

INFILTRATION BASIN DESIGN & INSTALLATION



Photo credit: Prime Environmental

SITING

Drainage Area

Varies; Up to 2 acres.

Space

Infiltration trenches can take up significant space and must have a level bottom surface.

Topography

Infiltration Basins are impractical in areas of steep slopes.

Soils

Permeable soils are best suited.

DESIGN INFORMATION

DESCRIPTION

An infiltration basin is a sodded or vegetated, open impoundment where incoming runoff is stored until it gradually infiltrates into the soil.

BENEFITS

1. Enhances groundwater recharge
2. Cost effective
3. Infiltration basins may also act as “bioretention areas” of shallow landscaped depressions, in which vegetation and filtration can further reduce runoff and remove pollution.

DESIGN CONSIDERATIONS

1. Variety of lengths depending on storage volume needed.
2. Minimum 5-6' bottom width.
3. Maximum 1% bottom cross slope.
4. Maximum 3:1 side slopes; preferably 4:1 or 5:1.
5. Vegetated alternative – minimum 60% plant density.

SIZING CALCULATIONS

1. Calculate Tributary area in square feet.
2. Divide tributary area by 100, then multiply by 15 to get water quality volume requirement (cubic feet).
3. Calculate the storage volume of your proposed infiltration basin $L \times W \times H \times L_{Side} \times R_{Side} = \text{total storage volume (cf)}$. See worksheet B for exact volume calcs.
4. The total storage volume shall exceed the minimum required water quality volume.
5. If you are taking advantage of open space credits and storm water control measure credits, see worksheet A & B for confirmation of volume requirement.

INSTALLATION

MATERIALS

1. Protect infiltration basin area from compaction during construction. If possible, install Infiltration basin during later phases of site construction to prevent sedimentation and/or damage from construction activity.
2. Install and maintain proper Erosion and Sediment Control Measures during construction.
3. If necessary, excavate Infiltration basin bottom to an uncompacted subgrade free from rocks and debris. Do NOT compact subgrade.
4. Seed and stabilize topsoil.
5. Vegetate if implementing a bio filtration swale as per the recommended plant specifications below. Make sure to maintain and water the vegetation as needed.
6. Rip Rap or Landscape stone is recommended for high velocity outflows.

Setbacks

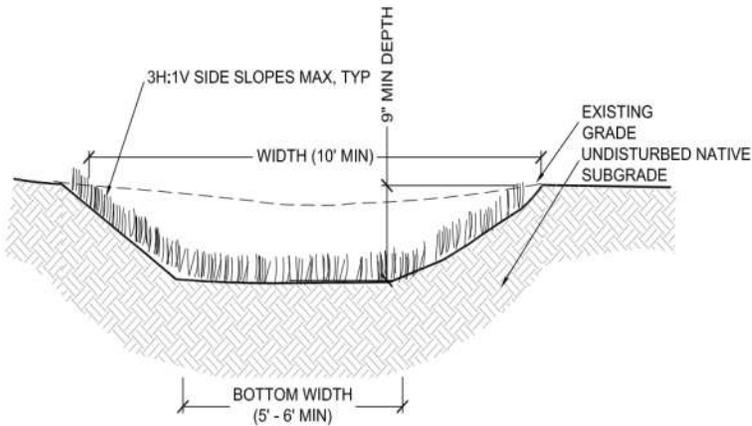
Min 10' from septic systems Min 10' from Building Foundations. Min. 25' from "404" wetlands

Vertical Separation

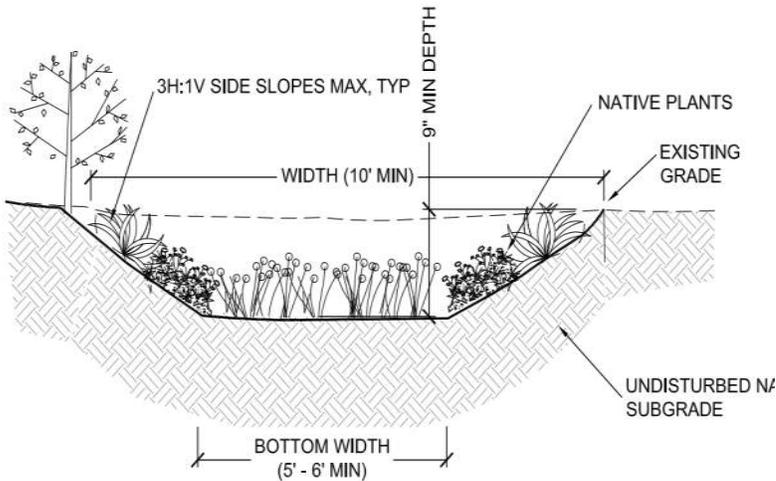
Min. 12" separation to seasonal high-water table from the bottom of the basin.

PLANTING

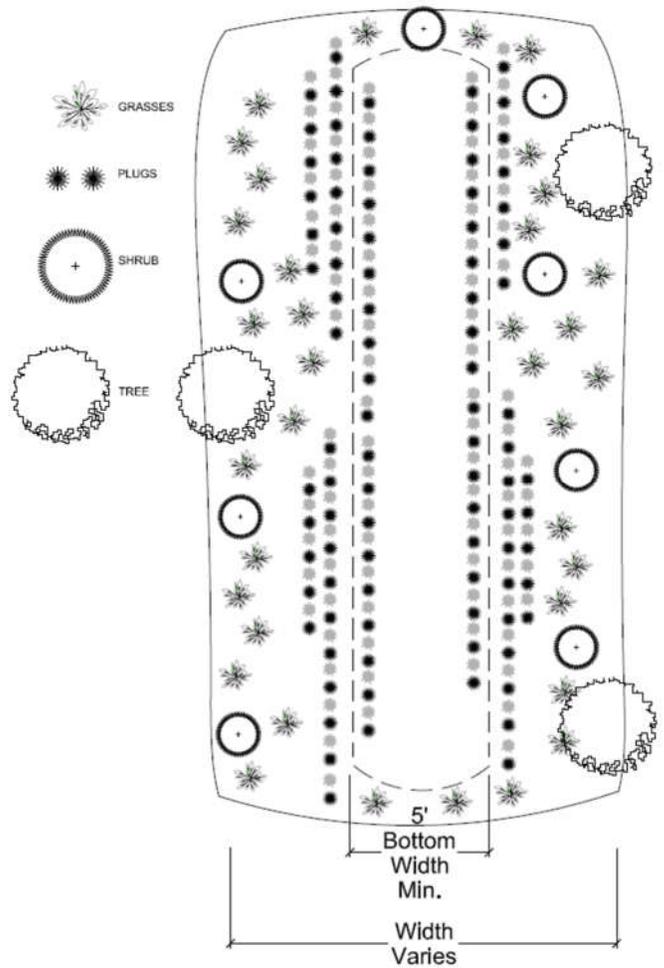
- Recommended planting guidelines: Basin lower slopes or bottom = 3 plugs per 1 square foot (min. 1-inch diameter by 6-inch tall) (plants that like standing water)
- Basin sides = Grasses – planted 2' – 3' o.c.
Shrubs – planted 6'-8' o.c
- Basin top= Trees – if desired, near top of swale, planted 10' o.c.



TYPICAL GRASSED INFILTRATION BASIN
NOT TO SCALE



TYPICAL BIO INFILTRATION BASIN
NOT TO SCALE



Typical Bio Infiltration Basin Planting Plan

Not to Scale

OPERATION & MAINTENANCE

(TO BE CONDUCTED POST-CONSTRUCTION & ANNUALLY)

Clogging

Litter and debris removal (monthly). Grass cutting for spillways and access routes (minimum of monthly during growing season). Mowing and /or cutting around the basin margins. (monthly during growing season)

Cleaning

Removal of sediment from inlets and outlet (annually) or after significant rainfall events (1.5 "or more).

Remedial Measures

Backfill/rehabilitate areas where any channeling was created during flash floods. Generally, ongoing maintenance is essential to maintain the effectiveness of infiltration basins. Since these basins are long-lived, once in operation only minimal maintenance costs arise.



Photo Credit: Konrad Lew