All County and Associates, Inc.

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Homeowner's Guide to Stormwater Management

What You Need to Know About Stormwater

Today, homeowners are facing a new situation around the house. Stormwater management is a hot topic for builders and homeowners. Homeowners have new requirements for property upkeep. Some even pay fees for municipalities to manage stormwater on their behalf.

Stormwater
Is the water that runs off land after rain or snowmelt. As impervious surfaces (rooftops, driveways, and sidewalks) increase, so does the runoff.

Maintenance
Homeowners must have a basic understanding of the practices to maintain them.

Control Measures
Builders include Best Management Practices to capture and treat runoff.

1 What is Stormwater?

When rain or snowmelt occurs, the associated runoff is Stormwater. This water can soak into the soil (infiltrate), evaporate into the atmosphere, or plants can soak it up (evapotranspiration). If one of those processes do not occur, it will flow over impervious surfaces (runoff). This runoff ends up in streams or lakes.

Undeveloped Land

Natural areas, such as meadows and wooden area, generate less runoff.

Developed Land:

Improved area, such as rooftops, driveways and roads generate more runoff. This because the water cannot soak back into the ground.

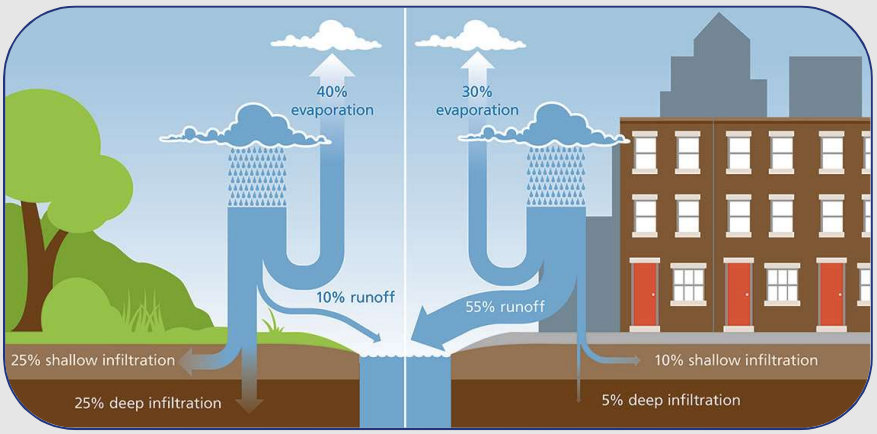

Image Courtesy of the City of Philadelphia

2 Why Should You Care about Stormwater Management?

Stormwater generated on a property can carry pollutants to lakes and streams. These pollutants can have negative impacts on plants, wildlife and downstream residents.

As the water runs off a property, it travels at a faster rate than in a natural environment. This increased volume and speed can cause flooding and erosion.

Image Courtesy of Metropolitan N. Georgia Water Planning District

3 What Are Stormwater Best Management Practices?

When a builder begins construction, they must have a plan that to treat runoff. These best management practices (BMPs) treat runoff during and after construction.

These BMPs can range from protecting open space, to engineered structures or ponds.

Image Courtesy of Carver County

Goals of Stormwater BMPs

- Reduce the volume of runoff
    - Infiltrate the runoff
    - Plant uptake of the runoff
- Slow the rate runoff
- Treat the runoff

4 Categories of Best Management Practices:

BMPs are either designed for Erosion and Sediment Control or Post-Construction Stormwater Management.

Erosion and Sediment Control BMPs

During construction, these controls prevent sediment laden runoff from leaving a construction site.

Post Construction Stormwater Management BMPs

After construction, these controls treat any runoff leaving the property. They come with a long-term maintenance need that will fall on the property owner to complete.

Image Courtesy of Cuyahoga Soil & Water Conservation District

5 Homeowner Responsibilities

After taking ownership, the owner must maintain any BMP within their property boundary. This includes long-term maintenance that ensures functionality.

Additionally, the recorded plan for construction of the property will include an easement. This easement provides another party access to the BMP. This access occurs when the property owner fails to uphold their maintenance responsibilities. If the municipality completes maintenance, they can bill the property owner.

Image Courtesy of the Town of Nags Head

6 Common Post-Construction Residential BMPs

Lets take a deeper look at the common BMPs a homeowner might encounter or add to their property.

Post- Construction BMPs:

- Rain Garden
- Rain Barrels
- Dry Well
- Infiltration Trench
- Pervious Pavement
- Vegetated Swale
- Amended Soils

Rain Gardens

What is It?

Rain gardens are specialty vegetated depressions that treat stormwater. They hold runoff, allowing plants and soil to absorb it. This process reduces the rate and volume of runoff. It also provides a benefit by treating the stormwater.

How Does It Work?

Runoff drains to the rain garden by downspouts or overland flow. The water fills the depressed area and soaks into the ground. This reduces the speed and volume of runoff leaving the property. The plant root structure of the plants allows more water to soak into the ground, than a traditional lawn. The plants also assists in removing pollutants.

How Does a Homeowner Maintain It?

Routine Maintenance

- Check vegetation health and ensure there are no spots of bare soil exposed.
- Check for any debris or sediment buildup that could be impacting flow to the rain garden.

Annual Maintenance

- Maintain perennial plants like a standard garden. Remove annual or dead plants and replanted in the spring.

Every Three Years:

- Replace mulch in the spring to cover any exposed soil. The mulch depth should not exceed 3”.

Extra Information

- The use of native plants reduces the maintenance required to sustain the plants.
- During the first years, owners must perform routine weeding to help vegetation establishment.
- Rain gardens should drain within 48 – 72 hours. If it takes longer than 72 hours, owners could have mosquito problems. Contact a professional if this occurs.
- Watering of plants may need to occur during droughts.

Image Courtesy of Toronto and Region Conservation Authority

Rain Barrels

What is It?

Rain Barrels are a way to capture runoff from the rooftop to be re-used on the property. The most common form of re-use is when a property owner uses the stored runoff to water gardens.

How Does It Work?

Rain barrels capture the runoff from a rooftop. The barrel provides a storage area for the water. If the rainfall is greater than the capacity of the barrel, it will overflow.

How Does a Homeowner Maintain It?

Routine Maintenance

- Clean the screen of any leaves or debris.
- Use the collected water before the next rainfall event.

Annual Maintenance

- Clean gutters and downspouts to reduce debris from clogging or filling the barrel.

Winterization:

- Empty the barrel before the first freeze of winter to prevent damage.
- Rinse out any accumulated sediment.
- Disconnect the barrel from the downspout and reconnect in the spring.

Extra Information

- The barrel will include a screen to prevent debris from entering and limit mosquitos.
- Water in the rain barrel is not safe for drinking.
- To reduce the usage of drinking water for watering gardens, install a spigot in the barrel.

Dry Well

What is It?

A dry well is an underground storage area for runoff generate from the rooftop of the house. These storages can include stone beds or a manufactured product.

How Does It Work?

Gutters capture the runoff from the rooftop. They direct it through the downspout and into the dry well. Over time, the collected runoff will soak into the ground surrounding the dry well. This infiltration reduces the rate and volume of runoff leaving the property.

How Does a Homeowner Maintain It?

Routine Maintenance

- Clean the screen of any leaves or debris.

Quarterly Maintenance

- There should be an observation port or lid that for inspection of the dry well. View down into the access area for sediment and debris buildup. Remove any built up debris to ensure proper long-term functionality.

Annual Maintenance

- Clean gutters and downspouts to reduce debris from clogging or filling the dry well.

Extra Information

- The dry well system will include a screen or structure to prevent debris from entering.
- Water within the dry well should drain within 72 hours. If water remains for longer, contact a professional. They will provide guidance on fixing or replacing the dry well.

Image Courtesy of NDS, Inc.

Infiltration Trench

What is It?

An infiltration trench is a buried bed of stone connected to impervious surfaces. These are larger stormwater structures designed by engineers. They incorporate a structure to capture and treat runoff.

How Does It Work?

Runoff flows across impervious surfaces. Structures or an exposed stone surface captures the runoff. A perforated pipe provides a means to get the water into the surrounding stone. From there, the native soil absorbs the water. This process helps direct runoff back into the ground, recharging the water table.

How Does a Homeowner Maintain It?

Routine Maintenance

- Clean the screen of any leaves or debris.

Annual Maintenance

- Inspect the perforated pipe for debris buildup. Locate and eliminate the source of the debris or incorporate a treatment device.

Extra Information

- A trench with an exposed stone surface, will need extra maintenance. This includes removing and cleaning the stone to prevent clogging. No driving should occur over the surface stone to prevent compaction.
- Most infiltration trenches come with a cleanout port to access and clean the system. If the trench retains water longer than 72 hours, contact a professional for guidance.

Image Courtesy of SUDS Wales

Image Courtesy of the Borough of Malvern

Pervious Pavement

What is It?

These modified impervious surfaces allow water to drain through them instead of runoff. You can find these used for driveways, sidewalks, trails, parking lots and patios. They can consist of porous asphalt, concrete or pavers.

How Does It Work?

As the rain falls on the surface, it passes through the void space of the surface into the stone bed below. From there the natural soil surrounding the stone bed absorbs the water back into the ground. To improve the benefit, direct more runoff toward the pervious surface.

How Does a Homeowner Maintain It?

Routine Maintenance

- Prevent debris from accumulating on the surface.
- If debris or soil washes onto the surface, a professional may need contacted. They will use a vacuum system to remove the debris from the voids and re-establish they system.

Annual Maintenance

- Perform annual vacuuming, even if debris or soil does not wash onto the surface.

Extra Information

- Never apply a sealer to the surface or it will prevent water from passing into the stone bed.
- Do not use sand or cinders to treat the surface during the winter.
- Owners should be careful when plowing to not damage the surface.
- Only use nontoxic salts if ice forms on the surface.

Image Courtesy of Better Living Through Design

Vegetated Swale

What is It?

Vegetated swales are wide, shallow channels that convey runoff. Check dams and plants improve the treatment capacity of the swale. Swales reduce the need for drainage structures to move water from one place to another.

How Does It Work?

The wide and shallow design allows for the slower flow of water. This combined with check dams allows water to soak into the ground. This promotes groundwater recharge. The addition of plants increases the pollutants removed from the water.

How Does a Homeowner Maintain It?

Routine Maintenance

- Grass swales receive routing mowing like a lawn.
- Inspect planted swales for dead plants., remove and immediately replace. Only remove and replace dead plants.
- After rainfall, look for debris at the inlet, outlet and any trash or debris throughout the swale

Annual Maintenance

- Maintain perennial plants like a standard garden.

Extra Information

- More weeding occurs till vegetation establishes. Do not use herbicides.
- During droughts, plants may need watered.
- Remove any winter sand or cinders that accumulate around the inlets. Only use nontoxic salt on any impervious surfaces draining to the vegetated swale.

Image Courtesy of Design Your Town

Amended Soils

What is It?

Amended soils contain supplements like compost, sand or topsoil. They replace compacted soils or ones without enough organic matter.

How Does It Work?

When soil becomes compacted, water has more difficulty passing through. Loosening the soils restores the pours of the soil and the water can pass through. The added material can also increase the pore space of the soil. Amendments additionally add organic matter that helps vegetation and water storage.

How Does a Homeowner Maintain It?

The best maintenance is to protect the areas. Parking and storage should not occur over the amendments. Additionally, owners cannot remove these areas.

Extra Information

- Soil amendments provide air spaces between soil particles for water to infiltrate.
- Amended soils can become compacted over time by allowing volumes of water to pond over them.

Image Courtesy of Xtremehorticulture of the Desert

Images Courtesy of Planners Web, TRCA, Mother Earth News, Allied All-City, Inc., KUNC, and City of Nashville

Helping You Make Informed Decisions

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