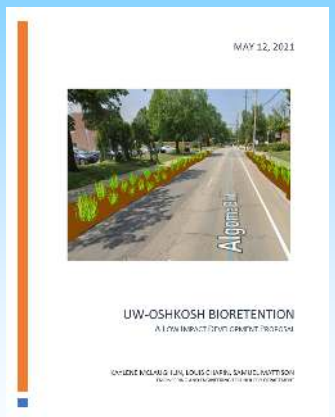
Algoma Boulevard
"Bioretention" Discussion
June 15, 2021

Justin Gierach, P.E., Engineering Division Manager / City Engineer

UW-Oshkosh Bioretention

A Low Impact Development Proposal



- Report was put together well and was easy to follow
- Touched on some of the potential issues

City of Oshkosh and Bioretention

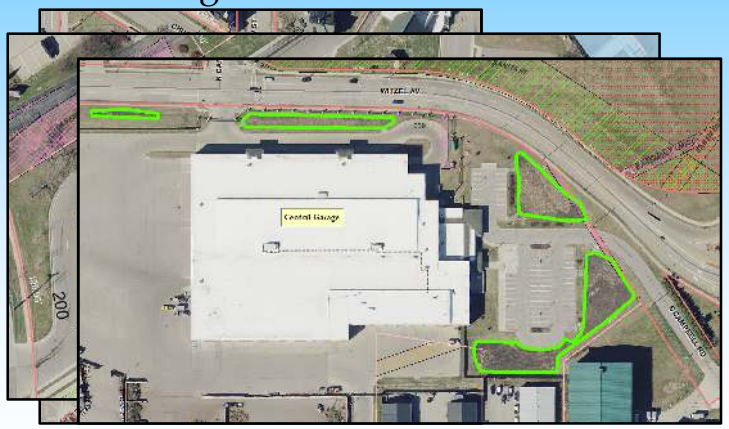
Safety Building/City Hall

City of Oshkosh and Bioretention

Seniors Center

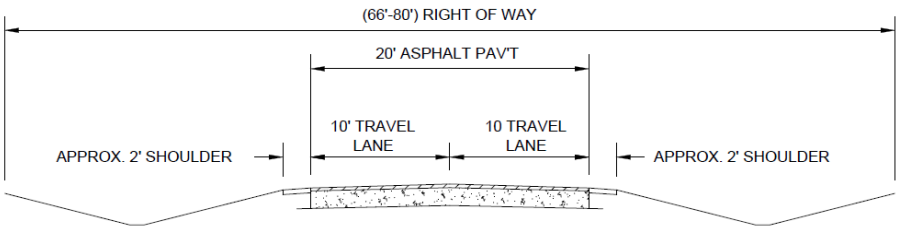
City of Oshkosh and Bioretention

Central Garage



West 9th Avenue Reconstruction

Rural to urban conversion



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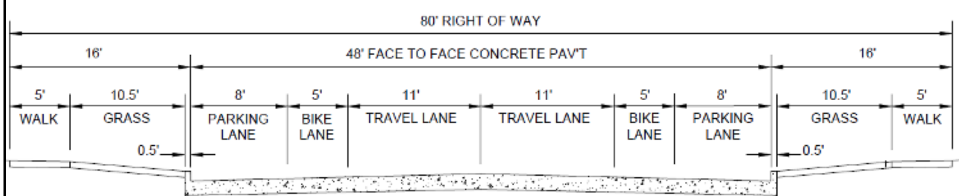

West 9th Avenue Reconstruction

Rural to urban conversion

Purpose of Technical Memo

Introduction / Project Description

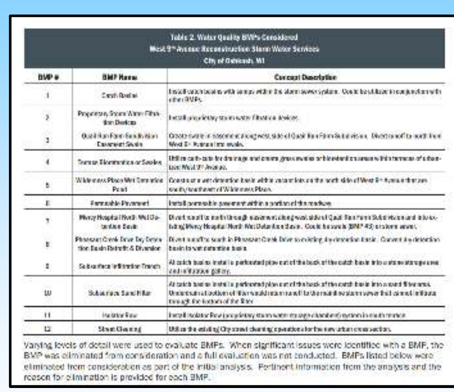

Table 2. Water Quality BMPs Considered West 9th Avenue Reconstruction Storm Water Services City of Oshkosh, WI		
BMP #	BMP Name	Concept Description
1	Catch Basins	Install catch basins with sumps within the storm sewer system. Could be utilized in conjunction with other BMPs.
2	Proprietary Storm Water Filtration Devices	Install proprietary storm water filtration devices.
3	Quail Run Farm Subdivision Easement Swale	[illegible]
4	Terrace Bioretention or Swales	[illegible]
5	Wilderness Place Wet Detention Pond	[illegible]
6	Permeable Pavement	Install permeable pavement within a portion of the roadway.
7	Mercy Hospital North Wet Detention Basin	[illegible]
8	Pheasant Creek Drive Dry Detention Basin Retrofit & Diversion	[illegible]
9	Subsurface Infiltration Trench	[illegible]
10	Subsurface Sand Filter	[illegible]
11	Isolator Row	[illegible]
12	Street Cleaning	Utilize the existing City street cleaning operations for the new urban cross section.

Varying levels of detail were used to evaluate BMPs. When significant issues were identified with a BMP, the BMP was eliminated from consideration and a full evaluation was not conducted. BMPs listed below were eliminated from consideration as part of the initial analysis. Pertinent information from the analysis and the reason for elimination is provided for each BMP.

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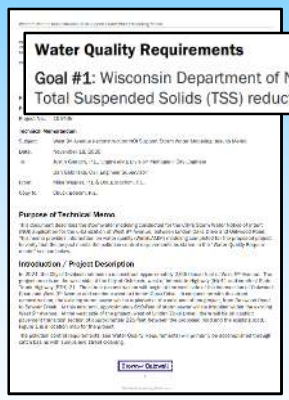
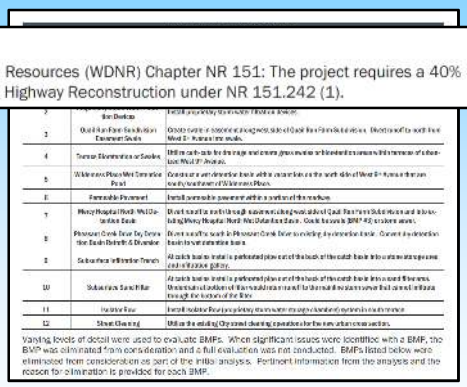


Water Quality Requirements

Goal #1: Wisconsin Department of Natural Resources (WDNR) Chapter NR 151: The project requires a 40% Total Suspended Solids (TSS) reduction as Highway Reconstruction under NR 151.242 (1).



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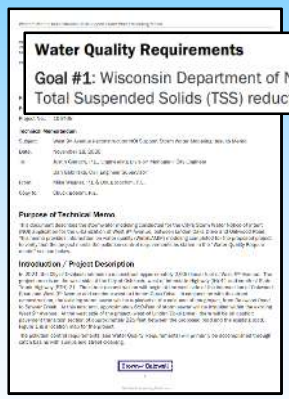

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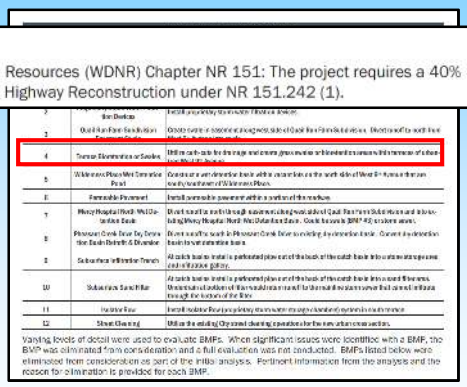

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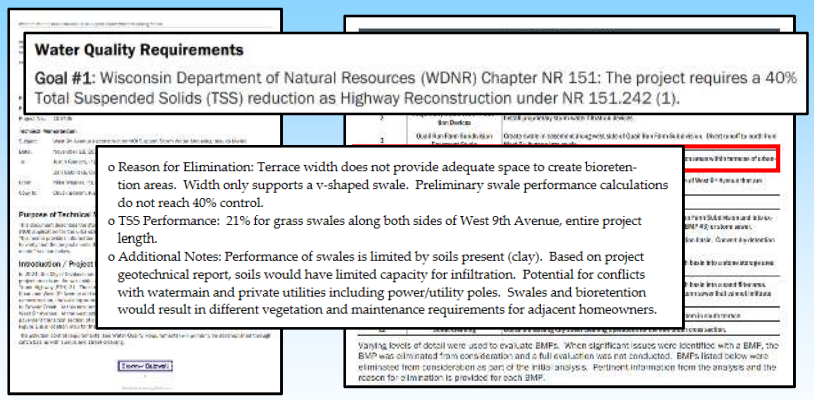

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- Reason for Elimination: Terrace width does not provide adequate space to create bioretention areas. Width only supports a v-shaped swale. Preliminary swale performance calculations do not reach 40% control.
- TSS Performance: 21% for grass swales along both sides of West 9th Avenue, entire project length.
- Additional Notes: Performance of swales is limited by soils present (clay). Based on project geotechnical report, soils would have limited capacity for infiltration. Potential for conflicts with watermain and private utilities including power/utility poles. Swales and bioretention would result in different vegetation and maintenance requirements for adjacent homeowners.

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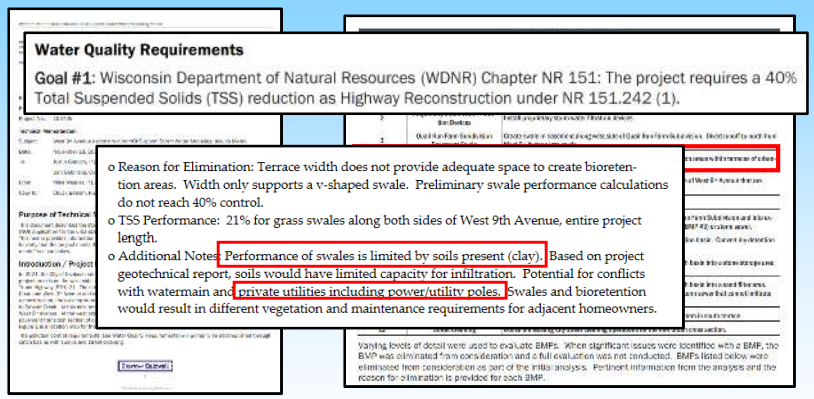

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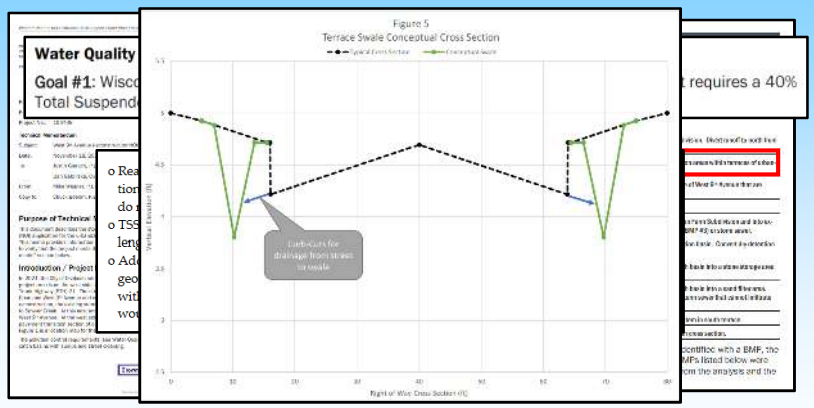

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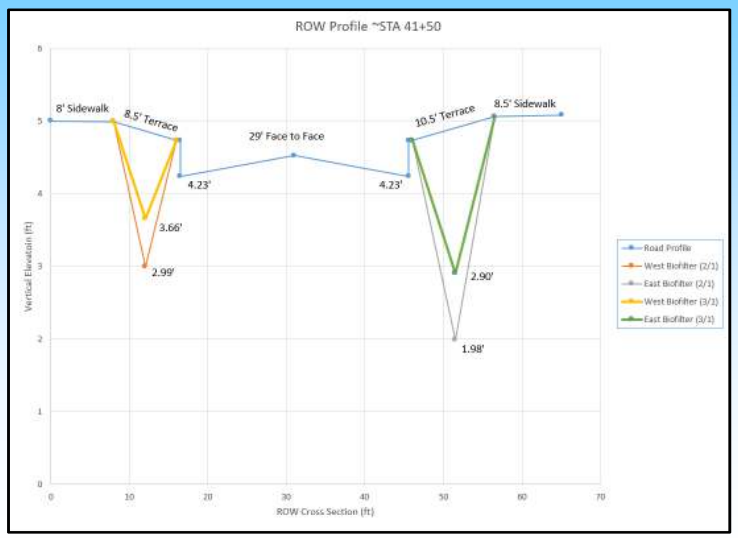

Algoma Boulevard Reconstruction

- Other challenges to install in the Right of Way (ROW)
  - Other existing utilities
    - Sanitary Laterals (can be 5′-10′ deep)
    - Water Laterals (typically ~6.5′ deep)
    - Storm Laterals (typically 3′-6′ deep)
  - UWO Facilities
    - Chilled Water Lines (depth can vary and is unknown)
    - Steam ducts/tunnels (depth can vary and is unknown)
  - Private Utility Companies Relocation (may be compensatory)
    - Telecommunications (typically 2′-4′ deep)
      - AT&T
      - Charter
      - NTD
    - WPS (Electric and Gas)
    - Power Poles
  - City Electric Facilities (typically 2′-3′ deep)
    - Street lighting
    - Fiber

Algoma Boulevard Reconstruction

- Maintenance Requirements
  - It is stated several times within the report that Bioretention facilities are “self-reliant”, “self-sustaining”, “less maintenance” etc…
  - “Less mowing for the university and less maintenance”
  - “Once established, the plants will continue to grow in the bioswale and not need additional attention”

Algoma Boulevard Reconstruction

Bioretention For Infiltration
(1004)

Wisconsin Department of Natural Resources
Technical Standard

Table 6. Typical Maintenance Activities for Bioretention Areas

ACTIVITY	FREQUENCY
Water Plants	As necessary during first growing season
Water as necessary during dry periods	As needed after first growing season
Re-mulch void areas	As needed
Treat diseased trees and shrubs	As needed
Inspect soil and repair eroded areas	Monthly
Remove liter and debris	Monthly
Add additional mulch	Once per year

B. Place the infiltration device in a site that is visible to encourage routine up-keep and maintenance. Choose a site that provides ample room for maintenance access to all parts of the device. Consider traffic visibility and other safety issues when siting the infiltration device.

Bioretention devices are not suitable for controlling construction site erosion. These devices will not treat chlorides, and will be damaged by heavy loading of salt-based deicers.

D. Snow shall not be dumped directly onto the conditioned planting bed.

400 Block North Main Street Parking Lot

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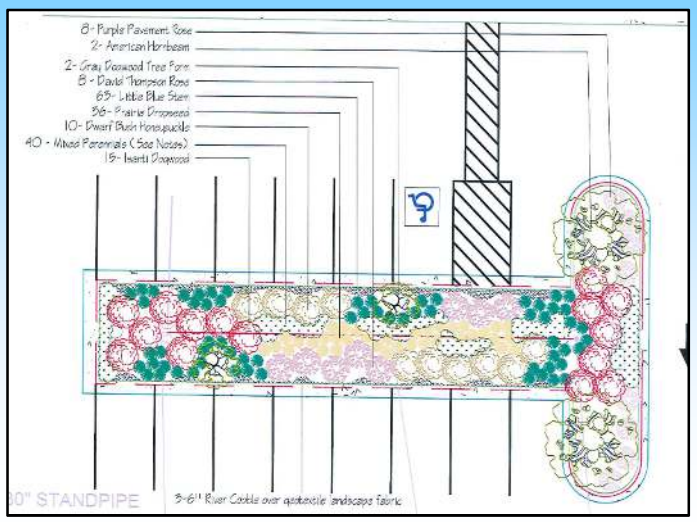

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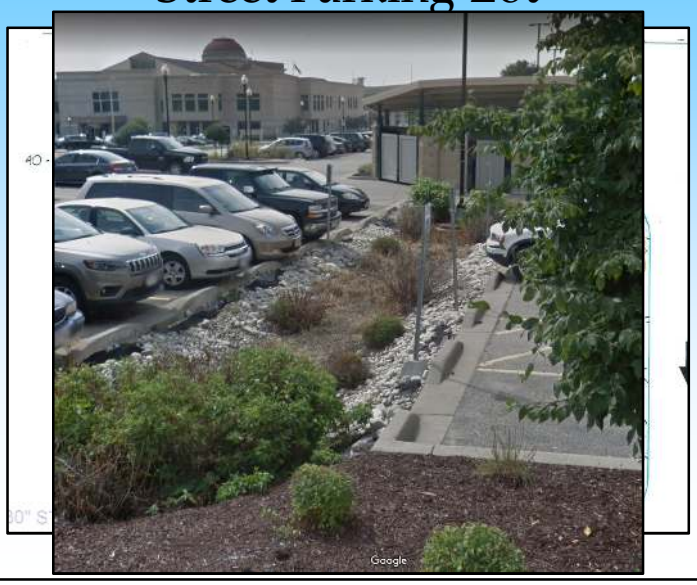

Algoma Boulevard Reconstruction

- Overall, the City looks at and uses Best Management Practices (BMP's) wherever practical/required.
- NR 151 does not require BMP's for TSS reductions on this type of a project.
- Initial installation costs were never planned for.
- Maintenance costs would be an ongoing (forever) issue.
- As of today, DPW has not found a good spot to use Biofilters/Bioretention on Street Reconstruction projects.
  - Existing utilities
  - Maintenance
  - Soil types
- Specifically this case, I can see an argument on both sides for pedestrian safety.
  - Curranty there is a fence stopping pedestrians from "jaywalking"
  - Bioretention may not "stop" the jaywalking

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Questions:

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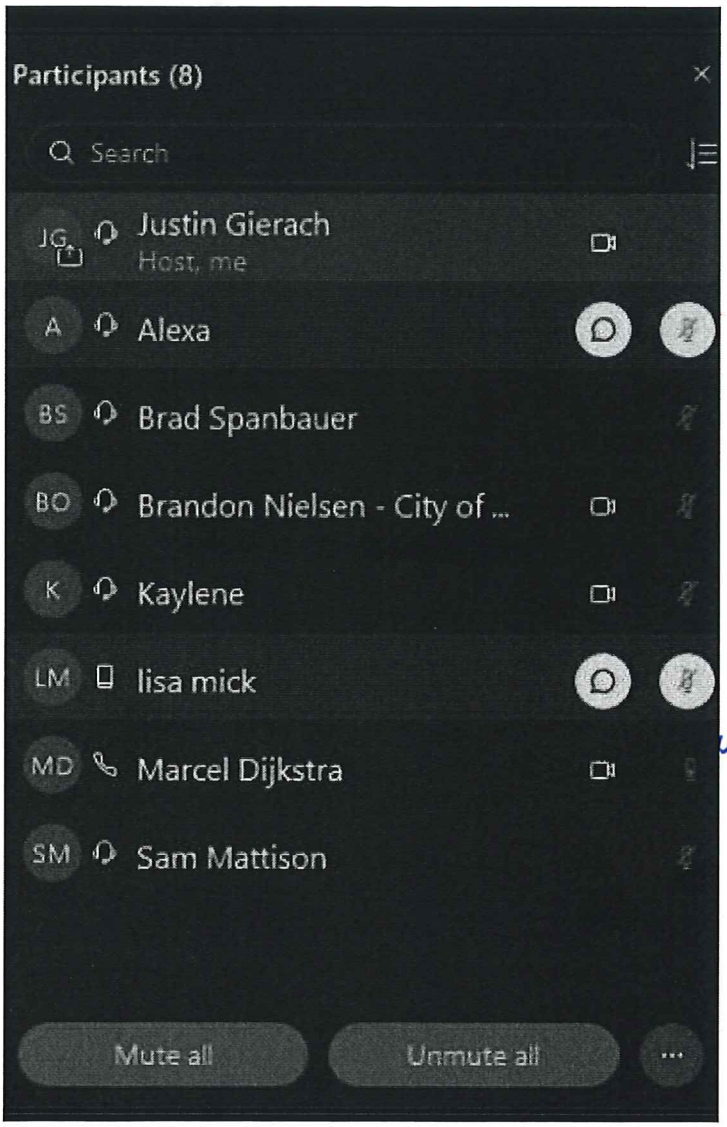
(920) 236-5065

www.ci.oshkosh.wi.us

06/15/2021 Algoma Biofilters Discussion



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