



AGENDA OF THE IMPROVEMENT AND SERVICES COMMITTEE

**WEDNESDAY, OCTOBER 26, 2022, 5:00 PM
AMENDED**

Immediately following Parks Committee.

**In person at City Hall, Room 207
Virtual attendance also available via Zoom.**

A. Zoom Meeting Instructions.

1. This item contains Zoom information, instructions, and a link to the Virtual Comment Form.

B. Roll Call.

C. Approval of the Agenda.

D. Approval of Minutes.

E. Regular Business.

1. Consideration with possible action on request by Paul Neja (1064 Roscoe Street) for unrestricted on-street parking allowances due to unique family circumstances and limited off-street parking options for the remainder of 2022 and all of 2023.
2. Consideration with possible action on request by Pat Daschner (1705 Spence Street) to rescind charges for sidewalk replacement.
3. Consideration with possible action on an amendment to the professional services contract with Modjeski and Masters for the onsite investigation and troubleshooting of center lock mechanisms of the Main Street Bridge over the Fox River, B-5-311, in the amount of \$10,070.

4. Consideration with possible action on the acquisition of a Watermain Easement along the north side of Finger Road east of Grandview Road from Car Green Bay (WI), LLC (Carnivore Meat).
5. Consideration with possible action on request by Department of Public Works to award a contract for the development of a Citywide Green Stormwater Infrastructure Plan to Stormwater Solutions Engineering in the amount of \$133,370.
6. Consideration with possible action on request by Department of Public Works to award a contract for 2023 Design Services for Berner Street Reconstruction from N. Irwin Avenue to N. Webster Avenue.

F. Informational.

1. Director's Report on recent activities of the Public Works Department.
2. The next Improvement & Services Committee meeting is scheduled for November 30, 2022.

G. Public Hearings.

H. Adjournment.

- 1) THIS MEETING IS RECORDED: THE VIDEO OF THIS MEETING AND MINUTES ARE AVAILABLE ONLINE AT www.greenbaywi.gov
- 2) ACCESSIBILITY: Any person wishing to attend who requires special accommodation because of a disability, should contact the City Safety Manager at 920-448-3125 at least 48 hours before the scheduled meeting time so that arrangements can be made.
- 3) QUORUM: Please take notice that a majority or quorum of the Common Council will attend this Improvement and Services Committee meeting and will constitute a meeting of the Common Council for purposes of discussion and information gathering relative to this agenda.
- 4) REPRESENTATION: The party requesting the communication, or their representative, should be present at this meeting.

Virtual Meeting Instructions



Improvement and Services Committee

Zoom Meeting Information

Join Zoom Meeting

<https://us02web.zoom.us/j/82206544400?pwd=NDd1bm5zNUhBW99RVU5ck1zMjZQT09>

Meeting ID: 822 0654 4400

Passcode: 635662

One tap mobile

+13126266799,,82206544400#,,,,*635662# US (Chicago)

+19292056099,,82206544400#,,,,*635662# US (New York)

Dial by your location

+1 312 626 6799 US (Chicago)

+1 929 205 6099 US (New York)

+1 301 715 8592 US (Washington DC)

+1 346 248 7799 US (Houston)

+1 669 900 6833 US (San Jose)

+1 253 215 8782 US (Tacoma)

Meeting ID: 822 0654 4400

Passcode: 635662

Find your local number: <https://us02web.zoom.us/j/kc7RtLdfPZ>

Public Comments

If you wish to speak at this public meeting or leave a comment, please fill out the online [Comment Form](#) prior to the meeting.

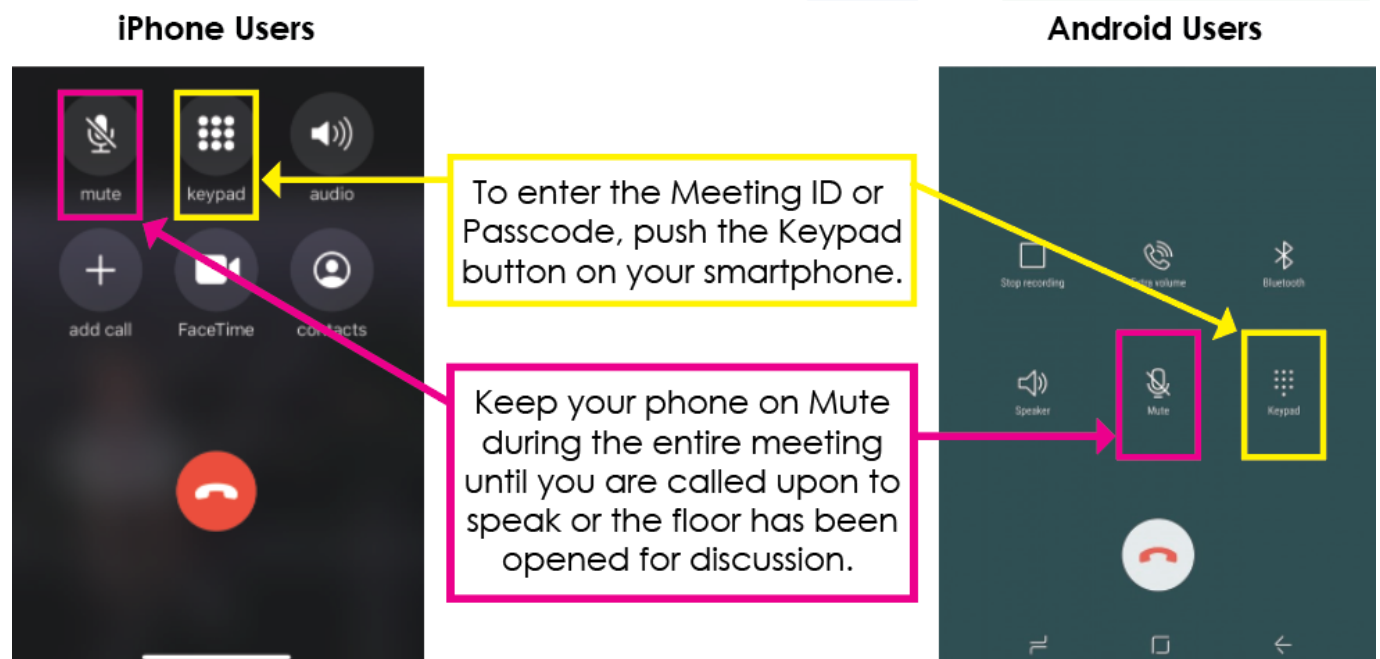
Additional Information

1. Wisconsin Open Meetings Law still applies
 - a. Persons interested in speaking to an item must state their name and address for the minutes.
 - b. Committee/Commission/Board members will still follow *Roberts Rules of Order Newly Revised 12th edition*.
2. Please log into the Zoom meeting at least 10 minutes before the meeting begins to ensure a proper connection and that your technology is working.
 - a. If you are a Board Member, please log into [CivicClerk](#) with a computer, laptop, or tablet device.
3. Once you are in the meeting please mute yourself.
 - a. You may unmute yourself when you are called upon to speak.
4. Waiting room
 - a. When you call in or connect via web or Zoom app, you will be placed in a "waiting room."
 - b. The meeting host will then admit you to the meeting, and mute you upon entrance (you will still be able to hear and or otherwise observe the meeting).
5. Registering
 - a. The host may ask you to register for the meeting. A registration link will be sent to you along with the invite. You'll receive another email confirming that you're registered for the meeting.
 - b. If you're using a phone, your registration will be tied to an email.
6. Raising your hand
 - a. Committee/Commission/Board members—you can either use CivicClerk and request to speak or you can also utilize the "raise your hand" tool in the Zoom platform (you'd need to use a computer or tablet) to let the host know you would like to speak. You can also un-mute yourself and start speaking.
 - b. Persons with items on the agenda or other interested parties—you can also utilize the "raise your hand" tool on the Zoom platform via computer or mobile device. You will be allowed to speak once the committee, commission, or board has moved to "open the floor for interested parties to speak." Once discussion on your agenda item has concluded, the host will mute you, unless the committee opens the floor again.
7. What devices should I use?
 - a. Smart phone (please see more detailed instructions on page 3)
 - b. Land line
 - c. Tablet—in advance of the meeting, please download the Zoom Meeting app by using either the Apple Store or the Play Store. You will be asked to input your name, to identify you for the meeting.
 - d. Computer—you can access the meeting through a web browser by clicking on the meeting link, or through the Zoom Meeting app. If using the app, please download it in advance of the meeting. You will be asked to input your name, to identify yourself for the meeting.
 - e. For tablet and computer users—if you download the app you may be asked to verify your email.

8. Zoom etiquette
 - a. Muting yourself when you're not speaking will prevent your background noise from interfering with others' ability to listen to and participate in the meeting.
 - b. If you're using a telephone, please identify yourself with your phone number and state your name and address before you speak. Zoom meeting hosts can see only your telephone number and will ask you to identify yourself.
9. Closed session
 - a. Persons in the Zoom meeting will be put into a waiting room while the committee/commission/board meets in Closed Session. Participants will be admitted back into the Zoom meeting once the committee reconvenes in Open Session.
 - b. Persons watching a Common Council meeting live on YouTube will see a gray screen with the City logo during closed session.
10. Persons interested in attending anonymously or listening to the meeting may call in by dialing *67 followed by the phone number in the Zoom Meeting Information box.

Calling into the Zoom meeting using a smartphone

1. Dial the phone number listed at the beginning of this document.
2. When prompted, enter the Meeting ID number followed by #
3. Once you are in the meeting, notify the meeting host that you are in and state your name.
4. If you do not wish to speak, please make sure your phone is on **Mute**
 - a. If you're using a smartphone, look at your screen and click the Mute button





Report to the
Improvement and Service Committee
of the City of Green Bay

MEETING DATE

October 26, 2022

PREPARED BY

AGENDA ITEM # E.I

Consideration with possible action on request by Paul Neja (1064 Roscoe Street) for unrestricted on-street parking allowances due to unique family circumstances and limited off-street parking options for the remainder of 2022 and all of 2023.

BACKGROUND

RECOMMENDATION

FISCAL IMPACT

ATTACHMENTS

None



Report to the
Improvement and Service Committee
of the City of Green Bay

MEETING DATE

October 26, 2022

PREPARED BY

AGENDA ITEM # E.2

Consideration with possible action on request by Pat Daschner (1705 Spence Street) to rescind charges for sidewalk replacement.

BACKGROUND

RECOMMENDATION

FISCAL IMPACT

ATTACHMENTS

- I. I&S Attachement

Alderman Chris Wery

920-490-9282

chriswery@att.net

Facebook: Alderman Chris Wery, District 8 City of Green Bay

On Tuesday, September 13, 2022 at 05:14:43 PM CDT, Pat Daschner < > wrote:

Good evening Chris,

Sorry I missed your call but thanks for getting back to me on this. We epoxied our sidewalks back in June of this year when we received the letter on what were acceptable repairs to the sidewalk areas but I must have missed where it said we had to have it reinspected by the city. Once the contractor came around and re-marked the squares being removed I thought it was odd they marked the ones we already repaired so I re-read the letter and noticed the inspection instructions and called the hotline 9/8 to let them know we fixed them. We didn't receive a call back until the afternoon of 9/9 stating it was too late. That's when they pointed us in your direction to see if there is anything we could do to get this resolved. I tried calling the hotline again this morning before the crew actually dug up the sidewalk but was told again they could not avoid having the contractor complete the squares at this time. I understand the reason for replacing some sidewalk squares but the ones we were required to repair were minor hairline cracks and only took a small amount of epoxy to fix and would like to avoid a \$500+ bill for a misunderstanding.

Let me know if there is anything else you may need from me.

Thank you,

Pat Daschner

1705 Spence St

Green Bay 54304

	Location	Parcel ID	Square Feet	Sidewalk Credit
DISTRICT	1720 FRANK ST	1-2439	162.0000	0.00
8	SCHMITT PLAT #8 NLY 75 FT O F LOT 7 BLK 1 KRISTIN E & JEFFREY H COLEMAN 1720 FRANK ST GREEN BAY WI 54304-3834			
DISTRICT	1703 FRANK ST	1-2441	350.0000	176.00
8	SCHMITT PLAT #8 LOT 1 & W 7 FT OF LOT 2 BLK 2 SUSAN M & CHARLES J ELLINGSON 1703 FRANK ST GREEN BAY WI 54304-3833			
DISTRICT	1702 SPENCE ST	1-2447	137.5000	86.00
8	SCHMITT PLAT #8 LOT 7 & E 23.5 FT OF LOT 6 BLK 2 DANIEL KOCH 1702 SPENCE ST GREEN BAY WI 54304			
DISTRICT	1714 SPENCE ST	1-2448	177.5000	101.00
8	SCHMITT PLAT #8 LOT 8 BLK 2 STEVEN D FREY, ETAL STEVEN D FREY & TAMMY L VOGEL 1714 SPENCE ST GREEN BAY WI 54304-3838			
DISTRICT	1713 FRANK ST	1-2454	522.0000	222.50
8	SCHMITT PLAT #8 LOT 14 BLK 2 KEVIN LAPOINTE KEVIN LA POINTE 4315 WINDEMER LN ONEIDA WI 54155-8656			
DISTRICT	1705 SPENCE ST	1-2455	250.0000	199.50
8	SCHMITT PLAT #8 LOT 1 BLK 3 PATRICK & EMILY SMITS 1705 SPENCE ST GREEN BAY WI 54304			
DISTRICT	1704 S ONEIDA ST	1-2466	94.5000	0.00
8	SCHMITT PLAT #8 LOT 12 BLK 3 JACQUE JAMES & MARY JO REVOCABLE TRUST 1819 RENAISSANCE CT GREEN BAY WI 54313			
DISTRICT	1708 S ONEIDA ST	1-2467	612.0000	251.00
8	SCHMITT PLAT #8 LOT 13 BLK 3 KENTON J MEHNE 2989 LONGVIEW LN SUAMICO WI 54173			

200.5 $\square$ @ 11/SF = \$2,205.50



Report to the
Improvement and Service Committee
of the City of Green Bay

MEETING DATE

October 26, 2022

PREPARED BY

AGENDA ITEM # E.3

Consideration with possible action on an amendment to the professional services contract with Modjeski and Masters for the onsite investigation and troubleshooting of center lock mechanisms of the Main Street Bridge over the Fox River, B-5-311, in the amount of \$10,070.

BACKGROUND

RECOMMENDATION

FISCAL IMPACT

ATTACHMENTS

1. Amendment to Agreement #3
2. Nitschke Bascule Bridge Strain Gauge and Span Lock Proposal 09-15-2022

AMENDMENT TO AGREEMENT

Amendment #3 dated October 11, 2022

The Agreement for Professional Services signed as of August 2, 2021, between the City of Green Bay, 100 North Jefferson Street, Green Bay, WI 54301 (OWNER) and Modjeski and Masters, Inc., 5510 Cascade Road SE, Suite 200, Grand Rapids, MI 49546 (CONSULTANT) is hereby amended as set forth below.

Project Background:

Modjeski and Masters, Inc. was retained for the evaluation of the mechanical system at the Main Street Bridge over the Fox River (B-5-311). Below lists the amendments to the original Professional Services Agreement.

Amended Scope of Services:

Onsite investigation and troubleshooting of center lock mechanisms as per the attached proposal dated September 15, 2022.

Compensation:

The above-amended scope of services to be completed by Modjeski and Masters, Inc. shall result in an increase not to exceed \$10,070 in compensation.

In Witness Whereof, the parties hereto have made and executed this Amendment to Agreement as of the day and year first written above.

City of Green Bay
OWNER

Modjeski and Masters, Inc.
CONSULTANT

_____	(Signature)	_____
_____	(Typed Name)	_____
_____	(Title)	_____
_____	(Date)	_____



Colorado | Illinois | Louisiana | Michigan | Missouri | New Jersey | New York | North Carolina | Pennsylvania | Texas | Washington, DC | West Virginia

9/15/2022

Ms. Trista Hobbs
Assistant City Engineer – Special Projects
City of Green Bay
100 North Jefferson Street, Room 300
Green Bay, WI 54301

RE: **Ray Nitschke Memorial Bascule Bridge – Span Lock Investigation**
Proposal

Dear Ms. Hobbs:

Modjeski and Masters, Inc. (M&M) is pleased to provide the following Proposal for Engineering Services to investigate the span lock operators of the subject bridge which are reportedly having issues during operation.

Should you have any questions or need more information, please refer to the contact information at the end of this document.

Span Lock Investigation and Troubleshooting

Description of Work

M&M will provide one electrical and one mechanical engineer to visit the subject bridge to inspect the span locking system and observe its operation. M&M will take any pertinent measurements of the span locking components and record electrical power consumption during operation. M&M will also inspect the span live load shoes to identify any deficiencies or adjustments that may be necessary.

M&M will perform this work during the previously scheduled strain gauge balance measurement site visit. Since the strain gauge balancing work included only one engineer, the cost associated with the span lock investigation will include travel time and costs for one electrical engineer only, and on-site inspection time for two engineers. Some additional time following the investigation is also included to summarize the findings in a letter report.

The on-site activity, in addition to the strain gauge balance work, is anticipated to take one to two days.

Administrative & Coordination

M&M will self-perform work and handle all aspects of project management for this project, including but not limited to reporting of progress to the City of Green Bay and attendance on conference calls.

Summary of Upset Limit for Engineering Services

M&M proposes to perform additional work during our visit to complete already approved strain gauge testing contract. This estimate is based on actual costs plus fixed fee with a not to exceed amount as shown below. M&M will invoice actual salaries times an overhead and profit multiplier of 2.86. The revised total fee for strain gauge testing and span lock investigation is \$22,760. Should circumstances arise that would require further investigation which exceeds this amount, M&M will notify the City of Green Bay as soon as possible and submit for a supplement.

Span Lock Investigation

- On-Site Investigation and Troubleshooting \$ 10,070



Ms. Trista Hobbs

- 2 -

9/15/2022

Summary

Thank you for considering Modjeski and Masters to perform this work. We trust that you will find this proposal responsive to your needs. If you have any questions concerning this proposal or need any additional information, please feel free to contact me, Laura Rampersad, PE, at (616) 481-8145 or lrampersad@modjeski.com. M&M's technical point of contact will be Geoffrey Forest, PE and can be contacted at (717) 443-5966 or glforest@modjeski.com.

We thank you for your kind consideration and look forward to your response.

Very truly yours,

A handwritten signature in blue ink, appearing to read "Laura Rampersad".

Laura Rampersad, PE
Project Manager, Regional Director
Modjeski and Masters, Inc.

cc: LLR, kwj, glf, tjm



City of Green Bay
Department of Public Works

Ray Nitschke Memorial Bascule Bridge Inspection Proposal

City of Green Bay - Nitchke Bridge
Strain Gauge Balance

- FEE ESTIMATE -

Engineering Services:

A. DIRECT LABOR : (current rates shown)

Principal	1	hours at	\$ 96.54	per hour,	\$	96.54
Project Manager	12	hours at	\$ 61.47	per hour,	\$	737.64
Senior Engineer	78	hours at	\$ 54.48	per hour,	\$	4,249.44
Engineer	42	hours at	\$ 46.91	per hour,	\$	1,970.22
Design CADD Operator	0	hours at	\$ 39.22	per hour,	\$	-
	133	hours				
					\$	7,053.84

B. LABOR ESCALATION: 1.00 (no escalation)

C. TOTAL ESCALATED DIRECT LABOR, A. x B.: Subtotal: \$ 7,053.84

D. OVERHEAD: 176% \$ 12,414.76

PROFIT: 10% \$ 705.38

E. SUBTOTAL, C. + D.: \$ 20,173.98

F. OUT OF POCKET EXPENSES: (see attached Schedule)

Permit Fees	0
Modjeski and Masters' Direct Expenses	\$ 2,587.00

G. TOTAL, E. + F.: \$ 22,760.98

PROPOSED DESIGN SERVICES FEE (Tasks 1-7): **\$ 22,760.00**



Report to the
Improvement and Service Committee
of the City of Green Bay

MEETING DATE

October 26, 2022

PREPARED BY

AGENDA ITEM # E.4

Consideration with possible action on the acquisition of a Watermain Easement along the north side of Finger Road east of Grandview Road from Car Green Bay (WI), LLC (Carnivore Meat).

BACKGROUND

RECOMMENDATION

FISCAL IMPACT

ATTACHMENTS

None



Report to the
Improvement and Service Committee
of the City of Green Bay

MEETING DATE

October 26, 2022

PREPARED BY**AGENDA ITEM # E.5**

Consideration with possible action on request by Department of Public Works to award a contract for the development of a Citywide Green Stormwater Infrastructure Plan to Stormwater Solutions Engineering in the amount of \$133,370.

BACKGROUND

In February of 2022, Common Council directed staff to develop a city-wide green stormwater infrastructure (GSI) plan. To meet this request, Public Works developed a Request for Proposals (RFP) to solicit proposals from qualified consultants to prepare a GSI Plan for the City of Green Bay. The GSI plan will be a critical strategy in the City's flood resiliency planning. This plan will identify projects and make recommendations for integrating GSI into public and private properties to reduce localized flooding, increase greenspace in neighborhoods and improve water quality.

The RFP period closed September 30, 2022 and four (4) proposals were received. Staff evaluated and scored the proposals based on the firm's technical expertise and experience with providing innovative, sustainable, and cost effective GSI solutions; credentials of project team, understanding of task requirements, capability for timely response, overall quality and completeness of submittal, and cost of services. The project is expected to take 9 months from the date of an executed contract agreement.

RECOMMENDATION

To award the Professional Service Agreement contract to Stormwater Solutions Engineering in the amount of \$133, 370.

FISCAL IMPACT

\$133,370

ATTACHMENTS

1. Consultant Proposals_Part1
2. Consultant Proposals_Part2
3. Consultant Proposals_Part3
4. Consultant Proposals_Part4
5. RFP Evaluation scores and score sheet
6. RFP Citywide Green Stormwater Infrastructure Plan_packet



Proposal For

City of Green Bay

**Consulting Engineering Services- City-Wide Green Stormwater
Infrastructure Plan**



**STORMWATER
SOLUTIONS
ENGINEERING LLC**



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TAB A

Cover Letter





247 Freshwater Way
Suite 410

Milwaukee, WI 53204

stormwater-solutions-engineering.com

September 30, 2022

City of Green Bay, Department of Public Works – Engineering Division
Attn. Melissa Schmitz, Resiliency Coordinator
100 N Jefferson Street
Green Bay WI 54301
920-448-3040
melissa.schmitz@greenbaywi.gov

RE: Consulting Engineering Services - City-Wide Green Stormwater Infrastructure Plan

Dear Melissa,

On behalf of Stormwater Solutions Engineering, LLC (SSE), I appreciate the opportunity to submit this proposal to the City of Green Bay (City) for the City-Wide GSI Plan. Our team provides traditional drainage, floodplain design, and stormwater management, along with extensive experience in green stormwater infrastructure (GSI or GI) design. While traditional drainage design involves the safe passage of floodwaters and improved water quality, we understand the planning, placement, design, and maintenance of GSI practices, to imitate nature for long term sustainable management.

We are teaming with Robert E. Lee Associates, Inc. to bring local knowledge of your systems, projects, processes, and nuances that we would lack being in Milwaukee. Together, we form a team of highly qualified, multi-disciplinary, and collaborative professionals with a wealth of experience in providing the critical, innovative, and creative design, and project management services required by the City for this project. SSE will be the prime consultant for the project with our depth of knowledge on green stormwater infrastructure planning, design, maintenance, and funding.

Over the past 20 years, SSE has focused our efforts on green infrastructure throughout southern Wisconsin and beyond. We have performed many similar services for clients such as the Milwaukee Metropolitan Sewage District (MMSD) with the development of the Kinnickinnic Watershed Green Infrastructure Plan (51% of the effort as a sub), the Green Infrastructure Operations and Maintenance manual (as the prime), and the Green Infrastructure for Schools Guidebook (as a sub) (see all plans at [Our Plans: freshcoastguardians.com](http://OurPlans.freshcoastguardians.com)). We have been working with the City of Madison locating and securing grant funding for stormwater and green infrastructure projects (\$400k secured in the past year), and with the City of Cudahy on locating GSI projects to meet their DNR Total Maximum Daily Load (TMDL) goals. We have designed and provided construction management on not less than 50 prominent sites in southern WI including 10 award-winning sites such as the Milwaukee Public Schools, War Memorial Center, and Summerfest Administration site. We have demonstrated our ability to work creatively and innovatively with project partners, including municipalities, schools, and private clients to find cost-effective solutions that meet multiple stakeholder goals. The SSE Team hopes to add the City of Green Bay to our list of satisfied clients, to plan for a future of reduced flood-risk, improved coastal resilience, water quality, and community enhancement.

Thank you for your consideration.

Sincerely,

A handwritten signature in black ink that reads "Carrie Bristol-Groll". The script is cursive and fluid, with the first name "Carrie" being more prominent than the last name.

Carrie Bristol-Groll, PE, ENV SP

Principal Civil Engineer / CEO

(414) 810-1245

cbg@stormwater-solutions-engineering.com

TAB B

Firm and Individual Qualifications



Firm Qualifications



Stormwater Solutions Engineering, LLC (SSE) is a civil engineering design firm specializing in comprehensive stormwater management planning and integrated site design. Founded in 2002 and located in Milwaukee's Global Water Center, we are a certified small woman-owned business in Milwaukee and Dane Counties, Cities of Milwaukee and Madison, with WisDOT, and federally registered. We have a highly capable team with a proven track record of serving Wisconsin communities and waterways. Since 2004 we have performed green infrastructure design, using biofiltration, porous pavement, underground exfiltration systems, native plantings, and other similar solutions. We understand how to communicate green infrastructure to interested stakeholders while designing innovative and buildable projects. SSE has won more than \$3.5 million dollars of green infrastructure funding for their clients and have won multiple awards for projects over the past years.

We serve watercourse districts, transportation agencies, municipalities, commercial and private property owners, and environmental organizations to manage water where it falls. Because of our focus and expertise, we have a broad toolbox to draw on to address water-based needs and regulations. And we strive to assist clients in finding their solutions to their water-related issues, instead of just offering a "cookie-cutter" approach.

Our staff cares about the environment and wellbeing of our community and treat every project as if it was our investment. We believe that we have a responsibility to future generations to leave things better than we found them. Our team also believes that nature provides the very best tools for managing water, as well as creating a welcoming space. We work to improve the built and natural environments within communities through sustainable engineering and design, which is evident through our past project examples.



Robert E. Lee & Associates, Inc. (REL) was established in 1956. REL's full-service consulting firm specializes in civil and environmental engineering, surveying, and natural resources services. This spectrum of services provides an integrated approach to project management for their commercial, industrial, and municipal clients throughout Wisconsin and Michigan. REL's philosophy of personalized services assigns a project/client manager for each project who is involved from conception through construction and start-up to provide consistency and act as the client's main point of contact.

Team Qualifications

Stormwater Solutions Engineering, LLC and Robert E. Lee & Associates, Inc. (Team) are highly qualified, multi-disciplinary, and experienced firms teaming together to provide the City of Green Bay (City) with an innovative and holistic approach to this project. Our Team understands the dynamics of designing public spaces that bring together multiple uses and functions. Our collaborative work styles integrate municipal and private site planning with stormwater engineering and landscape design. We are, therefore, able to test and evaluate design solutions in consideration to project and stakeholder goals against the realities and constraints of a site early in the process to

see how things work together for a cohesive site. Our team wants to be part of the solution in bringing this vision of climate resiliency through an improved City to fruition.

The City seeks a skilled team to provide quality, feasible, and cost-effective investigation, planning, and design to meet their multi-faceted objectives. We are that team. Under the direction of Carrie Bristoll-Groll the key personnel listed below and shown in the organization chart will provide the services requested.

Individual Qualifications



Carrie Bristoll-Groll, PE, ENV SP - Stormwater Solutions Engineering, LLC

Carrie is the principal civil engineer and owner of SSE. Carrie is responsible for the quality of all projects at SSE and relationships with clients.

She has been serving Wisconsin's waterways and stakeholders with stormwater and waterway related engineering for the past 25+ years, beginning at the City of Milwaukee's Stormwater Unit where she worked to maintain the City's stormwater permit, reviewed development plans, assisted with stormwater information and education activities, and conducted outfall monitoring. In 1999, she became the first Stormwater Engineer at the City of Brookfield, WI designing and managing stormwater

quality and flood solutions from concept through construction and working with property owners to manage their drainage and stormwater issues.

Carrie founded Stormwater Solutions Engineering, LLC in 2002. Since that time, she has built a team of professionals to meet the needs of municipalities, watercourse districts, transportation agencies and private property owners. Carrie manages design needs from project scoping through project delivery and is our team's drainage expert. Carrie is also the designer of the patented product StormGUARDen™, an attractive, low cost, and low maintenance rainfall integration solution that manages roof runoff at the downspout.

Carrie will serve as the Team's Project Manager and Admin lead.



Jared Schmidt, PE – Robert E. Lee & Associates, Inc.

Jared is the Vice President of REL and the Civil/Municipal Engineering Manager. Jared has many years' experience working with the City of Green Bay staff on projects across the disciplines of civil engineering, including stormwater and green infrastructure. Jared knows the workings of the City processes, projects, and CIP. Jared will ensure that all analysis and documentation produced by the Team will meet City standards and are truth-tested for buildability.

Jared will serve as the Teams Assistant PM, performing quality reviews and directing various GIS tasks.



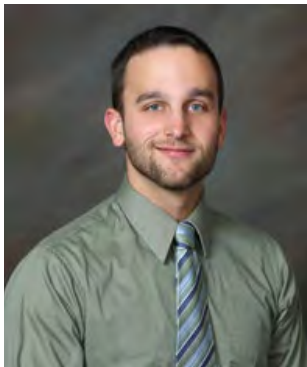
Adrienne Cizek, PhD, PE – Stormwater Solutions Engineering, LLC

Adrienne is a Senior Project Engineer, assisting all staff with design, QC, and senior level PM assistance.

Adrienne has 8 years professional experience in both hydrology and hydraulics, in addition to her advanced degrees. Adrienne is an adjunct professor at University of Wisconsin-Milwaukee School of Continuing Education, teaching courses related to natural approaches to stormwater management.

Adrienne is the lead designer of Regenerative Stormwater Conveyance (RSC), an innovative green infrastructure and erosion management design practice. Adrienne has successfully led many projects for WisDOT, MMSD, municipal and private clients, performed hydraulic (flood) analyses, CLOMR/LOMR permitting, and other FEMA processes. Her vast experience includes Wisconsin's first RSC system at North Point Lighthouse in Milwaukee in 2016, \$965,000 in grants for the War Memorial Center Green parking lot in 2020, and FEMA emergency stream bank stabilization design and permitting in De Soto, WI in 2018. Adrienne also led the effort of researching bacteria combating practices for stormwater facilities for the South Shore Parking Lot project, which lead to the use of native fungi/mycofiltration for increased bacteria removal.

Adrienne will serve as the Team's lead stormwater designer.



Aaron Breitenfeldt, PE – Robert E. Lee & Associates, Inc.

Aaron is a Civil/Municipal Engineering Project Manager at REL. Aaron's experiences centers around the detailed design and construction management of municipal engineered projects, with a specific focus on water resource relates projects. These projects include hydrologic and hydrologic analysis along with site specific and regional storm water management modeling and design.

A focus of our design efforts is to utilize the natural environment to help reduce the impact of development projects, with respect to water quality.

Looking at and evaluating multiple options to fit the site constraints of any project is critical, and ensuring the design approach is thorough, concise, constructable, and maintainable. He has also worked with local regulators and MS4 requirements in the lower fox river basin.

Aaron has worked on numerous projects for and within the City of Green Bay, including storm water facilities and Bay Beach Amusement Park, Major Medical Campuses within the City, and detailed design of City streets. These experiences, and direct exposure to City staff and requirements, gives him a sound appreciation of what design features work locally to the City.

Aaron will serve as the teams general constructability and QC reviewer.



Cassandra Hoppe – Stormwater Solutions Engineering, LLC

Cassandra is a Project and Business Development Engineer, assisting all staff with design, QC, and general PM assistance alongside her business development role.

Cassandra's passion for green infrastructure and attention to detail makes her an admirable designer. Her experience with projects involving community engagement and multiple stakeholders broadened her designs to be more holistic. She is an expert in thinking critically about design constructability and is very thorough in thinking through and communicating design details.

Cassandra has worked on projects involving drainage design and modeling, community outreach, full site design, and ADA compliance. She is an experienced ArcGIS user, having worked with municipalities to update their watershed boundary information for MS4 permit compliance and TMDL analysis purposes. She was a designer for the Dead Bird Brewery, with a fully porous pavement parking lot and bioswale designed into a former loading dock. For the City of Milwaukee Mitchell Parking Lot, Cassandra prepared plans, details and specifications for porous pavement, an urban orchard, bioswales, electric car charging station, storm sewer, lighting, and native landscaping to create the City's greenest parking lot example for future designs and managed the project through the permit process.

Cassandra will serve as the Team's stormwater designer and will develop specs, details, and other documents.



Anna Peters, GIS Specialist – Robert E. Lee & Associates, Inc.

Anna is a GIS Specialist, and is proficient in the integration of CAD and available base mapping to make output maps pertaining to regional drainage and storm water management plans. She has a sound background in the advanced working of GIS, coupled with the direct knowledge of Green Bay, Brown County, and state WDNR data sets.

She works closely with design engineers and planners to map out regional drainage basins, overlaying parcels, aerials, soils data, floodplain, and known wetland information to help inform the design and identify priority water sheds. She manages system wide GIS systems for various municipalities throughout northeast Wisconsin documenting and memorizing municipal assets such as storm sewer, sanitary sewer, watermain, manages zoning and other display maps, and develops applications for data collection of key features such as municipal infrastructure and tree inventorying.

Anna will work with the project team to aid in map making and integrating existing City GIS data with project deliverable mapping.



Eileen Freres, EIT - Stormwater Solutions Engineering, LLC

Eileen is a Junior Project Engineer, assisting all staff with design.

Eileen received her B.S. in Civil Engineering from UW-Milwaukee in 2019. There, she developed a passion for environmentally sustainable design through her internships and projects. Prior to Joining SSE, Eileen gained experience with multiple municipal clients on engineering studies to improve wastewater system performance and identify sources of infiltration and inflow during wet weather events.

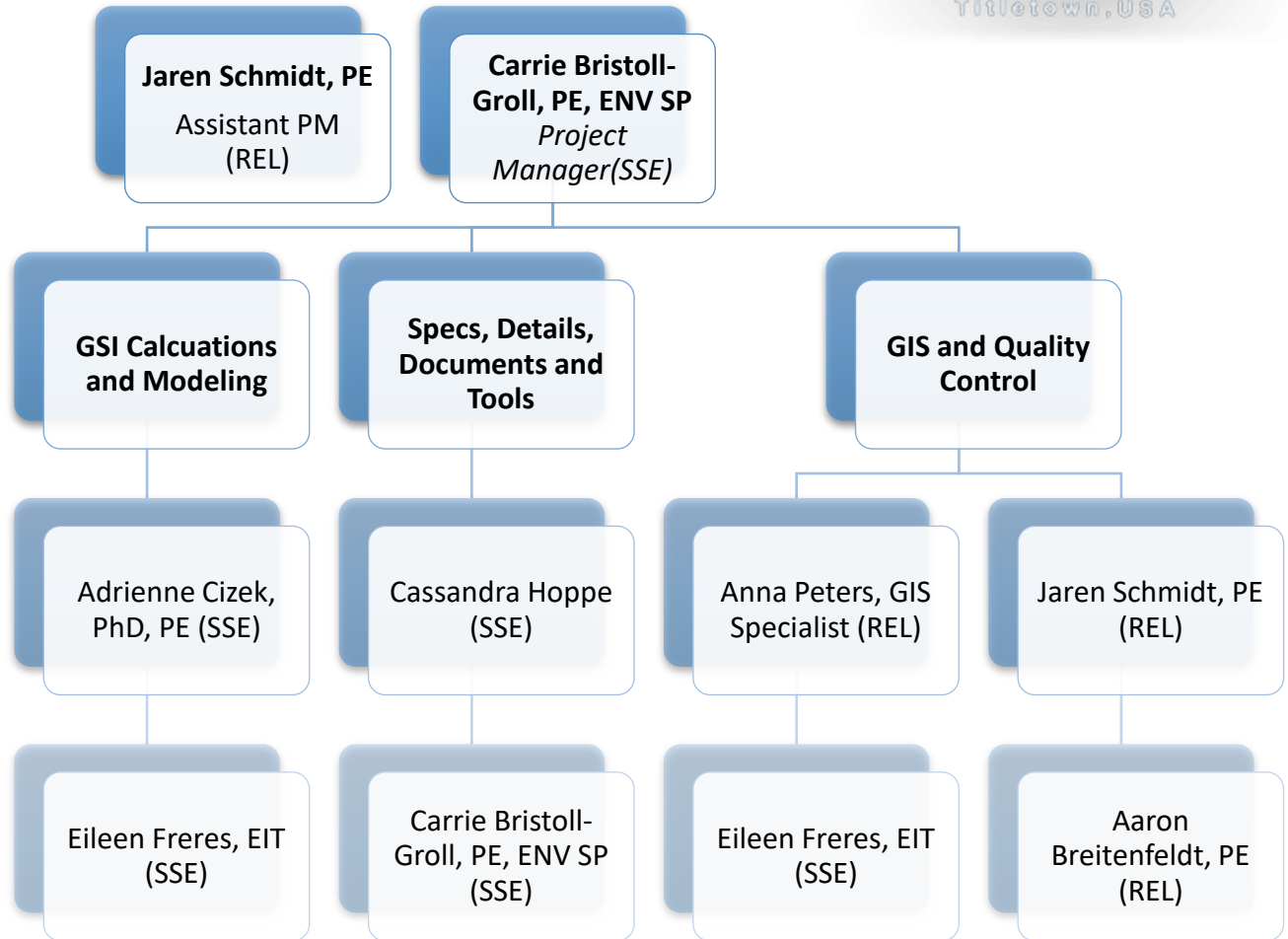
Eileen has experience in ArcGIS, WinSLAMM modeling, hydraulic and hydrologic modeling, including software such as PCSWMM, Mike Urban, and Hydrocad. She also has experience assessing and recommending solutions by modeling alternatives. Since joining SSE Eileen has worked on the City of Cudahy Municipal Stormwater and Green Infrastructure Plan, modeling water quality and quantity of proposed BMPs and GI devices to meet the watershed TMDL, along with various other projects.

Eileen will serve as the Team's designer.

TAB C

Organization Chart





TAB D

Project Approach



I. Background/History

The SSE Team is pleased to provide the City of Green Bay (City) with this proposal for the City-Wide Green Stormwater Infrastructure Plan. As the oldest city in the state, Green Bay is challenged with many of the same issues as other Great Lakes coastal cities, with dense development near the water's edge, vast expanses of impervious surface, flood-prone and stormwater ponding areas, with water quality issues as a result. The City desires to build future flood and climate change resiliency, increase healthy green spaces for the community, and improve water quality through GSI. The City's approach to city-wide planning is the best way to tackle these objectives systematically and in a cost-effective manner. When roadways are planned for replacement or improvements, and when private development is on the table, the cost of design, construction, and maintenance of added GSI is at a fraction of the cost when compared to a standalone or retrofit project.

II. Project Approach

The SSE Team proposes to provide all documents and processes as requested in the RFP, and further defined below. Preparing a comprehensive GSI Plan is something not many firms have had experience with. Milwaukee developed their first GI Plan about 10 years ago. SSE performed 51% of the tasks and organization for the first full-watershed wide GI plan in the state, for the Kinnickinnic River watershed on the City's south side, completed in 2017. Since that time, we have designed and led installation of numerous GSI devices on private and public property around southern Wisconsin, and developed what might be the only Green Infrastructure Operations and Maintenance Manual in the state, for our client Milwaukee Metropolitan Sewage District. This document will be revised and made suitable for the City of Green Bay with limited additional effort. Staff from Robert E. Lee & Associates will be on hand at each task, to lend their local knowledge of know flood-prone areas, future development, sensitive topics, and City standards. Our experienced team leads us to an approach for you that is streamlined and cohesive.

The approach begins with a workshop to review metrics, factors, and objectives that will form the framework for the project. In general, we want to know the factors that will drive best placement for future GSI, getting the most "bang for your buck" on checking the boxes of flood risk reduction, water quality improvement, reduction of heat island effect and improved air quality (toward climate change), positive impact to property values, contribution to meeting TMDL requirements, etc. These factors all lead to developing the triple bottom line evaluation.

Next, we'll dive into a check-list of generally available data from the City that can be used for the GIS assessment. Typical data sets and maps include, but not limited to: soils, depth the groundwater, impervious surface coverage, land use/zoning, delineated drainage areas per DNR permit, WinSLAMM (water quality calculations) output per storm sewer outfall (DNR permit), floodplain and known ponding areas, and more. We'll discuss any known areas of future development projects, and the City's Capital Improvement Program (CIP), and any other key areas of interest. When run through GIS, this information serves to narrow the focus for the best placement for GSI.

Our team's services will include the scope of services defined in the following tasks.

Task 1. Project Management and Kick-off Meeting

As in any good project, the organization and management of this project will be key from the beginning. As the SSE Team's Project Manager, Carrie will begin by organizing the list of materials to be received from the City, prior to the kick-off meeting, and will send a questionnaire to gather key information. Carrie will connect with the City's PM on a regular basis, at least monthly, to check in on project status and will provide regular invoices and progress reports.

The SSE Team proposes to make the most of the kick-off meeting by preparing documents to use as a workshop. We'll review the standard scope and schedule for the project, and brainstorm over a list of prioritizing factors to be used for establishing locations for GSI placement and triple bottom line analysis. We'll plan to discuss and review the long list of possibly GSI strategies, confirm project objectives, and discuss potential key project stakeholders.

Refer to Tab H for the schedule of fees.

Initial Cost (Design, Materials, Installation)	Level of Maintenance	Increased Job Growth	Increased Property Values	Relief to Existing Infrastructure
>\$25 per square foot	Frequent maintenance, expertise and/or special equipment required	Implementation requires three or more professional/service fields, Regular O&M required, Materials provided by three or more sources	Visible as an improvement, Vegetation Present, Often located near residential properties	Capture and store > 8 gal/sf
\$10 to \$25 per square foot	Seasonal maintenance, training required for maintenance	Installation, O&M, and material sourcing accompany BMP, but not to the degree described in "high" for each category	Visible as an improvement, Vegetation or other aesthetically pleasing feature present	Captures and stores 5 to 8 gal/sf
<\$10 per square foot	Seasonal maintenance, no special equipment	Installation, O&M, and material sourcing limited to one or fewer professional/service field each	Visible as an improvement	Captures and stores 1 to 5 gal/sf
No cost	No maintenance required	No job growth potential	No impact on property value	Negligible impact on existing infrastructure
	Potential to Reduce Crime	Access to Recreation/Education	Improves Community Connectedness	
	Vegetated, Often located in high traffic areas	Highly Visible, Accessible to public, Often located in or near park or school	Can be used as part of a green corridor, Accessible to Public, Visible	
	Vegetated, but not in high traffic area	Accessible to public, Visible	Can be used as part of a green corridor, but often is used separately	
	Not vegetated, but obvious structural improvement	Accessible to public	Not installed as part of green corridor, but can be used on residential lots	
	No crime reduction	No education/recreation potential	Does not promote community connectedness	
Improves Water Quality	Energy Savings	Reduces Urban Heat Island	Improves Air Quality	
Provides > 3 pollutant removal	Located on building roof or walls	Trees with large shade canopy	Trees present	

Figure 1. Sample of Workshop Criteria to be reviewed

Task 2. Location Analysis to ID Priority Subbasins

The SSE Team will provide a list of requested documents prior to the Kick-off meeting. These items will be used to build a GIS file to analyze the City for best placement of GSI. The list is expected to include available GIS files such as impervious surface, land use, and the Lower Fox River TMDL for Total Suspended Solids and Phosphorus, and drainage areas per storm sewer outfall from the City's DNR Municipal Separated Storm Sewer System (MS4) permit. SSE Team will also add water quality data from the City's MS4 permit to GIS, along with locations of City CIP/roadway projects, future private development areas, and known ponding and flood prone areas such as around Main/Mason, the East River, and East Town Mall. We will discuss at the Kick-

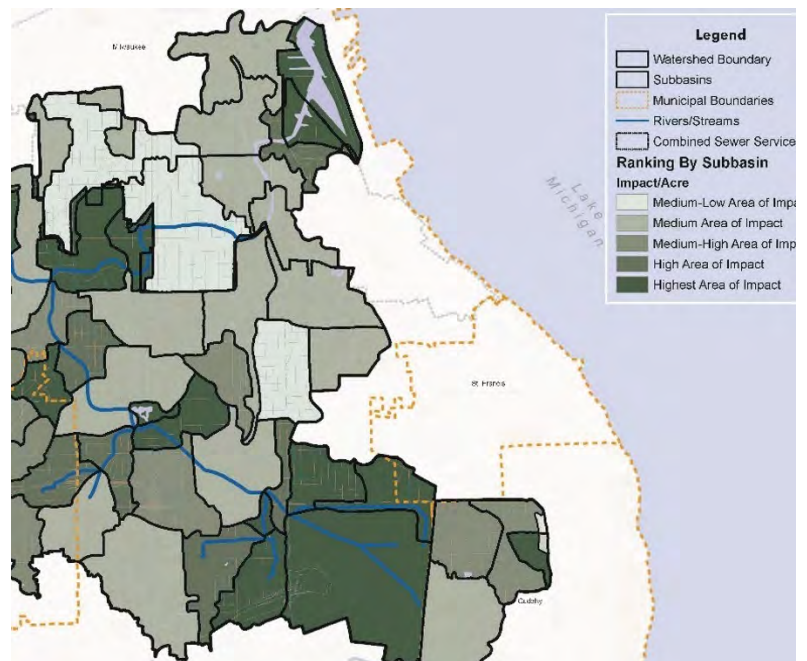


Figure 2. Kinnickinnic Watershed GIS output

off meeting a rating system for determining hierarchy which will be used to weigh the options. For instance, a subbasin of lower water quality (as determined by WinSLAMM data available from the City) within the TMDL area, in conjunction with a future large private development would be ranked high due to need and potential ease of implementation at lower cost.

We plan to focus on the 6 highest rated subbasins or location areas for the majority of prioritized public and private projects. The 6 highest rated areas will be submitted to the City for review and approval to proceed to Task 3. We'll discuss this in greater detail in tasks that follow. All findings will be summarized in the draft and final report.

Task 3. ID and Prioritize 30 Public and 20 Private GSI Projects

Using the output from Task 2, given future private development areas of the City, Park, or actual projects known at this time, the SSE Team will propose 30 public and 15 to 20 potential private GSI projects to achieve the agreed upon objectives. General locations will be shown on a GIS map, within



Figure 3. Bioswale image

the 6 highest rated subbasins with a concept photo and/or typical details of the type of GSI device. A general cost estimate will be provided for each type of device proposed.



Figure 4. Stormwater Tree Trench image

Task 4. Triple Bottom Line (TBL) Analysis

In our opinion, to produce a true TBL that has legitimate value to the City, hitting on as many objectives as possible will develop the best return on investment. Proposing GSI in areas tributary to known flooding (sometimes well upstream from the actual problem area), where water quality is poor, neighborhood home values are declining, and development may be proposed, will generally score high on the other criteria such as job growth and environmental factors. During the kickoff/workshop, we will present the list of typical criteria to be chosen and ranked to populate a matrix like the one shown below, used for our Kinnickinnic River Watershed GI Plan.

Output from the analysis will be summarized in a draft and final report.

	ECONOMIC					SOCIAL			ENVIRONMENTAL			
	Initial Investment Cost	O&M Cost	Job Growth	Increase Property Values	Relief to Existing Infrastructure	Potential to Reduce Crime	Potential Access to Recreation/Education	Improves Community Connectedness	Improves Water Quality	Energy Savings	Reduces Urban Heat Island (UHI)	Improves Air Quality
GI Strategy												
Wetland Construction/Resotration												
Floodplain Storage												
Removal of Structures/Pavement												
Rainwater Catchment												
Green Roof/Blue Roof												
Bioswale												
Rain Garden												
Porous Pavement												
Greenway												
Green Streets and Parking Lot												
Green Alley												
Stormwater Trees												
Native Landscaping												
Soil Amendments												
Urban Agriculture												

High

Medium

Low

None

High
Medium
Low
None

Figure 5. TBL Factors for various GSI

Task 5. Water Quality and Quantity Modeling

The 30 public and 15-20 private GSI locations will be sized based upon the area or assumed future drainage area (in the case of a future development or future roadway project), using HydroCAD software. We will discuss with the City the desired design storm to be used for sizing. It is commonplace that GSI is designed for what is known as the “water quality storm” or ½” to 1” of runoff capture. Some designers assume that GSI cannot be used for large storm event storage, but we will disagree with that assumption, as most of the new development stormwater best

management practices we have designed for the past 10+ years have been predominantly GSI rather than standard stormwater detention ponds or underground storage. There are economies of scale when the project is to be built, to add additional subsurface storage, even where groundwater is high, to expand the subsurface footprint. We will review these standards with the City at the kickoff-workshop to determine sizing standards to be assumed.

Once modeled for quantity control, the data will be entered into WinSLAMM, a Wisconsin-based water quality model, to determine the Total Suspended Solids (TSS) and Total Phosphorus (TP) removed as a result of the GSI device.

A summary of each location will be provided in a draft and final report.

Task 6. Creation of Maps for Integration with City's GIS

Using City-provided existing map data, the SSE Team will create maps showing hierarchy of priority subbasins, with added layers for capital improvement/roadway projects, projects to be considered within parks and parking lots.

Using the ArcGIS Online platform, the Team will create a layer to be used for tracking recently installed GSI. This would memorialize the construction and creation of that feature for general tracking by the City. We will then create a fillable form with critical features of the GSI, detailing ongoing monitoring and maintenance items for the city to be mindful of. This would be managed through Field Maps, as well as created with related tables for field inputs and ongoing data management. We will work closely with the City to ensure the means and methods of the created layer would integrate with the City's existing GIS system. The monitoring and maintenance items will tie to tracking the Maintenance and Operations Guidance to be provided as Task 9, which provides the City with a response to the biggest issue communities usually face with GSI ("how do we keep track of the maintenance?")!

A summary of the map creation and GIS tracking tool will be provided in draft and final report.

Task 7. Evaluation Process for Feasibility of GSI in ROW Projects - Tool

During the kickoff-workshop (or in a subsequent meeting with City representatives) we will discuss the critical success factors to GSI design and installation. The Team will ask for feedback on the typical list, and brainstorm additional pitfalls or challenges that may be encountered. We will develop a form/checklist that will populate a score for ease or probability for proceeding with the project. We provided a similar tool for a recent client, for determining when a rain garden would be the right GSI for sump pump discharge purposes.

A summary of the Feasibility Tool will be provided in draft and final report.

Land Use	Location	Wetland Construction/Restoration	Floodplain Storage	Removal of Pavement/Structure	Rainwater Catchment	Green Roof/Blue Roof	Bioswale	Rain Garden	Porous Pavement	Greenway	Green Streets, Alley, and Parking Lot	Stormwater Trees	Native Landscaping	Soil Amendments	Urban Agriculture
Residential	Roof				•										
	Yard							•				•	•	•	•
	Driveway			•					•						
	Alley								•		•				
Transportation	Streets								•		•				
	Parking			•					•		•				
	Medians						•				•	•	•		
Commercial	Parking			•			•		•		•				
	Buildings				•	•									
	Walkways			•					•			•	•	•	

Figure 6. Matrix of GSI recommended use locations

Task 8. GSI Design Guidance for Identified GSI Projects

The SSE Team will provide a list of typical GSI strategies to be considered (see Figure 5 for a sample). For each of the strategies or types of GSI determined to be acceptable by the City, the SSE Team will develop standard specs, construction details, some of which are readily available elsewhere in the state, or have been previously developed by SSE and can be updated for use by the City. The Team will also provide a matrix of where each strategy is best utilized, as shown in Figure 6, for all land use and development types.

A summary of all documents will be provided in draft and final report.

Task 9. Maintenance and Operations Guidance for Identified Projects

Maintenance and inspection guidance are the biggest headaches most often cited by city officials as to why GSI is difficult to institute. Getting a handle on these areas before a robust program begins is paramount to a successful program. SSE produced the Green Infrastructure Operations and Maintenance manual for MMSD in Milwaukee, which is available on their website under [Our Plans: freshcoastguardians.com](http://OurPlans.freshcoastguardians.com). This document was developed using experts from Wisconsin, and the east and west coasts of the US, to provide a breadth and depth of info on all types of GSI. The SSE Team will revise this document to fit the needs of the City, at a much reduced cost than the original, since the MMSD has made the document available to the public, and we hold the originals.

The document will be provided with the draft and final report.

Task 10. Compilation of Consultant Services into Final GSI Plan

Each Task noted herein will have a dedicated chapter in the GSI plan. Each section will be prepared during the process of development of each Task deliverable, so the compilation will be rather brief. A draft plan will be submitted to the City for review. Comments will be addressed in the submittal of the final plan.

Task 11. Five Meetings with City Representatives

Members of the SSE Team will be in attendance at 5 virtual meetings at times dictated by the City. We will plan to discuss the intended timeline and nature of each meeting at our Kick-off/Workshop. We will investigate the Key Project Stakeholders to ensure that meeting time has been set aside for each of them, with additional meeting time available on a time and materials basis upon request. Meetings are shown on the schedule/Gantt chart provided in the Schedule of Services tab.

Task 12. Presentation of Final Plan to GB Common Council or Other Committee

SSE will propose to provide a presentation around 2 weeks prior to the final plan submittal, to present key points of each Task of the project, and collect feedback from the Common Council or Committee. The comments received will be used in the revisions for the Final Report. This meeting is anticipated to be in-person and handouts will be provided upon request.

Additional Services if Authorized:

A. Grant Services

SSE has won approximately \$3.5 Million in grants for GSI for clients in Wisconsin in the past few years. See the list provided in the Project References Tab F. Grant services are available upon authorization. Upon request, SSE will research available local and national grants and submit a document to the client detailing pertinent information for each where the client can choose which grants to apply for. SSE will assist in completing the applications and submitting them for the client. SSE typical fees for grant application services is \$1,500-\$3,000 for the first grant app, and \$500-\$1,000 for each thereafter (as most documents can be repurposed). These services will be provided as separate estimated fees if requested and may include additional staff from SSE. See the list provided in the Project References Tab F.

B. Renderings

City-scape or private development renderings of a future condition including GSI is usually helpful in gaining favor with developers, city officials, and the public. The Team will provide 3D renderings of each specific site or GSI example as requested, at fees ranging from \$1,500-\$3,000 depending on complexity.

C. Training and Certification Program for GSI Design and/or Construction Inspection

The SSE Team has developed training programs for design and inspection staff, and maintenance and construction contractors. A Certification program for contractors and other professionals is recommended, so that a pre-certified list can be developed for City-owned projects.

D. Preliminary Design, Final Design, and Construction Inspection

The SSE Team has designed and managed construction over 50+ sites in Wisconsin in the past few years. We have worked through the issues prone to new designers, and are available to assist in a fast-paced project.

E. Review and Provide Recommendations to City Ordinances and Programs

We have found that many existing City codes unknowingly prevent or create obstacles from the ability to provide GSI on development sites and private property. The SSE Team would review and provide updated text to be used for removing issues such as limitations on type of pavement, inlets, underdrain, landscaping buffers, parking requirements, vegetation, etc. that may prevent GSI use. Our Team member REL has experience working with the City on existing codes that conflict with GSI, and area ready to assist with this as well.

F. Review and Revision Recommendations to City Stormwater Utility Credit Program

Incentivizing use of GSI on private property may require monetary or other benefits to developers and landowners. SSE would review and recommend changes to the Stormwater Credit Application program, to provide a larger percentage reduction in SW Utility fees for those who go over and above on provide water quality and quantity storage onsite in the priority Subbasins.

G. Detailed Cost Estimates for Design, Construction, and Construction Admin, and Maintenance of GSI

A useful but additional scope item not requested in the RFP are detailed cost estimates for each type of GSI. SSE Team have had numerous GSI projects bid in 2022 and have up to the minute unit bid prices for southern Wisconsin. With REL's assistance, the SSE Team would provide locally reported unit bid prices and calculate a per unit cost for each type of GSI to be anticipated in the next construction season.

TAB E

Resumes



Providing Quality Engineering For Our Water Resources Since 2002

247 Freshwater Way, Suite 410
Milwaukee, WI 53204
(414) 810-1245
cbg@stormwater-solutions-
engineering.com

Education and Licensure

Professional Engineer - State of
Wisconsin No. 33316

Envision Sustainability
Professional, 2021

Certified Floodplain Manager,
ASFPM, 2006-2021

Graduate coursework in Civil En-
gineering, UW-Milwaukee, WI

BS, Civil Engineering
UW-Milwaukee, Wisconsin, 1994

Professional Organizations

University of Wisconsin,
Milwaukee | Adjunct Professor

Milwaukee Riverkeeper Adopt-a-
River, Kinnickinnic River | Adopt-
er/Organizer

University Wisconsin-Sea Grant |
Former Advisory Council Member

American Council of Engineering
Companies (ACEC-WI) | Former
Board Member

Software Expertise

HEC-RAS

HydroCAD

Microsoft Products

WinSLAMM

Carrie has been serving Wisconsin in Stormwater Engineering for the past 25+ years, serving as a municipal stormwater engineer prior to founding Stormwater Solutions Engineering, LLC in 2002, where she's built a team of professionals all focused on designing stormwater systems for water quality and flood control. SSE won the 2018 Wisconsin Governor's Award for Small, Woman-Owned Business.

Carrie is inventor of a patented product, StormGUARDen™, a small site innovative stormwater management device which won a Water Council's Pilot Project and a BizTimes Innovation Quotient Award.



Carrie's project experience includes:

Milwaukee Public Schools, Green Infrastructure Upgrades—2019-2022

Assisted staff with construction document reviews for Cohorts 2, 3, and 4 Green Infrastructure Schoolyard Redevelopments and provided general project oversight.

MMSD Fresh Coast Partnership Program, Constructed Stormwater Wetlands—2020-2021

Provided scoping, property owner engagement, and QC for design of 2 large constructed stormwater wetlands on private property to provide wet-weather capture and storage of runoff as part of a large green infrastructure program. Project involved review of hydrologic and hydraulic modeling, and management of project through construction.

War Memorial Center (Milwaukee County), Green Parking Lot—2019-2021

Provided stakeholder engagement since 2016 resulting in the Greenprint Master Plan. Assisted in evolving the project from a mill and overlay of existing parking lots to relocating a lot away from the lake side and adding in green infrastructure features to manage runoff from the previously untreated site. Provided oversight for SSE staff with the applications and received \$966K in grant funding.

MMSD Kinnickinnic River Watershed GI Plan and Green Infrastructure Operations and Maintenance Manual — 2017-2021

Managed staff in developing first watershed-wide GI plan in the State of Wisconsin, using GIS and hydrologic modeling to develop priority areas and propose GI projects.

Managed staff in providing client with O&M manual for various types of GI strategies, including inspection, care and maintenance, on aspects of each from concrete inlets to vegetation.



Stormwater Solutions Engineering, LLC

247 W. Freshwater Way | Milwaukee, WI 53204

Phone: (414)810-1245

Web: www.stormwater-solutions-engineering.com



Education
Marquette University
Bachelor of Science
Civil Engineering, 2003

Registrations
Professional Engineer
Wisconsin

Professional Organizations
American Society of Civil Engineers
Fox Wolf Watershed Alliance, Past President
FWWA Conferences, Planning team
Northeast Wisconsin Storm Water Consortium
Brown County Home Builders Association,
Past Government Affairs Chairman
Preble Optimist Member

Continuing Education
Dam break analysis using HEC-RAS
Source Loading and Management Model (SLAMM)
P8 urban catchment model
Post-construction storm water management Con-
struction erosion control
Phase II storm water regulation and compliance
Docks and marinas

Jared G. Schmidt, P.E.

Vice President
Civil/Municipal Engineering Manager

EXPERIENCE

19 years experience in civil engineering covering the following areas of expertise:

- *Municipal engineering*
- *Site & storm water plan design*
- *Storm water management design & permitting*
- *Waterway analysis & design*
- *Site & recreational design & planning*
- *Material dredging*
- *Federal, state, and local agency permitting*

Municipal Engineering

Project manager for the design and construction of sanitary sewer, lift stations, water main, storm sewer facilities, material dredging, street and roadway cross sections; development of plans, specifications and necessary contract documents for bidding purposes; coordination between owner, contractor and construction observer. Coordination of public involvement meetings and information for municipal board meetings. Work also includes site design of residential developments, commercial building sites, parking lots, park and recreational areas. Project examples include:

- *Investors Court road/storm water work, Grand Chute, WI*
- *Centerline Drive, Founders Terrace, Lear Lane, Hobart, WI*
- *TID Planning and creation, Hobart, Florence County, Pulaski, WI*
- *Crivitz Drainage Improvements, Crivitz, WI*
- *83rd Street & 90th Avenue, Pleasant Prairie, WI*
- *NWTC Pond Dredging, Green Bay, WI*

Site & Storm Water Plan Design & Permitting

Layouts of physical improvements including building location, parking lots, and green space. Utility layouts (water main, sanitary & storm sewer), grading plans, and erosion control plans. Complete storm water BMPs design reporting, and permitting are typically required for this work. Project examples include:

- *Marinette Community Center, Marinette, WI*
- *Fountain Ridge, Pleasant Prairie, WI*
- *Bellin Hospital Courtyard Addition, Green Bay, WI*
- *Bellevue Crossing, Bellevue, WI*
- *South Bay Marina, Green Bay, WI*
- *Centennial Estates, Hobart, WI*

Storm Water Management Design

Regional facility designs included the development of regional storm water Best Management Practices (BMPs) for previously or newly developed areas. Identification of complete drainage basins, land uses, storm sewer conveyance systems, and site soils to design site specific BMPs. Regional ponds or other BMPs are then designed and evaluated for storm water quality and quantity impact. Project examples include:

- *"The Woods" Golf Course Storm Water Pond, Green Bay, WI*

Jared G. Schmidt, P.E.

Vice President

Civil/Municipal Engineering Manager

- *Brown County Farms Pond, Green Bay, WI*
- *Green Bay Parks - E. River Trail, Arnie Wolff Soccer Complex, Colburn Park, Bay Beach Facilities, Beaver Dam Park, Green Bay, WI*
- *Centennial Centre at Hobart Regional Storm Plan, Hobart, WI*
- *Fochs Trails, Hilbert, WI*
- *Rockville Heights, Kiel, WI*
- *Glen Kent Estates, Howard, WI*
- *Pulaski School District Pond Retrofit, Pulaski, WI*

Waterway Analysis & Design

Hydraulic & hydrologic analysis of numerous waterways throughout the state of Wisconsin. Data can be used for FEMA flood planing mapping, a base line for future development, culvert sizing, stream restoration. By utilizing HEC-RAS, detail analysis and design can be performed.

Site/Recreational Design & Planning

Planning and development of recreational facilities such as trails, shelters, playgrounds, ballfields, parking lots, and restrooms. Work includes coordination between clients, the users of the facility, and the agencies that oversee it; as well as design layout, cost estimates, specification writing, bid documents, and construction oversight. Project examples include:

- *NWTC Campus Development Projects, Green Bay, WI*
- *South Bay Marina, Green Bay, WI*
- *Marian College Baseball Facility, Fond Du Lac, WI*
- *Bay Beach Green Infrastructure Parking Lot, Green Bay, WI*
- *Bay Beach Falling Star Amusement Ride, Green Bay, WI*
- *Green Bay Booyah, Baseball Facility, Ashwaubenon, WI*

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247 Freshwater Way, Suite 410

Milwaukee, WI 53204

(414) 810-1245

adrienne@stormwater-solutions-
engineering.com

Education and Licensure

Professional Engineer—State of
Wisconsin No. 46560

PhD, Biological and Ag Engineering
with Minor in Landscape
Architecture, North Carolina State,
October 2014

MS, Environmental Engineering,
University of North Carolina, May
2008

BS, Civil Engineering,
UW-Madison, May 2006

Professional Organizations

Adjunct Professor UW-Milwaukee
School of Continuing Education

Wisconsin Association of Flood-
plain, Stormwater and Coastal
Managers (WAFSCM) | Member

American Council of Engineering
Companies (ACEC) | Member

Software Expertise

ArcGIS

Autodesk Civil 3D

HEC-HMS

HEC-RAS

HydroCAD

RSC Design

WinSLAMM

Adrienne joined SSE in 2014 after earning her PhD studying Regenerative Stormwater Conveyance (RSC) systems at North Carolina State University, working with the NC state extension, water quality regulators, and engineering design firms. She minored in landscape architecture while working with the Natural Learning Initiative, integrating green infrastructure into children's outdoor spaces. Adrienne passes her knowledge along as an Adjunct Professor at UW-Milwaukee's SCE. Adrienne is a proficient grant writer and has helped SSE win over \$2 million for our clients since 2015!



Adrienne's project experience includes:

City of Madison, **Stormwater Grant Review and Drafting** — 2022

Adrienne is leading the SSE team with providing grant research and review, drafting, application submittal, and reporting for the City of Madison. The grant funding opportunities provide potential alternate funding for multiple City stormwater projects to maximize the City's ability to achieve its water quality goals. The grants applied for are at the national, state-wide, and local level. To date, the team has secured just under \$380K in funding.

Milwaukee Public Schools, **GI Upgrades on Sixteen Schoolyards** — 2019-2022

Adrienne was part of the SSE project team (prime role) working on improving children's access to green and inspiring outdoor learning environments at 16 MPS schoolyards over the past three years. Responsibilities included engagement with students and community, engineering design, calculations for grant reporting, and preparation of construction documents and estimates.

MMSD Fresh Coast Partnership Program, **Constructed Wetlands** — 2020-2021

Adrienne was on the design team for two constructed stormwater wetlands (CSW) located in Milwaukee. One CSW was designed with the capacity for 1.85 million gallons and the other for 750,000 gallons. Adrienne performed hydrologic and hydraulic modeling, TSS modeling, and prepared construction documents, cost estimates and permit submittals.

War Memorial Center, **Green Parking Lots** — 2019-2021

Adrienne provided grant preparation receiving more than \$950k in grants for client. She performed public meeting planning, design, construction document preparation, construction inspection, and grant reporting for the site updates at the WMC. Construction was completed in Summer 2021.

MMSD, **City of Cudahy MS4 Stormwater Management Plan** — 2019-2022

Adrienne led the SSE Team in using GIS, Hydrocad, and WinSLAMM software to assist the City in managing their TMDL compliance through stormwater BMPs and green infrastructure. The plan includes a proposed timeline based upon stormwater utility funding and grant opportunities.

Stormwater Solutions Engineering, LLC

247 W. Freshwater Way | Milwaukee, WI 53204

Phone: (414)810-1245

Web: www.stormwater-solutions-engineering.com



Education
UW-Platteville
Bachelor of Science
Civil Engineering, 2010

Registrations
Professional Engineer
Wisconsin

Professional Organizations
American Society of Civil Engineers

Aaron Breitenfeldt, P.E.

Civil/Municipal Sr. Project Manager

EXPERIENCE

12 years experience in civil/municipal engineering covering the following areas of expertise:

- *Site & storm water plan design*
- *Waterway analysis & design*
- *Municipal engineering*
- *Federal, state, and local agency permitting*
- *Resident project representative services*

Site & Storm Water Plan Design

Design engineer for various commercial, industrial, and residential site plan designs. Design work includes developing the layout of proposed improvements and providing detailed utility plans, grading plans, and erosion control plans. Storm water management plans are also generally required. Design of storm water management plans includes the analysis of existing and proposed drainage basins, land uses, site specific soils, and storm water conveyance features. Permitting and coordination with local municipalities and state and federal agencies is generally also required. Project examples include:

- *High School Parking Lot Reconstruction, Marinette, WI*
- *High School Parking Lot Expansion, Marinette, WI*
- *Green Bay Rockers Stadium, Ashwaubenon, WI*
- *Marian University Baseball Field Upgrades, Fond du Lac, WI*
- *City of Marinette Community Center, Marinette, WI*
- *Town Center Park, Grand Chute, WI*
- *Bridgewater Trails Apartments, Little Chute, WI*
- *Prevea St. Nicholas Medical Office Building, Sheboygan, WI*
- *Prevea St. Mary's Medical Office Building, Green Bay, WI*
- *Community Memorial Hospital, Oconto, WI*
- *Bay Beach Green Infrastructure Parking Lot, Green Bay, WI*
- *Georgia Pacific Warehouse, De Pere, WI*

Center Valley Commercial Development, Grand Chute, WI

- *WG&R Furniture*
- *At-Home*
- *REI Co-Op*

Waterway Analysis & Design

Performed hydrologic/hydraulic analysis and design for a variety of projects. Types of projects include stream realignment, stream restoration, and flood plain determination. Most projects involve the analysis of drainage basins and the calculation of flood flows at a given location for multiple design storm events. The HEC-RAS program is then utilized to perform detailed flood plain calculations. Project examples include:

- *Yurek Road Culvert Analysis, Town of Chase, WI*
- *Lancaster Creek Stream Realignment, Hobart, WI*
- *State Street Culvert Extension, City of Algoma, WI*
- *Little Suamico River Stream Realignment, Little Suamico, WI*

Aaron Breitenfeldt, P.E.

Civil/Municipal Project Manager

- *Bower Creek Road Bridge, Village of Bellevue, WI*
- *CTH V Levee, Village of Bellevue, WI*
- *Fair Road Bridge, Town of Wrightstown, WI*
- *Mud Creek Bridge, Town of Grand Chute, WI*

Municipal Engineering

Project manager for the design of sanitary sewer, water main, storm sewer facilities, streets, roadways; development of plans, specifications, and necessary contract documents for bidding purposes; coordination between owner, contractor, and construction observer. Coordination of public involvement meetings and information for municipal board meetings. Work also includes site design of residential developments, commercial building sites, parking lots, park and recreational areas. Project examples include:

Street & Subdivision Design

- *Tailwind Crossing, Hobart, WI*
- *Fieldstone Estates, Hobart, WI*
- *Crosswind Estates, Little Chute, WI*
- *Dunham Grove Subdivision, WI*
- *Adams Street, City of Oconto Falls, WI*
- *Somerset Fields, Bellevue, WI*
- *Various Streets, Watertown, WI*
- *Centennial Centre Boulevard, Hobart, WI*
- *Founders Terrace, Hobart, WI*
- *Larson Orchard Parkway, Hobart, WI*
- *Centerline Drive, Hobart, WI*
- *Golden Gate Drive, Little Chute, WI*
- *90th Avenue & 83rd Street, Pleasant Prairie, WI*
- *Stargazer Estates, Harrison, WI*
- *Jewel Box Estates, Harrison, WI*
- *Chicago Street & 4th Street, Pulaski, WI*

Resident Project Representative

Function as an agent on the owner's behalf. Maintain close contact with the owner's representatives to keep them informed of work progress during construction period. Act as liaison between the owner and contractor. Interpret what is required by the drawings and specifications and offer assistance to the contractor(s). Conduct progress meetings with contractor, project manager, job superintendent, principal subcontractors, and other involved parties. Project examples include:

- *STH 96 Improvements, Grand Chute, WI*
- *Adams Street Reconstruction, Oconto Falls, WI*
- *Oakland Avenue Reconstruction, Oconto Falls, WI*
- *Flatley Avenue Reconstruction, Oconto Falls, WI*
- *Woodfield Prairie, Hobart, WI*
- *Centennial Centre Boulevard, Hobart, WI*
- *Founders Terrace, Hobart, WI*
- *Larson Orchard Parkway, Hobart, WI*
- *Overland Road Reconstruction, Hobart, WI*
- *Centerline Drive, Hobart, WI*

Providing Quality Engineering For Our Water Resources Since 2002

247 Freshwater Way, Suite 410

Milwaukee, WI 53204

(414) 810-1245

cassandra@stormwater-solutions-
engineering.com

Education and Licensure

BS, Civil Engineering,
UW-Milwaukee, Wisconsin, 2016

Cum Laude Academic Excellence
Award—College of Engineering and
Applied Sciences

Professional Organizations

Engineers Without Borders,
University of Wisconsin Milwaukee
Chapter (EWB at UWM) | Mentor

Keeping Greater Milwaukee
Beautiful (KGMB), Milwaukee |
Board Member

Women of Water (WoW),
Milwaukee | Member

Wisconsin Association for Flood-
plain, Stormwater, and Coastal
Management (WAFSCM) | Member

Milwaukee Riverkeeper Adopt-a-
River, Kinnickinnic River | Volunteer

Software Expertise

ArcGIS

Autodesk Civil 3D

HEC-RAS

HydroCAD

PCSWMM

WinSLAMM

XPSWMM

Cassandra's passion for green infrastructure and attention to detail makes her an admirable designer. Her experience with projects involving community engagement and multiple stakeholders broadened her designs to be more holistic. Cassandra is fluent in Spanish and has spoken as a translator at outreach events detailing site design in the greater Milwaukee area. She is also well versed with ADA compliance, bringing that knowledge to projects.



Cassandra's project experience includes:

Milwaukee Public Library, **Green Infrastructure Improvements** — 2018-Present

Cassandra co-designed 6 Library sites along with a LA subconsultant keeping ADA improvements as a priority while including green aspects wherever possible. Porous pavement, bioswales, StormGUARDen's, native landscaping, and soil amendments are among the improvements to the different sites. Also included in the design were program spaces, lighting enhancements, and safety considerations. Cassandra is currently leading construction oversight for the project.

Milwaukee Public Schools, **Green Infrastructure Upgrades** — 2019-2022

Cassandra was a co-designer for green infrastructure updates at eleven MPS schoolyards for Cohort 2 and Cohort 3 and the quality control reviewer for five schoolyards for Cohort 4. Site additions included stormwater green infrastructure, recreational improvements, outdoor educational spaces, and site amenities for the school and community to use. Cassandra was responsible for developing construction documents, assistance in green team meetings, assistance in bidding, QC review, and construction oversight help.

War Memorial Center (Milwaukee County), **Green Parking Lot** — 2019-2021

Cassandra provided public meeting planning, design, and construction document preparation for the project. She graded the site to best tie into existing surrounding components, ensure pathways were ADA compliant, and direct runoff to GI before entering the lake.

City of Milwaukee, **Historic Mitchell Street Green Parking Lot** — 2018

Co-designer for the parking lot, Cassandra incorporated green infrastructure within the project site to treat stormwater that previously all led to one inlet. The design includes bioswales and native landscaping that capture 132,000 gallons of stormwater. The finished lot includes porous pavement, an urban orchard, bioswales, electric car charging stations, BublR Bike stations, and native landscaping to create an oasis of green space in the city. Cassandra helped with public outreach events, speaking in Spanish alongside 16th Street staff to explain the proposed site to residents.

Stormwater Solutions Engineering, LLC

247 Freshwater Way | Milwaukee, WI 53204

Phone: (414)810-1245

Web: www.stormwater-solutions-engineering.com



Anna Peters

GIS Specialist

EXPERIENCE

5 years experience in Geographic Information Systems (GIS) services covering the following areas of expertise.

- *Water, sanitary sewer, and storm utility GIS mapping*
- *Municipal GIS and mapping administration*
- *Wetland and environmental mapping*
- *Conceptual site planning and mapping*
- *UAV (drone) data collection*

Water, Sanitary Sewer, Storm Utility GIS Mapping

Project specialist for the design, development, implementation, and maintenance of GIS systems for municipal utility clients. Visible utility features are located by our survey crew, and this data is combined with existing digital and paper as-built drawings to map the pipelines, record feature attributes, and create a complete view of the utility networks. All completed maps and data are uploaded to the ArcGIS Online platform, allowing the client to use the interactive maps on any desktop computer or mobile device. Any paper drawings associated with the utility system are scanned and indexed to be available within the GIS. As new utility work is completed, GIS system is updated to reflect the change. Training is provided on system completion.

Municipal GIS and Mapping Administration

Serves as the GIS administrator providing services to include creation and development of zoning, weapons discharge, street sign inventory, parks, trails, and EMS call maps. Provides regular updates to these municipal maps, as well as on-demand mapping services. ArcGIS software installation, updates, and training are also provided.

Wetland and Environmental Mapping

Provides GIS and mapping support for our ecological sector, NES Ecological Services. Create wetland delineation maps utilizing field data collected with the Trimble GEO7XH GPS, as well as soils, surface water, and wetland inventory data. Produce invasive species, controlled burn, and historical imagery maps, as needed. Assists with managing GPS hardware and configuring data and projects for devices. Configures multiple mobile data collection solutions for ArcGIS Collector and ArcGIS Survey123 to eliminate paper-based collection methods and automate reporting.

Education

UW - Stevens Point

Bachelor of Science
Hydrology with GIS Minor

Certifications

GIS Professional
Cartography
Natural Resources & GIS Applications
Remote Pilot Certification

Professional Organizations

Wisconsin Land Information Association

Anna Peters

GIS Specialist

Conceptual Site Planning and Mapping

Creates conceptual site maps for planning new development. Provides a comprehensive view of existing site conditions, bringing together data layers such as orthophotography, parcels, environmentally sensitive areas, floodplain, soils, wetlands, utilities, and built structures. Uses existing conditions to locate optimal areas for development as well as potentially excluded areas. Provides rapid prototyping of various site layouts, depicting proposed buildings, parking, roads, green space, and utilities in relation to the existing conditions. Utilizes SketchUp and ArcGIS Pro for three-dimensional views of proposed site conditions.

UAV (Drone) Data Collection

Pilots UAV system to collect high resolution aerial photos and 3D topography data. The data is used for a number of purposes, including site planning and analysis, mine and quarry surveys, construction site documentation, and environmental monitoring. The resulting 3D models can be used to generate detailed topographic contours, calculate volumes of stockpiles, and perform other analysis.

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247 Freshwater Way, Suite 410
Milwaukee, WI 53204
(414) 810-1245
eileen@stormwater-solutions-
engineering.com

Education and Licensure

Engineer-in-Training (EIT) - State of
Wisconsin No. 1513590-500

BS, Civil Engineering, UW-
Milwaukee, Wisconsin, December
2019

Professional Organizations

Central States Water Environment
Association (CSWEA) | Member

Water Environment Federation
(WEF) | Member

American Society of Civil Engineers
(ASCE) | Member

Milwaukee Riverkeeper Adopt-a-
River, Kinnickinnic River |
Volunteer

Software Expertise

ArcGIS

Autodesk Civil 3D

HydroCAD

InfoWorks

Mike Urban

PCSWMM

WinSLAMM

Eileen received her B.S. in Civil Engineering from UW-Milwaukee in 2019. There, she developed a passion for environmentally sustainable design through her internships and projects. Eileen enjoys working collaboratively with clients to improve stormwater management and sewer system performance. She uses her analytical eye to assess and recommend solutions to stormwater problems by modeling alternatives and evaluating outcomes.

**Eileen's project experience includes:****City of Madison, Stormwater Grant Review and Drafting — 2022**

Eileen is currently providing grant-writing assistance for the City of Madison to provide alternative funding for multiple City stormwater projects. The grants applied for are at the national, state-wide, and local level. She and the team are working to draft competitive grants with the potential to provide funding which would maximize the City's ability to achieve its water quality goals.

City of Cudahy, Stormwater Management Plan Update — 2022

Eileen coordinated with the City of Cudahy and WDNR to review SWMP requirements and outline new requirements for the updated SWMP. She utilized data from field investigations to map current BMPs and determine drainage areas. She gathered layer data from multiple governmental units to create the database necessary to perform the water quality analysis in WinSLAMM. The project includes compiling a list of straightforward recommendations based on water quality modeling to include in the SWMP for meeting TMDL requirements.

SJ Landscaping, Site Design and Stormwater Management — 2022

Eileen was the lead designer for the South Shore Garden Center site which includes Green Infrastructure such as a bioswale, native landscaping, and permeable pavers. Eileen and the team also designed various hardscape features such as asphalt surface in the parking lot and around proposed building, driveway approach, and storm sewer connections. The project included hydrologic and hydraulic modeling, construction document preparation, and cost estimating.

MMSD, Impact of Water Levels on District Conveyance System Assets — 2022

The purpose of the project is to help MMSD and local communities prepare for future impacts due to lake level rise and identify solutions to mitigate negative impacts such as basement backups and street flooding from sewer surcharge. Eileen coordinated with engineers from other firms to evaluate the sensitivity of the MMSD sewer system to extreme (up to 500-year) lake levels. She utilized PCSWMM to perform the analysis and interpret modeled results using conventional hydraulic and hydrologic principles.

Stormwater Solutions Engineering, LLC

247 W. Freshwater Way | Milwaukee, WI 53204

Phone: (414)810-1245

Web: www.stormwater-solutions-engineering.com

TAB F

Project References and Examples



Stormwater Solutions Engineering, LLC

A Sample of SSE Green Stormwater Infrastructure Projects

Project	Client	Prime	Sub
Milwaukee Public Schools Greening Schoolyards, 2019-2023, Team: Carrie Bristoll-Groll, Kara Koch, Adrienne Cizek, Cassandra Hoppe.	Milwaukee Public Schools	X	
Green Infrastructure Site Development at 5 Library Branches, 2018-2022 Team: Carrie Bristoll-Groll, Cassandra Hoppe, Alyssa Schmitt, Adrienne Cizek.	Milwaukee Public Libraries	X	
Green Streets Design at 65 th and 66 th Streets, 2022 Team: James Zsebe, Kara Koch, Carrie Bristoll-Groll.	City of West Allis, WI	X	
Green Bay Playfield Site Design and Green Infrastructure Renovations, 2021 Team: Kara Koch, Cassandra Hoppe, Carrie Bristol-Groll. Sub to Site Design.	Milwaukee Public Schools, MKE REC		X
Community Based Green Infrastructure (CBGI) – Fresh Coast Partnership Protection 2020-2022 Team: Carrie Bristoll-Groll, Kara Koch, Adrienne Cizek, Cassandra Hoppe. Sub to Corvias	Milwaukee Metropolitan Sewage District		X
GI Maintenance and Lessons Learned for Municipalities (P-2815), 2019-2020 Team: Alyssa Schmitt, Carrie Bristoll-Groll, Cassandra Hoppe	Milwaukee Metropolitan Sewage District	X	
Edgewood Avenue MIS (C05051D01), GI Concept Plan, 2019-2020 Team: Kara Koch, Carrie Bristoll-Groll. Sub to CDM	Milwaukee Metropolitan Sewage District		X
Wilson Park Creek – Reach 3 (W45002D01) (HNTB), GI and Permitting, 2021-current Team: Carrie Bristoll-Groll, Adrienne Cizek, Kara Koch. Sub to HNTB.	Milwaukee Metropolitan Sewage District		X
War Memorial Center Parking Lot Green Infrastructure Renovations, 2019-2020. Team: Adrienne Cizek, Cassandra Hoppe, Carrie Bristoll-Groll. Sub to Sigma.	Milwaukee County Parks		X
Deadbird Brewery Parking Lot Renovations, 2018-2019. Team: Cassandra Hoppe, Alyssa Schmitt, Carrie Bristoll-Groll.	Sid Grinker Restoration, Inc.	X	
Neighborhood Outreach and GI Installation - Shorewood (P-2739), 2018 Team: Carrie Bristoll-Groll, Alyssa Schmitt, Harlan Groll	Milwaukee Metropolitan Sewage District	X	
Witkowiak Park Green Infrastructure Site Design Renovation, 2017-2020	MKE Plays	X	
South Shore Park Parking Lot Water Quality GI Renovations, 2017 Team: Adrienne Cizek, Alyssa Schmitt, Carrie Bristoll-Groll. Sub to Sigma.	Milwaukee County Parks		X
GI Center of Excellence Strategic Plan (W96002P01), 2017	Milwaukee Metropolitan Sewage District	X	
Residential GI Project (M03090P06), 2016	Milwaukee Metropolitan Sewage District	X	
Jackson Park Project (HNTB), GI Design and Engineering Services During Construction [2019-2023]	Milwaukee Metropolitan Sewage District		X

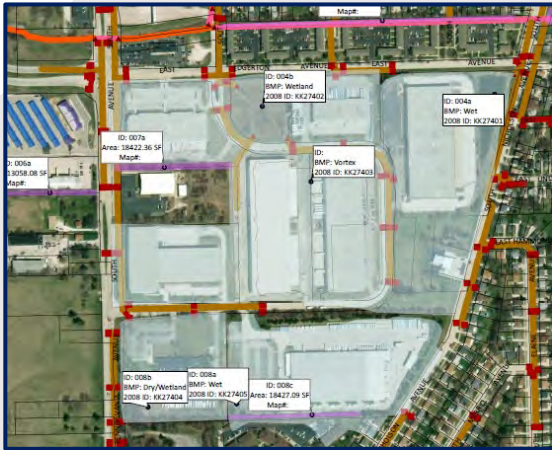
Green Infrastructure for Schools Guidebook (GRAEF), 2016	Milwaukee Metropolitan Sewage District		X
Neighborhood Outreach and GI Installation – Greenfield (P-2652), 2016	Milwaukee Metropolitan Sewage District	X	
North Point Lighthouse Regenerative Stormwater Conveyance System, 2015 Team: Adrienne Cizek, Carrie Bristoll-Groll	Milwaukee County Parks	X	
Preliminary Engineering and Design for Kinnickinnic River, Reach 2, Phase 1 (W40002005), (GRAEF), 2015 to 2017	Milwaukee Metropolitan Sewage District		X
Kinnickinnic River Watershed GI Plan-SSE 51% (GRAEF)	Milwaukee Metropolitan Sewage District		X
Green Infrastructure (RSC) at Pulaski Park and Engineering Services During Construction	Milwaukee Metropolitan Sewage District		X

Stormwater Solutions Engineering, LLC

Grant Award List

Updated 8/12/2022

Project	Year	Grantor	Grant Name	SSE Grant Services Fee	SSE Staff	Award Amount
Summerfest Administrative Building	2015	Milwaukee Metropolitan Sewerage District	Green Infrastructure Partnership Program	\$1,500.00	Carrie Bristoll-Groll	\$ 72,100.00
Summerfest Administrative Building	2015	Fund for Lake Michigan	Fund for Lake Michigan	\$500.00	Carrie Bristoll-Groll	\$ 25,000.00
North Point Lighthouse Green Infrastructure	2016	Milwaukee Metropolitan Sewerage District	Green Infrastructure Partnership Program	\$2,000.00	Adrienne Cizek	\$ 90,525.00
North Point Lighthouse Green Infrastructure	2016	Fund for Lake Michigan	Fund for Lake Michigan	\$500.00	Adrienne Cizek	\$ 85,000.00
North Point Lighthouse Green Infrastructure	2016	Milwaukee County Parks	Match funding	\$500.00	Adrienne Cizek	\$ 72,500.00
North Point Lighthouse Green Infrastructure	2016	Southeastern Wisconsin Watershed Trust	Water Quality Mini-Grant	\$100.00	Adrienne Cizek	\$ 5,000.00
Forest Exploration Center	2017	Milwaukee Metropolitan Sewerage District	Green Infrastructure Partnership Program	\$2,000.00	Adrienne Cizek	\$ 175,000.00
Forest Exploration Center	2017	Fund for Lake Michigan	Fund for Lake Michigan	\$500.00	Adrienne Cizek	\$ 100,000.00
War Memorial Center	2017	Milwaukee Metropolitan Sewerage District	Green Infrastructure Partnership Program	\$5,000.00	Adrienne Cizek	\$ 366,966.00
War Memorial Center	2017	Fund for Lake Michigan	Fund for Lake Michigan	\$500.00	Adrienne Cizek	\$ 125,000.00
War Memorial Center	2017	National Fish and Wildlife Federation	Sustain Our Great Lakes	\$5,000.00	Adrienne Cizek	\$ 473,826.00
StormGUARDen Pilot Grant	2017	The Water Council	Pilot Project Grant	\$0.00	Carrie Bristoll-Groll	\$ 50,000.00
Milwaukee Public Library	2018	Milwaukee Metropolitan Sewerage District	Green Infrastructure Partnership Program	\$3,500.00	Alyssa Schmitt	\$ 85,760.00
Milwaukee Public Library	2018	Fund for Lake Michigan	Fund for Lake Michigan	\$1,000.00	Alyssa Schmitt	\$ 125,000.00
Milwaukee Public Library	2018	National Fish and Wildlife Federation	Sustain Our Great Lakes	\$1,500.00	Alyssa Schmitt	\$ 514,544.00
Milwaukee Public Library	2018	Wisconsin Coastal Management Program	Coastal Management Grant	\$500.00	Alyssa Schmitt	\$ 96,230.00
Business Capacity Building for SSE	2018	City of Milwaukee	Business Capacity Building Program	\$0.00	Carrie Bristoll-Groll	\$ 25,000.00
City of Milwaukee - Mitchell Parking Lot	2019	EPA via MMSD	Great Lake Restoration Initiative	\$100.00	Carrie Bristoll-Groll	\$ 85,000.00
City of Milwaukee - Mitchell Parking Lot	2019	Wisconsin Coastal Management Program	Coastal Management Grant	\$3,000.00	Adrienne Cizek	\$ 45,125.00
SJ Landscaping Green Parking Lot	2020	Milwaukee Metropolitan Sewerage District	Green Infrastructure Partnership Program	\$2,500.00	Alyssa Schmitt	\$ 59,683.75
Astor Court Condo Association	2021	Milwaukee Metropolitan Sewerage District	Green Infrastructure Partnership Program	\$2,500.00	Adrienne Cizek	\$ 45,543.80
Milwaukee Montessori School	2022	Milwaukee Metropolitan Sewerage District	Green Infrastructure Partnership Program	\$2,853.00	Adrienne Cizek	\$ 316,769.00
City of Madison	2022	Wisconsin Department of Natural Resources	Urban Nonpoint Source and Stormwater Grant	\$5,768.00	Eileen Freres	\$ 101,304.00
City of Madison	2022	Wisconsin Department of Natural Resources	Urban Nonpoint Source and Stormwater Grant	\$8,476.00	Eileen Freres	\$ 56,730.00
City of Madison	2022	Wisconsin Department of Natural Resources	Municipal Flood Grant	\$7,482.00	Eileen Freres	\$ 218,515.00
Total				\$57,279.00		\$ 3,416,121.55



2019-2022 REVIEW AND UPDATE CITY OF CUDAHY MUNICIPAL STORMWATER MANAGEMENT PLAN (SWMP)

SERVICES

- Project Management
- Data Collection
- Ordinance Review
- BMP Site Inspections
- Existing Pollutant Loading
- Proposed BMP Solutions
- SWMP Reporting

PROJECT INFORMATION



CLIENT CONTACT:

Ryan Schmidt, PE, Staff Engineer
414-769-2213

STATUS:

Project Kickoff November 2019
BMP Inventory Completed 2020
Modeling and Report to be
Complete Spring 2022

CONSULTANT FEES:

\$200,000

KEY PROJECT STAFF:

Cassandra Hoppe
Carrie Bristoll-Groll, PE, ENV SP
James Zsebe, PE
Eileen Freres, EIT

PROJECT SCOPE

SSE was contracted by the City of Cudahy (City) to review the City's current SWMP and compare that to the current operations to evaluate the City's compliance in meeting its TMDLs for the Kinnickinnic (KK) Watershed. The project deliverable is an updated SWMP including proposed project and ordinance language alternatives that are sensible and actionable to make progress towards meeting the future permitted TMDLs.

SSE staff acquired all background resources provided by the City and WDNR. SSE found multiple discrepancies regarding existing stormwater best management practices (BMPs) subsequently completed site inspections of all the BMPs within the City to collect current site BMP data.

SSE staff completed 63 BMP site inspections in 2020. Inspections included verifying the condition, feature type, location, size, and documenting any other notable information. This verification step was crucial as many BMPs no longer existed or functioned as originally designed. The BMP inventory and condition was updated within the GIS files.

SSE staff is currently delineating subwatersheds within the GIS model and performing water quality (WinSLAMM) modeling for no-controls and with controls within the KK reachshed for Total Suspended Solids and Total Phosphorus.

To be completed in 2022 SSE staff will work through the draft final SWMP report to include proposed alternatives that will enable the City to achieve its TMDL goals. After reviewing the draft final report with the City and the WDNR, the report will be finalized. The City will then use the report to update any ordinances and begin to plan implementation for constructing future BMPs.



MPS GREEN INFRASTRUCTURE UPGRADES

COHORT 2, 3, & 4

SITE DESIGN & GREEN INFRASTRUCTURE

SERVICES

- Project Management
- Green Infrastructure and Sustainable Site Design
- Construction Documents
- Cost Estimates
- Permitting
- Student Engagement

CLIENT



**MILWAUKEE
PUBLIC SCHOOLS**

CONTACT:

Heather Dietzel
414-283-4713

STATUS:

Cohort 2 – Completed 2020
Cohort 3 – Completed 2021
Cohort 4 – In Construction

CONSULTANT FEES:

\$200,000 (annually)

CONSTRUCTION BUDGET:

\$3 Million (annually)

KEY PROJECT STAFF:

Kara Koch, PE, ENV SP
Adrienne Cizek, PhD. PE
Cassandra Hoppe
Carrie Bristoll-Groll, PE, CFM

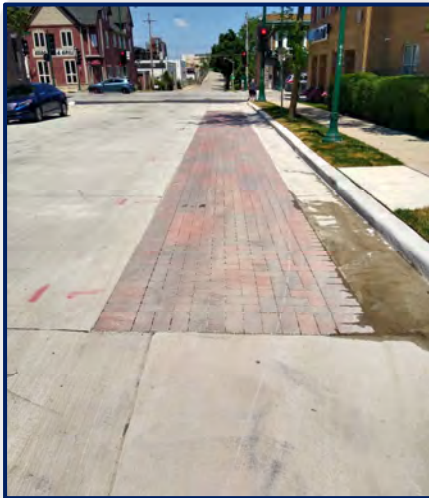
PROJECT SCOPE

SSE was the lead consultant for the Green Schoolyard Redevelopment Projects during Cohort 2, 3, and 4 for Milwaukee Public Schools. SSE along with their team redevelop a total of fifteen (15) schoolyards, which included removing asphalt and installing green infrastructure, outdoor classrooms, and natural play structures within the MPS's schoolyards for sustainable stormwater management and student engagement. These spaces include bioswales, native prairies and grasses, permeable artificial turf, permeable pavers, underground cisterns, stormwater trees, outdoor classroom features such as climbing logs, traditional tot-lots, and pavilions. The SSE team of engineers and landscape architects, worked with MPS Staff, Reflo, and the Green Teams to design functional spaces that will positively stimulate the students and community members while providing habitat for pollinators and managing stormwater sustainability.

SSE provided construction documents including engineer's cost estimates, plans, and construction specifications which were used to solicit bids from contractors and obtain permit reviews through the City of Milwaukee. SSE worked closely with contractors, MPS facilities, and Reflo providing site inspections, reviewing construction documents, and creating punch lists for contractors.

During the construction, SSE worked with MPS students and Arts@Large to provide meaningful connections to the workforce while educating students on the importance of stormwater management.





2021 CITY OF WEST ALLIS 65TH AND 66TH STREET DESIGN

STREET RECONSTRUCTION & GREEN INFRASTRUCTURE

SERVICES

- Green Infrastructure & Street Design
- Construction Documents
- Cost Estimates

CLIENT



CONTACT:
Robert Hutter
Interim City Engineer
414-302-8373

STATUS:
Design Completed January, 2022
Construction is currently underway

CONSULTANT FEES:
\$101,700

CONSTRUCTION BUDGET:
\$1,500,000

KEY PROJECT STAFF:
James Zsebe, PE
Kara Koch, PE, ENV SP
Carrie Bristoll-Groll, PE, ENV SP

PROJECT SCOPE

SSE was the lead design consultant for the 2021 street reconstruction of S. 65th and S. 66th streets in the City of West Allis. The projects included both traditional removal and replacement of street pavements, curb and gutter and sidewalks. Additionally, the project incorporated green infrastructure in the form of three bioswales, permeable pavement and native plantings adjacent to the street. The goal was to incorporate GI into the urban street environment to capture and treat stormwater runoff that would have otherwise been released directly to the municipal storm sewer system. By so doing the project helped the City of West Allis achieve its water quality requirements for Municipal Separate Storm Sewer System (MS4) permit with the WDNR. By having expertise in both street and GI design, the SSE team was able to work along with the city's engineering staff to deliver a complete set of construction documents to the city engineering department for implementation in their 2022 construction program.

SSE provided construction documents including engineer's cost estimates, plans, and construction specifications which were utilized to solicit bids from contractors. SSE continues to be in a construction administration supporting role to address questions from both the contracting team and the city staff and will remain in this supporting role until project completion.





MILWAUKEE PUBLIC LIBRARY GREEN SITE DESIGN AND CONSTRUCTION MANAGEMENT

Site Design & Green Infrastructure

SERVICES

- Project Management
- Green Infrastructure and Sustainable Site Design
- Construction Documents
- Permitting
- Engineering Services During Construction

CLIENT



CONTACT:

Jennifer Meyer-Stearns
414-286-3024

STATUS:

Design Completed February 2020
Construction completed Fall 2021

CONSULTANT FEES:

\$360,000

CONSTRUCTION BUDGET:

\$2 Million

KEY PROJECT STAFF:

Cassandra Bence, Designer
Adrienne Cizek, PhD, PE
Carrie Bristoll-Groll, PE, CFM
Harlan Groll - StormGUARDen

PROJECT SCOPE

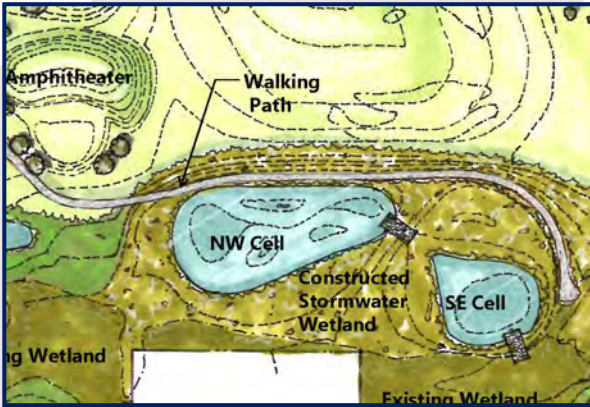
Milwaukee Public Library contracted with SSE to redesign six (6) library branch sites in need of pavement repairs and improvements to address ADA accessibility deficiencies, while also improving the aesthetics, safety, and environmental sustainability of each lot. SSE incorporated bioswales, permeable pavement, rain gardens, StormGUARDen™, native plantings, lighting, park amenities, and additional safety considerations for gathering and outdoor learning spaces.

In addition to winning more than \$825,000 in grants for the libraries, SSE provided concept, preliminary, and final design construction documents including cost estimates. The SSE team of engineers, landscape architects, and surveyor, worked with MPL to design functional spaces, managing stormwater sustainability, and ADA compliance. SSE lead the team through design workshops with stakeholders and city review meetings.

SSE provided plant establishment and operations and maintenance schedules and documents for the various forms of green infrastructure, for MPL staff to manage.

SSE assisted in soliciting bids to local contractors, and received bids close to SSE's engineered cost estimates. SSE also provided the engineering services during construction and construction site inspection. Construction was substantially complete in fall 2021.





NEW TESTAMENT CHURCH CONSTRUCTED STORMWATER WETLAND

GREEN INFRASTRUCTURE STORAGE & TREATMENT

SERVICES

- Project Management
- Green Infrastructure and Sustainable Site Design
- Construction Documents
- Permitting & Easement Modifications
- Coordination with Project Partners
- Construction Inspection

CLIENT



CONTACT:

Rick Norris, PE
Project Manager
Corvias Infrastructure Solutions, LLC

STATUS:

Completed Summer 2021

CONSULTANT FEES:

\$203,545

CONSTRUCTION BUDGET:

\$636,500

KEY PROJECT STAFF:

Adrienne Cizek, PhD, PE
Kara Koch, PE, ENV SP
Carrie Bristoll-Groll, PE

PROJECT SCOPE

Milwaukee Metropolitan Sewerage District (MMSD) and Corvias Infrastructure Solutions, LLC (Corvias) entered into a public/private partnership to create 8.45 million gallons of stormwater in the next three years (2020-2023) using green infrastructure (GI) toward meeting MMSD's 2050 goal of zero combined sewer overflows, reduce localized flooding, and improved water quality. As the first designed and constructed project in this partnership, the 4.7-acres of proposed constructed stormwater wetland (CSW) located at New Testament Church (NTC) in Milwaukee is designed to capture, treat, and store 1.86 million gallons of stormwater prior to its discharge into the Little Menomonee River tributary, a section 303d Listed impaired water body due to several pollutants.

The site receives stormwater runoff from approximately 98.4 acres of drainage area which includes discharge from a 36-inch City of Milwaukee storm sewer. Grading directs drainage from an existing wetland depression as well as diverted discharge from the City storm sewer to the Upper CSW for storage and treatment. Stored drainage from this cell overtops a rip-rap weir into the Lower CSW for further storage before draining into the existing drainage channel.

Stormwater Solutions Engineering sourced the project, coordinated between Corvias and the Property Owner, managed subconsultants for borings, survey, wetland delineation (Helianthus), and landscape architecture (Helianthus), prepared construction documents, obtained permits, and modified easement documents through the City of Milwaukee and Wisconsin Department of Natural Resources.



Ecological Restoration City of Green Bay



REL Staff

James Havel, Sr. Ecologist
Nick Kintopf, Restoration Ecologist

Coordinating Agencies

City of Green Bay
WDNR

In 2019, the City of Green Bay contracted NES to plan, implement, and maintain upland prairie seedings on the caps of two decommissioned landfills. NES conducted cover crop seedings and site preparation herbicide applications to ready the site for the seedings in the fall of 2020. The prairie plantings have been managed in the first established year via integrated pest management through timely mowings and herbicide applications. Maintenance to continue through 2022.

Since 2014, NES has performed vegetation assessments and maintenance for the City, managing new and established native plantings around multiple storm water facilities with site preparations, native prairie, wet meadow seedings, live emergent plantings, erosion mat installation, mowing, and spot herbicide applications to control terrestrial, aquatic, and woody invasive species and conducting prescribed burns. As of 2021, NES conducts these activities on a regular basis at 7 storm water facilities. The work ensures attractive community features for people, pollinators, and wildlife.

Working with DPW staff, parks dept., project stakeholders, and residents ensured design considerations took into account the needs of various interested parties. Facilities required special design considerations and complex permitting challenges.

City of Green Bay Storm Water Management Facilities



REL Staff

Jared Schmidt, P.E., V.P.
Aaron Breitenfeldt, P.E.
Patrick Kuehl, P.E.

Coordinating Agencies

City of Green Bay
WDNR
Army Corps of Engineers
Local Citizen Participation

Robert E. Lee & Associates, Inc. collaborated with the City of Green Bay and other project stakeholders to design and develop storm water facilities throughout the City of Green Bay. This work dates back to the design and construction of the regional storm water system in the I43 Industrial Park (early 2000s). REL has continually supported the City to reach for the ultimate goal of improving water quality through the reduction of peak discharge rates and removal of solids and pollutants.

Over the years, REL has helped design and permit various types of storm water facilities, servicing basins from 25 acres to several hundred. Design facilities have included wet ponds, vegetated wetlands, ponds that took into consideration thermal impacts, as well as bio-filters and subsurface water quality practices. These projects include several facilities at Bay Beach Amusement Park and projects at McAuliffe Park, Berger Street, Basten Street, Brown County Farms, and The Woods Golf Course to name a few.

For each project, it was important to work closely with City DPW staff, parks department, other project stakeholders, and residents to ensure design considerations took into account the needs of various interested parties. A number of the facilities were installed in sensitive areas that required special design considerations and complex permitting challenges.

Christa McAuliffe Park Pond City of Green Bay



REL Staff

Jared Schmidt, P.E., V.P.
Aaron Breitenfeldt, P.E.

Coordinating Agencies

Baird Creek Preservation Society
City of Green Bay
WDNR

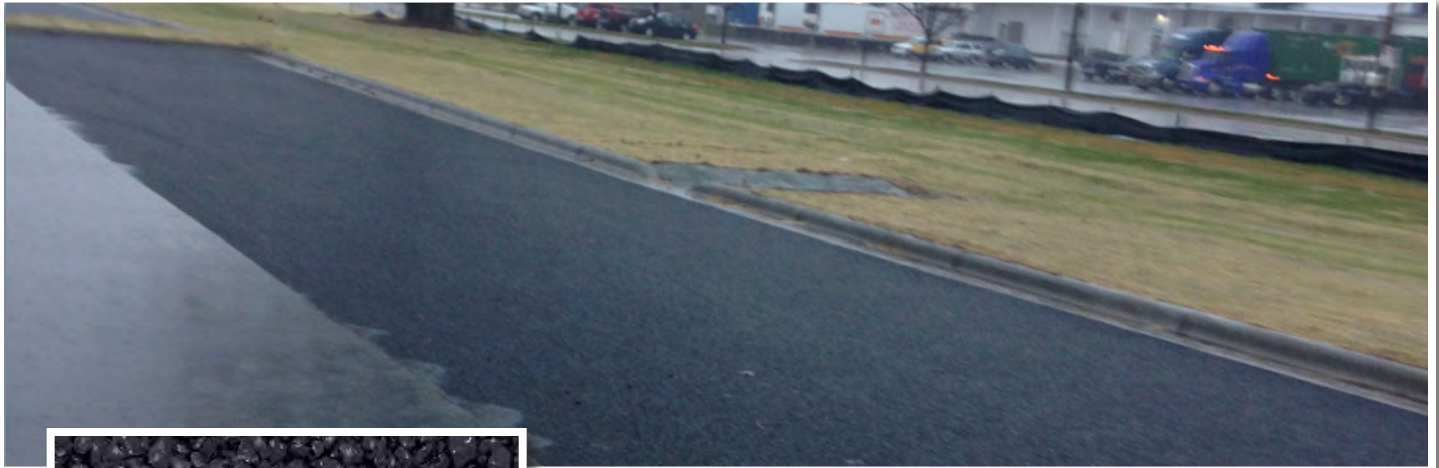
Robert E. Lee & Associates collaborated with the Baird Creek Preservation Society and the City of Green Bay to design a storm water feature to reduce storm water flows, prevent erosion of the downstream Baird Creek, and remove pollutants.

The final pond design featured an artificial wetland pond with small permanent water pools and a variety of native wetland plants. The pond effectively reduces peak flows and removed pollutants from a 100-acre drainage basin with the City.

The facility, located in a city park, was designed with numerous safety measures to help prohibit use by neighboring residents.

The pond was also designed to minimize thermal impacts of the drainage basin, helping promote a higher quality downstream watershed.

Green Infrastructure Parking Lot Bay Beach Amusement Park



REL Staff

Jared Schmidt, P.E., V.P.
Aaron Breitenfeldt, P.E.

Client

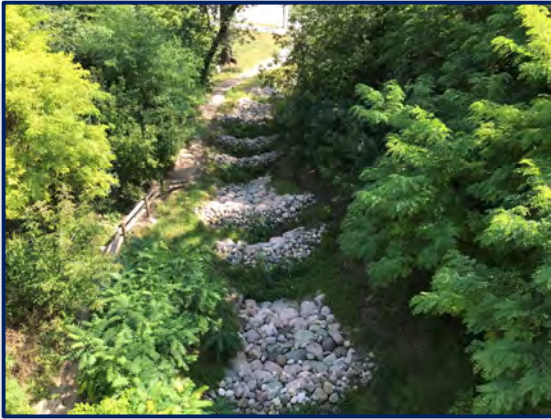
City of Green Bay

Services Provided

Design
Storm Water Management
Permitting
Survey

Robert E. Lee & Associates worked with the City of Green Bay to design parking for Bay Beach Amusement Park utilizing “green” storm water features. Work was constructed using an EPA grant the City received specifically to install permeable pavement and bio-retention ponds.

A 5-acre parking lot, walking trail, and a series of bio-retention ponds were constructed. Storm water is treated by both the permeable pavement and ponds. With the proximity to the Bay of Green Bay it was important to design a low-impact parking lot. The design allowed for peak discharge reduction and provided storm water quality improvement, while maximizing groundwater recharge.



2015 NORTH POINT LIGHTHOUSE RAVINE STABILIZATION

REGENERATIVE STORMWATER CONVEYANCE (RSC)

SERVICES

- Project Management
- Green Infrastructure and Sustainable Site Design
- Construction Documents
- Permitting
- Coordination with Funders
- Construction Inspection

CLIENT



CONTACT:

John Scripp
(414) 588-2720

STATUS:

Construction Completed 2016

CONSULTANT FEES:

\$42,682

CONSTRUCTION BUDGET:

\$237,146

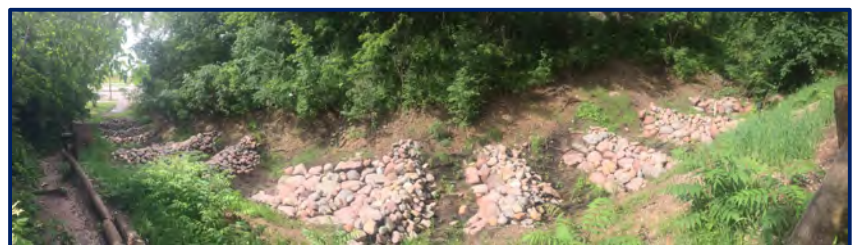
KEY PROJECT STAFF:

Adrienne Cizek, PhD. PE
Carrie Bristoll-Groll, PE, CFM

PROJECT SCOPE

Stormwater Solutions Engineering, LLC (SSE) has worked closely with North Point Lighthouse Friends (NPLF) and Milwaukee County Parks to design a new green infrastructure (GI) treatment train to manage stormwater from North Point Lighthouse property upstream of Bradford Beach. The GI train includes an 11,000 square foot permeable pavement parking and drive, a 1000 square foot new rain garden on the north side of the property and 1,000 square foot expansion of the existing rain garden near the drive, and 225 foot long regenerative stormwater conveyance (RSC) located in the ravine south of the lighthouse. RSC uses a series of pools and riffles connected by an underlying media layer designed to convey, manage, and treat stormwater runoff. The project has been awarded \$253 thousand in design, material, and construction funds by Milwaukee Metropolitan Sewerage District, Fund for Lake Michigan, Milwaukee County Parks, and Southeastern Wisconsin Watersheds Trust. Construction begins in late June 2016.

Regenerative stormwater conveyance (RSC) uses design principles from natural headwater streams to manage, treat, and convey stormwater in one BMP. RSCs are designed with a series of pools and riffles over a sand media bed. Runoff flow and velocities are reduced in each pool, allowing for infiltration into the sand media bed and important treatment processes to occur. Research has shown 75% TSS removal, and 30% removal of both TP and TN, along with reduction of peak flow and surface volume outflow to that of undeveloped conditions. Additionally, RSCs have demonstrated the ability to provide important ecosystem services beyond those observed in conventional stormwater practices.





MYCOFILTRATION TO REDUCE BACTERIA LOADINGS

Water Quality & Green Infrastructure

SERVICES

- Grant Acquisitions
- Green Infrastructure and Sustainable Site Design
- Construction Documents
- Permitting

CLIENT

Milwaukee County Parks
Milwaukee, WI



CONTACT:

David Gulgowski, PE
(414) 278-4942

STATUS:

Construction Completed 2018

CONSTRUCTION BUDGET:

\$2.66 Million

KEY PROJECT STAFF:

Adrienne Cizek, PhD. PE
Alyssa Schmitt
Carrie Bristol-Groll, PE, CFM

PROJECT SCOPE

Stormwater Solutions Engineering, LLC (SSE) was subcontracted through The Sigma Group, Inc. by Milwaukee County Parks to update the parking lot at South Shore Park prior to its discharge to Lake Michigan. South Shore Beach is the 8th dirtiest beach in the nation in terms of bacterial contamination, and as a result, is often closed to swimming. In recent years efforts have been made by South Shore Park Friends, Milwaukee County Parks, South Shore Yacht Club, and many residents to improve conditions at and the function of South Shore Park.

Improvements to the South Shore Park parking lot include updated fish cleaning station, re-routed bike path (for biker safety), addition of a promenade along the lake, and strategically placed bioretention cells to capture runoff prior to its discharge into the lake. The bioretention cells include a woodchip layer infused with native fungi that thrive around plant roots. These fungi naturally prey on bacteria, are self-sustaining, and acclimated to Wisconsin's harsh climate. Preliminary studies from other regions suggest that the addition of a myco-layer in bioretention cells may reduce bacteria by an additional 30% as compared to typical bioretention cells dependent only on media filtration. A specially designed port located on the discharge pipe will allow UW School of Freshwater Sciences to monitor the performance of the bioretention cells. Construction on the site was completed in 2018.





2018-2019 IT HAD TO BE YOU, LLC GREEN PARKING LOT

SITE DESIGN & GREEN INFRASTRUCTURE

SERVICES

- Project Management
- Green Infrastructure and Sustainable Site Design
- Construction Documents
- Cost Estimates
- Permitting

GENERAL INFORMATION

CONTACT:

Sharon and Michael Grinker
Sid Grinker Restoration, Inc.
414-264-7470

STATUS:

Design Completed March 2019
Construction Completed Fall 2019

CONSULTANT FEES:

\$13,989

CONSTRUCTION BUDGET:

\$297,006

KEY PROJECT STAFF:

Cassandra Hoppe
Alyssa Schmitt
Carrie Bristoll-Groll, PE, ENV SP

PROJECT TEAM:

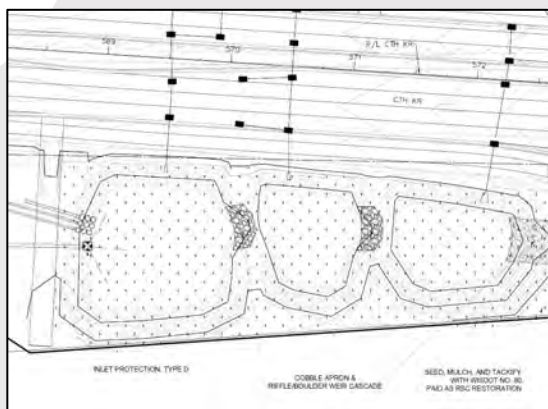
- New Eden Landscape Architecture
-James Piwoni, Architect

PROJECT SCOPE

SSE worked as the stormwater designers alongside the New Eden landscape architect and James Piwoni architect team for the Sid Grinker Deadbird Brewery. The SSE team worked to design an urban parking lot that considers stormwater management as a primary and complimentary function to the architects site layout. The design included removing asphalt, re-grading the site to accommodate parking for employees and customers, and installing green infrastructure (GI). The GI installed on site includes a permeable pavement parking lot that has underdrain leading to a rock channeled bioswale patrons can look upon while outside in the beer garden. Native landscaping encompasses the site to shed separation from the street and provide habitat for local pollinators.

SSE provided construction documents including engineer's cost estimates, plans, and construction specifications which were used to solicit bids from contractors and obtain permit reviews through the City of Milwaukee. Bids were received and approved, and contractors were selected.





2019 RSC FOR CTH KR ROADWAY EXPANSION

REGENERATIVE STORMWATER CONVEYANCE

SERVICES

- Project Management
- Green Infrastructure Design
- Construction Documents
- Cost Estimates

CLIENT



CONTACT:

Dave Giordano
(262) 883-4018

STATUS:

Design Completed March 2020
Construction Completed Spring 2021

CONSULTANT FEES:

\$24,902

CONSTRUCTION BUDGET:

\$283,465

KEY PROJECT STAFF:

Adrienne Cizek, PhD, PE
Cassandra Hoppe
Carrie Bristoll-Groll, PE, CFM

PROJECT SCOPE

The Wisconsin Department of Transportation (WisDOT) expanded County Highway KR to include multiple lanes and recreational pathway. As a result of the expansion, WisDOT is required to manage additional stormwater flows associated with the added pavement. A stormwater detention pond was initially proposed on a county-owned parcel riparian to the Pike River. Stakeholder groups, including Kenosha County, Root-Pike Watershed Initiative Network (RPWIN), Wisconsin Department of Natural Resources (WDNR), and WisDOT came together to find an alternative innovative solution that considered the ecology of the Pike River, potential recreational and development uses for the parcel, water quality improvements, and overall economics to manage the additional runoff.

SSE was funded by RPWIN to design a regenerative stormwater conveyance (RSC) for the site to manage and treat stormwater. RSC allowed for step-pools to be sculpted into the existing landscape (minimizing excavation and grading), while also providing improved water quality and ecological benefits. Additionally, project costs associated with the RSC were similar to costs to use the conventional detention pond design. The RSC was constructed in Fall 2020 through Spring 2021, with minimal contractor questions. This was the first use of RSC on a WisDOT project.





MITCHELL GREEN PARKING LOT

SITE DESIGN & GREEN INFRASTRUCTURE

SERVICES

- Project Management
- Green Infrastructure and Sustainable Site Design
- Construction Documents
- Permitting
- Construction Oversight

CLIENT



CONTACT:

Danielle Rodriguez, PM
414-286-2402

STATUS:

Project Completed Fall 2019

CONSULTANT FEES:

\$50,000

CONSTRUCTION BUDGET:

\$824,000

KEY PROJECT STAFF:

Alyssa Schmitt
Cassandra Bence
Carrie Bristol-Groll, PE, CFM

PROJECT SCOPE

The City of Milwaukee desired to replace an underutilized, deteriorating parking lot with a green parking lot that considered pedestrians, ADA accessibility, and natural elements. After several community engagement meetings for acceptance and their input on site elements, SSE designed a parking lot with natural wood boardwalk, porous and standard pavers, bioswales, native vegetation and trees, picnic tables and park benches, ambient lighting and removed pavement from an alley to create a pedestrian mall with urban orchard. The community's engagement determined what type of alley to be constructed, the color scheme, and the type of trees. In proximity to an apartment complex and a library, the parking lot also now includes a green space that allows pedestrians to sit and talk, read, eat, etc. while enjoying the outdoors.

SSE applied for and won \$256,125 in funding for the green improvements. SSE provided construction inspection and the site was completed in November 2019.





MMSD GI OPERATIONS AND MAINTENANCE STANDARDS GUIDE

Green Infrastructure

SERVICES

- Develop GI maintenance practices
- Interviews of local municipal leaders on GI Lessons Learned
- Lessons Learned Report

CLIENT



CONTACT:

Lisa Sasso, Project Manager
MMSD
414.225.2048

STATUS:

Completed 2020

SSE FEES:

\$72,390

KEY PROJECT STAFF:

Alyssa Schmitt – Project Manager
Carrie Bristoll-Groll, PE, CFM
Adrienne Cizek, PhD, PE
Kara Koch, PE, ENV SP

PROJECT SCOPE

SSE assembled a team with representation from the east and west coast of the US, and locally, to develop the GI operation and maintenance standards guide. The team evaluated and defined each type of green infrastructure recognized by MMSD, broke down each type of maintenance task generally anticipated within each GI feature, determined recommended schedules of maintenance, a list of invasive species with guidance on plant identification and recommended treatment for removal, along with photos of each.

BIORETENTION / BIOSWALE
(ALSO REFERRED TO AS: BIOFILTERS, BIORETENTION, AND BIOINFILTRATION)

DESCRIPTION

A stormwater management practice that allows water to pool in a depressed vegetated area and then infiltrate through engineered soils and into a gravel layer where water collects and is stored. The infiltrating or engineered soil layer is a special mix that typically includes sand mixed with compost. This layer is typically 18 to 24 inches deep to prevent disturbance of the gravel layer during maintenance activities. Both bioretention and rain gardens include an engineered soil layer. Unlike a rain garden, the bioretention includes a gravel storage layer and sewer systems. These sewer systems often include a section of perforated underdrain located within the gravel layer that carries stormwater to a discharge point. They also typically include cleanouts and a series of overflow structures that control the ponding depth. Bioretention can capture the stormwater runoff where it infiltrates through the engineering soil to remove pollutants. Bioretention can also retain the stormwater, slowly discharging to downstream storm sewer systems and waterways.



Vacuum Cleaning	sediment, etc. to clear and restore to function; maintain at least 50% function.	structures.	
	Vacuum out trash, debris, sediment, etc. from clogged structures.	Clogged inlets, outlets, or outfall structures.	As needed
Vegetation Components			
Invasive Species Control	Control invasive species impacting desired plant species in bioswale. Refer to Appendix of Top 10 Invasive Species	Invasive plants are present in bioswale.	Biannually, or as needed

Vegetation Maintenance	1				
Trash Removal	2	2	2		2
Organic Debris Removal	1		1		2
Pruning			1		
Structural Clearing & Maintenance	1				2
Woody Vegetation Removal			1		

TAB G

Schedule of Services



TAB H

Fee Schedule





City of Green Bay

Department of Public Works

100 N. Jefferson St., Room 300, Green Bay, WI 54301

QUOTATION REQUEST **CONSULTING ENGINEERING SERVICES** **CITY-WIDE GREEN STORMWATER INFRASTRUCTURE PLAN**

Due Date: September 30, 2022, 2:00 p.m. CST

Date: September 9, 2022

To: Stormwater Solutions Engineering, LLC

Attn: Carrie Bristoll-Groll, PE, ENV SP

From: Melissa M. Schmitz, Resiliency Coordinator

Fax: 920-448-3102 / **Voice:** 920-448-3100

Please quote **INSIDE DELIVERED** prices for materials listed below.

Task	QTY	UNIT	DESCRIPTION	UNIT PRICE	TOTAL
1	1	LS	Kick-off Meeting	11,211.00	11,211.00
2	1	LS	City-wide location analysis for strategic GSI investment	16,513.00	16,513.00
3	1	LS	GSI project identification for public and private property	14,272.00	14,272.00
4	1	LS	Triple Bottom Analysis	5,347.00	5,347.00
5	1	LS	Water quality and quantity modeling	41,968.00	41,968.00
6	1	LS	Creation of maps for integration with City's GIS	8,834.00	8,834.00
7	1	LS	Evaluation process for feasibility of GSI in ROW projects	4,582.00	4,582.00
8	1	LS	Design guidance for identified GSI projects	10,855.00	10,855.00
9	1	LS	Maintenance and Operations guidance for identified projects	3,917.00	3,917.00
10	1	LS	Compilation of consultant services into final GSI Plan	6,479.00	6,479.00
11	1	LS	Five meetings with City representatives	4,590.00	4,590.00
12	1	LS	Presentation of final plan to Green Bay Common Council or another City committee.	4,302.00	4,302.00
			TOTAL PROJECT COST AS DESCRIBED IN PROJECT STATEMENT AND GOALS	\$133,370.00	\$133,370.00

LEAD TIME: See Proposal

Stormwater Solutions Engineering, LLC

VENDOR

247 Freshwater Way, Suite 410
ADDRESS

Milwaukee **WI** **53204**
CITY **STATE** **ZIPCODE**

N/A
FAX



AUTHORIZED SIGNATURE

Carrie Bristoll-Groll/Owner
PRINT NAME AND TITLE

September 30, 2022
DATE

414-810-1245
PHONE

City of Green Bay, City-Wide Green Infrastructure Plan
Firm: Stormwater Solutions Engineering, LLC
Statement of Fees

Friday, September 30, 2022

[illegible]

	Total Task Hours	9	16	151	151	4	3	0	
		\$1,845	\$2,384	\$19,479	\$17,214	\$680	\$366	\$0	\$41,968
6	CREATION OF MAPS FOR INTEGRATION WITH CITY'S GIS								
	Analyze city data for creation of priority subbasins	2			4	2		2	\$ 1,392.00
	ROW mapping for ideal GSI locations	1			2			3	\$ 712.00
	Park mapping for GSI locations	1			2			3	\$ 712.00
	Parking area mapping for GSI locations	1			2			3	\$ 712.00
	GSI mapping system for tracking completed projects	4			4	2		24	\$ 3,848.00
	Summarize in Draft and Final Report	2			2				\$ 638.00
	Quality Reviews	4							\$ 820.00
	Total Task Hours	15	0	0	16	4	0	35	
		\$3,075	\$0	\$0	\$1,824	\$680	\$0	\$3,255	\$8,834
7	EVALUATION PROCESS FOR FEASIBILITY OF GSI IN ROW PROECTS- TOOL								
	List of design critical success factors to GSI, to be reviewed at kickoff	1	1						\$ 354.00
	Develop tool based upon review of critical success factors	2		12					\$ 1,958.00
	Submit and revise based upon comments received	1		8					\$ 1,237.00
	Quality Reviews	1				2	4		\$ 1,033.00
									\$ -
	Total Task Hours	5	1	20	0	2	4	0	
		\$1,025	\$149	\$2,580	\$0	\$340	\$488	\$0	\$4,582
8	GSI DESIGN GUIDANCE FOR IDENTIFIED GSI PROJECTS								
	General design checklist	1		8					\$ 1,237.00
	Standard specs	1	4	16					\$ 2,865.00
	Standard construction details	2	2	16	20				\$ 5,052.00
	Matrix for GSI location recommendations	1							\$ 205.00
	Summarize in Draft and Final Report	2		2					\$ 668.00
	Quality Reviews					2	4		\$ 828.00
	Total Task Hours	7	6	42	20	2	4	0	
		\$1,435	\$894	\$5,418	\$2,280	\$340	\$488	\$0	\$10,855
9	MAINTENANCE AND OPERATIONS GUIDANCE FOR IDENTIFIED PROJECTS								
	Review and revise SSE's previously prepared O&M guidance	2		8					\$ 1,442.00
	Revise per City's comments, resubmit	1		8					\$ 1,237.00
	Summarize in Draft and Final Report	1							\$ 205.00
	Quality Reviews	1				2	4		\$ 1,033.00
	Total Task Hours	5	0	16	0	2	4	0	
		\$1,025	\$0	\$2,064	\$0	\$340	\$488	\$0	\$3,917
10	COMPILATION OF CONSULTANT SERVICES INTO FINAL GSI PLAN								
	Assemble report components from each task	8	4	8	8	2	2	6	\$ 5,322.00
	Submit draft report, documents and attachments in digital format	1						4	\$ 577.00
	Quality Reviews	2				1			\$ 580.00
	Total Task Hours	11	4	8	8	3	2	10	
		\$2,255	\$596	\$1,032	\$912	\$510	\$244	\$930	\$6,479
11	FIVE MEETINGS WITH CITY REPRESENTATIVES								
	Planning Meetings with City-Virtual (min of 4)	8				8	2	2	\$ 3,430.00
	Meet for final review of written plan - virtual	4				2			\$ 1,160.00
									\$ -
	Total Task Hours	12	0	0	0	10	2	2	
		\$2,460	\$0	\$0	\$0	\$1,700	\$244	\$186	\$4,590
12	PRESENTATION OF FINAL PLAN TO GB COMMON COUNCIL OR COMMITTEE								
	Presentation of Final Plan (approx 8/15/2023) - In Person	8			8	6	2	2	\$ 4,002.00
	Mileage								\$ 150.00
	Materials and Printing								\$ 150.00
	Total Task Hours	8	0	0	8	6	2	2	
		\$1,640	\$0	\$0	\$912	\$1,020	\$244	\$186	\$4,302
	Total Hours	146	80	241	325	48	35	107	
		\$29,930	\$11,920	\$31,089	\$37,050	\$8,160	\$4,270	\$9,951	\$133,370
	Totals Per Firm				\$110,489		\$22,381		

ADDITIONAL SERVICES IF AUTHORIZED

Meetings with Identified Key Project Stakeholders
3D Renderings of specific areas: \$1,500-\$3,000 depending on the project
Grantor Identification and Grant Writing
GSI Design and/or construction inspection training programs for City Staff
Preliminary and Final Design of GSI
Construction Administration and Assistance
Development of GSI Builders certification program for local GSI contractors
Review and recommendation to City Ordinances that create obstacles to GSI use.

Hey and Associates, Inc.

MILWAUKEE, WISCONSIN

*26575 W. COMMERCE DRIVE, SUITE 601
VOLO, ILLINOIS 60073
PHONE (847) 740-0888
FAX (847) 740-2888*

CHICAGO, ILLINOIS

September 30, 2022

Ms. Melissa Schmitz, CEM, LEED GA
Resiliency Coordinator
City of Green Bay
100 North Jefferson Street
Green Bay, Wisconsin 54301

Re: Proposal for Consulting Engineering Services
City-wide Green Stormwater Infrastructure Plan

Dear Ms. Schmitz:

Hey and Associates, Inc. (Hey) is pleased to submit this proposal and statement of our firm's qualifications to assist the City with development of a City-wide Green Stormwater Infrastructure Plan. Our firm is a regional leader in solving complex water and natural resources issues. We specialize in this work, and have assembled a staff and project team that have dedicated their careers to the pursuit of improving our community's waterways.

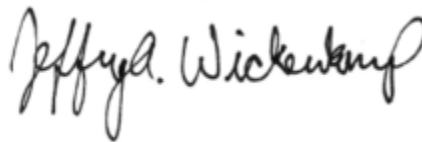
Our proposal outlines the substantial experience our team will bring to this project, arming us with the depth of knowledge necessary to solve the technical issues facing Green Bay, present the plan to assist in building community momentum, and ultimately help you see this plan through to execution. We have also supplemented our team with a local technical expert, Dr. Nelson Ham from St. Norberts College.

We would be grateful for the opportunity to bring the experience we have developed solving just these types of issues all over the Midwest to your projects. If you have any questions, please contact our project manager and firm principal, Mr. Dave Kraft at 608-217-4788 or dkraft@heyassoc.com.

Sincerely,



David A. Kraft, P.E., CFM
Principal Civil Engineer



Jeff Wickenkamp, P.E., CFM, D.WRE
President

Proposal for Consulting Engineering Services for

CONSULTING ENGINEERING SERVICES—CITY-WIDE GREEN STORMWATER INFRASTRUCTURE PLAN

for the
CITY OF GREEN BAY

ATTENTION:
MELISSA SCHMITZ, CEM, LEED GA
RESILIENCY COORDINATOR

ADDENDA ACKNOWLEDGEMENTS:
ADDENDUM #1: SEPTEMBER 26, 2022

DATE DUE:
SEPTEMBER 30, 2022 2:00 PM



SUBMITTED BY
Hey and Associates, Inc.



COVER LETTER

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LOCATIONS

Milwaukee

9401 W. Beloit Road, Suite 210
Milwaukee, Wisconsin 53227
414.327.0440

Chicago

8755 W. Higgins Road, Suite 835
Chicago, Illinois 60631
773.693.9200

Volo

26575 W. Commerce Drive, Suite 601
Volo, Illinois 60073
847.740.0888

ENGINEERING

Civil Engineering
Stormwater & Floodplain Management
Water Quality Planning
Soil Erosion & Sediment Control
Construction Engineering

ECOLOGY

Wetland Delineation & Permitting
Ecological Restoration & Management
Wetland Mitigation Design
Lake Assessment & Management
Ecological Inventories/Surveys

LANDSCAPE ARCHITECTURE

Site Design
Green Infrastructure
Natural Areas
Transportation
Parks and Recreation

SUPPORT SERVICES

Subsurface Drainage Analysis & Design
Certified Arborist Services
Unmanned Aerial Reconnaissance
Topography & Bathymetric Studies
Presentation Graphics

Hey and Associates, Inc. (Hey) is a professional engineering, ecological consulting, and landscape architecture firm founded in 1976 to deliver comprehensive solutions to complex water resources and natural resources challenges. Over the last 46 years, the firm has grown to offer a full range of professional services.

Hey's multi-disciplinary staff of approximately 30 engineers, scientists, landscape architects and support staff collaborate to identify opportunities, design creative solutions, and implement projects that are grounded in the fundamental principles of water resources, environmental science, and sustainability. Regulatory requirements, constructability, cost effectiveness, and long-term management requirements are thoughtfully considered for all projects to ensure we meet our clients' expectations.

Our talented engineers are trained in traditional civil, ecological, and water resources engineering. We are experienced in planning and designing stormwater management and flood control projects, green infrastructure, streambank and shoreline projects, conveyance improvements, site improvements, and utilities. Hey's engineering staff provides civil engineering services for institutional, public, and private sectors.

Staff ecologists and environmental scientists have an excellent working knowledge of the wetland and water quality regulations of the federal, state, and local governments and are some of the most experienced practitioners in the Midwest. They continually strive to be at the forefront of ecological restoration principles in order to deliver superior results. We work closely with our clients to identify restoration goals, and then tailor restoration plans to meet specific site opportunities, constraints, budgets, and schedules.

Site design, green infrastructure, natural areas, transportation, and parks and recreation are specialties of Hey's landscape architects. We address our clients' diverse needs throughout the analysis, planning, design, implementation, and maintenance stages of each project to create unique and consistently successful design solutions that are comprehensive, cost-effective, and environmentally sound.



WHY WE WANT TO WORK WITH GREEN BAY ON THIS PROJECT

Hey is recognized as a regional leader in the development of green infrastructure and best management practices to ameliorate flooding, protect water quality, prevent basement back-ups and combined sewer overflows, reduce heat island effects and related environmental issues, and restore natural and open spaces. Hey staff have worked on the development of regulations and standards for green infrastructure, green infrastructure program planning, design and construction management of green infrastructure, as well as the development and implementation of monitoring programs for green infrastructure.

The information provided in the following sections and subsequent appendices provides a summary of the substantial experience that our selected team and firm will bring to this project. Our work on green stormwater infrastructure spans nearly five decades and covers the full breadth from planning through implementation and maintenance. Understanding how these projects are designed, built, and maintained is critical to developing a successful plan.

Our firm was founded on the idea that we can make a difference in how our communities manage water and natural resources, and we have been putting that passion into action for nearly 50 years. More recent impacts from increasing rainfall and the ongoing impacts of urbanization have brought these issues to the forefront for many, while Hey has remained on the cutting edge of identifying and solving these issues well before this tipping point. As a firm that focuses our work in this field, we offer our clients the high-level expertise of a senior lead staff that brings decades of practical real-world problem solving to these issues.

We remain industry leaders, using modern tools, data, and technology to continue to innovate in addressing the water resources needs of our clients. Much of our work is now focused on the use of robust spatial datasets and process to create repeatable and supportable solutions to complex issues, while also relying on mapping and presentation tools to clearly communicate to communities. From digital data collection utilizing GPS, drone, and application based GIS tools, to complex two-dimensional modeling, our team is prepared to find efficient solutions to complex issues. We often solicit and present data using on-line mapping tools to enhance community engagement and relay project progress. The use of these tools is weighed against practical hard-won experience that can only be gained through years of study and successful project implementation. The project experience presented below covers the breadth of our work, specifically focusing on the many instances where we have developed long-standing relationships with clients. These relationships have often begun with similar planning level studies and investigations and allowed us to see these efforts through the implementation of projects and assistance in developing defined strategies and tools for green stormwater management and even assisting clients with developing improved stormwater regulations.

While our firm does not have a local office, we are a regional specialty firm, regularly tackling water resources issues throughout the Midwest. We're currently working on projects from Indiana to northwestern Wisconsin. Our proposed project manager, Dave Kraft, has deep connections to central Wisconsin, including family property a short drive west of the City down Highway 29 and in Door County. He is a frequent recreational user of Green Bay and the Fox River system, and will bring his passion for these resources to the project. As a regional firm headquartered near the Wisconsin/Illinois border and with a Milwaukee office, many of our staff or Wisconsin residents, and we will ensure that we are available to meet your needs and develop the critical on-the-ground understanding of the project areas. Our proposal assumes our work will be completed locally and does not include travel time or expenses from our Milwaukee office.

Working with communities on water resources we have personal connections to is the driving force behind our work. In addition to Mr. Kraft's history in the region, our vice president of ecology, Mr. Vince Mosca is a UW Green Bay alum with a long-history in the community. Combining these personal connections with an unmatched regional history of water resource management and problem solving, we feel Hey is the best choice to assist the City in moving this plan to successful implementation.

PROJECT EXPERIENCE

The successful execution of a project like the City-wide GSI plan relies on depth of experience in the field and past planning and implementation. As we described in the previous sections, Hey has been at the forefront of green infrastructure and creative water and natural resources management in the Midwest for nearly 50 years. Over the last several years, we have also been invited to bring our GIS and green infrastructure planning expertise to projects in California, Hawaii and Texas. From planning through construction, implementation of innovative stormwater management and restoration projects is the foundation of our work.

For this project we have identified the following key skills and experience that will be paramount to execution of the City's goals to address the ever-increasing flood risks and water quality degradation we face in this changing climate.

1. **Hydrologic and Hydraulic Modeling:** The ability to both understand where current flooding issues exist, why that may be the case, and develop solutions to have a meaningful impact on problems is paramount. Our team brings a deep understanding and decades of experience in hydrologic and hydraulic principals and modeling to this project.
2. **Water Quality Modeling and Design:** In addition to the community impacts that flooding and unmanaged runoff can cause, stormwater collects and conveys a wide variety of pollutants that can degrade our water and natural resources. The ability to model the impacts of this pollution and develop solutions ensures that the protection of the tremendous waterways in the Green Bay community and surrounding area stay at the forefront of plan goals and outcomes.
3. **Stormwater and Green Infrastructure Planning:** Planning for a project like this requires the ability to lean on the local experience and data from the community, integrate an ever-expanding suite of spatial and other data, and deftly connect that information with past experience to strategically organize an approach to identifying problems and solutions. This type of stormwater planning is a key part of our ongoing work at Hey.
4. **Stormwater and Green Infrastructure Design:** Once process is established and a roster of projects is identified in planning efforts, skilled design and permitting of these projects is the key to realizing the goals that lead to these planning efforts. Many factors can influence design, and our experience executing hundreds of stormwater green infrastructure projects provides the foundation to solving these problems. Our primary goal is always to realize the maximum community benefit and highest level of project implementation.
5. **Street and Roadway Best Management Practices:** In a municipal plan like this streets, roadways, parking areas, and rights-of-way can be key areas where City control exists and where much of the increases runoff and pollutant load is derived from. We have experience developing best management practice toolboxes for our public clients and helping facilitate their implementation.
6. **Project Assessment and Prioritization:** Perhaps the most critical aspect of a planning effort like this one, that will likely derive solutions that exceed the capital practicalities of the City budget, is the assessment and prioritization of projects. Helping derive where the most benefit can be realized for the community with always limited funds is the backbone of a good planning document and something Hey specializes in helping our clients with on a wide range of complex water resources issues.

The table below highlights 30 projects that speak to the depth of Hey's experience in these key aspects of what we envision as the necessary skills to collaborate with the City to realize the implementation of this plan. These projects range from similar large-scale planning studies to construction and implementation of a wide range of green infrastructure practices and projects. The ultimate goal of a plan like this is to see the plan realized and find measured success in flood reduction, water quality improvement, and community health. We note that many of the projects presented demonstrate long-standing relationships that Hey has cultivated through initial planning efforts that lead to plan execution. The City has noted that the goal is to move quickly into capital planning and project construction over a five-year period following adoption of the GSI plan. Hey has helped a wide range of our public-sector clients realize goals like this and can lean on that experience to help the City facilitate that plan. Appendix A contains detailed project descriptions for each project with contact information for references and additional project details presented in the same order as the table. We encourage you to reach out to these past and current clients to discuss our work with them. We would also be happy to provide example project deliverables at your request.

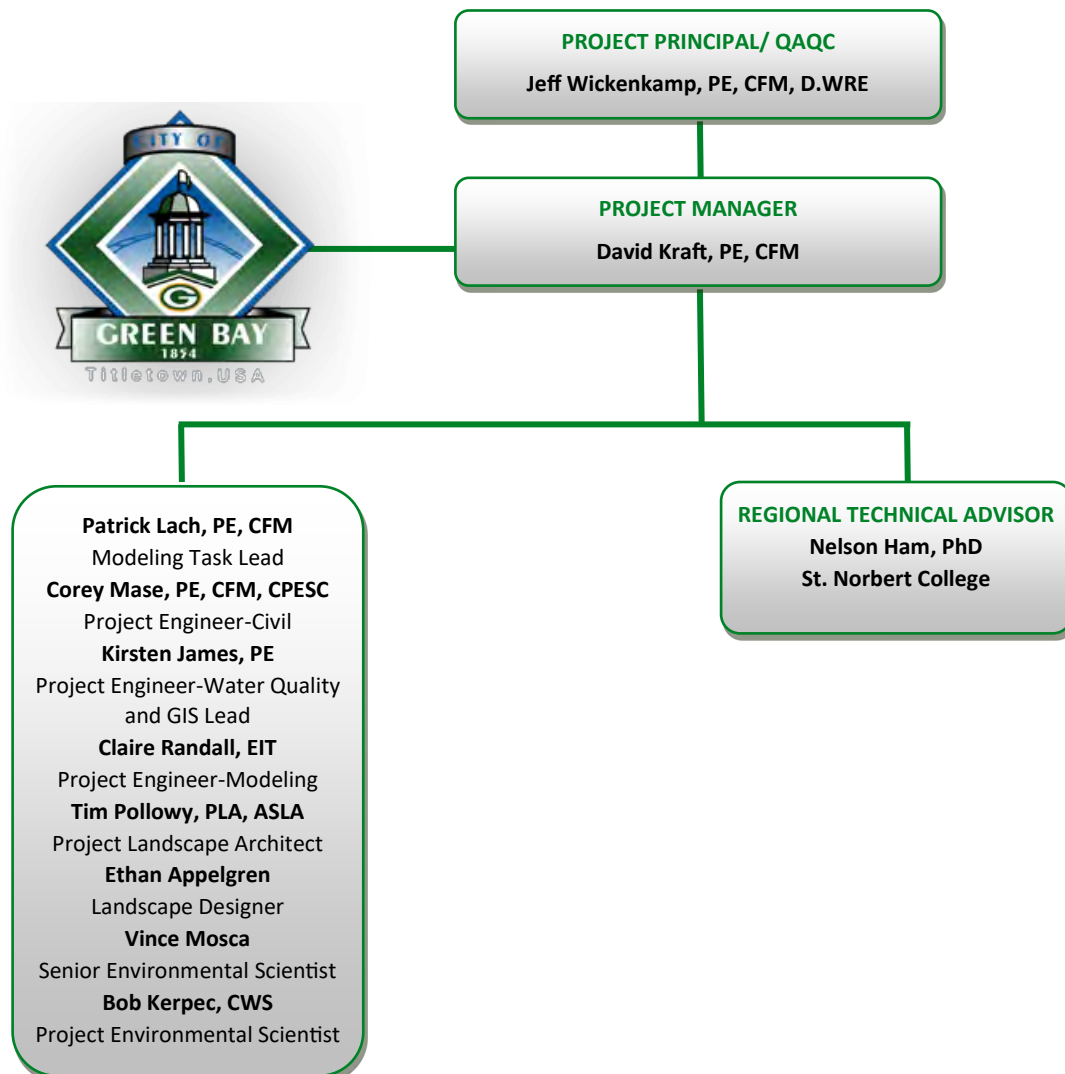
Project	Client	Hydrology & Hydraulics	Water Quality Modeling/Design	Stormwater/GI Planning	Stormwater/GI Design	Streets/Roadway BMPs	Project Assessment and Prioritization
Hoods Creek Improvement Planning Study	Mount Pleasant, WI	☐	☐	☐	☐		☐
Ravine System Assessment and Design	Lake Forest, IL	☐	☐	☐	☐	☐	☐
Preserve Planning and Restoration	Mequon Nat. Pres.	☐	☐	☐	☐		☐
Green Infrastructure Engineering Details	Evanston, IL		☐	☐	☐	☐	☐
Space to Grow Stormwater Improvements	CPS	☐	☐	☐	☐	☐	☐
Green Healthy Neighborhoods GI Planning	Chicago, IL		☐	☐	☐	☐	☐
Resilient Corridors Green Infrastructure Projects	Chicago, IL	☐	☐	☐	☐	☐	☐
Larson Lagoon Retrofit	Fort Atkinson, WI	☐	☐	☐	☐	☐	
GIS-Based Stormwater Planning	CMAQ		☐	☐	☐	☐	☐
Addison Creek Channel Improvements	MWRDGC	☐	☐	☐	☐	☐	☐
Buffalo Creek Preserve Improvements	LCDOT/LCFP/MWRDGC	☐	☐	☐	☐	☐	☐
Detention Basin Retrofits	LCDOT	☐	☐	☐	☐	☐	☐
Hydraulic Analyses, Drainage Investigations,	Cook County DOTH	☐	☐	☐	☐	☐	☐
Hydraulic Studies and Drainage Investigations	IDOT District 1	☐	☐	☐	☐	☐	☐
Berwyn Stormwater Master Plan	CMAQ	☐	☐	☐	☐	☐	☐
Stormwater Master Plan	Evanston, IL	☐	☐	☐	☐	☐	☐
Kinnickinnic River Watercourse Plan Update	MMSD	☐	☐	☐	☐	☐	☐
Menomonee Valley Flood Study	MMSD	☐	☐	☐	☐	☐	☐
DuPage County Streambank Stab. Guidebook	DuPage County		☐	☐	☐	☐	
Green Infrastructure for CSO Control	Aurora, IL	☐	☐	☐	☐	☐	☐
Wards Creek Watershed Plan	DuPage County		☐	☐	☐	☐	☐
Stormwater Master Plan and Implementation	Niles, IL	☐	☐	☐	☐	☐	☐
Stormwater Master Plan	Downers Grove, IL	☐	☐	☐	☐	☐	☐
Michigan City GI Plan	Alliance for Great Lakes		☐	☐	☐	☐	
Hydrologic Restoration -Multiple Sites	LCFP	☐	☐	☐	☐	☐	☐
GI Planning and GIS Assessment	Bayside, WI		☐	☐	☐	☐	☐
GI Planning and GIS Assessment	Bayfield, WI		☐	☐	☐	☐	☐
Stormwater GIS Based Planning	Texas/Hawaii/California		☐	☐	☐	☐	☐
Fox River/GB Natural Resources Assessment	USFWS			☐			☐
Nippersink Watershed Plan and Improvements	Walworth Co. WI, McHenry Co, IL	☐	☐	☐	☐	☐	☐

PROJECT TEAM

As with the majority of our stormwater projects, our team is highlighted by a multi-disciplinary team of engineers, landscape architects, and environmental scientists. With this mix of professionals, our team can cover all anticipated aspects of this project. Specializing in water resources allows our project team to be lead by our senior leadership group, who will all play key roles, lending their decades of experience to the City-wide Green Stormwater Infrastructure Plan. The key staff selected for this project have all dedicated their careers specifically to the study and resolution of water and natural resources issues, and will bring that passion and expertise to this project.

We have also enlisted the support of Dr. Nelson Ham, a Professor of Geology and Environmental Science at St. Norbert College. We value Dr. Ham’s expertise in both the scientific fields that form the foundation of good stormwater and natural resources design and planning, but also his substantial depth of local knowledge on how water resources issues are impacting the community.

The organizational chart below outlines our intended team. Brief introductions to these key team members follow, and resumes for each team member are also included in Appendix B.



KEY STAFF**Dave Kraft, P.E., CFM - Project Manager**

Mr. Kraft will serve as Project Manager and also as the lead project engineer for the project. He has over 19 years of professional experience in civil and water resources engineering project management and design, permitting, construction observation, contract administration, and review. Dave's passion for his work stems from a lifetime as a fisherman and outdoorsman. Since a very young age he explored all manner of streams, lakes, forests, and wetlands fishing and paddling with his father, ultimately building off of that experience for his career. He has been lead engineer on natural areas restorations, streambank stabilizations, hydrologic restorations, access improvements, trail and park design, stormwater management systems, roadway and parking design, urban flooding improvements, and general site development projects.

He is a graduate of UW Madison in Civil and Environmental Engineering and began his career in the Dam Safety and Floodplain division of the DNR. In December of 2021, Mr. Kraft was an invited speaker for internal DNR training on waterway and wetland restoration for the Waterway Program staff, sharing his experience over nearly 20 years of lessons learned in riparian corridor study and restoration. Central Wisconsin has always been foundational to his water resources experience, growing up trout fishing in Shawano and surrounding Counties in the headwaters of the Fox River system, and spending substantial time on the Door County peninsula over the last 30 years. He is very familiar with the issues and specific influences of the region.

Jeff Wickenkamp, P.E., CFM, D.WRE - Project Principal—QAQC

Mr. Wickenkamp is President of Hey, and will provide overall QAQC for the project, as well as lend his substantial water resources experience to the effort. He is a registered professional engineer, a certified floodplain manager, and a Diplomate, Water Resources Engineer. Mr. Wickenkamp's professional experience includes over 25 years of experience in stormwater management and flood mitigation projects, drainage design, green infrastructure, water quality best management practices, watershed planning, water quality studies, environmental compliance studies, and regulatory review and program development. He attended the University of Illinois where he received B.S. and M.S. degrees in Civil Engineering. Mr. Wickenkamp served for seven years on the Board of Directors for the Illinois Association for Floodplain and Stormwater Management.

Patrick Lach, P.E., CFM - Modeling Task Lead

Mr. Lach will serve as modeling task lead for the project and also lend his substantial experience to plan development. He has over 20 years of water resources and civil engineering experience and management, is a registered professional engineer and a certified floodplain manager. He currently serves as a Principal Civil Engineer for Hey and Associates with a significant focus on hydrologic and hydraulic analyses and stormwater infrastructure design for flood control and green infrastructure projects. He is well versed at evaluation of green infrastructure on both a regional and local scale. His experience includes the analysis and design of bioinfiltration basins, rain gardens, permeable pavement and other green infrastructure components using a variety of tools including hydrologic analyses, land use data, GIS data, LiDAR/DTM and localized flow path data representing overland surface flow routes. Evaluation of this data is used to evaluate prime locations for green infrastructure improvements to maximize the tributary area to the site for collection and infiltration of stormwater runoff on projects. His work experience for green infrastructure planning and analysis has been mainly in Illinois, Indiana and Wisconsin but he has also worked on projects in Texas, Hawaii and California. He has also prepared a presentation for the Chicago WEFTEC October 2013 conference which was titled "Long-Term Municipal Green Infrastructure Programs for Climate Change Adaptation."

Corey Mase P.E., CFM, CPESC - Project Engineer - Civil

Mr. Mase will serve as project engineer focused on traditional civil and municipal facets of the planning effort. Corey works out of Hey's Wisconsin office and is a Registered Professional Engineer in Wisconsin and Illinois, a Certified Floodplain Manager, a Certified Professional in Erosion and Sediment Control, and a Certified Public Infrastructure Inspector. He has over 20 years of professional experience in civil and water resources engineering and is proficient in the

development of design plans, specifications and cost estimates, as well as project management, permitting, construction observation, and design review. He has managed and been lead engineer on a wide variety of projects, including stormwater management design, creek corridor enhancement, site and subdivision development, trail design, access improvements, parking lot and roadway design and rehabilitation, and soil erosion and sediment control design. Mr. Mase received a Bachelor of Science degree in Civil and Environmental Engineering from the University of Illinois, Urbana/Champaign.

Kirsten James P.E.,- Project Engineer - Water Quality and GIS Lead

Ms. James will serve as the Water Quality and GIS Specialist for the project. She has acted as project engineer on a variety of stormwater, floodplain, planning, recreational, and restoration projects. A background in hydrologic, hydraulic, and water quality modeling, design, permitting, and grant writing positions her well to see projects through from planning to construction. As an active member of the Wisconsin Chapter of the American Water Resources Association, on the Planning Committee for the Wisconsin Lakes and Rivers Convention, and an all-around outdoor enthusiast, Kirsten's always looking for the next State Park to explore.

Growing up, Kirsten spent many summers in the driftless region, exploring forests, intermittent creeks, and backwaters of the Wisconsin River, inspiring her to restore and protect natural areas for years to come. A recent graduate of the Wisconsin Lake Leaders Institute, Kirsten received her degree in hydrology and environmental management applications of Geographic Information Systems from the University of Wisconsin - Stevens Point College of Natural Resources (CNR), where she began work with many lake, river, and watershed management groups through the University of Wisconsin Extension Lakes Program. Summers in the area included the CNR Field Experience in Tomahawk, a Teaching Assistantship for Field Experiences in Aquatic Ecosystem Evaluation at the Central Wisconsin Environmental Station in Amherst Junction, and many evenings and weekends on the lake and in the woods from Wausau to Shawano and through Appleton and Oshkosh. Since, she has earned her Professional Engineering licensure in the State of Wisconsin and continues to spend time chasing waterfalls and cliffs near Ashland, paddling the Lower Wisconsin, and skiing through old growth forests in the Northwoods.

Claire Randall, EIT - Project Engineer - Modeling

Ms. Randall serve as tour project engineer for modeling tasks. She graduated with a Bachelor of Science in Civil Engineering with a major in Environmental Engineering from Marquette University in 2021, where she was an active member and project lead in the Engineers Without Borders chapter. Since starting at Hey and Associates, Inc. in Chicago, she has gained experience in stormwater management and stream restoration projects, permitting, site design, and construction plan development. She has experience in hydrologic and hydraulic modeling and analysis for both urban and rural areas using the modeling software programs XPSWMM (1D and 2D), HEC-RAS, HEC-HMS, and FEQ. Additionally, she is proficient in in AutoCAD Civil 3D and ArcGIS on a wide variety of projects.

Tim Pollowy, PLA, ASLA - Project Landscape Architect

Mr. Pollowy will serve as project Landscape Architect, lending is substantial experience to site design input that will be critical for open space designs on the project. Built upon an education in landscape architecture and natural resources from the University of Illinois, Tim has 28 years of experience in landscape architecture, environmental planning, and ecological restoration. His areas of expertise include sustainable and resilient design, streambank stabilization and restoration, green infrastructure, wetland mitigation, soil bioengineering, native landscape design, passive recreation design, and the restoration and management of natural areas. Tim has a thorough hands-on understanding of construction management, and has overseen the successful implementation of a wide variety of projects. Mr. Pollowy possesses an IDOT Documentation of Contract Quantities certificate, has successfully completed IDOT/FHWA Context Sensitive Solutions (CSS) training for public consensus building, and is a Registered Landscape Architect in Illinois and Wisconsin.

Ethan Appelgren - Project Landscape Designer

Mr. Appelgren will lend his presentation and design talents to the project as Project Landscape Designer. He has 4 years

of experience in the field of landscape architecture, with his background including site design, planning and construction. Educated at the State University of New York, College of Environmental Science and Forestry (SUNY-ESF), he has completed numerous projects involving residential and commercial design, large-scale municipal planning, ecological restoration, parks and recreational space development and geospatial analysis. Ethan has spent his career in multi-disciplinary firms, working alongside civil engineers, environmental scientists, urban planners and arborists.

Vince Mosca - Senior Environmental Scientist

Mr. Mosca serve as Senior Environmental Scientist for the project. He has been involved with thousands of wetland and ecological assessment projects over the past 33 years in Wisconsin and northern Illinois. Vince also routinely leads regulatory permitting (local, state, and federal) efforts for both public and private sector projects. He has vast experience dealing with state and federal endangered species issues, and with all aspects of ecological restoration, particularly wetlands and streams. Many of his recent projects relate to green infrastructure planning and design for stormwater quality and quantity management. He was the lead author for the Green Bay Natural Resource Damage Assessment that identified priority acquisition and restoration parcels in the West Bay of Green Bay. Also, he recently was on a team that looked at ecological restoration and resiliency opportunities on the south shore of Lake Superior in Ashland, Wisconsin. He has given multiple presentations concerning modern approaches to water quality improvements for point and non-point sources, including discussions about costs related to design, operations and maintenance. Mr. Mosca graduated from Northland College with a Bachelor of Science in Biophysical Environmental Studies, Minor in Chemistry, as well as MS in Ecosystem Studies from the University of Wisconsin-Green Bay.

Bob Kerpec, CWS, CPESC, WDNR Assured Delineator, ISA Certified Arborist- Project Environmental Scientist

Mr. Kerpec will be the Project Environmental Scientist for the project. He has over 21 years experience conducting field surveys such as wetland delineations, tree surveys, soil erosion and sediment control inspections, ecological restoration management, and vegetation inventories. He is well versed in regulatory permitting issues, having successfully obtained federal and county wetland permits for many public and private sector clients throughout northeastern Illinois and southeastern Wisconsin. Mr. Kerpec has worked as a project manager for various Phase III IDOT and Lake County Division of Transportation (LCDOT) contracts for work consisting of ecological restoration management to natural wetland areas, hazardous tree and emerald ash borer assessments, and invasive plant species management. Work associated with these contracts included directing and documenting the general contractor on the implementation of all contract pay items such as tree removals, seeding, planting, weed control, mowing, and control burning. He is currently working as a Resident Engineer for a yearly LCDOT Basin Maintenance Contract, Lake County, Illinois. Work here includes vegetation management of naturalized detention basins and providing the client with contract bid documents and construction oversight. Mr. Kerpec has also worked as an inspector/Resident Engineer Assistant for the Illinois State Tollway Highway Authority Elgin O'Hare Western Access Wetland Mitigation Project (315-acres) located at the Pine Dunes Forest Preserve in Lake County. Mr. Kerpec received his Bachelor of Arts in Environmental Studies from Northeastern Illinois University. Mr. Kerpec is also a Certified Wetland Specialist in Lake County and McHenry County, Illinois and a Wisconsin Department of Natural Resources Assured Wetland Delineator.

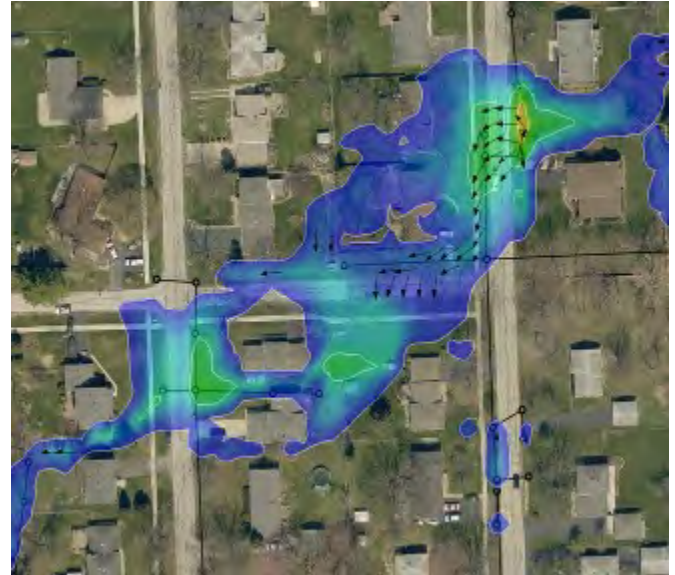
Nelson Ham, PhD, Professor of Geology & Environmental Science St. Norbert College - Regional Technical Advisor

Dr. Ham will lend both his immense technical expertise and local knowledge as a project advisor. He is a Professor of Geology and Environmental Science at St. Norbert College in neighboring DePere. Nelson is a passionate and curious scientist with an understanding of local geologic and environmental factors that will be invaluable to the development of the plan. His interest in interdisciplinary teaching and research focused on the important relationships among geology, biology, ecology and chemistry will help create a sound technical basis from which to build the project off of. This depth of technical and local understanding will lend nuance and breadth to the planning effort, ensuring that proposed projects and approaches are both regionally and locally appropriate.

PROJECT UNDERSTANDING

We understand that over the last several decades the impacts of increased rainfall and development have resulted in impacts to the Green Bay Community, not unlike the majority of urban and suburban areas in the Midwest. Like many cities constructed with waterways as their focal points, often with drained wetland areas as their foundation, managing these resources is one of the biggest challenges communities face. City regulations and stormwater design standards have attempted to keep up with these ever-growing issues. Recent historic annual rainfalls and high water elevations on Lake Michigan have caused a tipping-point for Green Bay and many great lakes communities, which has promoted the commission of the City-wide Green Stormwater Infrastructure Plan.

The plan aims to not only identify specific project locations and priority watersheds that can be acted upon to begin to address these issues, but also create a toolbox of evaluation techniques and practices that can be applied going forward in the majority of development and redevelopment situations. The end goal is to work towards addressing flooding, improve water quality, and prioritize the community at large for resiliency into the future. The experience of our team, presented above highlights why Hey is well-suited to work hand-in-hand with the City to realize these goals.



PROJECT APPROACH

The City has identified twelve key project tasks in the Request for Proposals. We concur with the approach identified in the RFP, and offer the following detail on how we intend to execute these tasks, with the aim of creating a plan that is well-supported and can move immediately into action, addressing the stormwater issues facing the community. The foundation of this project work will be the substantial available spatial and other data available for the City as well staff input and insight. We understand that preliminary efforts by the UW Sea Grant Institute will also provide a solid stepping off point for this work, with both substantial available datasets and preliminary problem area identification.

Kick-Off Meeting: We will use the project kick-off meeting to ensure that project vision is unified, discuss existing data and needs, and solicit any staff feedback on known problem areas, concerns, and most importantly ideas. We will present and discuss schedule as well, leaving with a clear plan of attack and understanding of project structure and timing.



City-wide Location Analysis for Strategic GS Investment: Location analysis for the community will lean on our substantial past experience with GIS-based green stormwater infrastructure planning and assessment. Our relevant project work across the country, described in detail in our project descriptions in Appendix A for CMAP, Downers Grove, Bayview, Bayside, and a host of other communities will guide our initial process. We envision that process to be:

- Build baseline GIS databases to create a project specific GIS environment.
- Assess the level of detail of existing subwatershed, sewer shed, LiDAR, and flow mapping data.
- Enhance and create flow mapping assessments for priority watersheds, as/if needed.

- Build City specific GIS tools and processes to facilitate location assessment. This will build off of past Hey efforts and City input to create a process unique to Green Bay's data and needs.
- Perform field reconnaissance to truth initial results and assess locations.
- Finalize tools and processes for plan completion and ongoing City use.

GSI Project Identification for Public and Private Property: With the foundation of the supported location analysis approach and tools, we will identify 30 public projects and up to 20 private projects for inclusion in the plan. We will also develop a strategy for prioritizing the projects, working closely with City staff to inform them on opportunities and constraints, and work to maximize project efficiency. Project identification will rely on results of the GIS Based location analysis assessment, anecdotal input from the City, field assessment, and practical factors such as ownership, access, utilities, and local neighborhood impacts.

Triple Bottom Line Analysis: Projects will be evaluated and prioritized on a range of factors beyond the simple potential for flood reduction. In the Triple Bottom Line Analysis project economics will be a key metric, but we will also work with the City to develop a quantifiable strategy to factor community and environmental impacts into each project evaluation and prioritization. Opportunities to expand community recreational opportunities, improve natural resources, and direct investment to disadvantaged areas of the community will be considered. Social and environmental concerns will be weighed along with financial realities and the technical performance metrics of the projects to developed a nuance prioritization strategy. We will work with the City to create a repeatable process for this assessment to ensure consistent project evaluation now and in the future.

Water Quality and Quantity Modeling: It will be fundamental to understanding project benefits to analyze the potential contributions to flood reduction and water quality improvements of each project. Water quality and quantity models will be a key tool in this analysis. Project type and location may dictate the tools and approach used. Available spatial data, including surface and sewer watershed information, recent high quality LiDAR data, and utility information will be utilized in these assessments. We will work with City staff to determine the most efficient and reliable way to establish project benefits related to flood reduction and water quality. Tools may range from project specific two-dimensional hydrologic and hydraulic modeling and discreet water quality modeling software such as WinSLAMM, to GIS and spreadsheet assessment for certain standard project types and tools. Where possible we will utilize tools that are readily available and easy to implement for plan consistency and potential staff and developer use for future project additions following identified plan processes.

Creation of Maps for Integration with City GIS: GIS tools and spatial data will form the backbone of the project. Maps identified in the RFP and additional imagery will create compelling graphical representations of the plan to ensure that City staff, elected officials, and community members develop a clear understanding of the plan vision. We will also work with staff to determine if on-line mapping applications for the plan are appropriate for either project solicitation from the community, or plan presentation. In recent years we have frequently found on-line mapping to be a valuable tool in these planning projects, and have successfully used it in a variety of ways.

Evaluation Process for Feasibility of GSI Projects: In association with the above tasks, we will develop a toolbox of street and right-of-way green infrastructure practices for implementation as part of street projects. This tool box will be presented with a repeatable process for project evaluation that can be used by City staff when planning and evaluating roadway improvements within the community. Hey has assisted the Cities of Chicago and Evanston and a variety of other clients with similar programs.



Design Guidance for Identified GSI Projects: Similarly, a key aspect of the project will be development of GSI details, specifications, and design guidance for common recommend practices to facilitate City and developer inclusion of these practices. Hey has previously assisted communities with inclusion of similar guidance in existing ordinances and preparation of associated technical guidance documents for use in both design and regulation of stormwater best management practices. This guidance will consider existing City, County, and WDNR regulatory requirements, as well as



means to exceed current minimum standards. Hey recently worked with the Root Pike Watershed Initiative Network in Kenosha and Racine County to prepare a similar design guidance document aimed at improving upon existing wet detention pond design standards, where traditional ponds are showing signs of impairing key waterways in the watershed.

Maintenance and Operations Guidance for Identified Projects: Green infrastructure, like all infrastructure is rarely maintenance free. Our depth of experience from planning, through design, construction, and management of projects has proven that long-term operations and maintenance are key to ensuring success of GI investment. Our staff regularly presents, on this topic and ensures that long-term management is considered from both a practical and capital perspective.

Compilation of Consultant Services Into Final GSI Plan: The ultimate goal of the project will be to deliver a comprehensive Green Stormwater Infrastructure Plan, compiling the information from the tasks above in an easy to understand and interpret document. The plan will include clear processes and guidance for City staff, developers, and residents to execute the plan. All base information will be cleanly organized and founded in base City spatial information for easy integration into existing City data and long-term updates and improvements.



Five Meetings with City Representatives: You know your community, and conveyance of that knowledge will be paramount to project success. Meetings with City staff will keep you abreast of project progress, but more critically, allow us to build on the inherent community understanding and reflect it in the plan.

Presentation of the Final Plan to City: While it is critical that the consultant and staff remain unified in how the plan will be constructed and implemented, perhaps more important is ensuring that elected officials and the community are engaged in the project and understand objectives clearly. We will present the final plan to the Common Council and other interested City committees, answering any questions that they may have.

Working in an advanced GIS environment, we will build a resilient green infrastructure plan to carry stormwater management in the City of Green Bay into the future. Specific project identification will be married with processes, guidance, and tools that will create an implementable plan that will realize immediate improvements in key water resources issues impacting the City. Appendix C contains the Quotation Request Form from the RFP as well as a proposed project schedule, aimed at moving to capital planning, grant request submittals, and project implementation by the late summer of 2023.

As a regional leader in solving water resources problems in innovative and broadly beneficial ways, Hey looks forward to the opportunity to assist the City with the project. We have intentionally provided deep and wide-ranging documentation of our experience, from planning to implementation. We pride ourselves on the long-term relationships we have built with many clients through efforts like this, helping them facilitate their own implementation programs and realize tangible benefits. Seeing previously flooded neighborhoods avoid damage, waterway improvements remain stable, and key indicator species return to preserved and restored areas provides meaningful measures of success, and we are lucky to have played a small role in creating these experiences with our clients for nearly 50 years.

APPENDIX A –REPRESENTATIVE PROJECTS

Client

Village of Mount Pleasant

Contact

Tony Beyer
262-664-7849
tbeyer@mtpleasantwi.gov

Status

Ongoing

Earned Fee

\$200,000+

Services Provided

Water Resources Engineering
Wetland Consultation
Hydrologic and Hydraulic Modeling
Natural Resources Assessment

Project Highlights

Watershed Planning
Stream Assessment
Recreational Planning
Regional Stormwater Design

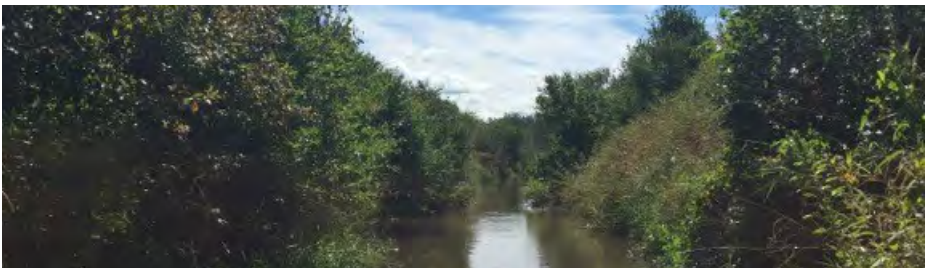


In 2016 the Village of Mount Pleasant began the initial planning phases for the Hoods Creek watershed. Hoods Creek, a tributary to the Root River, drains the northern half of the Village. Portions of the watershed also include the rapidly developing and modernizing I-94 corridor.

Initially, Hey worked with the Village and a group of watershed stakeholders to prepare a comprehensive planning document for the entire watershed and stream reach, focusing on identifying and defining opportunities and constraints within the watershed and stream corridor. The plan explored opportunities for development within several tax districts, recreational amenities such as regional trail, drainage improvements, water quality enhancement, and ecologic and habitat restoration.

Upon completion and publication of the *“Hoods Creek Improvement Planning”* study in Hey and the Village have set to work beginning the work improving the Hoods Creek watershed. Initially Hey prepared construction and permit documents for the removal of the Village municipal compost facility from the floodplain, which included enhanced stormwater management and water quality improvements as well.

Hey has also prepared preliminary engineering plans for trail, green infrastructure, and stream improvements along a portion of the creek in the Route 20 corridor, with the intent to implement the project as development progresses in the reach. Concept wetland mitigation planning documents have also been prepared and Hey is working with the Village to require restorable agricultural lands with the intent to enhance and restore wetlands, potentially as a Village wetland mitigation bank.



Client

City of Lake Forest

Contact

Mr. Jim Lockefer
847-810-3542
LockefeJ@cityoflakeforest.com

Status

Ongoing

Services Provided

Civil Engineering
Stormwater & Floodplain Management
Soil Erosion & Sediment Control
Construction Engineering
Wetland Delineation & Permitting
Site Design
Green Infrastructure
Transportation

Project Highlights

Ravine Restoration



Building on our decades of experience in ravine stabilization and restoration, Hey has acted as the primary ravine engineering consultant for the City of Lake Forest since 2018. The community lies on the shoreline of Lake Michigan and has several major ravines systems and miles of ravine that drain stormwater runoff to the lake and also contain other key City infrastructure.

One of the primary roles Hey has assisted the City with is annual field inspection of key ravine outfalls, culverts, and ravine reaches. Hey prepares an annual report providing insights and recommendations for ongoing capital planning for ravine repairs and maintenance, and then moves to assist City staff with final design, permitting, and project implementation. One such project was repair to an existing brick masonry culvert that was failing. Stabilization included steel pipe lining and an engineered natural stone and gabion mattress energy dissipating outfall, constructed in 2020.

Founded on our first annual assessment, Hey recommended and ultimately prepared a master plan for stabilization and restoration of the Seminary Ravine system. This ravine consists of several finger ravines and a main ravine, with more than two miles of bed. Conditions include exposed sanitary main from bed incision, slope failures, outfall and culvert scour, and degraded bed conditions. The master plan prepared identified key priority reaches and project areas, as well as a prioritized approach to implementation and funding options. Hey is currently working on engineering design of six specific reaches and three outfalls to move to construction and pursue grant funding. We are also currently preparing a similar study for a nearby smaller ravine system that has the Lake Forest Cemetery at the top of the slopes.

Hey works closely on a regular basis to assist the City with prioritizing the most beneficial use of City funds dedicated to ravine upkeep. Projects focus on stabilization, water quality, natural restoration of ravine beds and slopes, and protection of City infrastructure.

Client

Mequon Nature Preserve

Contact

Kristin Gies

Executive Director

262-242-8055

kgies@mequonnaturepreserve.org

Status

Ongoing

Annual Earned Fee

\$10,000

Services Provided

Stormwater & Floodplain Management

Civil Engineering Design

Water Resources Permitting

Project Highlights

Restoration design

Hydrologic and hydraulic analysis

Regulatory permitting

Stream restoration

Habitat enhancement



Hey has developed a long-term relationship with the Mequon Nature Preserve, assisting with planning, design, and permitting of natural areas restoration on the over 500 acre preserve.

In 2018, Hey provided engineering and permitting support for the restoration of the remaining ditched portion of Trinity Creek. Restoration included remeandering of the ditched creek, excavation of a floodplain and wetland scrapes, breaking of existing tiles, in-stream riffles and tree structures, and native corridor restoration. Hey prepared hydraulic modeling to support and refine the concept design, and completed permitting through the City of Mequon, and assisted with WDNR permitting for the project. The project completes restoration of the on-site portion of the creek, which has been a long-standing goal of the MNP since first restoring the upstream reach in 2008.

Since, Hey has provided similar services for hydrologic restoration of two other portions of the parcel that were formerly active agriculture. Hey remains engaged in the preserve planning and restorations efforts including:

- Planning for inclusion of natural restoration and sustainable agricultural practices on the 40-acre on-site Fondy Farm, which provide plots for disadvantaged farmers to grow and sell fresh produce in under-served communities.
- Master planning for conversion of an existing farmstead to a future educational center.
- Assistance with procurement of a 2022 Sustain our Great Lakes Grant for additional hydrologic restoration and water quality and habitat improvement on an approximately 100-acre portion of the preserve.
- Engineering and permitting for implementation of an MMSD funded forestry and wetland restoration pilot project.

Client

City of Evanston

Contact

Dave Stonebeck

847-448-8198

publicworks@cityofevanston.org

Status

Completed in 2012

Earned Fee

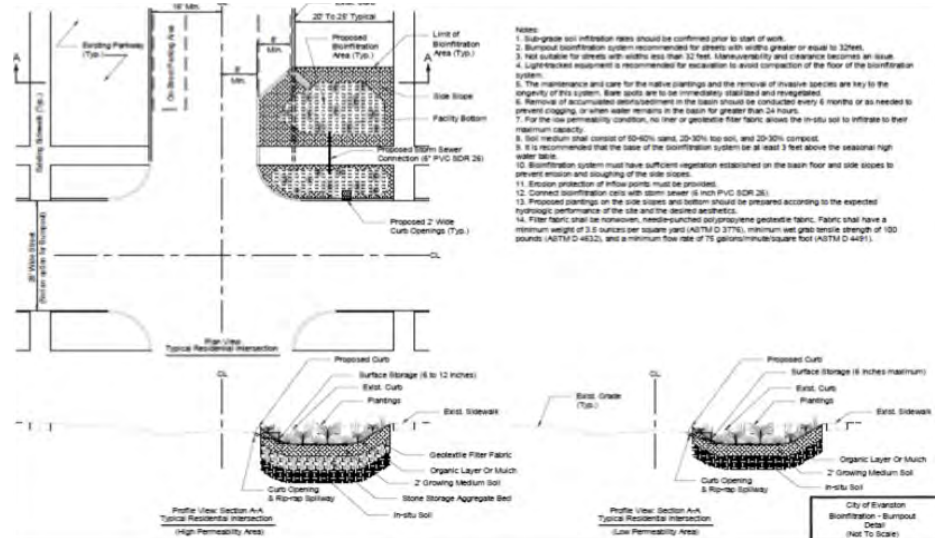
\$24,946

Services Provided

Stormwater & Floodplain Management
Civil Engineering Design
Landscape Architecture
Water Quality Planning
Sustainable Planning & Design

Project Highlights

Standard details for green infrastructure prepared
Feasibility of green infrastructure projects evaluated



Hey and Associates, Inc. (Hey) worked with the City of Evanston to prepare standard engineering details and guidance documentation for implementation of green infrastructure projects. Hey met with city staff to discuss previous projects completed by the city, discuss future opportunities, and identify the most suitable green infrastructure techniques for use in municipal projects. Engineering details were prepared for:

- Bioinfiltration – ROW Commercial
- Bioinfiltration – ROW Residential
- Bioinfiltration – Curb Bumpout
- Tree pit
- Permeable Concrete
- Permeable Asphalt
- Permeable Brick Pavers

Several complementary tasks were completed to further assist city staff to implement future green infrastructure projects. These included:

- Prepared overland flowpath analysis using LiDAR topographic data.
- Evaluated feasibility of retrofitting existing traffic circles to incorporate green infrastructure.
- Prepared a summary of underground storage options.
- Prepared a summary of permeable pavement options.
- Prepared a matrix/approach to evaluate feasibility of including green infrastructure in planned municipal construction projects.
- Prepared a matrix/approach to determine when green infrastructure may be an appropriate technique to address local drainage issues or nuisance flooding.

Owner

Chicago Public Schools

Contact

Mark Kozlowski
773-553-2301
mkozlowski@cps.edu

Status

Ongoing

Services Provided

Stormwater & Floodplain Management
Civil Engineering Design
Landscape Architecture
Sustainable Planning & Design

Project Highlights

Artificial Turf Fields
Basketball Courts
Jogging Tracks
Green Infrastructure
Permeable Pavement
Native Planting
Outdoor Classrooms
Learning Gardens
Modular Vegetable Gardens
Play Structures
Downspout Disconnection



Space to Grow is an innovative program led by Healthy Schools Campaign and Openlands, with a primary focus on transforming schoolyards into vibrant outdoor spaces that benefit students, the surrounding community, and the environment. In addition to providing updated playgrounds, artificial turf fields, outdoor classrooms, and related amenities, there projects also provide significant stormwater management benefits through the use of green infrastructure to help relieve basement back-ups and CSO events.

Hey and Associates, Inc. provided landscape architecture and engineering services for Space to Grow projects at Leland, Morrill, and Davis Elementary Schools. These projects started by meeting with each school's administrative staff and members of the community to identify project-specific goals and objectives. Each project converted approximately one acre of asphalt into exciting active play and learning environments featuring permeable surfaces, rain gardens, bioinfiltration areas, underground storage, and related improvements. The schools and surrounding neighborhoods have been extremely satisfied with these projects, as they provide much needed green space and stormwater management.

Client

City of Chicago

Contact

Michael Berkshire
312-744-0363
mberkshire@cityofchicago.org

Status

Completed in 2014

Earned Fee

\$78,000

Services Provided

Stormwater & Floodplain Management
Civil Engineering
Water Quality Planning
Green Infrastructure
GIS Services

Project Highlights

Spreadsheet tool for evaluating green infrastructure benefits and costs

Original green infrastructure implementation ideas developed for Chicago's existing drainage patterns

Use of LiDAR topographic data to identify flowpaths and green infrastructure opportunities



Hey and Associates, Inc. (Hey) worked with the City of Chicago's Department of Housing and Economic Development to identify stormwater management opportunities through the integration of innovative landscapes, streetscapes, and building techniques which incorporate green stormwater infrastructure into the urban fabric of Chicago neighborhoods. Phase 1 included the development of a green infrastructure scenario builder that allowed for an evaluation of the costs and benefits of green infrastructure within the context of the neighborhoods under study. When considering the stormwater management benefits, some green infrastructure tools can be highly cost effective while others can be downright expensive when compared to the derived benefits. In general, implementing green infrastructure as part of development or redevelopment projects is much more cost effective than green infrastructure retrofit projects.

Integrating green stormwater infrastructure into a highly developed area requires a decentralized and creative approach to planning and design. This study investigated the opportunities for the creation of storm water management landscapes, streetscapes, and building designs at the neighborhood level. The goals of the program included:

1. Reduce localized flooding
2. Reduce combined sewer overflows
3. Improve water quality
4. Improve the quality of life of residents

In Phase 2, green infrastructure implementation opportunities were identified throughout the Green Healthy Neighborhoods planning area. Several concepts were developed including end-of-alley rain gardens, stormwater storage basins on vacant properties, and daylighting a sewer as part of a planned unit development. LiDAR data was used to map overland flowpaths throughout the study area. These flowpaths were then used to assist in efficient green infrastructure siting.

Client

City of Chicago

Contact

Michael Berkshire

312-744-0363

michael.berkshire@cityofchicago.com

Status

Completed in 2018

Earned Fee

\$160,000

Construction Cost

\$4,500,000

Services Provided

Stormwater & Floodplain Management

Civil Engineering Design

Landscape Architecture

Soil Erosion & Sediment Control

Project Highlights

Vacant Lot Redevelopment

Underground Stormwater Storage

Green Infrastructure

Stormwater Monitoring



Hey and Associates, Inc. (Hey) was part of a team of consultants selected by the City of Chicago's Department of Planning and Development to prepare final engineering design plans for green infrastructure improvements in two of the city's west side neighborhoods. The improvements to ten lots along three commercial corridors are characterized by street-facing public spaces with interspersed plazas, pocket parks, and community gardens. Green infrastructure features including rain gardens and permeable pavement were also prominently featured. Each lot was designed with a community partner and features amenities that support local programming and neighborhood development.

Extensive coordination was required during project design. Remediation of contaminated soils had to be coordinated with IL EPA. The local alderman and resident groups strongly supported this project to remove urban blight and develop an open space that could be used by the community. Coordination with other agencies including the Chicago Department of Transportation, Chicago Department of Fleet and Facility Management, and Chicago Department of Water Management.

This is considered a pilot project for the department of planning that aims to activate blighted corridors in underserved neighborhoods and use green infrastructure to reduce the risk of basement backups. The innovative designs capture stormwater from the city right-of-way and convey it into the lots to be stored before infiltrating it or slowly releasing it back into the city sewer system. Stormwater monitoring equipment is being installed on three of the sites with a cloud based data management system. This data will be used to monitor the performance and the benefits of the projects.



Client

City of Fort Atkinson

Contact

Andy Selle, P.E.
920.563.7760
ASelle@fortatkinsonwi.net

Status

Completed in 2020

Earned Fee

\$50,000

Services Provided

Civil Engineering
Stormwater & Floodplain management
Water Quality Planning
Ecological Restoration & Management

Project Highlights

Water Quality Modeling
MS4/TMDL Documentation
Water Quality BMPs



Hey performed design and permitting services to retrofit the Larson Lagoon to provide water quality benefits. Runoff from approximately 450 acres of urban watershed is treated before it discharges to the Rock River. The pond was previously used as a settling pond for a vegetable canning facility to reduce BOD load to the City treatment plant, but had not been in use for over 20 years. The City was awarded a WDNR grant to reroute stormwater to the pond for treatment. Hey reviewed the concept plan submitted with the grant, and made design recommendations that reduced the overall project costs by over half, while improving upon the intended water quality function. The project savings allowed for inclusion of downstream wetland restoration to further enhance water quality, and improve habitat.

Hey prepared a WinSLAMM model to show greater than 90% reduction of suspended solids and total phosphorous. Hey also prepared an XP-SWMM model to confirm that upstream drainage impacts would not occur, and document the attenuation of peak flows, which will limit flood flows to the Rock River.

The project, constructed in 2019 and 2020, assists the City in meeting MS4 permit requirements, and overall Rock River TMDL goals.

Client

Chicago Metropolitan Agency for Planning

Contact

Jason Navota
312-386-8750
jnavota@cmap.illinois.gov

Status

Completed in 2016

Earned Fee

\$14,725

Services Provided

Stormwater & Floodplain Management
Water Quality Planning
Sustainable Planning & Design

Project Highlights

GIS-based flood risk analysis
Overbank flood risk identification
Local sewer flood risk identification
Stormwater and Green Infrastructure
improvement siting
Municipal and regional issue focus



Hey and Associates, Inc. (Hey) worked with the Chicago Metropolitan Agency for Planning (CMAP) on the development of a GIS-based flood risk analysis tool to identify areas with a high potential for urban flooding based on a variety of input datasets. Hey assisted CMAP with identifying and selecting relevant data needs, developing and fine-tuning risk identification and hierarchy, and providing input for assessment of potential problem areas and causes of flooding. Hey also used its experience with overland flowpath modeling to guide CMAP on ways to improve and assess the flowpath dataset.

CMAP tested the procedures on three pilot communities to have the resulting information be incorporated into updated Comprehensive Plans. This information would further guide the community on development and redevelopment opportunities to help alleviate and/or mitigate future flood risks. Hey assisted CMAP in reviewing and assessing existing datasets for incorporation into the GIS tools. Following the initial analysis for each community, Hey and CMAP worked through the risk factors to further refine how input data is evaluated to develop a risk hierarchy throughout the community. The resulting efforts including heat mapping of flood risk, overland flooding maps, catchment risk analysis, and identification of land use opportunities for flood risk reduction will provide a useful tool for other communities during comprehensive planning.

Client

Metropolitan Water Reclamation District

Contact

Michael Cosme
312-751-3092
michael.cosme@mwrdd.org

Status

Ongoing

Earned Fee

\$2,275,000



Services Provided

Stormwater & Floodplain Management
Civil Engineering Design
Wetland Delineation & Permitting
Landscape Architecture
Soil Erosion & Sediment Control

Following the completion of the preliminary engineering for Addison Creek Channel Improvements, MWRDGC retained Hey and Associates, Inc. (Hey) to complete the final engineering plans for approximately 5-miles of various structural and stabilization improvements along Addison Creek. Existing conditions for the 100-year storm event inundates hundreds of homes in this study reach. The improvements have an opinion of construction cost of approximately \$30 million. Work includes final hydraulic modeling and analysis of designed alternatives, design of gabion and soldier pile walls, streambank stabilization improvements, and bridge/culvert removals and replacements, storm and sanitary sewer design, utility relocations, and civil and site improvements (roads, parking lots, grading, etc.).

As part of the Addison Creek Channel Improvement project, Hey conducted a detailed site investigation of the project corridor including topographical survey, outfall identification, right-of-way/ property ownership research and analysis, public and private infrastructure, existing channel conditions, and utility information. In addition, soil borings were completed for a geotechnical report to aid in design and environmental sampling was completed to characterize project materials for appropriate disposal methods.

Project Highlights

Urban flood risk reduction
Conveyance and storage improvements
Unsteady HEC-RAS Modeling
Riparian corridor enhancement

Hey is currently completing the final design and producing construction documents for the channel modifications and associated infrastructure improvements. The project also involves permitting coordination with regulatory agencies and coordination with stakeholders and municipalities. The project deliverables include final engineering plans, specifications, cost estimates and reporting.

Clients

Metropolitan Water Reclamation District
of Greater Chicago (MWRDGC)

Lake County Division of Transportation
(LCDOT)

Site Owner

Lake County Forest Preserves (LCFPD)

Contacts

MWRDGC-Justin Kirk
312-751-3171
KirkJ@mwrdd.org

LCDOT-Betsy Duckert
847-377-7400
bduckert@lakecountyil.gov

LCFPD-Randy Seebach
847-968-3262
rseebach@lcpfd.org

Status

Ongoing

Services Provided

Stormwater & Floodplain Management
Civil Engineering Design
Wetland Delineation & Permitting
Landscape Architecture
Soil Erosion & Sediment Control
Construction Engineering

Project Highlights

Expansion of regional flood control facility
Hydrologic and hydraulic analysis
Regulatory permitting
Trails and boardwalks
Parking expansion
Dam safety
Stream restoration
Shoreline habitat enhancement
Upland habitat restoration
Wetland mitigation design



Hey and Associates, Inc. was retained by the MWRDGC and LCDOT to design and permit improvements on the Lake County Forest Preserve's Buffalo Creek Forest Preserve site. Working for the MWRDGC, the eastern portion of the preserve was enhanced to increase the flood control capacity of Buffalo Creek Reservoir, as well as enhance recreational elements with new and improved trails and boardwalks. Hey worked with LCDOT on the western portion of the 408 acre preserve to implement a wetland mitigation and full site restoration for future LCDOT roadway projects, as well as over a mile of new trail and trail connection to the reservoir project and adjacent neighborhoods.

Leaning on the trusted decades long relationship between Hey and the LCFPD, years of inter-agency coordination was key to the execution and implementation of these projects. Having worked on dozens of LCFPD sites, Hey brought this experience and understanding of the site owner's mission to these projects, helping facilitate communication and ultimate adoption of inter-governmental agreements for these projects, as well as stewarding them through to construction.

Both projects began with mirrored planning efforts, built off of years of careful data gathering and concept development. Weaving strengths in site design, water resources, and environmental science, Hey worked with the goals of all three entities to maximize site improvements to accomplish myriad goals. Regional flood control, localized drainage improvements, ecologic and hydrologic restoration, recreational opportunity, and community engagement and outreach were all accomplished as part of this full preserve multi-agency enhancement.

Construction on both projects was completed in 2019 and 2020, and Hey remains engaged in site management and monitoring efforts at the preserve.



Client

Lake County Division of Transportation

Contact

Al Giertych
847.377.7410
Agiertych@lakecountyil.gov

Status

Ongoing

Earned Fee

\$100,000

Services Provided

Stormwater & Floodplain Management
Civil Engineering Design
Wetland Delineation & Permitting
Topographic Survey Services
Soil Erosion & Sediment Control
Permitting

Project Highlights

Green Design for Improved Water Quality XP-SWMM Drainage System Retrofit



Hey and Associates, Inc. (Hey) was retained by the Lake County Division of Transportation (LCDOT) to assess and prepare construction documents for the retrofit of a number of existing detention basins owned by the LCDOT. Retrofits focused on improved basin functionality, primarily focused on improving water quality.

The first phase of the project included four basins and construction was completed in 2013. Retrofits included enhanced basin bottom drainage to minimize erosion and short circuiting, updated outlet design to enhance functionality, limited additional basin volume, and conversion of unmaintained and turf bottom basins to native vegetation.

The second phase of the project included a large scale enhancement of an existing basin at the LCDOT facility on Winchester Avenue in Libertyville. This basin was expanded to increase volume and mitigate know downstream drainage issues. This was documented in XP-SWMM with a model comparing the existing and proposed conditions. The retrofit will route a substantial portion of the existing runoff to the basin through a pretreatment bio-swale and wetland basin. The basins were planted with native vegetation and educational signage and a walking path will be included in the design.

Phase two also included detailed evaluation of eight additional basins for potential future retrofits. Construction documents for retrofits of four of these eight basins were subsequently completed, and construction took place in 2016. Improvements for this third phase of the project included similar improvements to the first phases. Hey has also provided recommendations for maintenance efforts performed by LCDOT maintenance staff for six additional basins.

Hey continues to support LCDOT by providing contract management and field oversight for annual maintenance of native basins and other natural areas.

Client

Cook County Department of Transportation
and Highways – Design Bureau

Contact

Adam D. James, P.E., CFM
312.603.7283
Adam.james@cookcountyil.gov

Status

Ongoing

Earned Fee

\$400,000

Services Provided

Stormwater & Floodplain Management
Civil Engineering Design
Water Quality Planning
Hydraulic Survey Services
Soil Erosion & Sediment Control
Wetland Delineation
Wetland Permitting

Project Highlights

Detailed H&H modeling using
state-of-the-art software
Hydraulic Reports
Drainage Investigations
Location Drainage Studies
Wetland Reports and Permits



Hey and Associates, Inc. (Hey) was retained by the Cook County Department of Transportation and Highways – Design Bureau to provide hydraulic engineering, surveying and wetlands services for roadway projects.

Hey's work includes Data Collection and Permit Identification, Wetland Delineation, Hydrologic and Hydraulic Analyses, Location Drainage Studies, Hydraulic Reports, Drainage Investigations, Plan Drawing Preparation, Storm Sewer Design, Scour Analysis, Surveying, Best Management Practice Design, supervision of sewer televising, and permitting in Cook County in northeastern Illinois. Existing and proposed drainage plans are prepared to evaluate existing drainage and to recommend designs for roadway projects. Some of the projects that were included under this contract are described below.

Permit Reviews — Hey provides drainage and utility review services for projects adjacent to or impacting County right-of-way. These projects include private and residential commercial developments, utility installation, roadway improvements, drainage improvements, and other projects. In addition, Hey provides drainage reviews on County-designed or led roadway projects including Location Drainage Studies and construction drawings. Hey has provided over 60 reviews on behalf of the County and typically provides a review turnaround time of approximately 5 business days.

Happ Road – A Hydraulic Report was prepared to investigate replacing a 1920's era concrete bridge over the Skokie River. In conjunction with this work, Hey updated the hydraulic model, performed Wetland Delineation and Permitting including a U.S. Army Corps of Engineers permit, and obtained an MWRDGC WMO permit. Design plans and specifications for roadway sections, ditches and culverts were prepared by Hey.

156th Street – A drainage study was completed for this street located in an area with very flat terrain in an industrial section of Harvey, IL. Hey staff prepared design plans and specifications for the storm sewer system and oversaw the Clean Construction or Demolition Debris (CCDD) testing for the site.

61st and Brainard – Flooding of residences and overland flow crossing the street were analyzed in a drainage study. An XP-SWMM model was created and potential solutions were vetted.

Client

Illinois Department of Transportation

Contact

E. Perry Masouridis, P.E.

847-705-4474

Eleftherois.masouridis@illinois.gov

Status

Ongoing

Earned Fee

\$1,000,000



Services Provided

Stormwater & Floodplain Management

Civil Engineering Design

Water Quality Planning

Hydraulic Survey Services

Soil Erosion & Sediment Control

Drain Tile Services

Hey and Associates, Inc. (Hey) was retained by the Illinois Department of Transportation (IDOT) under two separate contracts to prepare location drainage studies, hydraulic reports, drainage investigations and remedial design in northeastern Illinois. Example projects include: a Hydraulic Report to investigate replacing two 10' x 4' box culverts beneath Route 83 immediately north of 63rd Street to offset the potential loss of conveyance from two 76" x 48" elliptical pipes running diagonally across Route 83 and 63rd Street in Willowbrook and a Hydraulic Report to investigate replacing the existing box culvert beneath Route 68 at Middle Fork North Branch Chicago River. The nearby Shermer Road was evaluated for superstructure replacement and potential widening. Location Drainage Studies are prepared to evaluate existing drainage and to recommend designs for roadway projects such as the intersection improvements and Willow and Pfingsten Roads and at Halsted Street and Vincennes Avenue. Numerous other similar projects have been performed.

Hey's work included survey data collection and review, assessment of existing conditions and a proposed conditions evaluation. Hey also performs drainage investigations to determine the causes of system malfunctions and Phase I level plans are prepared for proposed drainage improvements.

Project Highlights

Detailed H&H modeling

Hydraulic Reports and

Drainage Investigations

Sewer cleaning and televising

As part of these contracts, Hey was also responsible for forensic sewer mapping, light and heavy cleaning, root cutting and televising of storm sewers. Hey retained subcontractors to assist with the cleaning which typically includes televising. Hey provided full-time field observation of the activities, provides written summary reports and makes recommendations for follow-up work. Example projects included Rt. 41 in River Forest, the Dan Ryan at 89th Street, 87th Street between Harlem and Cicero, Harlem from 95th to Stony Creek, and Main Street in Lemont among others.

Owner

Chicago Metropolitan Agency for Planning

Contact

Jason Navota
312-386-8750
jnavota@cmap.illinois.gov

Status

Completed in 2018

Earned Fee

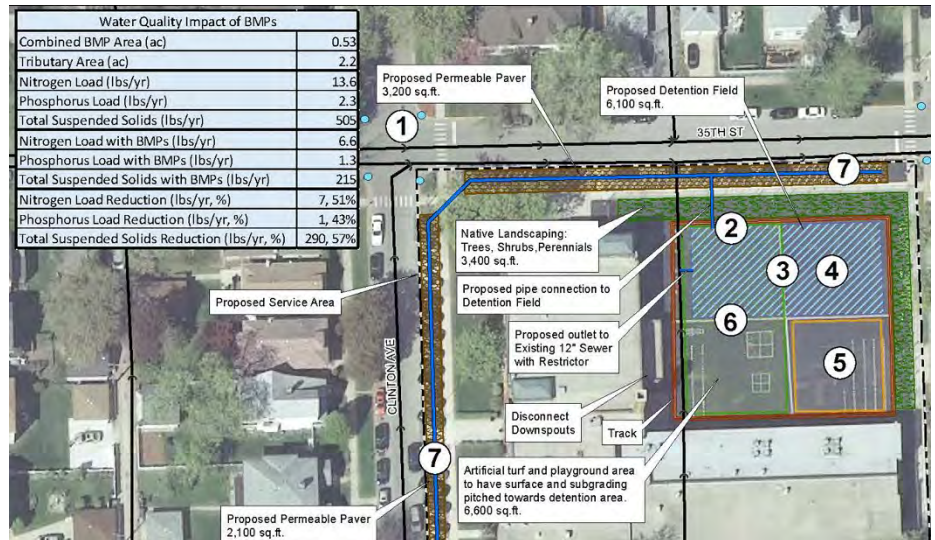
\$40,000

Services Provided

Stormwater & Floodplain Management
Water Quality Planning

Project Highlights

GIS-based flood risk analysis
Stormwater and Green Infrastructure
Improvement Concepts



Hey and Associates, Inc. (Hey) assisted the Chicago Metropolitan Agency for Planning (CMAP) on the development of the Stormwater Management Plan for the City of Berwyn in Cook County. Hey performed a sewershed analysis, identified priority catchments within the study area, developed a list of key recommendations, developed three concept plans to mitigate flooding, and developed a Stormwater Management Plan. Hey participated in coordination meetings with CMAP and project partners such as City staff, MWRD, and IDOT. Berwyn is an older community and was originally developed with a combined sewer system. Most sewers are undersized and are the main cause of urban flooding in Berwyn. A sewershed analysis was performed to identify areas experiencing lower sewer capacity. The analysis was used to identify priority catchment areas. Key recommendations were developed and framed by the following topic areas: Policy/Regulations, Flood Control Assistance, Capital Improvements, Maintenance and Monitoring, and Education and Outreach. Three concept plans were developed. They included a park concept that would serve as regional detention for the surrounding streets, a school concept, and a green street concept. Concept plans included a water quality impact analysis.

Client

City of Evanston

Contact

Paul Moyano, P.E.

847-448-4311

pmoyano@cityofevanston.org

Status

Ongoing

Earned Fee

\$590,832

Services Provided

Stormwater & Floodplain Management

Civil Engineering Design

Water Quality Planning

Sustainable Planning & Design

Project Highlights

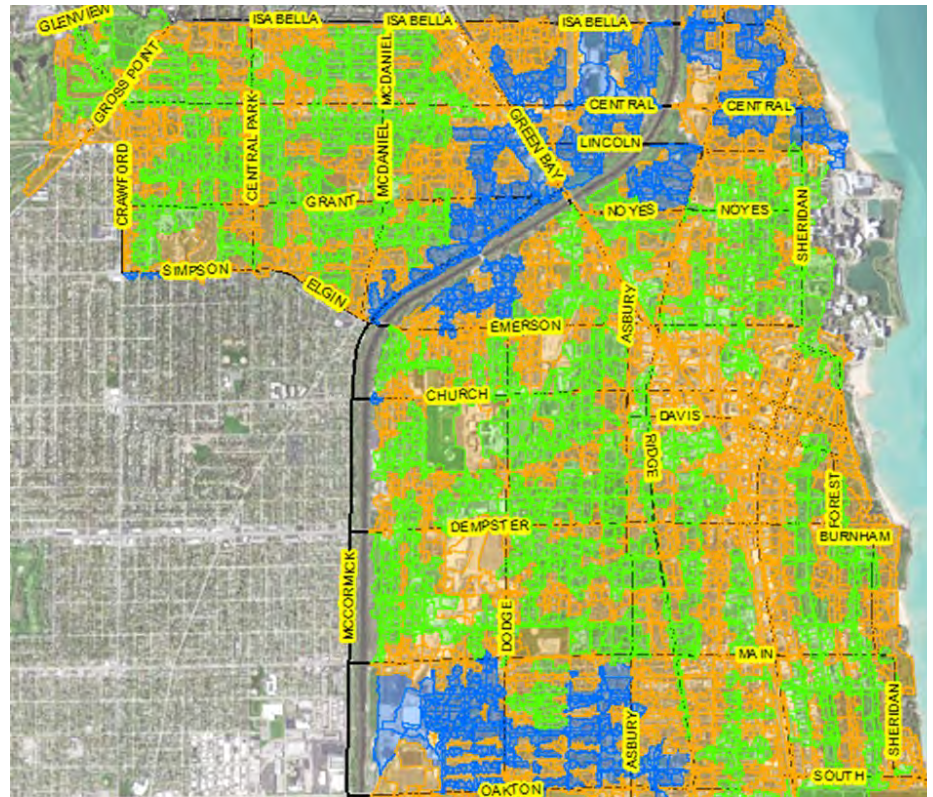
Hydrologic and hydraulic modeling

Flow monitoring

GIS-based analysis and reporting

Field Investigations

Program Recommendations



Building off of past efforts with the City of Evanston to prepare standard details for green infrastructure practices, Hey is preparing a full municipal Stormwater Master Plan for the community. Evanston's sewer system is particularly complex, employing combined sewers, storm sewers, relief sewers, connections to a deep tunnel system, and inlet restrictors.

Due to the high degree of interaction between the surface flow and the underground sewer system, the modeling software for this project needed both 1D and 2D hydraulic analysis capabilities. The 1D component of the model represents the network of sewers and hydraulic features and a digital elevation model (DEM) represents surface flow and surface storage. The model explicitly includes all public sewer segments and over 9,500 delineated catchments, resulting in an average drainage area size of only 1/2 acre.

In order to calibrate the model, a 12-week monitoring plan was prepared utilizing four rain gauges, 23 flow monitors, and four level meters. This extensive monitoring data set was used to develop key insights into how the drainage system performs and operates.

System performance results were used to identify basement flooding risk and surface flooding risk throughout the city. Comprehensive program recommendations are being prepared that includes of high priority capital improvements, maintenance and operations activities, and new or updated regulations and policies.

Client

Milwaukee Metropolitan
Sewerage District

Contact

Patrick Elliott
414-225-2168
pellott@mmsd.org

Status

Completed in 2017

Earned Fee

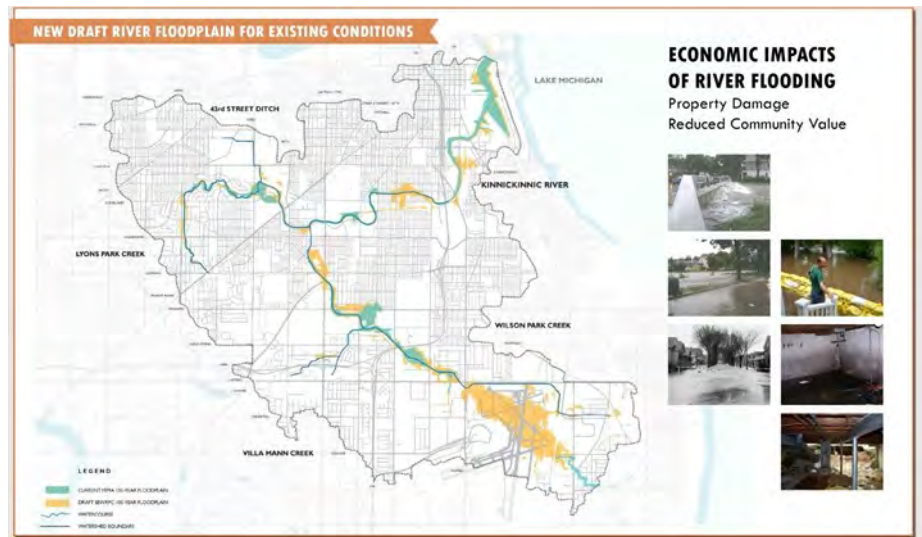
\$320,000

Services Provided

Hydrologic and Hydraulic Modeling
Stormwater & Floodplain Management
Flood Control Planning
Benefit/Cost Analysis
Habitat Restoration Planning
Sustainable Planning & Design

Project Highlights

Advanced hydrologic and
hydraulic modeling
Advanced GIS Analysis
Damage Computations
Public Outreach
Cost Estimating



Hey and Associates, Inc. (Hey) was part of team led by Graef to prepare a Watershed Plan as well as preliminary and final engineering plans for a portion of the lower Kinnickinnic River. Hey was primarily responsible for hydrologic and hydraulic analyses, development of watershed alternatives and preparation of the watershed plan report.

The Kinnickinnic River Watershed covers 25 square miles of urbanized land that was developed in the early to mid-20th century, prior to stormwater management regulations. The Watershed Flood Management Plan identifies a system of improvements across the watershed that will accomplish goals established by MMSD and a Watershed Advisory Committee. The watershed improvement goals consisted of:

- Reduce flood risk to all structures subject to flooding in the 1% probability event
- Improve public safety by reducing the risk of drowning
- Provide in-stream aquatic habitat
- Improve natural aesthetics of channel
- Leverage additional community objectives as identified in the Kinnickinnic River Corridor Neighborhood Plan.

The existing conditions flood risk analysis determined that over 700 structures were subject to flooding in the 100-year storm event. Flood damages were estimated using topographic data, flood elevations from a full range of storm frequencies, and U.S. Army Corps of Engineers structure damage curves. Annual estimated damages for the watershed were found to exceed \$2 million.

Alternative solutions were developed to address flood risk in the 100-year event throughout the watershed. Four alternatives were developed and refined through several rounds of stakeholder and public information meetings. A final set of recommended improvements include a range of channel rehabilitation work, bridge and culvert replacements, and storage facilities that work together to provide protection from flood damage in the 1% annual probability flood event. The total value of the proposed improvements was estimated to be \$240 million.

Client

Milwaukee Metropolitan
Sewerage District

Contact

Courtney Allen
414-225-2168
callen@mmsd.org

Status

Completed in 2019

Earned Fee

\$90,000



Services Provided

Hydrologic and Hydraulic Modeling
Flood Risk Analysis
Flood Control Planning
Floodplain Mapping

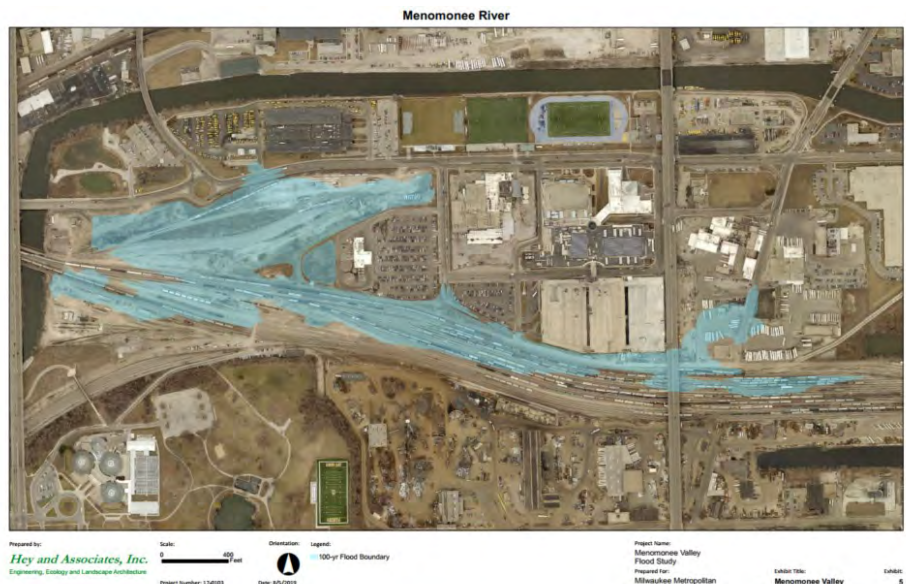
A proposed CLOMR for the Menomonee River expanded the floodplain and floodway due to overbank flooding in the Menomonee Valley. This caused over two dozen structures to be mapped within the CLOMR floodplain boundary. Hey and Associates undertook a detailed study of the overbank flooding to:

- Update the modeling to incorporate new bathymetric and bridge survey data.
- Develop detailed modeling of the overbank areas using XP-SWMM to evaluate the shallow flooding areas with consideration of the local storm sewer system.
- Revise the existing conditions flood risk assessment.
- Develop and evaluate potential flood risk mitigation projects.
- Consider floodproofing and acquisition as non-structural alternatives.

The more detailed hydraulic study reduced the mapped inundation areas and the number of at-risk structures was vastly reduced. Potential alternatives to further reduce risk were also prepared.

Project Highlights

Advanced Hydraulic Modeling
“Shallow Flooding” Mapping
Advanced GIS Analysis
Flood Mitigation Solutions
Floodproofing Evaluation
Cost Estimating



Client

DuPage County
Stormwater Management

Contact

Mary Beth Falsey
630.514.3165
falsey@dupageco.org

Status

Completed in 2020

Project Cost

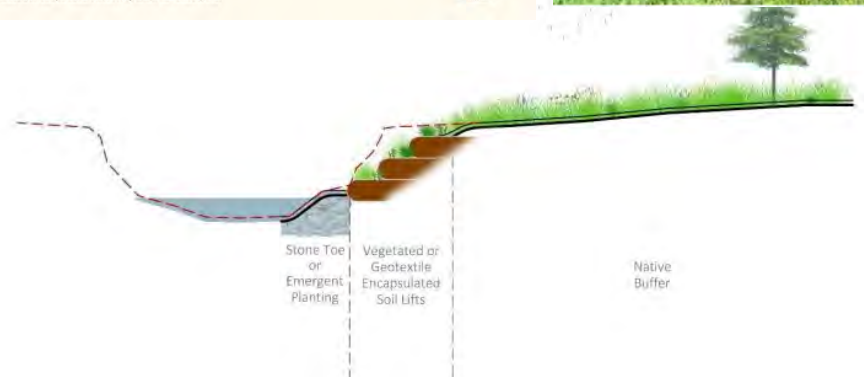
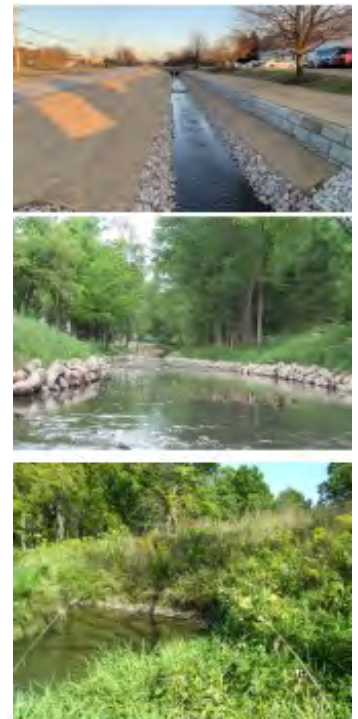
\$25,000

Services Provided

Civil Engineering
Stormwater & Floodplain Management
Water Quality Planning
Soil Erosion & Sediment Control
Construction Engineering
Wetland Delineation & Permitting
Ecological Restoration & Management
Green Infrastructure
Natural Areas

Project Highlights

Guidance manual for homeowners,
residents, stakeholders, etc.
Graphical illustrations of solutions
Step-by-step guidance for implementation



Hey and Associates, Inc. (Hey) prepared a streambank stabilization guidebook for DuPage County Stormwater Management called “Streambank Stabilization in DuPage County—Design & Permitting Project Guidance for DuPage County Residents, Businesses & Stakeholders. This report was geared to help educate property owners of the issues, needs, implementation and costs associated with streambank stabilization on their properties.

The guidebook provides step-by-step guidance to help understand and initially evaluate your streambank to help you choose potential solutions. In addition, a section details the need to navigate the various permitting requirements and how best to handle. Finally, graphical and actual project photos are included to demonstrate how each solution could be implemented and ultimately look on the property.

The manual can be found at:

https://www.dupageco.org/EDP/Stormwater_Management/Docs/65157/

Owner

City of Aurora

Contact

Eric Schoeny
630-844-3620
eschoeny@aurora-il.org

Status

Completed in 2015

Earned Fee

\$50,000

Project Value

\$1,786,000

Services Provided

Transportation
Green Infrastructure
Construction Engineering



Project Highlights

Illinois Green Infrastructure Grant funding
Streetscape design
Traffic calming
Improved, safer pedestrian circulation
Rain gardens
Stormwater infiltration for CSO reduction

The City of Aurora retained Hey and Associates, Inc. (Hey) to provide landscape architectural services associated with green infrastructure improvements for combined sewer overflow (CSO) control, which was part of the City's CSO Long Term Control Plan. Rain gardens were designed to infiltrate stormwater runoff at over 100 locations in the public right-of-way primarily in residential neighborhoods served by combined sewers on the City's near-east and near-west sides.

Hey's staff worked with the City's civil and traffic engineers on curb bump-outs to increase the area available for rain gardens. The bump-outs also provide significant traffic calming in the mostly residential neighborhoods, creating more pedestrian-friendly streets. Hey staff prepared graphics for and participated in public meetings to inform residents about the need to reduce CSOs, proposed improvements, and to build support for the project. Hey staff also provided Phase III inspection services during construction of the rain gardens.

Client

DuPage County
Stormwater Management

Contact

Chris Vonnahme
630.407.6712
christopher.vonnahme@dupageco.org

Status

Ongoing

Project Cost

\$85,000

Services Provided

Civil Engineering
Stormwater & Floodplain Management
Water Quality Planning
Green Infrastructure
Natural Areas

Project Highlights

FEQ Modeling
Floodplain damage analyses
Overbank flood reduction
Public meetings



Hey and Associates, Inc. (Hey) Hey and Associates, Inc. worked with the DuPage County Stormwater Management on developing a watershed plan for the Wards Creek Watershed, a tributary to Sawmill Creek located in southeastern DuPage County. This plan included existing conditions hydrologic and hydraulic analysis, estimate of historical flood damages, alternative evaluation, opinion of probable cost, and associated documentation and exhibits. The alternatives recommended in the plan were also required to comply with the DuPage County Stormwater and Floodplain Ordinance (DPCSFO). The analysis utilized the Wards Creek floodplain mapping FEQ unsteady hydraulic model and the DuPage County Historical Storm Series rainfall.

Damage areas were identified based on updated hydraulic modeling and a variety of alternatives were developed and assessed to determine if flood damages could be mitigated. These concept alternatives included evaluating conveyance improvements, flood storage, sediment basins, pond expansions, streambank stabilization, weir adjustments and culvert removals.

A watershed plan was prepared which includes recommended improvements, damage estimates, alternative benefits and cost estimates. This report is used to plan for future capital improvement projects.

Client

Village of Niles

Contact

Steve Vinezano
Village Manager
847-588-8002
scv@vniles.com

Tom Powers
Village Engineer
847-588-7900
tjp@vniles.com

Status

Ongoing

Services Provided

Civil Engineering
Stormwater & Floodplain Management
Soil Erosion & Sediment Control
Construction Engineering
Wetland Delineation & Permitting
Landscape Architecture
Green Infrastructure
Parks and Recreation



Hey and Associates, Inc. was initially retained in 2010 to prepare a Stormwater Master Plan for the Village of Niles which was adopted in 2012. Following the adoption, Hey worked with the Village on implementation of various stormwater management components including designing over \$12 million in stormwater detention basins and relief sewers, planning and design of green infrastructure, design of small flood relief projects and assisting the Village with property inspections as part of the overland flow assistance program. In addition, Hey recently (2018) prepared an update to the Stormwater Master Plan that reprioritized projects and components based on all the work completed over the last eight years. As part of these projects, Hey performed survey, coordination of geotechnical/environmental work, storm sewer design, detention design, hydrologic/hydraulic modeling, drainage and grading, grant applications and management, construction management, public outreach, and permitting.

Hey was successful in assisting the Village obtain multiple grants and funding sources to help leverage funding to expand and improve the scope of the projects. Hey helped the Village develop a stormwater ordinance that expanded upon the County ordinance and has also performed engineering reviews for development. Hey has obtained a Letter of Map Amendment and elevation certificate for the Village.

Additional work completed for the Village includes:

- Stormwater Relief Program Phases 1 and 2
- Greenwood Stormwater Park Planning and Design
- Niles IGIG Bioswale Design and Construction Management
- Howard Street Storm Sewer Design
- Tier 1 Stormwater Management Design
- Tier 3 Stormwater Project Feasibility Study and Design
- Sanitary Sewer Smoke Testing
- Oak Park Bioswale and Permeable Pavement Design
- Niles Overland Flow Assistance
- Stormwater Management Plan Update
- Cleveland Sewer Project Construction Management Support
- Commercial Development Engineering Reviews
- Niles Zoning Ordinance

Client

Village of Downers Grove

Contact

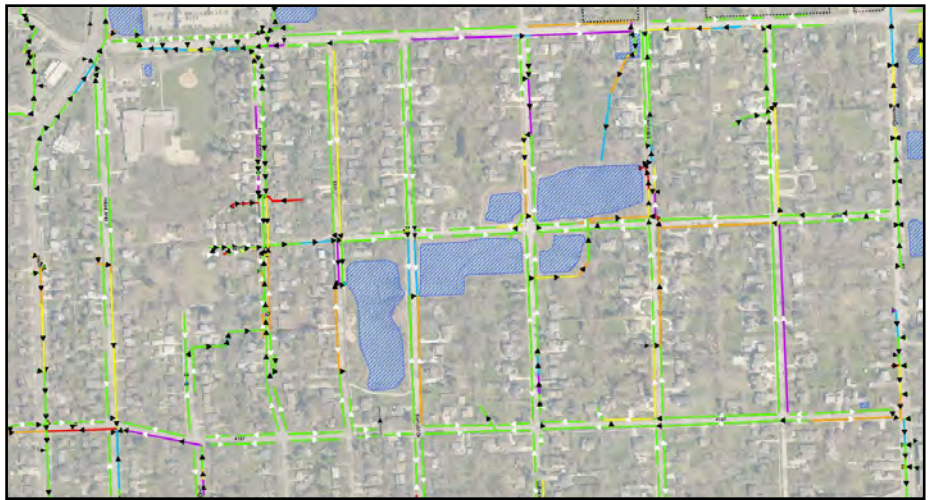
Kerry Behr
630.434.5489
kbehr@downers.us

Status

Ongoing

Earned Fee

\$160,000 (Phase I)



Services Provided

Hydrologic and Hydraulic Analysis
Stormwater Management
ArcHydro GIS processing
Flood Control Planning

Hey and Associates, Inc. (Hey) is currently working for the Village of Downers Grove to create a Stormwater Master Plan. As part of Phase I, advanced geo-processing was performed with GIS to develop a tool that evaluates the current Level of Service for each segment of drainage infrastructure by evaluating the conveyance capacity compared to the calculated stormwater runoff. The drainage system evaluation provided by the GIS-based tool will be used to identify areas where infrastructure is inadequate or non-existent.

The next phase of the project to be started in 2020 will focus on developing and identifying problem areas based on the tool and additional modeling. Problem areas will be rated based on the severity of the flooding. Concept plan solutions will be developed for the problem areas. The problem severity and the benefits of the solutions will be used to develop a prioritization system for the projects to be built by the Village in the coming years. The result will be a plan that includes both effective and feasible projects for implementation of the Village's goals to provide level of service.

Project Highlights

Advanced GIS geoprocessing
Advanced hydrologic and hydraulic analysis
Evaluation framework for future projects
Creation of specific GIS-based tool to evaluate drainage capacity village-wide



Identification of Areas without Drainage Infrastructure

Client

Alliance for the Great Lakes

Contact

Angela Larsen
312-445-9746
alarsen@greatlakes.org

Status

Completed in 2014

Earned Fee

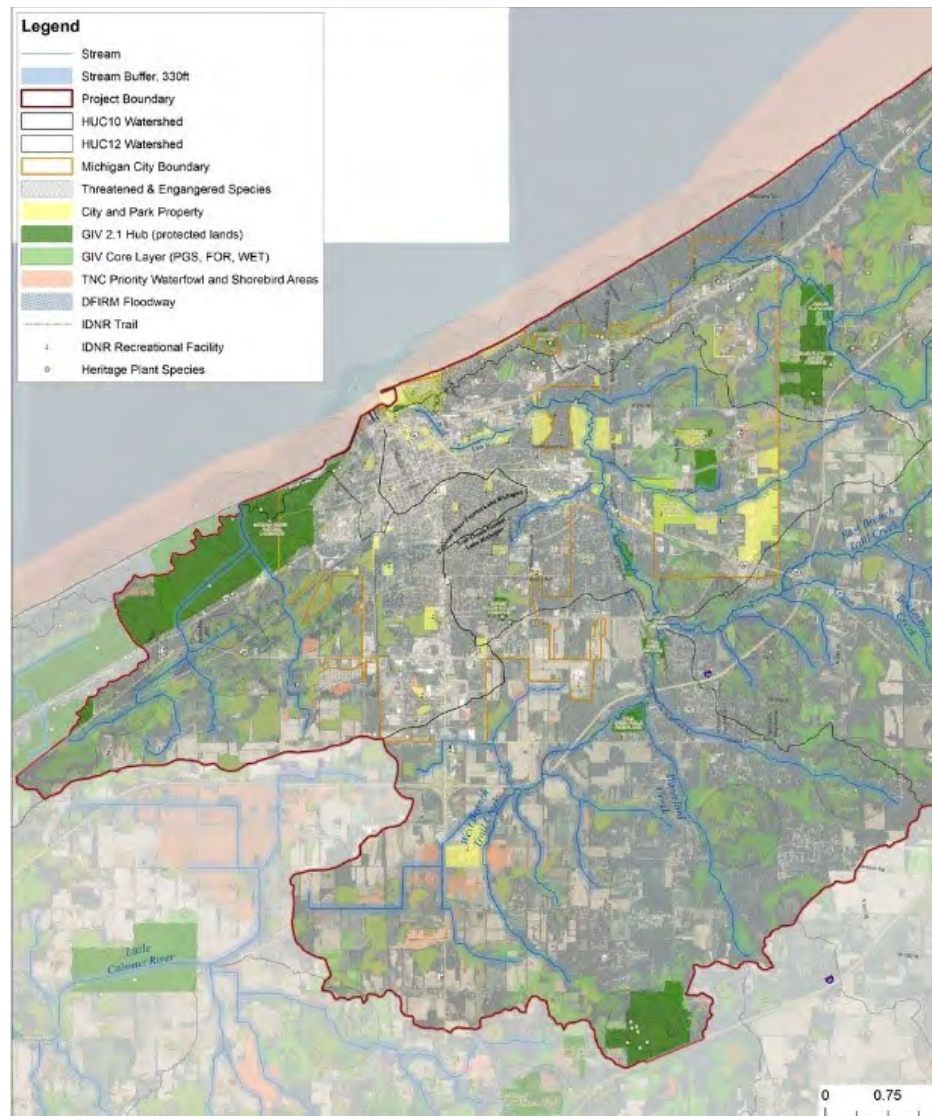
\$18,000

Services Provided

Stakeholder Engagement
Ecological Planning
Presentation Graphics

Project Highlights

Supported by GLRI Grant
Green Infrastructure
Plan Adoption



This was a GLRI-funded project where Hey and Associates, Inc. (Hey) worked with the Alliance for the Great Lakes, Delta Institute, the Field Museum, and the Michigan City Sanitary District to complete a local green infrastructure network plan that is a local prioritized and stepped-down version of the regional Chicago Wilderness Green Infrastructure Vision. The plan also gives consideration to climate change adaptations and community resiliency that can be enhanced by implementation of this plan. The final phase of the project will select on-the-ground site-scale green infrastructure projects that are priorities within the watershed-scale plan completed for Michigan City and the Trail Creek watershed. Hey lead the public/stakeholder input meetings and data gathering, and then presented a draft plan as a giant paper map that folks could mark up during a public forum. A final plan was adopted and used to identify priority projects.

Client

Lake County Forest Preserve District

Contact

Matt Ueltzen
847-968-3290
mueltzen@lcpd.org

Status

On-going

Estimated Fee

\$250,000

Construction Cost

Completed largely in-house

Services Provided

Drain Tile Services
Civil Engineering
Wetland Consultation
Hydrologic and Hydraulic Modeling
Permitting and Construction Documents

Project Highlights

Hydrologic Restoration
Grant Funding



Hey has a long history of assisting the the Lake County Forest Preserve District with locating existing drain tile and storm drainage features throughout dozens of their Preserves. Following these inventories, LCFPD and Hey work collaboratively, leaning on our 30+ year relationship, to provide hydrologic restoration planning, design and permitting services to support LCFPD restoration activities. The work includes tile disablement to maximize available hydrology, tile re-routing to maintain off-site drainage, placement of structures for water level management and grade control, streambank and channel stabilization, and installation of native vegetation. Restoration measures have also included planning and design for interaction with current and future recreation elements.

Implementation and restoration include well over 2,000 total acres at the Middlefork Forest Preserve, the Southern Des Plaines (including Grainger Woods, the historic Adlai E. Stevenson Homesite and Daniel Wright Woods), Cuba Marsh , Ray Lake , Grant Woods, and Prairie Wolf, and Lakewood Preserves, with plans to continue this work as part of the District mission into the future.

Owner

Village of Bayside

Contact

Andy Pederson
414-206-3925
apederson@baysidewi.gov

Status

Completed in 2019

Earned Fee

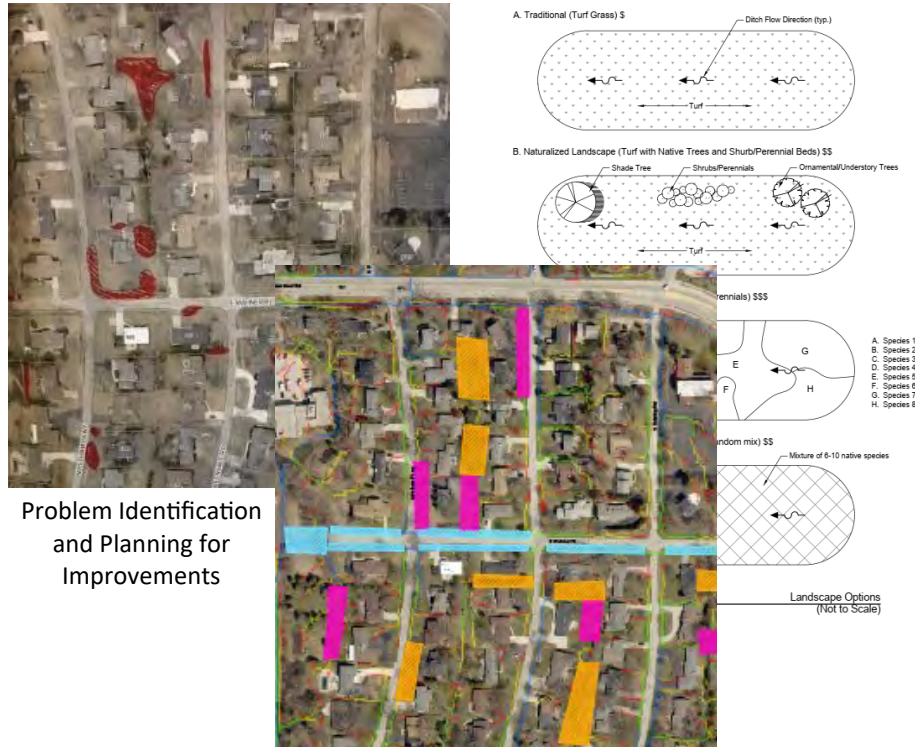
\$30,000

Services Provided

Stormwater & Floodplain Management
Civil Engineering
Green Infrastructure

Project Highlights

Flow Path Analysis
ArcGIS stormwater analyses
ArcGIS Data Collector App
Public Meetings
Green Infrastructure Planning & Design



Problem Identification
and Planning for
Improvements

Hey and Associates, Inc (Hey) has worked with the Village of Bayside on various stormwater planning and design projects. Hey initially developed overland flow path mapping analysis as part of a Drainage Improvement Plan for the Village of Bayside. The existing drainage data was reviewed for the study area. The ArcGIS Data Collector application was utilized to collect supplemental drainage data, including the location, material, and size of culverts and ditch flow lines.

The ArcHydro extension of GIS was used for the flow path mapping analysis. The flow path output was used to identify the causes of resident-reported flooding. During a public meeting, residents were given the opportunity to identify locations in their neighborhood where ponding and flooding was common. The flow path data was used to identify the reasons why flooding occurred at that location.

The flow path output was also used to recommend potential solutions and as a tool for planning improvements. With the flow path data, it was possible to recommend the appropriate type of solution and to recommend locations that would be best suited for certain types of green infrastructure.

Hey developed green infrastructure details and a design plan for the Village to implement to provide infiltration and stormwater storage in the Village's right of way and on private property with agreements from the owners.

Owner

Bayfield, Wisconsin

Contact

Juli Beth Hinds
802-324-5760
birchlineplanningllc@gmail.com

Status

Completed in 2020

Earned Fee

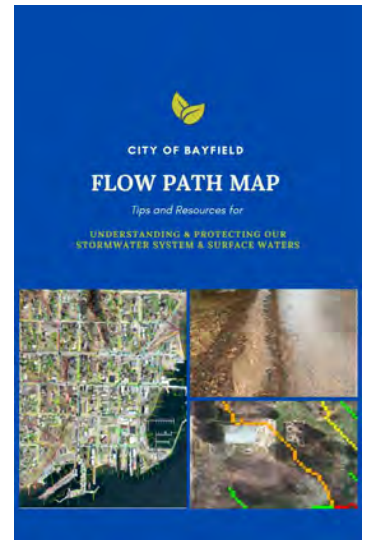
\$20,000

Services Provided

Stormwater & Floodplain Management
Civil Engineering
Green Infrastructure

Project Highlights

Flow Path Analysis
ArcGIS stormwater analyses
Green Infrastructure Planning



Hey and Associates, Inc (Hey) worked with Birchline Planning, LLC for Bayfield, Wisconsin to develop overland flow path mapping analysis in order to help staff and residents better understand stormwater systems and to further protect surface waters.

The ArcHydro extension of GIS was used for the flow path mapping analysis. The flow path output was used to understand how stormwater flows across the land, identify the types and sizes of green infrastructure, and help visualize why stream or shoreline setbacks are essential to protect property from flooding and protect water resources from pollution.

As part of the project, Hey developed conservation buffers based on significant overland flow paths to better guide development and redevelopment requirements throughout the city.

The data provided was also used to develop a manual for recommend potential solutions and as a tool for planning improvements. With the flow path data, it was possible to recommend the appropriate type of solution and to recommend locations that would be best suited for certain types of green infrastructure.

Owners

Malama Maunaloa, Hawaii
University of California-San Diego
San Diego International Airport
Texas A&M Agrilife
Bayfield, Wisconsin
Bayside, Wisconsin

Status

Ongoing

Project Cost

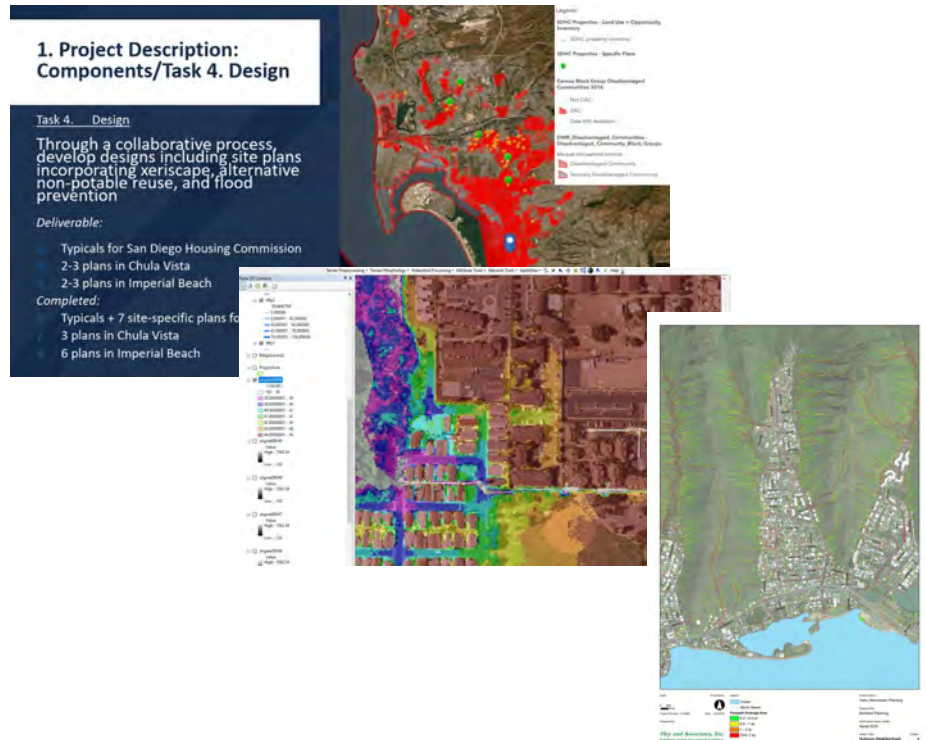
Varies

Services Provided

Civil Engineering
Stormwater & Floodplain Management
Water Quality Planning
Site Design
Green Infrastructure
Natural Areas
Parks & Recreation
Presentation Graphics

Project Highlights

GIS-Based Stormwater Planning &
Analysis
Stormwater Concept Design
Green Infrastructure Planning & Design
Public and Stakeholder Meetings
Presentations and Graphics



Building on a strong foundation of work in Illinois and the Chicagoland area, Hey and Associates, Inc. (Hey) has been involved with a variety of GIS-based stormwater planning and design projects throughout the U.S. With expansive GIS data becoming more prevalent in conjunction with LiDAR elevation data, Hey has been able to incorporate this data into analysis tools in ArcGIS. Analyses include developing digital elevation models, adjusted (i.e. stream and sewer-based) digital elevation models, drainage basin delineation and runoff calculations, stormwater infrastructure capacity evaluation, green infrastructure siting, zoning evaluations, and much more.

Projects typically involve data collection, GIS analyses, public and stakeholder engagement, project planning / design, and final reporting and presentations.

Project locations include:

- San Diego, California
- Chula Vista, California
- Imperial Beach, California
- University of California—San Diego
- San Diego International Airport
- Oahu, Hawaii
- Kingsville, Texas
- Houston, Texas
- Pearland, Texas
- Bayside, Wisconsin
- Bayfield, Wisconsin

Client

US Fish and Wildlife Service

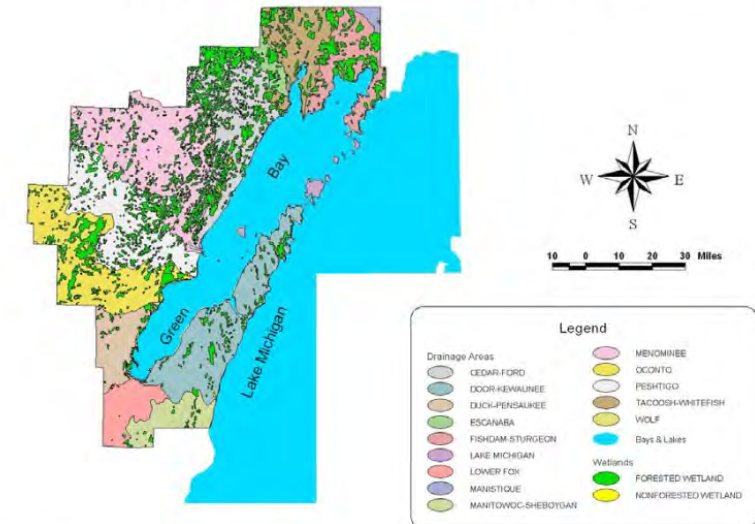
Status

Completed 2000

Services Provided

Stormwater & Floodplain Management
Water Quality Planning
Ecological Restoration & Management
Ecological Inventories/Surveys

Forested / Non-Forested Wetlands



**Green Bay, Wisconsin and Michigan
Natural Resources Damage Assessment**

For this project, Hey and Associates, Inc. prepared a section of the Natural Resources Damage Assessment (NRDA) document for the lower Fox River/Green Bay watershed. This work was a part of the extensive work conducted by Stratus Consulting Inc. and the U.S. Fish and Wildlife Service for the Restoration and Compensation Determination Plan related to the exposure of fish and wildlife to PCBs in the Green Bay area of Wisconsin and Michigan.

Acquisition, preservation and enhancement of existing wetlands, restoration of degraded wetlands, and creation of new wetlands are among the projects that were identified and are being considered to restore lost habitat values. In preliminary rankings of projects, those designed to create, preserve or enhance wetlands have received high relative rankings among project participants. This report assessed the value and potential for wetland preservation/restoration to improve overall fish and wildlife habitat in the Green Bay area. Other projects designed to preserve, create or enhance impacted fish and wildlife habitat also were discussed as appropriate.

Client

Nippersink Watershed Association
7602 Hancock Drive
Wonder Lake, IL 60097

Contact

Randy Stowe, Watershed Manager
815-648-2252
Rjstowe@gmail.com

Status

Completed 2020

Earned Fee

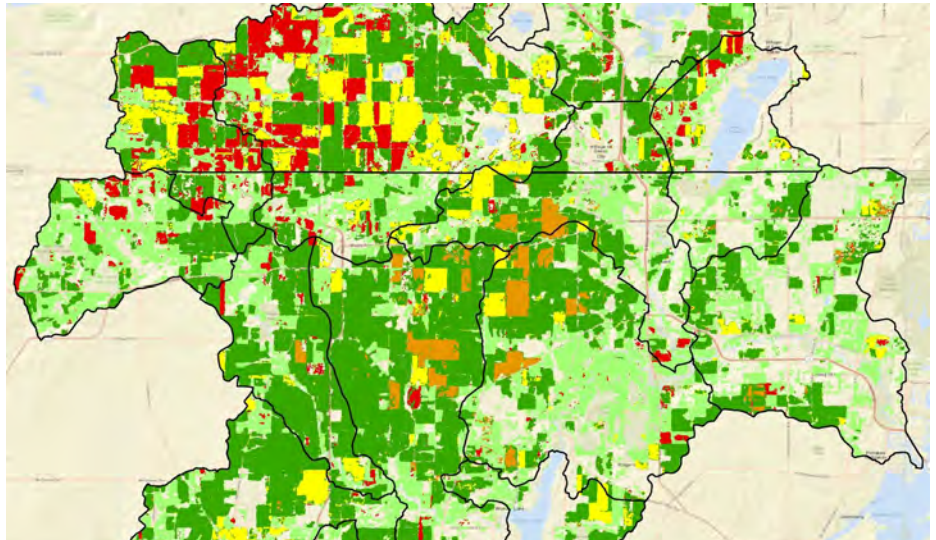
\$100,00

Services Provided

Stormwater & Floodplain Management
Civil Engineering Design
Water Resources Permitting
Soil Erosion & Sediment Control

Project Highlights

Expansion of regional flood control facility
Hydrologic and hydraulic analysis
Regulatory permitting
Public access improvements
Dam safety
Stream restoration
Shoreline habitat enhancement



Hey and Associates, Inc. was retained by the Nippersink Watershed Association (Association) to prepare design plans and permit documents for nine projects located within the Nippersink Creek watershed. These projects were awarded funding through the Illinois EPA (IEPA) 319 grant program to address non-point source pollution in 2016. The projects consist of two shoreline stabilization project on Wonder Lake, shoreline and riparian stabilization of two islands on Wonder Lake, four streambank stabilization projects, totaling nearly one mile of stream on the Nippersink Creek and its tributaries, and a ravine stabilization and stream realignment and stabilization of two direct tributaries to Wonder Lake.

Protection measures include rock and vegetative shoreline treatments, ravine bed stabilization, rock riffles, hybrid rock and vegetative streambank stabilization, culvert replacement and enhancement, drain tile disablement, and restoration of many acres of agricultural plains to native prairie and wetland habitats.

Hey performed field reconnaissance to assess conditions at each site and conducted topographic survey at each site. Hey prepared nine separate engineering plans, and permit documents through McHenry County, the Village of Wonder Lake, the Illinois Department of Natural Resources, McHenry County Soil and Water Conservation District, and the US Army Corps of Engineers. We worked close with the Association to prepare plans to fulfill for permit and construction needs, while taking into account grant and Association budget concerns. Typical stabilization practice details were developed and utilized at multiple sites to streamline the design and permitting process and to save fees.

In addition to the stabilization projects, Hey also assisted the Association in preparing water quality modeling for the Illinois portion of the Nippersink Creek Watershed, using the IEPA STEPL modeling spreadsheet, in an effort to update the existing watershed plan. We worked closely with Wisconsin Department of Natural Resources staff, who are prepared modeling for the Wisconsin portion of the watershed, to achieve a consistent and unified study.

Construction was completed in 2017-2020 for the 319 projects. The water quality modeling effort was completed in 2019.

APPENDIX B—RESUMES



David A. Kraft, P.E., CFM

Senior Civil Engineer

Mr. Kraft has over 20 years of professional experience in civil and water resources engineering design, permitting, construction observation, contract administration, project management, and review. He has managed and been lead engineer on dozens of projects, including natural areas restorations, streambank stabilizations, hydrologic restorations, access improvements, trail design, stormwater management systems, roadway and parking design, urban flooding improvements, and general site development tasks. In addition to design, he has substantial experience with hydrologic and hydraulic modeling and all facets of water resources permitting. Mr. Kraft is a registered Professional Engineer in Illinois and Wisconsin, a Certified Floodplain Manager, and a Certified Professional in Erosion and Sediment Control. Mr. Kraft received a Bachelor of Science degree in Civil/Environmental Engineering from the University of Wisconsin at Madison.

Civil Engineering

Village of Mount Pleasant - Hoods Creek Phase 1 Improvements, Mount Pleasant, Wisconsin. Acted as project engineer for design of regional trail, water quality, and stream and wetland restoration improvements along Hoods Creek.

Nippersink Watershed Association – 319 Grant Projects, McHenry County, Illinois. Acted as project manager and engineer for preparation of design and permit documents for nine non-point sources pollution control projects in the Nippersink watershed funded through the IEPA 319 grant program, including stream, lake shoreline, ravine, and wetland restoration and enhancement.

Lake County Forest Preserves – Grant Woods Preserve Hydrologic Restoration, Lake County, Illinois. Acted as project manager and engineer for design and permitting of hydrologic restoration elements such as tile disablement, surface drainage improvements, water level modification, and channel restoration at the Grant Woods Preserve.

Lake County Forest Preserves – McCormick Ravine Remediation, Lake Forest, Illinois. Acted as project manager and engineer for redesign of previous ravine stabilization project designed by USACE that experienced failure as a result of a substantial 2017 rain event.

Mequon Nature Preserve – Trinity Creek Restoration, Mequon, Wisconsin. Acted as project manager and engineer for restoration design and permitting of Trinity Creek on MNP property, including re-meandering, floodplain terracing, and in-stream habitat.

Village of Barrington – Village Stormwater Study Update, Barrington, Illinois. Performed updated XP-SWMM modeling and memorandum update focused on recently made improvements to known flooding area to previously prepared Village-wide stormwater study.

City of Fort Atkinson – Larson Lagoon Water Quality Improvements, Fort Atkinson, Wisconsin. Acted as project manager and project engineer for project to divert stormwater runoff to abandoned off-line treatment lagoon to meet water quality requirement and move towards TMDL based improvements for the City.

DuPage County Stormwater– Streambank Stabilization Manual, DuPage County, Illinois. Provided engineering insight and support for preparation of a Countywide streambank stabilization manual aimed at assisting residents and local riparian owners with navigating stream restoration design and permitting.

Education

B.S., Civil/Environmental Engineering, University of Wisconsin, Madison, December 2002

Previous Employment

Water Resources Engineer, Kabbes Engineering, Inc. 2003-2005

Dam Safety and Floodplain Management Engineering Specialist LTE, Wisconsin Department of Natural Resources, 2002-2003

Waste Management Specialist LTE, Wisconsin Department of Natural Resources, 2003

Registration & Certification

IL Professional Engineer, No. 062-060860

WI Professional Engineer, No. 40397-006

IL Certified Floodplain Manager, No. IL-06-00236

Qualified Engineer Review Specialist E-197, Kane County, Illinois

IDPH Prequalified Swimming Facility Engineer

Professional Memberships & Services

Illinois Association of Floodplain Managers

Wisconsin Association for Floodplain, Stormwater and Coastal Management

Chairman, Vill. of Lindenhurst Lakes Commission

Alternate Member, McHenry Co.. Stormwater

Technical Advisory Committee

President, Country Place HOA Board



Jeffrey A. Wickenkamp, P.E., CFM, D.WRE

President

Mr. Wickenkamp is a registered professional engineer, a certified floodplain manager, and a Diplomate, Water Resources Engineer. Mr. Wickenkamp has over 25 years of experience in stormwater management and flood mitigation projects. He has successfully managed design projects to implement drainage improvements, flood protection measures, green infrastructure, and water quality best management practices. He has also led the preparation and development of stormwater master plans, watershed plans, water quality studies, environmental compliance studies, and regulatory programs. He attended the University of Illinois where he received B.S. and M.S. degrees in Civil Engineering. Mr. Wickenkamp served for seven years on the Board of Directors for the Illinois Association for Floodplain and Stormwater Management.

Major Projects

Village of Niles – Greenwood Stormwater Management and Festival Park, Niles, Illinois. Led the design of a flood mitigation project incorporating conveyance and storage components. Project includes bore and jack sewers, underground storage below an event lawn, storage pond with scenic overlooks and a permeable paver streetscape.

Metropolitan Water Reclamation District of Greater Chicago – Addison Creek Channel Improvements, Cook County, Illinois. Flood mitigation project involves design and permitting of \$40M of channel improvements that include conveyance improvements, streambank stabilization, and bridge/culvert removals and replacements.

Private Industrial Client – Stormwater Pump Station and Stormwater Reuse, Cook County, Illinois. Designed a detention basin with a pump station discharge that incorporated an actuating valve to direct water for capture and reuse onsite.

Metropolitan Water Reclamation District of Greater Chicago – Poplar Creek Detailed Watershed Study, Cook County, Illinois. Prepared the Detailed Watershed Plan (DWP) for Poplar Creek and the adjacent watersheds of Flint Creek, Spring Creek, Brewster Creek, and West Branch DuPage River.

Milwaukee Metropolitan Sewerage District – Menomonee Valley Flood Study, Milwaukee, Wisconsin. Performed HEC-RAS and XP-SWMM modeling to lower the estimated flood risk in an area susceptible to shallow overland flow; a planned LOMR will remove the floodplain boundary from over 20 buildings.

Milwaukee Metropolitan Sewerage District – Kinnickinnic River Watershed Plan Update (2017), Milwaukee, Wisconsin. Led the modeling efforts using HSPF and HEC-RAS to prepare watershed-wide flood mitigation alternatives which were needed due to recent increases in the estimated flood risk.

Milwaukee Metropolitan Sewerage District – Kinnickinnic River Channel Rehabilitation Project Preliminary Engineering, Milwaukee, Wisconsin. Completed HSPF and HEC-RAS modeling and prepared preliminary design for the rehabilitation of a two-mile concrete lined reach of the Kinnickinnic River.

Milwaukee Metropolitan Sewerage District – Kinnickinnic Watershed Plan Phase 1, Milwaukee, Wisconsin. Prepared HSPF and HEC-RAS modeling for the watershed to identify watershed deficiencies and develop conceptual flood control alternatives.

Education

M.S., Env. Engineering in Civil Engineering,
Univ. of Illinois Urbana-Champaign, 1994

B.S., Civil Engineering,
Univ. of Illinois Urbana-Champaign, 1992

Previous Employment

Principal Water Resources Engineer,
NE IL Planning Commission, 2004-2005

Senior Project Manager,
Camp Dresser & McKee, Inc., 1998-2004

Water Resources Engineer,
Hey and Associates, Inc., 1994-1998

Registration & Certification

IL Professional Engineer, No. 062-052074

WI Professional Engineer, No. 40058-006

IL CFM, No. IL-06-00272



Patrick M. Lach, P.E., CFM

Principal Civil Engineer

Mr. Lach has 20 years of water resources and civil engineering experience and management, is a registered professional engineer, a certified floodplain manager and recently served as President of the Illinois Section of the American Society of Civil Engineers. He currently serves as a Senior Civil Engineer for Hey and Associates and is responsible for civil engineering staff in the Chicago office. His areas of expertise include civil and site design, stormwater infrastructure design, green infrastructure planning and design, and hydrologic and hydraulic modeling practices. He has extensive experience in developing design plans, specifications, cost estimates, and construction observation for civil engineering and water resources projects. He has successfully completed and managed a variety of water resources design projects, watershed plans, feasibility studies, and hydrology/hydraulic studies for both public and private entities. He received his Bachelor of Science in Civil Engineering from the University of Notre Dame and is a licensed engineer in Illinois, Indiana, Wisconsin, and Michigan.

Major Projects

Village of Bayside – Flowpath Model, Bayside, Wisconsin. Mr. Lach conducted GIS-based analysis of surface stormwater runoff and developed design parameters for municipal stormwater details.

Metropolitan Water Reclamation District of Greater Chicago – Addison Creek Channel Improvements Preliminary Engineering, various municipalities in Cook County, Illinois. Mr. Lach performed hydraulic modeling, designed stream channel improvements, and prepared engineering plans and specifications to mitigate overbank flood damages along Addison Creek.

Metropolitan Water Reclamation District of Greater Chicago – Addison Creek Channel Improvements Final Engineering, various municipalities in Cook County, Illinois. Mr. Lach managed the project team to develop construction documents, permits, and cost estimates for channel conveyance improvements, gabions, soldier pile walls, civil infrastructure, utilities, and recreational park improvements.

Metropolitan Water Reclamation District of Greater Chicago – Buffalo Creek Reservoir Expansion, Buffalo Grove, Illinois. Mr. Lach prepared hydrologic and hydraulic analyses for design, prepared grading plans, designed grade control for tributary streams, developed detailed cost opinions, and prepared permit applications.

Milwaukee Metropolitan Sewerage District – Kinnickinnic River Preliminary Engineering and Design of Reach 2 Phase 1, Milwaukee, Wisconsin. Mr. Lach oversaw HEC-RAS modeling of existing and proposed conditions for watershed alternatives as part of the effort to update the Kinnickinnic (KK) River Watercourse Management Plan.

Milwaukee Metropolitan Sewerage District – On-Call Services. Mr. Lach developed an XP-SWMM model for floodplain overbank flood analysis and mapping for the Menomonee River in Milwaukee.

Metropolitan Water Reclamation District of Greater Chicago – Roberts Road Drainage Improvements Preliminary Engineering, Palos Hills, Illinois. Mr. Lach managed and oversaw the hydraulic modeling, storm sewer design, preliminary engineering plans and specifications to reduce the risk of urban flooding.

Village of Carol Stream – Kehoe Blvd. Streambank Stabilization, Carol Stream, Illinois. Mr. Lach prepared design plans, pool and riffles, and permitting to stabilize an eroding stream between Kehoe Blvd. and private commercial property.

Education

B.S., Civil Engineering, University of Notre Dame, Notre Dame, Indiana, 2001

Previous Employment

Drainage Engineer, HDR Engineering, Inc., Chicago, Illinois, 2005-2007

Civil Engineer, Camp, Dresser & McKee, Inc. (CDM), Chicago, Illinois, 2001-2005

Registration & Certification

IL Professional Engineer, No. 062-058745

WI Professional Engineer, No. 39017-006

MI Professional Engineer, No. 6201053889

IN Professional Engineer, No. PE10809287

IL Certified Floodplain Manager, IL-10-00569

Qualified Engineer Review Specialist,
E-0189 Kane County



Corey T. Mase, P.E., CFM, CPESC

Civil Engineer

Mr. Mase is a Registered Professional Engineer in Illinois and Wisconsin, a Certified Floodplain Manager, a Certified Professional in Erosion and Sediment Control, and a Certified Public Infrastructure Inspector. He has over 18 years of professional experience in civil and water resources engineering and is proficient in the development of design plans, specifications and cost estimates, as well as permitting, construction observation, project management and design review. He has managed and been lead engineer on a wide variety of projects, including site and subdivision development, access improvements, trail design, parking lot and roadway design and rehabilitation, stormwater management design, and soil erosion and sediment control design. Mr. Mase received a Bachelor of Science degree in Civil and Environmental Engineering from the University of Illinois, Urbana/Champaign.

Civil Engineering

Lake County Division of Transportation – LCDOT Visitor Parking, Libertyville, Illinois. Acted as project manager and prepared engineering plans, specifications, calculations, and permit documentation for the reconstruction of an existing parking lot using porous pavement, as well as construction of ADA access, rain garden and landscaping improvements for a LCDOT facility.

Forest Preserve District of Kane County – Lake Patterson Access Area Renovation, Aurora, Illinois. Prepared engineering plans, specifications, calculations, and permit documentation for expansion of an existing parking lot and pedestrian trail system, as well as construction of various amenities and stormwater management improvements for a forest preserve site.

Lake County Stormwater Management Commission – Strawberry Condos Drainage Improvements, North Chicago, Illinois. Acted as project civil engineer and prepared engineering plans, specifications and calculations, as well as permit documentation, for construction of stormwater management improvements to help alleviate flooding of a residential condominium complex.

Village of Mount Pleasant – Compost Facility, Mount Pleasant, Wisconsin. Prepared engineering plans, specifications and calculations, along with permit documentation, for the construction of a yard waste drop-off facility, including widening and paving of the access road to the site and the associated floodplain, detention and drainage design.

NRB Land Development Group – Thatcher Meadows Wastewater Treatment Plant, Wonder Lake, Illinois. Prepared engineering plans for permitting and construction of a polishing wetland for the effluent outfall from a proposed wastewater treatment plant.

Crystal Lake Park District – Shamrock Hills Parking Lot, McHenry County, Illinois. Acted as project civil engineer and prepared engineering plans, specifications and calculations, as well as permit documentation, for widening of an existing asphalt entrance drive, and construction of an asphalt parking lot and stormwater management facilities.

Lake County Forest Preserves – Fort Sheridan Forest Preserve Public Access Improvements, Fort Sheridan, Illinois. Prepared engineering plans and project specifications for permitting and construction of proposed paved and gravel paths, asphalt parking lot, boardwalks over existing swales and ravines, re-alignment of Gilgare Road, raising the normal water level of the existing pond and expansion of the volume to accommodate the 100-year storm, and various other stormwater management improvements at the Fort Sheridan Forest Preserve.

Education

B.S., Civil Engineering, University of Illinois,
Champaign-Urbana, May 2002

Previous Employment

Project Engineer, Trotter and Associates,
Inc. 2012-2016

Project Engineer, JSD Professional Services,
Inc., 2011-2012

Project Engineer, Condon Consulting Engineers,
P.C., 2002-2008

Registration & Certification

IL Professional Engineer, No. 062-060872

WI Professional Engineer, No. 45139-6

ASFPD Certified Floodplain Manager,
No. US-17-09576

Qualified Engineer Review Specialist E-240,
Kane County, Illinois

Certified Professional in Erosion and
Sediment Control, No. 7131

Designated Erosion Control Inspector, Lake
County, Illinois

Certified Public Infrastructure Inspector

IDOT Documentation of Contract
Quantities, No. 15-0145

IDOT Small Drainage Structures, No. 2845564

Professional Membership & Service

American Public Works Association



Kirsten N. James, P.E.

Civil Engineer/Water Resources Specialist

Experience in restoration design, hydrologic, hydraulic, and water quality modeling, permitting, and grant writing positions Ms. James to develop and execute a variety of stormwater and floodplain management, natural areas restoration, and access improvement projects. Also focusing on comprehensive lake and watershed assessment, planning, and management studies, Ms. James targets best management practices and improvements projects to restore and protect water quality and improve local communities. Ms. James received a Bachelor of Science degree in Hydrology from the University of Wisconsin - Stevens Point and is a licensed Professional Engineer in the State of Wisconsin.

Major Projects

City of Lake Forest - Forest Park Bluff Assessment, Preliminary Design, Monitoring, and Final Design, Lake Forest, Illinois. Developing design and permit documents to stabilize and restore a Lake Michigan coastal bluff at a historic public park.

City of Lake Forest - Seminary Ravine Assessment and Preliminary Design, Lake Forest, Illinois. Prepared a strategic plan for restoration and reconstruction to protect infrastructure and stabilize a 1.7-mile ravine system.

Forest Preserves of Cook County - Powderhorn Lake Hydrologic Restoration, Chicago, Illinois. Designed and permitted a Great Lakes Restoration Initiative grant funded project to restore dune and swale system hydrology, manage water levels, and improve outlet system conveyance.

McHenry County Conservation District - School Springs Stream Channel Mitigation, Glacial Park, McHenry County, Illinois. Assisted in restoration design, and prepared hydraulic modeling, engineering plans, and support documentation for a tributary to Nippersink Creek as the first stream mitigation bank in the USACE Greater Chicago District.

Nippersink Watershed Association - Merchant Creek Trail Bridge, Wonder Lake, Illinois. Designing and permitting bank stabilization and installation of a trail bridge.

Forest Preserves of Cook County - Dam Maintenance Projects, Cook County, Illinois. Prepared an Operation and Maintenance Plan and hydraulic modeling for Tampier Lake Dam repairs.

Nippersink Watershed Association - Nippersink Watershed 319 Grant Projects, McHenry County, Illinois. Prepared engineering plans and secured permits for nine non-point source pollution control projects, including shoreline and streambank stabilization, ravine restoration, culvert replacement, and wetland enhancement.

Lake County Forest Preserve District - Grant Woods Forest Preserve Hydrologic Restoration, Lake Villa, Illinois. Prepared hydrologic and hydraulic modeling, prepared engineering plans, and secured permits for hydrologic restoration, channel stabilization, and installation of storm sewer infrastructure at an experimental research plot for native seed restoration.

Lake County Forest Preserve District - Lakewood Forest Preserve Drainage Modification and Planning Services, Lake County, Illinois. Created a hydrologic and hydraulic model and water budget analysis to aid in site planning and conceptual restoration design.

Education

B.S., Hydrology, University of Wisconsin - Stevens Point, 2016

Previous Employment

Program Assistant, University of Wisconsin Extension Lakes, Stevens Point, 2015 - 2016

Lead Project Coordinator, Groundwater Model Project, Stevens Point, Wisconsin, 2014 - 2016

Registrations & Certifications

WI Professional Engineer, No. 48677-6

Professional Memberships & Services

American Water Resources Association, Wisconsin Section, 2015 - Present

Des Plaines River Watershed Plan Committee, Lake County, Illinois 2016 - Present

Des Plaines River Watershed Workgroup, Lake County, Illinois 2018 - Present

Professional Advancement

Wisconsin Lake Leaders Institute Graduate, Crew 13, Wisconsin Lakes Partnership, 2021

Geographic Information Systems Professional Certificate, University of Wisconsin, Stevens Point, 2016

Geographic Information Systems Focal Certificate in Environmental Management, University of Wisconsin, Stevens Point, 2016



Claire Randall

Civil Engineer

Ms. Randall graduated with a Bachelor of Science in Civil and Environmental Engineering in 2021 from the University of Marquette, where she was highly involved in the Engineers Without Borders student chapter as a project lead on a pedestrian bridge project. Since beginning at Hey and Associates she has worked on a variety of projects in areas such as watershed planning and stormwater management, natural channel design and construction plan development. She has also developed her abilities in AutoCAD Civil 3D, ArcGIS, XPSWMM, and FEQ on these projects.

Civil Engineering

Metropolitan Water Reclamation District - Addison Creek Channel Improvements Final Engineering, various municipalities in Cook County, Illinois. Calculated construction quantities and cost estimates and assisted with edits to the final construction plan set utilizing Civil 3D.

Stormwater & Floodplain Management

DuPage County— Wards Creek Watershed Plan, various municipalities in DuPage County. Utilized the Full Equations Model program to analyze the flooding in the watershed and various proposed projects to mitigate the flooding, and prepared a report summarizing the findings of the analysis and providing.

Village of Niles—Greenwood Basin Final Engineering, Niles, Illinois. Performed volume control calculations, created exhibits wrote a memo for a Watershed Management Ordinance permit application for a section of permeable pavement within the project.

Village of Downers Grove— Downers Grove Stormwater Master Plan, Downers Grove, Illinois. Utilized XPSWMM to model potential improvements to the Downers Grove stormwater sewer system to alleviate flooding.

Powell Gravel and Excavating, Inc. — Powell Gravel Base Flood Elevation Determination, Chemung Township, McHenry County, Illinois. Created a HEC-RAS model to determine the base flood elevation by developing cross sections from topographic maps and utilizing stream flow and rainfall data.

City of Evanston — Evanston Stormwater Master Plan, Evanston, Illinois. Assisted in developing a model for the storm sewer system throughout all of Evanston utilizing EPA SWMM and ArcGIS.

Education & Previous Employment

Environmental Engineering, Marquette
University, 2021

Assistant Project Manager Co-op, La
Macchia Group 2019-2020

Professional Memberships & Services

Engineers Without Borders, 2017-Present



Vincent J. Mosca

Vice President, Principal Ecologist

Mr. Mosca has been involved with thousands of wetland and ecological assessment projects over the past 30 years in northeastern Illinois and Wisconsin. Vince also regularly leads regulatory permitting (local, state, and federal) efforts for both public and private sector projects. He has experience dealing with state and federal endangered species issues, and with all aspects of ecological restoration, particularly wetlands and streams. Many of his recent projects relate to green infrastructure planning and design for stormwater quality and quantity management. He has given multiple presentations concerning modern approaches to water quality improvements for point and non-point sources, including discussions about costs related to design, operations and maintenance. Mr. Mosca graduated from Northland College with a Bachelor of Science in Biophysical Environmental Studies, Minor in Chemistry, as well as MS in Ecosystem Studies from the University of Wisconsin-Green Bay.

Major Projects

Chicago Transit Authority/CDM Smith – Provided wetland delineation and agency coordination support for the Red Line Extension Project and NEPA/draft EIS analysis in Cook County. Conducted field work and prepared a wetland delineation report with backup documentation. Coordinated with U.S. Army Corps of Engineers for a jurisdictional determination and boundary concurrence.

Village of Wheeling—Incidental Take Authorization for Massasauga Rattlesnake, Wheeling, Illinois. Project ecologist

City of Elgin—Individual Permit application and Anti-degradation Analysis/Elgin Promenade, Elgin, Illinois. Project ecologist.

Loon Lakes Management Association—Conservation Plan and Incidental Take Authorization for Listed Fish Species to Support the Control of Aquatic Plants, East and West Loon Lakes, Antioch, Illinois. Project ecologist.

Wheaton Sanitary District Interceptor Project—Major sewer replacement and upgrade project through sensitive wetland complexes—Wheaton, Illinois. Project principal

Lake County Public Works - Permitting to support to Wastewater Treatment Plant, Old Mill Creek, Illinois. Project manager.

Del Webb Corporation of Illinois—Sun City Huntley Huntley, Illinois. Creation of 15-Acre Amenity Lake, Project manager.

Waste Management - Mitigation design for 215-acre upland and wetland complex in Grayslake, Illinois. Senior ecologist.

Abbott Laboratories—Land management strategy for Eastern Prairie Fringed Orchid, Lake County, Illinois. Ecologist.

Sterne's Fen and Woods Nature Preserve—Channel and vegetation restoration plan, Crystal Lake, Illinois. Project principal.

Lake County Department of Public Works—Ecological Assessment of Mill Creek in Lake County, Illinois. Project manager.

Lake County Forest Preserve District—Fort Sheridan Ravine Stabilization, Lake Forest, Illinois. Responsible for natural resources protection plan for unique and ecologically sensitive ravine tributary to Lake Michigan. Project ecologist.

Village of Richmond—Non-degradation study for potential stream impacts by new sewage treatment plant along Nippersink Creek, Richmond, Illinois. Senior ecologist.

Education

M.S., Ecosystem Studies, University of Wisconsin-Green Bay, 2018

B.S., Biophysical Environmental Studies (major), Chemistry (minor), Northland College, 1985

Previous Employment

Chemistry Teaching Assistant, University of Wisconsin-Green Bay, 1989

Limnology Research Assistant, University of Wisconsin-Green Bay, 1987

Naturalist, Carnegie Museum of Natural History, Pittsburgh, Pennsylvania, 1986-87

Registration & Certification

Certified Associate Ecologist, Ecological Society of America, 1993

Certified Wetland Specialist C-023, Lake County, Illinois

Qualified Wetland Review Specialist, No. W-001, Kane County, Illinois

Certified Wetland Specialist, McHenry County, Illinois

Green Infrastructure Maintenance and Operations Costs – McHenry County SWCD

Groundlayer Vegetation Considerations for Solar Farms– McHenry County



Education

B.A., Environmental Studies (major), Biology (minor), Northeastern Illinois University, 1998

Previous Employment

Environmental Scientist, Benchmark Environmental Services, Inc., Antioch, Illinois
2000-2006

Natural Resources Crew Leader, University of Nevada-Reno, Department of Biology Las Vegas, Nevada 2000

Restoration Specialist, Liberty Prairie Conservancy, Grayslake, Illinois 1998 –1999

Registration & Certifications

International Society of Arboriculture:
Certified Arborist IL-9165A

Certified Wetland Specialist C-094, Lake County, Illinois

Certified Wetland Specialist, McHenry County, Illinois

Wetland Assured Delineator, WDNR

Certified Professional in Erosion and Sediment Control (CPESC) No. 5864

Designated Erosion Control Inspector (DECI) Lake County, Illinois

IDOT Documentation of Contract Quantities Certificate No. 18-13371

Robert D. Kerpec, ISA Certified Arborist, CPESC, DECI Environmental Scientist

Mr. Kerpec has over 20 years experience conducting field surveys such as wetland delineations, tree surveys, soil erosion and sediment control inspections, ecological restoration management, and vegetation inventories. He is well versed in regulatory permitting issues, having successfully obtained federal and county wetland permits for many public and private sector clients throughout northeastern Illinois and southeastern Wisconsin. Mr. Kerpec has worked as a project manager for various Phase III IDOT and Lake County Division of Transportation contracts for work consisting of ecological restoration management to natural wetland areas, hazardous tree and emerald ash borer assessments, and invasive plant species management. Work associated with these contracts included directing and documenting the general contractor on the implementation of all contract pay items such as tree removals, seeding, planting, weed control, mowing, and control burning. He also worked as the Resident Engineer for construction observation and contract management for the permanent landscape items on the Stearns Road Bridge Corridor Project located in Kane and DuPage counties. Mr. Kerpec is currently working as an inspector/Resident Engineer Assistant for the Illinois State Tollway Highway Authority Elgin O'Hare Western Access Wetland Mitigation Project (315-acres) located at the Pine Dunes Forest Preserve in Lake County. Mr. Kerpec received his Bachelor of Arts in Environmental Studies from Northeastern Illinois University. Mr. Kerpec is also a Certified Wetland Specialist in Lake County and McHenry County, Illinois and a Wisconsin Department of Natural Resources Assured Wetland Delineator.

Major Projects

Lake County Forest Preserve District—North Mill Creek Channel Restoration Project, Lake County, Illinois. Provided weekly erosion and sediment control inspections for 7,500 feet of stream realignment.

Lake County Division of Transportation—Basin Maintenance Contract, Lake County, Illinois—Vegetation management of naturalized detention basins. Provide client with contract bid documents and construction oversight of all pay items.

Illinois Department of Transportation (District 1)—(Contract No. 60T45) Project manager for work consisting of ecological restoration management to natural wetland areas. Directed and documented the general contractor on the implementation of all contract pay items.

Village of Schaumburg—Municipal Center Woodland Restoration Project, Schaumburg, Illinois. Assisted in preparing plans and worked as Resident Engineer for work consisting of invasive species removals, seeding, and tree plantings.

City of Lake Forest—Seminary Ravine Stabilization Project, Lake County, Lake Forest, Illinois – Performed wetland delineation, federal wetland permitting, and threatened/endangered species consultation.

Lake Forest Open Lands Association—Trail improvements at McCormick Ravine, Lake Forest, Lake County, Illinois. Performed wetland delineation, tree inventory, and coordinated the USACE permit.

Lake County Forest Preserve District—Hydrological Restoration Project at Grant Woods, Lake Villa, Lake County, Illinois. Performed wetland delineation and coordinated the LCSMC and USACE wetland permits.

Village of Schaumburg Park District—Lancer Creek Stabilization Project, Schaumburg, Illinois – Performed wetland delineation, federal wetland permitting, tree survey, and threatened/endangered species consultation.



Timothy R. Pollowy, PLA, ASLA

Senior Landscape Architect

Built upon an education in landscape architecture and natural resources from the University of Illinois, Mr. Pollowy has over 30 years of experience in landscape architecture, environmental planning, and ecological restoration. Areas of expertise include sustainable and resilient site design, green infrastructure, the restoration and management of natural areas, transportation, and parks and recreation. He is an experienced project manager, using his organizational and communication skills to keep projects on track and within budget. Tim has a thorough hands-on understanding of construction management, and has overseen the successful implementation of a wide variety of projects. Mr. Pollowy has successfully completed FHWA Context Sensitive Solutions (CSS) training for public consensus building, and is a Registered Landscape Architect in Illinois and Wisconsin.

Representative Projects

DuPage River Salt Creek Work Group – Salt Creek Restoration at Fullersburg Woods Forest Preserve, Oak Brook, Illinois. Project manager during design and permitting of dam removal, river and floodplain restoration, public access improvements, and preservation of historic mill building.

City of Elmhurst – Police Station Improvements, Elmhurst, Illinois. Prepared master plan featuring permeable pavement parking lots, rain gardens, improved pedestrian safety, stormwater trees, and related enhancements; completed design of the first phase including disconnecting building downspouts, and directing roof runoff into a large formal rain garden with interpretive signage.

Village of Niles – Oak Park Bioswale and Permeable Parking, Niles, Illinois. Designed a parkway bioswale and interpretive signage adjacent to a public park.

City of Chicago – Green Healthy Neighborhoods, Chicago, Illinois. Served as lead landscape architect on an inter-disciplinary team planning green infrastructure, complete streets, pedestrian linkages, and related community enhancements in several City neighborhoods.

Town of Normal – Uptown Normal, Normal, Illinois. Project involvement focused on alternative stormwater management approaches, resulting in the incorporation of stormwater treatment cells within a prominent water feature located in the center of a traffic roundabout.

City of Chicago – Sangamon Paseo, Chicago, Illinois. Lead landscape architect during planning and design for conversion of an abandoned rail line to linear park in the Pilsen neighborhood.

MWRDGC – Addison Creek Open Space, Northlake and Stone Park, Illinois. As part of the Addison Creek Channel Improvements project a trail system, expanded neighborhood park, and riverwalk were designed as community enhancements. Work also included assessment and design of several miles of biotechnical streambank stabilization, riparian buffer plantings, in-stream habitat improvements, and related work.

City of Chicago – Resilient Corridors, Chicago, Illinois. Prepared plans for 13 neighborhood pocket parks along multiple community corridors, involved with soil remediation as it pertained to planting and stormwater management improvements, provided QA/QC of hardscape design work, prepared specifications, and provided construction phase services.

Education

Master of Landscape Architecture,
University of Illinois, 1992

Bachelor of Landscape Architecture,
University of Illinois, 1990

Previous Employment

Consulting and Design Manager, Landscape
Resources, Inc., Montgomery, IL, 1999-2003

Staff Ecologist, Applied Ecological Services,
Inc., Brodhead, WI, 1996-1999

Associate Staff, Otis Associates, Inc.,
Schaumburg, IL, 1994-1996

Landscape Planner, Village of Schaumburg,
Schaumburg, IL, 1993-1994

Associate Staff, Johnson Johnson & Roy,
Chicago, IL, 1992

Registration & Certification

Illinois Registered Landscape Architect
157001200

Wisconsin Registered Landscape Architect
594-014

IDOT Documentation of Contract Quantities (S-14)

FHWA Context Sensitive Solutions (CSS)



Ethan Appelgren

Landscape Designer

Mr. Appelgren has 4 years of experience in the field of landscape architecture, with his background including site design, planning and construction. Educated at the State University of New York, College of Environmental Science and Forestry (SUNY-ESF), he has completed numerous projects involving residential and commercial design, large-scale municipal planning, ecological restoration, parks and recreational space development and geospatial analysis. Ethan has spent his career in multi-disciplinary firms, working alongside civil engineers, environmental scientists, urban planners and arborists.

Site Design

Corporate Commons 3– Landscape Design, State Island, New York. Worked in conjunction with lead landscape architect to develop full site masterplan for corporate campus, including a central fountain pavilion and various green infrastructure projects.

Skaneateles Lake Rain Gardens– Landscape Design and Installation, Skaneateles, New York. Designed a series of rain gardens to assist in reducing the volume of polluted rainwater runoff which would reach a lake responsible for supplying the city of Syracuse's drinking water.

Queens Tree Trench and Utility Corridor– Landscape Design and Site Analysis, Queens, New York. Reviewed, assessed and designed tree trenches and pits as part of Queens' underground utilities expansion project.

Columbia Pacific Self Storage– Landscape Design, Yorktown, New York. Worked alongside lead landscape architect to convert a vacated property into a functioning self-storage site.

Gilboa Dam Restoration– Landscape Design, Hudson Valley, New York. Assisted in the preparation of a multi-phase landscape restoration project for a 25 acre site.

Geospatial Analysis

Corporate Commons 3– Analyzed septic flows and existing environmental features using orthoimagery and municipal data to assist in the development of wastewater solutions for a growing community.

Graphic Representation

Downtown Mahopac Municipal Park– Landscape Design and Rendering, Mahopac, New York. Assisted lead landscape architect in designing modernized site layout and prepared set of graphics for project presentation.

Education

Bachelor of Landscape Architecture, State University of New York, College of Environmental Science, 2020

Minor in Urban Environmental Science and Ecology

Previous Employment

Landscape Designer, Insite Engineering, Surveying and Landscape Architecture, 2020-2021

Landscape Designer, Being Here Landscape Architecture, 2019-2020

Landscape Designer, Keplinger Freeman Associates, 2018-2019

Assistant Project Manager, Kelco Construction 2017-2018

Nelson R. Ham, Ph.D.

Professor of Geology & Environmental Science
St. Norbert College
100 Grant Street
DePere, WI 54115-2099

(920) 403-3977 office
nelson.ham@snc.edu

TEACHING & RESEARCH INTERESTS: Geomorphology, Glacial Geology, Hydrology, Geology of Wisconsin and the Great Lakes Region, Natural and Environmental History, Geologic Mapping, Trout Stream Restoration

EDUCATION

Ph.D. Geology 1994, University of Wisconsin, Madison.

Quaternary Geology Program

Researched late Wisconsin ice-sheet dynamics in north-central Wisconsin based primarily on geologic mapping, aerial photo interpretation, and subsurface investigation. David Mickelson and John Attig, co-advisors

M.S. Geology 1991, University of Wisconsin, Madison.

Quaternary Geology Program

Studied till and debris-flow deposition at Burroughs Glacier, Alaska, using field sedimentology (primarily macrofabric analysis) David Mickelson, advisor

B.A. Geology 1989, Augustana College, Illinois.

Geology Field Camp, 1988, Southern Rocky Mountains, Colorado, Waynesburg College.

EMPLOYMENT and APPOINTMENTS

St. Norbert College

1994- present

Professor of Geology and Environmental Science

Regularly teach Introductory Geology courses, Geomorphology, and Hydrogeology.. Organize, lead, and co-lead numerous geology field trips and field courses to Hawaii, Costa Rica, Nicaragua, Alabama, Georgia, Florida, Texas, New Mexico, California, Nevada, Alaska, Michigan, and Wisconsin. Research the origin of glacial landscapes and deposits in Wisconsin and Alaska. Have written successful research and instructional grant proposals. Presented and published results of research in professional, academic, and public venues.

River Alliance of Wisconsin, Madison

2013-2014

Board of Directors

Principal science board member to RA, an advocacy organization focused on protection, restoration, and enhancement of rivers in Wisconsin.

University of Wisconsin-Extension Geological & Natural History Survey 1994-2010

Research Associate, Quaternary Mapping Program

Mapped Quaternary deposits in Wisconsin and researched late-glacial and post-glacial environments in Wisconsin. Presented and published results in professional, academic, and public venues. Conducted multi-year glacial geologic

mapping projects in Oconto County and Walworth County, Wisconsin. Funded by U.S. Geological Survey, U.S. Forest Service, and WGNHS.

University of Wisconsin-Extension Geological & Natural History Survey Spring 2006
Visiting Scientist (Sabbatical)

Researched Quaternary deposits of Walworth County, Wisconsin by interpreting drillers logs, mapping stratigraphic units, and conducting landform analysis in ArcView. Researched historical interpretations of the origin(s) of the Kettle Moraine, Wisconsin. Prepared manuscripts and maps for publication.

St. Norbert College 2004-2005

Administrative Intern to Dean of the College and Vice President for Academic Affairs

Researched faculty work loads of like-sized colleges and wrote recommendation plan. Attended administrative and professional meetings.

St. Norbert College Summer 2004

Co-Director, Matanuska Glacier, Alaska, National Science Foundation- Research Experience for Undergraduates (NSF-REU)

Collaborated with undergraduate students and university research scientists to conduct research on modern glacial processes related to erosion, weathering, glaciology, hydrology, glacio-tectonics, and late-glacial and post-glacial environmental changes.

Northwest Missouri State University (adjunct faculty) Summers 2002-2003

Co-Director, Matanuska Glacier, Alaska, National Science Foundation- Research Experience for Undergraduates (NSF-REU)

Collaborated as stated above; REU grant was administered through NWMSU.

Augustana College July 2001

Visiting Instructor, Matanuska Glacier, Alaska, National Science Foundation- Research Experience for Undergraduates (NSF-REU)

Collaborated as stated above. REU grant was administered through Augustana College.

University of Wisconsin-Department of Geology and Geophysics 1989-1994

Graduate Research Assistant, Graduate Teaching Assistant, and Head Graduate Teaching Assistant (in various years)

ARCO Oil and Gas Company, Midland, Texas Summer 1991

Summer Professional Geologist

Conducted a two-month study of the structure and geologic history of deep Paleozoic sedimentary rocks in the Permian Basin of west Texas using geophysical information (well logs and 2-dimensional seismic profiles)

GRANT SUPPORT (approximately \$500,000 in direct and indirect grant support)

Delineation of inland sand dunes & implications for post-glacial climatic change in eastern Wisconsin (Wisconsin Geological and Natural History Survey Grant, 2004, \$2000)

APPENDIX C—FEES AND SCHEDULE



City of Green Bay
Department of Public Works

100 N. Jefferson St., Room 300, Green Bay, WI 54301

QUOTATION REQUEST
CONSULTING ENGINEERING SERVICES
CITY-WIDE GREEN STORMWATER INFRASTRUCTURE PLAN

Due Date: September 30, 2022, 2:00 p.m. CST

Date: September 9, 2022

To: Hey and Associates, Inc. **Attn:** David Kraft

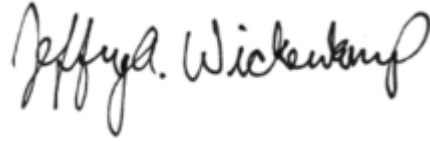
From: Melissa M. Schmitz, Resiliency Coordinator

Fax: 920-448-3102 / **Voice:** 920-448-3100

Please quote **INSIDE DELIVERED** prices for materials listed below.

QTY	UNIT	<u>DESCRIPTION</u>	UNIT PRICE	TOTAL
1	LS	Kick-off Meeting	\$835	\$835
1	LS	City-wide location analysis for strategic GSI investment	\$16,205	\$16,205
1	LS	GSI project identification for public and private property	\$27,370	\$27,370
1	LS	Triple Bottom Analysis	\$9,655	\$9,655
1	LS	Water quality and quantity modeling	\$20,100	\$20,100
1	LS	Creation of maps for integration with City's GIS	\$4,410	\$4,410
1	LS	Evaluation process for feasibility of GSI in ROW projects	\$7,120	\$7,120
1	LS	Design guidance for identified GSI projects	\$17,700	\$17,700
1	LS	Maintenance and Operations guidance for identified projects	\$6,940	\$6,940
1	LS	Compilation of consultant services into final GSI Plan	\$7,280	\$7,280
1	LS	Five meetings with City representatives	\$5,665	\$5,665
1	LS	Presentation of final plan to Green Bay Common Council or another City committee.	\$1,570	\$1,570
		TOTAL PROJECT COST AS DESCRIBED IN PROJECT STATEMENT AND GOALS	\$124,850	\$124,850

LEAD TIME:



Hey and Associates, Inc.

VENDOR

26575 W. Commerce Dr. Ste. 601

ADDRESS

Volo

IL

60073

CITY

STATE

ZIPCODE

847-740-2888

FAX

AUTHORIZED SIGNATURE

Jeff Wickenkamp, President

PRINT NAME AND TITLE

September 30, 2022

DATE

608-217-4788

PHONE

City of Green Bay City-wide Green Stormwater Infrastructure Plan Schedule

Task	Task Description	Nov. 2022	Dec. 2022	Jan. 2023	Feb. 2023	March 2023	April 2023	May 2023	June 2023	July 2023	August 2023
1	Kick-Off Meeting										
2	City-wide Location Analysis for Strategic GSI Investment										
3	GSI Project Identification for Public and Private Property										
4	Triple Bottom Line Analysis										
5	Water Quality and Quantity Modeling										
6	Creation of Maps for Interqation with City GIS										
7	Evaluation Process for Feasibility of GSI Projects										
8	Design Guidance for Identified GSI Projects										
9	Maintenance and Operations Guidance for Identified Projects										
10	Compilation of Consultant Services Into Final GSI Plan										
11	Five Meetings with City Representatives										
12	Presentation of Final Plan to City										

Technical Proposal



City-Wide Green Stormwater Infrastructure Plan Services



SEPTEMBER 2022

McMAHON
ENGINEERS ARCHITECTS

McMAHON ASSOCIATES, INC.

1445 McMAHON DRIVE NEENAH, WI 54956 Mailing: PO BOX 1025 NEENAH, WI 54957-1025 PH 920.751.4200 MCMGRP.COM

Introduction & Executive Summary

September 30, 2022

Ms. Melissa Schmitz, Resiliency Coordinator
City of Green Bay
Public Works Department
100 North Jefferson Street, Rm 300
Green Bay, WI 54301-5026

Re: Technical Proposal for City of Green Bay
City-Wide Green Stormwater Infrastructure Plan Services
McM. No. M0032- 9-99-000014.00

Dear Ms. Schmitz:

Thank you for the opportunity for McMahon Associates, Inc. (McMAHON) to provide a Proposal to the City of Green Bay for the City-Wide Green Stormwater Infrastructure Plan as described in your Request for Proposal dated September 9, 2022. McMAHON has recently provided similar services to numerous municipalities located in Wisconsin.

McMAHON is excited at the prospect of working with City Staff again. McMAHON recently completed a hydrologic and hydraulic analysis for the City's Stormwater Basins 106, 313, 342 and 581. McMAHON is also designing the Seymour Park and Wildlife Sanctuary improvements.

The enclosed Proposal includes our Project Approach, Firm Qualifications, Team Qualifications, References and Fee Proposal. McMAHON will perform all services in-house with our Team of talented staff located in our Neenah Office/Headquarters. We appreciate the opportunity to provide you with this Proposal and we look forward to working with you on this project. If you have any questions, please feel free to call me at 920-751-4200 at your convenience.

Respectfully,

McMahon Associates, Inc.



Nicholas A. Vande Hey, P.E.
Vice President / Sr Municipal & Water Resources Engineer

STATEMENT OF UNDERSTANDING

The City of Green Bay (City) is seeking Professional Engineering Services from qualified firms to develop a City-Wide Green Stormwater Infrastructure Plan. The planning effort will be critical to the City's long-term flood resilience strategy. The City's goal is for the plan to identify projects and make recommendations for integrating Green Stormwater Infrastructure (GSI) into public and private properties, which is intended to reduce localized flooding, improve water quality, and increase neighborhood greenspace.

As an older community in Wisconsin, past urban development has increased impervious surfaces and reduced stormwater infiltration. The City has also experienced more extreme rainfall, snowmelt, and climate related events or trends over the past few decades. For example, between 2018 and 2020, the East River, Fox River, Bay of Green Bay, and Lake Michigan were at record-high water levels. During this period of record water levels, each rainfall and seiche event further increased flooding anxiety.

Past flooding events in the City have caused service disruptions, public safety hazards, and property damage. Despite lake water levels dropping since 2020, the City continues to experience flooding in coastal, riverine, and urban areas during moderate to intense weather events. Of particular concern, the City has residential development in low lying areas which is mostly occupied by low to moderate income households who may not have the finances to improve their property's flood resiliency.

The purpose of the City-Wide Green Stormwater Infrastructure Plan is to demonstrate the City's commitment to flood and climate resiliency, water quality, and incorporation of GSI into public and private property. The GSI Plan will guide the identification, prioritization, implementation, tracking, and reporting of GSI projects in the City. The GSI Plan will be coordinated with other City plans and resources, such as the Comprehensive Plan, Stormwater Management Plan, District-Corridor Plan, Park-Recreation-Open Space Plan, Safe Walk-Bike Plan, flood hazard mapping, five-year street reconstruction schedule, and other relevant plans.

The City's objective is to develop, adopt, and implement a City-Wide GSI Plan that will achieve multiple benefits including reduced flooding, improved climate resiliency, improved water and air quality, enhanced traffic calming, and an overall more pleasant urban environment. Specific goals for the GSI Plan are as follows:

- Develop solutions appropriate to soil, topographical, and anticipated future precipitation conditions. For example, the Plan is to address the challenges of implementing GSI within floodplains and areas with high groundwater levels.
- Reduce flooding hazards in the City, especially to vulnerable residences and businesses along the East River and western slough neighborhoods.
- Provide a prioritized, actionable list of GSI projects (and other nature-based solutions) including location maps and an implementation framework.

- Build staff capacity for incorporating GSI into the evaluation, planning, engineering, design, and construction of municipal projects.
- Create a process for staff to evaluate the potential for implementing GSI strategies.

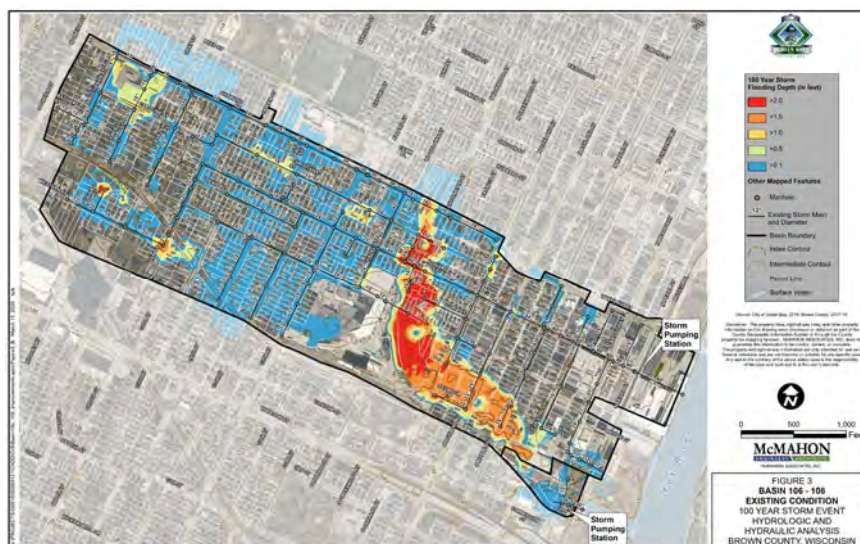
PROJECT APPROACH

McMAHON intends to hold a kick-off meeting with City Staff to gather information, obtain input, discuss City goals and concerns, and discuss the schedule and final deliverables. Based on our experience, planning is a dynamic process. The kick-off meeting is a great opportunity to discuss the project in more detail. McMAHON anticipates the level of effort for some tasks to change as information is discussed with City Staff. Based on feedback, City Staff and McMAHON can discuss the level of effort for specific tasks, whether additional tasks are needed, or whether some tasks should be eliminated. McMAHON intends to approach the project with flexibility, such that the City is provided with those efforts and services deemed most beneficial. Regardless, McMAHON is committed to delivering the project and scope of work on budget and schedule. Although not a complete list, a few items McMAHON desires to discuss during the kickoff meeting:

- Identify GIS mapping that is readily available. For example, in addition to available FEMA floodplain mapping, identify other sources of GIS flood mapping available from historic flood observations (e.g., western slough neighborhoods, former Town of Preble), past hydrologic and hydraulic studies, etc.
- Identify City design restrictions for GSI within public street rights-of-way. For example, the City may not allow curb bump outs to create real estate for potential GSI practices due to operational challenges associated with snow plowing. Also, the City may not allow specific GSI practices within street rights-of-way due to City maintenance efforts and staffing or budget restrictions.

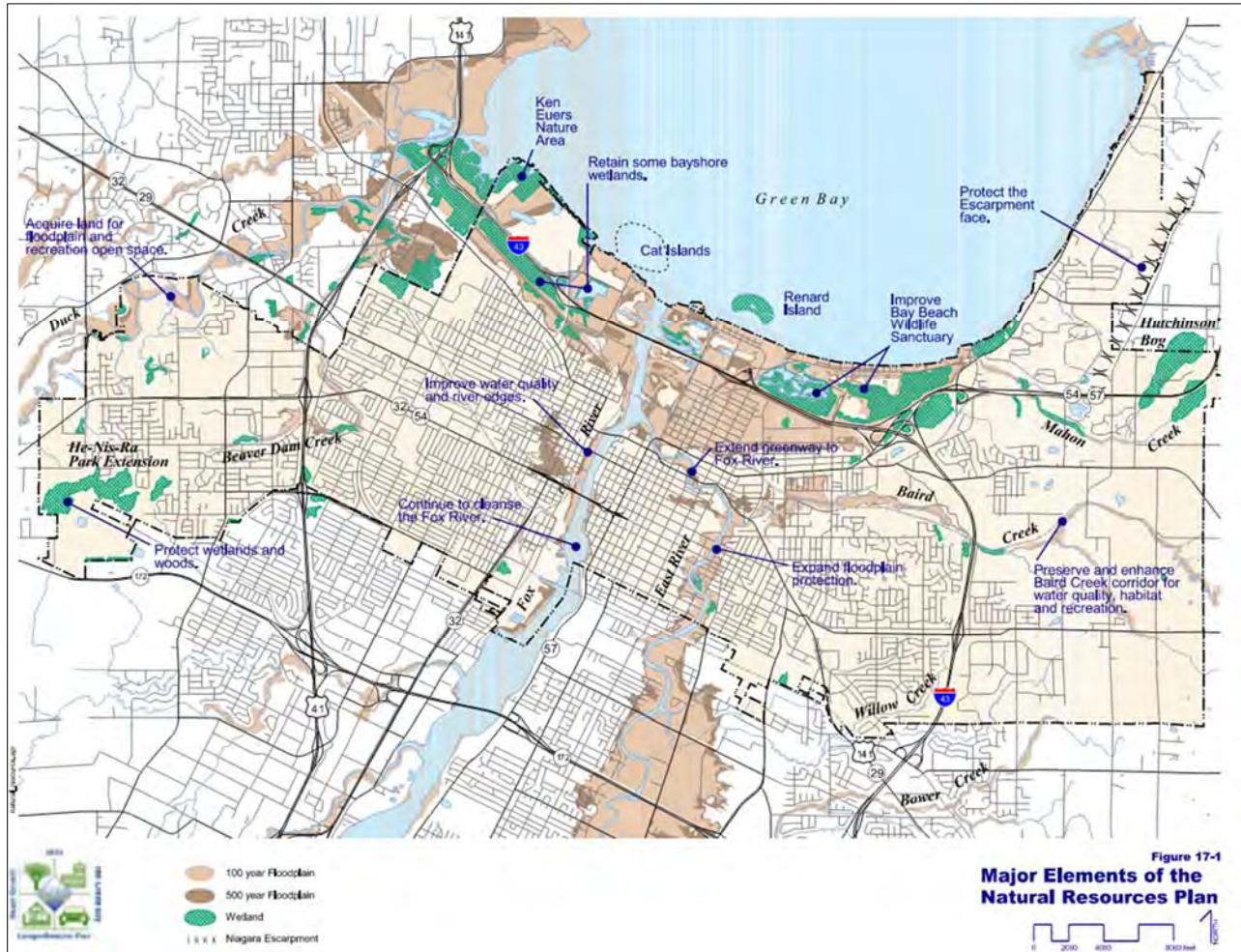
As part of the plan, McMAHON intends to address the challenges of implementing GSI within floodplains and areas with high groundwater levels. Exhibit 1, which was prepared by McMAHON for the City, identifies 100-year flooding vulnerability within a western slough neighborhood located in City Stormwater Basins 106 and 108. Using available information from federal, state, and local governmental agencies, McMAHON intends to prepare a City-Wide map of flood vulnerable areas and high groundwater which can be used in the analysis.

Exhibit 1 - Past Flooding Analysis in a Western Slough Neighborhood



In addition to mapping floodplains and areas with high groundwater levels, McMAHON intends to use readily available mapping of historical sites, contaminated sites, waterways, wetlands, groundwater levels, soils, land uses, topography, utilities, and areas currently served by stormwater facilities. For example, Exhibit 2 identifies wetland areas within the City. To reduce effort, McMAHON only intends to use GIS mapping information that is already available. These mapping layers will be used by McMAHON to prioritize and identify potential GSI solutions for soil, topographical, groundwater, and future project precipitation.

Exhibit 2 - Mapped Wetlands



As part of the analysis, McMAHON intends to take into consideration the Total Maximum Daily Load (TMDL) numeric goals for sediment and phosphorus, which are summarized in the Stormwater Management Plan or City-Wide 2018 SLAMM Analysis. Exhibit 3 identifies the TMDL Reachshed Drainage Areas from the City-Wide 2018 SLAMM Analysis. McMAHON intends that the proposed GSI Plan have synergy with these water quality requirements and the City's Municipal Separate Storm Sewer System (MS4) Permit. McMAHON anticipates the City will incorporate some or all of the proposed GSI Plan projects into a future City-Wide Stormwater Management Plan update.

Legend

Municipal Boundary		TMDL Drainage Area	
[Black line]	Municipal Boundary	[Pink]	Baird Creek
[Red dashed line]	Oneida Boundary	[Orange]	Bower Creek
		[Light Blue]	Duck Creek
		[Dark Green]	Dutchman Creek
		[Light Green]	East River
		[Yellow]	Lower Fox River
		[Blue]	Lower Green Bay

Figure 1-1
2018 TMDL Reached Drainage Areas

Scale: 0 2,000 4,000 Feet
North Arrow
Data sets sourced from the City of Brownsville, Texas

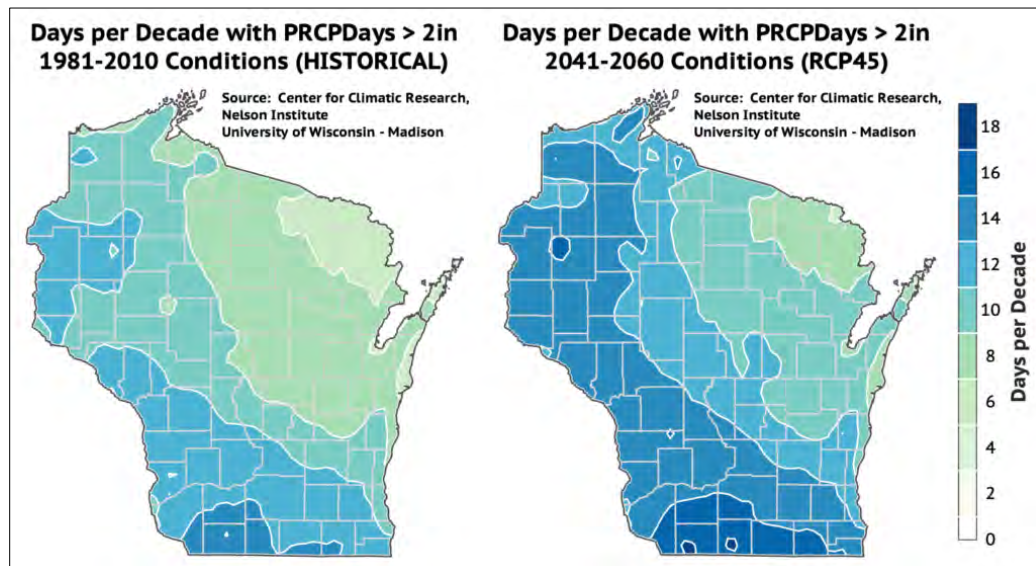
Brown & Caldwell

McMAHON intends to include an implementation framework into the GSI Plan report. The framework will provide strategies for incorporating GSI into the evaluation, planning, engineering design, and construction of both private and municipal projects. The framework will provide City Staff with a process to evaluate the potential for implementing GSI strategies. For example, one strategy McMAHON intends to include in the implementation framework are potential grant funding sources or financial incentive programs.

As an additional service, McMAHON recommends the City consider having McMAHON provide a GSI power point presentation to City Staff regarding zoning and development standard restrictions which may influence flood resiliency on private or public parcels. For example, City zoning ordinances may restrict impervious surface reductions which can affect runoff volumes and flooding resiliency. The presentation can also be considered educational for purposes of the City's MS4 Stormwater Permit with Wisconsin DNR.

As an additional service, McMAHON recommends the City consider having McMAHON perform an initial GSI resiliency analysis using historical and future projected rainfall data available from Atlas 14 or the Wisconsin Initiative on Climate Change Impacts (WICCI). Exhibit 4, which was prepared by WICCI, compares historical and future projected precipitation trends in Wisconsin.

Exhibit 4 – WICCI Historical (1981-2010) and Future Projected (2041-2060) Precipitation



The purpose of the aforementioned resiliency analysis is to provide the City with a comparison of a few initial GSI Best Management Practice (BMP) sizes and costs due to historic and future projected climate trends. During the initial progress meeting, McMAHON would discuss the initial resiliency analysis results with City Staff and the design rainfalls that can be incorporated into the GSI Plan analysis already included in the scope of work. McMAHON believes it important to select the rainfall to be used in the GSI Plan analysis before performing the analysis. Ideally, the selected rainfall will also be incorporated into the City's ordinances. For example, the City's current Stormwater Management Ordinance (Chapter 16, Article III) uses the old Technical Paper 40 rainfall depths and the SCS Type II rainfall distribution. Current Wisconsin DNR guidance recommends using the new Atlas 14 rainfall depths and MSE4 rainfall distribution. Future projected WICCI rainfall will likely be more intense than either the old TP 40 rainfall or new Atlas 14 rainfall. The rainfall selected by City Staff for use in the GSI analysis will influence the BMP sizes and costs in the final GSI Plan. The rainfall selected by City Staff may also result in a change to the City Stormwater Management ordinance.

McMAHON intends to maintain good communication with City staff during the project, including phone calls or virtual meetings when appropriate. McMAHON believes communication and collaboration are important to meeting the City's goals, budget, and schedule. As part of communication, McMAHON will provide recommendations and seek City input on decisions that may affect the project's budget or schedule.

SCOPE OF SERVICES

McMAHON proposes the following Scope of Services for this project:

- Attend a Kick-Off Meeting with City Staff to review scope, goals, work plans, deliverables, Gantt chart schedule, and other items.
- Attend four (4) collaborative progress meetings with City Staff.
- Conduct a location analysis to identify priority subbasins for strategic GSI investment on public and private properties, particularly redevelopment projects. Summarize the location analysis methodology in the final GSI Plan.
- Identify and prioritize thirty (30) GSI projects for public properties over a 5-year period, beginning with 2023. Focus on streets, alleys, sidewalks, parking lots, schoolyards, City parks, and athletic fields. Analyze the City's 5-year street reconstruction plan for feasibility of GSI practices within the street rights-of-way. Provide an implementation time frame for streets and alleys.
- Identify and prioritize fifteen (15) to twenty (20) GSI projects for properties or areas of the City which are not owned by the City.
- Project identification and prioritization shall include a Triple Bottom Line analysis, water quantity modeling, and water quality modeling for forty-five (45) to fifty (50) projects identified for priority areas.
- For the GSI priority location analysis, create maps using ArcGIS for coordination and integration into the City's GIS system. Maps to be created including the following:
 - ▶ Priority Subbasins.
 - ▶ Optimal Locations in Street Right-of-Way.
 - ▶ Optimal Locations in City-Owned Park Properties.
 - ▶ Parking Areas Suitable for GSI.
 - ▶ GSI Project Map/System for Tracking Completed Projects.
- Develop an ordered evaluation process for City Staff to use when determining the potential for inclusion of GSI in street, alley, and other street right-of-way projects. Evaluation criteria shall include, but is not limited to underground utilities, other underground conflicts, and limitations in the right-of-way.
- Provide design guidance and specifications for incorporating GSI components into identified projects. The GSI Plan shall include general design and construction guidelines, standard specifications, and details (or references to those documents) for incorporating GSI into projects within the City. The guidelines and specifications are to address different GSI project types, as defined by its land use and transportation characteristics. The guidelines and specifications are to allow projects to provide a range of functions and benefits, such as stormwater management (per a particular storm size), bicycle and pedestrian mobility and safety, public green space, and urban forestry.
- Incorporate guidance and resources that address short-term and long-term operations and maintenance of proposed GSI measures.
- Compile deliverables into a final GSI Plan in digital format (i.e. MSWord, GIS shape files).
- Attend a Close Out meeting with City Staff to present the final GSI Plan.
- Attend a Common Council or City Committee meeting to present the final GSI Plan.

ITEMS NOT INCLUDED IN THE SCOPE OF SERVICES

The following is not intended to be a comprehensive list. It is intended to highlight general areas not included in the Scope of Services.

- Topographic surveys, plats, CSMs, boundary surveys, title/easement searches, and deeds.
- Site investigations for archaeological, historical, endangered/threatened species, contamination, soils, groundwater, and wetlands.
- Floodplain analysis and FEMA submittals.
- Design, permit, bidding, and construction services.

McMAHON can assist the City with additional services, as needed. The scope of work and estimated fees associated with additional services can be jointly determined and negotiated with the City.

RESPONSIBILITIES OF THE CITY OF GREEN BAY

This Proposal is based on the City providing the following:

- A single contact person for the project.
- Coordination between City Departments and McMAHON.
- PDF copy of relevant studies, reports, plans, and record drawings.
- Text excerpts from relevant City Plans needed for inclusion in final City-Wide GSI Plan.
- Available modeling.
- In GIS compatible format, available aerial photographs, contours, utility systems (e.g., storm, sanitary, water main), and mapping from Comprehensive Plan, Stormwater Management Plan, District and Corridor Plan, Park-Recreation-Open Space Plan, Safe Walk and Bike Plan, and flood hazard mapping
- Available GIS utility attribute data (e.g., storm, sanitary, water main).
- Available data on the use and capacity of existing infrastructure.
- 5-year street reconstruction plan, including CIP or budgets for five-to-ten-year time frame.
- Critical information from Chapters 16, 24 and 44 of the Municipal Code and related TMDL requirements.

SCHEDULE

Upon receipt of an executed Agreement, work will be within nine (9) months of executed agreement. If the Agreement is executed by October 24, 2022, the attached schedule and milestones are anticipated.



CITY-WIDE GREEN STORMWATER INFRASTRUCTURE PLAN
CITY OF GREEN BAY, WI

Titletown, USA PROJECT SCHEDULE

[illegible]

Firm Qualifications

Mr. Nick Vande Hey, P.E. will be the Project Manager and primary contact person for the City of Green Bay's project. His contact information is as follows:

Mr. Nick Vande Hey, P.E.
McMahon Associates, Inc
1445 McMahon Drive
Neenah, WI 54956
Ph. 920-751-4200
Email nvandehey@mcmgrp.com

We've included additional information on McMAHON's background and qualifications, including a Company Overview, Our Services and Who We Serve, The McMAHON Way and several service overview sheets. We've also included other projects that have been completed by the Project Team.

COMPANY OVERVIEW

McMahon is a leading full-service engineering, architecture and consultant firm with a more than 100-year history of successfully delivering project results for our clients.

Our company was founded in 1909 in Wisconsin. Since then, we've expanded our geographical footprint with offices in Illinois and Indiana in addition to our corporate headquarters in Neenah, Wisconsin. We have also established additional companies that complement McMahon and offer services that uniquely meet the needs of our clients. Our team consists of more than 150 professionals including engineers, architects, surveyors, consultants, and technicians.

Although we have grown to support projects across the country, and even internationally, we maintain our small-business touch. We value providing unmatched service for our clients while focusing on building long-standing relationships. We pride ourselves on producing an end-result that is of quality, but it's the connections we make and the trust we earn along the way that sets us apart.

Our experience allows us to see the potential in your project and we have a diverse in-house team of experts ready to transform your ideas and vision into reality.



OUR SERVICES AND WHO WE SERVE

McMahon, offers a broad spectrum of services, provided by our in-house team of professionals

Environment & Infrastructure

- Municipal Engineering
- Transportation
- Water Resources
- Environment & Ecology
- Site Development
- Land Surveying
- Geospatial Solutions

Architecture

Water & Wastewater

- Drinking Water
- Wastewater
- Renewable Fuels / Waste-to-Energy

Structures & Building Systems

- Structural Engineering
- Electrical / Controls
- Mechanical HVAC
- Plumbing Design

Industrial Engineering

Public Safety & Municipal Management

Value Added Services

- Construction Services
- Funding Strategies and Grant Assistance
- Public/Private Partnerships (P3)
- Operations Services
- Design/Build
- Engineered Environmental Solutions

Our capabilities are as diverse as the clients we serve

- Municipal / Civic
- Commerce / Retail
- Healthcare
- Education
- Dairy / Food Processing / Pulp & Paper
- Industry / Manufacturing
- Agriculture
- Transportation
- Tribal
- Energy / Utilities
- Police / Fire / EMS
- Hospitality / Sports / Entertainment
- Cultural / Faith-based
- Residential



THE McMAHON WAY

At the center of everything we do at McMahon is a service-inspired philosophy we call the McMahon Way. It's about values, culture and relationships. Every project we take on, every decision we make, every word we speak is guided by this philosophy.

Strong Core VALUES

We hire people who strongly identify with our team's core values.

Every person working for McMahon:

- Acts with honesty and integrity in all communications between clients and other team members
- Knows the value of work and effectively contributes to our operations
- Strives for excellence with the understanding that we can always improve
- Places the client and customers first in a service-oriented approach

CULTURE for Success

McMahon is dedicated to creating a work culture that mentors and empowers our team.

Together we:

- Invest in our employees
- Allow our employees to operate and innovate with independence
- Entrust and empower all employees to make the best decisions for their projects
- Present diverse design capabilities and expertise to clients

Build Long-Term RELATIONSHIPS

We take pride in becoming a trusted partner for our clients.

We build connections by:

- Taking time to truly understand our clients' needs, goals and challenges
- Communicating openly and effectively
- Always striving for client satisfaction

Values, culture and relationships. This is the McMahon Way.



Water Resources Management, regulatory requirements and permitting can be daunting and overwhelming subjects. McMAHON is uniquely qualified and highly respected as leaders in the field of water resources management. Serving both municipalities and developers, our team of engineers, scientists, and technicians apply their collective knowledge of hydrology, hydraulics, water quality and wetland science to develop thoughtful, efficient and economical solutions to address permitting requirements and the demands of current and future development.

McMAHON provides the following water resources management services:

- Water Resources Management Planning Strategies
- Stormwater Quality & Volume
- Hydrologic & Hydraulic Modeling
- Flood Control
- Stream Corridor Restoration
- Implementation & Monitoring
- Regulatory Agency Coordination & Permitting
- Full-Service Design
- Bidding & Construction Services
- Funding & Grant Assistance



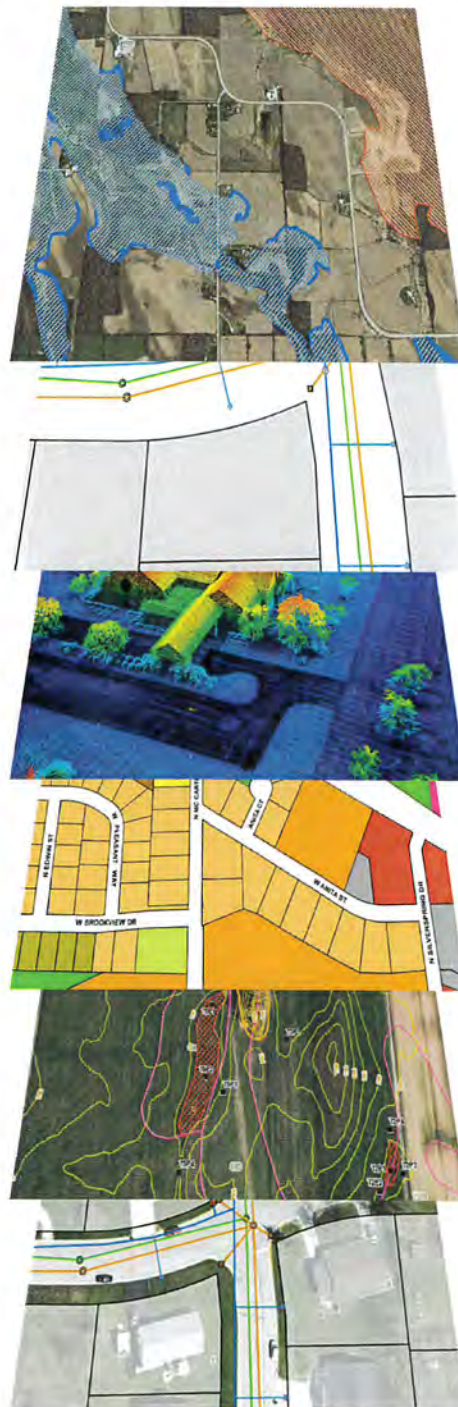
Geographical Information Systems (GIS) is a powerful tool that allows users to view, interpret, analyze and question all forms of geographically referenced information.

Using GIS technology, McMAHON can design, implement and maintain a GIS Program that integrates maps and data into a harmonic format, allowing access to the data interactively through an on-screen map. Paying attention to and understanding your needs allows McMAHON to customize a GIS Program that can be used as an efficient management tool for your community or organization.

Mapping the location of your assets, creates a more intelligent system which provides a greater understanding, optimizes performance and extends the life of its assets. This information is heavily relied upon to manage day-to-day operations. A GIS-based map provides an invaluable tool to make more informed decisions and better manage assets.

McMAHON provides the following GIS development services:

- GIS Needs Assessment
- AutoCAD Data Conversion
- Database Design & Maintenance
- GIS Technical Training & Support
- Asset Management Program Development
- Field Inspection Forms, Reporting & Mapping
- ArcGIS On-Line (AGOL) Development & Administration
- "Live" Data Dashboard Environments
- Facility Management GIS Applications
- Work-Order Management / GIS Integration



FOR GIS DEVELOPMENT SERVICES, CONTACT

Sam Pociask
Associate / Senior GIS Analyst
spociask@mcmgrp.com
920.751.4200 ext. 208

DOWNTOWN BLUFF AREA STREET RECONSTRUCTION - STORMWATER MANAGEMENT

APPLETON, WISCONSIN

BACKGROUND

The City of Appleton plans to reconstruct portions of Lawrence Street, Oneida Street, Morrison Street, and Durkee Street generally east of Appleton Street and south of College Avenue. Additionally, the City plans to construct stormwater improvements for a new Soldiers Square Parking Ramp. These reconstruction projects are related to a multi-block redevelopment of the Downtown Bluff Area, which includes other stakeholders.

Stormwater
Concept



EVALUATION

The City of Appleton retained McMAHON to perform a stormwater study on the existing infrastructure in this area and provide recommendations for stormwater improvements. The hydrologic and hydraulic analysis was performed using the XP-SWMM model. The water quality analysis was performed using the WinSLAMM model. McMAHON provided three concepts to the City, which included upsized storm sewer for conveyance and options such as hydrodynamic separators, underground detention facilities, and filtration for water quality benefits.

McMahon also provided design and permitting for the stormwater improvements, including storm inlet capacity. McMahon worked with the City to incorporate the stormwater design into the City's plan set.

PROJECT

The street and utility reconstruction project includes approximately 2,200 feet of Lawrence Street, Oneida Street, Morrison Street and Durkee Street from College Avenue to the cul-de-sac terminus south of Lawrence Street. The stormwater design chosen by the City includes approximately 1,770 feet of new storm sewer main line (ranging from 15-inch to 36-inch in diameter) and several underground water quality devices.

DETAILS

CLIENT: CITY OF APPLETON, WISCONSIN
CLIENT CONTACT: SUE OLSON, P.E., Project Engineer
920-832-6473
COMPLETION: 2022
PROJECT MANAGER: NICK VANDE HEY, PE
nvandehy@mcmgrp.com 920-751-4200
PROJECT ENGINEER: JOE HOECHST, PE
jhoechst@mcmgrp.com 920-751-4200

K2 DRAINAGE BASIN STORMWATER MANAGEMENT STUDY

APPLETON, WISCONSIN

BACKGROUND

The City of Appleton retained McMahon to re-evaluate the K2 Drainage Basin for compliance with NR 151 and the city's stormwater requirements. The K2 Drainage Basin includes several stormwater detention ponds that were constructed in 2003. Since then, several drainage basin characteristics and design variables have been modified including rainfall depths & distribution, soil group changes, land use changes, etc.

EVALUATION

The City of Appleton retained McMahon to prepare a stormwater management study to review the existing infrastructure in this area and provide recommendations for stormwater improvements. McMahon provided three concepts to the City, which included upsized storm sewer for conveyance and options to modify pond outlet structures to improve water quality benefits. The study included a peak discharge analysis, maximum flooding elevations and durations, and water quality results provided by the existing stormwater pond within the study area. The study also considered future development within the K2 Basin, including recommended future detention. The City plans to use the study to plan for long-term capital improvement projects.



DETAILS

CLIENT:	CITY OF APPLETON, WISCONSIN
CLIENT CONTACT:	SUE OLSON, P.E., Project Engineer 920-832-6473
COMPLETION:	2020
PROJECT MANAGER:	NICK VANDE HEY, PE nvandehey@mcmgrp.com 920-751-4200
PROJECT ENGINEER:	PHIL KLEMAN, CPESC pkleman@mcmgrp.com 920-751-4200

LAWRENCE UNIVERSITY PERMEABLE PAVEMENT GREEN STORMWATER INFRASTRUCTURE

APPLETON, WISCONSIN

BACKGROUND

Lawrence University wanted to reconstruct their parking lot at the Alexander Gym on campus. The City of Appleton required the site to achieve a 40% TSS reduction to satisfy their post-construction stormwater management ordinance. The University desired to investigate “non-traditional” green infrastructure to incorporate into the parking lot reconstruction project that would exceed City requirements. The University retained McMAHON to assist with developing green infrastructure concepts.

PROJECT

McMahon worked closely with university staff to develop a Green Infrastructure Concept Plan for the parking lot reconstruction project. This necessitated several meetings to review and discuss various green infrastructure, including permeable asphalt, permeable concrete, permeable pavers and linear sand filters. Long-term operation and maintenance was also reviewed and discussed with university staff. The concept plan is depicted below and includes details of the various green infrastructure selected for the site. An opinion of probable cost was also developed.



PROJECT CONCEPT

DETAILS

OWNER: LAWRENCE UNIVERSITY
COMPLETION: 2018
CONTACT: JOE KING, CONSTRUCTION MANAGER
920-979-4775
PROJECT MANAGER: RON WOLF, PE
rwolf@mcmgrp.com
PROJECT ENGINEER: PHIL KLEMAN, CPESC
pkleman@mcmgrp.com

RED OAK RAVINE STREAM RESTORATION GREEN STORMWATER INFRASTRUCTURE

CITY OF APPLETON & VILLAGE OF FOX CROSSING, WISCONSIN

BACKGROUND

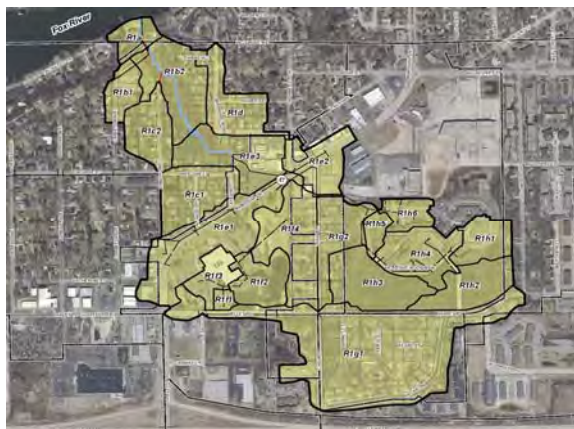
Red Oak Ravine is a wooded ravine partially located within the Village of Fox Crossing (Formerly Town of Menasha) and City of Appleton. An unnamed navigable stream meanders along the bottom of the wooded ravine and flows in a northwesterly direction before discharging into the Fox River. Over the past several decades, development has increased stormwater runoff volumes, peak flow rates and stream velocities within the Red Oak Ravine. These higher volumes, flow rates, and velocities have caused significant slope stability and erosion problems along the stream and ravine. Several riparian landowners along the ravine expressed concern for public safety and the potential for damage to their homes as a of failing banks/slopes. As such, the Village and City entered into an inter-governmental agreement to jointly construct the Red Oak Ravine Stream Restoration project.

PROJECT CHALLENGES

Numerous meetings with the riparian property owners occurred to discuss easements, regulatory permits and proposed streambank restoration/stabilization practices. In addition, several meetings with County, DNR and ACOE staff occurred to discuss regulatory permits, possible alternatives and feasibility. Ultimately, the project design was selected because it satisfies all project goals and was most accepted by the riparian property owners.

DESIGN SOLUTIONS

The project design included realigning, re-shaping and re-grading approximately 1,250 feet of waterway. The width of the restoration work across the ravine ranges from 30 to 50 feet. 16 grade control structures were installed with drops of 1 to 2 feet. The grade control structures and bank protection was lined with appropriately sized rip-rap. Native vegetation and trees were also planted along the stream corridor



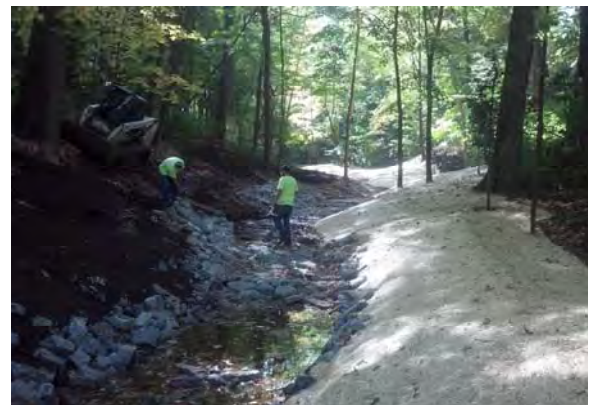
RED OAK RAVINE WATERSHED



PRE-PROJECT BANK EROSION



STEEP SLOPE REPAIR



GRADE CONTROL STRUCTURES

DETAILS

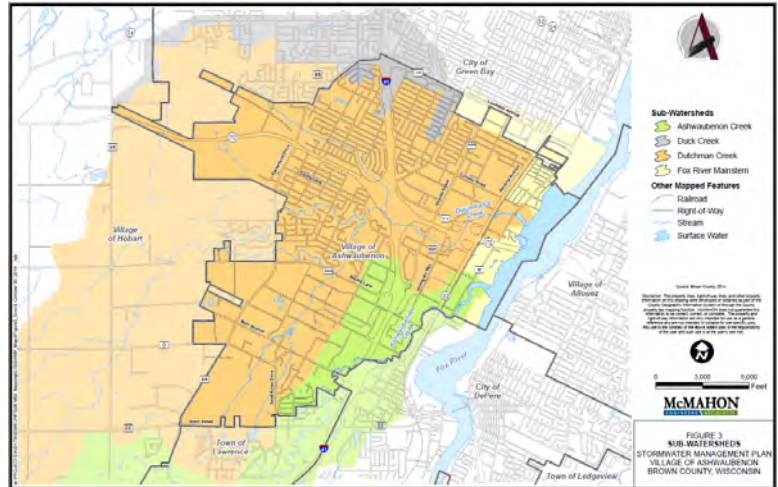
CLIENT:	VILLAGE OF FOX CROSSING, WISCONSIN
CLIENT CONTACT:	JEFF STURGELL 920-720-7101
COST:	\$360,000
COMPLETION:	2013
PROJECT MANAGER:	NICK VANDE HEY, PE – Client Contact, QA/QC, Project Management
PROJECT ENGINEER:	PHIL KLEMAN, CPESC – Design, Plan & Specifications, Permitting, Project Management

TMDL & GREEN INFRASTRUCTURE PLANNING

ASHWAUBENON, WISCONSIN

BACKGROUND

The Village obtained a Municipal Separate Storm Sewer System (MS4) Permit from the Wisconsin Department of Natural Resources (DNR). The Village's stormwater system discharges to Ashwaubenon Creek, Duck Creek, Dutchman Creek, and the Fox River, which are identified as 303(d) impaired waters. In 2012, the U.S. EPA approved a phosphorus and sediment Total Maximum Daily Load (TMDL) for these water bodies. For planning purposes, McMAHON assisted the Village with securing an UNPS&SW Planning Grant from the DNR.



PROJECT

McMAHON collaborated with the Village to complete the following services:

- Facilitated meetings with Village Staff, elected officials, and the public. Meetings included both public educational and involvement opportunities.
- Updated ordinances for the Village's construction site erosion control, post-construction stormwater management, and street sweeping programs.
- Updated policies and procedures for the Village's stormwater management program.
- Prepared a Village-Wide Stormwater Quality Management Plan and Plan of Action. McMAHON used the WinSLAMM model for the water quality analysis.
 - Evaluated baseline phosphorus and sediment loads, including reductions provided by current stormwater practices. Prioritized and ranked watershed areas.
 - Evaluated potential stormwater practices and retrofits for both parcels and street rights-of-way. Traditional practices included street sweeping, catch basin cleaning, wet detention ponds, and hydrodynamic separators. Green stormwater practices included biofiltration, rain gardens, permeable pavements, grass swales, filter strips, infiltration, filtration, and wetland systems. Enhanced pond settlement and enhanced leaf collection were also evaluated. Consideration was given to the Federal Aviation Administration (FAA) guidance on stormwater facilities, which have the potential to attract hazardous wildlife on or near airports.
 - Prepared Opinions of Probable Cost for individual practices, alternatives, and the plan of action. Ranked retrofit practices on a cost versus benefit basis. Summarized analysis in a written report and presented findings.
- Analyzed flood concerns in priority areas selected by the Village. McMAHON used the XP-SWMM hydrologic and hydraulic model for the peak discharge, flood, and/or extreme weather analysis.
- Prepared preliminary design of stormwater retrofits selected by the Village.



DETAILS

CLIENT: VILLAGE OF ASHWAUBENON, WISCONSIN
CLIENT CONTACT: STEVE BIRR, Village Engineer
920-492-2326
COMPLETION: 2018 & 2021
PROJECT ENGINEER: NICK VANDE HEY, PE
nvandehey@mcmgrp.com 920-751-4200
ANDY SCHMIDT, PE
aschmidt@mcmgrp.com 920-751-4200

BEACH PARK PERMEABLE PAVEMENT GREEN STORMWATER INFRASTRUCTURE

EGG HARBOR, WISCONSIN

BACKGROUND

Beach closure notices occurred at the only beach in a Village, which depends on tourism for their livelihood. The Village partnered with Door County and McMAHON to develop plans for best management practices to improve stormwater runoff quality; the cause of pollution.

CHALLENGES

Permitting projects on the shores of Lake Michigan takes considerable time and effort. The construction schedule needed to comply with permit conditions and occur during “off-season”.

CHALLENGES

Native plantings, beach grading, permeable pavement and two bioretention devices provide much needed stormwater treatment, runoff volume reductions, and water fowl deterrence.

McMAHON continues to work with the Village on stormwater treatment and runoff volume reduction practices to improve the Lake Michigan shoreline.

FUNDING

McMAHON wrote a successful Great Lake Restoration Initiative Grant obtaining funding.

AWARDS

- Recipient of the Gold Award in Commercial Design for a Concrete Paver Project by the Wisconsin Masonry Alliance.
- As a result of the stewardship and efforts to promote water quality, the Village was awarded the Water Star Community designation by the UW-Extension in 2011, recognizing efforts to improve surface, ground and recreational waters.



DETAILS

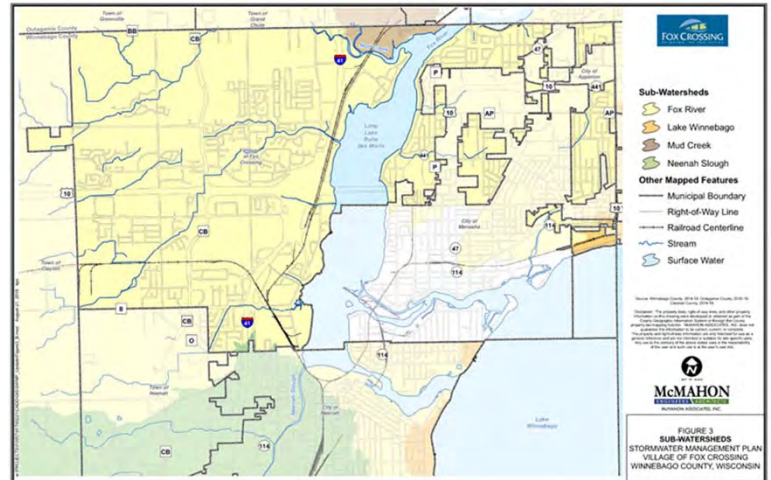
OWNER: VILLAGE OF EGG HARBOR
CONTACT: MEGAN SAWYER, Village Administrator
920.868.3334
PROJECT MANAGER: NICK VANDE HEY, PE
nvandehey@mcmgrp.com
PROJECT ENGINEER: JENNIFER SCHAFF, PE

TMDL & GREEN INFRASTRUCTURE PLANNING

FOX CROSSING, WISCONSIN

BACKGROUND

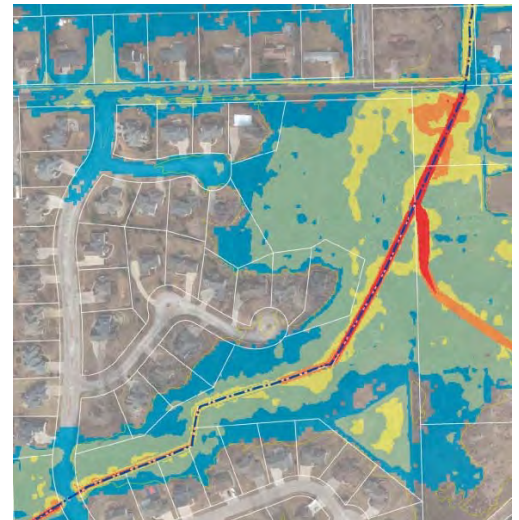
The Village obtained a Municipal Separate Storm Sewer System (MS4) Permit from the Wisconsin Department Resources (DNR). The Village's stormwater system discharges to Mud Creek, Neenah Slough, Fox River, and Lake Winnebago which are identified as 303(d) impaired waters. In 2012 and 2020, the U.S. EPA approved a phosphorus and sediment Total Maximum Daily Load (TMDL) for these water bodies. For planning purposes, McMAHON assisted the Village with securing an UNPS&SW Planning Grant from the DNR.



PROJECTS

McMAHON collaborated with the Village to complete the following services:

- Facilitated meetings with Village Staff, elected officials, and the public. Meetings included both public educational and involvement opportunities.
- Updated ordinances for the Village's construction site erosion control, post-construction stormwater management, and street sweeping programs.
- Updated policies and procedures for the Village's stormwater management program.
- Prepared a Village-Wide Stormwater Quality Management Plan and Plan of Action. McMAHON used the WinSLAMM model for the water quality analysis.
 - Evaluated baseline phosphorus and sediment loads, including reductions provided by current stormwater practices. Prioritized and ranked watershed areas.
 - Evaluated potential stormwater practices and retrofits for both parcels and street rights-of-way. Traditional practices included street sweeping, catch basin cleaning, wet detention ponds, and hydrodynamic separators. Green stormwater practices included biofiltration, rain gardens, permeable pavements, grass swales, filter strips, infiltration, filtration, and wetland systems. Enhanced pond settlement and enhanced leaf collection were also evaluated. Consideration was given to the Federal Aviation Administration (FAA) guidance on stormwater facilities, which have the potential to attract hazardous wildlife on or near airports.
 - Prepared opinions of probable cost for individual practices, alternatives, and the plan of action. Ranked retrofit practices on a cost versus benefit basis. Summarized analysis in a written report and presented findings.



2D Hydrologic & Hydraulic Analysis

- Analyzed and mapped Village-Wide flooding limits. McMAHON used the XP-SWMM hydrologic and hydraulic model for the 2D flooding and/or extreme weather analysis.
- Prepared preliminary design of stormwater retrofits selected by the Village.

DETAILS

CLIENT:	VILLAGE OF FOX CROSSING, WISCONSIN
CLIENT CONTACT:	JEFFREY STURGELL, Village Manager 920-720-7101
COMPLETION:	2018 & 2021
PROJECT MANAGER:	NICK VANDE HEY, PE nvandehy@mcmgrp.com 920-751-4200 ANDY SCHMIDT, PE aschmidt@mcmgrp.com 920-751-4200

GREEN VALLEY WATERSHED STUDY

FOX CROSSING, WISCONSIN

BACKGROUND

The Village of Fox Crossing desired to evaluate and implement improvements that would reduce flooding within the Green Valley Watershed, which is approximately 1,900 acres in size. A waterway flows from southwest to northeast through various neighborhoods, including the Green Valley residential neighborhood. The waterway discharges into Little Lake Butte des Morts and the Fox River. A Total Maximum Daily Load for excess phosphorus and sediment was recently developed for the Fox River, including the Green Valley Watershed.

McMahon was retained to evaluate hydrology and hydraulics along the Green Valley waterway. As part of the analysis, McMahon evaluated flood mitigation alternatives to reduce discharge rates, water elevations, and flooding volumes within the residential neighborhood.

CHALLENGES

- Flooding occurred along the Green Valley waterway for extended periods of time after a rainfall event
- The existence of a sluggish drainage system with minimal stream slopes, significant storage, and limited elevations

PROJECT

McMahon provided services including planning, hydrologic and hydraulic modeling, water quality modeling, design, permitting, and meetings.



100-year flooding along Green Valley Waterway



Green Valley Watershed



Waterway and culverts



DETAILS

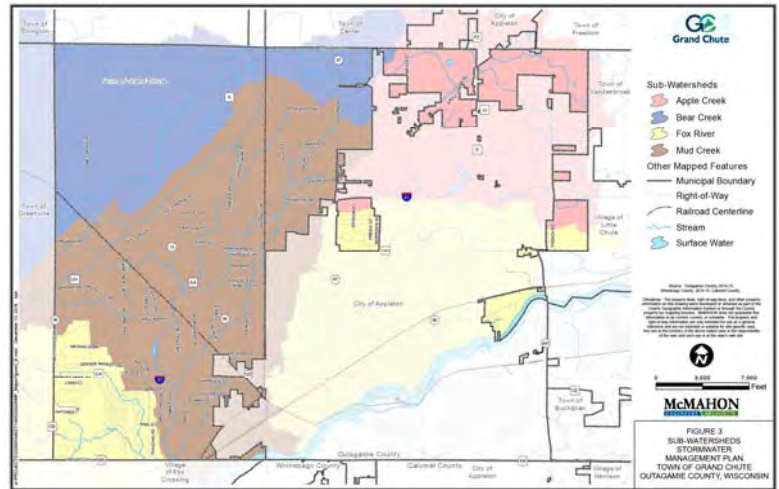
CLIENT:	VILLAGE OF FOX CROSSING, WISCONSIN
CLIENT CONTACT:	JEFFREY STURGELL, Village Manager 920-720-7101
COMPLETION:	2019
PROJECT MANAGER:	NICK VANDE HEY, PE nvandehey@mcmgrp.com 920-751-4200

TMDL & GREEN INFRASTRUCTURE PLANNING

GRAND CHUTE, WISCONSIN

BACKGROUND

The Town obtained a Municipal Separate Storm Sewer System (MS4) Permit from the Wisconsin Department of Natural Resources (DNR). The Town's stormwater system discharges to Apple Creek, Bear Creek, Mud Creek and Fox River which are identified as 303(d) impaired waters. In 2012 and 2020, the U.S. EPA approved a phosphorus and sediment Total Maximum Daily Load (TMDL) for these water bodies. For planning purposes, McMAHON assisted the Town with securing an UNPS&SW Planning Grant from the DNR.



PROJECT

McMAHON collaborated with the Town to complete the following services:

- Facilitated meetings with Town Staff, elected officials, and the public. Meetings included both public educational and involvement opportunities.
- Updated ordinances for the Town's construction site erosion control, post-construction stormwater management, and street sweeping programs.
- Updated policies and procedures for the Town's stormwater management program.
- Prepared a Town-Wide Stormwater Quality Management Plan and Plan of Action. McMAHON used the WinSLAMM model for the water quality analysis.
 - Evaluated baseline phosphorus and sediment loads, including reductions provided by current stormwater practices. Prioritized and ranked watershed areas.
 - Evaluated potential stormwater practices and retrofits for both parcels and street rights-of-way. Traditional practices included street sweeping, catch basin cleaning, wet detention ponds, and hydrodynamic separators. Green stormwater practices included biofiltration, rain gardens, permeable pavements, grass swales, filter strips, infiltration, filtration, and wetland systems. Enhanced pond settlement and enhanced leaf collection were also evaluated. Consideration was given to the Federal Aviation Administration (FAA) guidance on stormwater facilities, which have the potential to attract hazardous wildlife on or near airports.
 - Prepared opinions of probable cost for individual practices, alternatives, and the plan of action. Ranked retrofit practices on a cost versus benefit basis. Summarized analysis in a written report and presented findings.
- Analyzed and mapped Town-Wide flooding limits. McMahon used the XP-SWMM hydrologic and hydraulic model for the 2D flooding and/or extreme weather analysis.
- Prepared preliminary design of stormwater retrofits selected by the Town.



2D Hydrologic & Hydraulic Analysis

DETAILS

OWNER:	TOWN OF GRAND CHUTE, WISCONSIN
REFERENCE:	KATIE SCHWARTZ, PE, DPW 920.832.1581
COMPLETION:	2018 & 2022
PROJECT MANAGER:	NICK VANDE HEY, PE nvandehey@mcmgrp.com 920-751-4200
PROJECT ENGINEER:	ANDY SCHMIDT, PE aschmidt@mcmgrp.com 920-751-4200

CASALOMA DRIVE BIORETENTION GREEN STORMWATER INFRASTRUCTURE

GRAND CHUTE, WISCONSIN

BACKGROUND

McMahon provided design, permitting, bidding assistance and construction administration services for the urbanization of Casaloma Drive from Victory Lane to Prairie Song Lane.

With expanding area development and subsequent traffic increases, pedestrian safety became a concern. Therefore, the impetus behind the project was public safety, mainly for pedestrians and bicyclists. The Town also proposed storm sewer to address drainage issues, which the current ditches could not provide. A multi-modal trail was proposed south of Capitol Drive. Capitol Drive is the main east-west bicycle corridor and ties into the City of Appleton's trail system and associated planning.

EVALUATION

A new storm sewer and stormwater management system including thirteen bioretention or biofiltration devices were constructed as part of the project. McMahon obtained DNR permitting for wetland mitigation and the biofilters.

The urbanized street has a 37' B-B from Victory Lane north to Capitol Drive (commercial land use) and 33' B-B width north of Capitol Drive (residential land use). A 10-foot multi-modal trail runs parallel to the road along the east side from Victory Lane north to Capitol Drive. North of Capitol Drive, 5-foot sidewalks run along the east and west side of the roadway (from Capitol Drive to Prairie Song Drive).



Biofilters located in the terrace

PROJECT

The trail and sidewalk installation along the roadway resulted in limited space for stormwater management serving the urbanization project. Biofilters located in the terraces between the trail/sidewalk and curb and gutter were selected by the Town for the project. Driveways, utilities, laterals, wetlands, and property constraints further limited the biofilters. In order to provide required water quality credits, some biofilters included an infiltration component in the design to improve pollutant removal efficiencies. This was done by adding a storage layer below the biofilter to increase infiltration. In order to design for infiltration, the DNR requires further soil testing including test pits and infiltrometer testing which was completed by McMahon.



DETAILS

OWNER:	TOWN OF GRAND CHUTE, WISCONSIN
REFERENCE:	KATIE SCHWARTZ, PE, DPW 920.832.1581
SIZE:	1.0 MI
COST:	\$2.4 M
COMPLETION:	2018
PROJECT MANAGER:	NICK VANDE HEY, PE nvandehy@mcmgrp.com 920-751-4200
PROJECT ENGINEER:	ANDY SCHMIDT, PE aschmidt@mcmgrp.com 920-751-4200

STORMWATER BASIN 313 HYDROLOGIC & HYDRAULIC ANALYSIS

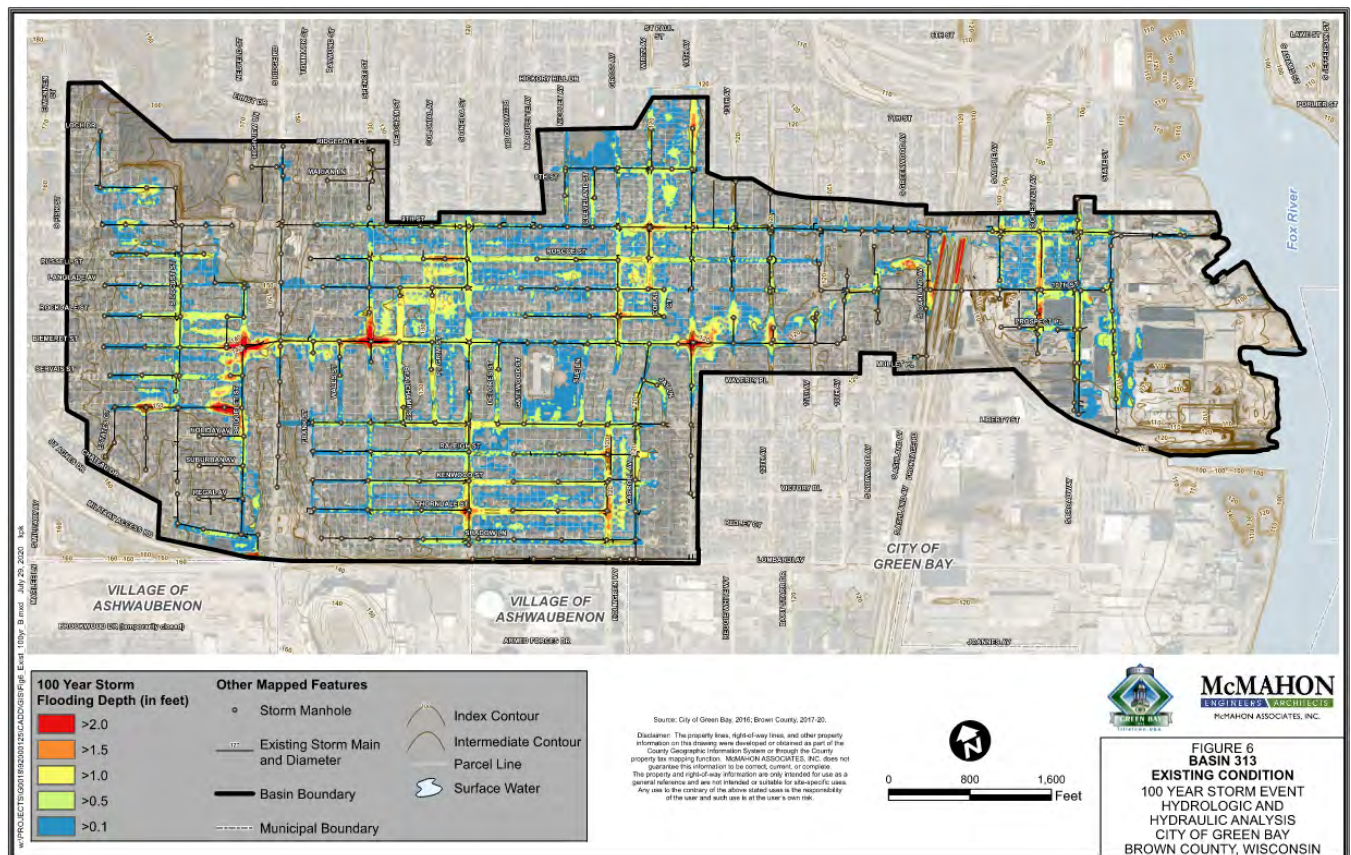
GREEN BAY, WISCONSIN

BACKGROUND

The City of Green Bay retained McMAHON to perform a Hydrologic & Hydraulic (H&H) analysis of the City of Green Bay Stormwater Basin 313, which has experienced high-water storm drainage issues in recent history with private property damage occurring in some instances. Specifically, along S. Broadway Street, between 10th Street and the railroad tracks. The City has monitored the flooding complaints using sensors placed on the underside of storm sewer manhole covers. Based on the sensors, the storm sewers have surcharged on multiple occasions during August and September of 2019. Services included modeling and mapping the 800-acre basin to evaluate locations of high water and drainage issues.

EVALUATION

The City of Green Bay retained McMAHON to prepare a H&H model of the storm sewer system within Basin 313 for the purpose of assessing the capacity of the City's existing storm water conveyance system and to analyze potential modifications to the existing system. McMAHON modeled Basin 313 in 2D to show the existing flooding conditions and the results of selected management options. Complexities of Basin 313 included calibrating specific, real-life storm events, to the manhole sensors installed by the City and accounting for the seiche effect. Seiches are typically caused when strong winds and rapid changes in atmospheric pressure push water from one end of a body of water to the other. In this case, it is north winds from Lake Michigan that push water south into the Bay of Green Bay. McMAHON provided several concepts to the City, which included upsized storm sewer for conveyance, a stormwater pond, and an underground detention facility. The City plans to use the H&H analysis for long-term capital improvement projects.



DETAILS

CLIENT: CITY OF GREEN BAY, WISCONSIN
CLIENT CONTACT: MATT HECKENLAIBLE, Utility Manager 920-448-3112
COMPLETION: 2020
PROJECT MANAGER: NICK VANDE HEY, PE nvandehy@mcmgrp.com 920-751-4200
PROJECT ENGINEER: SHAWN JANDREY, PE sjandrey@mcmgrp.com 920-751-4200

STORMWATER BASIN 581 HYDROLOGIC & HYDRAULIC ANALYSIS

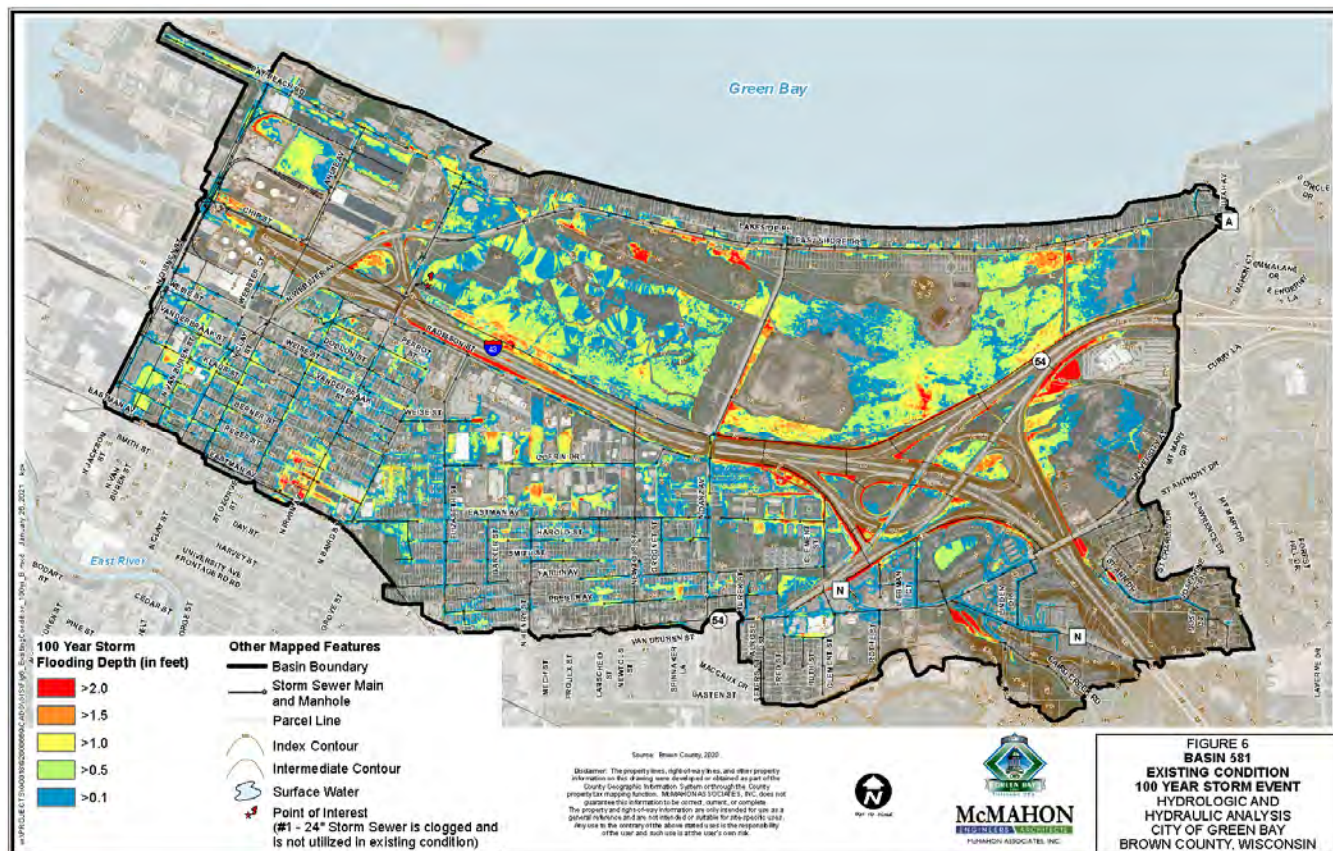
GREEN BAY, WISCONSIN

BACKGROUND

The City of Green Bay retained McMAHON to perform a Hydrologic & Hydraulic (H&H) analysis of the City of Green Bay Stormwater Basin 581, and sub-drainage basins 579, 417, 421, 413, 415, 427, 519, and 521. The north side of the drainage basin has experienced high-water storm drainage issues in recent history. Specifically, along East Shore Drive and portions of Irwin Avenue near the Bay Beach Amusement Park. Services included modeling and mapping the 2,300-acre basin to evaluate locations of high water and drainage issues.

EVALUATION

The City of Green Bay retained McMAHON to prepare a H&H model of the storm sewer system within Basin 581 for the purpose of assessing the capacity of the City's existing storm water conveyance system and to analyze potential modifications to the existing system. McMAHON modeled Basin 581 in 2D to show the existing flooding conditions and the results of selected management options. Complexities of Basin 581 included two lift stations, each with multiple pumps, and accounting for the seiche effect. Seiches are typically caused when strong winds and rapid changes in atmospheric pressure push water from one end of a body of water to the other. In this case, it is north winds from Lake Michigan that push water south into the Bay of Green Bay. McMAHON provided several concepts to the City, which included upsized storm sewer for conveyance and dry ponds at several different sites to provide dry detention. Another option included upsizing the lift station pumps. The City plans to use the H&H analysis for long-term capital improvement projects.



DETAILS

CLIENT: CITY OF GREEN BAY, WISCONSIN
 CLIENT CONTACT: MATT HECKENLAIBLE, Utility Manager
 920-448-3112
 COMPLETION: 2022
 PROJECT MANAGER: NICK VANDE HEY, PE
 PROJECT ENGINEER: SHAWN JANDREY, PE

FAIRWINDS & VILLAGE GARAGE RAIN GARDENS GREEN STORMWATER INFRASTRUCTURE

VILLAGE OF GREENVILLE, WISCONSIN

BACKGROUND

McMahon assisted the Village of Greenville with design, bidding and construction services for a Green Infrastructure Project to reduce sediment and phosphorus pollutant loads to Bear Creek, a 303(d) impaired water body. McMahon also assisted the Village with applying and securing a DNR UNPS&SW Construction Grant for the project. The Village goal was to improve water quality, educate the public and eliminate sump pump discharges that historically caused wet, unmaintainable ditch bottoms.

PROJECT

The project included retrofitting rain gardens and sand filters within the roadside ditches of Fairwinds Drive and within existing dry ponds at the Village's Municipal Garage. The project also including installing a mini-storm sewer system along Fairwinds Drive to collect and convey sump pump discharges, rather than allowing them to discharge into the ditches. The project required permitting by Wisconsin DNR and US Army Corps of Engineers. McMahon worked closely with the Village to satisfy WDNR grant funding requirements. As part of WDNR approval, the Village performed double ring-infiltrometer testing at the bottom of each device to better predict native infiltration rates used to determine runoff volume and pollutant load reductions. Most residents did not desire a traditional rain garden bed planted with plants. As such, many of the rain gardens were seeded with turf grass, resulting in a stormwater BMP that blends in with the adjacent residential lawns. Several property owners desired to have more traditional plantings installed, including native flowers or shrubs.



STREET RAIN GARDEN



DOUBLE RING INFILTRMETER TESTING

DETAILS

OWNER:	VILLAGE OF GREENVILLE, WISCONSIN
COST:	\$378,000
COMPLETION:	2019
CONTACT:	CHRIS PAGELS, STORMWATER SUPT 920-841-2244
PROJECT MANAGER:	NICK VANDE HEY, PE nvandehey@mcmgrp.com
PROJECT ENGINEER:	PHIL KLEMAN, CPESC pkleman@mcmgrp.com

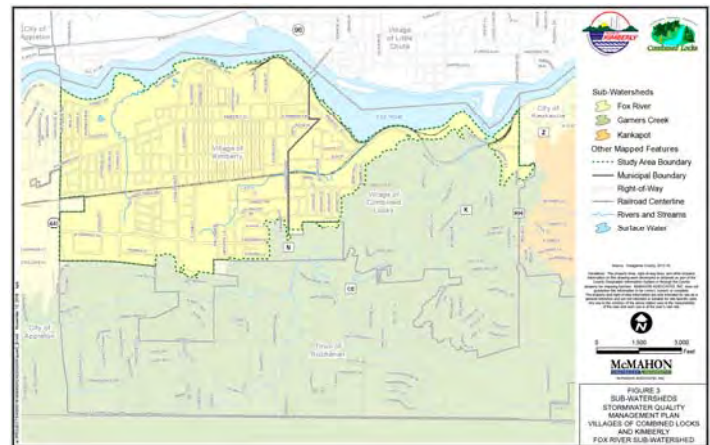
TMDL & GREEN INFRASTRUCTURE PLANNING

KIMBERLY, WISCONSIN

BACKGROUND

The Village obtained a Municipal Separate Storm Sewer System (MS4) Permit from the Wisconsin Department of Natural Resources (DNR). The Village's stormwater system discharges to Garners Creek and Fox River which are identified as 303(d) impaired waters. In 2012, the U.S. EPA approved a phosphorus and sediment Total Maximum Daily Load (TMDL) for these water bodies. For planning purposes, McMAHON assisted the Village with securing an UNPS&SW Planning Grant from the DNR.

This was a joint project between Village of Kimberly and Village of Combined Locks. The two municipalities combined their pollutant loads within the Fox River Sub-Watershed and worked together on several retrofit projects. The former industrial flats along the Fox River provided unique retrofit opportunities.



PROJECT

McMAHON collaborated with the two Villages to complete the following services:

- Facilitated meetings with Village Staffs, elected officials, and the public. Meetings included both public educational and involvement opportunities.
- Updated ordinances for each Village's construction site erosion control, post-construction stormwater management, and street sweeping programs.
- Updated policies and procedures for each Village's stormwater management program.
- Prepared a Village-Wide Stormwater Quality Management Plan and Plan of Action. McMAHON used the WinSLAMM model for the water quality analysis.
 - Evaluated baseline phosphorus and sediment loads, including reductions provided by current stormwater practices. Prioritized and ranked watershed areas.
 - Evaluated potential stormwater practices and retrofits for both parcels and street rights-of-way. Traditional practices included street sweeping, catch basin cleaning, wet detention ponds, and hydrodynamic separators. Green stormwater practices included biofiltration, rain gardens, permeable pavements, grass swales, filter strips, infiltration, filtration, and wetland systems. Enhanced pond settlement and enhanced leaf collection were also evaluated.
 - Prepared opinions of probable cost for individual practices, alternatives, and the plan of action. Ranked retrofit practices on a cost versus benefit basis. Summarized analysis in a written report and presented findings.
- Analyzed flood concerns in priority areas selected by each Village. McMahon used the XP-SWMM hydrologic and hydraulic model for the peak discharge, flood, and/or extreme weather analysis.
- Prepared preliminary design of stormwater retrofits selected by the two Villages.



DETAILS

OWNER:	VILLAGE OF KIMBERLY, WISCONSIN
REFERENCE:	ALLYN DANHOFF Kimberly Director of Operations 920.788-7507 RYAN SWICK, Combined Locks PW Foreman 920.788.7744
COMPLETION:	2018 & 2021
PROJECT MANAGER:	NICK VANDE HEY, PE nvandehay@mcmgrp.com
PROJECT ENGINEER:	PHIL KLEMAN, CPESC pkleman@mcmgrp.com

MEMORIAL PARK POND

KIMBERLY, WISCONSIN

BACKGROUND

The Village is redeveloping the former mill property located along the Fox River. The 90-acre redevelopment is a major project for the Village and will significantly change the character of the neighborhood. As such, the Village desired to create a “grand entrance” for the redevelopment site through the rehabilitation of Memorial Park, an unutilized area of their parkway system. The property would include a Regional Stormwater Facility that provides both recreational and aesthetic enhancement and also provides a link to the downtown and school. The Village wanted the stormwater pond to maximize water quality benefits and improve flooding in storm sewers.

FEATURES

The design included a recreational trail, bollard lighting, benches, pavilion, retaining walls, stormwater pond, three fountains, and significant landscaping. Landscaping consists of turf grass, wildflowers, wetland plantings, much beds, trees, shrubs and flowers.

PROJECT

McMahon provided planning, design, permitting, bidding and construction services. McMahon also assisted with applying for a DNR grant.



Trail, retaining wall, railing, bollard lights, and landscape beds



Park concept drawing



DETAILS

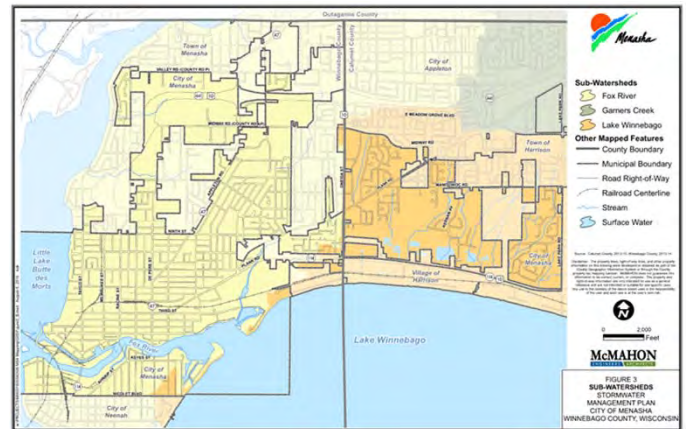
OWNER:	VILLAGE OF KIMBERLY, WISCONSIN
REFERENCE:	ALLYN DANNHOFF, Director of Operations 920.788-7507
COMPLETION:	2018
PROJECT MANAGER:	NICK VANDE HEY, PE nvandehey@mcmgrp.com 920-751-4200
PROJECT ENGINEER:	PHIL KLEMAN, CPESC pkleman@mcmgrp.com 920-751-4200

TMDL & GREEN INFRASTRUCTURE PLANNING

MENASHA, WISCONSIN

BACKGROUND

The City obtained a Municipal Separate Storm Sewer System (MS4) Permit from the Wisconsin Department of Natural Resources (DNR). The City's stormwater system discharges to Garners Creek, Fox River, and Lake Winnebago which are identified as 303(d) impaired waters. In 2012 and 2020, the U.S. EPA approved a phosphorus and sediment Total Maximum Daily Load (TMDL) for these water bodies. For planning purposes, McMAHON assisted the City with securing an UNPS&SW Planning Grant from the DNR.



PROJECT

McMAHON collaborated with the City to complete the following services:

- Facilitated meetings with City Staff, elected officials, and the public. Meetings included both public educational and involvement opportunities.
- Updated ordinances for the City's construction site erosion control, post-construction stormwater management, and street sweeping programs.
- Updated policies and procedures for the City's stormwater management program.
- Prepared a City-Wide Stormwater Quality Management Plan and Plan of Action. McMAHON used the WinSLAMM model for the water quality analysis.
 - Evaluated baseline phosphorus and sediment loads, including reductions provided by current stormwater practices. Prioritized and ranked watershed areas.
 - Evaluated potential stormwater practices and retrofits for both parcels and street rights-of-way. Traditional practices included street sweeping, catch basin cleaning, wet detention ponds, and hydrodynamic separators. Green stormwater practices included biofiltration, rain gardens, permeable pavements, grass swales, filter strips, infiltration, filtration, and wetland systems. Enhanced pond settlement and enhanced leaf collection were also evaluated.
 - Prepared opinions of probable cost for individual practices, alternatives, and the plan of action. Ranked retrofit practices on a cost versus benefit basis. Summarized analysis in a written report and presented findings.
- Analyzed flood concerns in priority areas selected by the City. McMAHON used the XP-SWMM hydrologic and hydraulic model for the peak discharge, flood, and/or extreme weather analysis.
- Prepared preliminary design of stormwater retrofits selected by the City.



2D Hydrologic & Hydraulic Analysis

DETAILS

CLIENT:	CITY OF MENASHA, WISCONSIN
CLIENT CONTACT:	LAURA JUNGWIRTH, PW Director 920.967.3620
COMPLETION:	2015, 2019, 2023 Update is Ongoing
PROJECT MANAGER:	NICK VANDE HEY, PE nvandehey@mcmgrp.com ANDY SCHMIDT, PE aschmidt@mcmgrp.com

NESHOTAH BEACH WETLAND GREEN STORMWATER INFRASTRUCTURE

TWO RIVERS, WISCONSIN

BACKGROUND

McMahon assisted the City of Two Rivers with a green infrastructure grant, design, bidding and construction services for a wetland retrofit project proposed by the city. The project goal was to improve the water quality at Neshotah Beach along Lake Michigan by detaining and treating storm sewer discharge at the Lake outfall. First flush storm runoff discharge from storm sewer was to be directed to a constructed treatment wetland designed to maintain water levels at or above the fluctuating levels of the lake. Bacteria, nutrients and roadside chemicals will be contained within the constructed wetland during most normal rain events, thus greatly reducing the discharge of these contaminants onto the public beach area.

The City applied for and received an EPA Great Lakes Restoration Initiative (GLRI) Shoreline Cities Green Infrastructure Grant for the project.



CONSTRUCTED WETLAND

PROJECT

The Wetland required permitting by Wisconsin DNR and US Army Corps of Engineers. McMahon worked closely with the City to satisfy GLRI grant funding requirements during the permitting, design, bidding and construction process. The project was constructed along the shoreline of Lake Michigan and was fully funded by the EPA under the GLRI funding source.

Under Construction: NESHOTAH BEACH NORTH CONSTRUCTED WETLAND

PROJECT OVERVIEW:

- Green Infrastructure project.
- Infiltration basin to remove surface water runoff pollutants such as organics and metals before discharge into Lake Michigan to improve beach water quality and reduce beach closures.
- Includes restoration of Sandreed Grass & Sand Dune Willow existing in the area.
- The Project includes a sump manhole which will be vacuumed to remove deposited sand and debris.
- Excavated sand will be stockpiled, spread and groomed into Neshotah Beach above the Ordinary High Water Mark (OHWM) to enhance the volume of sand on the beach.

50-Acre Watershed
Plan View

PROJECT FUNDING:

- The City received a Great Lakes Shoreline Cities Green Infrastructure Grant from the Federal Environmental Protection Agency (EPA).
- The GLSCGI Grant is through the EPA's Great Lake Restoration Initiative (GLRI) Grant program.
- The City is eligible for 100% of the project costs up to \$175,000.
- The project is anticipated to cost less than the grant award.

PROJECT SIGNAGE



DETAILS

OWNER:	CITY OF TWO RIVERS, WISCONSIN
SIZE:	0.15 AC
COST:	\$100,000
COMPLETION:	2018
CONTACT:	JIM McDONALD, PE - DPW 920-793-5540
PROJECT MANAGER:	NICK VANDE HEY, PE nvandehey@mcmgrp.com
PROJECT ENGINEER:	ANDY SCHMIDT, PE aschmidt@mcmgrp.com

Team Qualifications

McMAHON has assembled an experienced Project Team who specialize in water resource engineering. The Project Team identified will be performing the work covered by this Proposal and will not be substituted with other staff without the City's prior approval. McMAHON does not anticipate any changes in key staff during the project. However, McMAHON does have eight full-time water resource engineers on staff if additional personnel resources are needed during this project. For reference, the proposed Project Team assembled for this project are located at McMAHON's Neenah Headquarters / Office.

NICHOLAS A. VANDE HEY, P.E. will be the Project Manager and primary contact person for the City of Green Bay project. Nick will interface with City Staff and other stakeholders as needed. Nick will facilitate meetings, develop strategies, provide quality control, manage schedules, and oversee tasks completed by the Project Team. In Northeast Wisconsin, Nick has provided similar services to numerous municipalities including the City of Appleton, Village of Ashwaubenon, Village of Combined Locks, Village of Fox Crossing, Town of Grand Chute, City of Green Bay, Village of Greenville, Village of Kimberly, Town of Lawrence, City of Menasha, City of Neenah, City of Two Rivers, and many more. Nick has 27 years of water resource experience.

Nick is a Technical Advisory Committee member for several Wisconsin DNR regulatory updates related to runoff management, state-wide phosphorus, effluent limits, and total maximum daily loads. Nick is an Advisory Team member for several stormwater standards and guidance documents developed by the Wisconsin Standards Oversight Council. Nick is a stakeholder for the Wisconsin Initiative on Climate Change Impacts (WICCI). Nick is a past Council Member of Northeast Wisconsin Stormwater Consortium and past President of Fox-Wolf Watershed Alliance. Lastly, Nick is a past instructor for UW-Madison Engineering Professional Development short courses related to green infrastructure.

ANDREW W. SCHMIDT, P.E. will be the primary water resource engineer for the City's project. Andy will review available information, analyze watersheds, develop model concepts, and prepare concepts, opinions of probable cost, and reports. Andy has provided similar services to many municipalities including the Village of Ashwaubenon, Village of Fox Crossing, Town of Grand Chute, Town of Lawrence, City of Menasha, City of Seymour, City of Two Rivers, and many more. Andy has 18 years of water resource experience.

SHAWN M. JANDREY, P.E. will assist Andy as the secondary water resource engineer for the City's project. Shawn will assist Andy with analyzing watersheds, developing models, and preparing concepts, opinions of probable cost, and reports. In Northeast Wisconsin, Shawn has provided similar services to many municipalities including the Village of Fox Crossing, Town of Grand Chute, City of Green Bay, Village of Kimberly, City of Two Rivers, and many more. Shawn has 7 years of water resource experience.

KARIN P. KOOLS-SCHEEL will be the primary ESRI ArcGIS Analyst for the City's project. Karin provides GIS services, including database management and report figures. Karin has 26 years of experience.

Detailed resumes of each Team Member are included herein.

NICHOLAS A. VANDE HEY, PE

VICE PRESIDENT / SR. MUNICIPAL & WATER RESOURCES ENGINEER

PROJECTS

Appleton (City of), WI

- Downtown Bluff Area - Stormwater Management
- Evergreen Drive & Alvin Street – Stormwater Study & Design
- Evergreen Heights – Underground Detention
- K2 Basin - Stormwater Management Study
- Lawrence University Permeable Pavement, Green Infrastructure
- Red Oak Ravine Stream Restoration, Green Infrastructure

Ashwaubenon (Village of), WI

- Holmgren Wet Detention Pond
- Main Avenue Wet Detention Pond
- Sand Acres Stream Restoration, Green Infrastructure
- TMDL & Green Infrastructure Planning

Egg Harbor (Village of), WI

- Beach Park Permeable Pavement, Green Infrastructure

Fox Crossing (Village of), WI

- American Drive Stream Corridor
- Green Valley Watershed Study
- O’Hauser Park Bioretention, Green Infrastructure
- TMDL & Green Infrastructure Planning

Grand Chute (Town of), WI

- Bluemound Drive Bioretention, Green Infrastructure
- Casaloma Drive Bioretention, Green Infrastructure
- Gillett Street Urbanization & Wet Pond
- TMDL & Green Infrastructure Planning

Green Bay (City of), WI

- Stormwater Basin 313 H&H Analysis
- Stormwater Basin 581 H&H Analysis
- Seymour Park Stormwater Management Design
- Bay Beach Wildlife Sanctuary Bioretention, Green Infrastructure

Greenville (Village of), WI

- Fairwinds & Village Garage Rain Gardens, Green Infrastructure

Kimberly (Village of), WI

- Cedar West Wet Detention Pond
- Memorial Park Pond
- Treaty Park Wet Detention Pond
- TMDL & Green Infrastructure Planning

Menasha (City of), WI

- Brin Underground Detention
- Tayco Wet Detention Pond
- TMDL & Green Infrastructure Planning

Neenah (City of), WI

- MS4 & TMDL Stormwater Planning

Oshkosh (City of), WI

- Glatz Creek Watershed Study

Two Rivers (City of), WI

- 20th Street / Eggers Wet Detention Pond
- 25th Street Rain Garden, Green Infrastructure
- Neshotah Beach Wetland, Green Infrastructure
- MS4 Stormwater Planning



nvandehey@mcmgrp.com
920.751.4200 ext. 228
C: 920.850.1871

SPECIALIZED COMPETENCE

Stormwater Planning & Evaluation
Design, Bidding & Construction
Floodplain & Water Surface Profile Analysis (HEC-1, TR-55, HEC-2, HEC-RAS, TR-20, HEC HMS, SWMM)
Hydraulic Analysis of Sewer Systems (Hydraflow, XP-Rat, StormCAD, SWMM)
Stormwater Quality & BMP Facilities (SLAMM, P8, SWAT, Pondpack, SWMM)
Erosion Control, Grading & Drainage

ACADEMIC BACKGROUND

B.S. - Civil & Environmental Engineering -
University of Wisconsin-Madison
Sand Filter Design - Engineers & Surveyors Institute
Adequate Stormwater Outfall - Engineers & Surveyors Institute
HEC-1 Modeling Workshop
Hydraulic Design of Culverts
HEC-HMS Modeling Workshop
Organizing & Financing Stormwater Utilities
Creating & Using Wetlands for Wastewater & Stormwater Treatment & Water Quality Improvement
Wisconsin Wetland Workshop
SWMM Modeling Workshop
Designing Bio/Infiltration BMP's for Stormwater Quality Improvement

PROFESSIONAL AFFILIATIONS

American Society of Civil Engineers
Fox-Wolf Watershed Alliance
Northeast Wisconsin Stormwater Consortium

PROFESSIONAL REGISTRATION

Professional Engineer:
State of Wisconsin
State of Illinois

ANDY W. SCHMIDT, PE

MUNICIPAL & WATER RESOURCES ENGINEER

PROJECTS

Ashwaubenon (Village of), WI
Holmgren Wet Detention Pond
Main Avenue Wet Detention Pond
Sand Acres Stream Restoration, Green Infrastructure
TMDL & Green Infrastructure Planning

De Pere (City of), WI
WPS Business Park Stormwater Pond Modification

Ephraim (Village of), WI
Lake Michigan Shoreline Flooding Analysis

Fox Crossing (Village of), WI
American Drive Stream Corridor
Cold Spring Wet Detention Pond
Independence Wet Detention Pond
O'Hauser Park Bioretention, Green Infrastructure
TMDL & Green Infrastructure Planning

Grand Chute (Town of), WI
Casaloma Drive Bioretention, Green Infrastructure
TMDL & Green Infrastructure Planning

Lawrence (Town of), WI
Carpenter Crossing Wet Detention Pond
Fox Valley Auto Auction Pond
Orde Pond (South Business Park Stormwater Pond)
MS4 & TMDL Stormwater Planning
Stormwater Management Plan Reviews

Little Chute (Village of), WI
Polk Wet Detention Pond
Buchanan and Industrial Wet Detention Ponds

Menasha (City of), WI
Brin Underground Detention
Stormwater Pollution Prevention Plan
Tayco Wet Detention Pond
TMDL & Green Infrastructure Planning

Neenah (City of), WI
MS4 & TMDL Stormwater Planning

Seymour (City of), WI
Little Henry Creek / North Pearl Street Stormwater Study
Crestview Detention Pond

Two Rivers (City of), WI
Columbus & Hawthorne Wet Detention Ponds
Wentker Wet Detention Pond
25th Street Rain Garden, Green Infrastructure
Lake Michigan Shoreline Erosion & Outfalls
Neshotah Beach Wetland, Green Infrastructure
MS4 Stormwater Planning

Wrightstown (Village of), WI
Alleluia Lutheran Church Bioretention, Green Infrastructure



aschmidt@mcmgrp.com
920.751.4200 ext. 219
C: 920.428.1974

SPECIALIZED COMPETENCE

Design, Bidding & Construction
Stormwater Planning & Evaluation
Hydraulic Analysis of Sewer Systems (XP-SWMM)
Stormwater Quality & BMP Facilities (P8, Pond-Pack, SLAMM, XP-SWMM)
Storm Sewer, Sanitary Sewer, Water Systems, Streets, Parking Lots
Erosion Control, Grading & Drainage Plans
Erosion Control Planning
Construction Observation
Storm Sewer
Stormwater Pond Construction

ACADEMIC BACKGROUND

B.S. - Civil Engineering / University of Wisconsin – Platteville

PROFESSIONAL REGISTRATION

Professional Engineer: Wisconsin

SHAWN M. JANDREY, PE

MUNICIPAL & WATER RESOURCES ENGINEER

PROJECTS

Brillion (City of), WI
City Hall Bioretention, Green Infrastructure
Cedar Grove (Village of), WI
Commerce Street Stormwater Management
Sixth Street Sports Complex Stormwater Management
Center (Town of), WI
Mueller Storage Bioretention, Green Infrastructure
Fox Crossing (Village of), WI
American Drive Stream Corridor
Jacobsen Road Stormwater Management
Stormwater Management Plan Reviews
Grand Chute (Town of), WI
Casaloma Wet Detention Pond
Grand Market Drive Stormwater Study
Whispering Grove Drainage Analysis
Stormwater Management Plan Reviews
Green Bay (City of), WI
Stormwater Basin 106 H&H Analysis
Stormwater Basin 313 H&H Analysis
Stormwater Basin 342 H&H Analysis
Stormwater Basin 581 H&H Analysis
Seymour Park Stormwater Management Design
Bay Beach Wildlife Sanctuary Bioretention, Green Infrastructure
Greenville (Village of), WI
Fairwinds & Village Garage Rain Gardens, Green Infrastructure
Harrison (Village of), WI
Cobble Creek Floodplain and Stormwater Management
Schmidt Road Floodplain Study
Stormwater Management Plan Reviews
Kimberly (Village of), WI
Cedar West Wet Detention Pond
Cedar Central Stormwater Management
Memorial Park Pond
Oshkosh (City of), WI
Glacial Dental Bioretention, Green Infrastructure
Outagamie County, WI
French Road Floodplain Study
CTH O Drainage Study
Sherwood (Village of), WI
Stormwater Management Plan Reviews
Stockbridge (Village of), WI
Project Lakeside Stormwater Management
Two Rivers (City of), WI
20th Street / Eggers Wet Detention Pond
Neshotah Beach Wetland, Green Infrastructure
Wrightstown (Village of), WI
Alliance Films Drainage

McMAHON
ENGINEERS ARCHITECTS



sjandrey@mcmgrp.com
920.751.4200 ext. 211
C: 920.562.7551

SPECIALIZED COMPETENCE

Stormwater Planning & Evaluation
Design, Bidding & Construction
Floodplain & Water Surface Profile Analysis (TR-55, HEC-RAS, HEC HMS, SWMM)
Hydraulic Analysis of Sewer Systems (SWMM)
Stormwater Quality & BMP Facilities (SLAMM, Pondpack, SWMM)
Erosion Control, Grading & Drainage

ACADEMIC BACKGROUND

B.S. Biological Systems Engineering; Emphasis -
Natural Resource & Environmental Engineering;
University of Wisconsin-Madison / 2015

M.S. Environmental Engineering
University of Wisconsin-Madison / 2018

CERTIFICATIONS

Certificate in Engineering for Energy Sustainability
Fundamentals of Engineering (FE) Examination

PROFESSIONAL AFFILIATIONS

ASABE (American Society of Agricultural &
Biological Engineers); Member

PROFESSIONAL REGISTRATION

Professional Engineer:
State of Wisconsin

KARIN P. KOOLS-SCHEEL

GIS ANALYST

PROJECTS

PRELIMINARY WELL & PONDING SITING

Provide Geoprocessing Support for Engineers & Local Decision Makers

Brillion, WI

Chilton, WI

Fox Crossing, WI

Little Chute, WI

Neenah, WI

Wild Rose, WI

STORMWATER PROJECTS

Assist Engineers with Data Acquisition, Geoprocessing, & Map Production

Allouez, WI

Appleton, WI

Ashwaubenon, WI

Combined Locks, WI

Fox Crossing, WI

Grand Chute, WI

Green Bay, WI

Harrison, WI

Kaukauna, WI

Kimberly, WI

Lawrence, WI

Little Chute, WI

Manitowoc, WI

Menasha, WI

Neenah, WI

Sherwood, WI

Two Rivers, WI

PRESENTATION MAPPING/MEETING MATERIALS

Brillion, WI - FEMA Floodplain

Denmark, WI – Rural Development

Heart of the Valley Metropolitan Sewerage District, Kaukauna, WI - Marine Manhole Rehabilitation

Kimberly, WI - Pedestrian Underpass

Monroe Center, IL - Utility Improvements

Wild Rose, WI - Mill Pond Pedestrian Trail

GIS DATA CONVERSIONS (CAD TO GIS) AND UPDATES:

Belgium, WI

Fox Crossing, WI

Westville, IN

Wheatfield, IN



kkools-scheel@mcmgrp.com

920.751.4200 ext. 220

SPECIALIZED COMPETENCE

AutoCAD Drafting for Local Street Projects

GIS Mapping

Presentation Mapping

CAD to GIS Conversions

ACADEMIC BACKGROUND

BS in Geography – UW–Oshkosh; 1996

ESRI Certified GIS (Geographic Information Systems) Training; 1998

TECHNOLOGY/SOFTWARE

GIS – Archview 3.x, Arcinfo, ArcGis Desktop

(ArcInfo/ArcEditor, ArcView), ArcCatalog,

ArcToolbox, ArcExplorer

Other – Microsoft Office Suite

EVAAL

PROFESSIONAL AFFILIATIONS

WLIA (Wisconsin Land Information Association)

Below are several references for which McMAHON has completed water resource projects.

APPLETON (City of)

Contact: Sue Olson, P.E., Project Engineer
Ph. 920.832.6473
E-mail Sue.Olson@appleton.org

ASHWAUBENON (Village of)

Contact: Steve Birr, P.E., Village Engineer
Ph. 920.492.2308
E-mail sbirr@ashwaubenon.gov

FOX CROSSING (Village of)

Contact: Jeff Sturgell, Administrator
Ph. 920.720.7130
E-mail jsturgell@foxcrossingwi.gov

GRAND CHUTE (Town of)

Contact: Katie Schwartz, P.E., Public Works Director
Ph. 920.832.1581
E-mail katie.schwartz@grandchute.net

KIMBERLY (Village of)

Contact: Allyn Dannhoff, Director of Operations
Ph. 920.788.7507
E-mail adannhoff@vokimberly.org

TWO RIVERS (City of)

Contact: Greg Buckley, City Manager
Ph. 920.793.5532
E-mail gbuckley@two-rivers.org

COMPENSATION

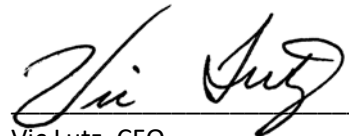
McMahon Associates, Inc. (McMAHON) proposes to provide the services outlined in the following Fee Proposal, on a time and expense basis. Personnel-hours per task and line-item cost estimates for services covered under this Proposal are provided in the attached table.

It is understood that if the City desires Scope of Services to be modified from this Proposal, the City of Green Bay and McMAHON will negotiate a detailed Scope of Services and establish the associated fee for those services prior to award. Should the City request any work over and above the final scope outlined in the contract, McMAHON will prepare a contract and fee amendment. It's understood that a Contract Amendment must be approved by the City before any additional work is initiated.

McMAHON's 2022 Fee Schedule and 2022 Reimbursable Expenses Schedule are enclosed for reference. Upon acceptance, McMAHON will prepare a formal Agreement for Professional Engineering Services for acceptance by the City of Green Bay. The Agreement will incorporate the Scope of Services outlined in our Technical Proposal, or as modified via negotiations between the City of Green Bay and McMAHON.

CERTIFICATION

I hereby certify that Nick Vande Hey is entitled to represent McMahon Associates, Inc., empowered to submit the Proposal, and authorized to sign a contract with the City of Green Bay.



Vic Lutz, CFO



City of Green Bay
Department of Public Works

100 N. Jefferson St., Room 300, Green Bay, WI 54301

QUOTATION REQUEST
CONSULTING ENGINEERING SERVICES
CITY-WIDE GREEN STORMWATER INFRASTRUCTURE PLAN

Due Date: September 30, 2022, 2:00 p.m. CST

Date: September 9, 2022

To: McMahon Associates, Inc. **Attn: Nick Vande Hey, PE**

From: Melissa M. Schmitz, Resiliency Coordinator

Fax: 920-448-3102 / **Voice:** 920-448-3100

Please quote **INSIDE DELIVERED** prices for materials listed below.

QTY	UNIT	DESCRIPTION	UNIT PRICE	TOTAL
1	LS	Kick-off Meeting	\$831	\$831
1	LS	City-wide location analysis for strategic GSI investment	\$8,165	\$8,165
1	LS	GSI project identification for public and private property	\$9,274	\$9,274
1	LS	Triple Bottom Analysis	\$17,602	\$17,602
1	LS	Water quality and quantity modeling	\$10,594	\$10,594
1	LS	Creation of maps for integration with City's GIS	\$3,573	\$3,573
1	LS	Evaluation process for feasibility of GSI in ROW projects	\$2,460	\$2,460
1	LS	Design guidance for identified GSI projects	\$3,036	\$3,036
1	LS	Maintenance and Operations guidance for identified projects	\$2,152	\$2,152
1	LS	Compilation of consultant services into final GSI Plan	\$4,406	\$4,406
1	LS	Five meetings with City representatives	\$6,126	\$6,126
1	LS	Presentation of final plan to Green Bay Common Council or another City committee.	\$831	\$831
		TOTAL PROJECT COST AS DESCRIBED IN PROJECT STATEMENT AND GOALS	\$69,050	\$69,050



HOUR & FEE PROPOSAL

CITY-WIDE GREEN STORMWATER INFRASTRUCTURE PLAN SERVICES

Prepared for City of Green Bay, WI

Task No.	Task / Scope of Services Item	Personnel Hours						Compensation		
		Nick Vande Hey	Andy Schmidt	Shawn Jandrey	Karin Kools Scheel	Admin. Assistant	TOTAL	Labor	Direct	TOTAL
REQUESTED BASE SERVICES										
	- Kickoff Meeting	4					4	\$780	\$51	\$831
	- City-Wide Location Analysis for Strategic GSI Investment	3	18	10	42		73	\$8,165		\$8,165
	- GSI Project Identification for Public & Private	6	19	42	10		77	\$9,274		\$9,274
	- Triple Bottom Analysis	6	34	82	30		152	\$17,554	\$48	\$17,602
	- Water Quality & Quantity Modeling	3	24.5	61			88.5	\$10,542	\$52	\$10,594
	- Creation of Maps for Integration with City GIS	2	2		30		34	\$3,520	\$53	\$3,573
	- Evaluation Process for ROW Projects	4	12				16	\$2,460		\$2,460
	- Design Guidance & Specifications for GSI	4	10	8			22	\$3,036		\$3,036
	- Operation & Maintenance Guidance	2	8	6			16	\$2,152		\$2,152
	- Compilation of GSI Plan Report	4	16	10		4	34	\$4,406		\$4,406
	- Five Progress Meetings with City	24	6	2		4	36	\$6,050	\$76	\$6,126
	- Common Council Meeting	4					4	\$780	\$51	\$831
REQUESTED BASE SERVICES TOTAL		66	149.5	221	112	8	556.5	\$68,719	\$331	\$69,050
ADDITIONAL SERVICES										
	- GSI Resiliancy Rainfall Analysis	5	6	12			23	\$3,099	\$1	\$3,100
	- GSI Development Standard / Zoning Presentation	12				2	14	\$2,498	\$2	\$2,500



FEE SCHEDULE | 2022

McMahon Associates, Inc.

Effective: 01/01/2022

This Fee Schedule is subject to revisions due to labor rate adjustments and interim staff or corporate changes.

NEENAH, WISCONSIN CORPORATE HEADQUARTERS

Street Address:
1445 McMAHON DRIVE
NEENAH, WI 54956
Mailing Address:
P.O. BOX 1025
NEENAH, WI 54957-1025
Ph 920.751.4200 | Fax 920.751.4284
Email: MCM@MCMGRP.COM
Web: WWW.MCMGRP.COM

1700 HUTCHINS ROAD
MACHESNEY PARK, IL 61115
Ph 815.636.9590 | Fax 815.636.9591
Email: McMAHON@MCMGRP.NET
Web: WWW.MCMGRP.COM

952 SOUTH STATE ROAD 2
VALPARAISO, IN 46385
Ph 219.462.7743 | Fax 219.464.8248
Email: MCM@MCMGRP-IN.COM
Web: WWW.MCMGRP.COM

LABOR CLASSIFICATION	HOURLY RATE
Principal	\$186.00
Senior Project Manager	\$186.00
Project Manager	\$131.00 - \$173.00
Senior Engineer	\$164.00 - \$173.00
Engineer	\$87.00 - \$156.00
Senior Engineering Technician	\$119.00 - \$132.00
Engineering Technician	\$83.00 - \$109.00
Senior Architect	\$158.00 - \$177.00
Architect	\$123.00 - \$147.00
Senior Land Surveyor	\$118.00 - \$155.00
Professional Administrator Services	\$84.00 - \$122.00
Public Management Specialist	\$119.00 - \$130.00
Public Safety Specialist	\$119.00 - \$130.00
Building Inspector Specialist	\$119.00
Land Surveyor	\$110.00
K-12 Administrative Specialist	\$112.00
Land Surveyor Technician	\$76.00 - \$98.00
Surveyor Apprentice	\$62.00
Senior Account Executive	\$62.00
Erosion Control Technician	\$83.00
Senior Hydrogeologist	\$186.00
Senior Ecologist	\$178.00
Environmental Scientist	\$89.00 - \$101.00
Senior G.I.S. Analyst	\$150.00
G.I.S. Analyst	\$82.00 - 101.00
Wetland Delineator	\$101.00
Senior Designer	\$129.00
Designer	\$82.00 - \$110.00
Senior On-Site Project Representative	\$111.00
On-Site Project Representative	\$74.00 - \$93.00
Plan Review	\$131.00
Certified Grant Specialist	\$133.00
Graphic Designer	\$98.00
Senior Administrative Assistant	\$95.00
Administrative Assistant	\$75.00
Intern	\$40.00 - \$61.00
Professional Witness Services	\$340.00



REIMBURSABLE EXPENSES SCHEDULE | 2022

McMahon Associates, Inc.

Effective: 01/01/2022

Services subcontracted will be billed to the Owner at invoice cost plus 12%.

Use of special equipment, such as computers, television and sewer cleaning devices, soil density testers, flow meters, samplers, dippers, etc., will be charged to the project per the standard Equipment Rate Schedule, which is available upon request.

NEENAH, WISCONSIN
CORPORATE HEADQUARTERS

Street Address:
1445 McMAHON DRIVE
NEENAH, WI 54956

Mailing Address:
P.O. BOX 1025
NEENAH, WI 54957-1025

Ph 920.751.4200 | Fax 920.751.4284

Email: MCM@MCMGRP.COM
Web: WWW.MCMGRP.COM

1700 HUTCHINS ROAD
MACHESNEY PARK, IL 61115
Ph 815.636.9590 | Fax 815.636.9591
Email: MCMAHON@MCMGRP.NET
Web: WWW.MCMGRP.COM

952 SOUTH STATE ROAD 2
VALPARAISO, IN 46385
Ph 219.462.7743 | Fax 219.464.8248
Email: MCM@MCMGRP-IN.COM
Web: WWW.MCMGRP.COM

DESCRIPTION

RATE

REIMBURSABLE EXPENSES:

Commercial Travel	1.1 of Cost
Delivery & Shipping	1.1 of Cost
Meals & Lodging	1.1 of Cost
Review & Submittal Fees	1.1 of Cost
Outside Consultants	1.12 of Cost
Photographs & Models	1.1 of Cost
Misc. Reimbursable Expenses & Project Supplies	1.1 of Cost
Terrestrial Laser Scanner	\$1,500.00

REIMBURSABLE UNITS:

Photocopy Charges - Black & White	\$0.08/Image
Photocopy Charges - Color / 8½" x 11"	\$0.45/Image
Photocopy Charges - Color / 8½" x 14" and 11" x 17"	\$0.75/Image
Mileage	\$0.65/Mile
Mileage - Truck/Van	\$0.85/Mile
All-Terrain Vehicle	\$60.00/Day
Global Positioning System (GPS)	\$21.00/Hour
Global Positioning System (GPS) Mobilization	\$100.00/Hour
Hand-Held Global Positioning System (GPS)	\$15.00/Hour
Robotic Total Station	\$20.00/Hour
Survey Hubs	\$0.45/Each
Survey Lath	\$0.75/Each
Survey Paint	\$4.50/Can
Survey Ribbon	\$2.50/Roll
Survey Rebars - 1¼"	\$10.00/Each
Survey Rebars - ¾"	\$3.00/Each
Survey Rebars - 5/8"	\$2.50/Each
Survey Iron Pipe - 1"	\$3.25/Each
Survey Plastic or Fiberglass Fence Post - 1"	\$2.75/Each
Survey Steel Fence Post - 1"	\$4.25/Each
Control Spikes	\$1.75/Each



Consulting Engineering Services City-Wide Green Stormwater Infrastructure Plan

RESPONSE TO REQUEST FOR PROPOSAL | SEPTEMBER 30, 2022

Prepared by:



Megan Bender
309 N. Water St.
Suite 350
Milwaukee WI 53202
414.918.7486
megan.bender@geosyntec.com

Prepared for:



Melissa Schmitz
City of Green Bay
melissa.schmitz@greenbaywi.gov

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Attachments

Attachment A – Service Quotation Form

Attachment B – Acknowledgement of Addendum 1, dated September 26, 2022

Cover Letter

September 30, 2022

Via email to melissa.schmitz@greenbaywi.gov

Ms. Melissa Schmitz, Resiliency Coordinator
City of Green Bay Department of Public Works
100 N Jefferson St, Room 300
Green Bay, WI 54301

Subject: Consulting Engineering Services — City-Wide Green Stormwater Infrastructure Plan

Dear Ms. Schmitz:

Geosyntec Consultants, Inc. welcomes the opportunity to submit this response to the City's request for proposal (RFP) to support the City of Green Bay to achieve its mission of a City-Wide Green Stormwater Infrastructure Plan. Our firm is well qualified to support this effort based on the following key considerations:

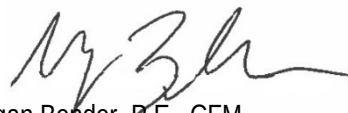
1. Our team provides **local familiarity** from Project Manager Megan Bender who has worked with NEW Water for the past 7 years planning, implementing, and tracking maintenance for stormwater BMPs on agricultural land in the Silver Creek, Ashwaubenon Creek, and Dutchman Creek watersheds. We also have a **municipal perspective** from team member Priya Iyengar who worked for Kansas City managing GSI projects and collaborating with multiple stakeholders for planning and implementation of green infrastructure BMPs.
2. We bring a **broad, MS4-oriented perspective** regarding realization of multiple benefits through green infrastructure, in addition to water quality improvement. Our team is experienced in screening, siting, conceptual design, and multi-benefit prioritization of green infrastructure. We have worked with municipalities in the Midwest and nationwide to develop prioritization approaches in line with agency-specific priorities including environmental, social, and cost-driven considerations. Additionally, our Project Director Matt Bardol has managed virtually all facets of stormwater programs for local government, including directing efforts for the MWRD Phase II Pilot Study for the City of Chicago to implement a similar green infrastructure project screening and prioritization process.

Our response to this RFP is attached. Should you have any questions, please contact Megan Bender at (414) 795-2222 or megan.bender@geosyntec.com. We appreciate the opportunity to support the City of Green Bay with this important effort.

Sincerely,



Matthew Bardol, P.E., CFM, CPESC, D.WRE
Senior Principal Engineer



Megan Bender, P.E., CFM
Senior Engineer

Section 1. General Information About Geosyntec

Geosyntec Consultants (Geosyntec) was established in 1983 (39 years) as a multidisciplinary engineering firm with a mission to provide **high quality, innovative, cost-effective** environmental consulting, engineering design, feasibility study, and construction quality assurance oversight services to public and private clients. With a combined staff exceeding 1,800 engineers, scientists, and related technical and project support personnel, we serve our clients from more than 90 offices in the United States, Canada, and in multiple countries across the world.

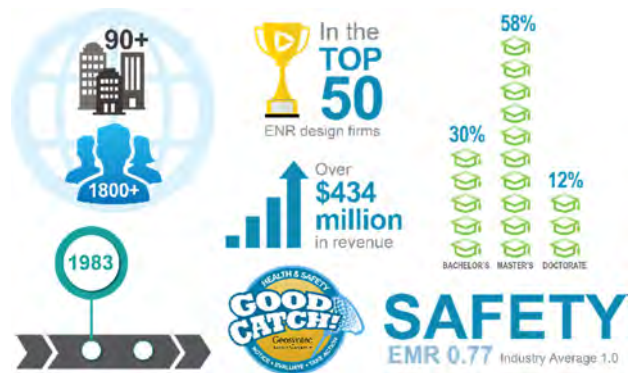
Geosyntec's corporate headquarters is located in Boca Raton, Florida.

At the center of Geosyntec's water and natural resources practice is a collaborative group of **nationally recognized** scientists and engineers dedicated to achieving the balance between built and natural environments. Their practice specialties represent a diverse array of disciplines, including geomorphology, ecology, biology, statistics, engineering design, construction management, and regulatory compliance.

Our national stormwater management practice utilizes **local experts** to focus on key issues in the **urban, rural, and agricultural** landscapes that can influence the environment, project economics, quality of life, and long-term regulatory compliance management. We bring extensive experience engaging with regulatory agencies, public policy-making boards/forums, non-profit organizations, and disadvantaged communities on the most pressing environmental issues. We apply best practices and industry standards to the planning, permitting, design, and implementation of practical solutions for state governments, local agencies, and private sectors.

Our practitioners are at the forefront of policy analyses, regulatory compliance, and technology applications that promote sustainable water resources management and ecosystem restoration. As **climate change** continues to affect weather patterns and water levels, we design stormwater management systems that can improve community resiliency and address disproportionately high and adverse effects on underserved urban communities.

Geosyntec is a co-sponsor of the **International Stormwater Best Management Practices Database (BMPDB)** which is a repository of Best Management Practices (BMP) field studies and related web tools, performance summaries, and monitoring guidance. Reports, tools and data provided on this website



Water Quality Infrastructure and Stream Restoration Services

were prepared by Geosyntec Consultants and Wright Water Engineers, Inc. Initiated over 25 years ago, the original focus was urban stormwater BMPs. Through the support of long-term partners, the project has expanded to develop additional resources related to both urban and agricultural runoff, treatment, and management.

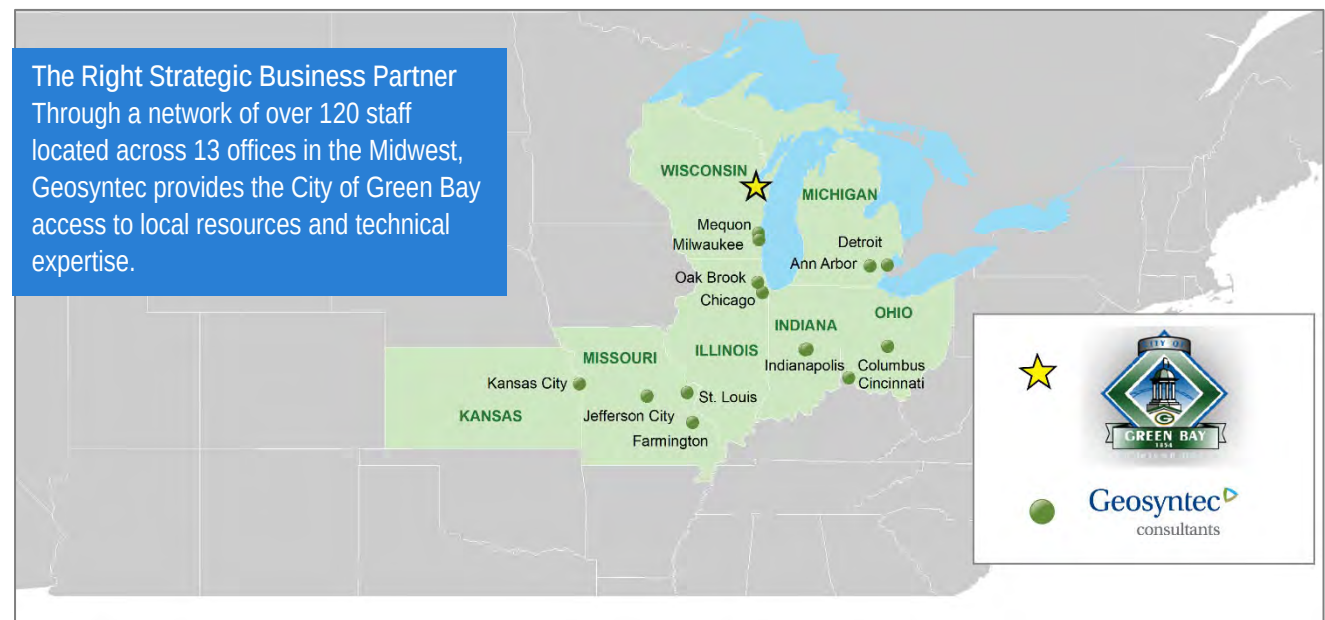
City-Wide Green Stormwater Infrastructure Plan

Through our comprehensive studies and analysis, we provide technically defensible tools and approaches that can be used in the development of Total Maximum Daily Load (TMDL) calculations and watershed protection plans. Our hydrodynamic and water quality models integrate inputs from point and non-point sources and help our engineers and scientists best determine impacts on water quality in receiving water. These models allow us to determine the assimilative capacities of a given body of water, propose best management practices that can affect pollutant impacts, or predict the time required for a system to recover after being altered in some way.

Using watershed studies, water quality monitoring, and hydrological and hydrodynamic modeling, we also can assess compliance with local, state, and federal water quality standards and are better able to evaluate the magnitude, frequency, and duration of impacts of a wide variety of pollutant sources. Our practitioners offer extensive experience with geographic information system applications for spatial analysis, planimetric and thematic mapping, and data representation.

Presence in the Local Community

Geosyntec has a staff total of 14 including 12 civil, environmental, and geotechnical engineers and geologists, and 2 technicians are located in Wisconsin within 2 hours from the City of Green Bay. We have a proven track record of successfully serving clients across Wisconsin and Illinois for more than 15 years, including several projects in Milwaukee, WI and Chicago, IL.



Commitment to Sustainability



Geosyntec is committed to sustainable business practices which strive to achieve successful social, economic, and environmental outcomes for today and tomorrow. As geologists, engineers, scientists, hikers, runners, swimmers, park lovers, artists, writers, and more, we are keenly aware of how vital our environment is to our work, our livelihoods, our families, and our communities. From daily practices in our offices such as the formation of Office Sustainability Coordinators company-wide, to project management strategies, to

the solutions we offer our clients from our Sustainability and Environmental Social Governance group, we work every day to make our global and local environments more sustainable. Our ongoing efforts are a testament to the passion and drive of Geosyntec staff to make a positive difference. We're able to make an even greater sustainability impact

City-Wide Green Stormwater Infrastructure Plan

when we help our clients with larger-scale challenges that have a positive effect on water conservation, reuse, and efficiency; waste management, reduction, and planning; and energy use.

Health and Safety

Safety is a daily commitment and investment in our organization, and we operate with the philosophy that safety, quality, and productivity complement each other. Geosyntec is committed to providing a safe and healthful workplace. We pride ourselves on the high level of quality work performed by our professionals and are committed to achieving the same level of health and safety performance. The foundation of this commitment is based upon the firm's behavior-based safety programs—an integral part of the Geosyntec culture. Accordingly, all staff members are trained to follow specific health and safety procedures to help them assess potential risks and avoid recognized hazards through effective risk management. Safety is a daily commitment and investment in our organization, and we operate with the philosophy that safety, quality, and productivity complement each other.



Inclusion, Diversity and Equity

Geosyntec is dedicated to fostering an inclusive, equitable and diverse environment for all our employees, clients, partners, and the communities we serve. Our commitment to inclusion, equity, and diversity is evidenced by the creation of Geosyntec Diversity Council, which works closely with senior leaders across the firm to establish, influence, and promote inclusion, diversity and equity culture. This furthers the continued success of our business by developing and advancing meaningful partnerships both internally and with our external stakeholders, enabling our employees to build rewarding careers at Geosyntec.

City-Wide Green Stormwater Infrastructure Plan

Section 2. Statement of Geosyntec's Qualifications

Introduction and Understanding of the Project

We understand the City of Green Bay seeks a consultant team to develop a city-wide Green Stormwater Infrastructure (GSI) Plan to help the City identify and implement GSI best management practices (BMPs) in areas both public and private in a prioritized manner to achieve improved water and air quality, reduce urban surface flooding, be more resilient to climactic changes, and create a more pleasant urban environment for the citizens of Green Bay. The plan will achieve the goals of appropriate solutions for the given site conditions, reducing urban flooding hazards especially in vulnerable areas, list out potential GSI BMPs in a prioritized, actionable list, all while building the capacity of City staff to incorporate GSI into the evaluation, planning, engineering, design and construction of municipal projects throughout the City. The plan will also create a process for City staff to evaluate potential future GSI strategies.

Our proposed Project Manager, Megan Bender, has worked for the past 7 years in Green Bay watersheds working on phosphorus and total suspended solids (TSS) reduction from agricultural land use through NEW Water's Adaptive Management Pilot Project in the Silver Creek watershed as well as the full-scale Adaptive Management Program in the Ashwaubenon Creek and Dutchman Creek watersheds. Because of our local experience, we understand Green Bay is a unique city, with the best attributes of both a small town and a major city. Our focus for the GSI Plan will be to keep that character, enhancing residential neighborhoods with increased greenery for encouraging pedestrian use and implementing GSI in the more densely urban areas as well for water quality improvement, increasing green space and still maintaining the urban density of those areas. We also know Green Bay would like to create a system of parkways to bring value and enjoyment to the community, which are a prime opportunity to incorporate GSI to add not only aesthetic improvements to these roadways, but also water quality and quantity benefits as well. Since Green Bay is an MS4 with incredible natural water resources it is important for Geosyntec to understand how to accentuate these areas while maintaining the working nature of the Fox Riverfront and international port. In addition to the major waterways like the Fox River and the Bay of Green Bay, the streams and tributaries also contribute to the quality of life in the City, so we understand the importance of GSI for contributing to improving water quality in these watersheds.

Collaboration between the various planning documents and City departments is clearly a priority to come up with the best plan for incorporating GSI into the existing Smart Growth strategy for Green Bay. We want the city-wide GSI plan to fit in with City objectives, including preserving and highlighting the special places that evoke the regional environmental and cultural history of Green Bay while enhancing and accentuating the identifiable districts and neighborhoods, encouraging vital and walkable activity centers, and allowing for improvements to community appearances, property values and quality of life. Working with City staff and the existing planning documents will create a plan that will be most beneficial and effective in implementation, and including City and site-specific criteria into the framework for prioritizing GSI practice locations will be key to creating a plan that will work for Green Bay.

Statement of Declaration

Geosyntec's experience in collaboratively working with local communities in developing prioritization strategies and implementation plans for green stormwater infrastructure throughout the Midwest as well as nationally for flood mitigation, increased green space, and water quality benefits is second to none. A recent example includes the work completed by Geosyntec for the Metropolitan Water Reclamation District (MWRD) of Greater Chicago, which shows the team's ability for innovation through utilizing new cloud-based optimization software coupled with local knowledge allowed for optimal placement of GSI projects where the benefit would be greatest and most cost-effective, while still allowing for application across the City. Our approach is to leverage our team member's knowledge through a collaborative processes with the Green Bay stakeholders to craft the ideal framework for the City's success. In our recent project in Chicago, our team collaboratively worked with MWRD to create a comprehensive plan for establishing a long-term vision of managing stormwater through a combination of green and grey infrastructure, optimized through

City-Wide Green Stormwater Infrastructure Plan

knowledge of land-use and site conditions and evaluation criteria to prioritize solutions. In Green Bay, our team would utilize a collaborative approach to planning GSI through understanding the existing site conditions and analyzing current land use and local climate to optimize GSI projects with prioritization lists for which BMPs would create the most benefit for the least cost with direct input from Green Bay staff. We would create a feasibility and prioritization framework with weighting criteria to score GSI opportunities and rank them utilizing a sensitivity analysis. Geosyntec would work with the City staff to determine weighting criteria for scoring the opportunities to ensure City priorities are appropriately incorporated into the analysis.

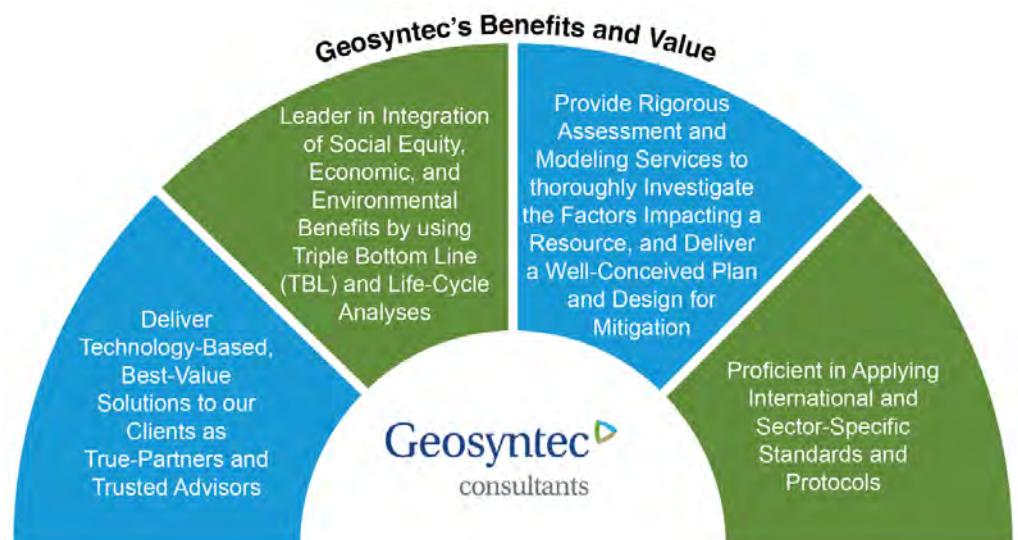
Geosyntec recently completed a Stormwater Master Plan for the City of Long Beach in California as well, which included a feasibility analysis and site screening for identifying multi-benefit GSI BMPs and resulted in a GIS-based interactive tool for the City to use in moving forward with implementation for projects identified as higher priority with the ability to submit those projects for funding through Los Angeles County's Safe, Clean Water (SCW) Program. This type of prioritization and tool development is what Geosyntec can bring to the project, with a focus on local needs, climactic drivers, and potential funding mechanisms. Our approach is rooted in our team's ability to leverage the expertise of our staff through a collaborative process to meet the needs of the local community. Megan Bender will lead this process with the city, using her 7 years of experience in Green Bay, and more than 15 years in Wisconsin.

This team is not only well-versed in GSI prioritization and planning but also in the issues facing the City of Green Bay. Through Ms. Bender's work in Green Bay watersheds she has gained local knowledge of the area, along with her knowledge of the State of Wisconsin gives this team the on-the-ground expertise needed to fully complement Geosyntec's background in GSI planning, design, and implementation. Her work on the Adaptive Management Program gives her an understanding of how BMP assets are managed and her experience managing the database for data collection and tracking give her an understanding of what to track and how to incorporate that with the City's needs.

Priya's experience implementing green infrastructure projects and programmatic elements in Kansas City, Missouri will bring a client's perspective in shaping the different elements of the project. Her experience working with stakeholder groups including the public, non-profit groups, public works, parks and recreation, city planning and development, and neighborhood and housing authority will bring value to the long-term planning of green infrastructure solutions for the City of Green Bay.

Geosyntec's experience in GSI planning nation-wide combined with the Project Manager's local experience and our team's experience from the client perspective gives us an edge for meeting the goals of this project. We understand the City's needs and how to provide solutions while bringing an innovative

lens from projects elsewhere, while maintaining the ability to collaborate and bring local site characteristics into the analysis for siting GSI most effectively and efficiently. The City of Green Bay is a unique place with a lot of natural resources that can be enhanced and protected through GSI implementation, and our team has a passion for creating



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unique and innovative plans in collaboration with local stakeholders that will do just that. We are pursuing this work because it falls in line with our goals for sustainability and resilience, it is in a uniquely small but urban city, and provides an opportunity for preventing water quality and quantity issues through innovative GSI placement that is environmentally just.

City-Wide Green Stormwater Infrastructure Plan

Section 3. Similar Project Experience and References

The following projects show Geosyntec's ability to deliver high quality urban green stormwater infrastructure plans for both smaller areas as well as large urban centers. The following examples show how we have developed green infrastructure solutions through site specific analyses and provided our clients with tools to implement the plans provided.



Stormwater Master Plan Pilot Study: Using Green Infrastructure to Solve Urban Flooding

Geosyntec provided value-engineering by leveraging a cloud-based optimizing tool that can help evaluate competing objectives to avoid overspending on infrastructure. This tool can also help address issues encountered in a traditional planning process by developing many viable strategies, evaluating performances and trade-offs, and refining solutions to identify best performance.

Client: Metropolitan Water Reclamation District of Greater Chicago

Services Provided

- Identification of green infrastructure solutions
- Determined and defined prioritization criteria
- Outlined the implementation strategy for scaling-up
- Developed a comprehensive plan
- Engaged with stakeholder groups

"Geosyntec embraced the challenge of utilizing the City of Chicago and MWRD hydraulic models, interaction with the community and environmental and spatial information to come up with a resilient solution to flooding. The product – an optimized blend of green infrastructure, gray infrastructure and innovative approaches to protect a community from Chicago's most pressing problem; water. The solution – brilliant!"

*David St. Pierre
Former Executive Director, MWRD*

Project Description

Geosyntec was selected to assist MWRD in determining the best solutions to urban flooding in the 8-ward study area, an approximately 17-square mile residential sewershed on the far south-side of Chicago, which is subject to frequent urban flooding including widespread basement backups and impassable streets. The team utilized data gathered from the City of Chicago, the District, and other sources to enhance the City's InfoWorks combined sewer model used to evaluate capital improvement projects. The team identified green stormwater infrastructure solutions based on land use and site conditions, finalized evaluation criteria to prioritize solutions, outlined an implementation strategy to overcome the challenge of scaling up green infrastructure and created a comprehensive plan that will establish a long-term vision for managing stormwater with a combination of green and grey infrastructure to help solve the urban flooding problem.

This was the first project to receive IAFSM's innovation award in the 8-year award history and was selected for its ability to embrace a new cloud-based optimizing software and show how the technology could automatically evaluate various alternatives to flooding. The software is coupled with Geosyntec's green infrastructure modeling approach and allowed 70,000 scenarios and 15 million options to be analyzed in just a few weeks.



Reference Contact Information

Mr. Richard Fisher, P.E., CFM
MWRD
Phone: (312) 751-5479

City-Wide Green Stormwater Infrastructure Plan

Green Infrastructure Design/St. Louis, Missouri



Client: Central Baptist Church & Greenprint Communities

Services Provided

- Collected and reviewed data
- Developed basis of design
- Performed hydrologic and hydraulic analyses
- Developed conceptual design documents
- Developed construction and permit design drawings
- Coordinated permit applications submittal

Project Description

As part of the Metropolitan St. Louis Sewer District (MSD) Project Clear, MSD's consent decree with the EPA, and the Missouri Coalition for the Environment, MSD is committed to spending \$120 million in Rainscaping investments, with an overall goal of reducing combined sewer overflows to the Mississippi River and River Des Peres. MSD's Project Clear Rainscaping Small- and Large-Scale Grant Programs are designed to engage private landowners and municipalities, local government agencies, community development organizations, and private developers in achieving combined sewer overflow reductions through the integration of green infrastructure technology. MSD's BMP Toolbox provides performance criteria for volume control and water quality treatment, RES partnered with Geosyntec Consultants to obtain several large-scale grants and assist RES with the design and implementation of BMPs on privately and publicly owned property in two downtown St. Louis locations – Greenprint Communities and Central Baptist Church.

A watershed-based approach was utilized to design bioretention basins within the Greenprint Communities' 7-acre residential site. The basins were designed to capture runoff from pavement, roofs, lawn areas, and vacant lots that may be developed for residential or commercial use. Seven bioretention basins were designed to redirect surface runoff into the BMPs and outlet system to convey moderate and high-volume flows that would exceed the design storm. Bioretention cells will be primarily in the public right-of-way, both within the sidewalk and roadway, and collect stormwater runoff from roofs, parking lots and roadways, and open space.

The project allowed for the annual reduction of combined sewer overflow by 10.8 ac-ft from BMPs implemented in the Greenprint Communities project, and reduced annual combined sewer overflow by 4.3 ac-ft from the BMPs implemented in the Central Baptist Church project.

Reference Contact Information

Aaron Defenbaugh

Resource Environmental Solutions (RES)

Email: adefenbaugh@res.us



Governors State University Stormwater Management and Natural Areas Restoration Plan

Client: Chicago Metropolitan Agency for Planning (CMAP)

Services Provided

- Model development for water quality and quantity analysis
- Prioritization of areas for stormwater management practices
- Alternatives analysis
- Incorporation of stormwater BMPs into existing infrastructure
- Updating Stormwater Master Plan

Project Description

Governors State University (GSU) was founded in 1969 to be a change leader in higher education and was distinctively committed to helping adults complete a bachelor's degree and engage in life-long learning. As a result, the campus is heavily used during the day and in the evenings. As part of GSU's Strategic Plan, the University strives to give a model of sustainable construction and development, best land use practices, and best practices for stormwater management consistent with the Illinois Sustainable University Compact. As part of the Local Technical Assistance (LTA) projects, the Chicago Metropolitan Agency for Planning (CMAP) was awarded a grant to evaluate flooding and develop an integrated stormwater management plan that focused on transportation-related impacts and opportunities for the campus.

Geosyntec assisted with the development of a project work plan and led the inventory and assessment of existing conditions. To support future stormwater and transportation planning, the team assembled all available data into a single, functional data set. The information was reviewed with CMAP and GSU staff. Site reconnaissance was conducted to annotate field observations, including identification of drainage problems. Geosyntec then evaluated available data to identify and prioritize problem locations and areas of opportunities for stormwater management along existing campus roadways, parking lots, and adjacent buildings. Geosyntec developed EPA SWMM models to assess existing conditions and alternatives. Alternatives included Green Infrastructure, restoration of natural areas, and integration of campus cultural landscapes. Geosyntec assisted the project team with refining GSU's stormwater master plan with updated analyses and alternatives.

The GSU campus has extensive existing infrastructure, and even so, Geosyntec was able to design controls within the limited space along roadways by putting storage areas into ditches to reduce flooding. In most areas, the plan was able to achieve a 100-year level of protection by using available open space for storage; a 25-year level of protection was achieved around the dormitories where open space was more limited.

Reference Contact Information

Jason Navota – Director
Chicago Metropolitan Agency for Planning
Email: jnavota@cmaphillinois.gov
Phone: (312) 386-8750

City-Wide Green Stormwater Infrastructure Plan

Section 4. Unique and Innovative GSI Projects

Geosyntec has delivered green stormwater infrastructure plans and projects all over the country, with some innovative and unique projects described below. The project team identified in the following section were heavily involved in delivering these projects on time, on budget, and in collaboration with the clients and stakeholders involved in the projects.

Delivering Innovative Green Stormwater Infrastructure Solutions Throughout North America



City-Wide Green Stormwater Infrastructure Plan



PROJECT #1: Soldiers Memorial Park Master Plan La Porte, Indiana

Client: City of La Porte, IN

Project Description: Soldiers Memorial Park offers a wide variety of active and passive recreation opportunities throughout its 556 acres of woodlands and water. To provide an inclusive and transparent master planning process, the project team developed a series of touch points with staff, key stakeholders and the general public to solicit feedback. A

master plan for the City of La Porte was created involving development of project vision and guiding principles to influence the physical site planning and design alternatives. This plan along with phasing and funding strategies allowed the Board to focus resources for investment and was adopted by the Board in 2019.

Innovation Highlight:

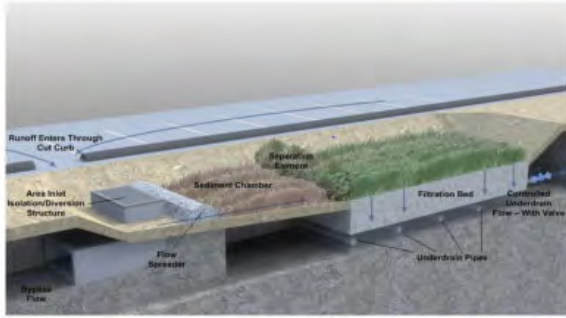
- Inclusive and transparent master planning process which developed a number of touch-points with staff, key stakeholders, and the general public to solicit feedback.
- Incorporated phasing and funding strategies to provide a road map for the Board to focus resources.



Reference Contact Information

Nick Minich, PE
City of La Porte Engineer
Email: nminich@cityuoflaporte.com

City-Wide Green Stormwater Infrastructure Plan



PROJECT #2: Stormwater Master Plan and Stormwater BMP Design Factsheets, Columbia, MO

Client: University of Missouri

Project Description: Geosyntec developed a multifaceted Stormwater Master Plan (SWMP) for the University to guide sustainable stormwater management as part of the University's Campus Master Plan, while integrating the USEPA requirements for MS4s. The team developed tailored design guidance documents for stormwater BMPs to be used

by both planners and engineers to guide integration of GSI on all future projects. A multi-page fact sheet was developed for each BMP that included design standards, performance metrics and standards, and selection criteria based on local applications.

Post-Construction Stormwater Best Management Practices

July 2011

Bioretention

Application

- Parking lot islands, traffic circles
- Road shoulders and medians
- Building downspouts

Advantages

- Provides high pollutant removal and volume reduction
- Can be integrated into landscape areas
- Relatively low maintenance

Limitations

- Not recommended for steep slopes
- Requires adequate soils for infiltration
- Adequate depth to groundwater required for infiltration

DESCRIPTION

Bioretention areas are vegetated and mulched (i.e., landscaped) shallow depressions that capture and temporarily store stormwater runoff. These facilities normally consist of a ponding area, mulch layer, planting soils, and plantings. For areas where native soils have low permeability or steep slopes, bioretention areas can be designed with amended soils and an underdrain system to route treated runoff to storm drain networks. Bioretention areas function as a soil and plant-based filtration device that removes pollutants through a variety of physical and biochemical treatment processes. As stormwater passes down through the planting soil, pollutants are filtered, adsorbed, and biodegraded by the soil and plants.

CONDITIONS WHERE PRACTICE APPLIES

Bioretention areas have a wide range of applications and can be easily incorporated into areas of existing development. These facilities are very versatile and can be easily integrated into landscaped areas and within roadway right-of-ways. Runoff from the site is typically conveyed in shallow engineered open conveyances, shallow pipes, curb cuts, or other innovative drainage structures. Perforated pipe underdrains are recommended for bioretention BMPs due to the limited infiltration capacity of soils underlying the University core campus. Underdrains can improve vegetation health and prevent the bottom of bioretention areas from becoming soggy.

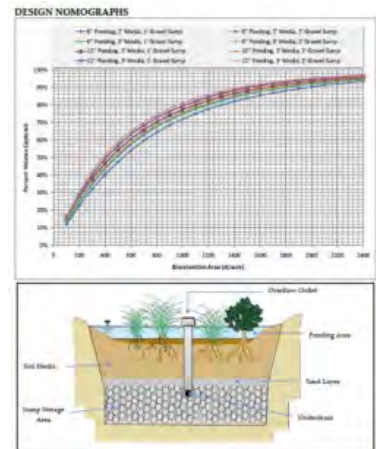
University of Missouri

Bioretention Page 1 of 6

The SWMP was developed with stakeholder involvement and provided the University with a plan that emphasized cost-effective optimization of capital investments and consideration of campus water resources needs to meet minimum control measures.

Innovation Highlight:

- Multi-page design fact sheets developed for each BMP including design standards, performance metrics and standards, and selection criteria based on local applications. The primary focus was volume reduction and removal of TSS.
- The plan is a vital component of the University's long-range development plans and utilized state-of-the-practice stormwater standards.



Reference Contact Information

Craig Stichter, Facilities Project Manager
Planning, Design and Construction
University of Missouri, Columbia, MO
Phone: (573)882-4097

City-Wide Green Stormwater Infrastructure Plan



BMP retrofit installed to measure flow

PROJECT #3: Watershed Monitoring and Assessment of Urban Stormwater BMPs, Missouri

Client: Boone County, MO

Project Description: Boone County embarked on a multi-year study of the Hinkson Creek watershed to assess changes in runoff volume and water quality to quantify the results of implementing retrofit structural BMPs. In addition, several BMPs were monitored to assess mass loading treatment efficiency. These data are being used to broadly implement the County's stormwater management program and support adaptive management actions administered

by state and federal agencies.

Geosyntec and Boone County prepared a Quality Assurance Project Plan (QAPP) in cooperation with the Missouri Department of Natural Resources to support stormwater BMP studies. Study data were reviewed regularly to assure quality. A comprehensive report was developed to document load reductions, BMP performance, and dataset integrity. For ambient water quality monitoring, Geosyntec provided field sampling training, sampling audit services, sampling oversight and sampling support to Boone County to assure compliance with the project QAPP.

Innovation Highlight:

- The Hinkson Creek watershed management study administered by Boone County and supported by Geosyntec is one of the first in-depth assessments conducted in Missouri that evaluates the efficacy of the 'volume control' approach to developing TMDLs. The information gained will advance urban stormwater initiatives and further enable local watershed managers to develop effective management strategies.
- Data collected from industrial and residential retrofit BMPs indicate that properly sized and maintained BMPs can reduce total and peak runoff volumes. In addition, BMPs implemented to treat industrial stormwater have the ability to reduce solids and other industrial pollutants in stormwater runoff. Industrial BMP data were submitted and published in the 2016 version of the International BMP database, which Geosyntec helps administer.

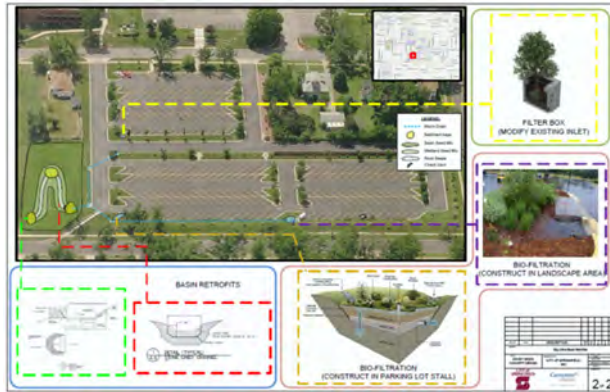
Reference Contact Information

Bill Florea
Boone County Resources Management
Phone: (573) 886-4330

City-Wide Green Stormwater Infrastructure Plan

PROJECT #4: Green Infrastructure Retrofit and Water Reclamation Facility

Client: City of Springfield, MO and Watershed Committee of the Ozarks



Green infrastructure storyboard

Project Description: Geosyntec was retained to develop detailed engineering plans and construction specifications for green infrastructure retrofits to existing dry-bottom detention basins with concrete-lined influent channels and to size rainwater harvesting tanks for watering the MSU William H. Darr Agricultural Center arena.

Geosyntec prepared a water budget and appropriately sized the tanks to store harvested rainwater. Work included design drawings depicting the layout of the water harvest collection system, primary pipe network, grading, and internal water delivery system.

To improve stormwater quality and quantity for the GSI retrofits, Geosyntec designed replacement of the concrete-lined channels with low-flow infiltration channels lined with river rock and the excavation of select areas to increase both the storage volume and ecological diversity of the basins. Other features included installation of energy dissipation measures, native planting plans to complement adjacent landscaping, and modifications to basin outlet control structures to enhance attenuation



Before and after channel improvements

Innovation Highlight:

- Nearly 90% of the water demand for dust suppression in the MSU facility arena met by capturing and treating over 360,000 gallons of harvested water annually. Flexible, functional and inviting green infrastructure designs implemented by contractors and student volunteers.
- Naturalized channels, improved infiltration capacity and volume capture, and improved ecological diversity for GSI retrofits.

Reference Contact Information

Stacey Armstrong

Watershed Committee of the Ozarks

Email: stacey@watershedcommittee.org



PROJECT #5: Clean Streets Clean Water Program San Diego, CA

Client: County of San Diego

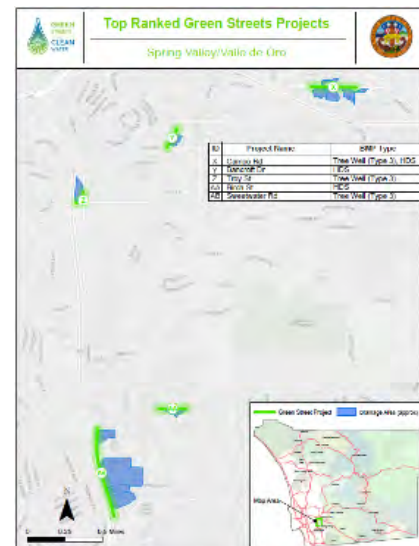
Project Description: Geosyntec is supporting the County of San Diego's pollutant load reduction compliance efforts under the MS4 Permit's Water Quality Improvement Plan and Total Maximum Daily Loads (TMDL) requirements in developing the Green Streets Clean Water Plan (GSCW Plan). The Plan identifies multi-benefit green street opportunities within the population centers of the unincorporated

County. Key components include site screening and selection, benefit quantification and ranking, and community engagement. The goal of the GSCW Plan is to maximize the potential benefit of green streets projects and to prioritize projects based on potential water quality and community benefits. The GSCW Plan presents the material in a public facing way that provides guidance for developing green streets projects and policy consideration to help pave the way for simplified implementation.

To quantify the potential pollutant load reduction of projects, a web-hosted water quality modeling tool was developed to enable the County to estimate annual wet and dry-weather load reductions as well as volume and peak flow reduction for individual projects or the entire menu of identified opportunities. The tool allows the County to revise project parameters and update load calculations instantly, resulting in a living water quality modeling engine that can be updated as projects are implemented and changed over time.

Innovation Highlight:

- Project included Green Streets screening and prioritization as well as benefit quantification and water conservation.
- Provided NPDES & MS4 Program administration support, public workshops and outreach, and basin planning support.
- Included the development of a modular water quality quantification engine to determine the pollutant load reduction of Green Streets and other low impact development projects.



Reference Contact Information

Sheri McPherson
Project Manager, Department of Public Works
County of San Diego
Phone: (619)458-7301
Email: sheri.mcpherson@sdcounty.ca.gov

City-Wide Green Stormwater Infrastructure Plan



PROJECT #6: Long Beach Consolidated Master Plan Phase 1 Long Beach, CA

Client: City of Long Beach

Project Description: Geosyntec was retained to conduct initial master planning to identify stormwater management project opportunities based on runoff treatment potential and their likelihood to obtain funding from the Los Angeles County's Safe, Clean Water (SCW) Program or other major funding source. The project includes the preparation of three separate plans – Stormwater Master Plan, Green Streets Master Plan, and Citywide Drywell Implementation Plan. Phase 1 included conducting the initial planning activities common to all three plans.

In Phase 1, Geosyntec utilized various GIS datasets to identify 44 areas with high potential for siting well-rounded, multi-benefit stormwater projects that meet the goals of the SCW program. These areas were evaluated for project feasibility at site-level and overlayed with regional planning project locations resulting in 15 prioritized potential project locations for submitting to the program.

Merging the common planning analyses in Phase 1 for the three separate master plans created an opportunity for innovation: the work was completed in only four months, which provided cost and schedule savings while providing results that will drive all three subsequent plans.

Innovation Highlight:

- Utilized the GIS-based visualization tool developed by Geosyntec with Sitka, which provides an interactive display including the locations and pertinent information about the 15 identified projects
- Utilized a merged common planning analyses split into phases, allowing the creation of three separate master plans driven by the results of the common planning in Phase 1.
- Included multi-benefit stormwater project identification and feasibility analysis

Reference Contact Information

George C. Ker, PE, GE, PMP
Senior Civil Engineer, Public Works
Phone: (562)570-6525
Email: George.Ker@longbeach.gov

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PROJECT #7: LASAN On-Call Planning and Technical Services for Wastewater, Stormwater and Solid Resources, Los Angeles, CA

Client: City of Los Angeles Department of Public Works Bureau of Sanitation and Environment

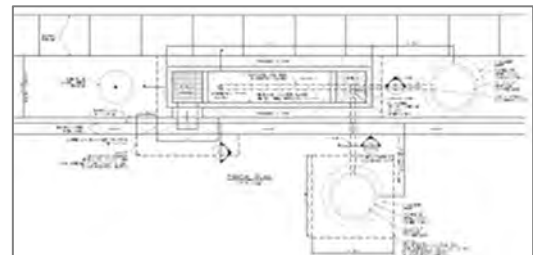
Project Description: Provided through various task orders for the City of Los Angeles Department of Public Works Bureau of Sanitation and Environment (LASAN), Geosyntec has completed a variety of engineering services related to the planning, design, construction, and maintenance of stormwater projects in Los Angeles. These include delivery of stormwater projects via progressive design build delivery method, strategic prioritization of LID projects, and public outreach.

Innovation Highlight:

- Public Right of Way LID (PROWL) and Green

Stormwater Infrastructure: included strategic prioritization of LID projects and GSI ordinance development, and included developing a stormwater management handbook.

- Development of Concept Reports for Enhanced Watershed Management Programs (EWMP) Projects: involved creating BMP conceptual designs and development of alternatives while developing cost opinions and operations and maintenance considerations.
- University Park Neighborhood Rain Gardens Pilot Study: this was a design-build community pilot study aimed at capturing and infiltrating urban stormwater to improve water quality in Santa Monica Bay.
- Van Nuys Green Street Project: Implementation of green street infrastructure consisting of drywells coupled with bioretention planters and porous gutters in the public ROW to capture and infiltrate stormwater to alleviate local flooding and enhance the local streetscape.
- Proposition O Project Optimization, Phase II: Included the optimization of eight of LA's Proposition O funded projects, including confirming each project's intent and site conditions, monitoring BMPs during both dry and wet conditions, project optimization, reporting, and development of O&M manuals for use by the City operators for each project.
- Kittyhawk Avenue Greenway Project: Involved planning, designing, and constructing GSI along Kittyhawk Avenue in LA consisting of five drywells, modified catch basin flow-through treatment systems, and decorative permeable pavement. Geosyntec completed hydraulic and hydrologic analysis to properly size the catch basins to convey the 85th percentile, 24-hour storm event.



Reference Contact Information

Shahram Karaghani

Division Manager City of LA Watershed Protection Division, Bureau of Sanitation

Email: shahram.kharaghani@lacity.org

City-Wide Green Stormwater Infrastructure Plan

Section 5. Key Personnel

	A. NAME Megan R. Bender, P.E., CFM		
	B. PROJECT ROLE Project Manager	D. LOCATION Milwaukee, Wisconsin	F. EDUCATION (HIGHEST DEGREE(S)/YEAR/SCHOOL/SPECIALIZATION M.S. 2012 Marquette University Environmental Engineering/Water Resources
	C. CURRENT PROFESSIONAL REGISTRATION Professional Engineer: Wisconsin, Illinois, Certified Floodplain Manager	E. YEARS OF EXPERIENCE/BILL RATE 15 years / \$230	

EXPERIENCE AND QUALIFICATIONS RELEVANT TO THE PROPOSED PROJECT

Ms. Bender has worked as a water resources engineer in the State of Wisconsin for 15 years, and has worked for the City of Green Bay on Adaptive Management projects for the past seven. She has worked on the Milwaukee Metropolitan Sewerage District (MMSD) Green Infrastructure O&M Implementation Framework and understands planning and prioritization for siting best management practices. She understands what it takes to coordinate with multiple agencies and collaborate across divisions to implement multi-faceted projects and to include stakeholder vision in guidance documentation. She has a strong background in hydrologic and hydraulic modeling and understands the issues and mitigation of urban stormwater flooding. Her time spent at the Southeastern Wisconsin Regional Planning Commission gave her an in-depth understanding of creating master planning documents and prioritizing project implementation.

Adaptive Management Program Assistance, NEW Water (Green Bay Metropolitan Sewerage District), Green Bay, Wisconsin, 2022. Served as Database Manager, Assistance Project Manager for a firm prior to Geosyntec. Assisted NEW Water with implementation of their full-scale Adaptive Management program in the Ashwaubenon Creek and Dutchman Creek Watersheds with a goal of meeting effluent permit limits for total phosphorus and total suspended solids by implementing best management practices upstream of the utility's effluent point. Manage client's data and data collection efforts incorporating automated reporting and assisting with mass reductions tracking and contracting of practices. Mobile data collection completed through ESRI Collector/Field Maps and ArcGIS Online.

Silver Creek Watershed Adaptive Management Pilot Project, NEW Water, Green Bay, Wisconsin, 2021. Served as Project Team Member for firm prior to Geosyntec. Analyzed the effectiveness of Adaptive Management and its applicability to larger scale watershed adaptive management for reducing phosphorus in the receiving water for the wastewater treatment plant effluent. Used GIS technology to create maps and analyze information obtained during field collection in order to determine phosphorus levels and the resource concern locations as opportunities for stormwater best management practice (BMP) implementation to reduce runoff from agricultural fields in the Silver Creek watershed. Effort included SWAT modeling for estimating impact of installed BMPs.

Regional Green Infrastructure Operations and Maintenance Implementation Framework, Milwaukee Metropolitan Sewerage District, Milwaukee, Wisconsin, 2017. Served as Project Team Member for firm prior to Geosyntec. Worked with 26 stakeholders in the region to determine current operations and maintenance as well as acceptability of potential frameworks and created the survey used to gauge stakeholder input. Analyzed cost/benefits of the various frameworks and helped determine scoring weights for determining the most acceptable and efficient framework for O&M implementation.

City-Wide Green Stormwater Infrastructure Plan

	A. NAME Matthew Bardol, P.E., CFM, CPESC, D.WRE		
	B. PROJECT ROLE Project Director	D. LOCATION Oak Brook, Illinois	F. EDUCATION (HIGHEST DEGREE(S)/YEAR/SCHOOL/SPECIALIZATION M.S. 2001 University of Southern California Civil Engineering
	C. CURRENT PROFESSIONAL REGISTRATION Professional Engineer: Illinois, Indiana, Michigan, + 6 additional states	E. YEARS OF EXPERIENCE/BILL RATE 26 years / \$269	M.S. 1999 Hardin-Simmons Environmental Management

EXPERIENCE AND QUALIFICATIONS RELEVANT TO THE PROPOSED PROJECT

Mr. Bardol, a Senior Principal, has over 26 years of diverse environmental and water resource engineering experience, providing a breadth of technical expertise in stormwater planning and design for the built and natural environment. Matt has extensive experience in complex water resources design for major urban centers and local communities across the U.S., with a focus on the Great Lakes Region. Central to his expertise, he has led innovative stormwater master plans for a range of urban environments and clients, which includes serving in a leading role in the recent development of the Stormwater Master Planning program for the Metropolitan Water Reclamation District of Greater Chicago. Matt has designed urban water quality BMPs, oversaw their construction, and led the planning to optimize their effectiveness for cities across the Midwest. Matt has played a vital role in securing numerous permits associated with wetland impacts, natural area restoration, floodway modifications, and local stormwater regulations.

Stormwater Master Planning for Urban Stormwater Green Infrastructure, Metropolitan Water Reclamation District of Greater Chicago, IL. Matt is serving as the senior engineer, leading the establishment of a program to develop stormwater master plans for the ultra-urban combined sewer area within Cook County and the City of Chicago. A central objective is to provide planning level resources to all stakeholders and communities, which consists of web-based GIS maps to assess current flood risk and opportunity areas, planning level concepts and tool boxes of applicable stormwater BMPs and green infrastructure practices.

Green Infrastructure Pilot Study – City of Chicago, MWRD, Chicago, Illinois. Led a first-of-its-kind urban stormwater study with the Metropolitan Water Reclamation District of Greater Chicago for a 17-square-mile area that intricately examined urban flooding within a combined sewer system and quantified the performance benefit of an array of green infrastructure practices to reduce basement backups, surface flooding, and the volume of water reaching the combined sewer system. Key to the quantitative approach was the integration of optimization software to evaluate over 500,000 potential combinations of green and gray infrastructure solutions.

St. Joseph Green Infrastructure Prioritization Planning, St. Joseph, MO. Led the comprehensive GI screening analysis to identify and prioritize over fifty GI opportunities. Detailed hydrologic and hydraulic modeling was performed to support the development of preliminary engineering design and to strategically place practices within the watershed based on a tailored prioritization matrix that balanced stormwater control and ancillary benefits.

Preliminary Restoration Plan and GI Implementation, Michigan City, IN. Served as the water resources engineer supporting the Delta Institute, Alliance for the Great Lakes, and the Sanitary District of Michigan City (the Project Partners) as they undertook a project to improve water quality and enhance a local Lake Michigan waterway.

Stormwater Master Planning for Green Infrastructure Implementation and Urban Flood Mitigation, St. Peters, MO. Project Director and engineer of record for a two-phased \$3.6M capital improvement planning and design project to eliminate urban flooding; and engineer for four detention basin retrofits for both flood control and water quality enhancements.

Stormwater Master Plan and BMP Design Factsheets for University of Missouri, Columbia, Missouri. Developed a multifaceted Stormwater Master Plan for the University to guide sustainable stormwater management as part of the capital improvement plan.

City-Wide Green Stormwater Infrastructure Plan

	A. NAME Priya Iyengar, P.E.	D. LOCATION Overland Park, Kansas	F. EDUCATION (HIGHEST DEGREE(S)/YEAR/SCHOOL/SPECIALIZATION) M.S. 2013 University of Missouri, Kansas City Environmental and Urban Geosciences
	B. PROJECT ROLE Project Engineer/GSI C. CURRENT PROFESSIONAL REGISTRATION Professional Engineer: Missouri	E. YEARS OF EXPERIENCE/BILL RATE 10 years / \$203	M.S. 2009 University of Missouri, Kansas City Environmental Engineering

EXPERIENCE AND QUALIFICATIONS RELEVANT TO THE PROPOSED PROJECT

Ms. Iyengar led the implementation of a wide range of multi-million-dollar green infrastructure projects for Kansas City, Missouri, including rain gardens, bio-retention basins, extended wet and dry detention, and permeable pavement technologies. She managed planning and design, provided construction oversight, and engaged with contractors daily to work through construction issues. She understands what it takes to implement a successful green infrastructure project in residential communities and commercial/transportation corridors from a public agency's perspective. Priya identified sewer program drivers and developed short and long-term performance monitoring frameworks and supported maintenance program development through the lens of asset management. She led the development of green infrastructure policy including technical research, review of standard methodology, writing of the policy, and coordination with stakeholder groups. She is knowledgeable in the regional stormwater quality design guidance and applies local standards and practices in the design of stormwater quality and quantity control systems.

Green Infrastructure Program, Kansas City, Missouri, 2021. The City amended its consent decree to expand on green infrastructure implementation as an alternative to large underground wet weather conveyance systems. As the lead on the green infrastructure program and from lessons learned on past projects, Priya developed a statement of qualifications package, to equip the city with better tools to solicit green infrastructure contractors. She supported the program team in project delivery outlines, resident project representative guidelines, and public outreach and communication strategies.

Sewer Separation for Outfall 054 and 40th and Monroe, Kansas City, Missouri, 2021. Strategic separation of combined sewers and integration of water quality green infrastructure for a 35-acre and a 200-acre residential area. Priya served as the project manager and played a key role in the conceptual and preliminary design phases including alternatives analysis, cost-effectiveness, and prioritization to assist the City in achieving federal consent decree and MS4 permit compliance.

BMP Alternatives Analysis (St. Louis) and Creek Restoration (St. Peters) Missouri. Priya currently serves as Geosyntec's assistant project manager on a creek restoration and stabilization project in St. Peters, Missouri. She provides engineering analysis and support to senior engineers on the geomorphological assessment and design to stabilize the severely eroded creek section. Priya also serves as the project engineer on a BMP alternatives analysis task comprising of water quality data analysis, technology-based BMP identification and prioritization, analysis, and documentation of existing BMP performance related to benchmark exceedance and preparation of construction cost estimates for each alternative.

City-Wide Green Stormwater Infrastructure Plan



A. NAME

Rebecca Helfrich, P.E.

B. PROJECT ROLE

Project Engineer/GSI

C. CURRENT PROFESSIONAL REGISTRATION

Professional Engineer: Illinois

D. LOCATION

Chicago, Illinois

E. YEARS OF EXPERIENCE/BILL RATE

10 years / \$203

F. EDUCATION (HIGHEST DEGREE(S)/YEAR/SCHOOL/SPECIALIZATION

B.S. | 2012 | University of Iowa | Civil Engineering

EXPERIENCE AND QUALIFICATIONS RELEVANT TO THE PROPOSED PROJECT

Ms. Helfrich has 10 years of experience in civil site design and project management across several practice areas including municipal, parks and recreation, higher education, and commercial projects. She is experienced working integrally with multidisciplinary design teams to provide innovative and holistic infrastructure solutions throughout all phases of the project. Becky has a strong background in the design and implementation of green infrastructure and resilient stormwater management practices across developments as well as the development of technical guidance manuals and toolkits regarding stormwater best management practices. Other areas of expertise include site utility infrastructure, urban stormwater design, grading, and earthwork balancing, permitting, and cost estimation.

Project Manager, Technical Green Infrastructure Guidelines, Northwestern Indiana Regional Planning Commission (NIRPC), Portage, Indiana. Ms. Helfrich served as project manager for the Technical Green Infrastructure (GI) Guidelines for Implementing NIRPC's Living Streets Policy. Geosyntec worked with the NIRPC to develop GI guidelines to complement NIRPC's policies within roadway public rights-of-way for northwest Indiana counties. The guidelines are intended to be used as a tool to plan for GI elements with a focus on reducing stormwater runoff and improving water quality. The guidance documents and fact sheets included recommended applications, critical design parameters, site suitability considerations, maintenance requirements, and concept details for GI facilities.

Project Engineer, West Fork Spencer Creek at Willott Road, St. Peters, Missouri. Ms. Helfrich serves as a project engineer for the conceptual design and construction documentation for an ongoing stream restoration and culvert replacement project along Spencer Creek. The culvert at Willott Road is experiencing settlement and the immediate downstream reach is experiencing severe incising and bank scour issues from upstream hydromodification impacts within the watershed. The project team will assess the existing conditions to inform design of restoration and stabilization measures. Design scope includes realignment of the stream, utility coordination, earthwork, and restoration through bid and construction.

Project Engineer, Stormwater Engineering Design for 3-Acre Sites, City of South Burlington, Vermont. Geosyntec evaluated four sites to determine if stormwater treatment practices are meeting Vermont stormwater regulations summarizing findings in an engineering feasibility analysis report for the sites. The engineering feasibility analysis reports include existing conditions evaluation, confirmation of applicable discharge requirements, stormwater calculations and recommendations for further analysis or retrofits to the existing stormwater treatment practice to meet regulations.

City-Wide Green Stormwater Infrastructure Plan



A. NAME

Shailendra Singh, Ph.D.

B. PROJECT ROLE

Project Engineer/GSI

C. CURRENT PROFESSIONAL
REGISTRATION

N/A

D. LOCATION

St. Louis, Missouri

E. YEARS OF EXPERIENCE/BILL RATE

8 years / \$159

F. EDUCATION (HIGHEST
DEGREE(S)/YEAR/SCHOOL/SPECIALIZATION

Ph.D. | 2021 | University of Illinois at
Urbana-Champaign | Hydrology,
Hydraulics, and Water Quality

EXPERIENCE AND QUALIFICATIONS RELEVANT TO THE PROPOSED PROJECT

Shailendra has 8 years of professional and research experience in H&H modeling, stormwater management, nutrient and sediment transport, flood impact assessment, land-use changes impact analysis, and water quality monitoring and modeling. He specializes in large scale watershed model development for hydrologic and water quality assessment, watershed planning, rainfall frequency analysis, hydraulic assessments and modeling of water resources infrastructures, and geospatial and statistical analysis.

Hydrologic and Hydraulic Study, Robeson County, North Carolina. Shailendra performed H&H modeling to evaluate a range of flood events to assess the peak stage elevations and corresponding erosive forces on the downstream slope of the dam in Robeson County, NC. The developed model assessed erosive forces for slope protection measures under proposed modifications of the downstream slope of the dam.

Maple Leaf Lake Dam Breach and Flood Route Mapping, Ohio and Kentucky. Shailendra performed an H&H analysis of the existing condition of the Maple Leaf Lake dam and spillway. He performed sunny day dam breach analysis and inundation mapping using the HEC-RAS 2D model for a range of dam breach scenarios. He used the HEC-HMS model to develop a hydrologic model for the lake to assess the design storms resulting in maximum outflow through the existing spillway and developed a conceptual design for the spillway for no downstream flooding scenario.

Willott Road Culvert at West Branch of Spencer Creek, City of St. Peters, MO. Shailendra led H&H modeling work to analyze existing culvert and creek performance. He developed a stormwater model using EPA SWMM to assess the peak discharges and analyzed the hydraulic capacity and performance of the culvert using the HY-8 program. He is also using 1D and 2D HEC-RAS models to assess the hydraulic capacity and performance of the creek corridor downstream of the culvert to support the design of channel and bank stabilization measures.

City-Wide Green Stormwater Infrastructure Plan



A. NAME

Rishab Mahajan, P.E., CFM, CPSWQ

B. PROJECT ROLE

Senior Technical Review

C. CURRENT PROFESSIONAL REGISTRATION

Professional Engineer: Georgia

D. LOCATION

Oak Brook, Illinois

E. YEARS OF EXPERIENCE/BILL RATE

12 years / \$230

F. EDUCATION (HIGHEST DEGREE(S)/YEAR/SCHOOL/SPECIALIZATION)

M.S. | 2009 | University of Cincinnati | Environmental Engineering

EXPERIENCE AND QUALIFICATIONS RELEVANT TO THE PROPOSED PROJECT

Mr. Mahajan is a water resources engineer principally involved in water quantity and quality modeling with a focus on stormwater and floodplain management, regulatory permits and requirements, surface water system assessments, total maximum daily load (TMDL) development and implementation, and nutrient criteria limit development. His stormwater and floodplain experience developing detailed hydrologic and hydraulic studies to obtain revisions to FEMA Flood Insurance Rate Maps (FIRM) and Flood Insurance Studies (FIS), floodplain permitting effective storm water management designs, NPDES permits, dam safety permits and designs. Rishab is a co-author on a Water Environment Federation (WEF) publication on Stormwater, Watershed, and Receiving Water Quality Modeling.

Kimberly North Stormwater Study, Village of Carol Stream IL. Project Director overseeing the completion of involving an analysis of an 80 Acre urban watershed study area and provide alternatives to maximize the stormwater management facility's flood reduction capability while supporting its retrofit to a native-vegetated, wetland bottom in order to minimize future maintenance. The analysis included development of hydrology and hydraulic model using EPA SWMM for assessing existing conditions and developing mitigation alternatives Conceptual design layouts and budgetary costs will be presented to the stakeholders to make an informed decision regarding implementation.

MWRD Phase II Pilot Study – City of Chicago, Metropolitan Reclamation District of Greater Chicago, IL. Hydraulic modeler and GIS lead for a 17-square mile area in the South Side of Chicago that intricately examines urban flooding within a combined sewer system. The two-year study explicitly modeled the performance of green infrastructure to reduce basement backups, surface flooding, and the volume of water reaching the combined sewer system. The detailed modeling of the system explored various methods to model and quantify the performance and cost of green infrastructure within the City's existing intricate InfoWorks model. Key to the quantitative approach to evaluating the performance of "upscaling" green infrastructure at a broad scale, was the integration of optimization software to evaluate over 315,000,000 potential combinations of green and gray infrastructure solutions.

Urban Stormwater Infrastructure Study and Design, City of St. Peters, Missouri, St. Peters, MO. Mr. Mahajan implemented the use of a genetic algorithm optimization technique with standard hydrologic and hydraulic modeling tools to evaluate over 200,000 alternatives to develop a multi-year phased Capital Improvement Plan (CIP) that achieved optimal performance by prioritizing improvements. The project involved the evaluation of a multi-faceted drainage system that collected approximately 356 acres of urban runoff. The system is comprised of a network of major trunk sewers, streams, ponds, and detention facilities. A watershed approach was taken for this project to effectively solve flooding issues and improve water quality to support an intelligent CIP to support NPDES compliance. Upon selection of prioritized solutions, the Geosyntec team developed detailed designs for each phase of implementation.



A. NAME

Aaron Vandermus, EIT

B. PROJECT ROLE

GIS Analyst

C. CURRENT PROFESSIONAL REGISTRATION

Engineer-in-Training,
NCEES 20-096-50

D. LOCATION

Oak Brook, Illinois

E. YEARS OF EXPERIENCE/BILL RATE

1 year / \$136

F. EDUCATION (HIGHEST
DEGREE(S)/YEAR/SCHOOL/SPECIALIZATION

M.S. | 2021 | University of
Alabama | Civil Engineering

EXPERIENCE AND QUALIFICATIONS RELEVANT TO THE PROPOSED PROJECT

Mr. Vandermus is a water resources engineer focused in hydrodynamic and water quality modeling as well as large-scale environmental data analysis and process automation. His time in the academic and consulting sectors have also granted experience in sediment transport, watershed modeling, mixing zone analysis, and stormwater management. Aaron earned his M.S. in Civil and Environmental Engineering at The University of Alabama. His graduate research dove into analyzing the patterns of short-term elevation change in coastal wetlands in response to acute environmental events (tropical storms, elevated riverine discharge, sediment transport regime change). He was also involved in researching and implementing web-based GIS automation techniques for long-term environmental monitoring projects which typically generate vast datasets on regular schedules.

Kimberly North Stormwater Study, Village of Carol Stream, IL. As staff engineer provided support in the synthesis and assessment of design-level rainfall events and runoff calculations for input in Storm Water Management Model (SWMM). Produced hydrologic data and characteristics for basins and subcatchments within the project area. Post-processed model results and efficiently summarized scenario comparisons for a large set of SWMM outputs.

Wesley/Grace Sewer Separation and Drainage Solutions, Chicago Metropolitan Water Reclamation District, Schiller Park, IL. As staff engineer and GIS specialist, processed and interpreted hydrologic spatial data to support the development of solutions to urban flooding. Produced maps efficiently summarizing data, calculations, and their networks in the project area.

GIS-Based Plume Data Web Portal, Alabama Department of Transportation, Montgomery, Alabama. As Project Manager, developed GIS-based solutions to optimize data management of long-term environmental and groundwater monitoring. Managed scheduling and activities for a multi-personnel research team. Established systematic data and document workflows for efficient import/export use by public and administrative users.

City-Wide Green Stormwater Infrastructure Plan

Support Personnel Bios

Aaron Poresky, P.E._(OR). Aaron has 17 years of experience, and is located in Geosyntec's Portland, OR office. Aaron supports clients in the municipal, private, and applied research sectors with challenging issues related to stormwater management, watershed planning, and project implementation. He holds two B.S. degrees from Oregon State University, in Civil Engineering (2006) and Environmental Engineering (2008). He is one of Geosyntec's practice leaders in BMP planning, selection, design, and operation, including innovative approaches for asset management and reporting. He has supported several municipal agencies and site owners with approaches for asset management and reporting at the site through watershed scales. He has also delivered asset management and reporting tools in collaboration with both internal and external software development teams.



Brian Valleskey, CLP, CFM. Brian has 23 years of water resources and water quality project design experience, and is located in Geosyntec's Oak Brook, IL office. He possesses a B.S. degree (1998) in Watershed Management from the University of Wisconsin, Stevens Point. He has experience working in both rural and urban watersheds, assessing the value of BMPs to reduce total suspended solids (TSS), and phosphorus inputs to surface waters in Missouri and throughout the Midwest. Brian has utilized a number of modeling techniques to assess project value improvement of projects at both local and watershed scale using tools such as STEP-L, WinSLAMM, and SWMM. He also has over 10 years directly serving in municipal consulting assisting local governments address MS4 and nutrient-related issues.



Emily Campbell, P.E._(IL, MI, CO, MA), CPESC. Emily is based out of Geosyntec's Ann Arbor, MI office with 8 years of experience in water resources engineering, including stormwater management, ecological restoration, and wastewater treatment design. Her experience includes the development of hydraulic, hydrologic and water quality models and fully dynamic SWMM models. Her expertise includes using GIS to analyze and map data and preparing engineering plans and bid documents. She was involved in the MWRD Phase II Stormwater Master Plan Pilot Study by assisting the modeling efforts to analyze the performance of Green Infrastructure to reduce basement backups, surface flooding, and the volume of water reaching the combined sewer system.



Mark Leisenring, P.E._(OR, WA). Marc has 19 years of water resources and watershed management experience working on projects for a variety of private and public sector clients. He is located in our Portland, OR office, and specializes in environmental data analysis, regulatory compliance, pollutant source control, stormwater treatment and management, and watershed-based approaches to stormwater and ambient water quality assessments, developing water quality models and decision support tools to support TMDL assessments, preparing and implementing monitoring plans, and working with academics, regulators, and program managers to identify mutually agreeable solutions to complex water resources problems.



Troy Hunt, P.E._(CO, UT, NV). Troy is a nationally recognized public infrastructure Public-Private Partnership (P3) development expert, with a specialty in performance-based delivery of urban green infrastructure and stormwater management, and has 31 years of experience, and is located in our Las Vegas, NV office. He holds a B.S. degree in Civil Engineering from the University of Utah (1991). He created and expanded delivery models for large-scale stormwater municipal partnerships using Triple-Bottom-Line, ESG, and Community-Based philosophies. He sourced and secured public and private financing for various partnerships, including State Revolving Fund (SRF), WIFIA, and private capital sources. He implemented four long-term stormwater partnerships and had overall responsibility for those programs, ensuring all key performance indicators were met, including the Fresh Coast Protection Partnership for the Milwaukee Metropolitan Sewerage District.



Section 6. Subcontractor Information

Geosyntec's engineers and scientists stand among the world's foremost experts in urban stormwater management and are leading innovators in the design of best management practices that mitigate impacts to surface water quality, enhance water conservations strategies, and alleviate urban flooding. With the team's vast experience in green stormwater infrastructure planning throughout the Midwest and nationwide, no subconsultants will be involved in this project.

City-Wide Green Stormwater Infrastructure Plan

Section 7. Schedule of Services and Cost

Based on an anticipated project completed within 9 months of an executed agreement, the following is Geosyntec's anticipated schedule of completing the City-Wide Green Stormwater Infrastructure Plan for the City of Green Bay:



The fee schedule for the anticipated work is provided on the following page, and the Quotation Request Form is also included as Attachment A. The allocation of hours and level of effort is based on our current understanding of the scope, including our acknowledgement of the additional information provided in Addendum #1 to this RFP, which is included as Attachment B. Our team, led by Megan Bender, will work collaboratively with the City of Green Bay to refine our approach as needed and identify elements of the approach to adjust to meet the specific goals of the city.

City-Wide Green Stormwater Infrastructure Plan

	Task	1	2	3	4	5	6	7	8	9	10	11	12	13	Total Hours w/ Recommended Tasks	Total Cost
	Hourly Rate	Kickoff Meeting & Project Management	Review Background Information	City-wide Location Analysis for Strategic GSI Investment	GSI Project Identification for Public and Private Property	Triple Bottom Line Analysis	Water Quality & Quantity Modeling	Creation of GIS Maps	Feasibility Analysis of GSI in ROW Projects	Design Guidance for Identified GSI Projects	O&M Guidance	Final GSI Plan	Five Meetings w/City Representatives	Presentation of Final Plan to Common Council		
Senior Principal/Project Director	\$269	10	4	4		4			4	4	4	4		4	42	\$11,298
Senior Professional/Project Manager	\$230	35	20	12	10	14	18	10	8	14	12	19	15	4	191	\$43,930
Project Professional	\$203	30	10	10	10	15	45	4	15	14	14	10	5	10	192	\$38,976
Senior Staff Professional	\$159				4	8	8		10	40	10	10	5		95	\$15,105
Staff Professional/GIS Analyst	\$136	4	30	20	20	4	10	20	10	80	20	30	5	10	263	\$35,768
Project Administrator	\$74	20													20	\$1,480
Total Hours:		99	64	46	44	45	81	34	47	152	60	73	30	28	803	
Labor Cost:		\$18,854	\$11,786	\$8,586	\$7,686	\$9,157	\$15,907	\$5,832	\$8,911	\$24,378	\$10,988	\$13,146	\$5,940	\$5,386		\$146,557
Direct Costs*:		\$720	\$354	\$258	\$231	\$275	\$957	\$415	\$267	\$731	\$330	\$394	\$950	\$162		\$6,043
Total Labor + Direct Costs:		\$19,574	\$12,140	\$8,844	\$7,917	\$9,432	\$16,864	\$6,247	\$9,178	\$25,109	\$11,318	\$13,540	\$6,890	\$5,548		\$152,600

*Includes mileage, technology/communication and GIS fees



City of Green Bay

Department of Public Works

100 N. Jefferson St., Room 300, Green Bay, WI 54301

QUOTATION REQUEST **CONSULTING ENGINEERING SERVICES** **CITY-WIDE GREEN STORMWATER INFRASTRUCTURE PLAN**

Due Date: September 30, 2022, 2:00 p.m. CST

Date: September 9, 2022

To: **Consultant**

Attn: **ENTER NAME HERE**

From: Melissa M. Schmitz, Resiliency Coordinator

Fax: 920-448-3102 / **Voice:** 920-448-3100

Please quote **INSIDE DELIVERED** prices for materials listed below.

QTY	UNIT	DESCRIPTION	UNIT PRICE	TOTAL
1	LS	Kick-off Meeting	\$19,574	\$19,574
1	LS	City-wide location analysis for strategic GSI investment	\$20,983	\$20,983
1	LS	GSI project identification for public and private property	\$7,917	\$7,917
1	LS	Triple Bottom Analysis	\$9,432	\$9,432
1	LS	Water quality and quantity modeling	\$16,864	\$16,864
1	LS	Creation of maps for integration with City's GIS	\$6,247	\$6,247
1	LS	Evaluation process for feasibility of GSI in ROW projects	\$9,178	\$9,178
1	LS	Design guidance for identified GSI projects	\$25,109	\$25,109
1	LS	Maintenance and Operations guidance for identified projects	\$11,318	\$11,318
1	LS	Compilation of consultant services into final GSI Plan	\$13,540	\$13,540
1	LS	Five meetings with City representatives	\$6,890	\$6,890
1	LS	Presentation of final plan to Green Bay Common Council or another City committee.	\$5,548	\$5,548
		TOTAL PROJECT COST AS DESCRIBED IN PROJECT STATEMENT AND GOALS	\$152,600	\$152,600

LEAD TIME: _____

Geosyntec Consultants

VENDOR

309 N Water St, Suite 350

ADDRESS

Milwaukee

WI

53202

CITY

STATE

ZIPCODE

FAX


AUTHORIZED SIGNATURE

Megan Bender, PE, CFM, Senior Water Resources Engineer

PRINT NAME AND TITLE

9/30/2022

DATE

(414)918-7486

PHONE

Quality-based category scores (Max of 400 points)

	Geosyntec	Hey & Associates	McMahon	SSE & REL	
Reviewer #1	26	29	30	70	
Reviewer #2	60	67	60	61	
Reviewer #3	58	74	69	75	
Reviewer #4	63	64	57	76	
Reviewer #5	55	68	61	65	
Total	262	302	277	347	

Proposal Fee category (Max of 40 points)

Reviewer #2	7	9	10	8
Reviewer #3	5	8	10	7
Reviewer #4	5	8	10	9
Reviewer #5	2	6	10	4
Total	19	31	40	28

<i>Sum of scores</i>	281	333	317	375
	0	0	0	0

Proposal Rankings

SSE & REL	375	staff recommendation
Hey & Associates	333	
McMahon & Assoc.	317	
Geosyntec	281	

**Public Works Department
Citywide Green Stormwater Infrastructure Plan
RFP # 2022-09
INDIVIDUAL SCORE CARD**

Instructions: Each team member will evaluate & score each firm's RFP responses per the categories below. Maximum allowable points are listed in the left column per each category with maximum of 90 total points possible. List your +pros, -cons or comments. Each proposal gets its own score card. Return score cards to Resiliency Coordinator by October 11, 12:00PM.

Firm / Proposer:

Possible Points	Categories	Points awarded to this vendor	Comments/ +Pros / -Cons
10	Experience & Qualifications - Evaluate the proposer's relevant experience, qualifications and past performance on similar projects. Do key personnel have engineering, design, GIS, and planning experience to develop solutions to Green Bay's local conditions? Does the firm have the necessary experience to meet the City's needs?		
10	Project Understanding - Proposal should convey an understanding of the City's flooding and stormwater challenges, plan goals, and required consultant services (as outlined in the RFP).		
10	Mapping & GIS - Proposer past projects demonstrate a history of producing accurate and professional GIS services. Ability to design and maintain a GIS database to ensure data management standards are met. Utilizes ArcGIS environment to perform complex GIS Analysis and representation of geospatial data in maps and deliverables. All GIS data must be sent to the City of Green Bay in either shapefiles or file geodatabases. (Consultant service #7 in RFP)		
10	Right-of-Way and Utility Issues - Knowledge, background of proposer to identify appropriate and effective GSI solutions in ROW to achieve plan goals.		
10	Schedule / Timeframe for Completion - Does the proposal align with the City's project completion goal of August 2023? Proposer should provide a timeline of project services and deliverables.		
10	Triple Bottom Line Analysis - The proposer demonstrates knowledge and experience with analyzing the social, financial and environment benefits (TBL) for past projects.		
10	Implementation Strategy - Proposal narrative describes on how the firm will carry out the project. Evaluate for innovative or unique approaches to delivering the requested services and achieving the goals of the project.		
10	Elements of Proposal - Evaluate the proposal for neatness, organization, and submission of all required materials.		
	Sub-Total of first 9 evaluation categories	0	
10	Proposal Fee		
	TOTAL	0	

CITY OF GREEN BAY
REQUEST FOR PROPOSAL/SERVICES
FOR
CONSULTING ENGINEERING SERVICES
CITY-WIDE GREEN STORMWATER INFRASTRUCTURE PLAN



The following dates are being provided for your information and planning purposes.

RFP issued	September 9, 2022
Question Deadline	September 23, 2022, 2:00 p.m. Last date for submission of written questions.
Site Inspection	Consultants may visit as necessary.
Addenda issued (if required)	September 26, 2022
Deadline for receipt of sealed quotation	September 30, 2022, 2:00 p.m.

Although every effort will be made to follow this schedule, the City reserves the right to modify the dates as necessary and to accommodate special circumstances.

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GENERAL

Background & Project Description

The City of Green Bay, (hereinafter called “City”), was founded as a European trading post in 1634, thus making it the oldest city in Wisconsin. As an older city, Green Bay has residential development in low-lying flood-prone areas, mainly occupied by low to moderate income households who may not have the finances to make their properties more resilient. Green Bay’s development has created a preponderance of impervious surfaces, which contributes to urban flooding.

Over the last few decades, the City has been experiencing more intense rain, snowmelt, and flooding events that cause a range of service disruptions, public safety hazards, and property damage. From 2018-2020, the Fox River, East River and Bay of Green Bay were at record-high levels brought anxiety with each precipitation event. The City continues to experience stormwater, coastal, and riverine flooding at various locations during moderate to intense weather events. A changing climate demands the City use innovative practices for managing stormwater, cultivating healthy green spaces, and improving water quality.

In February 2022, the Green Bay Common Council directed staff to develop a Comprehensive City-Wide Green Infrastructure Plan. The City is seeking proposals from qualified consultants to prepare a Green Stormwater Infrastructure (GSI) Plan for the City of Green Bay, Wisconsin. The GSI plan will be a critical strategy in the City’s flood resiliency planning. This plan will identify projects and make recommendations for integrating GSI into public and private properties to reduce localized flooding, increase greenspace in neighborhoods and improve water quality.

PROJECT STATEMENT AND GOALS

The purpose of the City’s GSI plan is to demonstrate the City’s commitment to flood and climate resiliency, water quality, and incorporation of GSI into public and private property. The GSI plan will guide the identification, prioritization, implementation, tracking, and reporting of GSI projects within the City. The GSI plan will be coordinated with other City plans and resources, such as the Comprehensive Plan, five-year street reconstruction schedule, Stormwater Management Plan; District and Corridor Plans, flood hazard mapping; Park, Recreation and Open Space Plan; Safe Walk and Bike Plan, traffic, and other relevant plans.

Developing, adopting, and implementing a citywide GSI plan will achieve multiple benefits to the community, including improved water and air quality, reduce flooding, climate resiliency, traffic calming, and an overall more pleasant urban environment.

Goals of the GSI Plan are to:

- Develop solutions appropriate to soil, topographical, and future precipitation conditions. For example, the plan shall address the challenges of implementing GSI in floodplains and areas with a high-ground water table.
- Reduce flooding hazards in the City, especially to vulnerable residences and businesses along the East River and western slough neighborhoods.

- Have a prioritized, actionable list of GSI projects (and other nature-based solutions) and maps of locations within the City as well as an implementation framework.
- Build staff capacity for incorporating GSI into the evaluation, planning, engineering, design, and construction of municipal projects.
- Create a process for staff to evaluate the potential for implementing GSI strategies.

Consultant. Services to be provided by the Consultant include:

1. A kickoff meeting shall be held with representatives from the City to review the schedule and deliverables for various tasks included in this RFP. The Consultant shall prepare a Gantt chart outlining the schedule of work.
2. Collaborative planning and input meetings with City staff during the project period.
3. Conduct a location analysis to identify priority subbasins for strategic GSI investment- for public and private property as well as redevelopment projects.
 - a. Analysis methodology must be clearly detailed in the final GSI plan.
4. Identify and prioritize thirty (30) GSI projects for public properties over a 5 -year period, beginning 2023, with a focus on streets, alleys, sidewalks, parking lots, schoolyards, City parks and athletic fields.
 - a. Analyze 5-year street reconstruction plan for feasibility of GSI ROW projects and provide an implementation time frame for streets and alleys.
5. Identify and prioritize 15-20 GSI projects for properties or areas of the City not owned by the City.
6. Project identification and prioritization shall include Triple Bottom Line analysis, water quality and quantity modeling of projects identified for priority areas.
7. Within the context of GSI priority location analysis, create maps using ARC GIS for coordination and integration into the city's GIS system. Maps to be created:
 - a. Priority Subbasins
 - b. Optimal Locations within ROW
 - c. Optimal locations within City-owned Park properties
 - d. Parking areas suitable for GSI
 - e. GSI project map/system for tracking completed projects
8. Develop an ordered evaluation process for staff to use in determining the potential for GSI in street, alley, and other ROW projects. Evaluation criteria shall include, but is not limited to underground utilities, other underground conflicts, and limitations in the ROW.
9. Provide design guidance and specifications for incorporating GSI components into identified projects.
 - a. The plan shall include general design and construction guidelines, standard specifications, and details (or references to those documents) for incorporating GSI into projects within the City. The guidelines and specifications should address different GSI project types within the City, as defined by its land use and transportation characteristics, and allow projects to provide a range of functions and benefits, such as stormwater management (per a particular size storm), bicycle and pedestrian mobility and safety, public green space, urban forestry, etc.
10. The plan shall include guidance and resources that address short-term and long-term operations and maintenance of proposed GSI measures.

11. Compilation of deliverables into an organized final plan in digital format (MS Word, GIS shape files).
12. Project meetings
 - a. Kick off meeting
 - b. Five (5) face-to-face or web-based meetings pertaining to Tasks 3-10
 - c. Presentation of final plan

Schedule.

Consultant shall prepare and submit a schedule based upon a Contract award of October 24, 2022. The City goal would be to have results and recommendations available prior to the middle of August 2023, for possible inclusion of projects into the 2024 budgets.

Improvement & Services Committee meeting: 10/12/2022

Common Council meeting: 10/18/2022

Consultant shall schedule the following meetings during the project period:

- Kickoff meeting with City staff and Consultant: Late Fall 2022
- A minimum of four meetings with City staff to seek input on service deliverables and provide progress reports throughout the project period.
- Meeting for final review of the written plan
- Presentation of plan at a Common Council or another City committee meeting

Anticipated project completion is within 9 months of executed agreement.

City. To the extent available, the City of Green Bay will provide the following services, items, or information without cost to the Consultant:

1. Coordination between all City departments and consultant.
2. Digital files of infrastructure and modeling (if available) needed to prepare base maps,
3. Text excerpts from other relevant city plans needed for inclusion in the final City-Wide GSI Plan.
4. Data on the use and capacity of certain existing infrastructure, if needed.
5. Existing capital improvement plans or budgets with a focus on those within a 5–10-year time period.
6. Critical information from Chapters 16, 24, 44 (municipal code) and related TMDL requirements.
7. Other information and data upon request if readily available.

General Provisions

1. Response to this RFP is required to be on the attached Service Quotation Form.
2. The City of Green Bay reserves the right to accept or reject any or all quotations or to waive any technicality and accept any quotation that is deemed to be in the best interests of the City of Green Bay.
3. The Department of Public Works - Engineering Division, which is the sole point of contact during the procurement process, issues this RFP on behalf of City of Green Bay. Responses to this RFP must be received by **2:00 p.m., CST on September 30, 2022.**

4. Question deadline: Direct questions to melissa.schmitz@greenbaywi.gov, by September 23, 2022, 2:00 p.m. CST.
5. RFP responses must be emailed to melissa.schmitz@greenbaywi.gov by September 30, 2022, 2:00 p.m. CST.
 - RFP submittals received after the date and time specified will be rejected.
 - RFP submittals received will not be publicly opened.
 - The following information must appear on the cover page:

“CONSULTING ENGINEERING SERVICES – CITY-WIDE GREEN STORMWATER INFRASTRUCTURE PLAN”

6. The price indicated in your quotation to be valid for 90 days. The submittal of a quotation by a consultant will be considered by the City as constituting an offer by the Consultant to perform the required services at the stated prices.
7. Evaluation Process - Submittals will be evaluated on, but not limited to, firm’s technical expertise and experience with providing innovative, sustainable, and cost effective GSI solutions; credentials of project team, understanding of task requirements, capability for timely response, overall quality and completeness of submittal, and cost of services. A submission of a proposal constitutes acceptance of the evaluation techniques and recognition and acceptance that the City’s evaluators will use subjective judgment in evaluating submittals.

In addition to the General Provisions, consultant proposals shall include:

1. The name of the proposing firm, address, telephone number, and the name and title of the person authorized to represent the firm.
2. General information about your firm.
3. Statement of your firm’s qualifications including a statement/declaration as to why your firm is interested in working for the City, what it has to offer the City, and why the City should select your firm.
4. A list of previous projects of a similar nature completed by your firm with references (provide client’s name, contact person, and phone number).
5. A list of unique and innovative GSI projects for both water quantity and water quality benefits that have been completed by your firm with references (provide client’s name, contact person, and phone number).
6. Identify key personnel that will be assigned to this project and the respective roles or services they will provide from your local office including names, job titles and billing fees.
7. Identify key personnel that will be assigned to this project and the respective roles or services they will provide from outside your local office including names, job titles and billing fees.
8. List any subcontractors you plan to use.
9. Submit a schedule of consultant services and cost associated with each service. Submit a fee schedule for personnel and services provided including mileage, equipment rentals and subcontracted work for 2022 and 2023.
10. Selected Consultants will be required to incorporate the City’s Standard Agreement for Professional Services terms and conditions (attached).

CONTRACTUAL REQUIREMENTS

STANDARD AGREEMENT FOR PROFESSIONAL SERVICES BETWEEN CITY OF GREEN BAY AND
CONSULTANT.



City of Green Bay
Department of Public Works

100 N. Jefferson St., Room 300, Green Bay, WI 54301

QUOTATION REQUEST
CONSULTING ENGINEERING SERVICES
CITY-WIDE GREEN STORMWATER INFRASTRUCTURE PLAN

Due Date: September 30, 2022, 2:00 p.m. CST

Date: September 8, 2022

To: **Consultant**

Attn: **ENTER NAME HERE**

From: Melissa M. Schmitz, Resiliency Coordinator

Fax: 920-448-3102 / **Voice:** 920-448-3100

Please quote **INSIDE DELIVERED** prices for materials listed below.

QTY	UNIT	DESCRIPTION	UNIT PRICE	TOTAL
1	LS	Kick-off Meeting		
1	LS	City-wide location analysis for strategic GSI investment		
1	LS	GSI project identification for public and private property		
1	LS	Triple Bottom Analysis		
1	LS	Water quality and quantity modeling		
1	LS	Creation of maps for integration with City's GIS		
1	LS	Evaluation process for feasibility of GSI in ROW projects		
1	LS	Design guidance for identified GSI projects		
1	LS	Maintenance and Operations guidance for identified projects		
1	LS	Compilation of consultant services into final GSI Plan		
1	LS	Five meetings with City representatives		
1	LS	Presentation of final plan to Green Bay Common Council or another City committee.		
		TOTAL PROJECT COST AS DESCRIBED IN PROJECT STATEMENT AND GOALS		

LEAD TIME:

VENDOR

AUTHORIZED SIGNATURE

ADDRESS

PRINT NAME AND TITLE

CITY STATE ZIPCODE

DATE

FAX

PHONE



Report to the
Improvement and Service Committee
of the City of Green Bay

MEETING DATE

October 26, 2022

PREPARED BY

AGENDA ITEM # E.6

Consideration with possible action on request by Department of Public Works to award a contract for 2023 Design Services for Berner Street Reconstruction from N. Irwin Avenue to N. Webster Avenue.

BACKGROUND

RECOMMENDATION

FISCAL IMPACT

ATTACHMENTS

None