

## 2.2.20 Soakage Trenches



**Description:** Soakage trenches are a variation of infiltration trenches. Soakage trenches drain through a perforated pipe buried in gravel. They are used in highly impervious areas where conditions do not allow surface infiltration and where pollutant concentrations in runoff are minimal (i.e. non-industrial rooftops). They may be used in conjunction with other stormwater devices, such as draining downspouts or planter boxes.

### KEY CONSIDERATIONS

**DESIGN CRITERIA:**

- Intended for space limited applications
- Like other infiltration devices, soakage trenches should not be used for stormwater containing high sediment loads to minimize clogging

**ADVANTAGES / BENEFITS:**

- Filtration provides pollutant removal capability
- Reservoir decreases peak flow rates

**DISADVANTAGES / LIMITATIONS:**

- Subsurface pipe considered an injection well and may require a special permit

### STORMWATER MANAGEMENT SUITABILITY

- P** Water Quality Protection
- S** Streambank Protection
- On-Site Flood Control
- Downstream Flood Control

### IMPLEMENTATION CONSIDERATIONS

- M** Land Requirement
- H** Capital Cost
- H** Maintenance Burden

### POLLUTANT REMOVAL

- 80%** **Total Suspended Solids**
- 60/60%** **Nutrients** – Total Phosphorous / Total Nitrogen Removal
- 90%** **Metals** – Cadmium, Copper, Lead, and Zinc Removal
- 90%** **Pathogens** – Coliform, Streptococci, E. Coli Removal

Residential Subdivision Use: Yes  
 Hi Density/Ultra-Urban: Yes  
 Drainage Area: 5 Ac. Max.  
 Soils: Pervious soils required (0.5 in/hr or greater)

**L = Low M = Moderate H = High**

### 2.2.20.1 General Description

Soakage trenches represent a variation of infiltration trench. Regular infiltration trenches drain from the surface, but in highly urbanized areas there is not often a suitable area available for this type of setup. Soakage trenches utilize a perforated pipe embedded within the trench, thereby minimizing the surface area required for the device. They can even be located under pavement.

Soakage trenches used for stormwater disposal are considered Class V injection devices by the EPA and fall under the Texas UIC program.

### 2.2.20.2 Pollutant Removal Capabilities

Pollutant removal is similar to infiltration trenches (see Section 2.2.12), but care should be taken to avoid clogging with sediments.

- **Total Suspended Solids – 80%**
- **Total Phosphorus – 60%**
- **Total Nitrogen – 60%**
- **Fecal Coliform – 90%**
- **Heavy Metals – 90%**

### 2.2.20.3 Design Criteria and Specifications

- The soakage trench should be located at least 5 feet from the nearest property line and 10 feet away from an occupied building (they may be closer to other structures, such as a parking garage or other structures on piers).
- The trench shall be excavated in native soil, uncompacted by heavy equipment.
- The trench should be at least 3 feet deep and 2.5 feet wide as shown in Figure 2.2.20-1. The exact dimensions will be dependent on the drainage characteristics of the surrounding soils.
- There should be at least four feet between the bottom of the trench and the seasonal high ground water table.
- A silt trap or similar device may be installed upstream of the perforated pipe if pretreatment is needed prior to discharge.
- The bottom of the trench should be filled with at least 18 inches of medium sand meeting TxDOT Fine Aggregate Grade No 1 and covered with a layer of filter fabric.
- A minimum of six inches of ¾" – 2 ½" round or crushed rock shall be placed on top of the fabric covered sand base.
- Piping should be 3" diameter prior to the perforated drainage pipe, 4" if serving greater than 1500 square feet of roof.
- The perforated pipe shall be an approved leach field pipe with holes oriented downward. It shall be covered with filter fabric, with at least 12" of backfill above the pipe.

### 2.2.20.4 Inspection and Maintenance Requirements

The inspection and maintenance requirements for soakage trenches are designed to maintain an adequate drainage rate through the trench, avoiding flooding.

Activity	Schedule
• Ensure that inflow is unimpeded.	Quarterly and within 48 hours of major storms
• Clean silt trap if it is more than 25% full of sediment	As needed, based on minimum annual inspection
• Inspect trench for waterlogged soils at surface.	Between 24 - 48 hours after major storms

## 2.2.20.5 Example Schematics

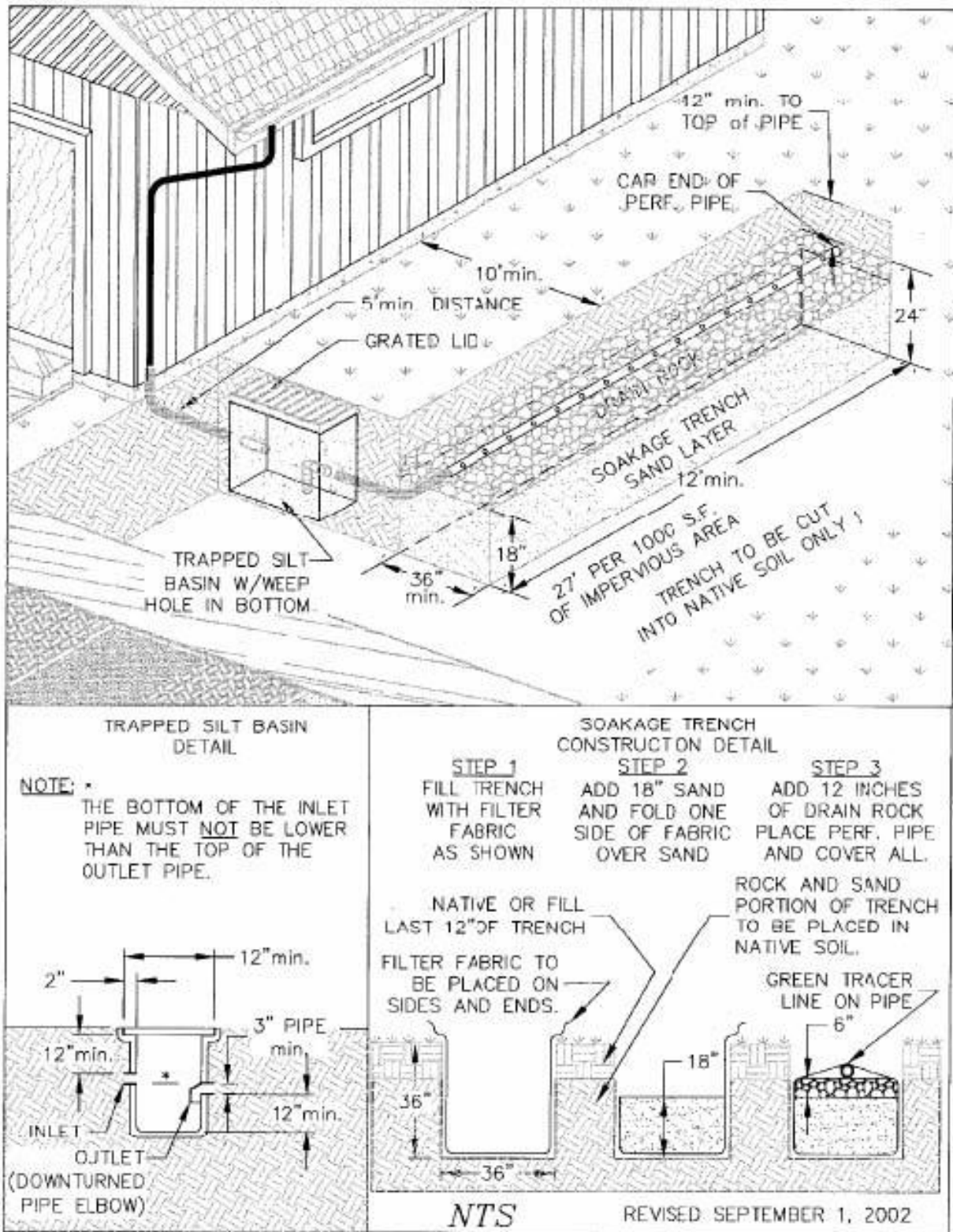


Figure 2.2.20-1 Schematic of a Soakage Trench

(Source: City of Portland, Oregon)

Soakage Trenches – end