



# Green Infrastructure & Stormwater Management CASE STUDY

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## Medical Center of the Rockies

**Location:** Loveland, CO

**Client:** Poudre Valley Health System

**Design Firm(s):** BHA Design (LA), Martin/Martin (Civil)

**Landscape architect/Project contact:** Angela Milewski, ASLA

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**ASLA Chapter:** Colorado



Photo: BHA Design Incorporated

## Project Specifications

**Project Description:** As a new major heart and trauma hospital, Medical Center of the Rockies was designed as a facility to provide world-class healthcare in a unique design that would join site and building in a single composition. The stormwater conveyance and detention facilities were designed as an integral part of a zoned, naturalistic landscape concept which embraced the natural Colorado landscape and helped achieve site credits toward achieving LEED Gold project certification. The resulting benefits included reduced irrigation water use, improved wildlife habitat and stormwater quality, and a restorative natural setting for users.

**Project Type:**

Institutional/education  
Part of a new development

**Design features:** Stormwater conveyance and detention facilities.

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

Local ordinance, NPDES

**Impervious area managed:** greater than 5 acres

**Amount of existing green space/open space conserved or preserved for managing stormwater on site:** greater than 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?** The stormwater improvements were part of an overall design for this new hospital facility. The project as a whole sought and received LEED Gold certification, so the improvements were part of a comprehensive design focused on sustainability. In addition, the pond areas are located flanking the main entrance to this regional destination medical facility, so the expectations for visual aesthetics were high. The pond areas were designed to promote water quality, but also to improve wildlife habitat and to provide a recreational benefit to hospital staff.



Photo: BHA Design Incorporated

**Cost & Jobs Analysis**

**Estimated Cost of Stormwater Project:** \$1,000,000-\$5,000,000 (Public funding: Not available )

**Related Information:** Estimate only - stormwater improvements were a part of the site improvements for an overall \$350,000,000 hospital project. No specific cost breakdown readily available.

**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:** Conserving larger amounts of open space helped to reduce the construction costs of the project (on-grade drainage treatments vs. piped infrastructure), but also overall reduced the amount of land available for 'development'.

**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). Difficult to specify actual amounts, but both short-term and long-term cost savings by use of natural systems to filter stormwater in lieu of implementing a mechanical system that potentially would have higher maintenance and replacement costs

**Number of jobs created:** Not available

**Job hours devoted to project:** Not available

Planning and Design: Not available

Construction: Not available

Annual Maintenance: Not available

## Performance Measures

**Stormwater reduction performance analysis:**

The storm drainage improvements were designed by the civil engineer. Each detention pond was designed with a 3-stage release structure to release the smallest storms through highly restrictive orifice plates designed to slowly release the pond over 48-hours. This was included in an effort to allow suspended solids and pollutants to settle out of the stormwater prior to release into the adjacent irrigation canal. The 3-stage release structure also included outlet control for the minor and major storm events (2-year and 100-year respectively) to protect downstream channels from erosion and flooding. In our case, we were more restricted than a typical project as our 100-year storm event was released from the project site at the 2-year historic release rate promoting wetland type growth in the ponds, increased sediment removal and significantly decreased the risk of downstream erosion in the receiving channel.

**Community & economic benefits that have resulted from the project:** The Medical Center of the Rockies project is an excellent example of how natural stormwater controls can be designed and implemented as a prominent visual feature of a high-quality facility. They not only offer a stunning setting for the hospital, but they provide significant water quality benefits,

improved wildlife habitat, and recreational opportunities for staff and the community.

### **Project Recognition**

2008 Colorado Chapter Merit Design Award

### **Additional Information**

Links to images: <http://www.bhadesign.com/project.php?gID=33>