

Storm water design study approved by the Board of the Friends, October 2016

For the storm water design study, a group of students in the UW-Madison Civil and Environmental Engineering Dept. will evaluate the problem and propose a range of potential solutions as part of their Senior Capstone design project under the leadership of Professor **Charlie Quagliana**. The \$1,000 we agreed to contribute to the capstone project will help defray the costs of the students work. In support of this project, **Mike Parsen** prepared a mock Request-for-Proposal (RFP) which provides some background about the Preserve and identifies the main problem (i.e., erosion and nutrient transport south of the gardens and down through Bill's Woods). See below.

The students, under their student manager **Maria Kealy**, submitted a research proposal to the Preserve which was approved in February 2016.

REQUEST FOR PROPOSAL

University of Wisconsin - Madison

Eagle Heights Community Gardens – Storm Water Erosion Mitigation Project
Madison, WI

January 15, 2016

University of Wisconsin –Madison Lakeshore Nature Preserve

The intent of this request-for-proposal, by the Friends of the Lakeshore Nature Preserve, is to provide a description of services needed to develop effective storm water mitigation strategies for parts of the Eagle Heights Community Gardens. The overall objective is to reduce the severity of runoff events, decrease nutrient-rich sediment transport, and increase infiltration within the area of interest.

History of the Preserve

The Lakeshore Nature Preserve (Preserve) is an integral part of the University of Wisconsin-Madison and is used by students and researchers focusing on ecological restoration as well by the general public for recreation and aesthetic pleasure. UW-Madison oversight of the Preserve lands has changed over the years from the Wooded Areas Committee, the UW Arboretum, and Campus Natural Areas Committee. Today, the property is managed by Facilities Planning and Management with oversight by the shared governance Lakeshore Nature Preserve Committee. The Friends of the Lakeshore Nature Preserve help to support the Preserve through land stewardship, advocacy, financial support, education and outreach, and by collaborating with, supporting, and advising the University's Preserve Management Staff and Governance Committee.

Many areas within the preserve were originally privately owned, but several acquisitions and donations over the past decades have allowed the Preserve to grow to encompass 300 acres of land and 4.3 miles of the Lake Mendota Shoreline. Some of the most popular destinations within the Preserve include, the Lakeshore path, Observatory Hill, Muir Woods, Willow Creek Woods, 1918 Marsh, University Bay Marsh, Picnic Point, Eagle Heights Community Gardens, Biocore Prairie, Frautschi Point, Raymer's Cove, and Eagle Heights Woods.

As described on the Preserve website:

"Some of the greatest scientists and scholars who have contributed to the making of an American land ethic drew inspiration from this place. The write John Muir lived next to it. The ecologist John Curtis studied and defended it. The soil scientists Francis D. Hole introduced students to explore the world beneath their feet in it. The naturalists Jim and Libby Zimmerman practiced ecological restoration in it. And the conservationist Aldo Leopold taught classes in it. The environmental tradition at the UW-Madison is as strong and deep as at any other university in the world, and the Lakeshore Nature Preserve has been central to that tradition from the beginning." (<http://lakeshorepreserve.wisc.edu/about/faq.htm>)

The Preserve is a diverse collection of landscapes, ecological niches, and habitats including shorelines, coves, marsh wetlands, lowland and upland woods, active community gardens, and restored prairies. The Preserve serves as a critical wildlife corridor for migrating birds and houses a diverse range of plant and animal species. Besides the natural wildlife, there is also a strong human connection to the landscape dating back, before the arrival of European settlers, to American Indians who inhabited this area. Several burial mounds are included within the Preserve and several archeological investigations have occurred within the preserve in recent years to learn more about the native peoples who once called this place home. Fast forward several hundred years to the late 19th Century and several leading local figures,

including John Olin and Edward Owen, established the Madison Park and Pleasure Drive which constructed a path for horses, carriages, and bicycles along the Lake Mendota shoreline, through the University Bay Marsh, and up into Eagle Heights on its way to Merrill Springs (Spring Harbor).

Eagle Heights Community Gardens lies at the center of the Preserve, and represents an active and frequently visited area within the preserve, at least during the summer months when hundreds of gardening enthusiasts meticulously tend and manage their garden plots.

Description of problem

While the Eagle Heights Community Gardens has been well managed and improved to handle many surface runoff issues, there remains a troublesome area along the southern edge of the gardens which regularly floods, sending sediment laden storm water down through Bills Woods. Furthermore, the activities of gardeners have been impacted along this corridor as leaves, compost, animal manure, wood chips, and aquatic vegetation (from weed cutting on the Madison Lakes) are periodically stockpiled in this area for incorporation as a soil amendment for gardening. While gardeners enjoy having a readily available source of compost, wood chips, and nutrients for their gardens, large storm events can generate runoff which inundates garden plots and transports nutrient-rich sediment away from the stockpile area. Due to the tight corridor between the Eagle Heights gardens and the steep slope of the land surface through Bill's Woods, just south of the gardens, it has also been challenging to slow the flow of runoff and create infiltration. Furthermore, the formation of tire ruts made by large trucks/vehicles which deliver materials to the stockpile area during wet-ground conditions present an additional concern for gardeners and maintenance staff who regularly access the Preserve along the access road.

Project Objectives

Preserve land in and adjacent to the Eagle Heights Community Gardens has storm water runoff problems which are leading to undesirable impacts to gardeners and visitors to this part of the Preserve. There is nutrient-rich runoff water moving into the swale catchment system along the Lakeshore Path and continued erosion through Bill's Woods.

The objective is to evaluate and design improved storm water mitigation strategies to reduce the severity of runoff events, improve ground conditions in and around the stockpile area, decrease nutrient-rich sediment transport, and increase infiltration.

The Friends of the Lakeshore Nature Preserve seek creative ideas, alternatives, and implementation details to provide a rehabilitated area in a manner that limits negative impacts to the environment, while enhancing positive impacts. We seek innovative approaches to solving this storm water problem that are both pragmatic and cost-effective.

The Friends of the Lakeshore Nature Preserve also request that the design team openly communicates throughout the design process to all involved stakeholders, including the Friends of the Lakeshore Nature Preserve, the UW-Madison Lakeshore Nature Preserve staff, the Lakeshore Nature Preserve Committee, the Eagle Heights Community Gardens, and the Village of Shorewood Hills. Due to the diverse group of stakeholders interested in the outcome of this design project, it is critical that the design team makes public outreach and stakeholder engagement an important part of this project.

Scope of Services

The Project (and Proposal) shall include necessary engineering services to complete the following major phases including: Alternative Analysis, Process Engineering, Preliminary Design Report, Design, Preparation Regulatory Permit and Construction Documents, Opinion of Probable Costs and Construction/Start-up Schedule.

The selected consultant will need to coordinate work efforts with the Company's Project Manager.

Project Schedule

First stakeholder meeting (in class): 3/3/2016

Preliminary Design Submittal: 3/15/2016

Second stakeholder meeting: TBD

Final design submittal: 4/26/2016

Deliverables

Preliminary Engineering:

- **Request a research permit from UW-Madison Lakeshore Nature Preserve by going to <http://tinyurl.com/research-permit> and completing the research permit application. This must be done prior to beginning work on this project!**
- Review of site conditions during a tour with client representatives
- Review of existing maps and spatial coverage data for the area of interest
- Host a stakeholder engagement meeting to solicit feedback about the design goals. This meeting should include representatives from the Friends of the Lakeshore Nature Preserve, the UW-Madison Lakeshore Nature Preserve staff, the Lakeshore Nature Preserve Committee, the Eagle Heights Community Gardens, and the Village of Shorewood Hills. Client representatives can help facilitate this meeting and will provide a stakeholder contact list.
- Presentation or memo documenting the evaluation process summarizing advantages and disadvantages for each alternative and any significant findings
- Operational factors and considerations
- Define environmental and construction permitting requirements
- Preliminary plan; schematic plan(s) and analysis of 3 design concepts/alternatives, including design criteria, for capital improvements required (each design should be relatively low-cost and present holistic solutions which address the above mentioned Project Objectives)
- Drawings of the 3 concept alternatives, including plan view, representative cross sections, catchment/infiltration details, piping plans, and other drawings necessary to convey the intent
- Evaluation of alternatives and recommendations
- Concept-level capital cost opinion spreadsheet for each alternative
- Preliminary layouts, design criteria, and capital costs
- Preliminary Engineering Report presentation

Final Design of Selected Alternative:

- Specification front end (advertisement, bid forms, contract, bond, etc.)
- Final design calculations
- Construction drawings including cover sheet, site plan, representative cross sections, catchment/infiltration plans, piping plans and other details or special-purpose drawings needed to describe work to contractors
- A list of all drawings required in the final construction drawing set
- Construction specifications for four key elements of the project, particularly non-standard items

- A list of all specifications sections required in the final project manual
- 3-D views of proposed design
- Opinion of probable capital costs
- Proposed project milestone schedule & implementation strategy
- Final Design Presentation

Selection Criteria and Submittal Requirements

The owner is using a **Qualification Based Selection Process**. The criteria for selection will include: professional competence, project management approach, technical approach, available resources and quality assurance initiatives. A preliminary fee estimate is requested but is not part of the selection criteria.

Written proposals (15 page maximum) should include:

- One page statement of interest and qualifications
- Written description of purpose and scope of project
- Proposed schedule
- Proposed project approach (Org. chart, list of key individuals, duties, methods to monitor schedule and budget)
- Resumes of team members
- Proposed invoicing methodology
- List of deliverables
- Preliminary fee proposal (in separate envelope)

Mentors:

Jan Kucher (jkucher42@gmail.com) and Jay Kemp (j_kemp@charter.net)

Client Representatives:

Mike Parsen (michael.parsen@wgnhs.uwex.edu) and Will Waller (*william.waller@charter.net*)