

Summary Fact Sheet

Category: 3.0 Permeable Pavements
Practice: 3.1 Infiltration Trenches

General Description: Infiltration trenches (also known as infiltration basins or galleries) are trenches that have been back-filled with stone. They collect runoff during a storm event and release it into the soil by infiltration.

Water Quantity Controls

The peak discharge rate for the design storm should not exceed the saturated flow rate through the infiltration trench. Storage volume calculations are provided in PFM section 6-1300 and in the *Northern Virginia BMP Handbook*.

Water Quality Controls

Phosphorus removal efficiencies for infiltration trenches are specified in the *Northern Virginia BMP Handbook* as follows:

- ? 50% removal for trenches that capture 0.5" of runoff from the impervious area
- ? 65% removal for trenches that capture 1.0" of runoff from the impervious area

Location: Infiltration trenches may be used in conjunction with another stormwater management device, such as a detention pond, to provide both water quality control and peak flow attenuation. Runoff that contains high levels of sediments or hydrocarbons (oil and grease) that may clog the trench must be pretreated with other devices such as grit chambers, water quality inlets, sediment traps, swales, and grass filter strips.

Design Construction and Materials:

Detailed design criteria are provided in PFM section 6-1300 and in the *Northern Virginia BMP Handbook*.

A grass or vegetated filter strip should surround the infiltration trench to treat surface flow. The Virginia Stormwater Management Handbook gives 20' as a minimum filter strip width (Minimum Standard 3.10). A minimum two (2) to four (4) foot clearance must be maintained between the bottom of the infiltration trench and the seasonal high groundwater table or bedrock, depending on site conditions.

Cost components for an infiltration trench are given below.

Item	Unit	Estimated unit cost (2005 dollars)
Excavation and fill	C.Y.	\$8 - \$10
Filter fabric	S.Y.	\$1 - \$5
Gravel	C.Y.	\$30 - \$35
Perforated pipe for observation well	L.F.	\$15 - \$20
Grass seeding for filter strip	M.S.F.	\$15 - \$20
Fine aggregate concrete sand	C.Y.	\$15 - \$25

Cost: The cost for an infiltration trench to treat runoff from ½ impervious acre is comprised of both the installation cost and annualized costs. An infiltration trench is assumed to have a lifespan of 10 years, at which point it will be removed and replaced.

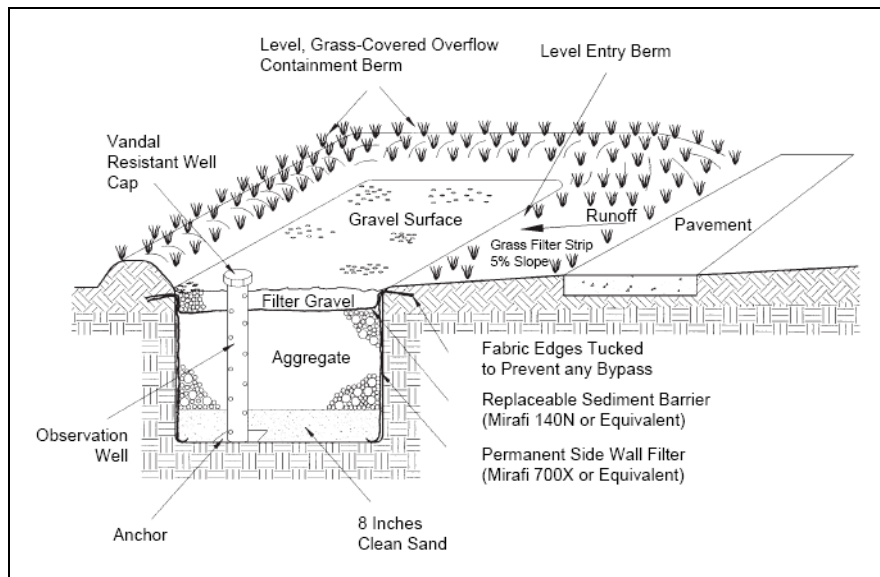
Item	Required Cost per Year (2005 Dollars)													
	0	1	2	3	4	5	6	7	8	9	10	...	25	
Installation ¹	10,000													
Sediment and Debris Removal (every month)		500	500	500	500	500	500	500	500	500				500
Reseed filter strip		50	50	50	50	50	50	50	50	50				50
Mow filter strip		100	100	100	100	100	100	100	100	100				100
Remove & Replace												10,000		
Total Cost	10,000	650	650	650	650	650	650	650	650	650	10,000			650
Annualized Cost	\$1,400 / year (includes replacement in years 10 and 20)													

¹Developer Cost. Not included in annualized cost.

Maintenance: The principal maintenance objective is to prevent clogging, which may lead to infiltration trench failure. Preventative maintenance (e.g. maintaining the pretreatment BMPs) will lengthen the life of the infiltration trench. Reseed any eroded areas in the grass filter strip immediately, and isolate those areas until they have recovered. Periodically mow the filter strip to maintain its appearance. However, the grass height should always be equal to or greater than the design flow depth. Remove accumulated debris monthly from the infiltration trench surface and the pretreatment area.

Performance and Inspection: Inspect the observation well to confirm that the trench is draining completely within 48 hours. Trenches with filter fabric should be inspected for sediment deposits by removing a small section of the top layer and examining the material in the trench itself. Inspect grass filter strips for erosion or other damage. Perform this inspection:

- bi-annually in spring and fall, and
- after large storm events.



Infiltration trench schematic
 Source: Northern Virginia BMP Handbook

Potential LEED Credits:

Primary: Sustainable Sites – Credit 6 “Stormwater Management” (1-2 Points)

Other: Innovation & Design Process (1-4 Points)

Links to Additional Information:

Fairfax County Department of Public Works and Environmental Services. 2001. “Stormwater runoff quality control criteria.” *Public Facilities Manual*, 6-0400. Available at <http://www.co.fairfax.va.us/dpwes/publications/pfm/6-0400.htm>

Northern Virginia Planning District Commission. 1992. *Northern Virginia BMP Handbook: A Guide to Planning and Designing Best Management Practices in Northern Virginia*. Available at <http://www.novaregion.org/pdf/NVBMP-Handbook.pdf>

United States Environmental Protection Agency Office of Water. 1999. “Storm Water Technology Fact Sheet: Infiltration Trench.” Available at <http://www.epa.gov/owm/mtb/infltrenc.pdf>