



Northeast  
Ohio Regional  
Sewer District

REGIONAL  
STORMWATER  
MANAGEMENT

# Individual Residential Property Credit Manual



# Why stormwater management?



THE INABILITY TO EFFECTIVELY DEAL WITH stormwater results in flooding, more pollutants in our waterways, and serious erosion problems. Solving these problems can be difficult, since stormwater runoff from one community drains into another. A regional approach is the solution.

An established regional organization, the Northeast Ohio Regional Sewer District (“Sewer District”) is joining more than 1,000 communities—including Columbus, Cincinnati, and Toledo—that have created user fees to solve stormwater problems.

## What are the benefits to communities and individuals?

The goals of the Sewer District’s Regional Stormwater Management Program include: fewer flooding incidents, healthier waterways, and a better quality of life for Greater Cleveland.

Stormwater problems require planning, modeling, construction, and innovative green practices like bioretention and stream restoration.

The Sewer District will continue to build projects and maintain streams and the large pipes that carry stormwater, and we will continue our rigorous water-quality monitoring activities.\* Under its Regional Stormwater Management Program, the Sewer District will also provide:

- Maintenance to the Regional Stormwater System, including routine inspection of culverts, stream sections, and other areas to assess problems and perform preventive maintenance. The Sewer District will carry this out in partnership with its member communities.

- Construction to address flooding and erosion problems, also in cooperation with member communities.
- A Community Cost-Share Program to support community-specific stormwater projects. The Sewer District will provide a portion of the revenue it collects from any member community back to that community for use on non-regional stormwater projects (including catch-basin cleaning and other projects that would otherwise not be completed under the regional program).
- Educational programs that promote the importance of healthy drainage systems.

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\* The Sewer District’s program focuses on large regional problems. Catch basins and small sewers will remain the responsibility of local communities.



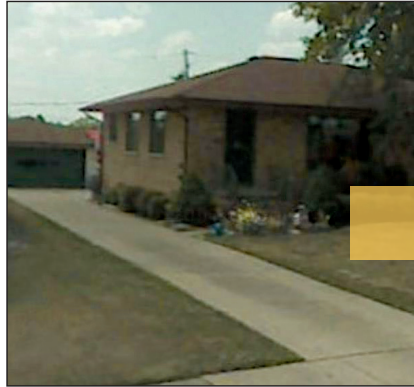
Rain garden



# What is the cost to our customers?

A stormwater utility is based on the premise that the urban drainage system is a public system, similar to water or sanitary systems. When a demand is placed on these systems, the user pays.

Parking lots, rooftops, and driveways can't absorb water, so it moves quickly over these surfaces into nearby streams or sewers. A greater flow of water—i.e. a greater demand—is placed on the urban drainage system. So, the more impervious surfaces there are on one's property, the greater the fee.



**Roof + driveway = 3,000 sq. ft. impervious surface area**  
**= One (1) Equivalent Residential Unit, or ERU**

For residential properties (four units or fewer) the user fee is based on an Equivalent Residential Unit (ERU) equal to 3,000 sq. ft. of impervious surface (such as roof and driveway). The rate for one ERU varies each year and can be found at [neorsd.org/rates](http://neorsd.org/rates).

Residences are placed in one of three tiers: Tier 1 (less than 2,000 sq. ft.), Tier 2 (2,000–4,000 sq. ft.), and Tier 3 (more than 4,000 sq. ft.)

Your current fee and your property calculation is available online. Visit [neorsd.org/FeeFinder](http://neorsd.org/FeeFinder) to find your property and learn more.

**NEORSD offers financial incentives for managing stormwater at the source, which reduces the regional costs of stormwater problems and encourages environmental stewardship.**

## What is the credit program?

Customers can receive a reduction in stormwater fees if they take measures to reduce the stormwater volume or minimize the pollutants flowing from their properties.

Stormwater credits can be obtained through:

- Installation and continuing use, operation, and maintenance of an approved Stormwater Control Measure (SCM, see p. 4) that the Sewer District does not own, maintain, or operate; or
- Activities that reduce or alleviate the Sewer District's cost of providing a regional stormwater management program.

There are three types of stormwater credits available for residential properties:

Individual Residential Property Credit  
Flat reduction of 25% (see pp. 4-5)

Stormwater Quantity Credit  
Reduction up to 75%

Stormwater Quality Credit  
Reduction up to 25%

NOTE: This manual only addresses the Individual Residential Property Credit (25%), not the Stormwater Quantity or Stormwater Quality credits.\*

\* Customers who have extensive stormwater retention plans or who live in a subdivision with its own stormwater basin or other stormwater control facility may qualify for the Stormwater Quantity and/or Stormwater Quality credits. Detailed information and application forms for these credits can be found in the comprehensive Stormwater Fee Credit Manual at [neorsd.org/stormwater](http://neorsd.org/stormwater)

# Individual residential property credit

## Stormwater Control Measures (SCMs)

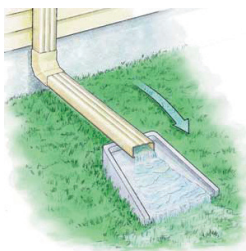
The Individual Residential Property Credit is a flat reduction of 25% off the stormwater fee for customers who implement a Sewer District-approved Stormwater Control Measure (SCM). These SCMs include:



### RAIN GARDENS

Rain gardens are landscaped areas that are designed to capture and filter stormwater runoff from a roof or other impervious (paved) surface.

- At least 25% of a property's roof or an equivalent impervious surface area must drain to the rain garden.
- Rain gardens must be sized according to the worksheet in the most current edition of the Rain Garden Manual for Homeowners: [neorsd.org/raingardenmanual](http://neorsd.org/raingardenmanual)
- Overflows must be directed to appropriate outlets or areas.



### VEGETATED FILTER STRIPS

Uniform strips of dense turf, meadow grasses, trees, or other vegetation with a minimum slope can treat the water quality of runoff from a roof and paved surfaces (see pp. 14-15). In certain circumstances, a large lawn may meet these criteria.

- At least 50% of a property's roof must drain to the filter strip.
- Strip must be fully vegetated (grass, shrubs, trees, flowers, etc.)
- Strip must contain at least 50 ft. of flowpath for stormwater runoff to flow through, depending on slope of yard.
- Strip must occur on the applicant's property.



### ON-SITE STORMWATER STORAGE

Includes rain barrels, cisterns, or other approved stormwater-runoff storage devices (see pp. 11-12).

- 50% of the property's roof area must be connected to rain barrels that provide at least 40 gallons of storage per downspout, OR . . .
- Storage devices (cistern) must be sized to hold the runoff from 50% of the property's roof during a one-inch rain storm.
- Must be covered to prevent mosquitoes.
- Must drain in no less than 24 hours and no more than 4 days, unless bigger than the minimum required storage.
- Overflows from storage must be directed to appropriate outlets or areas.



### PERVIOUS PAVEMENT \*

Permeable pavers, pervious concrete, or porous asphalt can be used for driveways and patios with a stone reservoir underneath (see p. 13). The reservoir temporarily stores surface runoff before infiltrating it into the soil below.

- Credit can be obtained if the applicant has at least 1,000 sq. ft. of pervious pavement.
- Must meet local building and zoning codes for driveways.
- Gravel driveways and traditional pavers are not considered pervious pavement.

#### \* TIER ADJUSTMENT

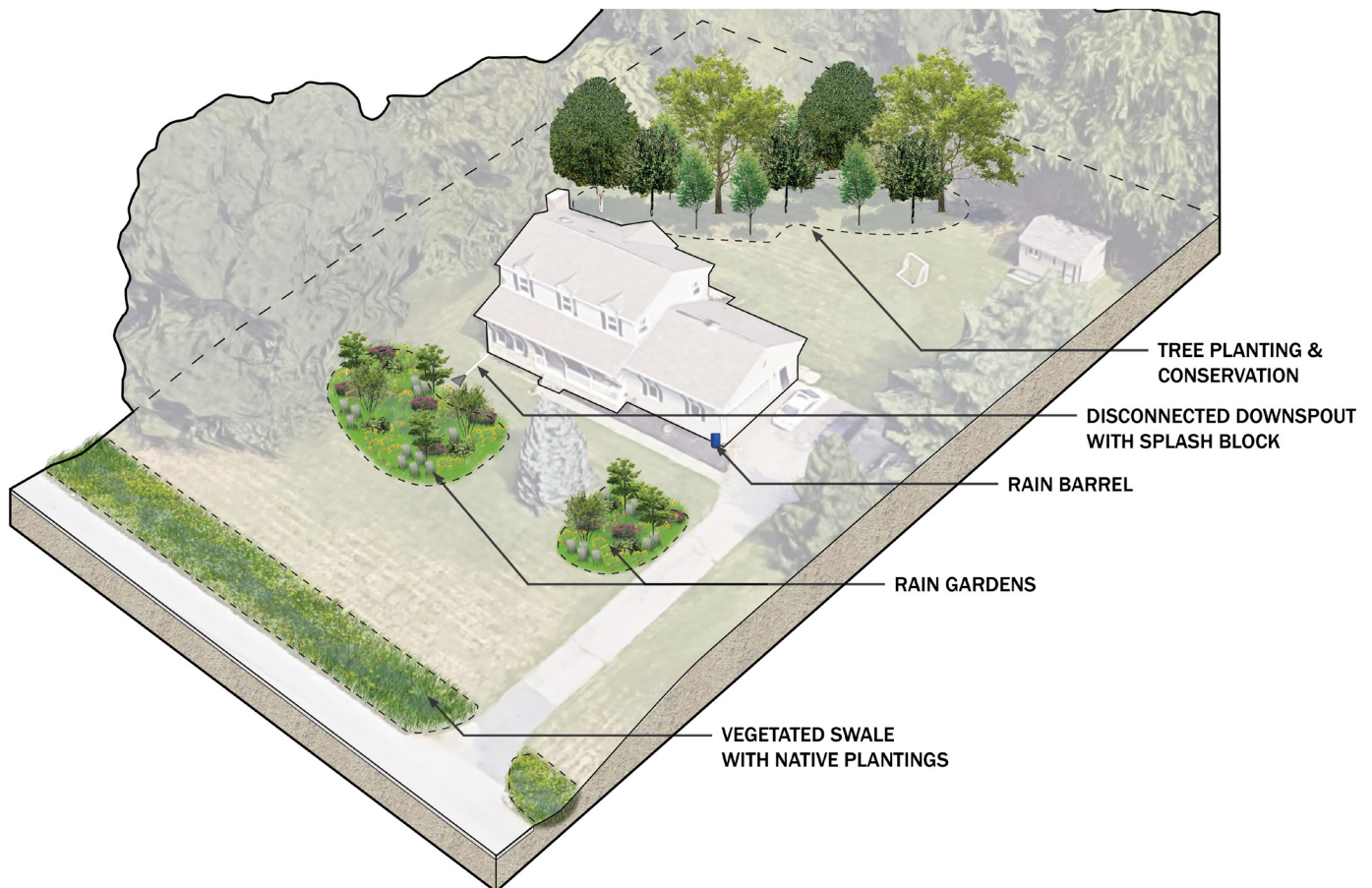
*If a property owner implements the requirements for the Pervious Pavement or Impervious Surface Reduction fee credits and successfully applies for a credit, the applicant may request a recalculation of their total impervious area. If the total impervious area reduction places the property in a lower tier, the lower tier rate will apply instead of the fee credit.*





# Instructions for completing the General Application

1. Applicant Name - Name of individual property owner.
2. Contact Name - Particularly in the case of a non-residential or group application, the name of the contact who is submitting the application.
3. Parcel Number - Each piece of land that is sold has its own Permanent Parcel Number. This information can be found through the County Auditor's office or website, or from a source such as your local library. If there are multiple permanent parcel numbers, attach a separate and complete list to the application, and note in box 3, "See attached list."
4. NEORS D Account Number - The account number can be found on the NEORS D billing statement.
5. Property Address - If there are multiple property addresses, attach a separate and complete list to the application, and note in box 5, "See attached list."
6. Mailing Address - Include if different from box 5.
7. Phone Number - Of primary contact for the application.
8. Email Address - Of primary contact for the application.
9. Applicant/Contact Signature
10. Date



This illustration shows several stormwater control measures (SCMs) eligible for fee credits.  
Courtesy of Central Lake Erie Basin Collaborative

## General Application for Individual Residential Property Credit (25%)

1. Applicant Name
2. Contact Name (if different than applicant)
3. Parcel Number
4. NEORSD Account Number
5. Property Address:  Street Number: City: Zip Code:
6. Mailing Address (if different):  Street Number: City: Zip Code:
7. Phone Number:
8. Email Address:
9. Applicant/Contact Signature:
10. Date:

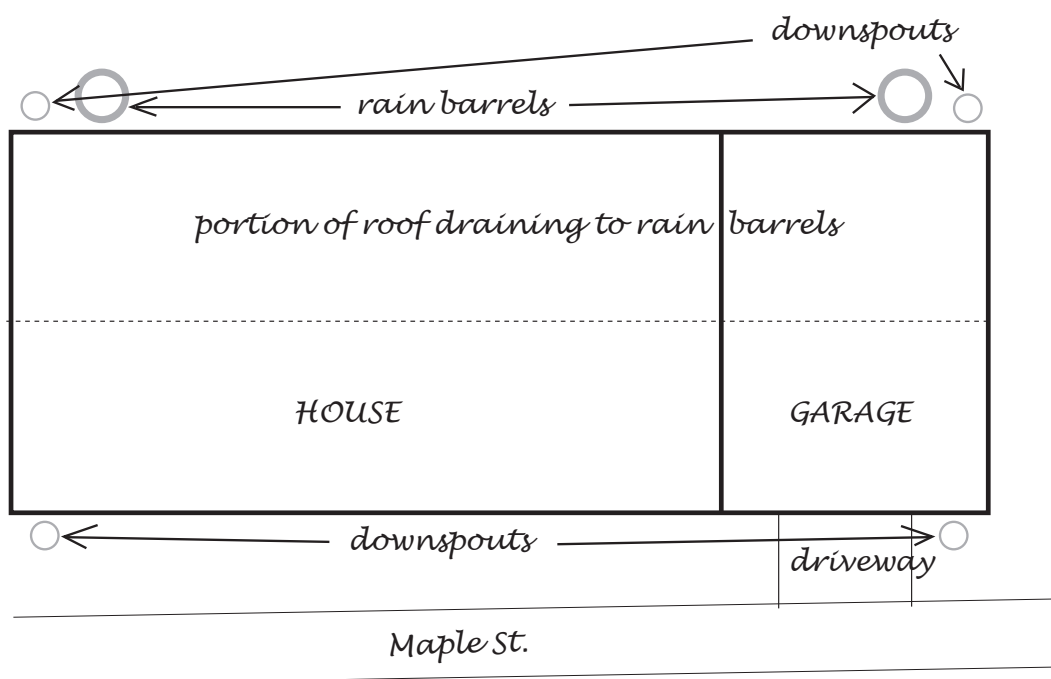
# Instructions for completing the Individual Residential Property Credit application

1. Applicant Name - Name of individual property owner.
2. Credits Applying For - Select the stormwater control measure (SCM) that is being submitted for credit approval. Appropriate implementation of any one (1) approved SCM is sufficient to receive the credit. Implementation of additional SCMs cannot increase the Individual Residential Property Credit beyond 25%.
3. Photograph of SCM As Installed - Attach a photograph of EACH installed SCM that indicates the date the photo was taken. If individual photos are included, please place name and address on the back of each photo.
4. Sketch of Property with SCM Shown - Include a sketch of the property for which the credit is to be applied. This can be a hand-drawn sketch. The sketch should represent an aerial view of the property and include at a minimum the house, driveway, SCM(s), and road. If applying for the On-Site Stormwater Storage credit, applicant must also show the location of the downspouts that drain to the storage device, and indicate the portion of the roof that drains to the downspouts.

In order to receive a credit for rain barrels, at least 50% of the TOTAL ROOF SURFACE (including garage) on a property must be connected to rain barrels, with at least 40 gallons of storage per downspout. See example sketch below for a typical rain barrel installation.

5. Local Codes - All SCMs must meet all applicable building, subdivision and planning, and zoning code requirements of member communities including downspout disconnection, landscaping, and property setbacks requirements. You can learn about code requirements by visiting your community's website or contacting community staff. Although departmental responsibilities vary by community, building, service, engineering, and planning/zoning departments may be good places to start.
6. Owner Certification - Check the box to certify that you are the owner of the property, and that all information provided is true.

Sketch of typical rain barrel installation





# Individual Residential Property Credit application

1. Applicant Name \_\_\_\_\_

2. Credit Applying For:

☐ **Rain Garden**

# of downspouts draining to rain garden \_\_\_\_\_ (if applicable)

☐ Completed Rain Garden Manual for Homeowners worksheet attached

☐ **On-Site Stormwater Storage**

☐ rain barrels (number: \_\_\_\_\_) ☐ cistern ☐ rain bladder

☐ other on-site stormwater storage

# of downspouts draining to on-site storage \_\_\_\_\_

Volume of on-site storage \_\_\_\_\_ gallons

☐ For cisterns, rain bladders, and other storage, calculations from  
residential on-site stormwater storage structure fact sheet (pp. 11-12) attached

☐ **Impervious Surface Reduction**

Impervious surface removed is \_\_\_\_\_ square feet

☐ **Pervious Pavement**

Pervious pavement type: ☐ permeable pavers ☐ grid or grass pavers

☐ pervious concrete or asphalt

Pervious pavement installed is \_\_\_\_\_ square feet

☐ Stone reservoir at least 10 inches deep at all points

☐ Compliant with local driveway installation code

☐ **Vegetated Filter Strips**

# of downspouts draining to vegetated strip \_\_\_\_\_

Slope of yard \_\_\_\_\_% (per residential vegetated filter strips fact sheet, pp. 14-15)

Length of vegetated strip \_\_\_\_\_ feet

3. ☐ Photograph of SCM as installed is attached.

Mail this application AND the General Application (p. 7) to:  
NEORSD, Watershed Programs Department, 3900 Euclid Avenue, Cleveland, Ohio 44115.

## Individual Residential Property Credit application (cont.)

4. Sketch of property with SCM shown (see instructions for sketch requirements, p. 8)

5. All applicable local codes

☐ I, the applicant, have complied with all local codes applicable to the installation of the SCM.

6. Owner certification:

☐ I hereby certify that I own this property and I further declare, under penalty of perjury, that the information provided by me in this application is the truth to the best of my knowledge and belief.

7. Applicant/Contact Signature:

8. Date:

# Residential on-site stormwater storage structures

ON-SITE STORMWATER STORAGE STRUCTURES can include rain barrels, cisterns, bladders, or other storage devices as approved by the Northeast Ohio Regional Sewer District (NEORS D). These structures collect and capture rooftop rainwater that would otherwise drain directly to the stormwater system or streams. The collected stormwater can be used to water plants, trees, or lawns during dry periods.

## Rain barrel:

A rain barrel is composed of a 40-55 gallon barrel or drum with some type of diverter or connection from a downspout, a spigot or hose to drain the barrel, and some type of overflow mechanism. Any openings to the air should be screened to keep debris and insects out.

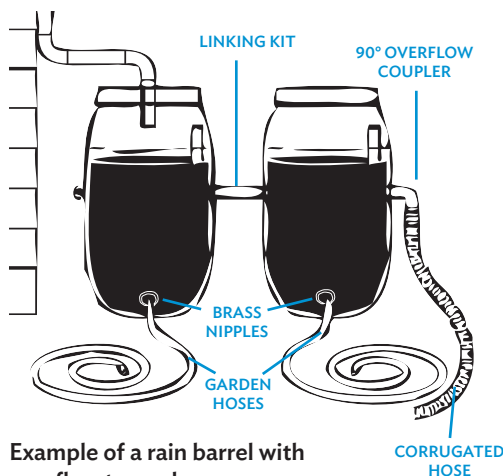
An overflow mechanism must be provided so that when the rain barrel is full, excess water can flow back into the downspout and then to a storm sewer, or into a landscaped area.



Example of a rain barrel with downspout diverter that directs overflow back to the downspout

Saving water not only helps protect the environment it saves money and energy because of the decreased demand for treated tap water. Check with your County Soil and Water Conservation District or local watershed group for instructions on how to make and install a rain barrel. Rain barrels can also be purchased through several online suppliers. Ensure your

rain barrel will meet the requirements on the next page.



Example of a rain barrel with overflow to yard

## Rain bladder:

A rain bladder is a flexible modular tank designed to be installed into the tightest locations and can be completely hidden from view. They can be installed under the sub-floor of a home, gazebo, and under decking.



Rain bladder

## Cistern:

Cisterns are similar to rain barrels in function but hold larger quantities of water. They can be installed underground, at ground level, or elevated depending on the site and space constraints of the property.



Cistern

A cistern should be constructed out of reinforced concrete, galvanized steel, or plastic, and should have smooth interior surfaces, be watertight, have enclosed lids and be sized according to the installation standards on the next page to manage the proper amount of runoff.

**To obtain an individual residential property credit for on-site stormwater storage, certain standards and guidelines must be met. (See next page.)**



## Installation standards:

To obtain an individual residential property credit for on-site stormwater storage the following standards and requirements must be met:

1. 50% of the property's total roof area is properly connected to rain barrels or other approved storage devices that provide at least 40 gallons of storage per downspout,  
- or -  
storage structures must be sized to hold the runoff from at least 50% of the property's roof area during a 1-inch rainfall event.

$$V = \frac{1}{2} \times A \times 0.6225 \text{ gallons/feet}^2$$

Where:

V = volume of storage structure in gallons

A = total surface area of roof in square feet

0.6225 = conversion factor (gallons per cubic foot per inch of rain)

### Example

A 500-gallon cistern would provide runoff storage from a 1,600-square-foot rooftop for a one-inch rainfall.

$$A = 1,600 \text{ square feet}$$

$$\frac{1}{2} \times 1,600 \times 0.6225 = 498 \text{ gallons}$$

2. On-site stormwater storage must be completed in such a way that does not provide mosquito breeding grounds, such as making sure rain barrels are covered with a lid or screen that prevents mosquitoes from entering the storage structure.
3. On-site stormwater storage must be equipped with an overflow or bypass mechanism to divert rainwater to the storm drainage systems when storage structure is full. These mechanisms must not cause erosion, property damage or overflow onto a neighboring property.
4. On-site stormwater storage must be completely drained in no less than 24 hours and no longer than 4 days after each rainfall event.
5. All on-site stormwater storage structures must meet the requirements of member community building and zoning codes for downspout disconnection, landscaping, property setbacks, and other applicable local codes.

## Maintenance guidelines:

1. Clean your gutters regularly to reduce debris.
2. Clear off any screens as necessary.
3. Periodically check any hoses associated with the storage structure to clear any debris.
4. To winterize, disconnect and return the downspout to its original configuration. Remove the hoses and mesh screen and store them. Make sure to drain the container to prevent it from freezing and cracking. If possible, store it upside down, so no water or materials will be able to enter.
5. For cisterns, leave the outflow spigot fully open during frost/freezing periods and unhook the drain hose about twice a year to clean out any compacted sediment.

## Where to get a rain barrel:

You can purchase a rain barrel at most major lawn and garden centers. Call your local center to see if they carry them or if they can order one for you. There are numerous online suppliers as well.

You can also make your own rain barrel using a large trash can, agricultural supply container, or other large container and a little ingenuity.

For further recommendations, talk to your local Soil and Water Conservation District or watershed group (see back page).

# Residential pervious pavement

PERVIOUS PAVEMENTS are designed to allow percolation or infiltration of stormwater through the surface into the soil below where the water is naturally filtered and pollutants are removed. Pervious pavement may include permeable pavers, pervious concrete, or pervious asphalt.

It is recommended that a qualified installer with knowledge in hydrology and hydraulics be consulted for applications using pervious pavement to ensure desired results. This fact sheet provides an overview of construction guidelines and research to date and is not meant to replace the services of experienced, professional installers.

## Installation standards:

To obtain an individual residential property credit for pervious pavements the following criteria must be met:

- Installed for the purpose of runoff infiltration.
- Area of pervious pavement is at least 1,000 sq. ft.
- Used on slopes no greater than 4%.
- The stone reservoir underneath the pavement type must be at least 10 inches deep at all points.
- The installation meets the local building and zoning standards for driveway installations.

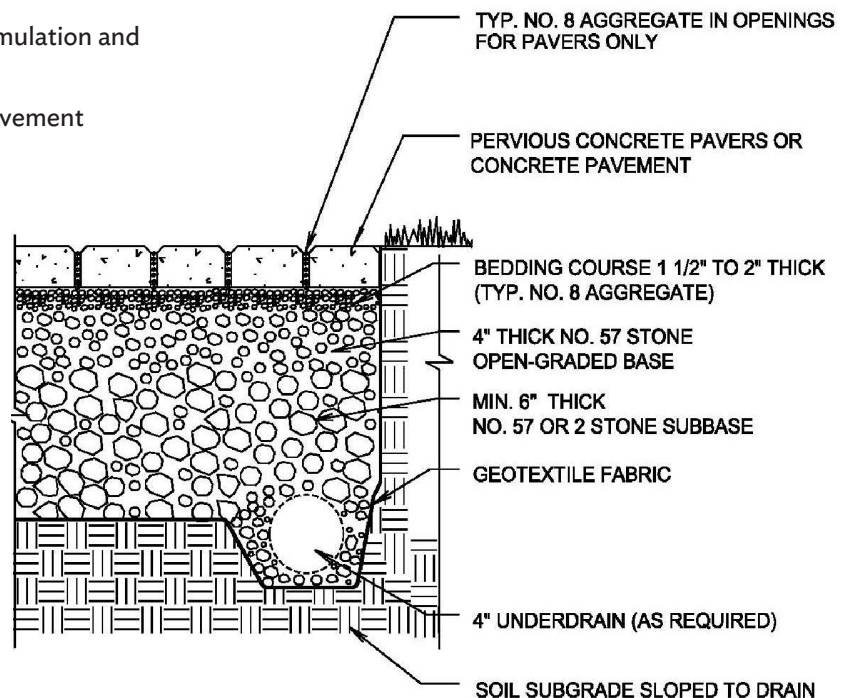


Example of pervious pavers used for residential driveway

## Maintenance guidelines:

1. Ensure pervious pavement system is draining, and there are not visible signs of standing water on surface.
2. Remove accumulated salt on surface during winter months.
3. Vacuum as necessary to remove sediment accumulation and organic debris on the pavement surface.
4. Remove accumulated leaves and debris from pavement surface in the fall.

Minimum Residential Pervious Driveway Typical Section



# Residential vegetated filter strips

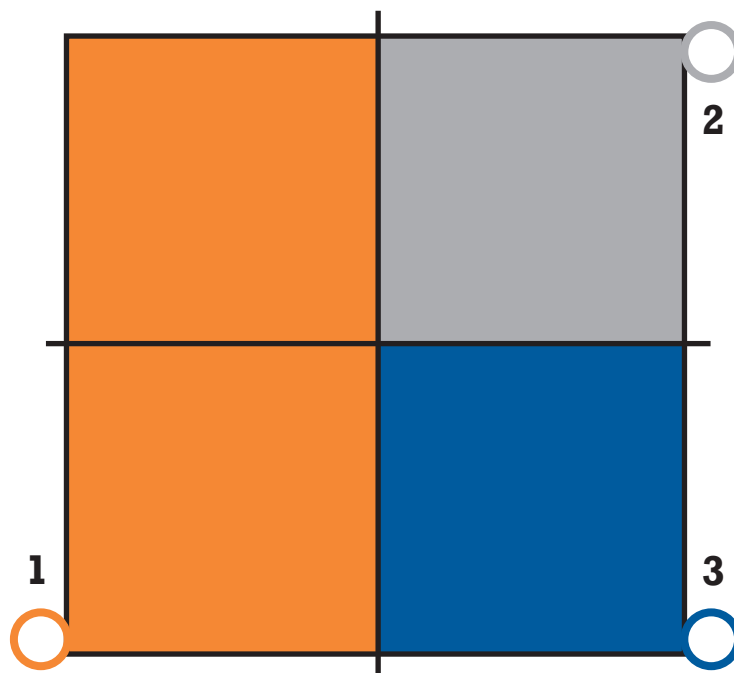
VEGETATED FILTER STRIPS are uniform strips of dense turf, meadow grasses, trees or other vegetation with a minimum slope to treat the water flowing from impervious surfaces. In certain circumstances a large lawn that receives runoff from impervious areas of a property may meet the criteria for a grass filter strip.

## Installation standards:

To obtain an individual residential property credit for vegetated filter strips the following criteria must be met:

- 50% of the property's total roof area must drain to the vegetated filter strip.
- Runoff from downspouts must be dispersed using splash block prior to reaching filter strip.
- The slope of a vegetated filter strip must be greater than 1% and less than 5%.
- Filter strips must be fully vegetated, and vegetation must be kept healthy.
- Filter strips must have a minimum length of 50 feet, but should be designed to provide a length based on their slope within the ranges noted on the next page.
- Filter strips must occur entirely on the applicant's property.

Example of roof showing drainage area to downspouts to vegetated filter strips:

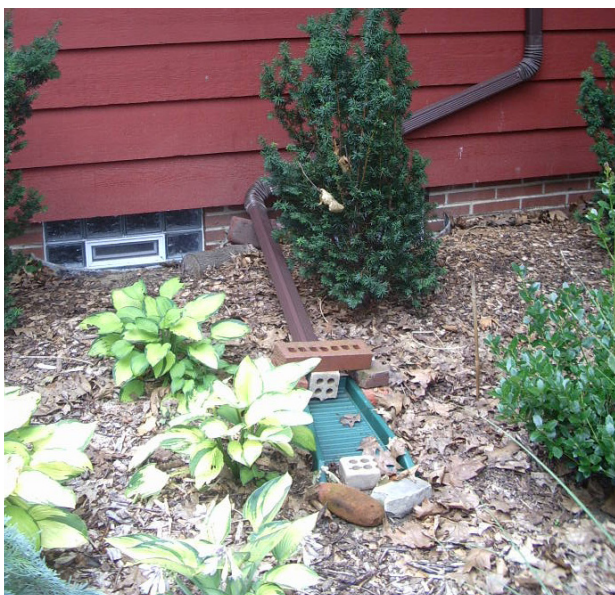


Downspout 1—Drains the orange area (1/2 of roof)

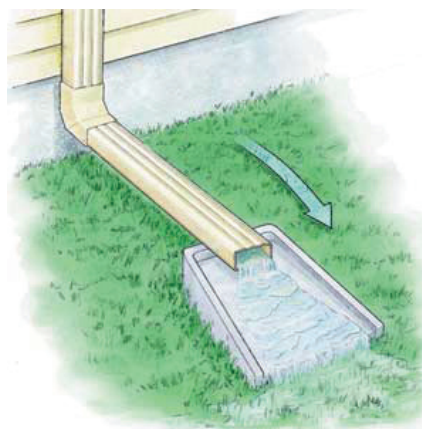
Downspout 2—Drains the grey area (1/4 of roof)

Downspout 3—Drains the blue area (1/4 of roof)

To be eligible for the credit either Downspout 1 or both Downspouts 2 and 3 need to outlet to vegetated filter strips.

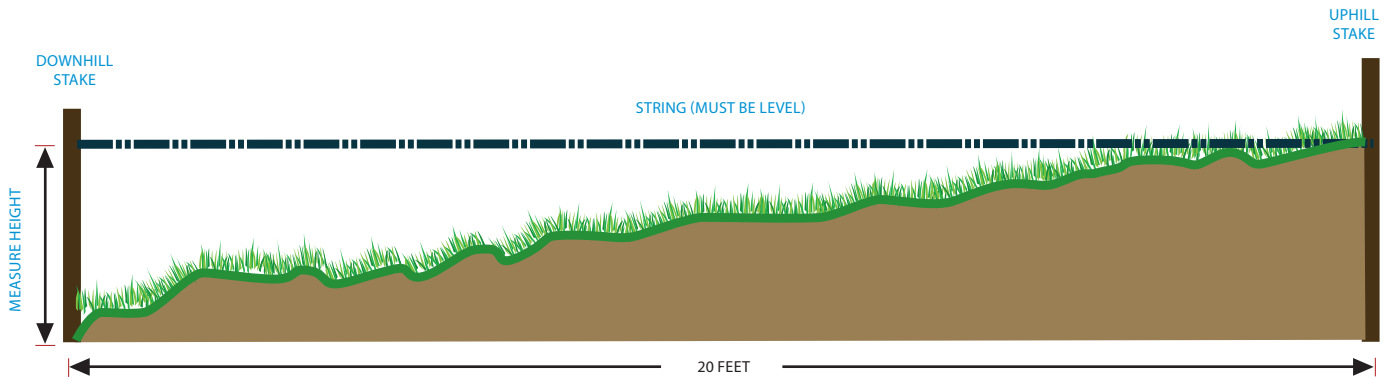


Examples of downspouts for vegetated filter strips





## How to measure the slope of a residential vegetated filter strip:



Height of string at downhill stake	Approximate slope of filter strip	Minimum length of filter strip
2.5 inches	1%	50 feet
5 inches	2%	120 feet
7 inches	3%	135 feet
10 inches	4%	170 feet
12 inches	5%	210 feet

## Maintenance guidelines:

1. Maintain healthy vegetation along the filter strip. If planted with grass, the height should be at least 3 to 4 inches.
2. If erosion occurs causing rills and gullies, repair and stabilize.
3. Check splash blocks twice a year to make sure they are not broken or deteriorating. Replace as needed.

# Resources

Technical assistance for fee credit applications is available from NEORS staff and its partner organizations:

## Bluestone Heights

Advocates for small watersheds and landforms in the Cleveland area. [facebook.com/bluestoneheights](https://www.facebook.com/bluestoneheights)

## Big Creek Connects

To conserve, enhance, and bring recognition to the natural and historic resources in and around the Big Creek Watershed and develop a recreational trail network that connects these resources to each other and the community. [friendsofbigcreek.org](http://friendsofbigcreek.org)

## Central Lake Erie Basin Collaborative

A network of organizations and initiatives that work collaboratively to protect and restore natural areas and promote stormwater solutions for healthy streams and Lake Erie. [centrallakeerie.org](http://centrallakeerie.org)

## Chagrin River Watershed Partners

Works with member communities, partners, and landowners to develop strategies for solving flooding, erosion, and water-quality problems. [crwp.org](http://crwp.org)

## Cuyahoga Soil & Water Conservation District

Responsible for protecting the natural resources within the county, providing local leadership, education, and technical assistance. [cuyahogaswcd.org](http://cuyahogaswcd.org)

## Doan Brook Watershed Partnership

Through collaboration and sharing of resources, develops and implements a watershed management plan for the preservation and improvement of Doan Brook. [doanbrookpartnership.org](http://doanbrookpartnership.org)

## Euclid Creek Watershed Program

The Euclid Creek Watershed Program works to protect and restore the health of this urban watershed in northeast Ohio. [cuyahogaswcd.org/euclid-creek](http://cuyahogaswcd.org/euclid-creek)

## Lake County Soil & Water Conservation District

Provides leadership and technical expertise to guide the protection and conservation of the unique soil and water resources of Lake County. [lakecountyohio.gov/swcd](http://lakecountyohio.gov/swcd)

## Lorain Soil & Water Conservation District

Provides leadership in a partnership effort to help people conserve, maintain, and improve the natural resources and environment in Lorain County. [lorainswcd.com](http://lorainswcd.com)

## Mill Creek Watershed Partnership

Citizens, businesses, agencies, and government organizations working together for the improvement of the Mill Creek watershed. [millcreekpartnership.org](http://millcreekpartnership.org)

## Rocky River Watershed Council

Protects, restores and perpetuates a healthy watershed through public education, watershed planning, communication and cooperation among stakeholders. [myrockyriver.org](http://myrockyriver.org)

## Summit Soil & Water Conservation District

Provides local leadership and technical assistance for programs to conserve soil, improve water quality, and enhance the natural resources of Summit County. [sswcd.summitoh.net](http://sswcd.summitoh.net)

## Tinker's Creek Watershed Partners

Works to protect and restore water quality and habitats of the Tinker's Creek watershed through community partnerships, promoting low-impact and conservation development practices that balance environmental integrity with human development. [tinkerscreek.org](http://tinkerscreek.org)

## Watershed Stewardship Center

The first facility in Cleveland Metroparks dedicated to scientific research and promoting sustainable action. Science-based programs invite teachers, students, professionals and the public to learn about replicable stormwater management methods.

[clevelandmetroparks.com/parks/visit/parks/west-creek-reservation/watershed-stewardship-center](http://clevelandmetroparks.com/parks/visit/parks/west-creek-reservation/watershed-stewardship-center)

## West Creek Conservancy

Seeks to conserve open space and create outdoor recreation opportunities in the West Creek watershed in Parma, Seven Hills, Brooklyn Heights, and Independence [westcreek.org](http://westcreek.org)

For more information, email [stormwater@neorsd.org](mailto:stormwater@neorsd.org) or call 216-881-8247

[neorsd.org/stormwater](http://neorsd.org/stormwater)

