



# Stormwater Manual for Outdoor Living Areas

Accepted by Vienna Town Council on [DATE]



## Introduction

The Stormwater Manual for Outdoor Living Areas (“Manual”) is intended to establish guidelines for the design, construction, and maintenance of stormwater management solutions associated with up to 400 square feet of impervious surface from outdoor living areas in the Town of Vienna (Town). The Best Management Practices (BMPs) outlined in this Manual serve for compliance with *Section 18-15. - Area requirements., Subsection F. Lot coverage.*, of the Code of the Town of Vienna.

This Manual does not supersede or eliminate any provision of the Town Code. The BMPs outlined in this Manual are derived from technical resources, namely the *Virginia Stormwater Best Management Practice (BMP) Clearinghouse* available online at [swbmp.vwrcc.vt.edu](http://swbmp.vwrcc.vt.edu). This website is jointly administered by the Virginia Department of Environmental Quality (DEQ) and the Virginia Water Resources Research Center (VWRRC). For this Manual, the *Virginia Stormwater BMP Clearinghouse* website practices were adapted to the small-scale application associated with outdoor living areas as per *Section 18-15*. The guidelines herein do not include the necessary design and engineering considerations for larger applications or locations that collect off-site contributing runoff. This Manual does not apply to land-disturbing activity that results in a land disturbance equal to or greater than 2,500 square feet. All land-disturbing activities must adhere to Federal, State, and County regulations and Town codes and ordinances.

The following general property management and maintenance guidelines also apply.

- Contact Virginia Miss Utility (VA811) by calling 811 or visiting [va811.com](http://va811.com) online to have underground utilities on your property marked 48 hours before any digging.
- Ensure channeled water or any discharged overflow is not directed toward building foundations or adjacent properties.

*Disclaimer Statement: This Manual provides only general information about BMPs. These BMPs may not be appropriate or safe for every situation. Each user of this Manual is responsible to ensure they have the knowledge and experience to undertake any BMP project or has coordinated with an experienced professional.*

## Background

Stormwater is surface runoff from disturbed and developed lands produced immediately following a rainfall event. Factors that affect stormwater include the quantity and intensity of the rain event, soil type and condition, land cover, and topography. The size of impervious surfaces, such as pavement and roofs, also impact the quantity and quality of stormwater that reaches local streams. Stormwater management aims to reduce runoff volume, control peak flow rate, and improve water quality using BMPs. The specifications and application of BMPs are constantly evolving with new information and more experience. The guidelines found in this Manual may be updated as more research and information are gathered.

## General Treatment Volume Requirements

The BMP guidelines in this Manual are designed to treat approximately one (1) inch of rainfall over the associated outdoor living space impervious surface area. In Virginia, one (1) inch of rainfall represents most stormwater runoff events on an annual basis. Water quality is generally improved by capturing one (1) inch of rainfall to treat and filter the pollutants. The BMPs presented in this Manual also aim to reduce the quantity and rate of stormwater runoff. Many of these practices infiltrate stormwater to help recharge groundwater levels and reduce the velocity of runoff to help reduce erosion.

## How to Use this Manual

The Manual is organized into information sheets for each stormwater BMP option as required by Town Code *Section 18-15*. Each BMP information sheet contains the following information.

- Description of the BMP.
- Design and installation guidelines.
- Minimum design and sizing requirements associated with the property's outdoor living area impervious surface.
- Ongoing maintenance and inspection requirements.
- Additional sources of more in-depth technical information.

This Manual does not limit property owners from implementing other Best Management Practices in compliance with Virginia Stormwater Management Program (VSMP) Regulation, as outlined by the *Virginia Stormwater BMP Clearinghouse*. If a property owner chooses to utilize a different BMP, a design and engineering plan must be completed by a qualified professional engineer licensed in Virginia and submitted to the Town for review and approval prior to any work being performed. Outdoor living areas designed with land disturbance greater than 2,500 square feet and included on an approved stormwater management plan do not need to apply the small-scale BMP applications outlined in this Manual.

## Best Management Practice (BMP) Options Summary

For *Section 18-15* compliance, property owners must install one of the following BMPs.

- Rain Barrel
- French Drain
- Conservation Landscaping
- Rain Garden

Specific BMP sizing and design requirements are based on the impervious area associated with each outdoor living use. **Sizing requirements are determined in 100 square foot increments, up to 400 square feet.** The table below provides a summary of BMP compliance options.

<b>Outdoor Living Area is Less than or Equal to:</b>	<b><u>Rain Barrel</u> (Number of 50-gallon barrels)</b>	<b><u>French Drain</u> (Length in feet)</b>	<b><u>Conservation Landscaping</u><sup>1</sup> (Length in feet)</b>	<b><u>Rain Garden</u><sup>2</sup> (Area in square feet)</b>
<b>100 square feet</b>	One (1)	Equal to the adjacent downstream edge of the impervious area.	25	N/A
<b>200 square feet</b>	Two (2)		25	30
<b>300 square feet</b>	Three (3)		35	45
<b>400 square feet</b>	Four (4)	The minimum length is 10 feet.	35	60

<sup>1</sup> Filter strip width must be equal to or greater than the width of the impervious area. The minimum width is 10 feet.

<sup>2</sup> Assumes 6-inch ponding depth. See the rain garden section for additional design options.

## Next Steps

1. Determine the size of the proposed outdoor living area.
2. Select a BMP from the Best Management Practice Options Summary (see above).
3. Show the location of the outdoor living area and the BMP on the Property Plat being submitted for review and approval along with the permit application.
4. Complete an Outdoor Living Area permit application using the Town’s IDT Plans portal at [vienna.idtplans.com](http://vienna.idtplans.com).
5. Once the permit is reviewed, approved, and issued, work may begin with the appropriately qualified professional, as necessary, to install the BMP per the guidelines outlined in the Manual and supplemental resources.
6. Once work is completed, request final BMP inspection using the Town’s IDT Plans portal.
7. Perform required maintenance to keep the BMP in good working order and functioning as designed.

# Rain Barrel

## What is a rain barrel?

Rain barrel systems intercept, divert, store, and release rainfall for future use. Rain barrels are typically located at the bottom of downspouts to capture runoff from the roof. When collected runoff is used around the home to water lawns and gardens, it absorbs slowly into the ground which filters runoff and reduces downstream erosion.



Rain Barrel System Collecting Runoff from Downspout  
(©Rain Water Solutions photo courtesy of the Metropolitan Water Reclamation District of Greater Chicago)

## How do I design and install a rain barrel?

Many retailers sell pre-assembled rain barrel kits. You can also build one yourself with materials from a hardware store or through a Northern Virginia Soil and Water Conservation District Rain Barrel Workshop. Additional information on Rain Barrel Workshops and installation instructions are available at [www.fairfaxcounty.gov/soil-water-conservation/rain-barrel](http://www.fairfaxcounty.gov/soil-water-conservation/rain-barrel).

There are a variety of rain barrel styles and designs. For *Section 18-15* compliance, rain barrels must include the following.

- A screen to ensure mosquitos cannot enter.
- An emergency overflow system to convey extra water when the rain barrel is full.

## What size rain barrel do I need?

Outdoor Living Area Less than or Equal to:	Minimum Rain Barrel Size (gallons)
100 square feet	50 (one 50-gallon barrel)
200 square feet	100 (or two 50-gallon barrels)
300 square feet	150 (or three 50-gallon barrels)
400 square feet	200 (or four 50-gallon barrels)

## How do I maintain my rain barrel?

Property owners are responsible for the proper operation and ongoing maintenance of all BMPs. Rain barrel maintenance includes the following tasks.

- Empty collected rainwater to leave capacity before the next rain. Rain barrels may include a soaker or irrigation hose directed to a planting bed. Before the first winter freeze, disconnect and drain the rain barrel.
- Inspect to ensure the barrel is free of any structural damage or leaks.
- Inspect to ensure any screens, gutters, and downspouts are free of leaves and debris.

## Where can I find additional information on rain barrels?

Virginia DEQ Stormwater Design Specification No. 6

Rainwater Harvesting

<https://swbmp.vwrrc.vt.edu/>

Northern Virginia Soil and Water Conservation District - Rain Barrels

<https://www.fairfaxcounty.gov/soil-water-conservation/rain-barrel>



Rain Barrel Collecting Runoff from Downspout  
(Photo courtesy of the City of Rockville)

# French Drain

## What is a french drain?

A french drain is an underground drainage device that conveys water to a suitable outlet. A french drain consists of a perforated pipe surrounded by gravel and lined with sturdy landscape fabric. A french drain provides for additional subsurface storage and encourages the infiltration, filtering, and conveyance of stormwater runoff to a suitable outlet which by design reduces downstream erosion.

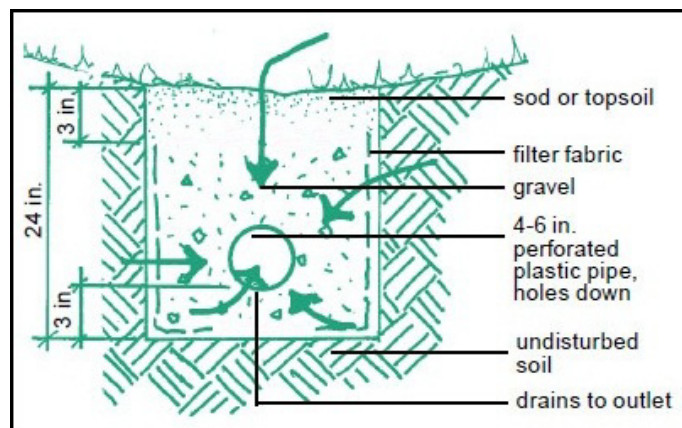


French Drain collecting Runoff from a Patio  
(Photo courtesy of University of Rhode Island)

## How do I design and install a french drain?

For *Section 18-15* compliance, installation of a french drain must follow the steps listed below.

1. Dig a two (2) foot wide by two (2) foot deep ditch adjacent to the downstream edge of the impervious surface.
2. Line the ditch on all sides with landscape fabric to prevent soil erosion.
3. Place a (3) three-inch layer of gravel at the bottom of the ditch. Recommended gravel diameter should be between 1.5 inches and 3.5 inches.
4. Place a six (6) inch perforated plastic pipe on top of the gravel and surround it with gravel around the sides and over the top. Gravel can be left exposed at the surface or covered with a decorative rock material that does not prevent the french drain from collecting the stormwater runoff.
5. Connect the perforated plastic pipe to a solid plastic pipe that conveys the runoff to a pop-up emitter located in the rear or front on the property at least ten (10) feet from the property line.



French Drain Diagram  
(Photo courtesy of Fairfax County)



### What size french drain do I need?

Outdoor Living Area Less than or Equal to:	Minimum French Drain Length (feet)
100 square feet	Equal to the adjacent downstream edge of the impervious area.  The minimum length is ten (10) feet.
200 square feet	
300 square feet	
400 square feet	

### How do I maintain my french drain?

Property owners are responsible for the proper maintenance and operation of all BMPs. Ongoing french drain maintenance includes the following tasks.

- Ensure the surface is free of litter, leaves, and sediment buildup.
- Ensure upstream vegetative cover and stabilization to prevent erosion and tracking of sediment into the practice.

### Where can I find additional information on french drains?

Northern Virginia Soil and Water Conservation District (NVSWCD) Control Heavy Runoff – Solving Drainage and Erosion Problems

<https://www.fairfaxcounty.gov/soil-water-conservation/drainage-problem-control-runoff>

# Conservation Landscaping

## What is conservation landscaping?

Conservation landscaping is a meadow or mulched area that includes specific plants designed to slow, filter, and treat stormwater runoff from impervious surfaces. Conservation landscaping includes the conversion of turf grass areas or bare soils to areas planted in native herbaceous and woody species.

## How do I design and install conservation landscaping?

A conservation landscaping area must be located on a relatively level area with a slope less than four percent (4%) downstream of the contributing impervious surface. Stormwater runoff that enters the conservation landscaping must be evenly dispersed. All concentrated flows, including downspouts, must be dissipated using a pop-up emitter, gravel sump, or other form of erosion prevention. Additional information on conservation landscaping construction and installation instructions are available online at:

[https://vaswcd.org/wp-content/uploads/2020/07/FY2021\\_VCAP-BMP-Manual.pdf](https://vaswcd.org/wp-content/uploads/2020/07/FY2021_VCAP-BMP-Manual.pdf).

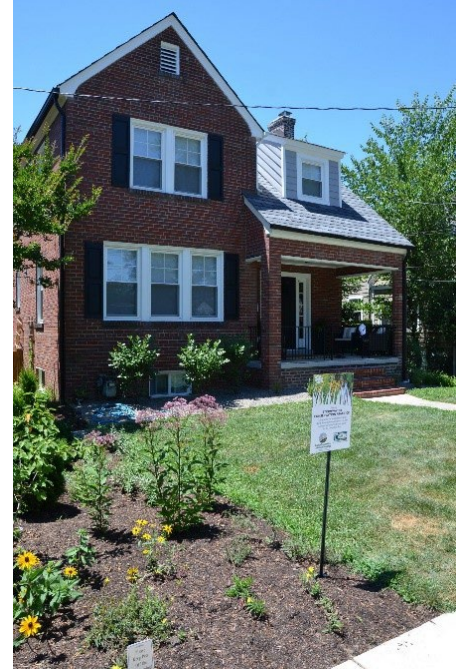
For *Section 18-15* compliance, conservation landscaping must include the following.

- Soil compost raked into the top twelve (12) inches of the conservation landscaping area.
- Native plant species and be free from invasive plants.

## What size conservation landscaping do I need?

Outdoor Living Area Less than or Equal to:	Minimum Conservation Landscaping Size	
	Length (feet)	Width (feet)
100 square feet	25	Equal to the width of the impervious area.  The minimum width is ten (10) feet.
200 square feet	25	
300 square feet	35	
400 square feet	35	

**Length** is the measurement of distance perpendicular to the slope as measured from uphill to downhill. **Width** is the measurement of distance along the contour parallel to the impervious area.



Conservation Landscaping Area  
(Photo courtesy of Virginia SWCD)

## How do I maintain my conservation landscaping?

Property owners are responsible for the proper maintenance and operation of all BMPs. Ongoing conservation landscaping maintenance includes:

- Spot weeding, erosion repair, and removal of trash, debris, and invasive species.
- Removal and replanting of dead plants. Pruning of dead branches from trees and shrubs and deadhead perennials if needed to encourage blooming.
- Inspection to ensure the area consists of native plants and is free of invasive plants.

## Where can I find additional information on conservation landscaping?

Virginia DEQ Stormwater Design Specification No. 2  
Sheet Flow to a Vegetated Filter Strip or Conserved Open Space  
<https://swbmp.vwrrc.vt.edu/>

Plant NOVA Natives  
<https://www.plantnovanatives.org/>

The Flora of Virginia Project  
<https://www.dcr.virginia.gov/natural-heritage/vaflora>  
<https://floraofvirginia.org/>

Chesapeake Bay Landscape Professional (CBLP)  
<https://cblpro.org/>



Conservation Landscaping Area  
(Photo courtesy of Potomac Conservancy)

# Rain Garden

## What is a rain garden?

A rain garden is a shallow landscaped area that captures and holds stormwater runoff and encourages infiltration into the underlying native soil. Rain gardens include specific layers and plantings to further treat and filter stormwater runoff.

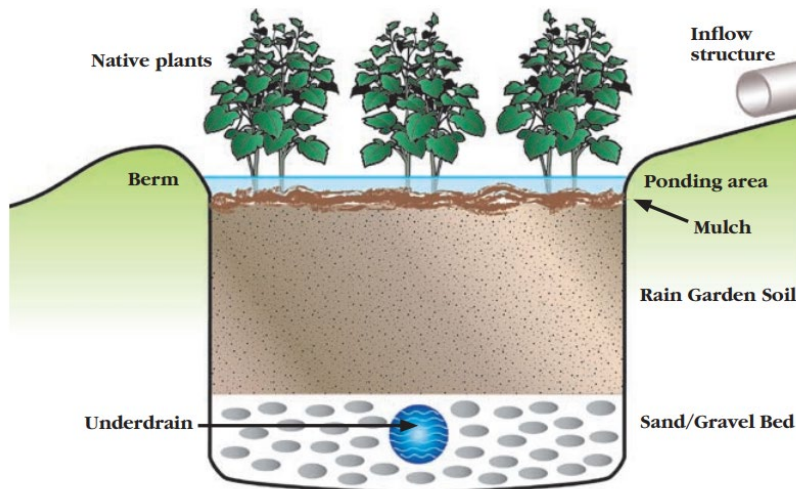


Vienna Town Hall Rain Garden

## How do I design and install a rain garden?

Rain gardens must be located within forty (40) feet of the downspout or contributing impervious surface and must be set back at least ten (10) feet downhill from any building foundation. Once you have identified possible locations for your rain garden, test the soil. The success of your rain garden depends heavily on the infiltration rate of the soil.

For *Section 18-15* compliance, rain gardens must design and construction must follow *The Northern Virginia Soil and Water Conservation District's Guide* available online at <https://www.fairfaxcounty.gov/soil-water-conservation/sites/soil-water-conservation/files/assets/documents/raingardenbk.pdf>



Rain Garden Diagram  
(Photo courtesy of Fairfax County)

## What size rain garden do I need?

Outdoor Living Area Less than or Equal to:	Minimum Rain Garden Size (square feet)		
	6" Ponding Depth	9" Ponding Depth	12" Ponding Depth
100 square feet	N/A	N/A	N/A
200 square feet	30	20	15
300 square feet	45	30	20
400 square feet	60	40	30

## How do I maintain my rain garden?

Property owners are responsible for the proper maintenance and operation of all BMPs. Ongoing rain garden maintenance includes the following tasks.

- Ensure the rain garden is free of litter, leaves, and sediment buildup.
- Ensure side slopes are free from erosion or tacking of sediment into the rain garden.
- Inspect to ensure the area consists of native plants and is free of invasive plants.
- Remove and replant any dead plants. Prune dead branches from trees and shrubs, and deadhead perennials when needed to encourage blooming.
- Inspect to ensure the water that pools in the rain garden will drain within 48 hours.
- Monitor that the mulch layer is un-compacted. Replace any mulch layer that has become compacted.

## Where can I find additional information on rain gardens?

Virginia DCR Stormwater Design Specification No. 9

Bioretention

<https://swbmp.vwrrc.vt.edu/>

Plant NOVA Natives

<https://www.plantnovanatives.org/>

The Flora of Virginia Project

<https://www.dcr.virginia.gov/natural-heritage/vaflora>

<https://floraofvirginia.org/>

Chesapeake Bay Landscape Professional (CBLP)

<https://cblpro.org/>