



Privately-Owned Stormwater Management Systems

Operation & Maintenance

NICK VANDE HEY, PE
8/10/2023



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Federal Clean Water Act



- US Environmental Protection Agency requires each state to identify water bodies that are not 'fishable or swimmable'
- Each state also needs to identify the pollutants causing the water body impairment



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Pollutants Causing Impairment



Sediment

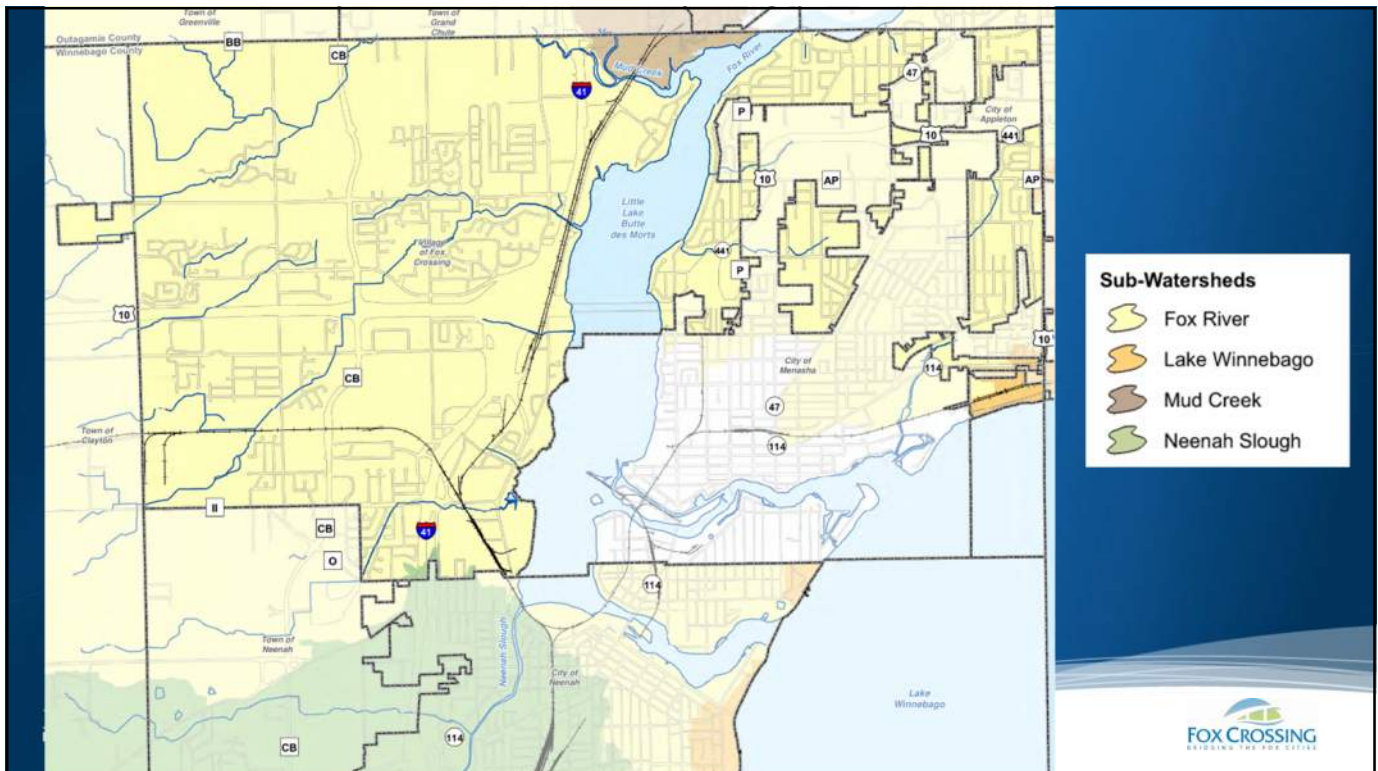


Phosphorus

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FOX CROSSING
EXCEEDING THE JOB EXPECTATIONS

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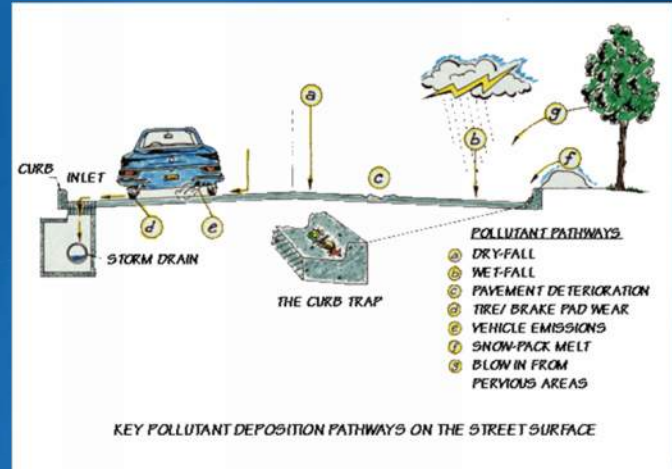


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The **McMAHON** Way...values. culture. Relationships, since 1909.

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Stormwater Pollutant Pathways



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Municipal Stormwater Permit

- Public Education
- Public Involvement
- Illicit Discharge Detection & Elimination
- Construction Site Pollutant Control
- **Post-Construction Stormwater Management**
- Municipal Pollution Prevention
- Stormwater Quality Management



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EXCEEDING THE JOB OFFER

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Post-Construction Stormwater

- Wisconsin DNR & Village Requirements:
 - Comply with stormwater quality, peak discharge, infiltration, protective area, and petroleum sheen requirements
 - Obtain a permit for the stormwater system design
 - Construct the stormwater system
 - Inspect, operate, and maintain the stormwater system
 - Responsible Party (landowner)
 - Operation & Maintenance Plan (how to manual)
 - Landowner confirms to Village that maintenance was completed (annually)
 - Village audits the landowner's efforts (inspections)

Debris & Litter



- Maintenance:
 - Inlets
 - Outlets
 - Trash racks
 - Orifices, weirs,
 - Channels, pipes, spillways
 - Filter or soil surfaces
 - Other Areas
 - Open water, shoreline, vegetation

Vegetation



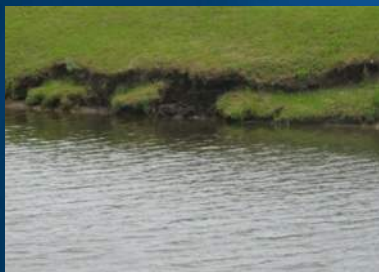
- Maintenance:
 - Vegetation Health & Density
 - Mowing Height (swales)
 - Noxious Weed Growth
 - Unauthorized Growth (trees)
- Filtration and infiltration devices benefit from deep rooted plants

Wildlife



- Maintenance:
 - Muskrats
 - Burrow holes in embankment, liner, etc.
 - Fish
 - Do not stock ponds
 - Carp can uproot wetland plants and stir up bottom sediment
 - Birds
 - Geese can damage wetland plants and degrade water quality
 - Large birds near airports are a hazard

Erosion



- Erosion Types:
 - Channel, Rill, Scour, Shoreline
- Maintenance:
 - Topsoil, seed, fertilizer, mulch
 - Erosion mat (channels, slopes)
 - Turf reinforced mat
 - Riprap with geotextile fabric
 - Dense wetland planting (shoreline)

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EXCEEDING THE JOB OFFER

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Aesthetics & Pollutants



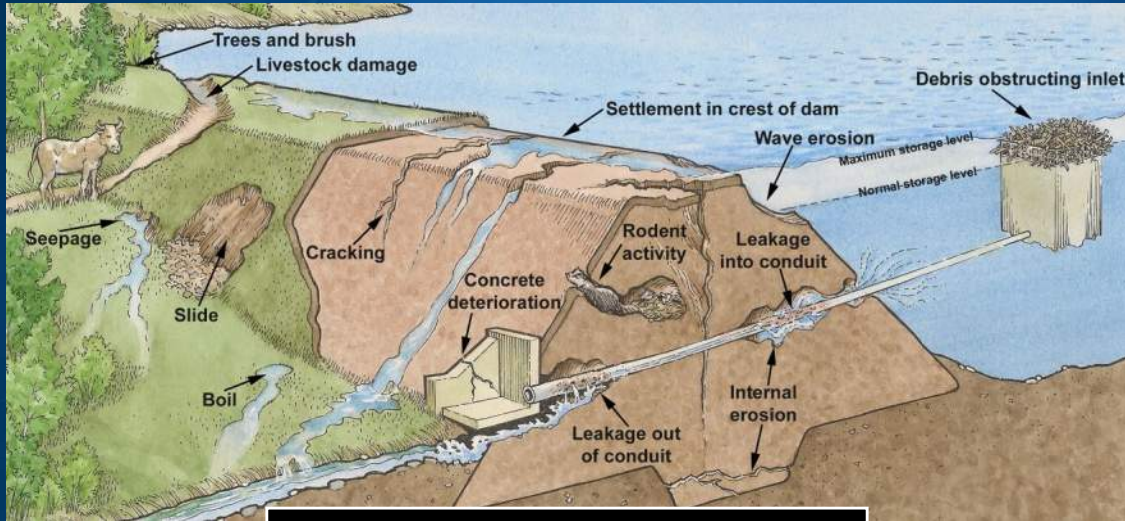
- Maintenance:
 - Algae if an aesthetic concern
 - Remove with skimmer
 - Hide with shoreline wetland plants
 - Aerator or fountain (approval needed)
 - Chemicals (approval needed)
 - Graffiti on concrete structures
 - Potential Pollutants
 - Illicit discharge
 - Illegal dumping

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Structural



Embankments, Dams, Spillways, Liners



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Wet Detention Pond (1001)



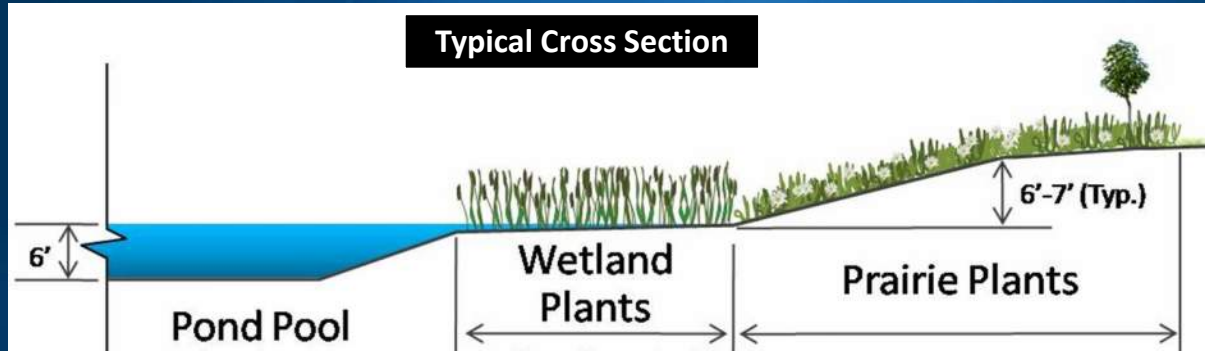
□ Maintenance:

- Debris, Vegetation, Wildlife, Erosion
- Structural
 - Embankments, dams, spillways, pipes, etc.
 - Clay or synthetic liner
- Sediment Accumulation
 - Wet Pond - Permanent pool < 3.5 feet water
 - Dry Pond – Storage volume reduced > 10%
 - NR 528 sediment testing before disposal
- Aerator or Fountain
 - Approval needed



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Wet Detention Pond (1001)



- Sediment Accumulates in Pool of Water
- Wetland Plants Reduce Shoreline Erosion
- Prairie Plants Reduce Mowing Effort

Infiltration Basin (1003)



□ Maintenance:

- Debris, Vegetation, Wildlife, Erosion
- Level Spreader, Winter Bypass
- Structural
 - Embankments, dams, spillways, pipes, etc.
- Sediment Accumulation
 - Pretreatment device to protect infiltrating surface
 - Storage volume reduced > 10%
- Soil Clogging or Compaction Mitigation
 - Surface water > 24 to 72 hrs after 0.5" rain

Bioretention (1004)



□ Maintenance:

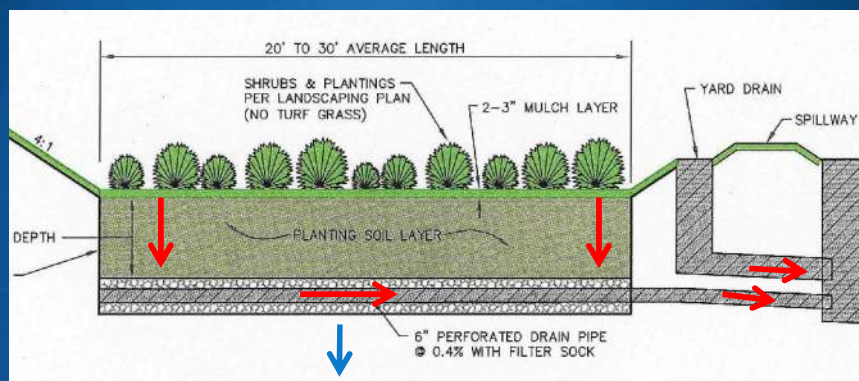
- Debris, Vegetation, Wildlife, Erosion
- Surface Mulch (replenish, not too thick)
- Structural (standpipe, underdrain, filter)
- Sediment Accumulation
 - Storage volume reduced > 10%
- Soil Clogging or Compaction Mitigation
 - Surface water > 24 hrs after 0.5" rain
 - Subsurface water > 72 hrs after 0.5" rain

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EXCEEDING THE JOB ORDER

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Bioretention (1004)



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Vegetated Swale (1005)



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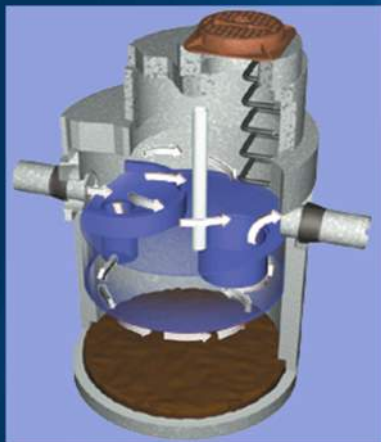
FOX CROSSING
EXCEEDING THE JOB LIST

□ Maintenance:

- Debris, Vegetation, Wildlife, Erosion
 - Vegetation health and density
 - Mowing height (follow design requirement)
 - Length (follow design, not enclosed or lined)
- Permanent Ditch Check
- Sediment Accumulation
 - Storage volume reduced > 10%
- Soil Clogging or Compaction Mitigation
 - Surface water > 48 hrs after 0.5" rain

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Proprietary Sediment (1006)



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EXCEEDING THE JOB LIST

□ Maintenance:

- Debris, Litter, Obstructions
- Petroleum sheen (if required)
- Structural
 - Cracking, spalling, corrosion, joint leak, liner
- Sediment Accumulation (NR 528)
 - Follow proprietary manufacturer's recommendations for frequency of accumulated sediment removal
 - Test or landfill the removed sediment

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Infiltration Trench (1007)



□ Maintenance:

- Debris, Vegetation, Wildlife, Erosion
- Surface Stone or Hardwood Mulch
- Structural (observation wells, pipes)
- Sediment Accumulation
 - Storage volume reduced > 10%
- Soil Clogging or Compaction Mitigation
 - Surface water > 24 hrs after 0.5" rain
 - Subsurface water > 72 hrs after 0.5" rain

Porous Pavement (1008)



□ Maintenance:

- Debris, Erosion From Run On Area
- Regenerative Air or Vacuum Sweep
 - Twice per year to clean pavement surface
- Structural
 - Do not crack seal pavement surface
 - If pavers, joint aggregate (replenish, replace)
- Soil Clogging or Compaction Mitigation
 - Surface water > 24 hrs after 0.5" rain
 - Subsurface water > 72 hrs after 0.5" rain

Rain Garden (1009)



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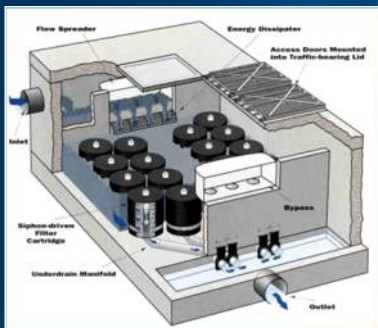
FOX CROSSING
EXCEEDING THE JOB LIST

□ Maintenance:

- Debris, Vegetation, Wildlife, Erosion
- Surface Mulch (replenish, thickness)
- Sediment Accumulation
 - Storage volume reduced > 10%
- Soil Clogging or Compaction Mitigation
 - Surface water > 72 hrs after 0.5" rain

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Proprietary Filter (1010)



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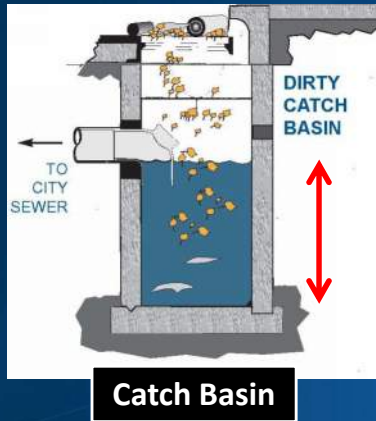
FOX CROSSING
EXCEEDING THE JOB LIST

□ Maintenance:

- Debris, Litter, Obstructions
- Petroleum sheen (if required)
- Structural
 - Cracking, spalling, corrosion, joint leak, liner
- Sediment Accumulation
 - Pretreatment (settling chamber)
 - Follow proprietary manufacturer's recommendations for filter (life span, clogging)
 - Test or landfill the removed sediment

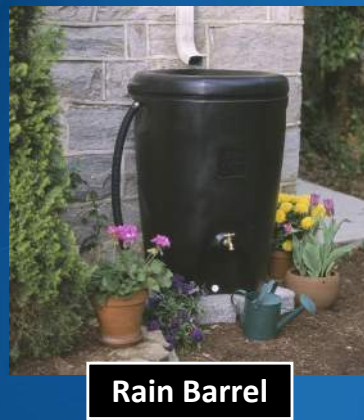
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Hydro Dynamic Separators



- Oversized Manhole, Catch Basin
- Maintenance:
 - Debris, Litter, Obstructions
 - Structural
 - Cracking, spalling, corrosion, joint leak, liner
 - Sediment Accumulation
 - Follow O&M Plan recommendations for frequency of accumulated sediment removal
 - Test or landfill the removed sediment

Other Stormwater Devices



Record Keeping

- ❑ How do I obtain a copy of approved plans for my property?
- ❑ How long do I need to keep my inspection forms?
- ❑ What happens if I don't perform the required maintenance?

Village of Fox Crossing
2000 Municipal Drive
Neenah, WI 54946
Phone: 920.720.7140

FOX CROSSING
EXTENDING THE FOX LIFESTYLE

**STORMWATER MANAGEMENT SYSTEM
INSPECTION, OPERATION, & MAINTENANCE FORM**

Site or Subdivision Name: _____ Parcel ID: _____

Site Address / Location: _____

Inspection Frequency (check one): > 0.5 Inch Rain (R) Monthly (M) Biannual (B) Annual (A) 5-Year Cycle (C) Other _____

Date of Inspection: _____ Inspector Name: _____ Maintenance Crew Leader Name: _____

Maintenance Items – Wet or Dry Detention Pond (1001)	Frequency	Observed?	Inspector Comments	Maintenance Completed
1. Debris & Litter – At inlets and outlets (grate, orifice, weir, pipe, spillway, etc.)	R, M, B, A, C	<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No
2. Debris & Litter – At other device location		<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No

Sample Inspection & Maintenance Form



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Thank You for inviting us to present today!

Questions?



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