



# Green Infrastructure & Stormwater Management CASE STUDY

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## Student Wellness Center Addition

**Location:** Duluth, MN

**Client:** Saint Scholastica College

**Design Firm(s):** Toltz, King, Duvall and Anderson (TKDA)

**Landscape architect/Project contact:** Rich Gray ASLA, Jeffrey Zeitler, ASLA

**Email:** [richard.gray@tkda.com](mailto:richard.gray@tkda.com)

**ASLA Chapter:** Minnesota

## Project Specifications

**Project Description:** The College is sited on a hill overlooking Lake Superior in Duluth, Minnesota. It is also immediately adjacent to Chester Creek, a designated trout stream. Due to the temperature sensitive nature of trout, special provisions were incorporated into the stormwater treatment improvements to enhance water quality and cool stormwater runoff prior to entering the Chester Creek. A combination of methods were used to create a 'treatment train' to infiltrate what was possible, and cool the rest of the water before it reached the stream. In addition, peat filter beds were used to imitate the natural cooling process often found in parts of northern Minnesota. The final design used a variety of methods to infiltrate and cool the water, including pervious asphalt on the lowest parking lot, extensive use of shade trees over the remaining impervious lots, planted detention/infiltration areas (rain gardens) skimmers, underdrains, and the sand/peat treatment filters mentioned above.

### Project Type:

Institutional/education

Part of a redevelopment project

**Design features:** Rain garden, porous pavers, and porous asphalt (not pavers), skimmers, underdrains, peat beds and a stilling pond and rain gardens were connected in a series of treatment methods to clean and cool the water before it entered Chester Creek, a designated trout stream..

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

State statute, local ordinance

**Impervious area managed:** 1 acre to 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?** The client wished to preserve and enhance the college campus environment. This meant keeping green space, and adding it in strategic places when possible.

## Cost & Jobs Analysis

**Estimated Cost of Stormwater Project:** \$100,000-\$500,000 (Public funding: project was entirely funded by a private 4-year college)

**Was a green vs. grey cost analysis performed?** Yes, the cost of pervious vs. traditional impervious asphalt was compared. Pervious was about 40% more expensive, largely due to the difficulty of finding local contractors willing and able to perform the work.

**Cost impact of conserving green/open space to the overall costs of the site design/development project:** It was more expensive, but the project would not have been permitted if special measures weren't taken beyond the typical stormwater management and treatment requirements.

**Cost impact of conserving green/open space for stormwater management over traditional site design/site development approaches (grey infrastructure)?** Slightly increased.

**Number of jobs created:** Not available

**Job hours devoted to project:**

Planning and Design: 200

Construction: 400

Annual Maintenance: 24

Other:

## Performance Measures

**Stormwater reduction performance analysis:**

100% of the water would be treated in a 2-year storm. A 100-year storm was used to model the runoff from the project area. All water would either be infiltrated, or treated extensively and cooled before gently discharging into the trout stream.

**Community & economic benefits that have resulted from the project:** Protection of a valuable local natural resource that allows trout fishing within the Duluth city limits. Cold trout streams are an important part of the ecology of Northern Minnesota and also a draw for tourists, providing an important economic benefit.

### **Additional Information**

**Links to images:** I don't have any linkable files that are in the public domain. However, I am willing to send a nifty graphic that I put together showing how the entire treatment train works. I also have some project photos, but none showing the site at present. I can e