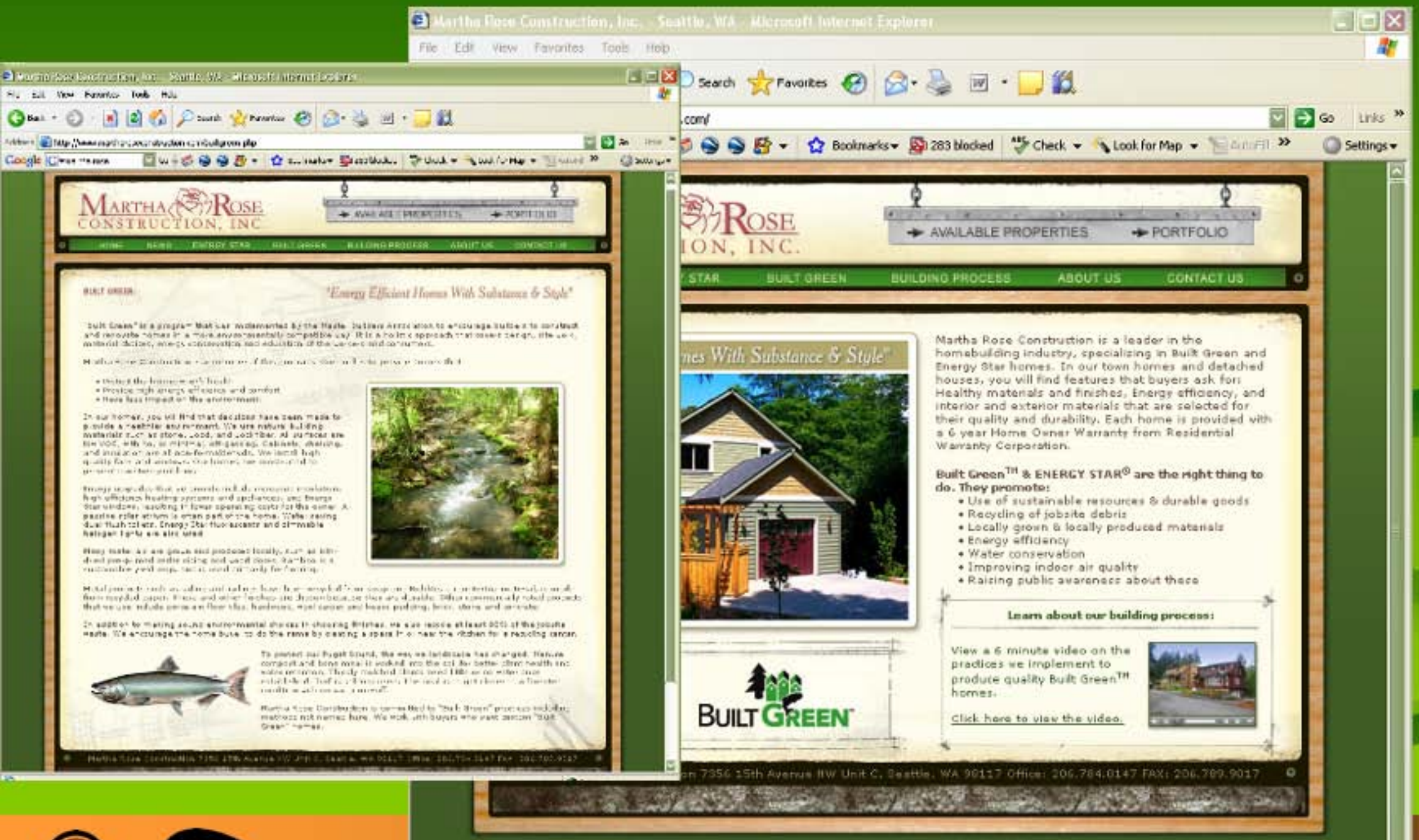
Martha Rose Construction



www.martharoseconstruction.com

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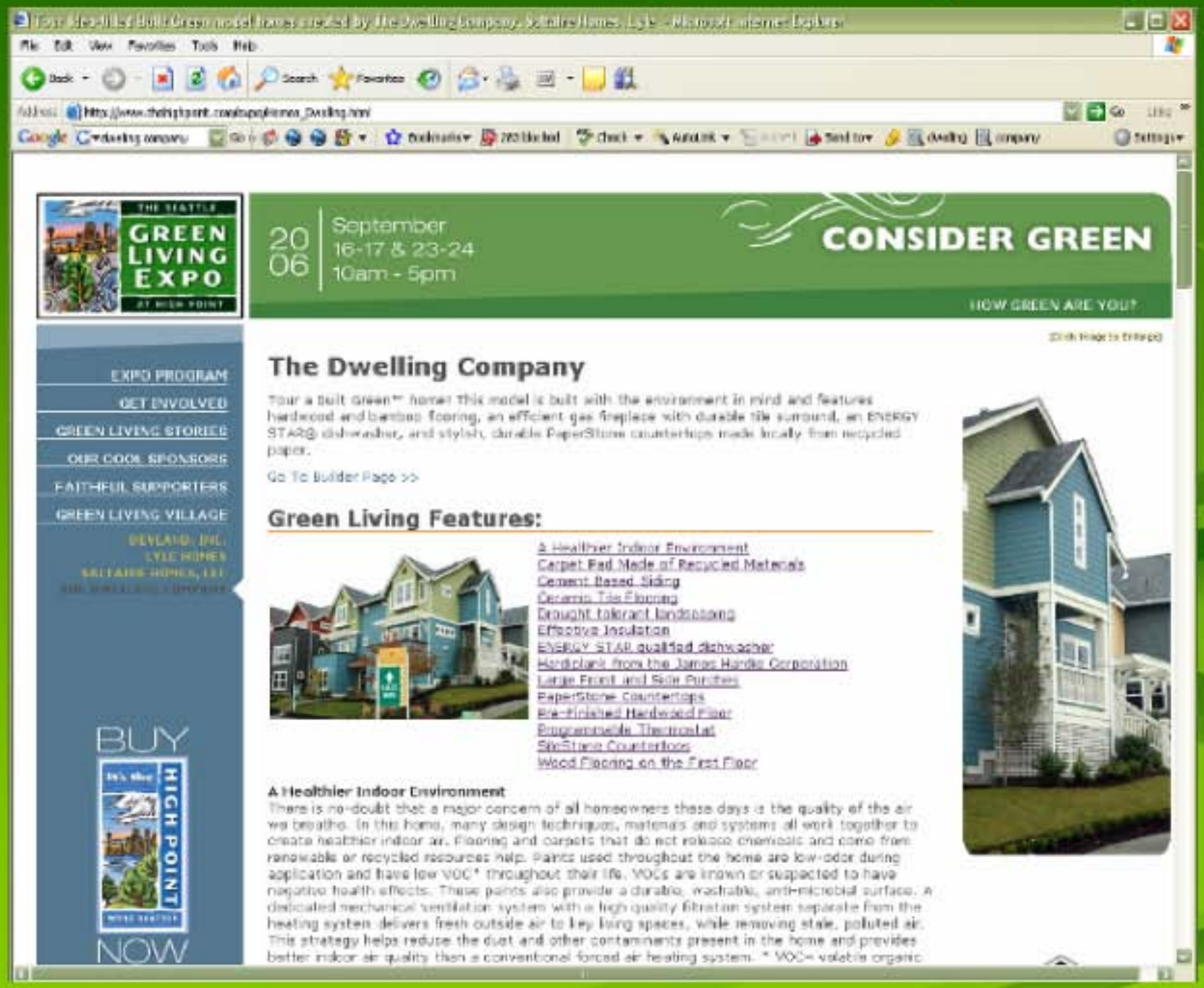
The Dwelling Company



www.thedwellingcompany.com

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Bennett Homes

www.bennetthomes.com

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Apply for Awards

2007 NAHB GREEN BUILDING AWARDS

www.nahb.org

2008 EVHA

EnergyValue Housing Award℠

Honoring builders who voluntarily incorporate energy efficiency in the design, construction, & marketing of new homes

www.nahbrc.org/evha/

SBIC

SUSTAINABLE BUILDINGS INDUSTRY COUNCIL

www.sbicouncil.org/prog_bpawards.htm

BUILT GREEN™

"imagine if everyone did"

www.builtgreen.net

AIA

Show You're Green

Affordable Green Housing Awards

www.aia.org/br_cfe_greenhousing07/

Maximize Your BMPs

5-Star Level Requirements (350 points minimum)

- Meet 4-Star requirements plus 100 additional points.

Site and Water requirements

- Amend disturbed soil to a depth of 8 to 10 inches to restore soil environmental functions (See action item 2-13).
- Use pervious materials for at least one-third of total area for driveways, walkways, and patios (See action item 2-18)

Energy Efficiency requirements

- Minimum R-26 for overall wall insulation.
- Maximum average U-value for all windows of .30.
- Advanced framing with double top plates (See action Item 3-14).
- Pre-wire for future PV
- 75% minimum *Energy Star* light fixtures.
- Alternate: In Lieu of above energy requirements demonstrate home energy performance 30% beyond code per action item 3-1.

Health and Indoor Air Quality requirements

- Detached or no garage OR garage air sealed from house with automatic exhaust fan (See action item 4-17).
- Use plywood and composites of exterior grade or formaldehyde free (for interior use) (See action item 4-20)

Materials Efficiency requirements

- Achieve a minimum recycling rate of 70% of waste by weight.
- Use a minimum of 10 materials with recycled content.

Promote Environmentally Friendly Homeowner O&M requirements

- Limit use of turf grass to 25% of landscaped area (See action item 6-5).

Section One: Build to Green Codes/Regulations

- ☐ (★) 1-1. Meet Washington State Wtr Use Effcy Stds
- ☐ (★) 1-2. Meet Stormwater/Site Development Stds
- ☐ (★) 1-3. Meet Washington State Energy Code
- ☐ (★) 1-4. Meet Washington State Ventilation/IAQ Code

- ☐ (4) 2-13. Amend disturbed soil to a depth of 8 to 10 inches to restore soil environmental functions
- ☐ (3) 2-14. Replant or donate removed vegetation for immediate reuse
- ☐ (3) 2-15. Grind landclearing wood and stumps for reuse
- ☐ (5) 2-16. Use a water management system that allows

healthier soil

cool, pervious pavement

lower energy costs

reduce fossil fuel use

healthier indoor air

less waste

green materials

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Review of Components

- Use case studies as a marketing strategy
- Review other case studies and borrow ideas
- Green your business and educate all staff
- Create your own template for case studies that feature your BMPs
- Use the Built Green checklists as framework
- Incorporate green into website, realtor postings, marketing collateral, events, model homes
- Include buyer stories
- New MLS listings include GREEN CERTIFICATIONS
  - Include in your listings
  - Make sure your realtors understand and can sell it

Resources

- Electronic files (give us your business card and we'll email files to you)
- www.greentools.com

patti.southard@metrokc.gov
King County
King Street Center
South Jackson
206.296.8480

robin.rogers@otak.com
Otak, Inc.
University and Third
Downtown Seattle
206.442.1361

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Questions?

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Panel of Experts

- Martha Rose
  - Martha Rose Construction
- Michael McFadden
  - Stuart Silk Architects
- Cheri Westphal
  - Northwest Property Imaging
- Pam Worner
  - Green Dog Enterprises