



An Introduction to the **LEED™ Green Building Rating System**

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Environmental Impact of Buildings

- 65.2% of total U.S. electricity consumption ¹
- > 36% of total U.S. primary energy use ²
- 30% of total U.S. greenhouse gas emissions ³
- 136 million tons of construction and demolition waste in the U.S. (approx. 2.8 lbs/person/day) ⁴
- 12% of potable water in the U.S. ⁵
- 40% (3 billion tons annually) of raw materials use globally ⁶



What is “Green” Design?

Design and construction practices that significantly reduce or eliminate the negative impact of buildings on the environment and occupants in five broad areas:

- Sustainable site planning
- Safeguarding water and water efficiency
- Energy efficiency and renewable energy
- Conservation of materials and resources
- Indoor environmental quality

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Benefits of Green Building

Environmental Benefits

- Reduce the impacts of natural resource consumption

Economic Benefits

- Improve the bottom line

Health and Safety Benefits

- Enhance occupant comfort and health

Community Benefits

- Minimize strain on local infrastructures and improve quality of life

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Economic Benefits

Competitive first costs

- Integrated design allows high benefit at low cost by achieving synergies between disciplines and between technologies

Reduce operating costs

- Lower utility costs (i.e., \$.60–\$1.20 per square foot versus \$1.50).*

* Rough estimate based on LEED credits that reward up to 60% energy savings over ASHRAE 90.1-1999 and up to 30% water use reduction (after meeting the Energy Policy Act of 1992).

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Economic Benefits

Increase building valuation

- Using the income-capitalization method: asset value = net operating income (NOI) divided by the capitalization rate. If the cap rate is 10%, multiply the reduction in annual operating costs by 10 to calculate the increase in the building's asset value

Decrease vacancy, improve retention

- Marketing advantages

Optimize life-cycle economic performance

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Economic Benefits

Improve productivity

- Estimated \$29 –168 billion in national productivity losses per year ¹

Reduce absenteeism and turnover

- Providing a healthy workplace improves employee satisfaction

Reduce liability

- Improve risk management

Increase Retail Sales with Daylighting

- Studies have shown ~40% improvement ²

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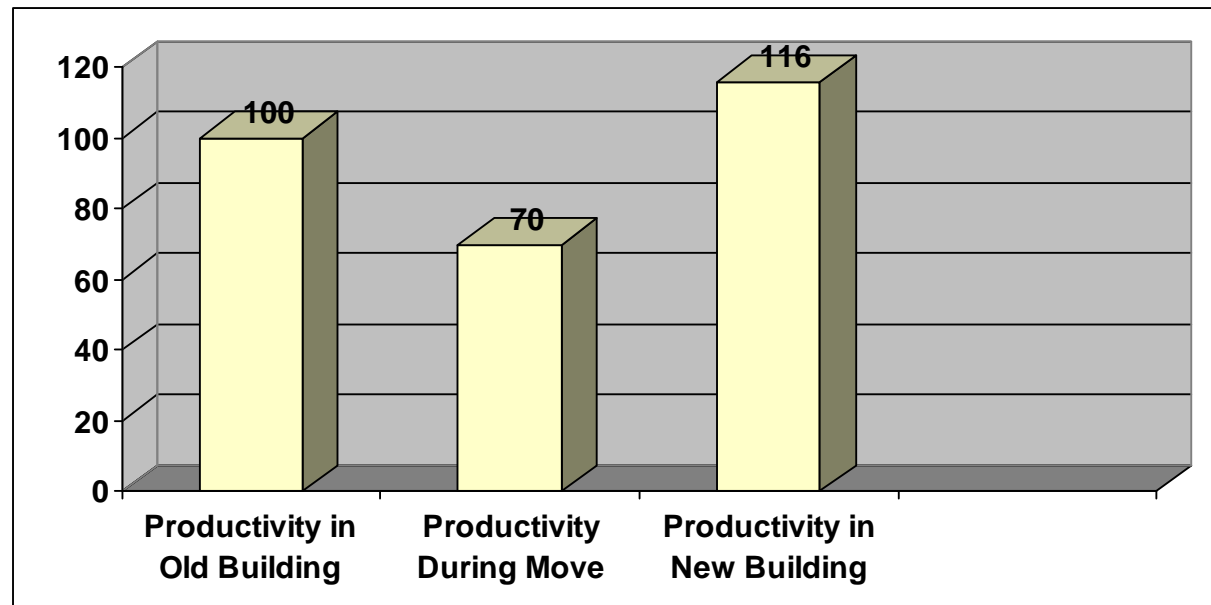
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West Bend Mutual Insurance Company

(West Bend, WI)



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Leadership in Energy & Environmental Design

A leading-edge system for designing, constructing, and certifying the world's greenest buildings.

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Why Was LEED™ Created?

- Facilitate positive results for the environment, occupant health and financial return
- Define “green” by providing a standard for measurement
- Prevent “greenwashing” (false or exaggerated claims)
- Promote whole-building, integrated design processes



Why Was LEED™ Created?

- Use as a design guideline
- Recognize leaders
- Stimulate green competition
- Establish market value with recognizable national “brand”
- Raise consumer awareness
- Transform the marketplace!

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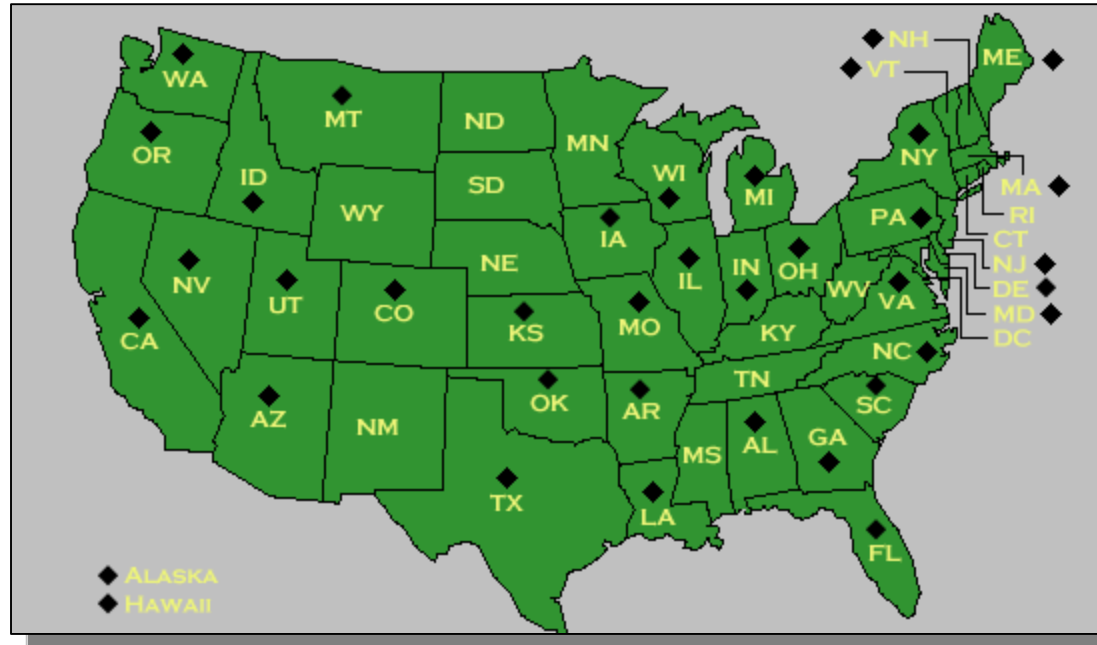
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LEED™:

Transforming the Marketplace

- More Than 275 Registered Projects



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Diverse Owners and Buildings: Examples of Certified Projects



PNC Firstside Center

PNC Financial Services, Pittsburgh, PA

647,000 gsf Commercial Office Building

LEED 2.0 Silver, 2000

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Phillip Merrill Environmental Center Headquarters Annapolis, Maryland



Owner: Chesapeake Bay Foundation

Project Team:
 Architect: *SmithGroup, Inc.*
 Engineer: *SmithGroup, Inc.*
 P.Manager: *Synthesis, Inc.*
 Contractor: *Clark Construction Group*
 Consultant: *Janet Harrison, Architect*

Building Statistics:
 Completion Date: *November, 2000*
 Cost: *\$6.36 M*
 Size: *30,600 gross square feet*
 Footprint: *12,000 square feet*
 Construction Type: *3B, Two Stories over Open Parking*
 Use Group: *Business(B), Assembly(A-3), Storage(S-2)*
 Lot Size: *33 acres*
 Annual Energy Use: *23 kBtu/sf/year*
 Occupancy: *90 Staff*



LEED™ 1.0 Certification:
PLATINUM

Notes from the Project Team: *LEED™ was instrumental in conveying the importance of the sustainable elements of the design to CBF's Board of Trustees.*

- Sustainable Sites**
 - **Site Selection:** *Erected in Smart Growth Funding Area on footprint of existing structure. 26.6 acres remain undisturbed in Land Trust.*
 - **Educational Model:** *Interpretive trails & demonstrations for public visitors*
 - **Storm/Waste Water:** *All Composting Toilets & Bioretention/Wetland*
 - **Resource Protection:** *Woodland, Wetland, & Tidal Water Restoration*
- Water Efficiency**
 - **Water:** *Rainwater Catchment & Reuse for Hand Washing & Irrigation*
- Energy and Atmosphere**
 - **Domestic Hot Water:** *Thermomax-Solar Technology*
 - **Energy:** *Exceeds ASHRAE/IES Standard 90.1-1989 by 50%*
 - **HVAC:** *Natural Ventilation and Desiccant Dehumidification & Heat Recovery*
 - **Controls/Monitoring:** *Building Energy management System, "Green Light" notifies staff to open windows when outside conditions comply*
 - **Power Source:** *30% Renewable with Geo-Exchange & Photovoltaics*
 - **Lighting:** *Daylight Harvesting and time clock lighting controls*
 - **Rapidly Renewable:** *Bamboo, cork and linoleum floorings*
 - **Recycled Content:** *Metal roofing and siding, acoustic ceiling, ceramic tile, and MDF cabinetry*
- Materials and Resources**
 - **Structure:** *Rapidly Renewable-Paralam Post, Beam, and Truss system*
 - **Envelope:** *Structural Insulated Panels (SIP) R-20 walls, R-30 roof*
- Indoor Environmental Quality**
 - **Indoor Environmental Quality:** *CO₂ and VOC monitors.*
 - **Furniture:** *Small, open offices allow for communal space. Systems furniture allows flexible layout to accommodate "churn"*



Diverse Owners and Buildings: Examples of Registered Projects



Whitehead Research Building

Emory University, Atlanta, Georgia

325,000 gsf Laboratory and Office Building

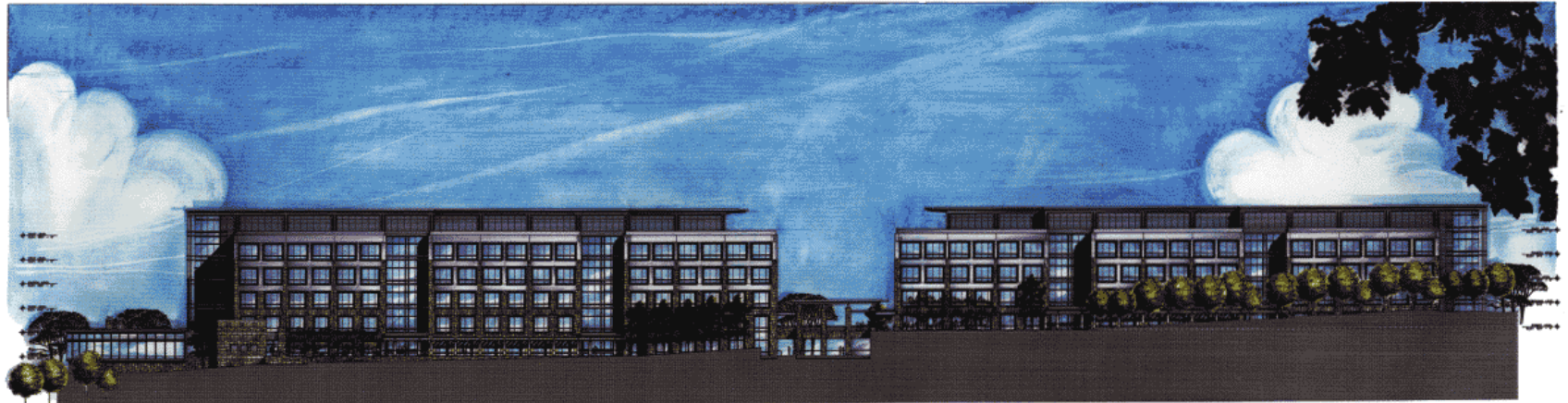
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Diverse Owners and Buildings: Examples of Registered Projects



HKS

Architectural Facade Study

Sabre Corporate Campus

Sabre, Inc., Southlake, Texas

464,000 gsf Office Building

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Diverse Owners and Buildings: Examples of Registered Projects



Greenwood Elementary School

Seattle Public School District, Seattle, WA

61,000 gsf educational building

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Diverse Owners and Buildings: Examples of Registered Projects



Pottery Barn

Williams-Sonoma, Inc., San Francisco, California

12,000 gsf Retail Store

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Technical Overview of LEED™

- Green building rating system, currently for commercial, institutional, and high-rise residential new construction and major renovation.
- Existing, proven technologies
- Evaluates and recognizes performance in accepted green design categories
- LEED 3.0 product development includes existing buildings, multiple buildings, core & shell, interiors, and residential

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Technical Overview of LEED™

(continued)

- Whole-building approach encourages a collaborative, integrated design and construction process
- Optimizes environmental & economic factors
- Four levels of certification
 - LEED Certified 26 - 32 points
 - Silver Level 33 - 38 points
 - Gold Level 39 - 51 points
 - Platinum Level 52+ points (69 possible)

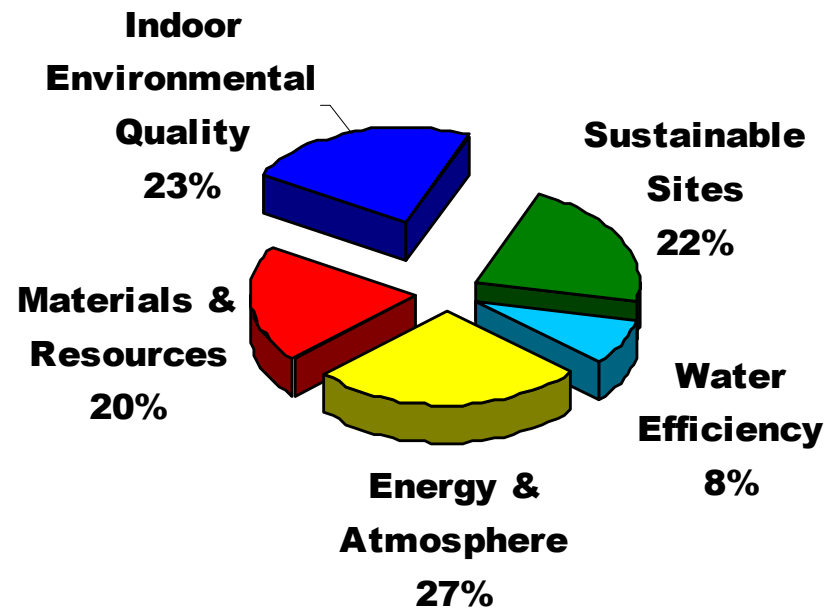
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LEED™ Point Distribution



Five LEED credit categories

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LEED™ Certification Process

A three step process :

- Step 1: Project Registration
 - Welcome Packet and on-line project listing
- Step 2: Technical Support
 - Reference Package
 - Credit Rulings
- Step 3: Building Certification
 - Upon documentation submittal and USGBC review

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LEED™ Resources

- LEED Green Building Rating System
- Training Workshop
- Reference Package
- Professional Accreditation
- Welcome Packet
- Credit Rulings
- Website
(www.leadbuilding.org)

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Certification Benefits

Recognition of Quality Buildings and Environmental Stewardship

- Third party validation of achievement
- Qualify for growing array of state and local government incentives
- Contribute to growing knowledge base
- LEED certification plaque to mount on building
- Official certificate
- Receive marketing exposure through USGBC Web site, case studies, media announcements

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