



# Green Infrastructure & Stormwater Management CASE STUDY

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## 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, John R. Hink

**Email:** [jhink@solutionblue.com](mailto:jhink@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 systems) 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 storage 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 the 1-year, 2-year, 10-year and 100-year 24-hour storm events. In addition, the

as-built BMPs have been built to lower peak discharge rates and volumes for the pre-settlement conditions for the 10-year, 24-hour rain event.

**Project Type:**

Institutional/education

A retrofit of an existing property

**Design features:** Bioretention facility, rain garden, bioswale, downspout removal, porous pavers, and existing flat roof tops 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, they wanted 100% relief from the stormwater fees of the city of Minneapolis. They have been relieved of this fee 100%. And 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 thousand dollars more than grey. The client was paying in excess of \$10,000 per year in stormwater fees, therefore when this improvement allowed a waiver 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 incorporated into the overall green/open space and a landscape amenity. The compact landscape BMP 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 Grant

### Additional Information

**Links to images:** [www.solutionblue.com/heading30page34.aspx](http://www.solutionblue.com/heading30page34.aspx)

Project recycled asphalt from old parking lots and re-used as gravel base for new lots. Designed rain gardens to re-use stormwater runoff as 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



Photo: Solution Blue, Inc.

amount of pollutants reaching Lake Calhoun, recharge groundwater supplies, and decrease the burden on City storm sewers.



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