Leadership in Energy and Environmental Design (LEED)

California State University, Sacramento

February 24, 2010
Motivations for Building Green

Lower Operating Costs
- Reduce Energy Use
- Conserve Water
- Lower Maintenance

Customer/Occupant Satisfaction
- Improved Comfort and Indoor Air Quality
Motivations for Building Green

Good for the Environment

- Reduce Greenhouse Gas Emissions
- Reduce Environmental Impact
- Reduce Waste
Motivations for Building Green

- Executive Order S-20-04 signed December 14, 2004
- Chancellor’s Executive Order 987
- AB 32 – Global Warming Reduction
- Green Building Code (part of Title 24)
LEED Program

- Administered by the US Green Building Council (non-profit)
- No “S” in LEED
- Projects/Buildings – Certified
- Individuals - Accredited
LEED NC
New Construction
*LEED for Health Care
*LEED for Retail

LEED-S
for Schools

LEED-CS
Core & Shell

LEED-CI
Commercial Interiors
*LEED for Retail Interiors

LEED EB
Existing Buildings
*LEED for Existing Schools

LEED-H
for Homes

LEED-ND
Neighborhood Development

LEED ID&C
Interior Design & Construction

LEED O&M
Operations & Maintenance

LEED-H
for Homes

LEED-ND
Neighborhood Development
ENERGY SAVINGS 30%

CARBON SAVINGS 35%

WATER USE SAVINGS 30-50%

WASTE COST SAVINGS 50-90%
LEED BD&C Categories

1. Sustainable Sites (26 pts)
2. Water Efficiency (10 pts)
3. Energy & Atmosphere (35 pts)
4. Material & Resources (14 pts)
5. Indoor Environmental Quality (15 pts)
6. Innovation in Design (6 pts)
7. Regional Priority (4 pts)

TOTAL 110 pts
Platinum  80 points
Gold  60 points
Silver  50 points
Certified  40 points
American River Courtyard

- 606 Bed Student Housing
- Opened Fall 2009
- Area: 209,000 square feet
- Contractor: Brown Construction
- Architect: Mogavero Notestine
The WELL

- Health Center
- Recreation Center
- Area: 150,000 sq ft
- Open for Fall 2010
- Contractor: McCarthy Builders
- Architect: Hornberger + Worstell
Overview of Measures

CSUS American River Courtyard Student Housing: LEED Strategies and Applications
Sustainable Sites (26)

- Construction Activity Pollution Prevention (p)
- Site Selection (2)
- Development Density & Community Connectivity (5)
- Alternative Transportation: Public Transit, Bicycling, Low-Emitting Fuel Vehicles (12)
- Site Development (2)
- Storm Water Design (2)
- Heat Island (2)
- Light Pollution (1)
Development Density and Community Connectivity

Community Services
Open Space

Courtyard Area
Alternative Transportation

Public Transportation
Alternative Transportation

Bike Racks
Heat Island - Nonroof

Shading and Solar Reflectance
Heat Island - Roof

Reflective Roofs
Water Efficiency (10)

- Water Efficient Landscaping (4)
- Innovative Wastewater Tech. (2)
- Water Use Reduction (4) (p)
Water Efficient Fixtures

37% Water Savings from Baseline
Energy and Atmosphere (35)

- Building Commissioning (2) (p)
- Optimize Energy Performance (19) (p)
- On-site Renewable Energy (7)
- Refrigerant Management (2)
- Measurement & Verification (3)
- Green Power (2)
Energy Efficiency

Energy Efficient Lighting

35% Energy Savings from Baseline
Energy Efficiency

Variable Frequency Drives/Computerized HVAC Controls
Energy Efficiency/Refrigerant Management

High Efficient Chillers installed at American River Courtyard
Energy Efficiency/Low Polluting Boilers

90% Efficiency

Low NOx High Efficiency Condensing Boilers
Alternative Energy

Solar Water Heaters
Green Power

Purchase Green Power Credits
Building Performance
Materials and Resources (14)
- Building Reuse (4)
- Construction Waste Management (2) (p)
- Materials Reuse (2)
- Recycled Content (2)
- Regional Materials (2)
- Rapidly Renewable Content (1)
- Certified Wood (1)
Construction Waste Management

75% Construction Waste Diversion
Indoor Environmental Quality (15)

- No Smoking – 25’ from building (p)
- Low Emitting Materials (5)
- Indoor Air Quality Plan (4) (p)
- Controllability (2)
- Thermal Comfort (2)
- Daylight and Views (2)
IAQ/Controllability

Temperature and CO2 Sensor
Low Emitting Materials
## CREDIT COMPLIANCE

Please provide the required data for each indoor Adhesive, Sealant, Sealant Primer and Aerosol Adhesive Product(s) used on this project.

### List of all Indoor Adhesives, Sealant and Sealant Primer Products

<table>
<thead>
<tr>
<th>Product Manufacturer</th>
<th>Product Name / Model</th>
<th>Product VOC Content (g/L)</th>
<th>SCAQMD Allowable VOC Content (g/L)</th>
<th>Source of VOC Data</th>
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<tbody>
<tr>
<td>Mapei</td>
<td>Ultra/Blond ECO 575</td>
<td>0.00</td>
<td>50.00</td>
<td>MSDS</td>
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<tr>
<td>The Mohawk Group</td>
<td>Nu Broadlok Premium Plus</td>
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<td>50.00</td>
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<td>3M</td>
<td>Fire Barrier IC 15WB+ Sealant</td>
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<td>80.00</td>
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<td>3M</td>
<td>Brand Fire Barrier CP-25 WB+</td>
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<tr>
<td>GE</td>
<td>GE Silicone 1® Window &amp; Door</td>
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<td>100.00</td>
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<tr>
<td>Henkel Consumer Adhesives</td>
<td>Green Series Sub-Floor &amp; Deck High Performance Construction Adhesive</td>
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<td>MSDS</td>
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<td>Martile</td>
<td>Martile CS91 Construction Adhesive</td>
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<td>Westpac Materials</td>
<td>Joint Compound</td>
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<td>50.00</td>
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<tr>
<td>DAP Inc.</td>
<td>Alex Plus Acrylic Latex Caulk Plus Silicone</td>
<td>39.10</td>
<td>70.00</td>
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<tr>
<td>Hilti</td>
<td>CP 606 #209623 Flexible Firestop Sealant</td>
<td>71.00</td>
<td>80.00</td>
<td>hilti.com - Tech Center, LEED Documentation</td>
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<td>3M</td>
<td>Firedim 130 Caukl</td>
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<tr>
<td>Loctite</td>
<td>SuperFlex White RTV Silicone Adhesive Sealant</td>
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<td>Dow Corning</td>
<td>786 Silicone Sealant</td>
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<td>Dow Corning</td>
<td>General Purpose Silicone Sealant</td>
<td>32.00</td>
<td>70.00</td>
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Daylight and Views
Innovation in Design (6)

- Creative Ideas
- Exemplary Performance
- LEED Accredited Professional (LEED-AP)
Heating and Cooling Switch

Turns off A/C when window is open
Green Housekeeping

Cleaning Products
Chemical Free Water Treatment

Dolphin Water Treatment
### Additional constructions costs for LEED-certified buildings

Average for offices and schools, based on 40 buildings

<table>
<thead>
<tr>
<th>LEED Rating</th>
<th>Additional Cost</th>
<th>Number of Buildings</th>
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<tbody>
<tr>
<td>PLATINUM</td>
<td>6.8%</td>
<td>2</td>
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<tr>
<td>GOLD</td>
<td>2.2%</td>
<td>9</td>
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<tr>
<td>SILVER</td>
<td>1.9%</td>
<td>21</td>
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<tr>
<td>CERTIFIED</td>
<td>0.66%</td>
<td>6</td>
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After LEED Certification is Awarded:
Sustainable
Not Sustainable

- CFC (Chlorofluorocarbon)
- VOC (Volatile Organic Compounds)
- Incandescent Lighting
Links

- California Energy Commission: http://www.energy.ca.gov
- US EPA Water: http://www.epa.gov/watersense
- Green Seal: http://www.greenseal.org
- Green Label Plus: http://www.carpet-rug.org
- US EPA IAQ: http://www.epa.gov.iaq
Links

- Transportation: http://www.csus.edu/aba/utaps
- Campus Recycling: http://www.fm.csus.edu/iwm
- Daylighting: http://www.wbdg.org/
- Green Power: http://www.green-e.org
Questions