



Waterways

City of Madison Engineering Division • Annual Stormwater and Sewer Utilities Newsletter

cityofmadison.com/engineering/stormwater

FALL, 2024

University Avenue: Two Decades of Construction Complete

After at least twenty years of phased construction, the University Avenue Relief storm sewer system construction is complete! The University Relief Sewer System, runs from Willow Creek, west down University Ave. and Campus Drive to Midvale Boulevard. The majority of the relief storm was completed with street reconstruction projects, which included other significant improvements, such as a new pedestrian and bike overpass of University Bay Drive, and a widened sidewalk along the southerly side of University Ave. What you don't see is the new 96-inch diameter storm sewer pipe that connects to previous projects, and discharges to Willow Creek, significantly improving drainage along the corridor.

From 2001 to 2024, over \$15 million was directed toward the University Avenue relief storm sewer project. This relief storm sewer significantly improved the level of flood protection for this area of the city. The full length of the sewer pipe is approximately 8,000 linear feet. The Engineering Division needed to reconstruct the street infrastructure of University Avenue, and in many cases, relocate other utilities to accommodate for the size of the pipe. Over the 20 year period, the Engineering Division successfully completed seven major projects to construct the University Sewer Relief System.

Following the 2018 historic floods, the City of Madison Engineering Division focused on improving the design to limit the impacts of future potential flooding along the University Corridor.

University Avenue is a core piece of our transportation infrastructure that serves Downtown, the UW campus, and the UW Hospital, providing connectivity for first responders during emergencies. Prior to the University Avenue project, this corridor became impassible with flooding at least once a year.

The historic 2018 flood event varied in intensity across the City, but, in this area, it was approximately a "100-year-rain-event," a significant storm that is has a 1% chance of occurring in any given year, but has a 26% chance of occurring at least once in 30 years. During this event, significantly more water needed to move through the storm sewer system than what it was originally designed to handle. This resulted in damaged infrastructure, flooded streets, and, in many cases, flooded homes.

Prior to construction, the University Relief Storm Sewer System was only equipped to handle a "2-year-event," a smaller-sized storm that has a 50% chance of occurring in a year. After reconstruction, the new system is able to withhold more severe storms and limit the impacts of flooding during a "10-year-rain-event." While this is less than our design goal of protection of private property to the 100-year event, it does represent a significant improvement over the existing conditions.



A Message from Your City Engineer, Jim Wolfe

In just the last two years, the City of Madison has had to grapple with some of the more extreme weather that we will continue to see as a result of climate change. For much of 2023, the area experienced a significant drought. Then during the spring and early summer of 2024, we had a significant amount of rain, much of it coming during brief, intense storms, causing flash flooding of streets, and leading to elevated lake levels. And then another abnormally dry period. Beyond just the varying rainfall patterns, climate change will bring a number of challenges our way, and the City, including the Stormwater and Sanitary Sewer Utilities, are working hard to manage our infrastructure amongst those challenges. This includes continuing our efforts to complete the watershed studies across the City, and implement the recommended flood mitigation solutions that come out of those studies, see page 3 for some example projects (LBMCP & BRIC). We're also undertaking efforts to plan how we can use vegetation on stormwater utility lands to our benefit (see page 2), which often becomes a major component of some of our larger pond and greenway projects and can provide a number of benefits. Caring for the quality of the waterbodies within the City remains a priority as well, and in this issue of Waterways, you can learn more about some of the less visible pieces of infrastructure that the City uses to help remove pollutants (see page 4, catch basins) and also about some of the efforts our residents and visitors can use to help protect our lakes and streams too! (see page 2 – rain gardens, and page 3 – boating).

Jim Wolfe

Do Rain Gardens Reduce Salt Pollution?

Green infrastructure projects like rain gardens are highly effective at slowing down stormwater and filtering out a variety of pollutants. Unfortunately, they are not a solution for salt reduction.

Rain gardens aren't magic, and salt makes them less effective.

Rain gardens do a lot of good. Water that rain gardens capture infiltrates into groundwater. Sand and sediment that they capture is held in or on the soil, and nutrients that they capture can be used by plants. Rain gardens mitigate a lot of stormwater pollutants, but they aren't magic - they don't make anything disappear.

Salt is hard to capture. When salt melts snow and ice, it breaks down into tiny sodium and chloride particles which are too small to be physically filtered out. Sodium particles stick to the soil, but this is harmful to soil structure and fertility. Sodium reduces soil's ability to infiltrate water and increases erosion.

Chloride particles stay within the water, and move with water down through the soil and into our groundwater, where it accumulates over time. (See the graph of chloride levels in Madison drinking water wells.)

Should I worry about the Salt in my Drinking Water?

The City of Madison's drinking water is under EPA limits for sodium and chloride. If you are on a low/no sodium diet, you can see what the water quality for the well serving your area is at this website, www.cityofmadison.com/water/water-quality

While all City of Madison public wells meet EPA limits, if you are concerned about sodium / chloride levels you could install reverse osmosis filtration system for your kitchen faucet or purchase distilled water, drinking water (have it tested) directly from a private provider in 5-gallon bottles. Reverse Osmosis is the only treatment option that removes salt from water.



Sanitary Lateral Responsibility Reminder

Buying your first house is an exciting feeling. Being a homeowner also carries the responsibility to maintain your space. Just like roofs and driveways, maintaining the sanitary lateral is a homeowner's responsibility.

A sanitary sewer lateral is the pipe that conveys wastewater from your home to the City sewer main, which is typically located in the street. When you use water and flush it down the drain, the water flows into your sewer lateral, and then it flows through the pipe connection to the City's main sewer, then proceeding through the City sewer system to be treated.

If your home has a clay or cast iron sewer lateral, City Engineering recommends that you clean it every 1-3 years to prevent blockage. Homeowners with PVC sewer laterals generally don't require cleaning, unless you are flushing nonorganic materials. To prevent blockage in your pipes, avoid flushing these materials:

- » Greases, fats, and oils (never empty a greasy frying pan down the drain)
- » Flushable wipes (they're not actually flushable)
- » Feminine hygiene products
- » Materials made of cloth
- » Non-Latex based Paints
- » Medicines (there are collection events throughout the Dane Co area)
- » Gas or other chemicals
- » Plastic bags or wrapping
- » Coffee grounds



The cost of sewer backups can depend on the severity of the clog and affected area in your home.

If you have a sewer backup, make sure to call Engineering Operations at 608-266-4430. To clean your own lateral, the City recommends contacting a sewer cleaning service.

Stormwater Vegetation Management Plan

Development of the City of Madison's Stormwater Vegetation Management Plan is underway and will provide a framework for sustainable and resilient vegetation management on property owned by the City's stormwater utility for decades to come.

City Engineering is taking a proactive approach to vegetation management by prioritizing operational activities reflective of input received through the plan development process.

Vegetation plays an integral role in how the Stormwater Utility's stormwater ponds and greenways function and can have an impact on local and regional waterways. Blocked inlets and channels, downed trees, and invasive, non-native species can cause adverse effects on the function of stormwater systems and their larger role in the environment.

How the City manages vegetation within storm lands influences water quality, flooding, erosion, groundwater recharge, habitat for pollinators, biodiversity, and other environmental impacts. The framework reflected in this plan will identify larger goals and strategies to manage vegetation with increasing impacts related to climate change.

This plan is not for specific projects, but rather a framework for long-term vegetation management strategies of the lands under the utility's management. The resultant plan will provide the City and its residents a better understanding of the stormwater utility lands, their conditions, and our resources. But the most important part of this plan is the conversation it creates.

Developing the Stormwater Vegetation Management Plan includes several components to integrate community concerns and incorporate outside expertise, including reaching out to over 160 experts from University of Wisconsin, Dane County, WDNR, and other local and regional experts a variety of fields related to ecology, conservation, water resources, sustainability, climate change, stormwater impacts, and pollinators and wildlife impacts.

The Stormwater Vegetation Management Plan will be shaped by public input, and there will be an additional opportunity to comment on the plan as it will go to the Board of Public Works for final acceptance.

To get involved in the public engagement process, sign up for project updates on the City's website: www.cityofmadison.com/projects.



Lower Badger Mill Success

The Lower Badger Mill Creek Ponds (LBMCP) project is underway, but already making a major impact in our community. The LBMCP project includes a series of regional detention basins, located on the west side near Meadow Road and Mid Town Road, which are excavated areas that are designed to hold back flood water to reduce downstream flooding and minimize local flood impacts by storing water for a limited period of time. The Badger Mill Creek Pond area has a history of localized flooding, and with anticipated increased precipitation related to climate change, it was expected to continue without mitigation efforts. City Engineering needed to provide additional flood storage and water quality ponds to minimize the downstream migration of sediment and debris. In total, the LBMCP receive stormwater runoff from approximately 3,900 acres.

The ponds are designed to slow down water draining from this area as it moves south, ending up in the Lower Badger Mill Creek. The ponds aid in reducing downstream flooding and improving water quality in the creek by removing sediment that is trapped in the stormwater draining off of those 3,900 acres.

Construction began in 2023, but the City's work isn't done quite yet. This year, the Stormwater Utility began the process of ecological restoration at the Badger Mill Ponds. This process includes integrated pest management, native seeding, installation of wetland and emergent plants, and installation of native trees and shrubs, to restore native plant ecosystems on this large stormwater utility parcel. Completion of the ecological restoration there will include:

- » Removal of invasive plants via prescribed burning
- » Approximately 15 acres seeded with native wetland and prairie seed
- » Approximately 20,000 native wetland plants seeded
- » 100+ shrubs planted
- » Approximately 20 trees planted

Construction is also underway on new street connections around the ponds with the extension of Feather Edge Road to Meadow Road. New multi-use paths are also being constructed around the ponds, not only as future transportation connections, but to also allow people to connect with and enjoy all of the new native plantings and ecosystem. Construction on all of the streets and paths will officially be completed by summer of 2025.



Building Madison BRIC by BRIC

Major flooding prevention improvements are about to start (Spring of 2025) on Madison's far west side, specifically in the Old Sauk Trails Business Park. The Business Park was devastated by the 2018 floods, and the drainage system serving this area is being improved to better prepare the area for future extreme flood events, thanks to a Building Resilient Infrastructure and Communities (BRIC) grant used for the project. The Federal Emergency Management Agency (FEMA) awarded the City of Madison \$6 million through the BRIC grant program. The BRIC grant covers 70-percent of eligible project costs, which are estimated to be \$8.6 million.

The grant process was very competitive, and the City is proud to have earned the opportunity to improve community resilience in this area of the City.

The upcoming Pheasant Branch Tributary Greenway Enhancement project, located in the Old Sauk Trails Business Park between Deming Way and Excelsior Drive, is an infrastructure improvement project designed to mitigate flood risks through improved capacity of the existing greenways and ponds.

"Flood mitigation work is vital to our community on so many levels," City of Madison Engineering Division Principal Engineer Janet Schmidt said. "This funding proves the work we've been doing with our Watershed Studies and flood modeling efforts means major improvements for our community for years to come."

The project includes increasing capacity of 2,000+ feet of greenway channels, expanding stormwater flood control ponds, upsizing of storm sewer systems and culvert crossings of roadways, and ecological restoration of the greenways and ponds on stormwater utility lands.

This project benefits the community in the following ways:

- » Approximately seven buildings with existing first-floor structure flooding would be removed from the 1% annual chance flood impact by this project
- » 17 total structures benefit from lowered flood elevations for improved access and potential damages (e.g. removal or reduction of flooding of surface parking lots, improved ingress/egress to buildings).
- » Reduced or eliminated street flooding to improve safe access to emergency vehicles, motor vehicles, pedestrians, bicyclists, and buses.
- » Reduced or eliminated economic impacts that will help keep businesses undamaged, which will allow them to remain open to the public and employees.

Clean Your Boat Before You Float

Written by Clean Lakes Alliance

Aquatic invasive species (AIS) are more than just a hindrance by name. They have the potential to be detrimental to our ecosystems by disrupting food webs. New introductions of critters both big and small, from the invasive carp to the nearly microscopic spiny water flea, can cause far-reaching problems. With the potential to reproduce unchecked by natural predation, they frequently outcompete native organisms for resources.

Beyond disrupting aquatic ecosystems, AIS can have impacts felt beyond the water's edge. Invasives, like zebra mussels, damage infrastructure and clog water intake pipes. According to the U.S. Fish and Wildlife Service, AIS inflicts an estimated \$100 billion in damages each year.

However, not all hope is lost when it comes to these invaders. "Stop Aquatic Hitchhikers" has been a nationwide campaign to fight the spread of invasive species since 2002. Through the promotional slogan "Clean, Drain, Dry and Dispose," boaters are reminded to take the following precautions each time they enter or leave a waterbody:

- » Remove attached plant debris from trailers and boat props.
- » Drain water from livewells and bilges.
- » Dry boats and equipment for at least 5 days before using on another waterbody.
- » Dispose of unwanted fishing bait in the trash.



5,500 Catch Basins Catch Tons of Sediment, Protecting Lakes

The City has a number of stormwater tools to help improve water quality in our community's water bodies. However, something that often goes unnoticed while doing significant work protecting our lakes are the City's hard-working catch basins.

Stormwater does not receive the same intensive treatment that sanitary sewage receives at a wastewater treatment facility before discharging to the environment. To help reduce the pollutant load in stormwater prior to discharge to waterbodies, Madison's stormwater engineers and operations crews design, construct, and maintain treatment devices at strategic points along the water's journey to catch sediment and pollutants, improving water quality.

Catch basins are a type of infrastructure that lie beneath the surface. Strategically placed in locations to treat numerous inlets, catch basins act like miniature ponds to slow down water flow and catch pollutants as they settle in the "sump" (bottom of the structure that is constructed deeper than the pipes) of the basin.

The City of Madison has around 5,500 catch basins spread throughout the city. These catch basins prevent sand, grit, leaves, sticks, and trash from flowing into our lakes. Without these catch basins, sediment would ultimately end up in the lakes or in a detention basin. Any sediment or other material in the storm sewer ends up at an outfall, or a discharge point of storm sewer, to a body of water. The more we can trap and remove upstream of these discharge points, the less of this material is discharged, reducing impacts to the waterbody and nearby communities. In the same way that ponds need to be dredged occasionally, catch basins require clean-out maintenance so that they can continue to effectively trap runoff pollutants. The City of Madison Engineering Division cleans them a minimum of twice a year and collect approximately 1,200 tons of sediment annually! This is approximately a football field covered 1' deep in sediment.

The cleaning process requires the work of the Big Green Vector, the City's primary tool to clean and maintain the City sewer system and catch basins. The Big Green Vector uses high pressure water and a large vacuum hose to clean these catch basins. It is much easier to clean catch basins than it is to remove debris from lakes. The best treatment is prevention, and our Engineering Division operation crews work day and night to keep your streets and water clean and safe!



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