Sustainability Conference

January 23, 2009
Outline

- Opus’ History with Sustainable Buildings
- LEED/Sustainable Design Overview
- Sustainable Strategies for the Leadership Studies Building
Opus’ Sustainable Growth

• Opus has completed more than 3 million square feet of LEED-certified buildings.
• Currently, Opus has nearly 7 million square feet of development in planning or under development that is seeking LEED certification.
• In total, Opus has more than 16 million sustainable square feet in planning or under development incorporating sustainable elements recognized by USGBC, ENERGY STAR, Green Globes, etc.
### Incremental Capital Costs of 33 USGBC LEED Certified Projects

<table>
<thead>
<tr>
<th>Level of LEED Certification</th>
<th>Average Green Cost Premium (% of total construction cost)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Certified (8 projects)</td>
<td>0.66% (Opus +/- 0%)</td>
</tr>
<tr>
<td>2. Silver (18 projects)</td>
<td>2.11%</td>
</tr>
<tr>
<td>3. Gold (6 projects)</td>
<td>1.82% (Opus +/- 4%)</td>
</tr>
<tr>
<td>4. Platinum (1 project)</td>
<td>6.50%</td>
</tr>
<tr>
<td><strong>Average of 33 Buildings</strong></td>
<td><strong>1.84%</strong></td>
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</tbody>
</table>
Why Build Green?

• Environmental Stewardship
  – Reduce waste
  – Preserve natural resources

• Health and Safety
  – Better air to breathe
  – Daylight and views in buildings improves mental health

• Rising Energy and Water Costs

• Marketplace Demands
Environmental Impact of Buildings

• Buildings consume more than:
  – 40 percent of all energy created
  – 60 percent of all electricity
  – 30 percent of all raw materials
  – Create 25 percent of all solid waste
What is LEED?

- Leadership in Energy and Environmental Design
- Formed by USGBC (United States Green Building Council)
- Independent third party, national leader in methodology to document sustainable practices
- Point based rating system
- Rating systems for multiple project types
LEED™ Market Transformation Products

LEED PRODUCT FAMILY

- LEED-NC New Construction
- LEED-EB Existing Buildings
- LEED-CS Core & Shell
- LEED-CI Commercial Interiors
- LEED-H Homes
- LEED-ND Neighborhood Developments

- Healthcare Guide
- Laboratory Guide
- Schools Guide

U.S. GREEN BUILDING COUNCIL

LEED
LEADERSHIP IN ENERGY & ENVIRONMENTAL DESIGN
LEED™ Green Building Rating System

Four levels of LEED-NC certification

Certified Level  26 - 32 points
Silver Level     33 - 38 points
Gold Level       39 - 51 points
Platinum Level   52+ points

Six Credit Categories

Sustainable Sites  14 points
Water Efficiency   5 points
Energy & Atmosphere 17 points
Materials & Resources 13 points
Indoor Environmental Quality 15 points
Innovation & Design Process 5 points

TOTAL  69 possible points
<table>
<thead>
<tr>
<th>Yes</th>
<th>?</th>
<th>No</th>
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<tbody>
<tr>
<td><strong>Project Totals (Pre-Certification Estimation)</strong></td>
<td>69 Points</td>
<td></td>
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<thead>
<tr>
<th>Yes</th>
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<tr>
<td><strong>Sustainable Sites</strong></td>
<td>14 Points</td>
<td></td>
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<thead>
<tr>
<th>Yes</th>
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<th>No</th>
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</thead>
<tbody>
<tr>
<td><strong>Prereq 1</strong></td>
<td>Construction Activity Pollution Prevention</td>
<td>Required</td>
</tr>
<tr>
<td>Credit 1</td>
<td>Site Selection</td>
<td>1</td>
</tr>
<tr>
<td>Credit 2</td>
<td>Development Density &amp; Community Connectivity</td>
<td>1</td>
</tr>
<tr>
<td>Credit 3</td>
<td>Brownfield Redevelopment</td>
<td>1</td>
</tr>
<tr>
<td>Credit 4.1</td>
<td>Alternative Transportation, Public Transportation</td>
<td>1</td>
</tr>
<tr>
<td>Credit 4.2</td>
<td>Alternative Transportation, Bicycle Storage &amp; Changing Rooms</td>
<td>1</td>
</tr>
<tr>
<td>Credit 4.3</td>
<td>Alternative Transportation, Low-Emitting &amp; Fuel Efficient Vehicles</td>
<td>1</td>
</tr>
<tr>
<td>Credit 4.4</td>
<td>Alternative Transportation, Parking Capacity</td>
<td>1</td>
</tr>
<tr>
<td>Credit 5.1</td>
<td>Site Development, Protect or Restore Habitat</td>
<td>1</td>
</tr>
<tr>
<td>Credit 5.2</td>
<td>Site Development, Maximize Open Space</td>
<td>1</td>
</tr>
<tr>
<td>Credit 6.1</td>
<td>Stormwater Design, Quantity Control</td>
<td>1</td>
</tr>
<tr>
<td>Credit 6.2</td>
<td>Stormwater Design, Quality Control</td>
<td>1</td>
</tr>
<tr>
<td>Credit 7.1</td>
<td>Heat Island Effect, Non-Roof</td>
<td>1</td>
</tr>
<tr>
<td>Credit 7.2</td>
<td>Heat Island Effect, Roof</td>
<td>1</td>
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<tr>
<td>Credit 8</td>
<td>Light Pollution Reduction</td>
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<thead>
<tr>
<th>Yes</th>
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<tbody>
<tr>
<td><strong>Water Efficiency</strong></td>
<td>5 Points</td>
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<tr>
<td>Credit 1.1</td>
<td>Water Efficient Landscaping, Reduce by 50%</td>
<td>1</td>
</tr>
<tr>
<td>Credit 1.2</td>
<td>Water Efficient Landscaping, No Potable Use or No Irrigation</td>
<td>1</td>
</tr>
<tr>
<td>Credit 2</td>
<td>Innovative Wastewater Technologies</td>
<td>1</td>
</tr>
<tr>
<td>Credit 3.1</td>
<td>Water Use Reduction, 20% Reduction</td>
<td>1</td>
</tr>
<tr>
<td>Credit 3.2</td>
<td>Water Use Reduction, 30% Reduction</td>
<td>1</td>
</tr>
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</table>
Site Plan
Sustainable Sites

• P1 Construction Activity Pollution Prevention
• SS1 Site Selection
  • ☒ Prime farmland
  • ☒ Undeveloped land in floodplain
  • ☒ Endangered species habitat
  • ☒ Proximity to wetlands
  • ☒ Proximity to water body
  • ☒ Public parkland
• SS2 Development Density & Community Connectivity
  • Within ½ mile of 10 basic services
Sustainable Sites

• SS4.1 Alternative Transportation
  • Within ¼ mile of two bus routes
• SS4.2 Alternative Transportation
  • Bicycle storage and changing rooms
• SS4.3 Alternative Transportation
  • Low-emitting & fuel efficient vehicles
• SS4.4 Alternative Transportation
  • Parking capacity
• SS5.1 Site Development
  • Restore 50% of site (excluding building footprint)
• SS5.2 Maximize Open Space
  • Vegetated open space = 20% of site area
Sustainable Sites

• SS6.1 Stormwater Design – “Quality” Control
• SS6.2 Stormwater Design – “Quantity” Control
• SS7.1 Heat Island Effect – Non Roof
  • Reflectivity of surfaces
• SS7.2 Heat Island Effect – Roof
  • 75% of roof meets SRI (✗) Did not achieve
• SS8 Light Pollution Reduction
  • Control light projection from within building
  • Control light projection at site boundaries
  • (✗) Did not achieve due to security standards
Sustainable Sites

• Achievements:
  • Restored habitat, optimized open space/vegetation
  • Reduced stormwater impact
  • Limited environmental impact on local ecosystems and infrastructure
Water Efficiency

• WE1.1 Reduce Landscape Irrigation 50%
• WE1.2 No Potable Landscape Irrigation (✗) Did not achieve
• WE2 Innovative Wastewater Technologies
  • Reduce potable water use by 50%
• WE3.1 Water Use Reduction 20%
• WE3.2 Water Use Reduction 30%
  • Utilize water efficient fixtures
Water Efficiency

• Achievements:
  • Reintroduction of native plants
  • Reduction in potable water use
  • Reduced demand on utility infrastructure
Energy & Atmosphere

• P1  Fundamental Building Systems Commissioning
• P2  Minimum Energy Performance
  • ASHRAE 90.1-2004
• P3  Fundamental Refrigerant Management
  • No CFCs or Phase-out
• EA1  Optimize Energy Performance
  • 10% to 42% reductions gains 1-10 points
  • Initial goal for 2 points
• EA2.1, 2.1, 2.3 Renewable Energy - Pending
• EA3  Enhanced Commissioning – Pending
• EA4  Enhanced Refrigerant Management – Pending
• EA5  Measurement & Verification
• EA6  Green Power
Energy & Atmosphere

• Achievements:
  • Reduced environmental impact from energy production
Materials & Resources

• P1 Storage & Collection of Recyclables
• MR1 Building Reuse (∅) Can’t achieve
• MR2 Construction Waste Management – Divert 50-75%
• MR3 Resource Reuse (∅) Can’t achieve
• MR4 Recycled Content – 5-10%
• MR5 Local / Regional Materials
  • 20% Manufactured locally
  • Of above, 50% harvested locally
• MR6 Rapidly Renewable Materials
  • <10-year cycle for 2.5% of construction value
• MR7 Certified Wood
Materials & Resources

• Achievements:
  • Established a culture of recycling for building users
  • Reduced construction debris to landfills
  • Supported local economies and reduced transportation impact relative to materials used
  • Reduced natural resource consumption
  • Improved stewardship of forests and related ecosystems
Indoor Air Quality

- P1 Minimum IAQ Performance – ASHRAE 62.1 – 2004
- P2 Environmental Tobacco Smoke Control
- IAQ1 Outdoor Air Delivery Monitoring
- IAQ2 Increased Ventilation – 30% above ASHRAE
- IAQ3.1 Construction Activity IAQ – During
- IAQ3.2 Construction Activity IAQ – After
- IAQ4 Low-Emitting Materials
  - Adhesives & Sealants
  - Paints
  - Carpet
  - Composite Wood and Agrifiber
Indoor Air Quality

- IAQ5 Indoor Chemical & Pollutant Source Control
- IAQ6.1 Controllability of Systems – Lighting
- IAQ6.2 Controllability of Systems – Thermal Comfort
  - (✘) Did not achieve
- IAQ7.1 Thermal Comfort – Design
  - Meet ASHRAE 55-2004
- IAQ7.2 Thermal Comfort – Verification
  - Survey occupants and plan for remedy
- IAQ8 Daylight & Views
  - 75% of spaces ?
  - 90% of spaces ?
Indoor Air Quality

• Achievements:
  • Improved occupant well-being by using materials that release fewer harmful chemical compounds and by providing higher ratios of filtered outdoor air.
Innovation & Design

• Total of Four Possible Credits
  • Educational Programs
  • Exemplary Credits
  • Creative Strategies
Site Plan

School of Leadership Studies
Kansas State University

January 23, 2009
Questions & Answers