



## WAR MEMORIAL CENTER North Parking Lot Site Design

Cassandra Hoppe | Project and Business Development Engineer



## IMPROVING THE BUILT AND NATURAL ENVIRONMENTS WITHIN COMMUNITIES THROUGH SUSTAINABLE ENGINEERING AND DESIGN









We are a specialized civil engineering design firm focused on <u>water quality</u>, <u>drainage</u> <u>design</u>, <u>integrated site design</u>, and <u>flood management</u>. We provide:

- Stormwater Management
- Green Infrastructure Design
- $\circ$  Stormwater Integrated Site Design
- Drainage Design & Erosion Control
- Hydraulic Analysis & Reports
- Aquatic Organism Passage
- Stream Restoration
- Regenerative Stormwater Conveyance
- o StormGUARDen's
- Grant Application Support... AND MORE!





### SSE SERVICES

By providing engineering and project management from concept through construction, we work closely with our clients to help them find *their* ideal solutions. We serve:



- $\circ$  Municipalities
- Schools/Educational Facilities
- Transportation agencies
- Watercourse districts
- $\circ~$  Parks and Recreational Facilities
- Commercial property owners
- Residential property owners
- Environmental organizations







Carrie Bristoll-Groll, PE, ENV SP Principal Civil Engineer & CEO



Tony Groll Business Manager



Adrienne Cizek, PhD, PE Senior Project Engineer



Eileen Freres, EIT Project Engineer



James Zsebe, PE Senior Project Engineer



Jossiel Delgado Marketing Coordinator



Kara Koch, PE, ENV SP Senior Project Engineer



VACANT SPOT Junior Project Engineer

**StormGUARDen** 



Cassandra Hoppe Project and BD Engineer



VACANT SPOT Quality Reviewer Senior Engineer









Greenprint-Milwaukee	Stakeholders Team	Grant Applications
Shoreline Vision Plan		TSS Reduction and Gallons
April 2017 Plan	Who?	<b>Captured Goals</b>



#### OTHER NOTABLE FACTS

• There are 7 phases of the Greenprint Vision Plan

• SSE always brings up grant funding with a project – never hurts!



## GREENPRINT-MILWAUKEE SHORELINE VISION PLAN



# Public Meeting 3/14/2017

**Final Report** 

• 4/21/2017

Stakeholder & Focus Group Meetings • 7/2016 - 2/2017



The Sigma Group, Inc. 1300 W. Canal Street Milwaukee, WI 53233 (414) 643-4200 rpeschel@thesigmagroup.cl

SEH

SEH, Inc.

159 N. Jackson Street #10

Milwaukee, WI 53225

(608) 977-0817

mail: efreer@sehinc.com

Stormwater Solutions Engineering LLC 247 Freshwater Way, Suite 410 Milwaukee, WI 53204 (414) 810-1245 Email: cbg@stormwatersolutions.co



## STAKEHOLDER TEAM

### **Steering Committee Members:**

- Milwaukee County Department of Administrative Services
- Milwaukee County War Memorial Center
- Milwaukee County Parks
- Rotary Club of Milwaukee
- Milwaukee Art Museum

### **Consulted Stakeholder Groups:**

- War Memorial Tenants
- Veterans Groups
- Local Government
- Community and Environmental Non-Profit Organizations
- Park Users











Grant Name: Fund For Lake Michigan Award Amount: \$125,000



Grant Name: Green Infrastructure Partnership Program Award Amount: \$366,966



Grant Name: Sustain Our Great Lakes Award Amount: \$473,826

Total Award Amount: \$965,792.00



## DESIGN PHASE



Bioswales Landscape features that capture and infiltration can also remove pollutants.

Greenways Riparian and non-riparian buffer zones and s store and drain stormwater runoff into the g naturally.



Native Landscaping The use of native plants that can tolerate drc flooding cycles because of deep roots and cli adaptations.

Porous Pavement Pavement that can reduce and infiltrate surfthrough its permeable surface into a stone of below





Green Infrastructure Additions	Public Input Meeting	Final Design
How Many?	What Was Discussed	Phase A and B

#### **OTHER NOTABLE FACTS**



SSE takes public input seriously as community acceptance is key to success
 Approximately 70% of SSE projects include Green Infrastructure



## GREEN INFRASTRUTURE ADDITIONS





## PUBLIC INPUT MEETING

ENVIRONMENTAL BENEFITS:

- Manages stormwater runoff and associated pollutants prior to Lake Michigan.
- Provides habitat for migratory birds, butterflies, and other wildlife.

Improves community quality of life.Improves aesthetics.

- Provides space and landscape for reflection.
- Increases pride in community and honor for military veterans

Attractive lakefront brings more tourists

- Increased water quality results in fewer beach closures deterring visitors
- Increased onsite stormwater storage reduces sewer backup/overflows and associated costs of utility upgrades









## BENEFITS:

SOCIAL

#### ECONOMIC BENEFITS:









## POST-CONSTRUCTION PHASE



Ribbon Cutting Ceremony	Site Monitoring	Awards
9/21/2021	Marquette University Data	MMSD Green Luminary Award



**FUN FACTS** 

Marquette monitors temperature, flow, and water quality
 Since 2017, 16 projects SSE has worked have received awards



## RIBBON CUTTING CEREMONY – COMPLETED SITE





## SITE MONITORING

### Marquette Group:

• Walter McDonald, Charitha Gunawardana, and Matthew Dupasquier

### What Is Monitored:

- Runoff from asphalt and permeable pavement that flows into bioswales and discharges into a rip-rap lined channel
- Onset HOBO water level sensors and tipping bucket rain gauge

### **Results:**

- 21 runoff events captured from 6/29/21-10/29/21
- 91% of stormwater runoff was infiltrated
- Peak flow rates were reduced by over 98%
- Influent to effluent reductions:
  - Permeable pavers = 77%
  - Bioswale 1 = 84%
  - Bioswale 2 = 85%
- The GI in a series reduced runoff temperatures to levels below the threshold for freshwater fish species (22.5 °C/72.5°F)





## GREEN LUMINARY AWARD









20

Green Infrastructure for Water Quality and Watershed Management



Grey Infrastructure / Traditional Drainage Design





Watershed Modeling for Quality and Quantity



Facility and GI Inspection and Maintenance



### THANK YOU!



#### FOLLOW US ON SOCIAL MEDIA!



Facebook.com/StormH2O

instagram.com/stormwater solutionsengineering



in

0)

@Storm\_H2O

LinkedIn.com/company/ stormwater-solutionsengineering-llc

Cassandra Hoppe | <u>cassandra@stormwater-solutions-engineering.com</u>

247 Freshwater Way - Suite 410, Milwaukee WI 53204 | (414) 810-1245

