Green Construction

2014

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… definitions

California Department of Resources Recycling and Recovery:

> A green building (sustainable building) is a structure that is designed, built, renovated, operated or reused in an ecological and resource-efficient manner. Green buildings are designed to meet certain objectives such as protecting occupant health; improving employee productivity; using energy, water and other resources more efficiently; or reducing the overall impact to the environment.

Environmental Protection Agency:

> The practice of maximizing the efficiency with which buildings and their sites use resources- energy, water and materials – while minimizing building impacts on human health and the environment, throughout the complete building life cycle – from siting, design, and construction operation, renovation and reuse.

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A little history

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What is Green Construction?

Sustainable materials

Low carbon emissions from building and manufacture of materials

Low pollution from demolition

Compatible with surrounding environment

No bigger or smaller than is needed

Occupant comfort using micro-climates

Location – Transit, occupants, etc.

And more…

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What is **Green** Construction?

Codes exist but not always adopted.

Emerging business

What percent of building constitutes green?

What materials and who decides which is betters?

ICC INTERNATIONAL CODE COUNCIL®

People Helping People Build a Safer World™

IgCC

SAFE & SUSTAINABLE BY THE BOOK

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LEED Certification

U.S. Green Building Council – driving the green movement within all levels of local and national government

LEED Certified (Leadership in Energy and Environmental Design) – program run to provide a universal framework for implementing green building design and construction.

Sustainable sites
Water efficiency
Energy and atmosphere
Material and Resources
Indoor environmental quality
Innovation

The sum of the scores in each category puts you into a class ….. Certified to Platinum.

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LEED


PLATINUM
U.S. GREEN BUILDING COUNCIL
LEED™
ADERSHIP IN ENERGY AND ENVIRONMENTAL DESIGN
VERSION 1.0, 2003

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More than plants on the roof.

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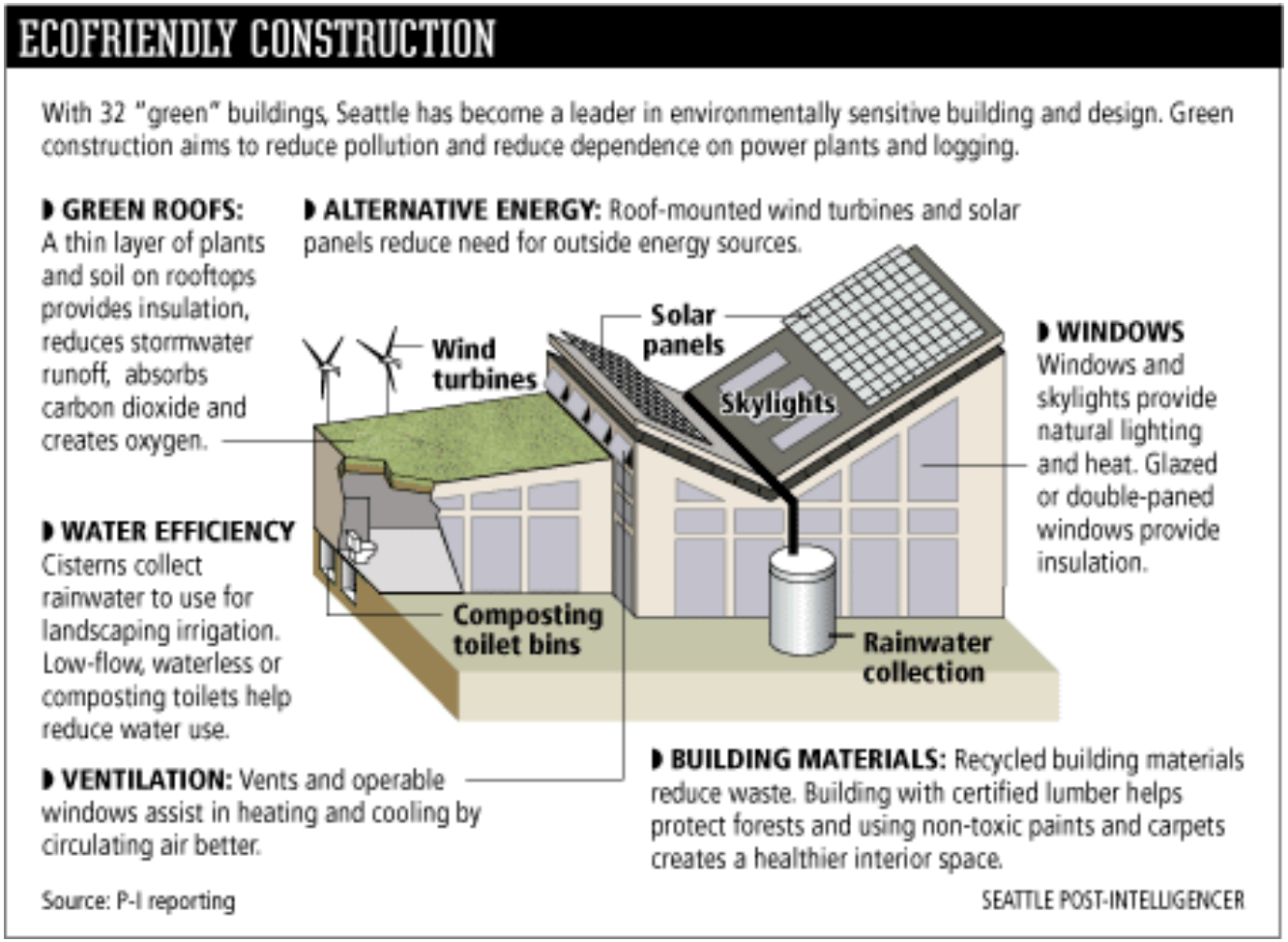
Green attributes make up a **Green** Building



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Green Construction is here to stay

Higher rent and occupancy rates

By 2015 – over 40% of new non-residential construction (by value) will be environmentally friendly

2012 - ICC Green Construction Code

Energy Codes

Waste Water Runoff

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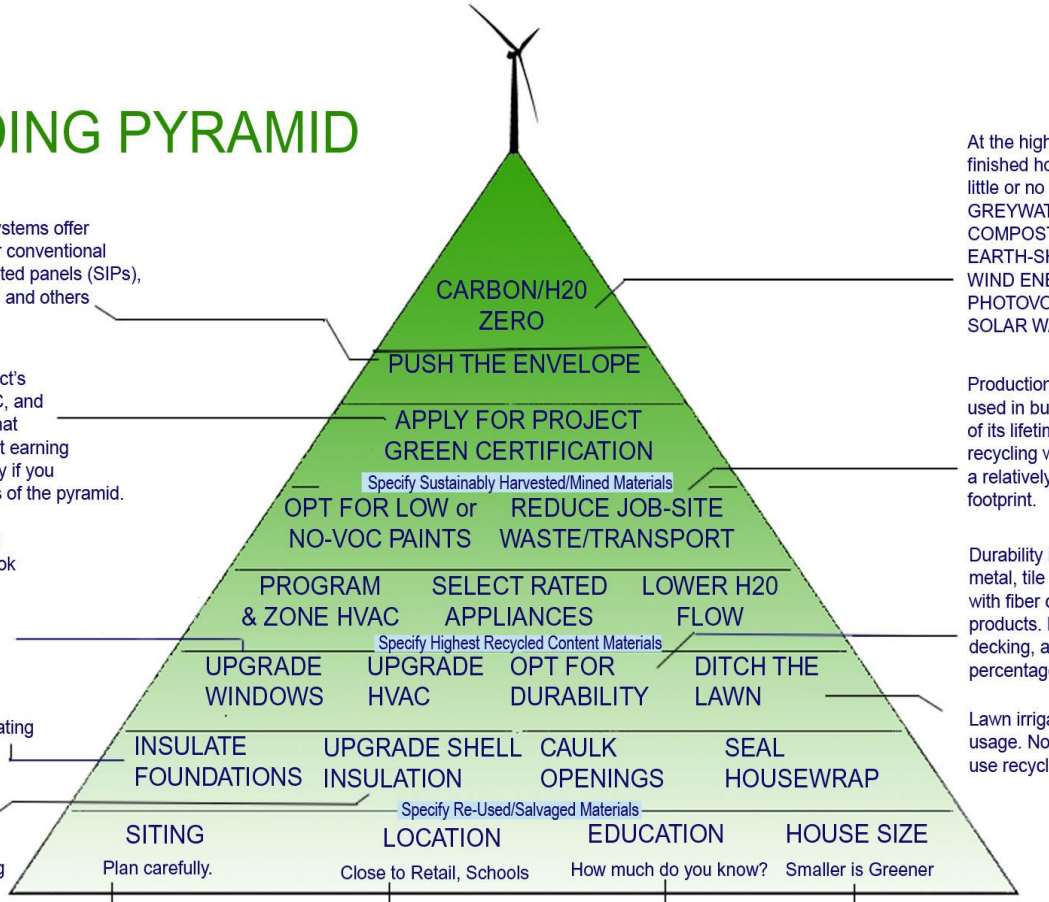
GREEN BUILDER MAGAZINE's

GREEN BUILDING PYRAMID



Several time-tested alternative structural systems offer higher R-values and other advantages over conventional stick framing. They include structural insulated panels (SIPs), InsulatingConcrete Forms (ICFs), Polysteel and others Don't rule out factory-made panelization.

Various organizations will "certify" your project's green features, including the NAHB, USGBC, and Environments for Living. Some may argue that cerfication belongs lower on the pyramid, but earning that green stamp of approval will come easily if you have given attention to the bottom two-thirds of the pyramid.

At a bare minimum, windows in a new home should include insulated Low-E glazings. Look for long-lasting clad wood windows or composites and install them tightly with artight sealing around the perimeter.

Uninsulated concrete foundations can reduce HVAC efficiency by 30% to 50%. Specify exterior rigid form insulation or Insulating Concrete Forms (ICFs) for best results. Consider also frost-protected shallow foundations and slab on grade construction.

For stick-framed walls and ceilings, we recommend blown-in insulation or expanding foam (rather than insulating batts,) to reduce potential installation gaps. The age of 2"x4" framing is over, incidentally. Specify 2"x6" 24" OC walls and look into optimal value engineering.

Well designed site plans take advantage of free solar energy and minimize damage to local ecosystems.

Automobile dependency is not a green asset.

If you can't explain green principles to clients, you're already behind the curve. Consider a cram course at Green Builder College (www.greenbuildercollege.com), or hit the books on your own.

Doubling a home's size triples its annual energy use for the life of the home.

At the highest level of green building, the finished home recycles water, and uses little or no energy. It may include:
GREYWATER SYSTEMS
COMPOSTING TOILETS
EARTH-SHELTERED ROOFS
WIND ENERGY
PHOTOVOLTAICS
SOLAR WALLS (PASSIVE HEATING)

Production and transportation of materials used in building a home account for only 6% of its lifetime energy use. Reducing and recycling waste on the job is important, but a relatively small player in a home's ecological footprint.

Durability is an often overlooked green asset. Specify metal, tile or extended life (recyclable) asphalt roofing. Side with fiber cement, cedar, brick veneer, or other long-lived products. Build outdoor structures using improved composite decking, aluminum handrails. Avoid products containing high percentage of virgin polyvinyl chloride (PVC).

Lawn irrigation accounts for almost half of all residential water usage. No lawns are good lawns. Specify xeriscaping and use recycled water when possible for landscape watering.

GREATER LESSER

KEY: Difficulty/Knowledge required for implementation. Note that some of the easiest changes have greatest green impact over the life of the home.

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Recycled denim

Lightweight construction

Solar Panels

Automatic fire sprinkler system

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Building Envelope and Features

Recycled cotton-based denim material in concealed spaces

- fire spread vertically and horizontally in the walls
- had a “Class A” fire rating

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Recycled Denim Insulation

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Exterior Foam Insulation Material

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Vegetative Roof Systems

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Does Earth movement excl. apply??

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Atrium for natural light

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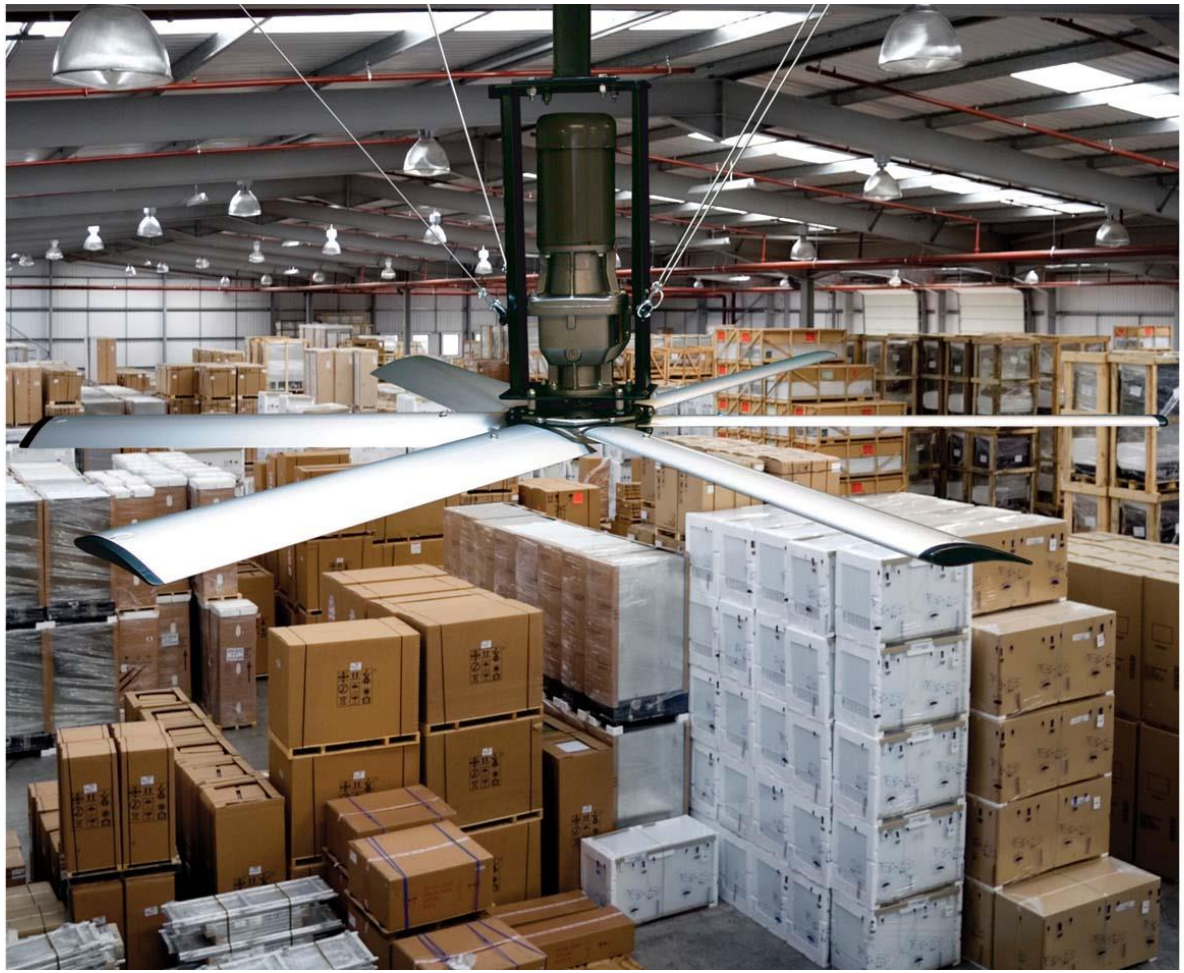
High Volume Low Speed Fan



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BuildingWithAwareness.com

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Lightweight wood trusses - gusset plates

Faster loss of structural integrity

TJI's

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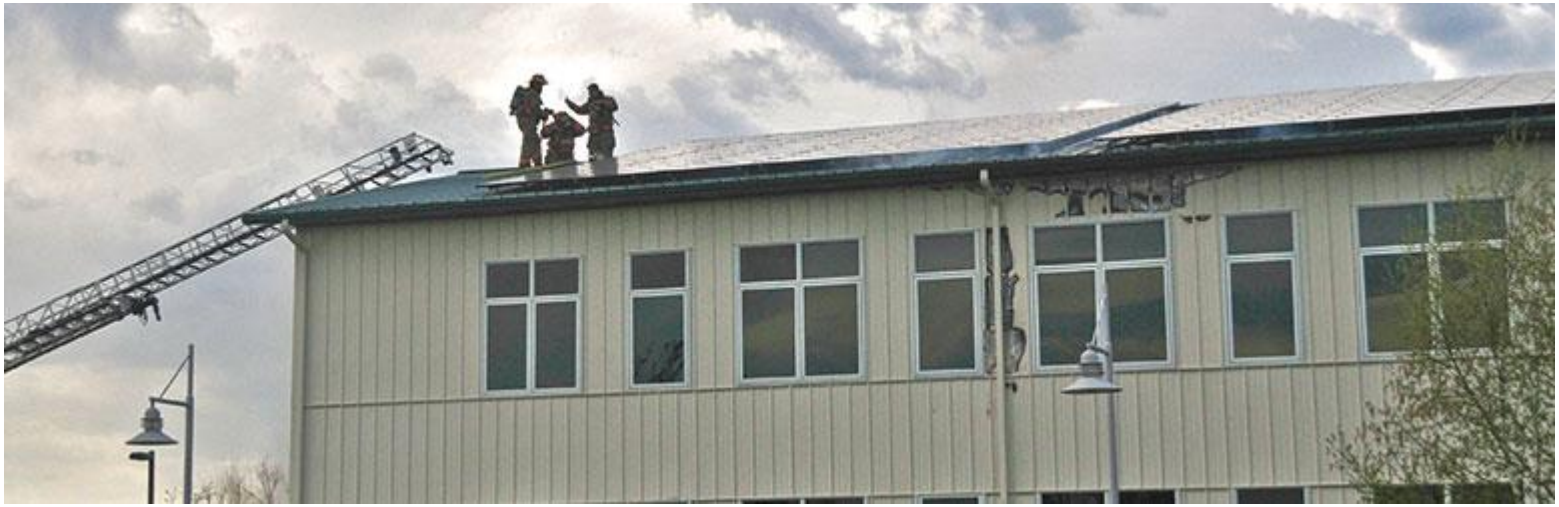
Alternative Power Sources

Photovoltaic panels

- couldn’t vent through the roof
- metal roof was energized (50 volts of direct current)



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Wind Turbines

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Hydrogen Fuel Cells

Battery storage systems

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Site Location

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Urban Village

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Permeable surfaces

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Automatic Fire Sprinklers

The Automatic fire sprinkler system broke when roof collapsed – taking water from the hydrants.

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Insurance Issues

Firefighting obstacles

Additional costs of Construction

Recertification when rebuilt

Water Intrusion

Vegetated features and porous paving

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Roundtable – What are your concerns?

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