

**Stormwater Management Practices  
for projects which are exempt under Section 402 of this  
Ordinance.**

## **STORMWATER MANAGEMENT PROCEDURES FOR PROJECTS MEETING THE LAND COVER EXEMPTION CRITERIA**

### **What are the Act 167 Stormwater Management Requirements?**

Pennsylvania Act 167 was authorized on October 4, 1978 (32 P.S., P.L. 864) and gave Pennsylvania Municipalities the power to regulate activities that affect stormwater runoff, surface and groundwater quantity and quality.

### **Who is affected by these requirements?**

The Windsor Township Stormwater Management Ordinance affects all NEW development in Windsor Township. Individual home construction projects on single family lots which result are exempt under Section 402 of this Ordinance, are not required to submit formal drainage plans to Windsor Township; however, they must still address Water Quality and Groundwater Recharge criteria specified in the Stormwater Management Ordinance (Ord. Sections 305 and 306).

### **Do I require professional services to meet these requirements?**

This brochure has been developed to assist the individual homeowner in meeting the water quality and groundwater recharge goals of the Windsor Township Stormwater Management Ordinance. If the guidelines presented in this brochure are followed, the individual homeowner will not require professional services to comply with these water quality and groundwater recharge.

### **What do I need to Send to Windsor Township?**

Even though a formal drainage plan is not required for many individual lot owners, a brief description of the proposed infiltration facilities, including types of material to be used, total impervious areas and volume calculations as shown above, and a simple sketch plan showing the following information shall be submitted to Windsor Township prior to construction:

- Location of proposed structures, driveways or other paved areas with approximate size in square feet.
- Location of any existing or proposed on site septic system and/or potable water wells showing rough proximity to infiltration facilities.

### **Determination of Recharge Volume**

The amount of recharge volume to be provided can be determined by following the simple steps below. Impervious area calculations should include all areas on the

individual lots that are covered by roof area or pavement which would prevent rain for naturally percolating into the ground, including sidewalks, driveways or parking areas. Sidewalks, driveways or patios that are constructed with gravel or turf pavers and will not be blacktopped in the future, need not be included in this calculation.

Example Recharge Volume:

STEP 1 – Determine Total Impervious Surfaces:

House Roof (Front)	12 ft x 48 ft	=	576 sq. ft.
House Roof (Rear)	12 ft x 48 ft	=	576 sq. ft.
Driveway	12 ft x 50 ft	=	600 sq. ft.
Parking Pad	12 ft x 12 ft	=	144 sq. ft.
Walkway	6 ft x 20 ft	=	120 sq. ft.
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			2,016 sq. ft.

STEP 2 – Determine Require Infiltration Volume (Rv) Using the Following Equation

$$Rv = \frac{0.46 \text{ inches} \times (\text{total impervious area in square feet})}{12} = \text{_____ cubic feet of recharge}$$

$$Rv = \frac{0.46 \text{ in.} \times 2,016 \text{ sq. ft.}}{12} = 77.3 \text{ cu. ft.}$$

STEP 3 – Sizing of Select Infiltration Method

The following pages show several methods of infiltrating stormwater runoff from residential areas. Their appropriateness depends on the amount of infiltration volume required and the amount of land available. More than one method can be implemented on a site, depending on site constraints. Dry wells should be used only for receiving runoff from roof drains. Infiltration trenches are appropriate for receiving runoff from driveways, sidewalk or parking areas. Other methods may be appropriate, but these should be discussed with the municipal engineer prior to installation.

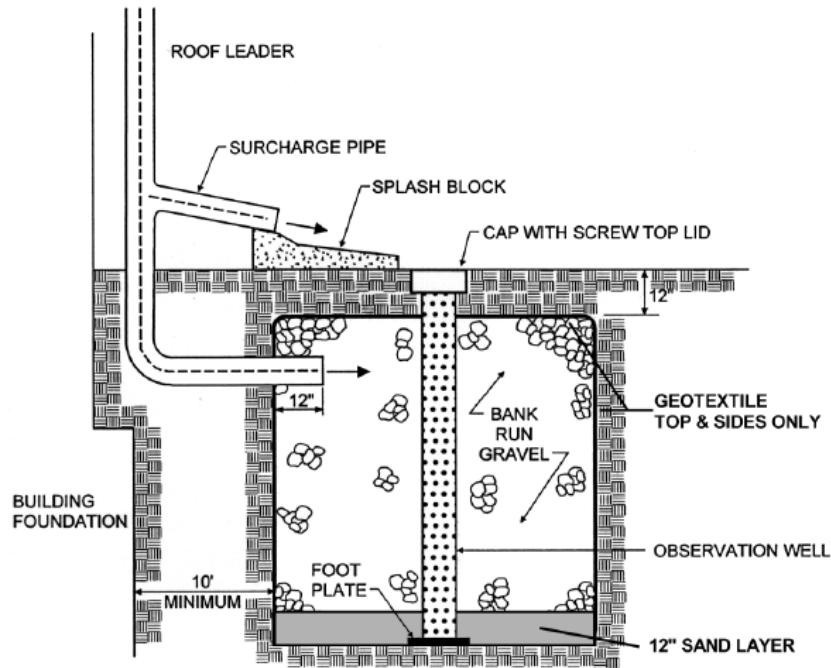
**Dry Wells**

Dry wells are effective methods of infiltrating runoff from roof leaders. These facilities should be located a minimum of 10 feet from the building foundation to avoid seepage problems. A dry well can be either a structural prefabricated chamber or an excavated pit filled with aggregate. Construction of a dry well should be performed after all other areas of the site are stabilized, to avoid clogging. During construction, compaction of the subgrade soil should be avoided and construction should be performed with only light machinery. Depth of dry wells in excess of 3 ½ feet should be avoided. Gravel fill

should be an average 1.5 – 3.0 inches in diameter. Dry wells should be inspected at least four times annually as well as after large storm events.

**FIGURE G-1**

**TYPICAL DRY WELL CONFIGURATION**



Source: Maryland Stormwater Design Manual, 2000

Example Sizing:

STEP 1 – Determine Total Impervious Surfaces

House Roof Area: 12 ft x 48 ft = 576 sq. feet

STEP 2 – Determine Require Infiltration Volume using Equation

$$\frac{0.46 \text{ in.} \times 576 \text{ sq. ft.}}{12} = 22.1 \text{ cu. ft.}$$

$$\frac{22.1 \text{ cu. ft.}}{0.4} = 55.3 \text{ cu. ft. (* assume 40% void ratio in gravel bed)}$$

STEP 3 – Sizing of Select Infiltration Method

Volume of facility = Depth x Width x Length

Set D = 3.5 ft; Set W = L for a square chamber

55.3 cu. ft. = 3.5 x L X L ; L = 4.0 ft

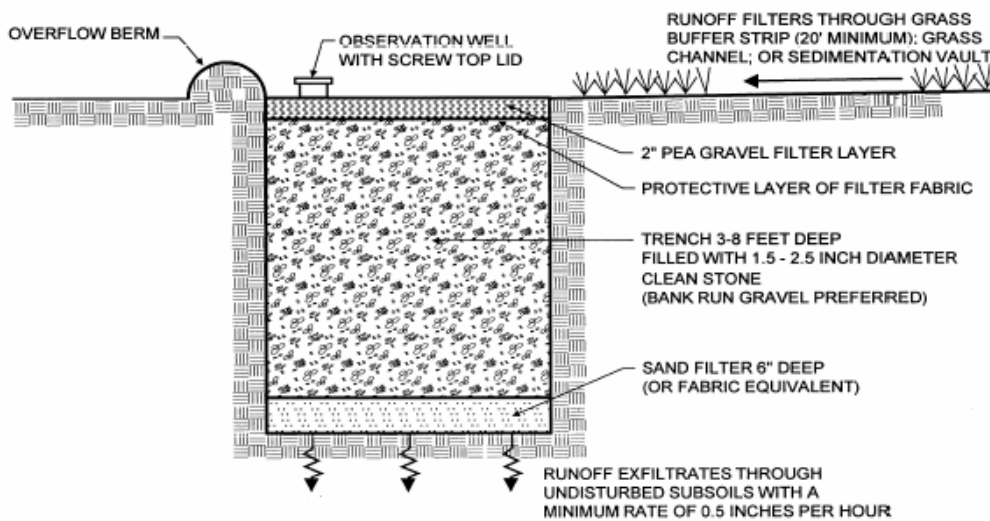
Final Facility Dimensions: 3.5 ft (D) x 4.0 ft (W) x 4.0 ft (L)

## Infiltration Trenches

An infiltration trench is a long, narrow, rock-filled trench with no outlet that receives stormwater runoff. Runoff is stored in the void space between the stones and infiltrates through the bottom and into the soil matrix. Infiltration trenches perform well for removal of fine sediment and associated pollutants. Pretreatment using buffer strips, swales, or detention basins is important for limiting amounts of coarse sediment entering the trench which can clog and render the trench ineffective.

**FIGURE G-2**

### TYPICAL INFILTRATION TRENCH CONFIGURATION



Source: Maryland Stormwater Design Manual, 2000

### Example Sizing:

#### STEP 1 – Determine Total Impervious Surfaces

Driveway	12 ft x 50 ft	=	600 sq. ft.
Parking Pad	12 ft x 12 ft	=	144 sq. ft.
Walkway	6 ft x 20 ft	=	120 sq. ft.
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			864 sq. ft.

STEP 2 – Determine Required Infiltration Volume using Equation

$$\frac{0.46 \text{ in.} \times 864 \text{ sq. ft.}}{12} = 33.1 \text{ cu. ft.}$$

$$\frac{33.1 \text{ cu. ft.}}{0.4} = 82.8 \text{ cu. ft. (* assume 40% void ratio in gravel bed)}$$

STEP 3 – Sizing of Select Infiltration Method

Volume of facility = Depth x Width x Length

Set D = 3.0 ft; Determine Required Surface Area of Trench

$$82.8 \text{ cu. ft.} / 3.0 \text{ ft.} = 27.6 \text{ sq. ft.}$$

The width of the trench should be greater than 2 times its depth (2 x D); therefore in this example a trench width of 6 feet is selected;

Determine trench length:  $L = 27.6 \text{ sq. ft.} / 6 \text{ ft} = 4.6 \text{ ft.}$

Final Trench Dimensions: 3.0 ft. (D) x 6 ft. (W) x 4.6 ft. (L)

**FIGURE G-3**

**SAMPLE SITE SKETCH PLAN**

