Neighborhood and Commercial Stormwater Facilities



MAINTAINING YOUR FACILITY

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Topics

- Importance of maintenance
- First steps
- Systems overview
 - Key maintenance concerns and inspection activities
- What to do; when to do it; and who should do it
- Liabilities and record keeping
- Plan for current and future needs



Why is maintenance important?



- Stormwater systems need upkeep to operate properly
- A properly functioning system protects aquatic ecosystems and prevents flooding
- Small regular investments prevent costly repairs in the future

What are the first steps?

What do you own?
What are you required to
What condition is it in?





What are you required to do and when?

Specific maintenance and inspection requirements for:

- Bellingham
- Ferndale
- Certain areas of Whatcom County
- Lynden



Typical Neighborhood Stormwater System

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Stormwater Systems

- Ditches and Pipes
- Catch basins
- Swales
- Bio-retention and raingardens
 - Ponds
- Vaults



Ditches

Inspection:

Annually and after large storms

BMPs:

- Check dams replace rocks if necessary
 - Vegetation mow, cut back & remove
 - Structure remove sediment; repair undercutting, scouring or slumping; remove trash





Grass taller than 9", trees, or shrubs may impede the flow of water

Ditches



Conveyances along private roads are the owner's responsibility. Conveyances along city and county roads are not owner's responsibility, but they may impact your facility. Call for maintenance.

Pipes

Inspection:

Annually & after large storms

BMPs:

- Remove sediment
- Remove vegetation growth blocking openings and outlets

Conveyances along private roads are the owner's responsibility. Conveyances along city and county roads are not owner's responsibility, but they may impact your facility. Call for maintenance.





Type 1 Catch Basins

Inspection:

- Monthly (weekly when leaves are falling)
- After storms and regularly during construction periods

BMPs:

Remove trash and sediment from grate

Clean filter if clogged Sump Remove sediment when 60% of sump is filled or <6 inches of invert clearance.



Type 2 Catch Basins

Inspection:

 Annually, or more often if basin is located in area where sediment accumulates or construction is underway.
 (Note: Street sanding!)

BMPs:

Remove trash and debris from inside the basin if more than 60% of the sump depth



Catch basins



<image>

Vac truck cleaning out catch basins

Checking sediment depth

Typical Stormwater Pond



Typical Stormwater Pond



- Access ramp into pond
- Energy dissipater
- Emergency overflow
- Pond Inlet Pipe

Dams, Berms, Spillways, and Ramps







Berm failure

 Erosion, boring animals, settlement and sloughing can lead to major costly problems.







Trees vs. Grass?



Trees in right places are good for aesthetics, stabilization and habitat. Remember – no trees on berms!



- Access, visibility, shading, inspection, leaf and debris management
- Grass keep < 9" long and removed after cutting.

Dams, Berms, Spillways, and Ramps

Inspection:

Annually, and after major storms.

BMPs:

- Control vegetation Remove trees >4" and brush; control invasive species
- Repair erosion Keep slopes vegetated
- Address structural problems Slumping and settling; Get an engineer
 - Protect the overflow Keep rocked and limit vegetation growth
- Remove burrowing animals

Control Structures



The heart of the stormwater facility!

Control Structures



Caution! Confined space. Contact a trained professional.



Typical Control Structure Operation











Control Structures

BMPs:



- Cover & Ring Repair grouting, reposition ring
- Sediment Remove if clearance <12" or more than 25% of sump depth
- Debris and Litter Remove
- Piping Repair cracks in concrete and grouting; secure pipes
- Shear Gate– Operational; handle or chain intact; leakage; closed
- Water level check current/historical (tub line, debris)

Control Structures

 Watch for indications of high water and high water for long periods of time (tub line)





Pond Bottom

Inspection:

Annually except outlets should be checked after major storms

EMPs:

- Inlets and outlets clear of vegetation, leaves and debris
- Erosion control add or restore energy dissipaters
 Remove cattails and sediment if between cattails
 cover 25-50% of the pond AND sediment is >10% of depth;
- Remove trees and woody vegetation.
- Exposed or damaged liner cover or repair
- Oils, fuel or chemical smells investigate and report
- Debris and litter remove

Inlets and Outlets

Keep inlets and outlets clear, and well marked



Marked inlet to pond



Blocked outlet to control structure

Cattails...

- Build muck year by year, releasing nutrients. Height is function of soil/muck depth.
 Remove plants and sediment.
- Replant!





Good vegetation...

- Low growing plants with less biomass
- Native species enhance habitat and beauty of a pond









Sedge

Burweed

Rush

Energy dissipaters

 Add rock to prevent erosion and to maintain energy dissipaters



Vaults



Remember – No entry to confined spaces!

Vaults

Inspection:

Annually except after major storms

BMPs:

- Sediment Remove if clearance <12" or more than 25% of sump depth
- Debris and Litter Remove if you can reach
 Oils, fuel or chemical smells note and report
- Control Structure Grouting, Strapping, Piping
- Shear Gate Operational, handle or chain in tact, leakage, closed
- Water level check current and historical (tub line, debris)

Swales and Bioswales

Inspection:

Quarterly and after large storms.

BMPs:

- Remove excess sediment
- Replant bare spots
- Remove inappropriate plant species
- Clear inlets and outlet





Bioretention and Raingardens



Access Control

Inspection:

Annually unless unauthorized access noted



Fencing – Keep in good condition

BMPs:

- Access Maintain perimeter access to inlets, outlets, berm, overflow and control structure
 - Poisonous plants and insects – Remove if they limit access
- Yard waste dumping Work with property owners



Invasive Vegetation Annually

 Remove or control using appropriate methods







http://www.co.whatcom.wa.us/publicworks/weeds/weedlist.jsp



Discharge to Streams

- Observe turbidity of water.
- Outlets should have energy dissipaters. Check for proper placement of rocks, and replace if necessary.





What can you do?

- Grass cutting and brush clearing
- Trash rack clearing
- Cattail & brush removal near inlets and outlets
 Garbage clean-up
- Fence and signage upkeep
- Clean catch basin grates





Other things can you do...





- Observe seasonal pond conditions
- Control access and unauthorized uses
 - Prevent encroachments that limit access
- Prevent dumping of yard waste or garbage
- Keep leaves and bark out of the street
- Request street sweeping and catch basin cleaning
- Watch out for runoff from construction piles

Safety Concerns



- Confined spaces
- Steep and slippery slopes
- Insects and poisonous plants
- Lifting and exertion
- Equipment
- Chemicals

What work should professionals do?

- Vault inspections and cleaning
- Pesticide spraying
- Large vegetation removal
 - Sediment removal
- Structural or plumbing repairs or improvements
- Design planting program



What are your liabilities?

Personal injury

- Damage to public or private property
- Regulatory water quality and/or habitat





Record keeping

- Record observations on paper
- Take photos of issues
- Report any problems to managers
 - Keep in a file

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Planning current and future needs

- Understand <u>condition</u> of your facilities and how they function over time
- Identify ongoing and major <u>maintenance</u> requirements
- Understand your <u>liabilities</u> and water quality concerns
- Consider <u>enhancements</u> if opportunities are there
- Seek support of neighbors and/or members
- Develop a <u>simple plan</u> with a prioritized list of activities and projects

Budgeting current and future needs

- Evaluate what work can be done in house and what should be contracted
- Prioritize projects
- Solicit estimates
- Develop budget scenarios
- Get support and approval
- Use annual assessments
- Implement plan
- Review your plan and facility conditions each year



Maintaining your stormwater system will:

- Reduce long-term maintenance and repair costs
- Protect water quality for future generations
- Protect downstream property from flooding and erosion
- Retain and enhance property values
- Provide a green space amenity.



QUESTIONS?

Please contact the Kulshan Services Stormwater Team <u>www.KulshanServices.com</u> Or 360-393-4706