

Storm Water BMP inspections and outreach to Homeowners Associations

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Waukesha County Department of Parks and Land Use

CoCoRaHS Mapping System

24-Hour Precipitation
Apr 7, 2022
4:30 AM-9:30 AM local obs time

- NA
- Zero
- Trace
- 0.01 - 0.18 in.
- 0.19 - 0.54 in.
- 0.55 - 1.08 in.
- 1.09 - 1.87 in.
- 1.88 - 2.65 in.
- 2.66 - 10.03 in.

BMP Listing Project Listing Permit Tracking User Access Management Pick List Maintenance Lookup Tables

Waukesha County Storm Water (BMP) Tracking System
Provided by the Department of Parks and Land Use

BMP

Data Entry

Project Identifier: Tara Hill Condominiums
BMP Identifier: 188
BMP Description: Stormceptor
Municipality: City of Waukesha
Survey Township: Pewaukee
Section: 31
1/4 Section: SE
Status: In Service
BMP Type: In-ground Water Quality
Drainage Area Served (Acres): 1.53
As-Built Date: (m/d/yyyy)
Planned Inservice Date: (m/d/yyyy)
Next Planned Inspection Date: (m/d/yyyy)
Certification Date: (m/d/yyyy)
Certification PE Name:
Certification Company:

Save Edits
Delete
Return To Project
Add BMP Point to GIS

Watershed: Fox River Watershed
Subwatershed: Pebble Creek
Hydrologic Unit:
Parcel:
Maintained By:

Create Date: 5/10/2006 2:17:50 PM
Last Updated Date: 1/15/2010 11:30:23 AM
Update Count: 2

Search Results:

Post-Construction BMP Inspections: Resources

- BMP database
- Plans
- Maintenance agreements
- Inspection Forms
- Previous inspection and repair reports
- GIS / Topo (location, watershed, soils, depth to water table, wetlands)
- Recent rainfall history (CoCoRaHS, treatment plants)
- Plat (easements, maint. responsibility, location of practice)

Exhibit D (continued)
Data Summary Sheet for Basin Design

Design Element	Design Data
Site assessment data: (see attached maps)	
Contributing drainage area to basin	10.24 acres
Distance to nearest private well (including off-site wells)	~350 feet
Distance to municipal well (including off-site wells)	> 1200 feet
Wellhead protection area involved?	No
Ground slope at site of proposed basin	average 2%
Any buried or overhead utilities in the area?	No
Proposed outfall conveyance system/dischARGE (w/ distances)	60 ft. to Silvernail Road ditch
Any downstream roads or other structures? (describe)	(2) 21"X27" cmp road culverts
Floodplain, shoreland or wetlands?	No
Soil investigation data (see attached map & soil logs):	
Number of soil investigations completed	2 (in basin area)
Do elevations of test holes extend 4 ft. below proposed bottom?	Yes
Average soil texture at pond bottom elevation (USDA)	Gravelly loam
Average soil texture at rain garden bottom elevation (USDA)	Silt loam
Design infiltration rate at rain garden bottom and method of analysis	1.3 in/hr, NCRS Soil Infiltration Rates
Measured infiltration rate <i>following construction</i>	
Distance from pond/rain garden bottom to bedrock	> 5 feet
Distance from rain garden bottom to seasonal water table	5 feet
General Wet Pond basin design data (see attached detailed drawings):	
Pond Basin bottom area	1,110 sq. ft.
Pond Basin bottom elevation	elev. 924.75
Pond Top of berm elevation (after settling) and width	elev. 934.35 / 8 feet wide
Pond Basin storage below outlet	0.690 ac-ft
Sediment forebay size & depth	0.03 acres (12% pool size)/5 feet
General Rain Garden design data (see attached detailed drawings):	
1% of development area (258,040 sf)	2,580 sq. ft.
Rain Garden Basin area	2,050 sq. ft.
Rain Garden Basin effective infiltration area	1,520 sq. ft.
Rain Garden Basin bottom elevation	elev. 929.90
Rain Garden Top of berm elevation (after settling) and width	elev. 931.00 / 3 feet wide
Basin storage below outlet	1,050 cu.ft.
2-yr 24-hr post-development infiltration volume	4,791 cu.ft.
10% of 2-yr 24-hr post-development runoff volume	4,680 cu.ft.

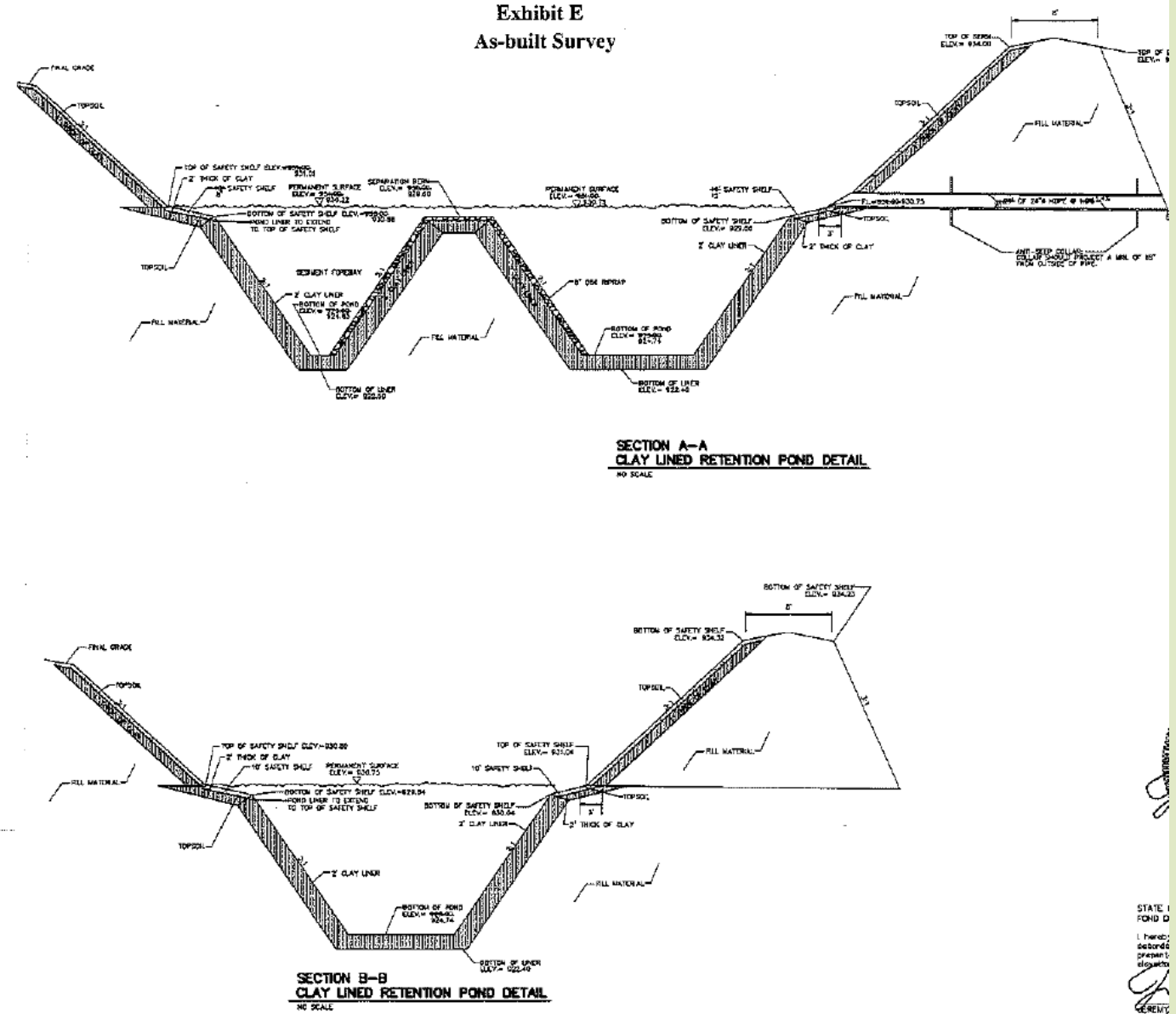
Design Basin Inflow, Outflow & Storage Data
 (see attached hydrographs and detail drawings)

Inflow Peak/Volume	Maximum Outflow Rate	Max. Water Elevation	Storage Volume at Max. Elev.	Outflow Control Structures*
10.68 cfs Post 1-yr./24 hr. peak	3.98 cfs	931.60 ft.	11,674 cu.ft.	#1
13.64 cfs (Post 2-yr./24 hr. peak)	5.21 cfs	931.78 ft.	14,287 cu.ft.	#1
22.06 cfs (Post 10-yr./24 hr. peak)	8.32 cfs	932.28 ft.	22,079 cu.ft.	#1
40.2 cfs (Post 100-yr./24 hr. peak)	16.68 cfs	933.31 ft.	38,015 cu.ft.	#1

* The controlling elements are summarized below (See attached detail drawing of outlet structure):
 #1 - 24 inch diameter HDPE outlet pipe - flow line elev. At 930.75

END VIEW ELEVATION IMAGE OF THIS

Exhibit E
As-built Survey



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Inspection Equipment

- ▶ Water / sediment depth measurement (rod/sinker, staff + ice auger, hydrone, tape, yardstick....)
- ▶ Plant ID app
- ▶ Survey instrument
- ▶ Soil probe / bucket auger
- ▶ Aerial drone for photos
- ▶ Lifting hook for grates
- ▶ Infiltrometer



What to look for?

- Erosion
- Vegetation
- Water
- Sediment
- Animal burrows
- Berm settlement
- Trash
- Construction issues
- Snow storage

Attachment B: Infiltration Basin BMP Inspection Report Waukesha County, Wisconsin

Project Name: _____	Inspection Date: _____
BMP Description: _____	BMP ID Number: _____

Code Key:

N/A = Not Applicable M = Monitor (potential for future problem) NP = Not a Problem WN = Work Needed

INFLOW POINTS

Assessment	Code	Comments
Obstruction: vegetation/debris/sediment		
Erosion/undercutting		
Displacement of fabric/rip rap		
Pipe Condition		
Other (describe)		

FOREBAY

Assessment	Code	Comments
Sediment depth (ft. below principal outlet)		
Side slope erosion		
Invasive vegetation		
Safety shelf		
Other (describe)		

MAIN BASIN AREA

Assessment	Code	Comments
Standing water (> 3 days after storm) + % cover		
Sediment accumulation		
Vegetation height/type		
Bare soil/erosion		
Invasive vegetation (estimate a %)		
Weeds (estimate a %)		
Infiltration trench		
Cell dividers/level spreaders		
Other (describe)		

Common Erosion Issues

► Scour

- Around riprap – not channelized – cuts through liner and causes leakage, dropping pool
- Under riprap – no fabric
- Below riprap – not extended far enough (to pond bottom) – water level fluctuation



Erosion Issues

- ▶ Around outlet pipes
 - ▶ Piping – no anti-seep collar
 - ▶ Sinkholes / seepage due to gaps in pipes and structures



Woody vegetation

- Breaks berm compaction if large / deep enough
- Shades out grasses in basin bottoms
- Obstructs inlets and outlets



Native vegetation

- Required in many infiltration and bioretention basins
- Deep roots help maintain infiltration rates
- Requires skill to establish, maintain, and inventory
- Maintenance agreement may require minimum coverage



Invasives

- Suppression required by NR 51, weed ordinances
- Competes with desired vegetation
- Ability to ID helpful



Water

- Pool levels (wet detention)
 - Water level vs design elevation
 - Is safety shelf covered?
 - If not, why?
 - Rain history,
 - leakage,
 - contrib. watershed
 - Is low flow orifice clogged? (high water level)



Water

- ▶ Leakage (wet detention)
 - ▶ Scour through liner (see plans for type, design)
 - ▶ Liner slumping due to rise / fall of water table around liner
 - ▶ Punctured plastic
 - ▶ Animal burrows



Water

- ▶ Standing water (infiltration, bioretention, trench)
 - ▶ Rain history
 - ▶ Vegetation – stressed, different, cattails, water marks
 - ▶ Observation sump



Sediment

- Measure in wet detention with
 - Sebo-meter (fishing rod, sinker, slip bobber),
 - staff + ice auger,
 - drone,
 - Canoe
- Infalls – soil probe, flow obstruction?
- Pre-treatment – trigger for removal?
- Clogging infiltration / bioretention basin bottom?



Berm settlement

- Location of spillway
- Are there visibly lower spots on berm? Survey if needed
- Inadequate compaction? Did not allow for settlement?



Construction: Missing components / materials

- Safety shelf
- Plug for dewatering outlet
- Riprap / TRM
- Liner
- Low flow orifice protection



Snow storage

- ▶ Undesirable due to chlorides, vegetation damage, excessive sediment accumulation
- ▶ Look on edges close to parking, large paved areas
- ▶ Signs of
 - ▶ vegetation stress
 - ▶ Sediment piles
 - ▶ Scraped sod




After BMP inspections—then what??

- Share the inspection findings with your Homeowners Association
 - Individual mailings ?
 - Phone calls ?
 - Workshop/Meeting ?





Homeowner Education Workshop

- Share information with many at once
 - Help save them money
 - Encourage them to budget for maintenance
- 

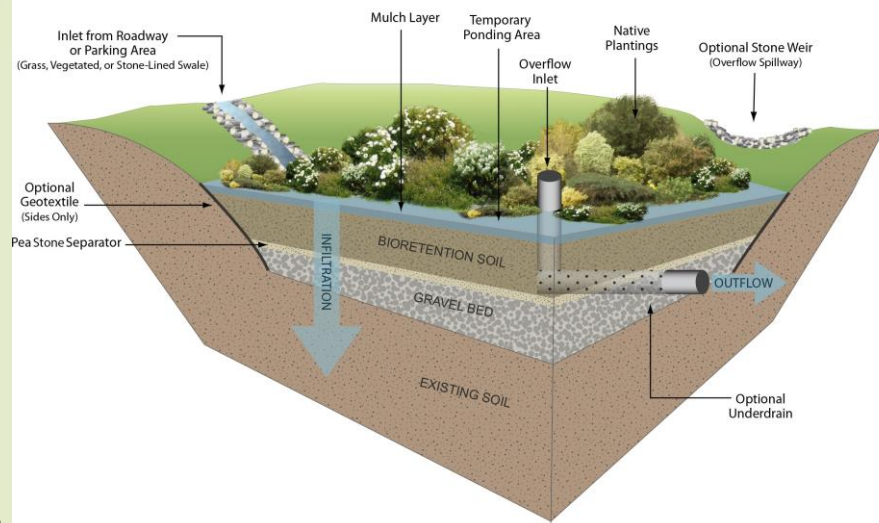
Agenda

- Brief history of stormwater regulations
- Municipality specific inspection findings
- Maintenance that can (and should!) be performed by the HOA
- Maintenance that should be hired out
- Budgeting for maintenance

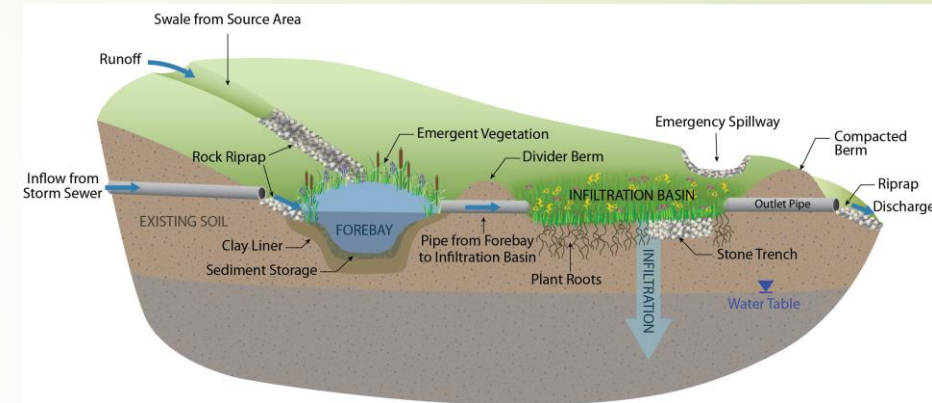


Resources to share- BMP Factsheets

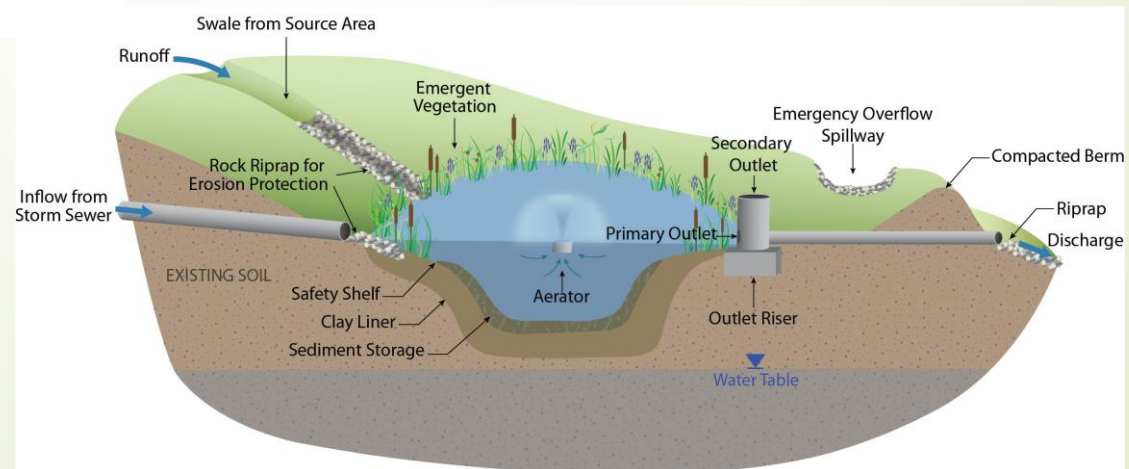
Bioretention Basins



Infiltration Basins



Stormwater Ponds



BMP Factsheets

Each fact sheet contains:

- A drawing to show the parts of the practice as well as a narrative description
- A list of maintenance practices homeowners can do themselves
- A list of maintenance practices that should be done by a hired professional
- Suggestions of practices homeowners can do to extend the life of their BMP

Available at www.waukeshacounty.gov/cleanwater - look under the news and events tab



Make the invitation serious (even scary)—use letterhead and phrases like “responsible for maintenance” or “you are required to maintain”.



Don't let the agenda get bogged down in site specific questions—push those to the end.



Use partners—give an agenda item to people outside of your municipality such as the County or DNR.



Do have site specific inspection information available at the meeting, but save it for after the agenda.



Avoid jargon—the general public does not know what a BMP is or does.



Lessons
learned

Questions?

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