Applying Green
Site, Infrastructure & Building Design

Luke Leising
Sustainability Director
AIA, EI, LEED AP

- Sustainable Site Design
- Green Architecture
- Infrastructure Design
- Water & Wastewater Facilities
- LEED Existing Buildings
- LEED Consulting
- Environmental Engineering

Indiana Chapter USGBC
http://chapters.usgbc.org/indiana
PERCEPTION
REALITY
What is Green?

Green . . .

Environmentally Friendly . . .

High Performance . . .

Sustainable . . .

“Sustainable design meets the needs of the present generation without compromising the ability of future generations to meet their own needs.”

United Nations General Assembly, the Brundtland Commission
What is Green?

Green Principles

1. Reduce energy use
   • high efficiency

2. Conserve resources
   • benefit the environment
   • use and encourage recycling

3. Promote the health of users
   • walking/biking
   • air quality
LEED® The Leadership in Energy and Environmental Design (LEED®) a third party green building rating system™

– United States Green Building Council (USGBC)

LID Low Impact Development, “comprehensive land planning and engineering design approach with a goal of maintaining and enhancing the pre-development hydrologic regime of urban and developing watersheds.”

– Low Impact Development Center (LIDC)

LID & LEED are not the same
What is LEED®?
immediate & measurable

LEADERSHIP in ENERGY and ENVIRONMENTAL DESIGN

A leading-edge system for certifying DESIGN, CONSTRUCTION, & OPERATIONS of the greenest buildings in the world

John M. Langston High School
Arlington, VA
Levels of LEED® Ratings

LEED® has four levels

- **Platinum**: Points based system
- **Gold**: Third Party Verified
- **Silver**: Consensus based
- **Certified**: Recognized standard
Sections of LEED®?

Scores are tallied for different aspects of efficiency and design in appropriate categories.

1. Site Planning
2. Water Management
3. Energy Management
4. Material Use
5. Indoor Environmental Air Quality
6. Innovation & Design Process
What is a Low Impact Design?

An approach to designing stormwater management systems that:

• strives to mimic pre-development hydrologic processes
• integrate multi-use functionality into site design
• minimize cumulative impacts of watershed alteration.

Copy what works in Nature
Why does LID matter?

• Potential to lower costs (construction, maintenance, operation)
• Addresses Clean Water Act regulations, and flood control needs at a site level
• Reduces Combined Sewer Overflows (CSOs)
• Helps decrease downstream impacts
• Improves/increases local habitats
• Potential for more usable area on a site
How does LID work?

The Ideal result is to Maintain/ or Restore:

• Storage Volume
• Infiltration Volume
• Evapotranspiration Volume
• Runoff Volume
• Original flow paths

Achieved through de-centralized, distributed, disconnected, multi-functional areas.

“Hydrology as the Organizing Principle”
LID Examples

Rain Gardens & Bio-Swales

Photos Courtesy of Kevin Perry
Glencoe Elementary School
LID Examples

Street Tree Filters

Photos Courtesy of Kevin Perry
SW 12th Avenue Green Street
LID Examples

Permeable Surfaces
LOW IMPACT DESIGN DATA

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Site Area</td>
<td>13.96 acres</td>
<td></td>
</tr>
<tr>
<td>Parking Provided</td>
<td>900</td>
<td>spaces</td>
</tr>
<tr>
<td>Impervious Area</td>
<td>10.06 acres</td>
<td></td>
</tr>
<tr>
<td>Pervious Area</td>
<td>3.89 acres</td>
<td></td>
</tr>
<tr>
<td>Bldg. sft @ 3.5/1000:</td>
<td>257,143 sft</td>
<td></td>
</tr>
<tr>
<td>Bldg. sft @ 4.0/1000:</td>
<td>225,000 sft</td>
<td></td>
</tr>
<tr>
<td>Max sft per acre</td>
<td>18,419 sft</td>
<td></td>
</tr>
</tbody>
</table>

SITE - LOW IMPACT DESIGN

STRUCTUREPOINT INC.
Summary

Green Principles
1. Reduce energy use
2. Conserve resources
3. Promote the health of users

Challenge to LID is the ability to implement:
- Zoning regulations
- City/county engineering requirements
- Lack of understanding, i.e. calculation

Low Impact Development
LEED® as a design tool
Establish Goals
- energy reduction
- reduce runoff
Applying Green

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AMERICAN STRUCTUREPOINT INC.

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