



# Green Infrastructure & Stormwater Management CASE STUDY

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## West Campus Urban Stormwater Management Project

**Location:** Lawrence, KS

**Client:** University of Kansas

**Design Firm(s):** Landworks Studio

**Landscape architect/Project contact:** Marion Paulette, ASLA

**Email:** [marion@ku.edu](mailto:marion@ku.edu)

**ASLA Chapter:** Prairie Gateway

### Project Specifications

**Project Description:** The West Campus Urban Stormwater Management Project is a green infrastructure initiative located on the University of Kansas campus in Lawrence. The project is designed to capture stormwater runoff through bioretention swales, natural channels and native vegetation. The channels, planted with native plants, will slow the water and remove pollutants from the runoff, capture water on site, and allow it to percolate into the soil. Additionally this functional open space connects the research buildings and satellite parking via accessible sidewalks and promotes the opportunity for interaction among building occupants. The project provides a focal point, sense of place and amenity for the developing West Campus. The native and naturalized vegetation will require less maintenance once established, less water and fewer chemicals to thrive and will increase the natural diversity of the site. Economic resources are being directed towards sustainable practices that will generate long term environmental and social benefits.

#### Project Type:

Institutional/education

Part of a new development

**Design features:** Bioretention facility, rain garden, and bioswale.

**This project was designed to meet the following specific requirements or mandates:** To meet funding criteria, developer/client preference

**Impervious area managed:** 1 acre to 5 acres

**Amount of existing green space/open space conserved or preserved for managing stormwater on site:** 1 acre to 5 acres

**The regulatory environment and regulator was** supportive of the project.

**Did the client request that other factors be considered, such as energy savings, usable green space, or property value enhancements?** The project will provide a focal point, sense of place and amenity for the developing West Campus. The native and naturalized vegetation will require less maintenance, less water and fewer chemicals to thrive and will increase the natural diversity of the site. Economic resources are being directed towards sustainable practices that will generate long term environmental and social benefits. Enhancing this open space with pedestrian paths, walks and future seating will create a useable and attractive environment within the southern portion of West Campus. The space unifies the variety of architectural styles and provides a lush setting for the buildings.

### **Cost & Jobs Analysis**

**Estimated Cost of Stormwater Project:** \$100,000-\$500,000 (Public funding: Federal, state - ARRA funds as a low-interest loan from the Kansas Department of Health and Environment)

#### **Related Information:**

- \$25,000 Design
- \$160,000 Construction including grading, sidewalks, retaining walls and plants
- \$25,000 Planting labor

**Was a green vs. grey cost analysis performed?** No

**Cost impact of conserving green/open space to the overall costs of the site design/development project:** The cost to create the bioswales and rain garden was less than constructing a traditional storm sewer system to handle the water.

**Cost impact of conserving green/open space for stormwater management over traditional site design/site development approaches (grey infrastructure)?** Slightly reduced costs (1-9% savings).

**Number of jobs created:** No new jobs were created by this project

#### **Job hours devoted to project:**

Planning and Design: 300

Construction: 1,175 excludes planting

Annual Maintenance: 220 after establishment (estimate)

## Performance Measures

### Stormwater reduction performance analysis:

Ten percent of the 9.75 acre drainage area runoff will be retained on site during a 2-year storm event. The rain gardens provide 9,450 sq/ft of ponding area with a depth of 12 inches.

**Community & economic benefits that have resulted from the project:** This project will benefit the University and City of Lawrence improving the environment and reducing stormwater entering the constructed storm system, providing savings for utility construction and maintenance. The incorporation of native plantings and vegetated bioretention swales allowing rainwater to filter into the soil will require less ongoing maintenance for plants as well as infrastructure. Native plants will also create habitat and increase diversity of the landscape. Prior to the construction of this project a small vegetated swale had been constructed and planted in this vicinity. It soon became evident that the design and plant selection were not producing the desired result. Plants adapted to wet conditions and that have the root structure to hold the soil during periods of heavy rain are essential. The design and location of the channel is also critical, otherwise the water will find the path of least resistance to the lowest point.

## Additional Information

The bioswale feature is an educational opportunity, likely to interest students and faculty in the surrounding buildings, those studying civil engineering, architecture, environmental studies, and plant sciences, as well as school groups and the public. No funding is available now for informational signage, but the plan is to add them at a later date.