



School of Leadership Studies

Kansas State University

Sustainability Conference

January 23, 2009





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OPUS

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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

| Level of LEED Certification | Average Green Cost Premium (%of total construction cost) |
|--------------------------------|--|
| 1. Certified (8 projects) | 0.66% (Opus +/- 0%) |
| 2. Silver (18 projects) | 2.11% |
| 3. Gold (6 projects) | 1.82% (Opus +/- 4%) |
| 4. Platinum (1 project) | 6.50% |
| Average of 33 Buildings | 1.84% |



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™ 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 |





LEED for New Construction v 2.2 Registered Project Checklist

Project Name: _____

Project Address: _____

| Yes | ? | No | | | | |
|-----|---|----|---|-----------------------------|---------------------------|-------------------------------|
| | | | Project Totals (Pre-Certification Estimates) | | | 69 Points |
| | | | Certified: 26-32 points | Silver: 33-38 points | Gold: 39-51 points | Platinum: 52-69 points |

| Yes | ? | No | | |
|-----|---|----|--------------------------|------------------|
| | | | Sustainable Sites | 14 Points |

| Yes | ? | No | | |
|-----|---|----|------------|---|
| | | | Prereq 1 | Construction Activity Pollution Prevention Required |
| | | | Credit 1 | Site Selection 1 |
| | | | Credit 2 | Development Density & Community Connectivity 1 |
| | | | Credit 3 | Brownfield Redevelopment 1 |
| | | | Credit 4.1 | Alternative Transportation, Public Transportation 1 |
| | | | Credit 4.2 | Alternative Transportation, Bicycle Storage & Changing Rooms 1 |
| | | | Credit 4.3 | Alternative Transportation, Low-Emitting & Fuel Efficient Vehicles 1 |
| | | | Credit 4.4 | Alternative Transportation, Parking Capacity 1 |
| | | | Credit 5.1 | Site Development, Protect or Restore Habitat 1 |
| | | | Credit 5.2 | Site Development, Maximize Open Space 1 |
| | | | Credit 6.1 | Stormwater Design, Quantity Control 1 |
| | | | Credit 6.2 | Stormwater Design, Quality Control 1 |
| | | | Credit 7.1 | Heat Island Effect, Non-Roof 1 |
| | | | Credit 7.2 | Heat Island Effect, Roof 1 |
| | | | Credit 8 | Light Pollution Reduction 1 |

| Yes | ? | No | | |
|-----|---|----|-------------------------|-----------------|
| | | | Water Efficiency | 5 Points |

| | | | | |
|--|--|--|------------|---|
| | | | Credit 1.1 | Water Efficient Landscaping, Reduce by 50% 1 |
| | | | Credit 1.2 | Water Efficient Landscaping, No Potable Use or No Irrigation 1 |
| | | | Credit 2 | Innovative Wastewater Technologies 1 |
| | | | Credit 3.1 | Water Use Reduction, 20% Reduction 1 |
| | | | Credit 3.2 | Water Use Reduction, 30% Reduction 1 |

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Last Modified: May 2008 1 of 4



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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 1/2 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**





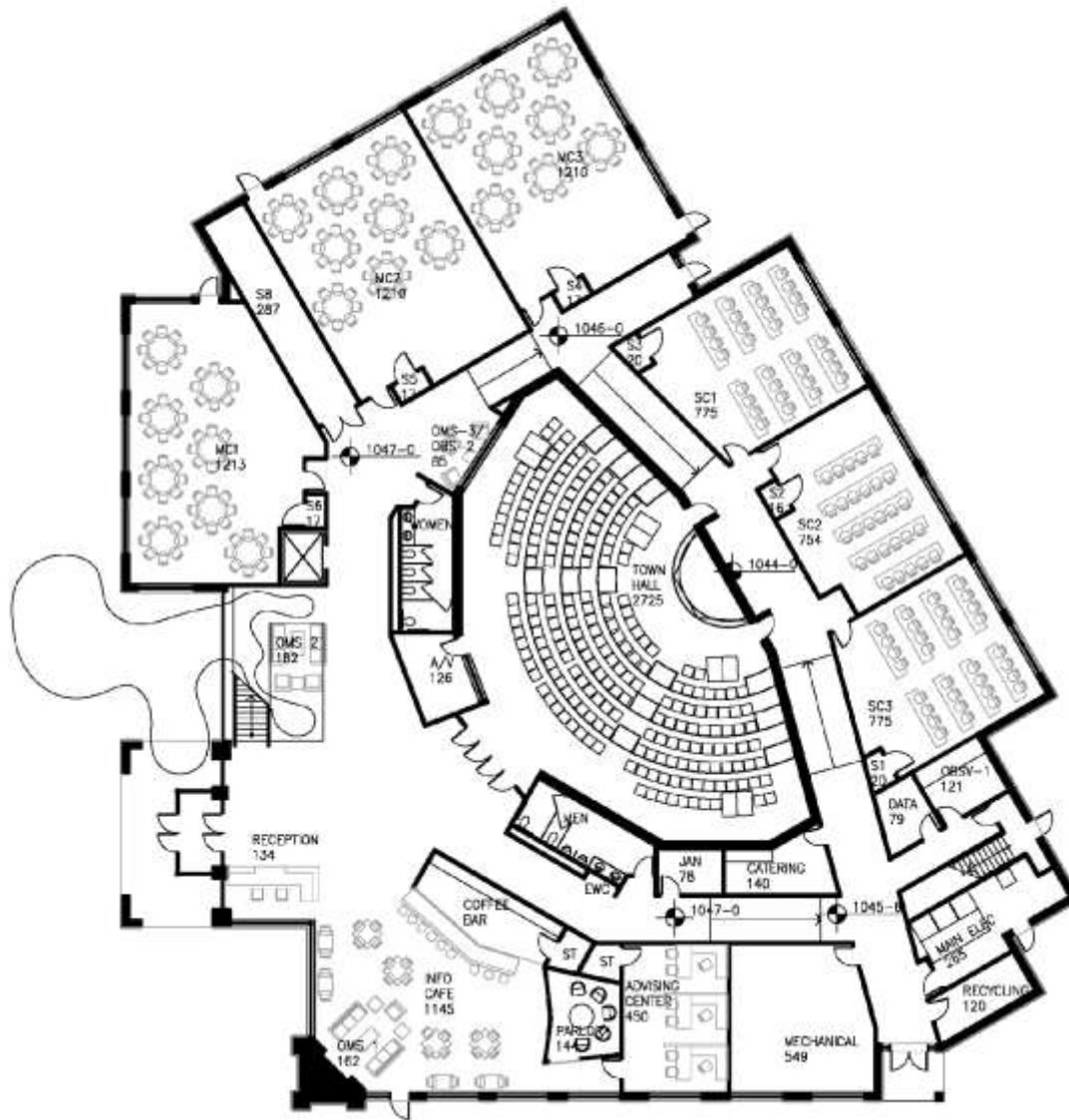
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Site Plan





First Floor 19,710 s.f.
36,829 s.f.



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Second Floor 17,119 s.f.
36,829 s.f.





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Questions & Answers



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