



Green Infrastructure & Stormwater Management CASE STUDY

St. Mary's Greek Orthodox Church Site improvements

Location: Minneapolis, MN

Client: St. Mary's Greek Orthodox Church

Design Firm(s): Solution Blue, Inc.

Landscape architect/Project contact: Mitchell Cookas, Associate ASLA; Stephen Wensman, RLA; John Hink

Email: mcookas@solutionblue.com

ASLA Chapter: Minnesota



Photo: Solution Blue, Inc.

Project Specifications

Project Description: This project included several site improvements (parking lots, walkways, landscape beds, irrigation system) and new stormwater BMPs for the Church's existing 3.5-acre campus. Design used existing flat rooftops for detention, five subsurface soy-based plastic storage chamber systems, one subsurface corrugated metal infiltration reservoir, one turf infiltration basin, one turf detention basin, five rain garden bioretention basins, and 3,550 sq. ft. of permeable pavers. The site maintains peak discharge rates and volumes for pre-development conditions for up to the 100-year (6.0") 24-hour storm event. In addition, the as-

built BMPs were built and documented to show reduced peak discharge rates and retain 100% of runoff volumes (compared to the pre-settlement conditions) for the 10-year (4.2") 24-hour rain event.

Project Type:

Institutional/educational

A retrofit of an existing property

Design features: Bioretention facility, rain garden, bioswale, downspout removal, porous pavers, and existing flat rooftops for rainwater detention storage.

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

State statute, county ordinance, local ordinance, 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? Yes, the Church wanted relief of their "Stormwater Fee" paid to the City of Minneapolis. Upon completion of construction, they were relieved of 100% of this "Stormwater Fee" (First owner ever to achieve 100% reduction of City fee). Also, the Church wanted a significant amount of usable space for their annual community festivals and programs.

Cost & Jobs Analysis

Estimated Cost of Stormwater Project: \$500,000-\$1,000,000 (Public funding: Regional)

Related Information: Labor - \$244,000 Materials - \$373,000 Equipment - \$167,000 Permits - \$8,400 Testing - \$7,100 Design/Eng - \$60,900

Was a green vs. grey cost analysis performed? Yes, the green cost was approximately \$60,000 more than grey. The client was paying in excess of \$10,000 per year for their "Stormwater fees," therefore, when this improvement allowed a waiver of 100% of those fees, a 5-year ROI on this investment was achieved. The "Stormwater fees" are waived in perpetuity.

Cost impact of conserving green/open space to the overall costs of the site

design/development project: The cost impact was minimal because the condensed stormwater BMPs were effectively incorporated into the overall green/open space and landscape amenities. The compact landscape BMPs minimized cost impacts.

Cost impact of conserving green/open space for stormwater management over traditional site design/site development approaches (grey infrastructure)? Slightly increased, although the cost very slightly increased, the resulting aesthetic benefits were a vaulted asset.

Number of jobs created: no new jobs

Job hours devoted to project:

Planning and Design: 400

Construction: 3,600

Annual Maintenance: 20

Other: 10

Performance Measures

Stormwater reduction performance analysis:

Project resulted in a significant reduction in stormwater runoff rates of discharge

and volume. The volume of water leaving the site for the 100-year storm event has been reduced by over 54% when you compare the pre-project conditions to the as-built construction. For the "first flush" events (1-1/4") the volume of water leaving the site has been reduced by over 96%, resulting in a significant reduction in pollutant loading for Total Suspended Solids and Phosphates.

Community & economic benefits that have resulted from the project: Significant improvement to neighborhood aesthetics. Property is along Minneapolis Chain of Lakes park system and is highly visible. The Property has become a valuable resource, and serves as a model for light imprint design and engineering.

Project Recognition

Minnehaha Creek Watershed District – Low Impact Development cost-share grant (\$211,000)

2011 Watershed Heroes Award for "Excellence in Development" – Minnehaha Creek Watershed



Photo: Solution Blue, Inc.

Additional Information

Links to images: <http://solutionblue.com/heading30page34.html>

Project recycled asphalt from old parking lots and re-used as gravel base for new parking lots. Designed rain gardens to re-use stormwater runoff as an irrigation resource. Installed storage chambers made from soy-based resin (vs. petroleum-based). Utilized compost in rain gardens from local Minneapolis yard waste. Enabled infiltration in all stormwater features to reduce the amount of pollutants reaching Lake Calhoun, recharge groundwater supplies, and decrease the burden on City storm sewers.