

WATER

26 Attachment 7

Township of East Rockhill

Appendix G Simplified Stormwater Management Procedures for Existing Single-Family Dwelling Lots

Projects eligible for this procedure

Individual home construction projects on single-family lots which result in less than 2,000 square feet of impervious area (including the building footprint, driveway, sidewalks, and parking areas) and less than 5,000 square feet of earth disturbance but do not meet exemption criteria of § 26-305C may utilize the simplified procedure contained in this appendix to meet requirements of Part 3 and are not required to submit formal drainage plans to the Township.

Are professional services necessary to meet these requirements?

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

What do I need to send to the East Rockhill Township?

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

- Location of proposed structures, driveways or other paved areas with approximate surface area in square feet.
- Location of any existing or proposed onsite septic system and/or potable water wells showing proximity to infiltration facilities.
- Bucks County Conservation District erosion and sediment control “adequacy” letter.

Determination of recharge volume

The amount of recharge volume that must be provided is determined by following the simple steps below. Impervious area calculations must include all areas on the lot proposed to be covered by roof area or pavement which would prevent rain from naturally percolating into the ground, including sidewalks, driveways or parking areas. Sidewalks, driveways or patios that are constructed with turf pavers and are not included in this calculation.

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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	4 ft. x 20 ft.	=	80 sq. ft.
			1,976 sq. ft.

STEP 2 — Determine Required Infiltration Volume (Rv) Using the Following Equation:

$$Rv = \frac{2.0 \text{ inches} \times (\text{total impervious area in square feet})}{12} = \text{_____ cubic feet of recharge}$$

$$Rv = \frac{2.0 \times 1,976 \text{ sq. ft.}}{12} = 329 \text{ cu. ft.}$$

STEP 3 — Sizing of Selected Infiltration Method

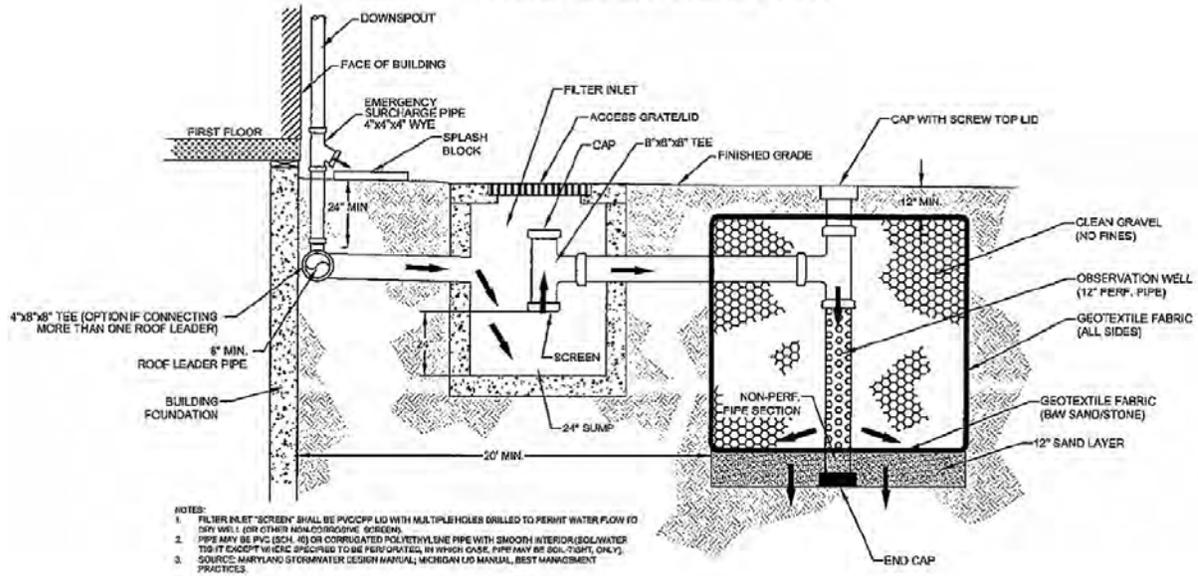
The following pages identify several methods to infiltrate stormwater runoff. Their appropriateness depends on the amount of required infiltration volume and amount of available land. More than one method may be implemented on a site, depending on site constraints. Dry wells may be used only for receiving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

Dry wells

Dry wells are effective methods to infiltrate runoff from roof leaders. These facilities must be located based upon a determination by the design professional to reduce potential basement seepage problems but not less than a minimum of 20 feet from the building foundation. A dry well maybe either a structural prefabricated chamber or an excavated pit filled with aggregate. Dry well shall not be constructed until all other areas of the site are stabilized, to avoid clogging. During construction, compaction of the sub-grade soil shall be avoided, and construction may be performed with only light machinery. Depth of dry wells in excess of 3 1/2 feet should be avoided unless warranted by soil conditions. "Clean" gravel fill should average 1.5 inches to 3.0 inches in diameter. Dry wells should be inspected at least four times annually as well as after large storm events.

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**Figure J-1
Typical Dry Well Configuration**



Example Sizing For Drywells:

STEP 1 — Determine Total Impervious Surfaces

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

STEP 2 — Determine Required Infiltration Volume using Equation

$$\frac{2.0 \text{ in.} \times 576 \text{ sq. ft.}}{12} = 96 \text{ cu. ft.}$$

$$\frac{96 \text{ cu. ft.}}{0.4^*} = 240 \text{ cu. ft.} \text{ (*assumes 40\% void ratio in gravel bed)}$$

STEP 3 — Sizing of Selected Infiltration Method

Volume of facility = Depth x Width x Length

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

$$240 \text{ cu. ft.} = 3.5 \times L \times L; L = 8.3 \text{ ft.}$$

Final Facility Dimensions: 3.5 ft. (D) x 8.3 ft. (W) x 8.3 ft. (L)

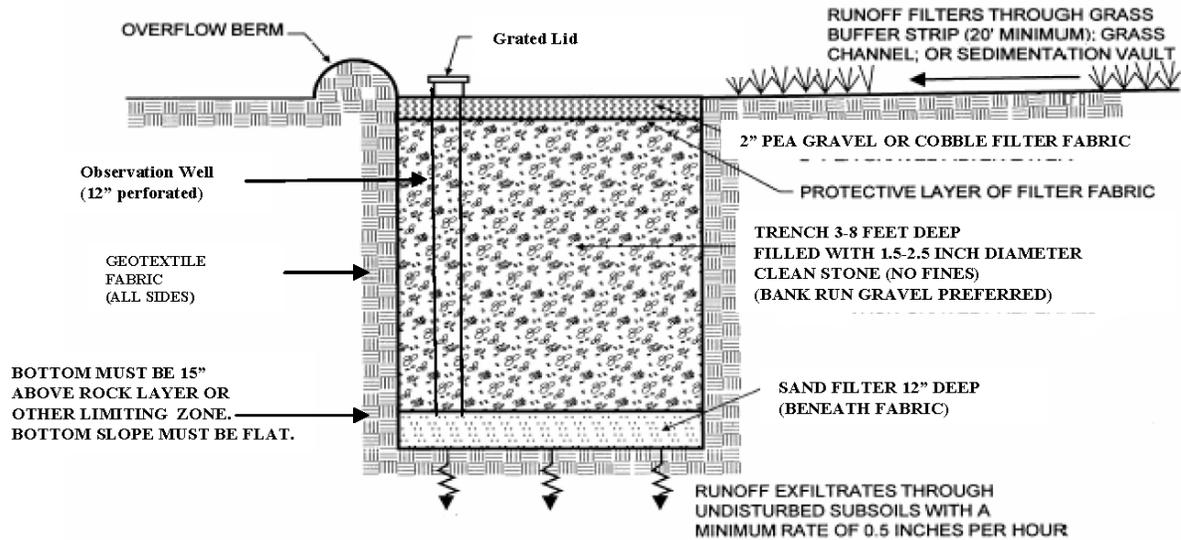
Infiltration trenches

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

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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 J-2
Typical Infiltration Trench Configuration**



Source: Maryland Stormwater Design Manual, 2000

Example Sizing For Infiltration Trenches:

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	4 ft. x 20 ft.	=	80 sq. ft.
			824 sq. ft.

STEP 2 — Determine Required Infiltration Volume using Equation

$$\frac{2.0 \text{ in.} \times 824 \text{ sq. ft.}}{12} = 137 \text{ cu. ft.}$$

$$\frac{137 \text{ cu. ft.}}{0.4^*} = 343 \text{ cu. ft. (*assumes 40\% void ratio in gravel bed)}$$

STEP 3 — Sizing of Selected Infiltration Method

Volume of facility = Depth x Width x Length

Set D = 3 ft.; determine required surface area of trench

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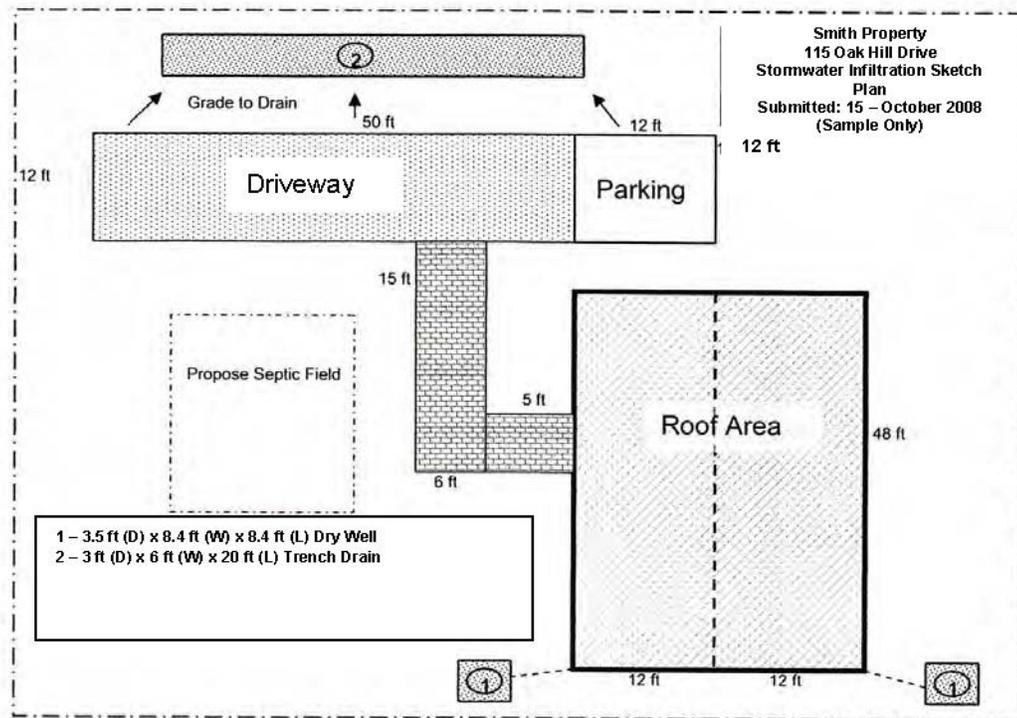
343 cu. ft. / 3 ft. = 114 sq. ft.

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: $L = 114 \text{ sq. ft.} / 6 \text{ ft.} = 19 \text{ ft.}$

Final trench dimensions: 3 ft. (D) x 6 ft. (W) x 19 ft. (L)

Figure B-3
Sample Site Sketch Plan



Source: Maryland Stormwater Design Manual