BMP T5.10B: Downspout Full Infiltration – Infiltration Trenches

Downspout Full Infiltration Trenches are underground trenches filled with rock and containing perforated pipe that are designed to infiltrate runoff from roof downspout drains into the soil. Alternatives to rock-filled trenches, such as preformed chambers, are acceptable if equivalent storage volume is provided.

Applications, Limitations and Setbacks
Downspout Full Infiltration Trenches are designed to infiltrate runoff from residential roof downspout drains and cannot be used to directly infiltrate runoff from pollutant-generating surfaces (e.g. driveways).

Soil investigation is an important first step to determining the feasibility of using downspout infiltration. The required soil investigation described in Section 5 includes an initial assessment of the type of site soils, and the infiltration potential.

Setbacks
See BMP T5.10A for setback information.

Infeasibility Criteria
The following criteria describe conditions that make Downspout Full Infiltration Trenches infeasible to meet Minimum Requirement #5. Citation of any of the infeasibility criteria must be based on an evaluation of site-specific conditions and documented in the LID Feasibility Checklist. Downspout Full Infiltration is considered infeasible under the following conditions:

- A qualified professional determines that soils in the infiltration zone at the location of the drywell do not fall within USDA textural classes of coarse sands to medium sands, loam, or cobbles and gravels.
- Less than one foot exists between the bottom of the infiltration trench to the groundwater elevation.
- The facility is less than 100 feet from closed or active landfills.
- The facility is less than 10 feet from a sewage disposal drainfield, including reserve areas and grey water reuse systems.
- The facility is less than 100 feet upgradient from any septic system unless site topography clearly prohibits subsurface flows from intersecting the drainfield.
- The facility is less than 10 feet from an underground storage tank and its connecting pipes that is used to store petroleum products, chemical, or liquid hazardous wastes in which 10% or more of the storage volume of the tank and connecting pipes is beneath the ground.
- The facility is less than 10 feet from any structure, property line, or sensitive area (except slopes over 40%). However, if the roof downspout infiltration system is a common system shared by two or more adjacent residential lots and contained within an easement given to owners of all residential properties draining to the system, then the setback from the property line(s) shared by the adjacent lots may be waived.
The facility is less than 50 feet from the top of any slope over 40%. This setback may be reduced to 15 feet based on a geotechnical evaluation.

**Design Criteria**

- The following minimum lengths per 1,000 square feet of roof area based on soil type may be used for sizing downspout infiltration trenches:
  - Coarse sands and cobbles: 20 linear feet
  - Medium Sand: 30 linear feet
  - Fine sand, loamy sand: 75 linear feet.
  - Sandy loam: 125 linear feet
  - Loam: 190 linear feet
- Maximum length of any one trench is 100 feet from the inlet sump. If the minimum required length for the soil type, above, is greater than 100 feet split flow into parallel trenches.
- Minimum spacing between parallel trench centerlines is 6 feet.
- Filter fabric shall be placed over the drain rock prior to backfilling. Filter fabric should not be used where it can impede the flow into the soil.
- Infiltration trenches may be placed in fill material if the fill is placed and compacted under the direct supervision of a geotechnical engineer or professional civil engineer with geotechnical expertise, and if the measured hydraulic conductivity of the compacted fill material is at least 8 inches per hour. Trench length in fill shall be 60 linear feet per 1,000 square feet of roof area.
- Infiltration trenches should not be built on slopes steeper than 25%.
- A geotechnical analysis and report is required on slopes over 15% or if located within 200 feet of the top of slope steeper than 40%, or in a landslide hazard area.
- Choking stone or filter fabric (geotextile) shall be placed on top of the drain rock and filter fabric shall be placed on trench sides prior to backfilling. Filter fabric shall not be placed on the bottom of the trench.
Figure 1: Typical Downspout Infiltration Trench

(Modified from Clark County standard detail D16.0, January 2015)