3.9 Infiltration Trench

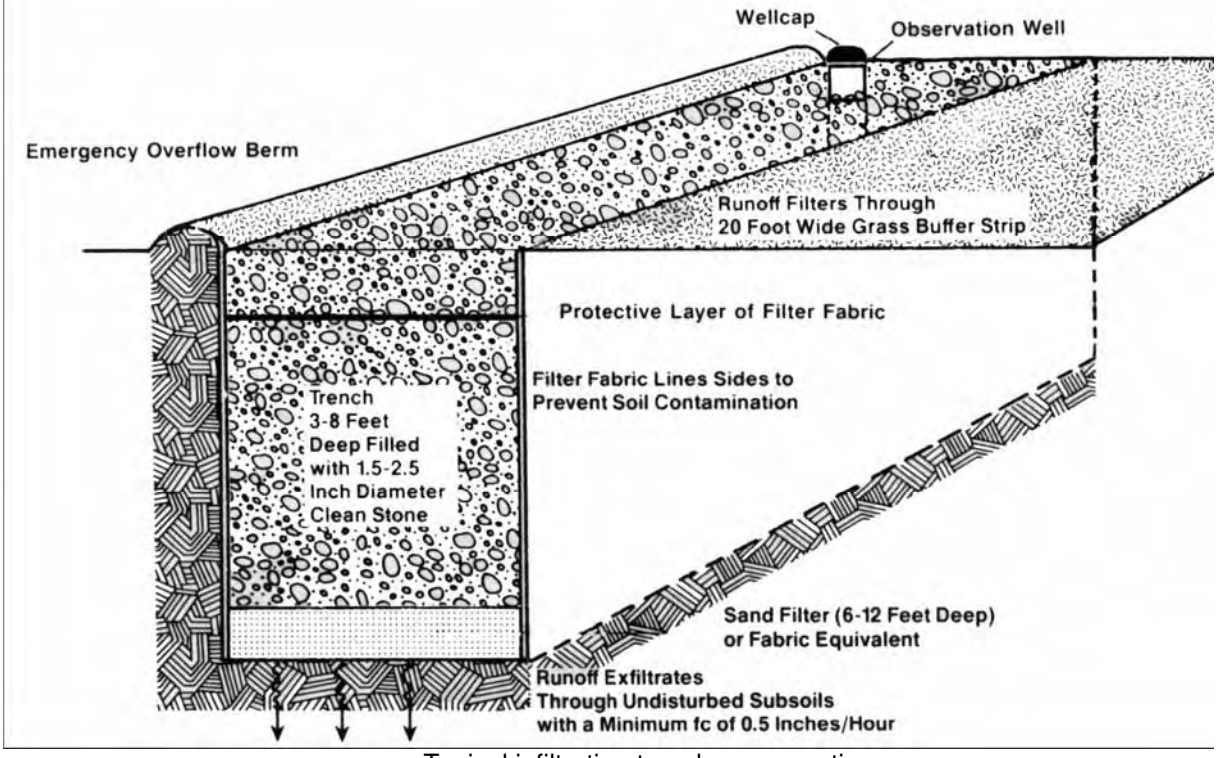
Description

Infiltration trenches are excavations that are lined with filter fabric and backfilled with aggregate. During runoff events water enters the trench where it is initially stored and then infiltrated into surrounding soil. Pollutants are filtered out as water passes through the aggregate and filter fabric, and into the soil. Infiltration trenches can treat and detain runoff for areas at the scale of residential blocks or individual commercial and governmental parcels. Their ability to remove a variety of pollutants, as well as their relatively small footprints, makes them ideally suited for applications such as parking lot island.

Infiltration trenches are most effective when applied in conjunction with other BMP types. For example, placing a vegetated filter strip around the trench decreases the amount of sediment flowing into the trench, reducing maintenance requirements and increasing the filtration efficiency.

Effectiveness	Infiltration trenches can be very effective for reducing runoff volume and for filtering sediments. Removal efficiency for pollutants can vary, but is expected to be relatively low. Infiltration trenches must be maintained as they are susceptible to clogging from fine particles.
Advantages	• Effectively removes or reduces many pollutants, including suspended solids, bacteria, and trace metals. • Reduces runoff volumes during storm events. • Increases baseflow in nearby streams.
Disadvantages	• Infiltration trenches may require periodic maintenance to prevent clogging.
Implementation Considerations	• Soils adjacent to planned trench site should be adequately permeable so as to allow infiltration • Slopes adjacent to the trench should be less than 12-15%. • Bottom of trench must be far enough from seasonally high water table to allow filtration by intermediate soil. • Trenches should not be employed where the potential is high for spills that might contaminate groundwater via the trench. • Pre-treatment practices, such as a vegetated filter strip, vegetated bioswale, or oil-grit separator are required where sediment loads from the contributing area would otherwise clog the trench, such as in parking lots and along roadsides.

Implementation Cosiderations	• Infiltration trenches in Lincoln should be constructed so a portion of the trench is below the frost line and so that ice and snow can be removed from the surface, ensuring proper functioning during cold weather. • During construction, care should be taken to avoid compacting soil surrounding the trench site, by using light equipment. • The contributing area must be stabilized before construction. Unstable areas will contribute excessive sediment to the trench, quickly clogging.
Cost	Low – approximate costs are estimate between $1.00 to $1.50 per cubic foot (USEPA, 1999)
Main Design Components	• Trenches should be excavated to a depth of approximately 3-8' and filled with washed aggregate of a diameter between approximately 1.5 to 3 inches. • The surface of the trench may be covered by aggregate, pea gravel, or vegetation. Pea gravel and vegetation both increase sediment filtering and prolong the life of the trench. If a vegetated surface is desired, it should be installed in approximately one foot of soil. • A vegetated filter strip at least 20 feet wide should be constructed upslope from the trench, to increase sediment capture and prolong the life of the trench. • Simple observation wells, constructed of PVC pipe, allow monitoring of water levels and evaluation of performance. • Flow into the trench should be evenly distributed.



Typical infiltration trench cross section