



**DPS**

Montgomery County  
Department of Permitting Services



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## **Guidelines for Control of Water Runoff on Small Lots**

**01/03/2022**

### **Introduction and Purpose:**

Chapter 8, Section 8-29B of the Montgomery County Code established the requirements to manage water runoff from construction of **new single family dwellings** and **additions to existing single family dwellings** (including accessory structures, such as attached garages, carports and sheds) that are located on lots which have an area of **less than 15,000 square feet**.

Any construction that is covered by an approved Stormwater Management plan is exempt from the requirements of this legislation. However, any building permit application for constructing a new house that has obtained a waiver from Stormwater Management approval, or any habitable construction that alters the existing drainage pattern must include provisions for the control and/or safe conveyance for the runoff according to these guidelines.

Any building permit application for additions that propose to increase the building lot coverage (the footprint of the main building or any accessory structures, such as attached garages, carports and sheds) by **more than 400 square feet** (calculated from outside wall to outside wall of the addition(s)), or any habitable construction that alters the existing drainage pattern must include provisions for the control and/or safe conveyance for the runoff according to these guidelines.

Accessory Dwelling Units (ADUs) will require drainage review, regardless of roof size.

Local Municipalities are subject to drainage review except, City of Gaithersburg and City of Rockville. City of Takoma park would be exempt from drainage review, only with approved Storm Water Management plans by the City of Takoma Park.

The purpose of this manual is to provide assistance to the building permit applicants, homeowners, contractors and design consultants in what is required to be in compliance with the Montgomery County Code.

### **Administrative Procedures:**

1. The Applicant shall submit **three (3) sets of the drainage plan** (unless submitted electronically through eplans) that includes any applicable standard details and a copy of the Maryland Department of Assessments and Taxation (Real Property Data Search), Showing the property land area for review and approval. The plans shall be submitted as part of the building permit application to the Land Development Division for drainage review.

2. After approval, One (1) Set of plans will be sent to the MCDPS inspector, the other two sets of plans will be returned to the applicant along with any other documents that were approved by the reviewer so that they can be included in the building permit set. **The Permittee must ensure that work is done in accordance with the approved plans.**
3. Prior to the final building inspection, the permittee must provide the Certification of Completion to the SC Inspection Section that the drainage system is installed per the approved drainage plan.
4. If any changes are made to the approved drainage plans, approval must be obtained from the Division of Land Development following the same procedures noted above.
5. If the water runoff is discharged onto a public right-of-way (ROW) through a pipe (PVC), a ROW permit is required, see appendix A. Drainage plans will be reviewed to ensure that any runoff to the public ROW will be safely conveyed to the public street/drainage system. The building permit will be issued after the ROW permit is issued.
6. If a ROW permit is required, the final building inspection will not be approved until the ROW final inspection has been approved.

### **Plan Submittal Requirements:**

Drainage plans must indicate the proposed drainage system for collecting, transporting and disposing of water runoff. Collected runoff shall be discharged into the County's approved drainage systems or natural drainage systems (streams, natural swales, Etc.). Existing drainage patterns must not be altered in a manner that would adversely affect adjoining or nearby properties.

### **Proposed Drainage plans shall include the following information:**

1. Scale 1" = 10' (engineering scale)
2. All lot dimensions (bearings and distances), Subdivision name, Lot number and plat number, Lot area in square feet, widths of all easements and rights of way.
3. Location of all existing and proposed **buildings and structures**, driveways, sidewalks, drainage devices, drainage ditches, swales, curb and gutter, patios and any other impervious surfaces within the property and the first public improvement (such as a sidewalk, curb and gutter or the edge of pavement, stormdrain structure or pipe) that is located within the right of way.
4. Dimensions and amount of area (in square feet) of existing and proposed buildings and structures mentioned in items 1 and 2.
5. Elevations and contour lines are required at the corners, midpoint of the wall, downspout locations of all existing and proposed structures. Elevations and contour lines are required at the centerline and edges of any proposed or existing swales, they are also needed at the midpoint and property lines of all front, side and rear yards.
6. Elevations of the lower floor, basement floor slab, garage floor slab and impervious surfaces for all existing and proposed buildings.
7. Location and elevations of all roof downspouts that make contact with the ground, provide total area of the runoff handled by each downspout and provide location and elevation for all existing and proposed buildings.
8. Directional arrows and dividing lines to show location of existing drainage areas and existing vs proposed drainage patterns. For example, show the downspout flows and sheet flows that are conveyed off the lot or collected in an on-site device or facility.

9. Size and length of the drainage pipes (solid schedule 40 PVC pipe is only type of pipe allowed) within the existing and proposed collection system. Provide invert elevation of the pipe at all discharge points and distance the runoff will travel to the first public improvement.
10. If fill is added to the lot, the grades on neighboring properties must be shown for the existing buildings. **Site grading shall not obstruct or alter existing drainage patterns** flowing from or to adjacent properties.
11. Plans that were prepared by an Engineer, Surveyor or Architect must include a certification block that contains his/her seal, date the plan was prepared, date of license expiration and their signature.

\* Note: plans that do not include the items listed above or that are drafted at a different scale than the required scale as listed above will be rejected without a complete in-depth review.

### **General Design Criteria:**

When designing a new house or an addition, you must take into consideration how the building along with its associated grading, driveway, accessory structures and patios will affect the current water runoff patterns. All runoff from additional impervious areas must be safely conveyed away from adjoining properties or controlled in a way that minimizes the runoff on adjacent properties.

Control or conveyance measures are used to manage water runoff, these facilities must be sized to handle 1.5 inches of rainfall over a 24-hour period. Based on this, 100 square foot of impervious generates 12.5 cubic feet or 94 gallons of water. There are several simple facilities which can be used to achieve this goal.

All pervious areas remaining within the disturbed area on the lot after construction should be top soiled per Maryland Department of the Environment (MDE) recommendations. Construction activities tend to compact the soil. Loosening subsoil and replacing topsoil will encourage rainwater to percolate into the ground, helping to reduce runoff. Topsoil also has the added benefit of reducing the amount of fertilizer and irrigation needed to maintain healthy lawns and gardens.

The following section gives guidance on acceptable methods for runoff control. Permittees are encouraged to utilize the best combination of practices to meet their unique needs of the site.

### **Dry Wells:**

Dry Wells are an excavated pit that is filled with ASTM D448 No. 1 stone that provides temporary storage of rooftop runoff within the void space in the stone media allowing water to infiltrate the ground. Extreme care must be taken when deciding where to install a dry well. Dry wells should be a minimum of 15 feet from all foundations (this can be reduced to 10 feet if the foundation is slab on grade) for additional set-back information please see the dry well detail in appendix B. As additional water from the dry well can have an adverse effect on adjacent foundations the distances above need to be applied to adjoining foundations also. Dry wells should be placed down gradient whenever possible.

Each 100 square foot of roof area will require a 3' X 3' X 3.5' deep dry well. **No more than 1,000 square feet of rooftop area should be directed to each dry well.** Overflow from the dry well should be directed to a safe area away from adjacent houses. Dry wells shall not be placed in fill (soil typing or infiltration testing is recommended in appendix B,

Section B(2) to determine if the soils are suitable for drywell installation), nor shall they be installed on slopes greater than 15%. Dry wells must not be installed under pavement or a deck of any kind.

A proprietary substitute may be used. See Appendix B for more dry well information and detail.

Roof Area Square Footage (square feet)	Dry Well Size (feet)
100	3 X 3 X 3.5
200	4 X 4 X 3.5
400	6 X 6 X 3.5
500	6 X 6 X 4
1,000	9 X 9 X 4

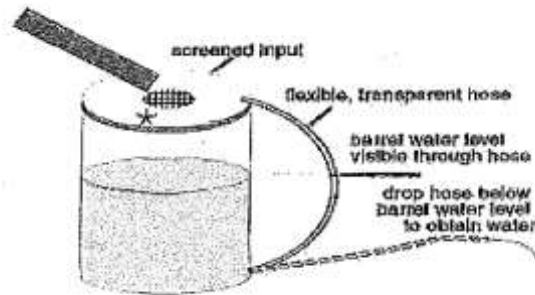
**Rain Barrels:**

Rain barrels come in many shapes and sizes. The size and number of rain barrels is based on the square footage of roof area draining to them. **Rain barrels must be emptied between each rain event.** Water from the rain barrels can be used for irrigation.

Roof Square footage	Number of 60-gal Rain Barrels	Number of 90-gal Rain Barrels
100	2	1
400	6	4
500	8	5
1,000	16	10
1,200	19	13
1,500	24	16

## Simple Rain Barrel Design Considerations

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### Critical Points:

- Modify downspout to barrel inflow site
- Screened inflow design
- Outflow hose / barrel connection
- Design to keep hose above barrel rim
- Water draining from the barrel must be directed away from the adjacent homes, preferably out to the street or to an existing swale or storm drain.

### **Cisterns:**

A design of the cistern must be submitted for review. **A separate building permit is required** for the construction of a cistern.

Cisterns can be located underground or above ground and used to capture and store large amounts of runoff. Cisterns can be slowly emptied through gravity flow, or by pumping the water out. The water from the cistern can be used for irrigation. **Cisterns need to be emptied before each rainfall.**

When emptying a cistern, the runoff must be directed away from adjacent homes to a place that will allow for a safe outfall.

### **Natural Topography / Buffers/ Swales:**

When the slope of the lot is less than 5%, allowing the runoff to flow through a vegetated area before it leaves the property will help slow the runoff and allow more of it to be absorbed into the ground. Landscaping that will slow down water flow and promotes infiltration is encouraged. Proper ground

preparation including the addition of topsoil is required. **Runoff must drain towards areas such as parkland, floodplains, public right of way and other areas where runoff will not affect homes.** These undeveloped areas can allow excess runoff to infiltrate into the ground or allow the runoff to be collected by the drainage system within the right of way.

Grass swales (typically a small depression with raised sides that conveys runoff) are the preferred conveyance method for discharging to the right of way (the point of discharge must be a minimum of 30 feet away from the first public improvement). Grass swales allow the runoff to percolate into the ground, reducing the amount of runoff leaving the property.

### **Storm Drains / Yard Drains:**

Protection of adjacent properties can also be accomplished by safely conveying the runoff away from the properties through the use of pipes. Always remember to direct the water to an area which will not impact adjacent houses.

Downspouts can be buried and taken to a safe outfall. The minimum slope for a pipe should be 2% or 2½ inches of fall (or drop) in 10 feet of distance. The minimum allowable pipe size shall be 4 inches.

**Discharging pipes and swales directly onto sidewalks is not permissible due to the possibility of ice forming on the sidewalk (the point of discharge must be a minimum of 30 feet away from the first public improvement, the runoff must also flow through vegetated areas for the entire 30 feet).**

The discharge should outfall to a location such as common space areas, stream valley, drainage swale, roadside open-section or an existing enclosed drainage system. **A Right of Way permit is necessary to connect a downspout to the street via a curb cut or to an existing storm drain pipe or structure.**

### **Rain Gardens / Biofilters:**

**(Plans of this type must be prepared by a Landscape Architect, Professional Engineer or Professional Land Surveyor that is licensed in the State of Maryland).**

Rain gardens and Biofilters are landscaped areas which collect and filter rainwater. Rain gardens must also be designed with a safe overflow. Since rain gardens are designed to hold water for an extended period, they should be kept a minimum of 20 feet from all foundations (this can be reduced to 10 feet if the foundation is slab on grade) and kept a minimum of 5 feet from all property lines. Additionally, water from the rain gardens can have an adverse effect on adjacent foundations, the distances above need to be applied to adjoining foundations as well. Rain gardens should be placed down gradient. Rain gardens / biofilters should not pond more than 1 foot in depth of water. See Appendix D for more rain garden / biofilter information and details.

Rain gardens and biofilters must have computations and a layout that were designed and certified by an engineer, land surveyor, or landscape architect who is registered in the State of Maryland.

A qualified garden designer can recommend plants for the rain garden. Rain garden soils are not meant to stay wet all the time. Therefore plants which require wet or constantly moist soils will not do well. Plants which tolerate floodplain conditions are ideal. Native plants are preferred, but the garden should be designed to blend into the surrounding landscaping.

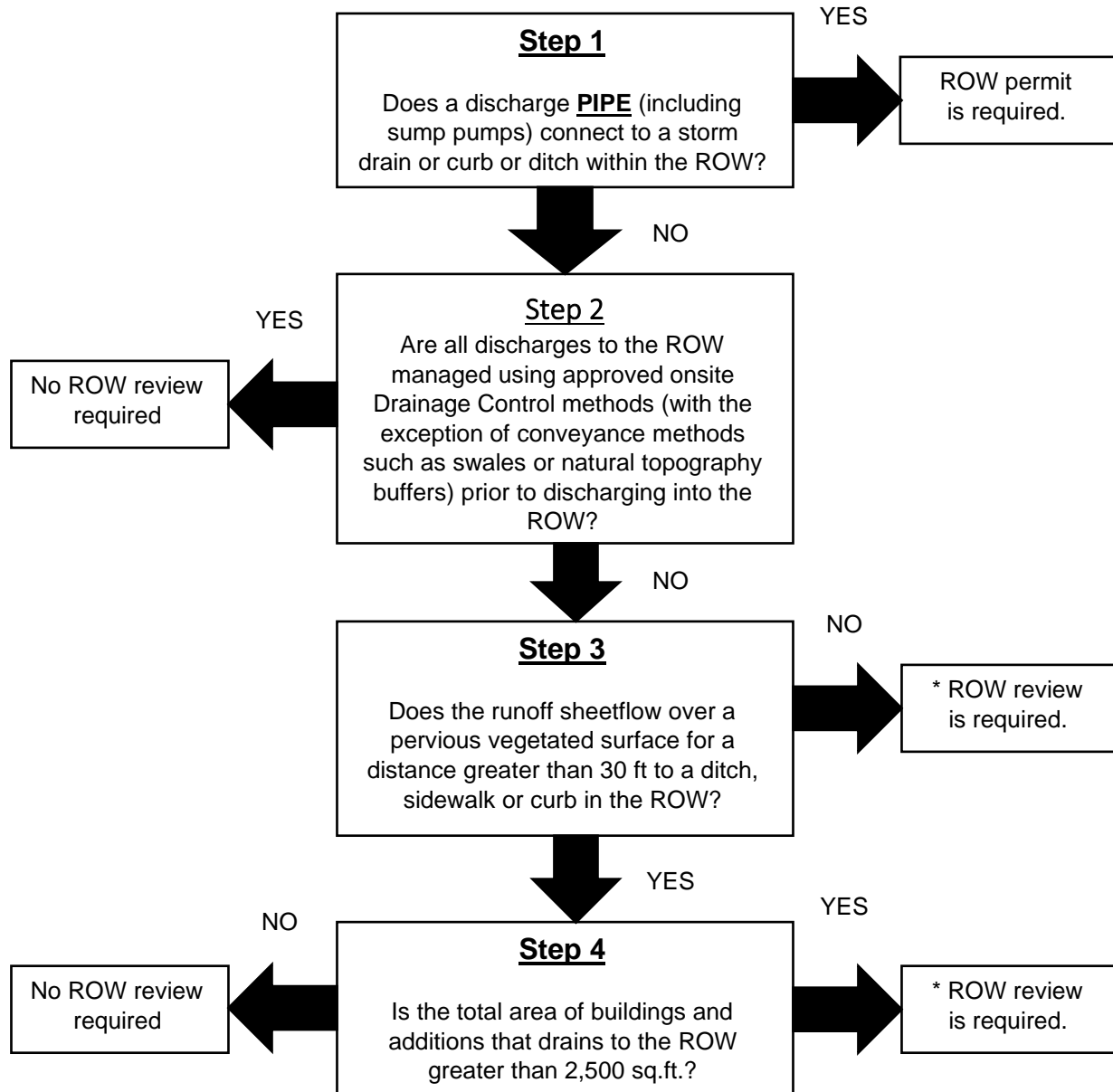
**Reminder:**

Refer to Rain Garden (RG) guideline dated October 6, 2012

**Appendix A**

**Does your Drainage plan also require**

**a Right of Way permit?**



\* Note: A Right of Way Plan Reviewer will determine if Right of Way permit is required.

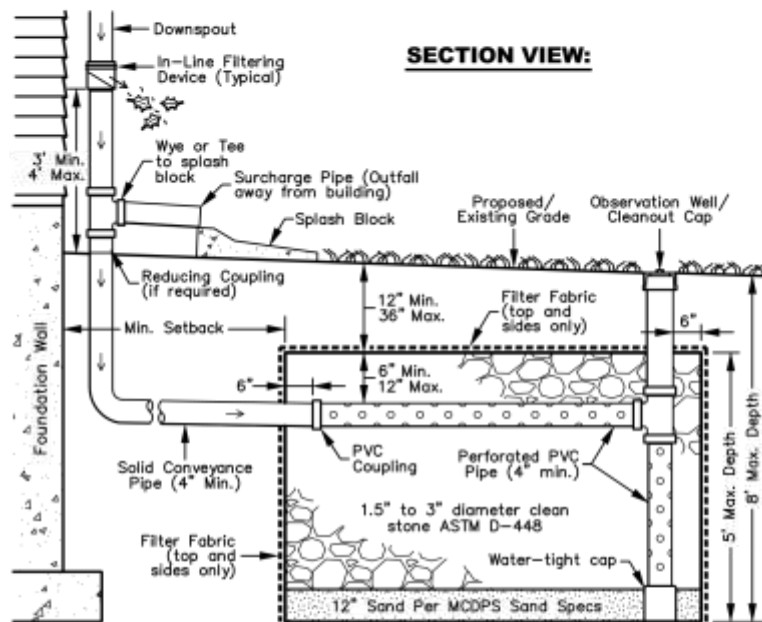


## Appendix B

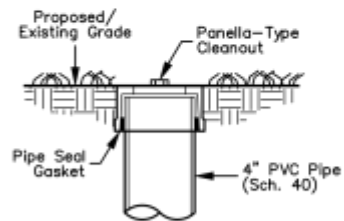
### Drywell Information and Detail

#### **GENERAL NOTES:**

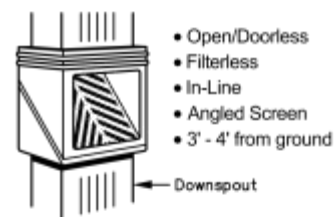
- 1 Dry wells may receive water from roof downspouts only.
- 2 Length, width and depth of each dry well is to be as specified by the design engineer on the approved plan.
- 3 Manufactured sand is not acceptable. Refer to the MCDPS Sand Specifications.
- 4 With the inspector's approval dry well locations may be field adjusted for site conditions. All adjustments must meet the minimum setbacks.
- 5 Impermeable liners may be used when specified by the design engineer and shown on the plan.
- 6 Overflow pipes may be used when specified by the design engineer and shown on the plan. They shall be set at a minimum 2% slope. If the outfall is to daylight the outfall invert shall be shown.
- 7 Pop-up emitters may be used when specified by the design engineer and shown on the plan.



#### **OBSERVATION WELL/ CLEANOUT CAP DETAIL:**



#### **IN-LINE FILTERING DEVICE DETAIL:**



#### **LAYOUT GUIDANCE:**

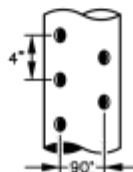
- Downspouts shall be shown on the plan view.
- Conveyance pipe(s) from the downspout(s) to the dry well shall be shown on the plan view, including connections from other downspouts. Standard readily-available bends shall be used at couplings.
- When possible there should be only one conveyance pipe entering the dry well. It should be centered and should enter at 90 degrees.
- The interior 6" PVC perforated pipe shall be designed and shown on the plan to maximize distribution within the dry well.
- When a dry well's length is greater than its width consider locating the perforated pipe along the longest dimension.
- The observation well with cleanout shall be shown on the plan view.

#### **MINIMUM SETBACKS:**

- 5 feet from property lines. Zero from R/W
- 10 feet from slab-on-grade buildings/pools
- 15 feet from buried foundations
- 15 feet from another dry well
- 30 feet from septic trench or tank
- 100 feet from primary well location or open loop geothermal well
- 50 feet from alternate well location or closed loop geothermal well
- So as to avoid basement seepage
- In accordance with other county requirements

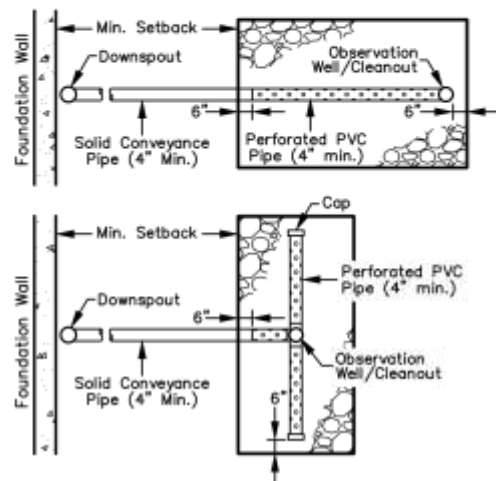
#### **PERFORATED PVC PIPE:**

- Schedule 40 PVC
- 3/8 Inch holes
- 4" on center
- 90° around pipe



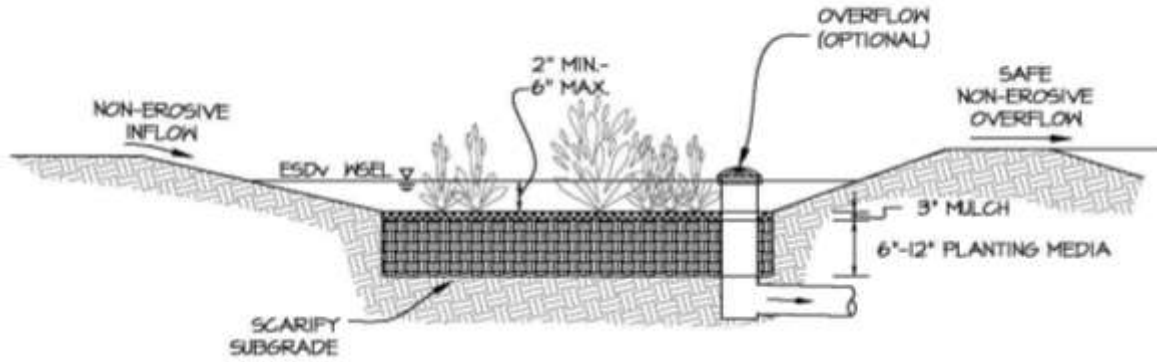
#### **EXAMPLE LAYOUTS\* - PLAN VIEW:**

\* Design plans must show the layout of each dry well.



## Appendix C

### Rain Garden / Biofilter Information and Details



**RAIN GARDEN**  
**TYPICAL CROSS SECTION**  
NTS