



# Green Infrastructure & Stormwater Management CASE STUDY

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## Angel's Flight Estate

**Location:** Fontana, WI

**Client:** Dr. Keith and Mrs. Gibson

**Design Firm(s):** Kelly Design Group, LLC

**Landscape architect/Project contact:** Shawn T. Kelly, FASLA

**Email:** [stkelly@kdgllc.com](mailto:stkelly@kdgllc.com)

**ASLA Chapter:** Wisconsin

## Project Specifications

**Project Description:** An estate plan that included proactive, redundant stormwater control devices and permeable pavements throughout. The plantings and hardscape solutions, together, produced a plan that is ecotypic with the local environment and complimentary to the expected finish for such a property.

### Project Type:

Single family residential

A retrofit of an existing property

**Design features:** Bioretention facility, downspout removal, porous pavers, and subsurface retention under all paved surfaces, with multiple level spreaders introduced in the BMP treatment train to slow, mitigate flow, and improve the quality of stormwater by phytoremediation and subsurface storage/staging.

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

County ordinance, local ordinance

**Impervious area managed:** 5,000 sq/ft to 1 acre

**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?** No

## Cost & Jobs Analysis

**Estimated Cost of Stormwater Project:** \$100,000-\$500,000 (Public funding: None, all private funds.)

**Related Information:** Overall costs include placement of over 67,000 individual paver units over improved base designed to hold and stage the 100-year storm event for eight hours total time of precipitation. The project was installed by a landscaper who excavated the material on site and a hardscape installed who placed all the subsurface materials and finish paver units. This included multiple level spreader installations, along with phytoremediation plantings done by the landscape installer. The total cost was just under \$600,000.00.

**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:** The overall cost of development dropped per square foot because of the management of open space to contribute to the management scheme.

**Cost impact of conserving green/open space for stormwater management over traditional site design/site development approaches (grey infrastructure)?** Significantly reduced costs (10% or greater savings).

**Number of jobs created:** 3

**Job hours devoted to project:**

Planning and Design: 85

Construction: days under construction: eighty with multiple participant crews.

Annual Maintenance: three hours per week during summer.

Other:

## Performance Measures

**Stormwater reduction performance analysis:**

The 100-year event is retained on site for a duration of eight hours. There is zero runoff from the site after work was completed. I was allowed to design this site based on prior analysis that I presented to the County proving extreme runoff into the adjacent Lake Geneva. The project was proceeded in the County by several other of my projects that introduced the ideas of subsurface detention and phytoremediation to improve the runoff condition and water quality that enters the Geneva Lake resource.

**Community & economic benefits that have resulted from the project:** This project allowed me to design the adjacent property and successfully move the County to allow stormwater

detention in the lake yard area now, without instant denial. The adjacent property is owned by Mr. and Mrs. Tim Feltes, and was installed at the same time as the final stages of the Gibson property. This has become a precedent for the stormwater reviews in Walworth County, Wisconsin.

### **Additional Information**

**Links to images:** Go to the projects/portfolio section of my website, at [www.kdglc.com](http://www.kdglc.com), and scroll through to the images that are for the presentation for the property. The working drawings are not included in this site.

The evolution of local law to allow stormwater detention in the lake yard property is a landmark that actually began with a project I was successful in getting approval for done almost thirteen years ago. The project in the lakefront property of the Lake Geneva Youth Camp and Conference Center. The property is just on the lakeside of the then state highway 120. All stormwater flowed off the highway, across the client's property, and into Geneva Lake. My project introduced subsurface retention and detention devices into a BMP train that ended with the stormwater passing through a sandy beach before it entered the Geneva Lake water body. The initial reviews denied approval based on laws that were interpreted to mean any structure in the lake yard was not allowable, even those structures below the surface. My work with the County eventually allowed approval for the project. This has finally produced a change in the law to allow the projects noted above.