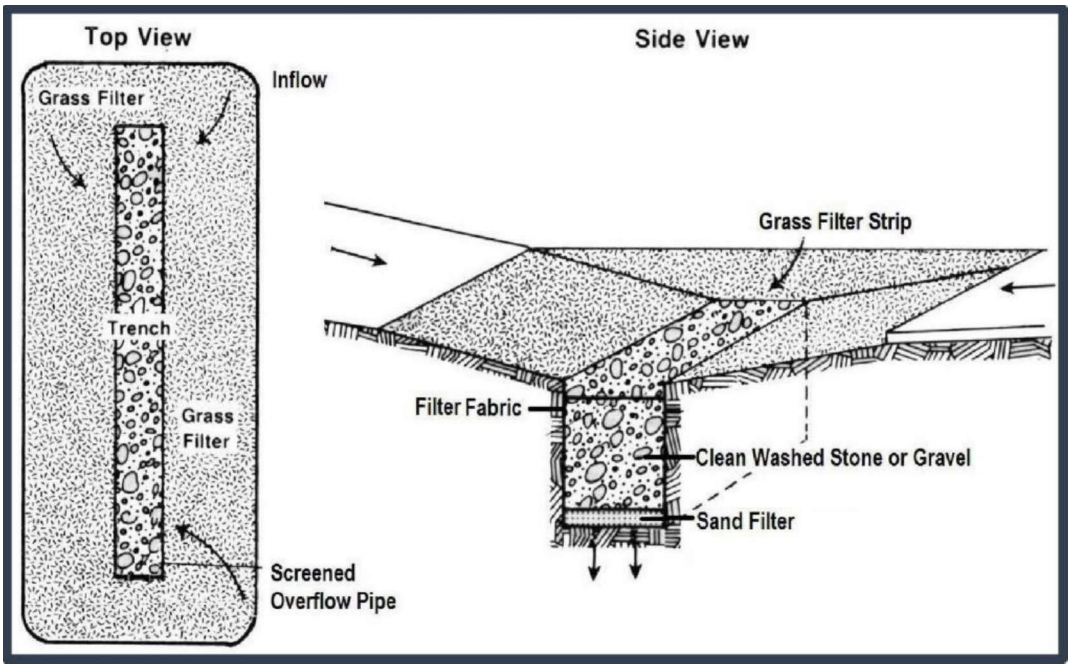
GREEN INFRASTRUCTURE: INFILTRATION TRENCHES

An Infiltration Trench is a stone filled trench with a level bottom used to capture stormwater runoff and allow infiltration into the surrounding soils from the bottom and sides of the trench. Infiltration trenches are excavated areas typically filled with stone to create an underground reservoir for stormwater runoff. The runoff volume is stored in the void space between the stones within the trench and gradually exfiltrates through the bottom and sides of the trench into the surrounding soils.



Schueler, Tom. 1987. *Controlling Urban Runoff: A Practical Manual for Planning and Designing Urban BMPs.* Metropolitan Washington Council of Governments, Washington D.C.

DESIGN PARAMETERS*

Design Storm	Varies
Drainage Area	5 acres (max.)
Site Slopes	20% (max.)
Sizing	2% to 3% of tributary impervious area
Dimensions	3- to 8- feet deep 25 ft. trench width (max.) 1% slope storage bed (max.)
Ponding Depth	N/A
Drawdown Time	48 hour (max.)
Underlying Soils	0.5 inch/hour infiltration rate (min.) 30% clay (max.)
Water Table Depth	2 feet below the bottom layer (min.)
Pretreatment	Level spreader, grass filter strip or other
Observation Wells	Every 50 feet
Additional Parameters	Aggregate Fill 1.5 to 3 inches in diameter with 30% to 40% void space

By diverting runoff into the soil, an infiltration trench not only improves the water quality, but also helps to preserve the natural water balance on a site and can recharge groundwater. Infiltration trenches are designed primarily for stormwater quality. However, they can provide limited runoff quantity control, particularly for smaller storm events. Due to the relatively narrow shape, infiltration trenches can be adapted to many different types of sites and can be utilized in retrofit situations. Wider, shallow trenches are preferred as they reduce the risk of clogging by spreading the flow over a larger area for infiltration. Due to their high potential for failure, these facilities must only be considered for sites where upstream sediment control can be ensured. Infiltration trenches are not intended to trap sediment; therefore, pretreatment measures are needed to prevent clogging and failure.

** Industry standards; permitting through the Village to ensure compliance with local and county requirements.*

CONSTRUCTION AND COSTS

The construction cost of infiltration trenches can vary greatly depending on the configuration, location, design requirements, materials used, and site-specific conditions.

ADVANTAGES	DISADVANTAGES
• Works well in highly impervious areas, such as parking lots • Provides for groundwater recharge • Works well on small sites with porous soils • Small land requirement • Works well in retrofit applications	• Increased maintenance to prevent clogging • Construction requirements to prevent compaction • Additional area and/or infrastructure needed for pretreatment • Significant setback requirements • Restrictions on the placement due to groundwater contamination and soil infiltration capacity

MAINTENANCE

Maintenance of infiltration trenches is critical to keep the surface permeable. Vehicles should not be parked or driven on a vegetated infiltration trench, and care should be taken to avoid excessive compaction.

Maintenance Activity	Frequency
• Ensure that the tributary area, facility, and inlets are clear of debris, • Ensure that the tributary area is stabilized, • Remove sediment and oil/grease from pretreatment devices and overflow structures, • Mow grass; filter strips should be mowed as necessary; remove grass clippings.	Monthly
• Check observation wells following 3 days of dry weather; failure to percolate within this time period indicates clogging. • Remove trees that start to grow in the vicinity of the trench.	Semi-annually
• Perform complete rehabilitation of the trench to maintain design storage capacity, • Excavate trench walls to expose clean soils, and • Replace pea gravel layer.	As needed

FLOOD REDUCTION

Infiltration trenches are designed primarily for stormwater quality with a design storm that is a frequent, small event such as the one-year storm. They will provide a reduction in peak discharge and runoff volume as well as improved water quality for all storm events equal to or less than the design storm.