



Chester County Stormwater BMP Tour Guide
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BMP: Infiltration Basin

Site Name: Victoria Gardens Retirement Community

Location: Kennett Square Township, ADC Map Coordinates: 47-H3
Directions: From Route 1; Kennett Square Exit; left onto McFarlan; left onto Yorktown Drive. The smaller infiltration basin is to the left and the larger stormwater pond is to the right.

Land Use: Single and Multi-Family Residential (Retirement Community)

Watershed: Red Clay Creek (Stream Use Designation: TSF, CWF)

Description: An infiltration basin is a stormwater pond designed to promote the infiltration of stormwater that collects in the basin. An infiltration basin stores stormwater until it gradually seeps through the bottom soil and into the ground and water table below. For an infiltration basin to properly function, the soil in the basin must be permeable and remain uncompacted for the life of the structure. Soil percolation tests must be performed to ensure the soil has sufficient infiltration capacity. This infiltration basin receives the majority of surface runoff from the site. It is sized to infiltrate stormwater from a 2-year storm event. Stormwater in excess of the 2-year storm overflows into a nearby non-infiltrating stormwater pond through an underground stormwater pipe. Both the infiltration basin and the non-infiltrating stormwater pond will be planted with turf grass.

Function: Infiltration structures replenish water table and can help maintain stable base flow in nearby streams. Infiltration basins provide efficient groundwater recharge since infiltration occurs relatively close to where the runoff is generated thus limiting evaporative loss and infiltrating more rainfall. Infiltration structures have limited pollutant removal capacity independently. Grass in the basin bottom can physically trap suspended solids, including suspended particles like dirt and sand, and has the potential to uptake nutrient pollutants. Oil and grease may also be trapped within the basin grasses and in the upper soils.

This BMP is not advisable for use in drainage areas that have extensive stormwater pollution sources, since independently it has limited pollutant removal capabilities. (For example, this infiltration basin is not designed to remove petroleum-based pollutants and other toxic chemicals.) Functioning as designed, an infiltration basin can approximate the following pollutant removal efficiencies:

- Total Suspended Solids (TSS): 95 %
- Total Phosphorus: 70 %
- Total Nitrogen: 51%
- Metals (copper and zinc): 99 %

- Bacteria: No Data

Operation and Maintenance: Chester County Conservation District considers infiltration basins to have moderate maintenance requirements. Operation and maintenance requirements include the following:

- Inspect infiltration basin regularly to ensure it is properly infiltrating
- Avoid running heavy equipment over infiltration structure to prevent soil compaction
- At the completion of construction, scrape soils to remove accumulated sediment and conduct soil percolation test
- Maintain turf in accordance with site maintenance schedule
- Limit mowing to maximize the opportunity to grass to trap pollutants
- Do not apply chemical pesticides and fertilizers to turf in and around the basin

Cost Factors: The cost to construct and maintain infiltration ponds is comparable to that of a conventional non-infiltrating pond. Factors influencing the cost include the necessary soil percolation tests, the possible need for importing soils, and the process of protecting soils during site construction and the life of the basin. It is critical to implement measures during site development to protect the infiltrating soils from inundation soils, like clay, that have lower infiltration capacity.

Other Site BMPs

Permanent Plunge Pool. The on-site stormwater pond has a plunge pool at its inlet location to help slow the velocity of incoming stormwater. This plunge pool is a depression formed by an earthen berm and filled with riprap. Plunge pools generally maintain a permanent pool of water, which, along with the riprap, serve to dissipate the velocity of entering stormwater. At this site, the plunge pool was installed due to the steep slope of the stormwater pipe conveying water into the basin.

Permanent Level Spreader. The on-site stormwater pond that receives overflow from the infiltration basin has a constructed level spreader at its outfall location. This level spreader consists of gabion baskets and riprap, which disperse the water discharging from the basin into the adjacent wetland. The level spreader helps control the velocity of discharging stormwater, which controls the formation of gullies and channels in the wetland.

For More Information

Designer: Brandywine Valley Engineers, (610) 444-6522 (Ty Leineweber)

Site Contact: Tony Pappalardo or Todd Gannon. (610) 444-4285

References

Center for Watershed Protection, *Approaches to Stormwater Treatment*, Copyright 2001.

Pennsylvania Handbook of Best Management Practices for Developing Areas, Prepared by CH2MHILL, Spring 1998.

Site 10 - Victoria Gardens (During Construction)– Future Infiltration Basin



During site construction measures are needed to prevent compaction of soils by equipment and excessive sedimentation since this structure will be converted to an infiltration basin when construction is complete.



Rock and level spreader (riprap contained in wire cages) pictured in the middle of picture used during construction to dissipate energy and disperse stormwater discharging basin into the adjacent wetland.