



Green Infrastructure & Stormwater Management CASE STUDY

Common Grounds Community Center Drainage Improvements

Location: Omaha, NE

Client: City of Omaha Public Works Environmental Quality Division

Design Firm(s): Community ReDesigned

Landscape architect/Project contact: Thomas Bentley, ASLA

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ASLA Chapter: Great Plains

Project Specifications

Project Description: The project was a mitigation effort to a 200 LF open channel swale receiving discharge from a 36" culvert outlet conveying an estimated 25-acre watershed. Conventional stone rip-rap stabilization during initial construction failed and a scoured cut nearing 12' in depth and increasing had occurred. Project implemented a series of weir drop down structures preceded with native grass vegetation within each bay. Entire swale received geosynthetic cellular erosion protection type product. The goal of the project is to reduce the velocity of the stormwater discharge and decrease volume through bio-infiltration prior to entering existing sewer drop structure at the outfall of the swale. A naturalized solution was implemented at the headwall of the culvert via soil wrapped in coir (coconut fiber) matting and planted in regionally native thicket forming shrub varieties to hold the embankment. Recycled glass porous pavement was implemented as an interpretive area overlooking the swale to educate on the stabilization and infiltration strategies within the renovated conveyance system.

Project Type:

Civic recreation facility

A retrofit of an existing property

Design features: Rain garden, poured recycled glass porous pavement in lieu of pavers, and naturalized culvert headwall bank stabilization.

This project was designed to meet the following specific requirements or mandates:

None other than eminent erosive damage to pavement and infrastructure

Impervious area managed: greater than 5 acres

Amount of existing green space/open space conserved or preserved for managing stormwater on site: 5,000 sq/ft to 1 acre

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: \$50,000-\$100,000 (Public funding: State, local - partially funded by a natural resource district grant and balance by City operating funds)

Related Information: Total project cost \$69,585. Break out information not available from contractor schedule of values. Labor, materials, and equipment per schedule lumped together for aggregate cost values. Unit costs of materials can be projected based on consultant opinion of cost but is regionally specific. Examples: Common Earthwork: \$2/CY, Buffalograss/Sheeps Fescue Sod \$0.65/SF, Specially pre-grown native switchgrass sod, \$3.50/SF, Filterpave recycled glass porous paving \$7.50/SF, Geosynthetic soil stabilizing products per North American Green product cost sheet.

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: This project not totally applicable to the specific question; however, the mitigation to the conveyance swale was required as the erosive activity was encroaching upon an existing parking lot bay of 30 stalls and had exposed a 4" high voltage electrical conduit. What the project achieved was avoidance of increased costs should the parking area or conduit been compromised.

Cost impact of conserving green/open space for stormwater management over traditional site design/site development approaches (grey infrastructure)? Grey infrastructure costs were not compared. Hard piping entire swale was not an available alternative to consider and soil stabilization to prevent further erosion leads to a green solution as opposed to concreting the flowline.

Number of jobs created: 0

Job hours devoted to project:

Planning and Design: 80 +/-

Construction: 300+/-

Annual Maintenance: Projected less than 50 during yrs 1-3, less than 10 after

Performance Measures

Stormwater reduction performance analysis:

Information not available. No pre-existing stormwater discharge volumes historically recorded to compare against established bioinfiltration. No reduction to contributing watershed projected.

Community & economic benefits that have resulted from the project: Enhancement to existing facility with a prairie aesthetic bordering the street frontage. Education and interpretive benefits to green solutions in a community currently undergoing a Combined Sewer Outfall mandate with a component of green solutions to compliment grey infrastructure CSO solutions.

Additional Information

Links to images: Project photographs available via direct email upon request to the Landscape Architect.

The primary promotion of the project was to be an example of mitigating failed swale and channel conditions in an open conveyance system within a suburban/urban setting.