# Green Infrastructure & Stormwater Management
# CASE STUDY

## Bioswales and Rain Gardens

**Location:** Naples Botanical Garden, Naples, FL
**Client:** Naples Botanical Garden
**Design Firm(s):** GOETZ+STROPES LANDSCAPE ARCHITECTS INC.
**Landscape architect/Project contact:** Ellin Goetz, FASLA
**Email:** egoetz@gsnaples.com
**ASLA Chapter:** Southwest Florida

Photo: GOTEZ+STROPES LANDSCAPE ARCHITECTS, INC.

### Project Specifications

**Project Description**: Stormwater design system for parking and entry of 160-acres botanical garden. It incorporates vegetated bioswales filtering runoff with parking areas connected via piping to rain garden environment at entrance. The rain garden and bioswales utilize native plantings tolerant of seasonal wet conditions to filter rainwater before it is returned to site lakes.

Site lakes are used for irrigation source for developed portions of site. Over 190,000 annual visitors learn about this system.

**Project Type**:
Open space - garden/arboretum
Part of a new development

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

**This project was designed to meet the following specific requirements or mandates:**
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. We designed wider medians (12') separating bays of parking with retaining walls 30" deep below the parking surface; sheet flow enters bioswales, flows underground via piping to the entrance area with vegetated rain garden containing water until it achieves higher elevation where drain pipe takes it back to site lake.

**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?** No.

## Cost & Jobs Analysis

**Estimated Cost of Stormwater Project:** $500,000-$1,000,000 (Public funding: None, non-profit raised funds for this project)

**Related Information:**

- Entry Drive and Parking for 240 cars/7 buses $250,000
- Bioswales $150,000
- Stormwater Pipes $80,000
- Plantings $100,000

**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:** Long term landscape management costs radically reduced by native plant community design; bioswale construction costs at front end much higher than traditional stormwater design.

**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:** 10

**Job hours devoted to project:**

Planning and Design: 200
Construction: 1,000
Annual Maintenance: 24

## Performance Measures

**Community & economic benefits that have resulted from the project:** Naples Botanical Garden has over 190,000 visitors annually who travel to the site, park in the lots, walk past the bioswales and have the rain garden interpretation as the first experience at the entry; importance of water and how we can handle with positive environmental and economic benefits is front and center to the visit. They learn about a revolutionary way to handle stormwater.

## Project Recognition

FNGLA 2010 Award of Excellence; Urban Land Institute, Southwest Florida Chapter, 2010 Impact Award

## Additional Information

**Links to images:** www.gsnaples.com

Naples Botanical Garden by Goetz+Stropes Landscape Architects