Infiltration Basin Factsheet

1.0 General Description

Figure 1. Infiltration basin (UC Santa Cruz)

Potential Treatment Mechanisms								
I	ET	FA	B	RH	S	F	P	T
✓	✓	✓			✓			✓

Legend:
I = Infiltration
ET = Evapotranspiration
FA = Filtration and/or Adsorption
B = Biochemical Transformation
RH = Rainfall and Runoff Harvest
S = Sedimentation
F = Floatation
P = Plant Uptake
T = Trash Capture

Infiltration basins are shallow basins designed to infiltrate stormwater runoff into the underlying soil. These basins are typically sized to infiltrate collected water within 48 hours. The maximum drain time (via infiltration) is specified to prevent mosquito breeding and to restore capacity for subsequent storm events. A minimum drain time is sometimes specified to encourage quiescent conditions for particle sedimentation. A riser or overflow weir is typically provided to route flood flows. A schematic of a basic infiltration basin is shown in Figure 2.

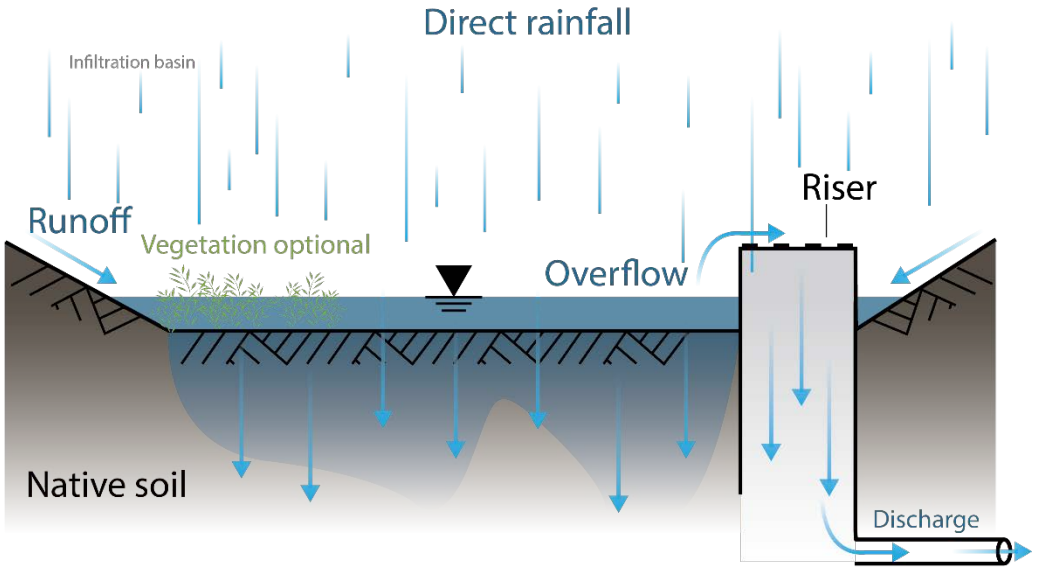

Figure 2. Schematic of a basic infiltration baisn (not to scale)

1.1 Variations and Alternative Names

- Retention basins
- Spreading grounds

2.0 Advantages & Limitations

2.1 Advantages

✓ Provides substantial reduction of pollutant load discharged to surface waters
✓ Infiltration basins can be integrated into an aesthetically appealing landscape design, though access restriction may be required for public safety

2.2 Limitations

× Not suitable for:
  - areas where the water table is near the ground surface

- areas where the groundwater is already contaminated
- areas with low infiltration rates (slowly permeable soils)
- industrial sites where spills of dissolved pollutants are likely to occur and escape pretreatment infrastructure

- If the basin ever becomes clogged with sediment, heavy equipment may be required to restore infiltration rates to an acceptable level

3.0 SITING

The site should not have the potential for spills nor can the groundwater level be too high or have previous contamination. The site also should not have soils throughout the vadose zone that infiltrate too quickly (i.e. have little pollutant removal capacity). However, if the infiltration rate is too fast, pretreatment (e.g., soil amendments or filter layers) may be used to protect groundwater.

Infiltration basins must be set back from buildings, slopes, highway pavement, and bridges that are not designed for sustained soil saturation.

4.0 DESIGN CONSIDERATIONS

When designing an infiltration basin, the following parameters should be considered:

- ❑ Contributing drainage area
- ❑ Soil type/infiltration rate
- ❑ Location in relation to foundations/pavement
- ❑ Base flow
- ❑ Drawdown time
- ❑ Groundwater depth
- ❑ Freeboard
- ❑ Setbacks
- ❑ Inlet and overflow spillway (if existing) erosion control
- ❑ Side slope
- ❑ Access ramp
- ❑ Maintenance drain (optional)
- ❑ Vegetation type
- ❑ Seepage collar (to prevent piping/internal erosion on bermed systems)

5.0 CONSTRUCTION CONSIDERATIONS

- ❑ Stabilize the drainage area before establishment of final grade
  - If stabilization is not possible, flows should be diverted from the basin
- ❑ Completely remove excavated material from the site to avoid any soil washing back into the basin
- ❑ Prohibit any non-tracked heavy equipment from driving over the infiltrating surface to avoid excess compaction

6.0 MAINTENANCE

- ❑ Measure the drawdown time
- ❑ Check for sediment & particulate buildup
- ❑ Plant maintenance
  - Removal of woody vegetation
  - Vegetation managed to aesthetic standards

7.0 REFERENCES

California Stormwater Quality Association (CASQA 2003). *Stormwater Best Management Practice Handbook: New Development and Redevelopment*. January 2003.

California Stormwater Quality Association (CASQA 2017). *Draft Stormwater Best Management Practice Handbook: New Development and Redevelopment*. April 2017.

Sacramento Stormwater Quality Partnership (SSQP 2018). *Stormwater Quality Design Manual*. July 2018.