

City of Madison Rural to Urban Street Reconstruction Stormwater Approach V2022_03_21

There are many streets in the City of Madison that are considered rural (also referred to as “unimproved”). Rural streets are streets with no curb and gutter and limited storm sewer. The stormwater will drain to the side of the road and flow to the next lowest area, and/or into the limited storm sewer system. If there is limited storm sewer in these areas, generally it has been installed piecemeal over the years; often in response to drainage issues/complaints.

The policy of City Engineering is to install water quality improvements with all street reconstruction projects regardless of regulatory requirements to do so. The structural water quality features used routinely include catchbasins/sediment traps and rain gardens.

In certain circumstances, Street Reconstruction can be subject to stormwater regulations under State Administrative Code NR-151 and Madison General Ordinance (MGO) 37. These codes apply to:

1. Any street construction or reconstruction exceeding twenty thousand (20,000) square feet of added impervious area that is not directly associated with a new plat or certified survey map (CSM) development and does not result in the removal of a defined ditch section that drained the existing street is subject to Secs. 37.09(1), (2) and (4).
2. Any street reconstruction exceeding 1 acre of land disturbance that is not directly associated with a new plat or CSM development and results in the removal of a defined ditch section that drained the existing street is subject to Secs. 37.09(1), (2) and (3) with regard to total suspended solids (TSS) control (sediment removal) and rate control (detention).

Because many of the unimproved streets in the City of Madison, do not have defined ditch sections conveying stormwater, they are not subject to the post-construction stormwater management requirements noted above.

Stormwater quality resulting from unimproved streets can be a concern. Unimproved streets with shoulders that are not stabilized can result in soil erosion. This erosion carries stormwater pollutants into our rivers and lakes.



Photos: Unimproved Street Erosion. Lake Mendota Drive. December 21, 2021

Installing curb and gutter and storm sewer in these areas reduces the chances of erosion occurring for many reasons, including 1) it is more difficult for vehicles to drive over the vegetation, 2) snowplows

have a curb edge to plow against, and 3) the stormwater drainage is along concrete and there is not vegetation/soil for it to erode.



Photos: Improved Street Curb and Gutter. Waite Circle. May 1, 2019.

As noted previously, the City of Madison installs stormwater treatment with most street reconstructions regardless of requirements to do so. The treatment measures include both structural and operational changes including the following:

1. Catch Basins with Sumps. Where drainage conditions allow, the City installs catch basins with sumps. The sumps in the catch basins trap sediment and store it. The City then cleans the catch basins and disposes of the sediment. The 2020 TMDL/MS4¹ modeling conducted for the City's MS4 permit found that the City's catchbasins with sumps remove, on average, approximately 10% of the TSS that discharges to them.
2. Rain Gardens/Biofiltration Devices. When there is space available, the City installs terrace rain gardens and/or biofiltration devices. Rain gardens and biofiltration devices trap sediment and infiltrate stormwater runoff. The 2020 TMDL/MS4 modeling conducted for the City's MS4 permit found that the City's rain gardens and biofiltration devices remove, on average, approximately 75% of the TSS that discharges to them.
3. Street Cleaning. The City cleans all of its streets with either a mechanical broom sweeper or a vacuum assisted street cleaner. These vehicles remove street dirt. The 2020 TMDL/MS4 modeling conducted for the City's MS4 permit found that the City's street cleaning program removes, on average, approximately 8% of the TSS on a citywide basis. Street sweeping is less effective on poor, uneven pavements, and reconstructing the street with curb and gutter and new pavement can ensure that the City is getting the most benefit from street sweeping.
4. Fall Leaf Pick-up. The City picks up leaves every fall. The 2020 TMDL/MS4 modeling conducted for the City's MS4 permit found that the City's leaf pick-up program removes, on average, approximately 17% of the total phosphorus from residential areas.

¹ The City of Madison is a Wisconsin Pollutant Discharge and Elimination System (WPDES) Phase I community, and, as such has to comply with the requirements of the WPDES permit. One of the permit requirements is to conduct computer modeling that calculates the pollution discharged from the City's

municipal separate storm sewer system (MS4). "MS4" is another term for the City's stormwater drainage system. The computer modeling and subsequent report was completed in January 2020.