Intro to Green Building, USGBC & the LEED™ Rating System

with the USGBC-CF’s

Kyle Abney – Hoar Construction, LLC
Agenda

Defining a Green Building

Benefits of Green Building

Costs of Green Building

The USGBC

LEED™
Kyle Abney

HOAR
CONSTRUCTION

**Education**

- Bachelor of Design, University of Florida
- Master of Building Construction, Concentration in Sustainable Construction, University of Florida

**Affiliations**

- U.S. Green Building Council – National: Chapter Regionalization Task Force
- U.S. Green Building Council – Central Florida: Board Member & Current Treasurer
- U.S. Green Building – University of Florida Student Chapter: Founding President
Environmental Impact of Buildings*

- 65.2% of total U.S. electricity consumption
- > 36% of total U.S. primary energy use
- 30% of total U.S. greenhouse gas emissions
- 136 million tons of construction and demolition waste in the U.S. (approx. 2.8 lbs/person/day)
- 12% of potable water in the U.S.
- 40% (3 billion tons annually) of raw materials use globally

* Commercial and residential
A **Green** Building is a:

- High Performance Building
- Energy & Water Efficient
- Longer Life Cycle
- Healthy Building
- Lower VOCs; Cleaner Air
- Responsible Building
- Environmentally & Socially
Which one is the Green building?

ALL OF THEM ARE GREEN!
Benefits of Green Building

Economic Benefits

- Energy savings
- Water savings
- Daylighting – increase sales 40%
- Improve productivity, reduce absenteeism and turnover (savings here have been shown to exceed the entire energy bill)

Community Benefits

- Reduce strain on infrastructure (if we can be more water efficient – can we avoid millions of dollars for a new treatment plant?)
Benefits of *Green* Building

*Environmental Benefits - Reduce the Impacts of Natural Resource Consumption*

- Fossil Fuels
- Aquifers
- Landfills

*Health and Safety Benefits - Indoor Environmental Quality*

- Daylighting – increase test scores
- Occupant Comfort
- Ventilation Effectiveness
- Non-toxic building materials
Costs of Green Building

"Costing Green: A Comprehensive Cost Database and Budgeting Methodology"

- Less than 2% additional costs for LEED™ silver in a similar climate (Houston)

**Eugene M. & Christine Lynn Business Center at Stetson University**

- Florida’s first LEED™ certified building
- $9 million construction cost with $110,000 due to LEED™, results in a 1.2% cost increase
- Energy savings resulted in a 5 to 8 year payback!
Costs of Green Building


- Studied 33 green buildings in California
- On average, less than 2% additional costs for all levels of LEED™ buildings
- Less than 1% additional costs for LEED™ certified

<table>
<thead>
<tr>
<th>Category</th>
<th>20-year NPV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy Savings</td>
<td>$5.80/SF</td>
</tr>
<tr>
<td>Emissions Savings</td>
<td>$1.20/SF</td>
</tr>
<tr>
<td>Water Savings</td>
<td>$0.50/SF</td>
</tr>
<tr>
<td>Operation &amp; Maintenance Savings</td>
<td>$8.47/SF</td>
</tr>
<tr>
<td>Productivity &amp; Health Benefits</td>
<td>$36.90-$55.30/SF</td>
</tr>
<tr>
<td>Average Premium for Green Buildings</td>
<td>($4.00)/SF</td>
</tr>
<tr>
<td>Total 20-year Net Present Benefit</td>
<td>$50-$65/SF</td>
</tr>
</tbody>
</table>
Costs vs. Benefits
Costs vs. Benefits

Average Annual Commercial Expenditure
2000 (Dollars/SF)
Costs vs. Benefits

- Productivity in Old Building: 100
- Productivity During Move: 70
- Productivity in New Building: 116
What is the US Green Building Council?

USGBC is...

- A national nonprofit organization
- A diverse membership of organizations
- Consensus-driven
- Committee-based product development
- Developer and administrator of the LEED® Green Building Rating System
What is the US Green Building Council?

USGBC’s MISSION:

to promote the design and construction of buildings that are environmentally responsible, profitable, and healthy places to live and work.

The organization’s activities…

- Integrate building industry sectors
- Lead market transformation
- Educate owners and practitioners
Who are US Green Building Council Members?

- Architecture Firms
- Engineering Firms
- Contractors
- Manufacturers
- Government Entities
  - Federal, State, and Local
- Real Estate Developers & Owners
- Financial Institutions
- Universities/Colleges
- Retail Companies
- Nonprofit Associations
- Utility Providers
- Others
USGBC’s Membership*

*as of 11/2004

On Average, 150 Companies Join a Month!
2003: Over 5000 Registered Attendees
2003: Over 300 Exhibitors
2004: Over 8000 Registered Attendees
2004: Over 480 Exhibitors
USGBC - Central Florida

Mission Statement

Have a positive impact on Central Florida's environment, economy and social well being by:

- Promoting green and sustainable design, construction and operation of buildings.
- Developing green and sustainable building standards, design practices and technologies.
- Outreach and education to our members and communities.
USGBC-Central Florida

Founding Members

Burns Brothers, Inc.  
Civil & Marine  
Florida Business Interiors  
GDC Properties  
GRG Consulting Engineers, Inc.  
Haworth, Inc.  
Herman Miller  
Hoar Construction, LLC  
HuntonBrady Architects  
Interface Flooring Systems  
Johns Manville  
Johnson Controls  
Morris Architects  
PRB Design  
Shaw Tek  
SchenkelShultz  
Skanska USA Building, Inc.  
TLC Engineering for Architecture  
The Trane Company
Emerging Green Builders

Who we are:
The USGBC's Emerging Green Builders represents a coalition of students and young professionals intent on promoting the integration of future leaders into the green building movement.

Vision:
To integrate students and professionals into the green building movement.

Mission:
To create a network of emerging green building leaders and develop opportunities for involvement through the USGBC to further generate momentum for the green building industry.
LEED (Leadership in Energy & Environmental Design) Green Building Rating System

A leading-edge system for designing, constructing, operating and certifying green buildings.
LEED Applications

LEED-NC (New Construction) – Version 2.2
LEED-EB (Existing Buildings) – Version 1.1
LEED-CI (Commercial Interiors) – Version 1.1
LEED-CS (Core & Shell) – Pilot
LEED-H (Home) – Pilot
LEED-NB (Neighborhood Developments) – D&D
LEED-R (Retail) – D&D
LEED-MB (Multiple Buildings) – D&D
LEED-HC (Healthcare) – D&D
## LEED-NC Breakdown

<table>
<thead>
<tr>
<th>Category</th>
<th>Possible Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sustainable Sites</td>
<td>14</td>
</tr>
<tr>
<td>Water Efficiency</td>
<td>5</td>
</tr>
<tr>
<td>Energy &amp; Atmosphere</td>
<td>17</td>
</tr>
<tr>
<td>Materials &amp; Resources</td>
<td>13</td>
</tr>
<tr>
<td>Indoor Environmental Air Quality</td>
<td>15</td>
</tr>
<tr>
<td>Innovation &amp; Design</td>
<td>5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>69</strong></td>
</tr>
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LEED-NC Ratings

Certified: 26-32 Points
Silver: 33-38 Points
Gold: 39-51 Points
Platinum: 52-69 Points
## LEED-NC in the Last Four Years

<table>
<thead>
<tr>
<th></th>
<th>2000</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
</tr>
</thead>
<tbody>
<tr>
<td>Register Projects</td>
<td>45</td>
<td>602</td>
<td>1077</td>
<td>1542</td>
</tr>
<tr>
<td>Cumulative SF</td>
<td>8.4M</td>
<td>&gt;80M</td>
<td>&gt;141M</td>
<td>&gt;188M</td>
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</tbody>
</table>
LEED & Stormwater Management

Sustainable Sites

Prerequisite – Erosion and Sedimentation Control

Credit 6.1 – Stormwater Management

Credit 7.1 - Landscape & Exterior Design to Reduce Heat Islands
Sustainable Sites

Prerequisite – Erosion and Sedimentation Control

Intent: Control erosion to reduce negative impacts on water and air quality.
Sustainable Sites

Prerequisite – Erosion and Sedimentation Control

Requirement: Design a sediment and erosion control plan specific to the site that conforms to U.S. EPA September 1992 Storm Water Management for Construction Activities, (Document No. EPA-832-R-92-005, Chapter 3) or local sedimentation and erosion standards, whichever is more stringent. The plan shall meet the following objectives:
- Prevent loss of soil during construction by storm water runoff and/or wind erosion, including protecting topsoil by stockpile for reuse.
- Prevent sedimentation of storm sewer or receiving streams and/or air pollution with dust and particulate matter.
Sustainable Sites

Credit 6.1 – Stormwater Management: 2 Points

(Rate & Quantity)

Intent: Limit disruption of natural water flows by minimizing stormwater runoff, increasing on-site infiltration and reducing contaminations.
Sustainable Sites

Credit 6.1 – Stormwater Management

Rate: 1 Point

Requirement: No net increase in the rate and quantity of stormwater runoff from existing to developed conditions; OR, if existing imperviousness is greater than 50% implement a stormwater management plan that results in a 25% decrease.
Sustainable Sites

Credit 6.1 – Stormwater Management

Quantity: 1 Point

Requirement: Treatment systems designed to remove 80% total suspended solids (TSS), and 40% of the average post development total phosphorus (TP), by implementing Best Management Practices (BMPs) outlined in Chapter 4, Part 2 (Urban Runoff), of the United States Environmental Protection Agency’s (EPA’s) Guidance Specifying Management Measures for Source of Nonpoint Pollution in Coastal Waters, January 1993 (Document No. EPA-840-B-92-002) or the local government’s BMP documents (whichever is more stringent).
Sustainable Sites

Credit 7.1 – Landscape & Exterior Design to Reduce Heat Islands: 1 Point

(Roof)

Intent: Reduce heat islands (thermal gradient differences between developed and undeveloped areas) to minimize impact in microclimates, human and wildlife habitat.
Sustainable Sites

Credit 7.1 – Stormwater Management

Roof – 1 Point

Requirement: Use ENERGY STAR compliant (highly reflective) AND high emissivity roofing (emissivity of at least 0.9 when tested in accordance with ASTM 408) for a minimum of 75% of the roof surface; OR, **install a green (vegetated) roof for at least 50% of the roof area.** Combinations of high albedo and vegetated roof can be used providing they collectively cover 75% of the roof area.
LEED™ in Florida

50,000 sq. ft. Dunedin Community Center:
Reduced electricity costs by $24,500 per year

27,000 sq. ft. Girl Scouts Facility in Sarasota:
Will use Low-emitting carpet, paint and adhesives to achieve higher Indoor Air Quality
LEED™ in Florida

20,000 sq. ft. Office Building in Lake Worth:

Will harvest rainwater and filter through a Living Machine to save thousands of gallons of water per year…

University of Florida:

It would take the rest of the day to go through all of their LEED™ Projects!
University of Florida
Rinker Hall:
First LEED™ Gold
Building in Florida utilizes
daylighting to save
energy and improve
Indoor Environmental
Quality
Green Building is Not a Fad

There is an estimated $15 billion worth of green buildings currently in design or under construction in the US, representing 12-15% of total public construction and 2% of private sector construction. Although the $15 billion is less than 5% of the total $315 billion US annual construction for commercial, industrial and institutional buildings, this category is growing at a rate of about 75% annually.

Hybrid Vehicles

Organic Groceries
David A. Gottfried Honorary Scholarship
Founder of the USGBC
$1500 – Deadline is Nov. 15th
All majors related to the protection of the environment.

Applications available at the end of presentation.
On behalf of the Central Florida Chapter of the USGBC,

Thank You.