

Applying Green

Site, Infrastructure & Building Design



AMERICAN
STRUCTUREPOINT
INC.

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

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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® & LID?

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

Site
Planning

Indoor
Environmental
Quality

Water
Management

Material
Use

Waste
Management



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

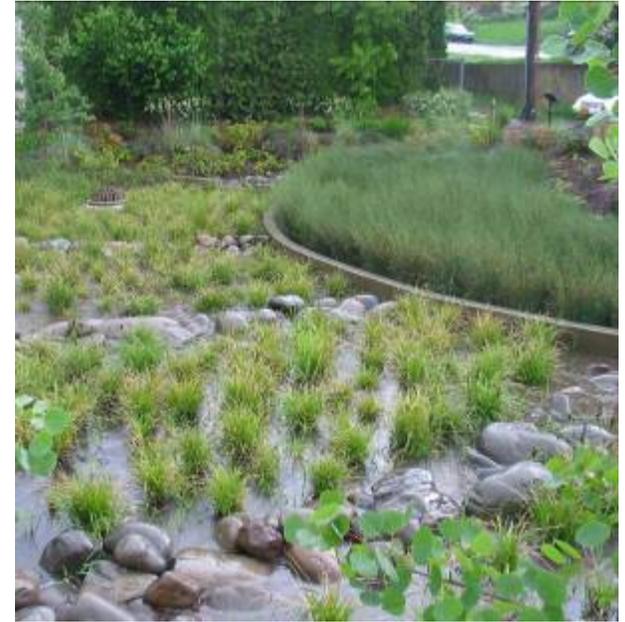
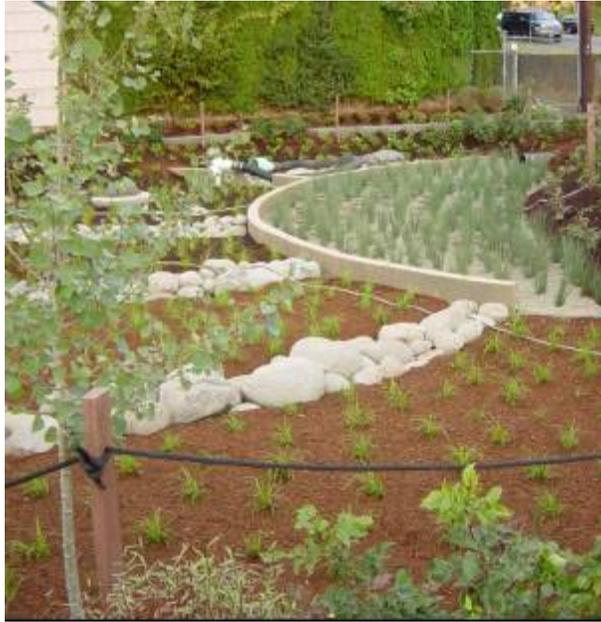
Achieved through de-centralized, distributed, disconnected, multi-functional areas.



“Hydrology as the Organizing Principle ”

LID Examples

Rain Gardens & Bio-Swales

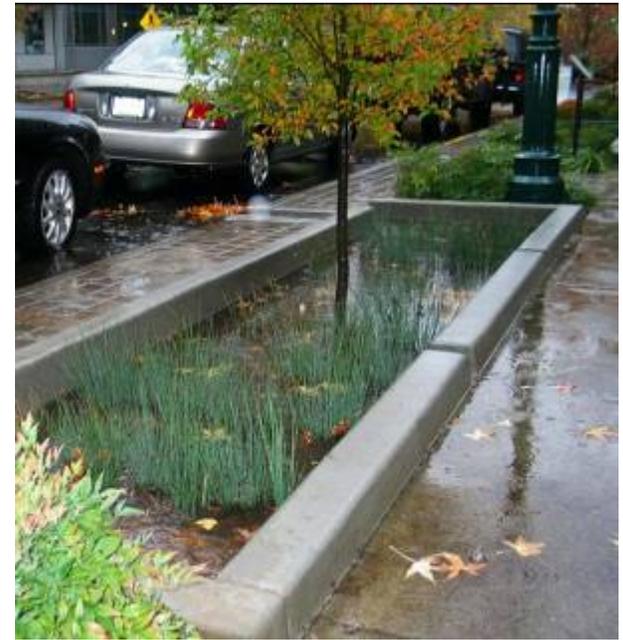


Photos Courtesy of Kevin Perry
Glencoe Elementary School



LID Examples

Street Tree Filters



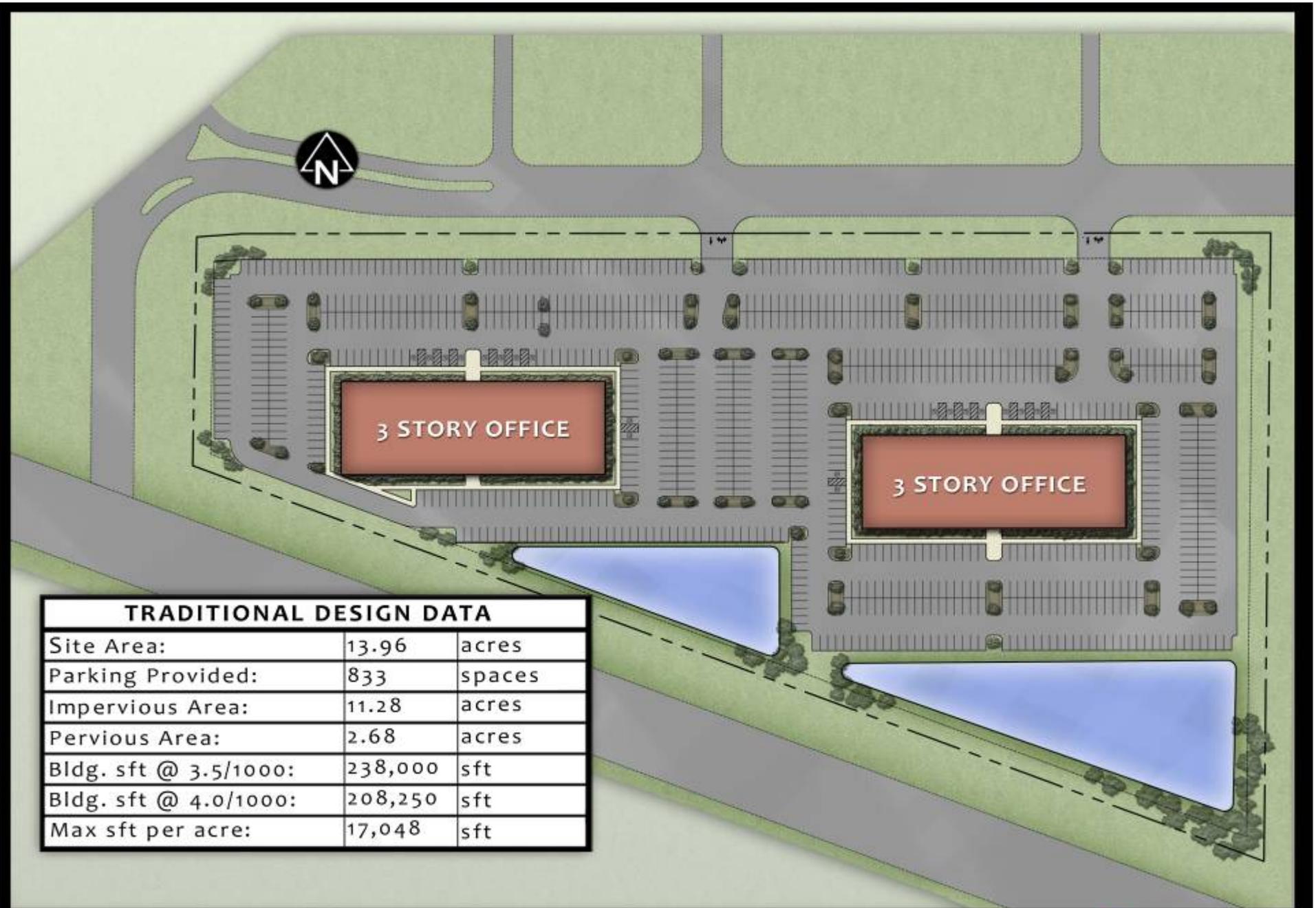
Photos Courtesy of Kevin Perry
SW 12th Avenue Green Street



LID Examples

Permeable Surfaces





TRADITIONAL DESIGN DATA		
Site Area:	13.96	acres
Parking Provided:	833	spaces
Impervious Area:	11.28	acres
Pervious Area:	2.68	acres
Bldg. sft @ 3.5/1000:	238,000	sft
Bldg. sft @ 4.0/1000:	208,250	sft
Max sft per acre:	17,048	sft

SITE - TRADITIONAL DESIGN

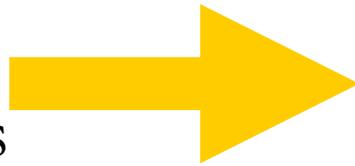


LOW IMPACT DESIGN DATA		
Site Area:	13.96	acres
Parking Provided:	900	spaces
Impervious Area:	10.06	acres
Pervious Area:	3.89	acres
Bldg. sft @ 3.5/1000:	257,143	sft
Bldg. sft @ 4.0/1000:	225,000	sft
Max sft per acre:	18,419	sft

Summary

Green Principles

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



Low Impact Development

LEED® as a design tool

Establish Goals

- energy reduction
- reduce runoff

Challenge to LID is the ability to implement:

- Zoning regulations
- City/county engineering requirements
- Lack of understanding, i.e. calculation



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