



Best Management Practices (BMPs) O & M FACT SHEET

Village of La Grange Park
447 North Catherine Avenue, La Grange Park, Illinois 60526

Illinois Green Infrastructure Grant: Downspout Disconnection Assistance Program

DESCRIPTION

Best Management Practices (BMPs) eligible for reimbursement under the Downspout Disconnection Assistance Program per the Illinois Green Infrastructure Grant Program for Stormwater Management must be constructed in conjunction with the required disconnection of roof gutter downspouts from the Village of La Grange Park combined sewer and as described herein. This Fact Sheet includes information on the design, expected performance, and maintenance requirements of Best Management Practices (BMPs).

The purpose of the Downspout Disconnection Assistance Program is to prevent pollutant run-off into the combined sewer and reduce its overflow into Salt Creek and the Des Plaines River by maintaining and managing stormwater impacts onto personal property. This protection from pollutants into waterways will facilitate the improvement of biological, chemical and physical quality of the Des Plaines River. The goals of program are more likely to be achieved if the BMP implemented is constructed and maintained by the Landowner in accordance with this Operations and Maintenance Fact Sheet.

ELIGIBLE BEST MANAGEMENT PRACTICES (BMPs)

The following presents the description of two eligible BMPs, Rain Barrels and Rain Gardens. Included is overview on suitability, design considerations (benefits & limitations), performance, and site factors.

RAIN BARRELS

Rain barrels are provided at no cost as part of this program as part of an intergovernmental partnership with the Metropolitan Water Reclamation District of Greater Chicago (MWRDGC). Residents are eligible to receive one rain barrel per downspout. Multiple barrels interconnected to one downspout or rain barrel systems require additional approval from the MWRDGC. Rain barrels are available in four colors: Terra Cotta, Blue, Black, and Gray.

Definition

Rain barrel utilization is one way to harvest rain water, the practice of collecting rain water from impermeable surfaces, such as rooftops, and storing for future use. Rain barrels are typically located at the downspout of a gutter system and are used to collect and store rainwater for watering landscapes and gardens. The simplest method of delivering water is by the force of gravity. However, more complex systems can be designed to deliver the water from multiple barrels connected in a series with pumps and flow control devices. Due to their size and storage capacity, these systems are typically used to irrigate landscapes and gardens on a regular basis reducing the strain on municipal water supplies during peak summer months. The storage capacity of a rain barrel is a function of the catchment area, the depth of rainfall required to fill the system and the water losses. A general rule of thumb in sizing rain barrels is that one inch of rainfall on a 1,000 square foot roof will yield approximately 600 gallons of runoff.



Key Design Considerations

The rain barrel should be watertight, have a smooth interior surface, be located on level and stable ground and placed on a stand or cinder blocks, have a tight-fitting lid, good screens on the inlet and outlet and have an emergency overflow device. To prevent the breeding of mosquitoes, empty the water in less than 5 days or place a fine screen over all openings. Material can withstand the pressure of water over long periods of time. Disconnect and drain rain barrels in the winter to prevent freezing and deformation of the rain water harvesting system.

Benefits

Rain barrels capture rainwater from your roof and save it for when you need it. By keeping this water out of the sewer system, they can also help prevent sewer overflows and flooding. You can use rain barrel water to wash your car, water your lawn, or clean work tools. Rain barrel water is naturally free of chlorine, lime, and calcium and some gardeners believe their plants prefer it. However, since rain barrel water is runoff from your roof, do not drink it!

Rain barrels protect water supplies by reducing use during peak summer months. The process mimics the natural hydrology of the area by infiltrating a portion of the rain water falling on the site. Rain barrels reduce volume of storm water being delivered to downstream waterbodies. Finally, the use of rain barrels result in cost savings by reducing municipal water bill.

Rain barrels can be easily painted. Wipe down the barrel with a one-to-one mixture of vinegar and water. Rough the surface of the barrel with a piece of fine grit sand paper. Apply a coat of latex bonding primer. Paint your design with “exterior latex paint”

Limitations

They are not suitable for the following roof types: tar and gravel, asbestos shingle and treated cedar shakes. Finally, depending on the design, the use of the rain barrel requires a certain amount of operation and maintenance.

Performance

Rain barrels control for water quantity, but do help with water quality issues such as: channel protection, overbank flood protection, extreme flood protection, and recharge volume. Rain barrels promote retention of rain water on private property. Water from the rain barrels undergoes natural filtration (of suspended solids, nutrients, metals, pathogens, and toxins) if applied to vegetated pervious areas. The barrel protects from evaporation. The water collection depends upon the drainage area of the roof and the efficiency of the gutter and connecting systems. The rain barrel system is poorly suited to freeze thaw cycles and requires maintenance.

Maintenance

In general:

- Follow installation guidelines provided by the MWRDCG on page 3.
- Make sure your overflow is directed away from your house (minimum of 4’, preferred 10’)
- A pervious (not paved) surface under the placement of the barrel absorbs overflow
- Elevate your rain barrel for better water pressure (concrete blocks work well)
- Check your gutters for debris at least twice a year
- Check the seals around the spigot and drain/hose attachment of the rain barrel
- Always use the water in the rain barrel within 3 days if possible

At season’s end:

- Remove the diverter piece from the downspout
- Remove leaves that may have collected on top
- Unscrew the cap on the rain barrel and empty the water out
- Spray the inside of the barrel with water and shake leaves and debris out
- Secure winter cap over the hole in the downspout
- Turn the rain barrel upside down open spigot and store in your garage or outside

Installation Instructions

Please read these instructions and warnings thoroughly before beginning installation and retain for future reference.

INCLUDED

- Rain barrel body (A)
- Rain barrel lid (B)
- Mesh filter (preinstalled in lid) (C)
- 1 overflow hose and 1 hose clamp (D)
- 1 spout, 1 rubber gasket, 1 nut (E)
- 4 screws

NEEDED

- Slothead and Phillips (crosshead) screwdrivers
- Wrench
- Tape measure and marker
- Safety glasses, safety gloves
- Hacksaw
- Hammer or chisel

Step 1 Locate

Choose a location below a downspout for your rain barrel. The location must have level, firm ground. A 3'x3' paving stone can be used to provide stability. Avoid locations near ground-level basement windows or window wells.

Step 2 Assemble

Put the rubber gasket on the spout and place it through the hole at the front of the barrel. Thread the nut onto the back of the spout from inside the barrel. Hold the nut in place with a wrench and hand tighten only. It only needs to be tight enough to prevent water leakage. Use caution as over-tightening can crack the barrel.

Step 3 Cut Downspout

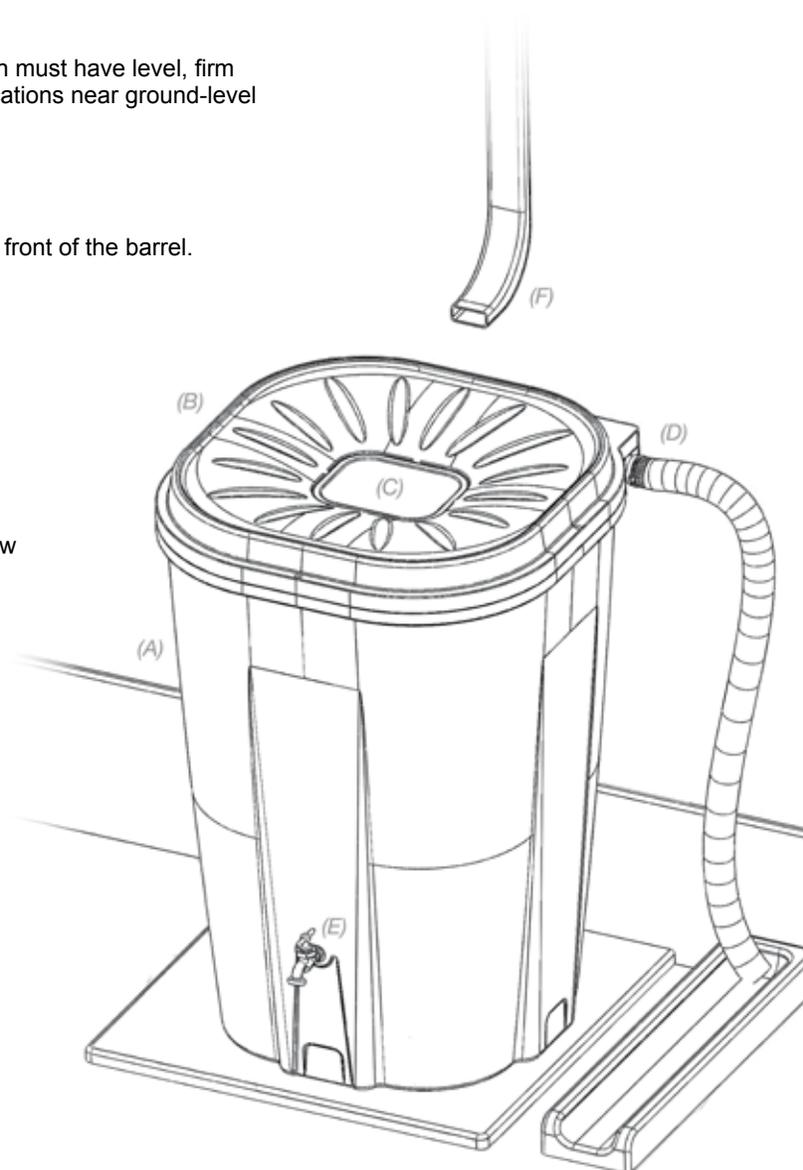
Place the barrel beside the downspout to measure and mark your required cut. Make sure to allow enough room for the barrel, lid and elbow spout. **Wearing safety glasses and gloves**, cut the downspout using a hacksaw. Attach your existing elbow spout (F) to the new downspout end.

Step 4 Overflow

Choose which side overflow spout you will use. Both spouts are blocked by a plastic disc by default. Remove the disc by inserting a slot screwdriver or chisel into the overflow tube from the outside, and gently tap with a hammer around the edges of the disc until it pops free. Attach the overflow hose using the hose clamp and a slot screwdriver. Direct the other end of the hose to wherever your downspout originally drained, which should be either a splash pad or sewer drain.

Step 5 Attach Lid & Place

Place the lid on the barrel and affix using the four provided screws (#6 x 1.5") and a crosshead screwdriver. Hand-tighten only. Over-tightening may crack the plastic. Place assembled bin under downspout and ensure it is level and stable.



Option Connecting Multiple Barrels

Multiple FreeGarden™ RAIN barrels can be connected to collect additional water from the same downspout. On each additional barrel tap out BOTH plastic discs in the overflow spouts as in Step 4 above, then connect and clamp the end of the first barrel's overflow hose to one of the spouts of the additional barrel. Clamp and connect another overflow hose to the other spout of the additional barrel and direct the open end to wherever your downspout originally drained (usually a splash pad or sewer drain).

Usage

Congratulations! You can use your collected rainwater for many purposes, such as:

- Watering lawns
- Watering gardens
- Washing cars
- Cleaning outdoor furniture
- Washing garden tools and containers
- Watering indoor and outdoor potted plants

Note: **NEVER DRINK OR INGEST STANDING WATER.** Do not allow ingestion by pets and animals, and do not cook or wash anything in collected rainwater in any way that may result in ingestion. Ingestion may cause serious illness or death. See below for further important warnings.

Maintenance

SUMMER

Clean the screen once a month to prevent clogging. Check for erosion under/around rain barrel; platform/support must remain level and stable at all times.

WINTER

Drain barrel and store in shed or garage. If left outside with freezing water inside, the barrel may crack.



WARNINGS

Drowning Hazard

Never permit children to play on, in, or near a rain barrel. Always affix the lid securely to avoid drowning. Never use a rain barrel without the lid securely affixed, or with a damaged, cracked, warped or broken cover. Never place a rain barrel near a deck, stairs, chair, or other structures or items that may allow a child to climb above, on, or in the rain barrel.

Water Contamination Hazard

Do not use collected water for drinking, cooking, washing or in any way that may result in ingestion of the water by humans and/or animals. Water in rain barrels may become stagnant and/or contaminated. Ingesting rain barrel water may cause serious illness or death. Use only for watering plants and cleaning of outdoor items not related to eating or drinking.

Tipping Hazard

A misinstalled rain barrel may tip over causing bodily injury or property damage. Never place rain barrels on non-level or uneven surfaces. Always use a solid, stable platform under the rain barrel. Water is very heavy. The preparation and placement of the installation are critical; the platform must be level and provide robust support for a filled rain barrel.

Electrical Hazard

If the downspout contains heating cables, there is a potential electrocution or fire hazard during installation. Ensure power is disconnected at the electrical panel before manipulating heated downspouts. Consult a qualified electrician for modifications to heated downspouts.

Installation Hazards

Rain barrels are for water collection and outdoor use only. No other uses are recommended. Downspout edges may be sharp. Wear protective gloves when cutting and handling downspouts. Always wear safety glasses when cutting or drilling to prevent eye injuries. Protect siding from damage by inserting a sheet of plywood between the downspout and siding. Read all instructions and warnings thoroughly before installing this product.

Warning and Limitations

Improper installation and maintenance may result in property damage, bodily injury and/or death. Enviro World Corporation is not responsible for any damages or injuries caused by or resulting from improper installation and/or continued maintenance. Retain this sheet for future reference.

International Headquarters

Enviro World Corporation
7003 Steeles Ave. W., Unit 6
Toronto, ON Canada M9W 0A2
Tel 416-674-0033 Fax 416-679-0368
Toll-free 877-634-9777 solutions@enviroworld.ca

www.enviroworld.ca

RAIN GARDENS

Rain Gardens are eligible for a \$400 maximum reimbursement from the Village.

Definition

A rain garden is also known as bioretention and is a terrestrial-based (upland as opposed to wetland), water quality and water quantity control process. The rain garden employs a simplistic, site integrated design that provides opportunity for runoff infiltration, filtration, storage and water uptake by vegetation. In general, rain garden systems can be described as shallow, landscaped depressions commonly located in parking lot islands or within small pockets in residential areas that receive stormwater runoff. Rain garden facilities capture rainwater runoff to be filtered through a prepared soil medium. Once the soil pore space capacity of the medium is exceeded, stormwater begins to pool at the surface of the planting soil. Pollutants are removed by a number of processes including adsorption, filtration, volatilization, ion exchange and decomposition (Prince George's County, MD, 1993). Filtered runoff can either be allowed to infiltrate into the surrounding soil (functioning as an infiltration basin or rainwater garden), or collected by an under-drain system and discharged to the storm sewer system or directly to receiving waters (functioning like a surface sand filter). Rain gardens are a stormwater treatment practice that utilizes the chemical, biological and physical properties of plants, microbes and soils for capturing/reducing stormwater runoff and removing pollutants from runoff. This process is often incorporated into many different types of filtration and infiltration stormwater treatment practices.

Key Design Considerations

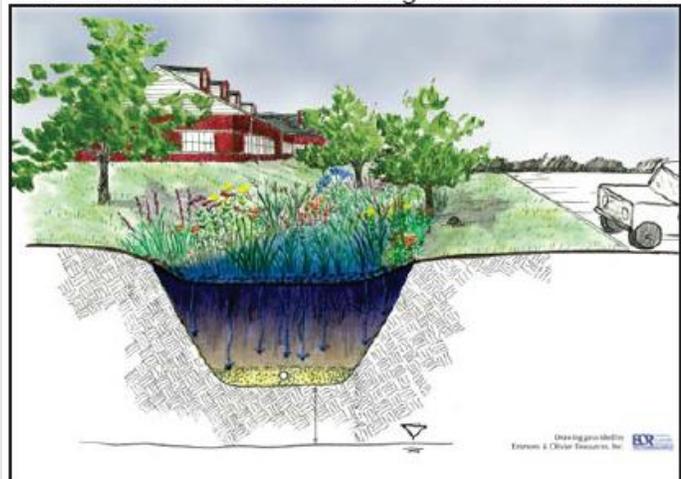
Infiltration requires suitable soils. There should be a minimum 10' setback and located down grade from home foundations. Rain gardens are best applied to drainage areas with relatively flat slopes (5%). An on-lot rain garden should include a simple design that incorporates a planting bed in the low portion of the site. These systems are designed to receive flows from gutters, and/or other impervious surfaces.

Rain gardens can be very effective for removing fine sediment, trace metals, nutrients, bacteria and organics. They also provide many additional environmental (habitat, improves air quality, urban microclimates), social (creates a unique

Start of Storm Event - Initial runoff & storage



Duration of Storm Event - Storage & filtration/infiltration



Following Storm Event - Remaining storage draw-down



Graphics Courtesy of Rice Creek Watershed District

sense of place) and economic benefits (reduces development and maintenance cost, greater lot yield, increases property values). Rain gardens are well suited for high impervious areas. Generally speaking they are effective in reducing runoff volume. Rain gardens provide a great deal of flexibility in design, affording many opportunities for creativity.

Limitations

Rain gardens are susceptible to clogging by sediment; therefore maintenance and pretreatment is necessary to maintain effectiveness. They are not effective for large drainage areas (use multiple structures, closer to source of runoff). Utilizing rain gardens requires space consumption (5%-10% of drainage area).

Performance

Rain gardens control for water quality, recharge volume, channel protection but not for overbank flood protection or extreme flood protection. Rain gardens promote infiltration of rain water on private property. Water directed into the rain garden undergoes natural filtration (of suspended solids, nutrients, metals, pathogens, and toxins) in vegetated pervious areas. Unlike the rain barrel, rain garden does not protect against evaporation. Performance on water collection and infiltration is dependent upon the location of the rain garden in relation to the lay of the land and whether there are any rain collection systems (such as a rain barrel) conveying water into the garden. The rain garden's capacity to hold water, infiltrate and act as a recharge volume system depends on the backfill materials used in the deepest layers, the types of native plantings utilized, as well as the depth and size of the garden. The rain garden system is well suited to freeze thaw cycles and requires maintenance.

Maintenance

Years 1 & 2

New rain gardens will need to be watered for the first one or two years until the garden is established. Apply mulch twice per year until groundcover establishes. After the first season, it may be obvious what plants were successful and what plants do not work for your rain garden. Weeding will be needed the first couple of years. Remove by hand only those plants you are certain are weeds. Try to get out all the roots of the weedy plants. Weeds may not be a problem in the second season, depending on the variety and tenacity of weeds present. Keep a close eye on invasive weed species such as Thistle and Wild Cucumber.

Years 3+

In the third year and beyond, the native grasses, sedges, rushes, and wildflowers will begin to mature and will out-compete the weeds. Weeding isolated patches might still be needed on occasion. After each growing season, the stems and seed heads can be left for winter interest, wildlife cover and bird food. Once spring arrives and new growth is 4-6-inches tall, cut all tattered plants back. If the growth is really thick, hand-cut the largest plants and then use a string trimmer to reduce the planting back to a height of six to eight inches. Dead plant material can also be removed with a string trimmer or weed whacker (scythe) and composted or disposed of as appropriate. Burning is banned in the Village of La Grange Park, and is not an option for removal dead plant material. Another option is to mow the dead plant material. If the mowing deck of your lawn mower can be raised to a height of six inches or so, mow your rain garden is a good option. Then, rake up and compost or properly dispose of the dead plant material. If the mower deck won't raise that high, use a string trimmer or weed-eater to cut the stems at a height of 6-8 inches. On thicker stems, such as cup plant, goldenrods and some asters, a string trimmer may not be strong enough. For these, use hand clippers or pruning shears to cut the individual stems.

Regular Evaluation

Since the rain garden serves the purpose of catchment, sediment will tend to accumulate within the garden. Remove sediment as necessary. Core aerate or cultivate bare areas annually if surface becomes clogged with fine sediments. Replant or seed if there are areas of exposed soil. Replace dead or diseased plantings. Evaluate the health of native plantings. Plant more of the successful species in the rain garden as necessary. Replace rocks that may be diverting flow out of the garden.



BMP - Rain Garden Program Guidelines & Requirements



Program Guidelines

To qualify for a Rain Garden reimbursement of a maximum of \$400 under the Downspout Disconnection Assistance Program, residents must follow these steps:

1. Complete a disconnection of downspouts from the combined sewer.
2. Review the program details. Please note that in order to receive the rebate you must sign an agreement with the Village to maintain the rain garden for a minimum of 10 years.
3. Conduct a preliminary site assessment on your property to identify good places for your rain garden. For the preliminary assessment, assume that the rain garden should be located:
 - ✓ At least 10 feet from the home.
 - ✓ At least 5 feet from structures and property lines
 - ✓ In flat or low slope areas, away from steep (20% or greater) slopes; and
4. Proximate to a disconnected downspout or in a location that can be fed by gravity from impervious areas on your property (e.g., roofs, driveways, patios).
5. Complete a **Best Management Practice (BMP) Permit (Downspout Disconnection Program Permit)**. These are available at the Village's website or at Village Hall at 447 N. Catherine Avenue. This Intent Form lets the Village know that you intend on submitting a BMP Permit Application.
6. Schedule an on-site review meeting. Once the Village has received your permit application, the Village will contact you to schedule an on-site review meeting. During this meeting, the Village will:
 - ✓ Help layout the location of the rain garden on your property and provide recommendations on plant materials that might work well at your site; and
 - ✓ Answer any questions you might have about the rain garden rebate program.
7. Get bids from a contractor licensed to do work in the state of Illinois. The Village recommends receiving at least three bids.
8. If completing the construction of the rain garden as a do-it-yourself, plans, drawings and specifications will be required. All design requirements must be met.
9. **Complete a BMP Permit Application.** This permit will require that you sign a **Landowner Agreement** with the Village. The Permit will require the design details for your rain garden and the operations and maintenance requirements.
10. Build the rain garden.
11. Schedule post-construction inspection for the rain garden.
12. If necessary, call the Village to schedule the final inspection.
13. Once inspected, the Village will administer your reimbursement.
14. Continue to maintain the garden for 10 years. Resident is subject to periodic inspections with advanced notification from the Village.





Requirements

STANDARD DETAILS FOR RAIN GARDEN CONSTRUCTION

Your rain garden will need to be designed and constructed in accordance with the specific constraints of your site and in compliance with any applicable codes and regulations as they pertain to your rain garden. This document is intended to walk the owner and/or contractor through the design process of the rain garden. Read through this document and fill out the applicable information to demonstrate the construction methods and requirements that apply to your rain garden. Please note that this will be included as an Exhibit to your BMP Permit and Landowner Agreement.

Step 1: Sizing and Siting the Rain Garden

This section of the manual covers rain garden basics such as where to put the rain garden, how big to make it, how deep to dig it, and what kind of soils and slope are best. The instructions in this section are the best way to ensure a successful rain garden project.

SIZE – How big should the rain garden be?

- ✓ **Requirement:** The minimum surface area or size for a rain garden under this program is 48 square feet.
- ✓ **Requirement:** The rain garden must be at least 10 feet from the house so infiltrating water doesn't seep into the foundation.
- ✓ **Requirement:** The rain garden must be at least 5 feet from any other structure and 5 feet from neighbor's property line.

The surface area of the rain garden can be almost any size, but time and cost will always be important considerations in sizing decisions. Any reasonably sized rain garden will provide some stormwater runoff control. A typical residential rain garden ranges from 60 to 300 square feet. Rain gardens less than 100 square feet will have less plant variety. If a rain garden is larger than 300 square feet it takes a lot more time to dig, is more difficult to make level, and could be hard on your budget.

SITING – Where should the garden go?

- ✓ Applicants must attempt to locate the rain garden in an area that is less than 12% slope. Putting the rain garden in a flatter part of the yard will make digging much easier. For example, a rain garden 10 feet wide on a 10% slope must be 12 inches deep to be level, unless you import topsoil or use cut and fill.

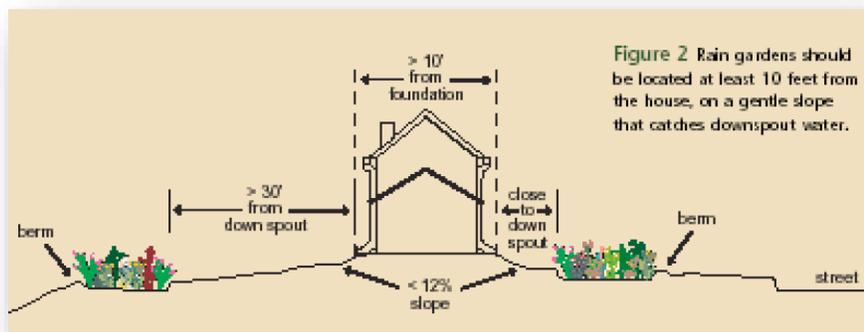
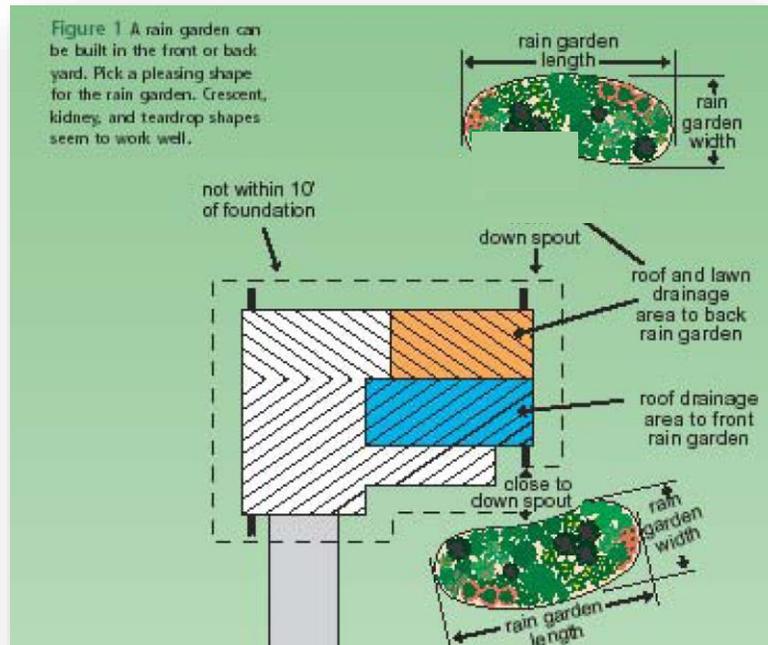
To calculate your percent slope:

- Hammer two stakes into the slope – one at the top of the slope and one at the bottom
- Tie one end of a string to the stake at the top of the slope, at the point where the stake intersects the ground
- Put a line level on the string, and stretch the string taut to the stake at the bottom of the hill
- While holding the string taut, lift the string until the line level indicates that your string is "level"
- Measure the distance between the level string and the ground (this is your height, which we will call "H")
- Now measure the length of the string from one stake to another, indicated by the dashed line (this is your length, which we will call "L")
- Calculate the slope – make sure you measured height and length in the same units (i.e. feet or inches)
 - % Slope = $H \div L \times 100$ Ex: Height (H) = 6 inches; Length (L) = 127 inches
 - $6 \div 127 = 0.047$, and $0.047 \times 100 = 4.7\%$. Your slope is 4.7%



SITING CONTINUED – Where should the garden go?

- ✓ It is better to build the rain garden in full or partial sun, not directly under a big tree.
- ✓ Home rain gardens can be in one of two places – near the house to catch only roof runoff or farther out on the lawn to collect water from the lawn and roof. See illustrations below.



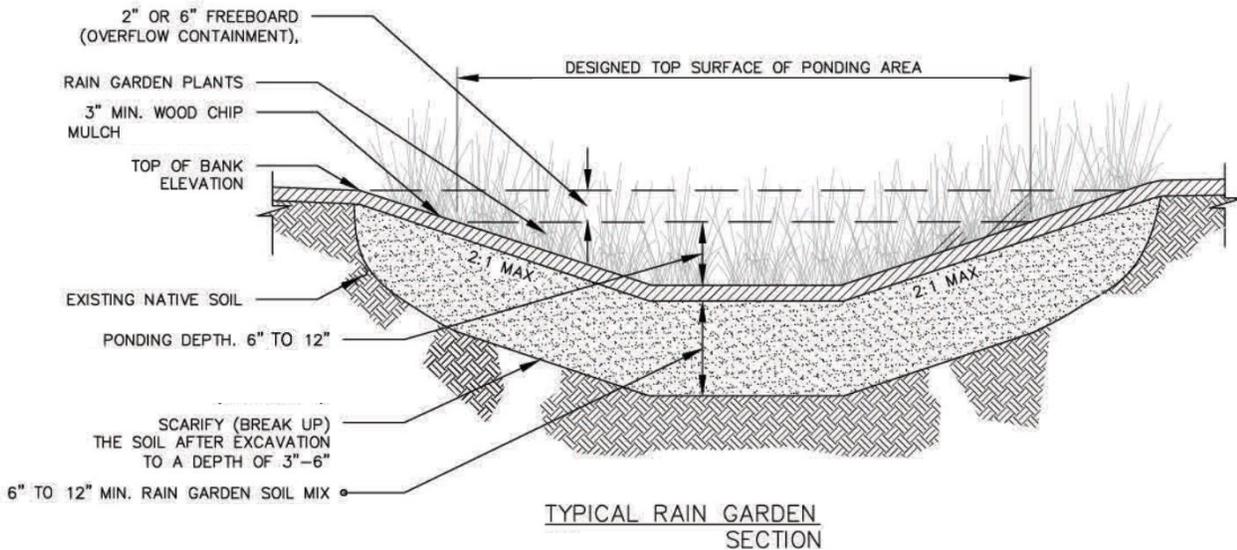
DEPTH – See Illustrations on next page.

- ✓ **Requirement!** The ponding area must be no deeper than 6"–12" (and must overflow to a point lower than any inflow pipe to prevent backflow – see *Rain Garden Downspout Conveyance*) and should be at least 10 feet from the foundation
- ✓ **Requirement!** Remove sod and soil to a depth 6" (**required minimum**) to 12" deeper than your desired final depth (Ex: dig 12" for a 6" final ponding depth)
- ✓ Use rakes to grade gradually back to the lawn on all sides – steeper sides are more prone to erosion
- ✓ Loosen the soil in the bottom of the rain garden with a spade, fork or rake
- ✓ **Requirements!** Add a 6" to 12" layer of Rain Garden Soil Mix, as illustrated on the Cross Section on the following page. An Ideal Soil Mix must be used in accordance with the existing soil makeup of your yard. Most properties in La Grange Park are clay yards.
 - The Ideal Soil Mix for a No Clay Yard: compost to the basin and lightly mix in. Do not add sand alone to the rain garden – doing so may result in very poor drainage. Ideal Soil Mix: 40% sand, 30% topsoil (no clay), 30% compost.
 - The Ideal Soil Mix for a Clay Yard: (Most properties in La Grange Park are clay yards) If you have slow-

draining clay soil, you'll have to excavate the clay. Remove the top 10 to 12 inches of soil and replace with a composition of: 40% sand, 20% topsoil, 20% compost, and 20% clay. This soil mix will support plant growth and improve infiltration. Leaving a small percentage of clay in the mix will prevent a "layering effect." In other words, if no clay is mixed into the replacement mix, plant roots may behave as if they were in a clay bottomed pot and stay in the top layer of soil, and water will not move through the soil as is your intention.

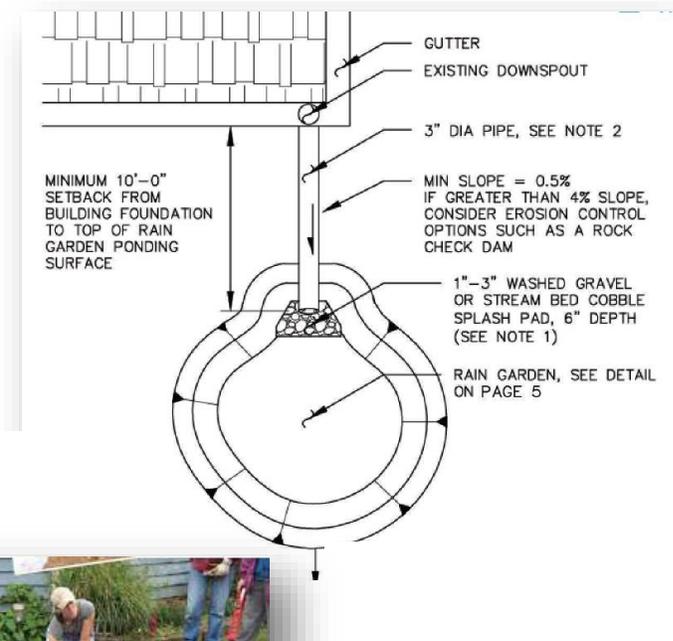
Rain Garden Section

The following details provide the required dimensions and depths for the construction of the rain garden.



Rain Garden Downspout Conveyance

- ✓ **Requirement!** Grade the soil in your garden such that water will flow in from the downspout, gather in the ponding area, and then overflow from a notch or other lowest point in the rain garden wall to a safe grassy or landscaped area away from the house and neighbors' properties.
- ✓ To prevent backup, use a line level to make sure your overflow is lower than your inflow.
- ✓ **Requirement!** Position your overflow point in a direction that will not impact neighbor's property.



BIO SWALES

Bio Swales are eligible for a \$400 maximum reimbursement from the Village.

This is a vegetated, shallowly sloped channel that slows and treats stormwater runoff on your property. Like a rain garden, a swale contains soils and plants that filter pollutants from the stormwater it captures, have minimal watering requirements, and attract local wildlife. Unlike a rain garden, a swale's primary function is to slow and treat water as it continues to flow to an existing stream, rain garden, infiltration drain, or dry well. Be mindful of the water's destination, as you don't want to create new problems for yourself or your neighbors.



REFERENCES / RESOURCES

- Minnesota Stormwater Manual Chapter 12: Details of Stormwater Best Management Practices (BMPs). 2005.
Website Link: <http://www.rwmwd.org/vertical/sites/%7B493DE7-F6CB-4A58-AFE0-56D80D38CD24%7D/uploads/%7BDCDF0AC4-06FE-4F08-9BC6-2335583CEBBD%7D.PDF>.
 - Fresh Coast Milwaukee Wisconsin: Rain Barrel Care. 2013.
Website Link: http://www.freshcoast740.com/pdf/homepage/13-056c_RainBarrelSheetLSsml.pdf
 - For more information on how to install a Rain Barrel, visit www.earthmindedconsumerproducts.com.
 - Rain Gardens: A household way to improve water quality in your community.
Website Link: <http://clean-water.uwex.edu/pubs/pdf/gardens.pdf>
 - Rain Gardens: A how-to manual for homeowners.
Website Link: <http://dnr.wi.gov/topic/Stormwater/documents/RgManual.pdf>
 - How to Build a Rain Garden: A beautiful addition to your yard that helps protect our water resources
Website Link: <http://www.danewaters.com/pdf/HowToBuildaGarden.pdf>
 - Home and Garden: Reduce runoff with a rain garden.
Website Link: http://www.lakesuperiorstreams.org/citizen/wet_garden.html
- Bio swales Capturing Rainwater on Your property.
http://rainready.org/sites/default/files/factsheets/Factsheet-RainReady-CapturingRainwater_0.pdf