LEED, LID and BMPs in the Redevelopment of a Midwestern Urban Campus

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Theory and Practice

Southfield
Campus Map

- Southfield, Michigan
- Founded in 1932
- 120-acre campus
- 4,300 students
- Colleges of:
  - Architecture and Design,
  - Arts and Sciences,
  - Engineering, and
  - Management
Planning Considerations

- Campus Access and Identity
- Stormwater and Wetlands
- Open Space System
- Vehicular Circulation and Service Access
- Surface Parking
- Pedestrian Circulation
- Utility Corridors
- Potential Building Sites
- Maintenance & Effectiveness
Project Locations
Thanks!

Questions?

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http://www.ltu.edu/stormwater/index.asp
Main Campus

- A: Green roof
- B: Bioretention
- C: Bioswale
- D: Porous Pavers
- E: Stormwater Treatment Wetland
- F: Naturalized Detention
- G: Riparian Buffer
- H: Cistern
Athletic Fields

E: Stormwater Treatment Wetland
Green Roof

Definition
- A green roof consists of vegetation and soil, planted over a waterproofing membrane. They can be either extensive or intensive.

LTU Project
- 10,000 sq ft extensive green roof designed by Hydrotech.
- Research project to determine the long term effectiveness with regards to water quality and quantity (USEPA and LTU COE).

Maintenance = Medium (2 years) / Low

Effectiveness = High
**Bioretention/Rain Gardens**

**Definition**
- Natural or excavated depression backfilled with engineered fill media designed to capture, filter, and store storm water.

**LTU Project**
- Installed two bioretention cells as catch basin retrofits using difference planting mixtures.
- Research project to determine the long term effectiveness with regards to water quality and quantity (USEPA - RPO)
- Two additional retrofits per year.

**Maintenance = Medium/High**

**Effectiveness = Medium/High**
Bioswale

Definition
- A long narrow channel, planted with a variety of trees, shrubs, and grasses over permeable soils. Stormwater runoff from impervious surfaces is directed through the swale to filter pollutants and promote infiltration.

LTU Project
- A circular bioswale was installed around the campus quadrangle

Maintenance = Medium

Effectiveness = Medium
Porous Pavers

Definition
• Concrete pavers that provide a solid surface but allow natural drainage and migration of water into the earth by permitting water to drain through spaces. Pavers provide the same advantages as traditional concrete pavers with additional water quality benefits.

LTU Project
• Installation of a dining patio completed in June, 2008 using Unilock Uni-Ecostone interlocking pavers.

Maintenance = Low

Effectiveness = Medium/High
**Riparian Buffer/Grow Zone**

**Definition**
- A riparian buffer or grow zone is an area of native plantings located adjacent or close to receiving waters that improve water quality through filtering and infiltration.

**LTU Project**
- Future projects include implementing several grow zones in 2009 & 2010 adjacent to tributaries of the Rouge River. This will minimize maintenance, enhance aesthetics, and increase water quality within the nearby creek.

**Maintenance** = Low

**Effectiveness** = Medium
Cistern

Definition
• An underground retention facility that holds storm water for reuse.

LTU Project
• A 10,000 gallon cistern that captures excess roof water from student services center for gray water reuse.

Maintenance = Very Low

Effectiveness = High
Porous Pavement

Definition
- Pavement (concrete or asphalt) consisting of traditional structural materials with regularly interspersed void areas that allow drainage.

LTU Project
- Long term future plan includes repaving South Housing parking lot with porous pavement and porous pavement being used for any newly constructed parking areas.

Maintenance = Medium

Effectiveness = Medium/High
Stormwater Treatment Wetlands

Definition
• Wetland systems that are designed to maximize the removal of pollutants from stormwater runoff through settling and both uptake and filtering vegetation. Constructed stormwater wetlands temporarily store runoff in relatively shallow pools that support conditions suitable for the growth of wetland plants.

LTU Project
• Long term plans to construct one or more treatment wetlands on campus as part of stormwater retrofits.

Maintenance = Medium
Effectiveness = High
Naturalized Detention

Definition
• Stormwater control facilities that are planted with native vegetation rather than maintained as lawn to improve water quality. Both detention basins, where the water drains out completely between storms, and retention or wet basins can be naturalized.

LTU Project
• An extended detention basin completed in 2001 was constructed with natural grasses lining the bottom.

Maintenance = Low/Medium

Effectiveness = Medium