The LEED rating system

Erin Mack Ashley, Ph.D.
Director of Codes and Sustainability, NRMCA

WWW.NRMCA.ORG

What is Sustainable Development?

“development that meets the needs of the present without compromising the ability of future generations to meet their own needs”

World Commission on Environment and Development’s (the Brundtland Commission) report, Our Common Future, (Oxford University Press, 1987)

WWW.NRMCA.ORG

What is Sustainable Development?

“development that meets the needs of the present without compromising the ability of future generations to meet their own needs”

World Commission on Environment and Development’s (the Brundtland Commission) report, Our Common Future, (Oxford University Press, 1987)

WWW.NRMCA.ORG

Triple Bottom Line

Social

Local

Environment

Tomorrow

Regional

Local

Today

Global

Economic

WWW.NRMCA.ORG

Green Building

- Focuses on the built environment
- Minimize environmental impact of buildings and their surrounding landscape
- A subset of sustainable development

WWW.NRMCA.ORG

Major “Green” Market Driver

United States
Green Building Council

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

WWW.NRMCA.ORG

LEED

- LEED – Leadership in Energy and Environmentally Design
- Green Building Rating System
- Covers whole buildings and their exteriors, not individual parts of buildings

WWW.NRMCA.ORG
Environmental Impact of Buildings

- Buildings in the United States contribute 38.1 percent of the nation’s total carbon dioxide emissions, including 20.6 percent from the residential sector and 17.5 percent from the commercial sector.

Concrete vs. Asphalt

- Life cycle analysis on concrete and asphalt roadways.
- Compared embodied energy and global warming potential for construction and maintenance over a 50-year life cycle.
- For a high volume highway:
  - Asphalt pavement required 3 times more energy than concrete pavement.
  - Asphalt generated global warming potential of 738 t/km of CO₂ equivalents compared to 674 t/km for concrete.

Average Savings of Green Buildings

- Energy Savings: 30%
- Carbon Savings: 35%
- Water Use Savings: 50-50%
- Waste Cost Savings: 50-90%

LEED NC (New Construction)

Buildings are certified, not materials, products, companies, or individuals.

LEED Certification

<table>
<thead>
<tr>
<th>Certification Levels</th>
<th>Points Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>Certified</td>
<td>26-32 Points</td>
</tr>
<tr>
<td>Silver</td>
<td>33-38 Points</td>
</tr>
<tr>
<td>Gold</td>
<td>39-51 Points</td>
</tr>
<tr>
<td>Platinum</td>
<td>52-69 Points</td>
</tr>
</tbody>
</table>
**LEED® Categories**

- Sustainable Sites 22%
- Water Efficiency 6%
- Energy & Atmosphere 27%
- Materials & Resources 20%
- Indoor Environmental Quality 23%

**Stormwater Management**

**Sustainable Sites Credit 6.1**

- Limit disruption and pollution of natural water flows by managing stormwater runoff

  - Option 1: If existing imperviousness is less than 50% then maintain existing discharge rate
  - Option 2: If existing imperviousness is more than 50% then decrease discharge rate by 25%

**Stormwater Management**

- Promote natural infiltration
- Minimize impervious surfaces
  - Green roofs
  - Pervious pavements

**Pervious Concrete**

- 15-30% voids
- Rainwater percolates through the slab
- Minimizes runoff to surrounding streams and lakes
- Functions like retention basins
- Recharges groundwater supplies

**Water Efficient Landscaping**

- Limit the use of potable water for landscape irrigation
  - Potable water for irrigation must be reduced by 50%
- The gravel sub-base under pervious concrete can be used to store stormwater for irrigation.

**Pervious Pavement Profile**
Heat Island Effect (non-roof)

Sustainable Sites Credit 7.1
- Reduce heat islands
- Option 1: Provide any combination of the following for 50% of the site hardscape
  - Shade (within 5 years of occupancy)
  - Paving materials with a Solar Reflectance Index (SRI) of at least 29
  - Open grid paving system for 50% of parking area
- Option 2: Place a minimum of 50% of parking spaces under cover where roof has an SRI of at least 29

Heat Island Effect (Green Highways)

Light Pollution Reduction

Sustainable Sites Credit 8
- Reduce impact on night sky
- Interior Lighting: Angle of maximum candela shall not exit out through windows
  - OR – All non-emergency lighting shall be automatically controlled to turn off during non-business hours
- Exterior Lighting: In addition to interior lighting requirements, only light areas required for safety and comfort.

Reduced Light Pollution

- 30% fewer fixtures can produce the same level of lighting on concrete compared to asphalt

Regional Materials

Materials & Resources Credit 5.1 and 5.2
- Increase demand for materials within region
- Based on value (cost) of materials
- Worth 1 point for 10% manufactured regionally within a radius of 500 miles
- Worth 2 points if 20% of regionally manufactured materials are also extracted, harvested, and recovered with 500 miles

Recycled Content

Materials & Resources Credit 4.1 and 4.2
- Increase demand for recycled products
- Post-consumer + ½ post-industrial
- Based on value (cost) of materials

Innovation in Design

- Reduction of CO₂ by 40%
- Increase use of SCMs such as fly ash and slag

Benefits of LEED Certification

- Minimizes environmental impact
- Projects a positive image
- Energy cost savings
- Increased labor productivity
- Tax credits in some cities and states
- Higher rents for green buildings
Summary

- U.S. Green Building Council (USGBC)
  - Developer and administrator of the LEED® Green Building Rating System
- LEED® - A leading-edge system for designing, constructing, operating and certifying the world’s greenest buildings.
- LEED® Categories:
  - Sustainable site planning
  - Safeguarding water and water efficiency
  - Energy efficiency and renewable energy
  - Conservation of materials and resources
  - Indoor environmental quality
- CONCRETE - Is a major contributor to earning points necessary for LEED® Certification.

Additional Information

www.nrmca.org
www.rmc-foundation.org
www.ecco.org
www.usgbc.org

Questions?