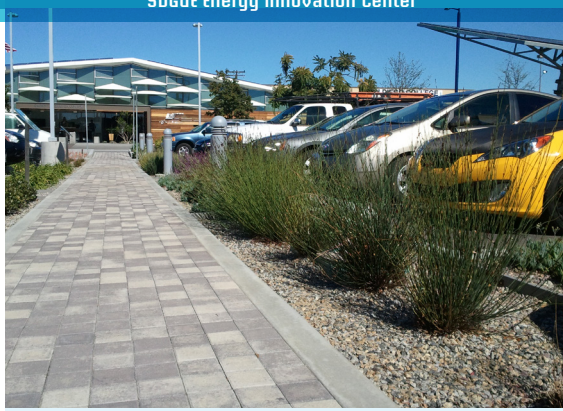
Infiltration Trench


SDG&E Energy Innovation Center

Background

An infiltration trench is a long, narrow trench that is lined with filter fabric and backfilled with stone or other bioretention media to collect and temporarily store runoff until it can, ultimately, soak into the ground. Infiltration trenches remove fine sediment, reduce runoff volume, and allow for groundwater recharge. The surface of an infiltration trench can be stabilized with gravel or a decorative stone to enhance aesthetics.

Infiltration trenches are effective in removing:

- Sediments
- Trash
- Bacteria
- Organics
- Nutrients
- Metals
- Oil and grease

Site Assessment

Infiltration trenches are well suited for areas with limited space where vegetation might not be feasible, such as at the edges or medians of roadways or parking lots. Though designed to collect sheet flow off of impermeable pavements, curb cut outs or drains can be used to funnel runoff into the infiltration trench. Sites with claybased or compacted soils must be able to absorb the water at an appropriate rate or else need to be constructed with additional subsurface storage or an underdrain system. Pretreatment, such as a vegetated filter strip, is suggested to remove sediment and prevent clogging.

Drainage area	Soil infiltration rate	Water table separation	Depth to bedrock	Facility slope	Inflow rate
< 2 acres	> 0.5 in/hr	> 10 ft	> 10 ft	< 2%	3 cfs

Pollutant Removal			Runoff volume reduction	Groundwater recharge
	Sediments: High Trash: High Bacteria: High Organics: High	Nutrients: High Metals: High Oil and Grease: High	High no UD*; Medium with UD*	High no UD*; Low with UD*

**UD = Underdrain system*

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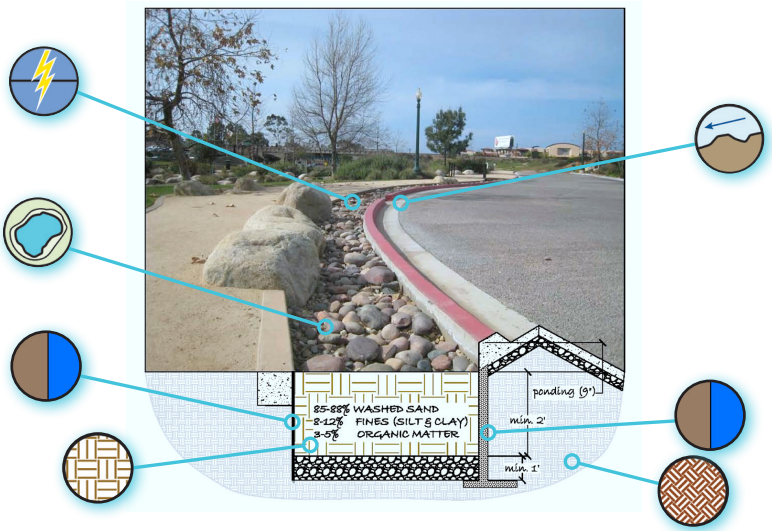

Flow regulation: Inflow must be non-erosive sheet flow (3 feet per second for grass cells) or use energy-dissipating devices. Infiltration trenches can be used effectively in areas with slopes from 2 to 5 percent by installing check dams to prevent erosive flow velocities.

Shallow ponding area: Drainage area should be less than 2 acres. Ponded water must completely drain into the soil within 24 hours, with 12 hours preferred as a safety factor. Ponding depth should be less than 12 inches, 9 inches preferable.

Soil Type: Soil testing should be performed at the site by a licensed soil scientist or geological engineer to determine the infiltration rate of the in-situ soils. The soils surrounding the trench should be suitable for infiltration to allow for proper drainage response times.

Media layers: Media depth must be a minimum of 2 feet. The soil media within the infiltration trench should be highly permeable (an infiltration rate of at least 0.5 in/hr) and have an appropriate amount of organic material to support plant growth (e.g., loamy sand mixed thoroughly with an organic material). A deeper soil media depth will allow for a smaller surface area footprint.

Impermeable Barriers: When designing an infiltration trench, designers need to carefully consider both the restrictions on the site and design features to improve the long-term performance. The bottom of the trench is the effective infiltration area, but infiltration into the soil along the sides of infiltration trench may need to be prevented using a impermeable barrier if built close to structures, such as buildings or roads. Soil and structure loads on this impermeable barrier need to be considered and the engineer may need to apply principles of retaining wall design into the design of this barrier.

To access the complete San Diego Low Impact Development Design Manual, visit:
sandiego.gov/stormwater/pdf/lidmanual.pdf

To access the Storm Water Design Standards Manual, visit:
sandiego.gov/development-services/news/pdf/stormwatermanual.pdf

To report storm water pollution, call (619) 235-1000