

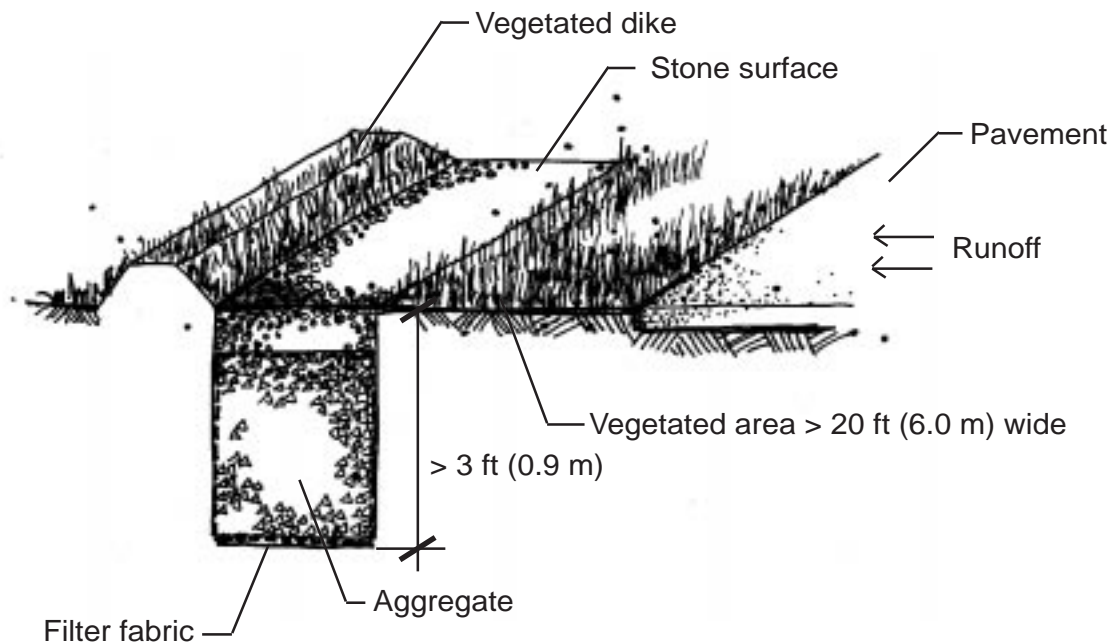
PRIMARY USE: Storm water flow control.
ADDITIONAL USES: To improve water quality.

EXFILTRATION & INFILTRATION

What is it? Below ground retention of stormwater for release into the soil. Stormwater runoff is temporarily stored in perforated pipe or coarse aggregate and allowed to infiltrate the trench walls and bottom for disposal and treatment. This practice is most frequently used where space is limited and expensive.

Purpose

Exfiltration/infiltration structures can: reduce overall runoff; help to retain the first flush of runoff (which tends to be most heavily polluted); filter contaminants; and promote recharge of groundwater. They may be appropriate for retrofitting.



**Exfiltration / Infiltration
Section View**

Limitations

Soil must be sufficiently permeable to allow adequate infiltration. The water table must be sufficiently low to prevent groundwater contamination. Exfiltration / infiltration structures are susceptible to clogging, so they are not recommended for water containing a high sediment load or oil/grease content unless pretreatment is provided.

Materials

Perforated pipe or coarse aggregate.

Installation

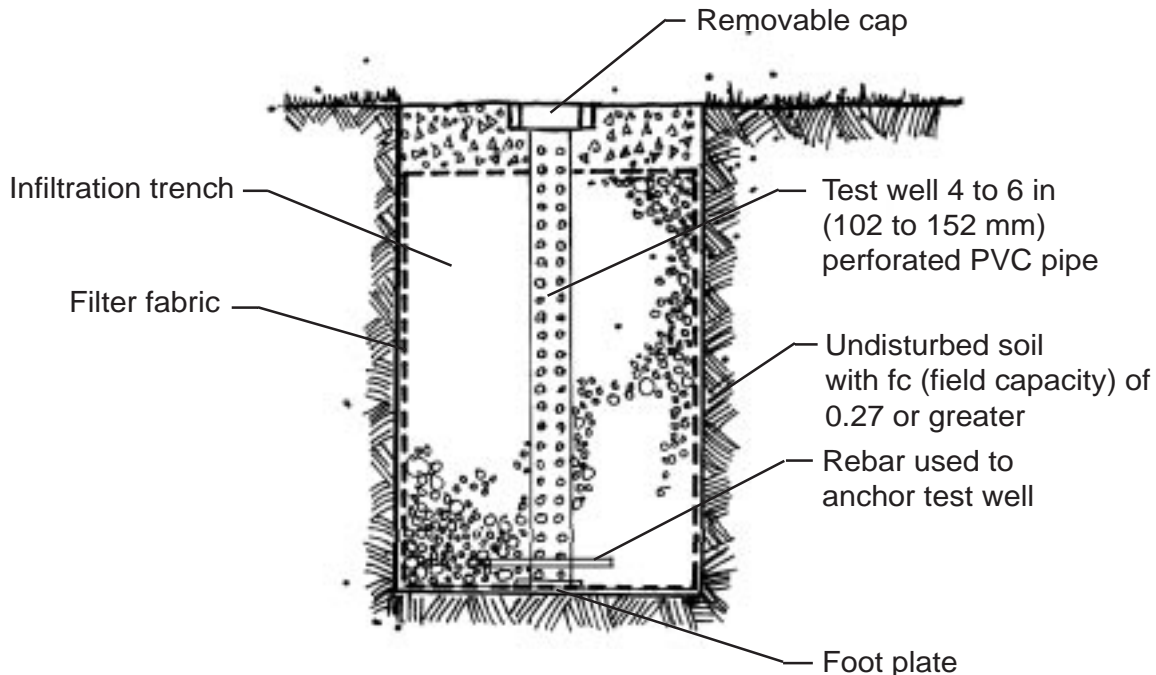
Exfiltration / infiltration trenches usually have depths less than 6.0 ft (1.8 m). Wide and shallow trenches usually have better infiltration rates. Grease, oil, floating organics, and settleable solids should be removed via pretreatment. Filter strips, sediment traps, and grease traps can provide effective pretreatment.

Source: NRCS Planning and Design Manual, NRCS.

EXFILTRATION & INFILTRATION

Additional Considerations and Drawings:

1. A storage volume that accommodates the first 1/2 in (13 mm) of runoff or runoff from the first inch (25 mm) of rainfall is estimated to provide 80% annual removal efficiency.
2. Drawdown time should not exceed 72 hours.
3. An observation well is recommended to determine maintenance needs and to monitor drawdown time.



**Exfiltration / Infiltration Observation Well
Section view**

Observation Well:

1. Soil percolation should have a rate not less than 0.6 in (152 mm) per hour.
2. Prior to construction, heavy equipment should be kept off of the proposed site to avoid soil compaction.
3. Construction of the trench should either occur after the site has been stabilized or diversions should be used to prevent sediment-laden water from the trench area.
4. The trench should be excavated using equipment having tracks or oversized tires to avoid compacting the subsoil.
5. Sediment and erosion control structures are critical for maintaining trench function. The control structures should be regularly inspected.
6. Trench slopes can be 1:1 in stable soil or 2:1 in cohesionless soils.
7. Clean and washed stone aggregate (e.g., screened limestone, washed pea gravel, or river gravel) is used in the bottom of the trench to form the base. Coarse aggregate is used to support the sides and the top.
8. Pea rock or gravel is placed in a 0.6 in (152 mm) layer over the top of the aggregate to act as a filter.
9. If the surrounding soil includes fine particulates, filter cloth should be placed around the aggregate. In some applications, filter fabric is wrapped around the perforated pipe as well. This may lead to accumulation of solids within the pipe and so should be linked to a program of regular maintenance.