

# Green Buildings and LEED Certification

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# What Makes a Building Green?

- A green building, also known as a sustainable building, is a structure that is designed, built, renovated, operated, or reused in an ecological and resource-efficient manner.

# LEED Certification

The Leadership in Energy and Environmental Design (LEED) is an internationally recognized green building certification system, providing third-party verification that a building or community was designed and built using strategies aimed at improving performance across all the metrics that matter most:

- energy savings,
- water efficiency,
- CO<sub>2</sub> emissions reduction,
- improved indoor environmental quality,
- and stewardship of resources and sensitivity to their impacts.



# Areas of Measurements



**Innovation in  
Design**



**Locations &  
Linkages**



**Sustainable Sites**



**Water Efficiency**



**Energy &  
Atmosphere**



**Materials &  
Resources**



**Indoor  
Environmental  
Quality**



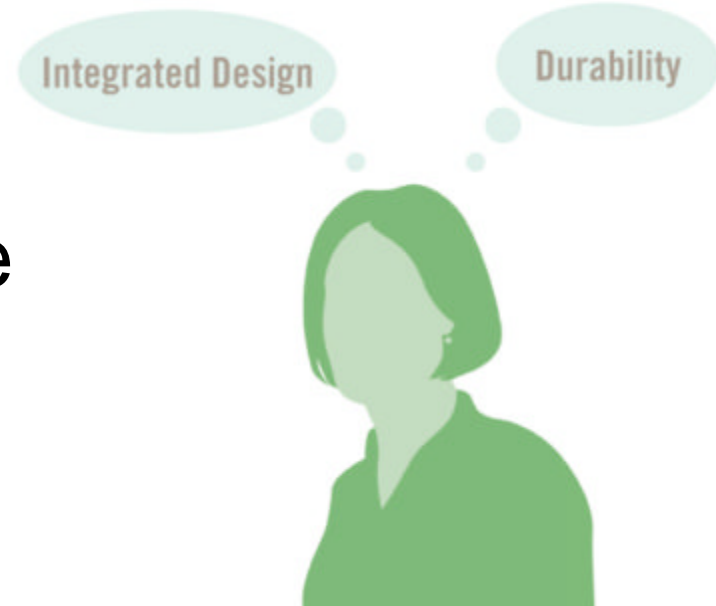
**Awareness &**



# Innovation and Design Process (ID)



- Maximize opportunities for integrated, cost-effective adaptation of green design and construction strategies
  - Select Target Level **Innovation & Design (ID)**
  - Select Team
- Promote durability and high performance
  - Water
  - Heat
  - Pests



## Location and Linkages (LL)

- Encourage LEED buildings in LEED neighborhoods
- Avoid development on environmentally sensitive sites:
  - Flood areas
  - Wetlands
- Encourage building in or near existing communities and infrastructure
  - Water & Electricity
  - Parks, libraries, stores, etc.

# Sustainable Sites (SS)

- Minimize long term environmental effects from construction
- Design landscaping that minimize demand for water and chemicals, and that reduce heating effects.
  - Shade trees and shrubs
- Minimize erosion from runoff

# Sustainable Sites (SS)

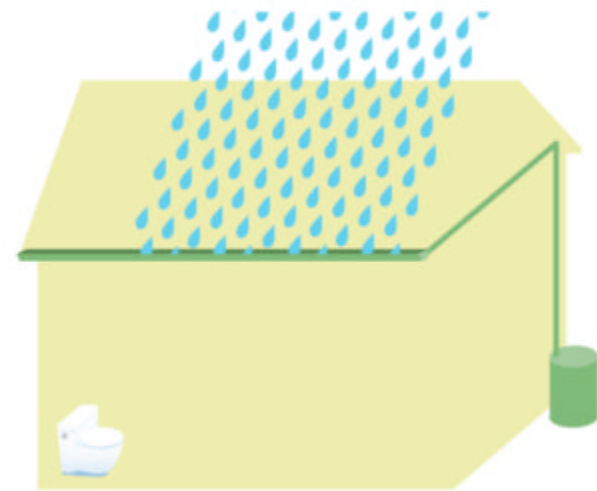
- Design features that eliminates chemical pest control
  - Seal cracks and joints
  - Keep wood 8-12 off of the ground
  - Termite bait system



# 💧 Water Efficiency (WE) 💧

- Offset water supply issues with collecting rainwater and recycling grey water
- Design water efficient irrigation
- Minimize interior water use buy utilizing efficient fixtures:
  - Low-flow shower heads

Water Efficiency (WE)



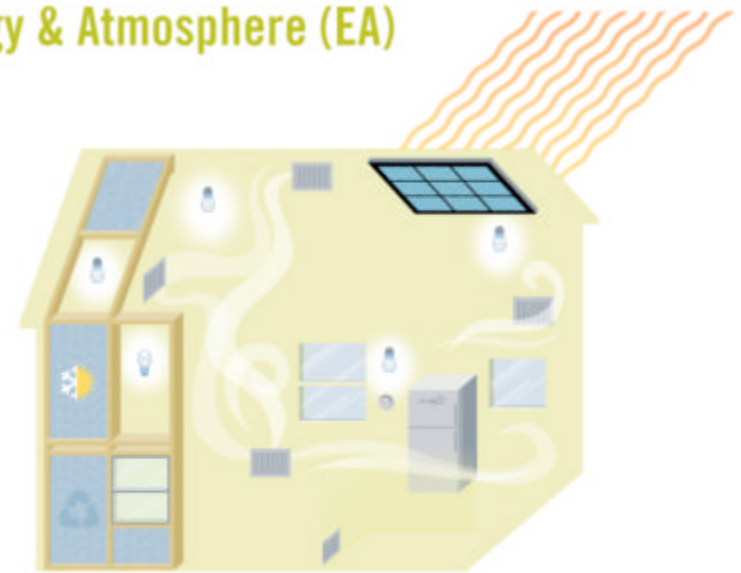
# ☀️ Energy and Atmosphere (EA) ☀️

- Improve overall energy performance

$$\text{LEED Pts.} = \{[\text{Log} (100 - \text{HERS Index})] / 0.021\} - 60.8$$

- Install Insulation
- Minimize uncontrolled air leakage
- Use energy efficient windows

Energy & Atmosphere (EA)



# Energy and Atmosphere (EA)

- Minimize energy consumption in:
  - Heating and cooling systems
  - Water heating
  - Lighting
  - Appliances

# Materials and Resources (MR)

- Optimize framing materials
- Increase the use of environmentally friendly materials or processed in region
  - Example: wood and stone from Indiana
- Reduce Waste generation during construction
  - RECYCLE/REDUCE/REUSE



# Indoor Environment Quality (IEQ)



- Improve overall air quality
- Minimize leakage of combustion gases
  - Fire places and wood stoves
- Minimize air moisture
  - Dehumidifiers
- Appropriate distribution of heating and cooling
- Optimize air filtration
- Garage pollutants

Indoor Environmental Quality (EQ)



# Awareness and Education (AE)

- Maintain optimal home performance by educating residents
  - Operation manual
  - Proper knowledge of systems

Awareness & Education (AE)



# Point System

LEED Certification Levels	Points Needed
Certified	45 – 59
Silver	60 – 74
Gold	75 – 89
Platinum	90 – 128
Total Possible	129

# Examples

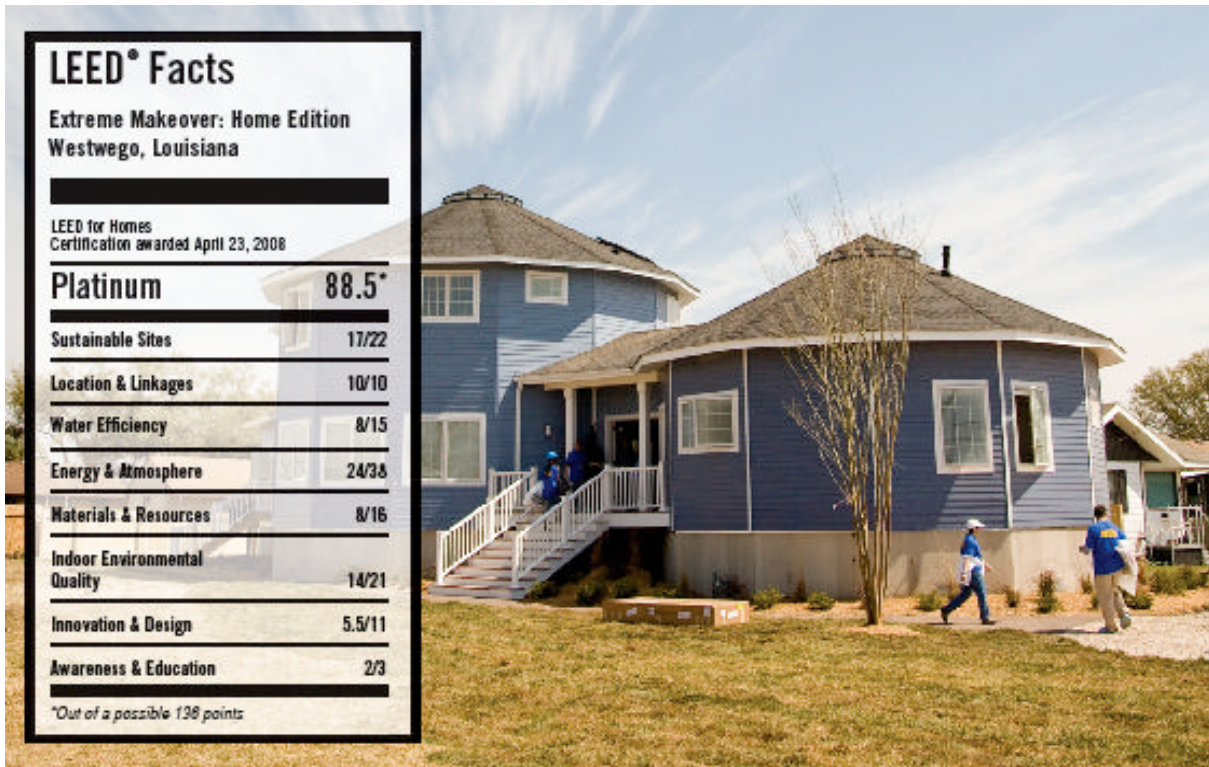
**Extreme Makeover: Home Edition Westwego, Louisiana**

**37% improved energy efficiency over International Energy Conservation Code, according to HERS rating**

**52% builder's projected water use reduction, compared to a conventional home**

**78% waste reduction in prefabricated structural shell**

**85% permeable lot**



**LEED® Facts**  
Extreme Makeover: Home Edition  
Westwego, Louisiana

LEED for Homes  
Certification awarded April 23, 2008

<b>Platinum</b>	<b>88.5*</b>
Sustainable Sites	17/22
Location & Linkages	10/10
Water Efficiency	8/15
Energy & Atmosphere	24/38
Materials & Resources	8/16
Indoor Environmental Quality	14/21
Innovation & Design	5.5/11
Awareness & Education	2/3

\*Out of a possible 138 points

The image shows a blue two-story house with a white porch and stairs. Two people are walking on the lawn in front of the house. The LEED Facts sign is overlaid on the left side of the image.



# Examples

## Clark University Lasry Center for Bioscience Worcester, Massachusetts

- 34% less energy use
- 31% less water use
- 92% of construction waste diverted from the landfill





Making the  
World a  
Greener Place

[www.usgbc.org](http://www.usgbc.org)

Questions????