

Shortcomings of Traditional Stormwater Basin Design

Most detention basins constructed in the past have been primarily designed to control the speed of runoff from new developments.

What is the common design process for traditional stormwater control? Runoff from rainstorms is...

- generated from impervious surfaces like roads, rooftops and parking lots;
- concentrated into a piping system; and
- quickly transported off-site or into a detention basin.

This process was designed for the sole purpose of reducing downstream flooding from new developments. However, the construction of numerous basins along the same stream can actually cause new flooding since:

- the speed of stormwater leaving a new development is the same as it was prior to development,
- but the amount of water has increased, causing stormwater to flow from the site for a longer period of time.



Mown grasses develop shallow root systems which can lead to erosion in high velocity flows. Mown grass has little ability to filter stormwater.

Stormwater from neighboring developments can then overlap and produce flooding where none existed before.



Concrete low flow channels heat runoff and quickly transport it through a basin, without filtering it.

What are some other concerns with the traditional process of stormwater detention?

- Traditional basins decrease the base flow of streams by quickly sending stormwater downstream.
- Water quality is often degraded by sediments, lawn chemicals, fertilizers and other pollutants carried directly into streams.
- Local streambank erosion commonly results which alters or decreases stream habitat.
- Traditional designs result in basins that provide very little aesthetic value to the community.
- Maintenance costs for the basin owner are high due to required weekly grass mowing.



A traditional stormwater detention basin.

Benefits of Naturalized Stormwater Basin Design

One of many new methods to help alleviate some of these traditional stormwater problems is to naturalize existing stormwater basins. The goal of naturalizing existing stormwater basins is to maintain the overall design of the basin while increasing environmental, aesthetic and economic benefits.

What are naturalized stormwater detention basins?

A naturalized stormwater basin is one that is attractively landscaped, incorporating native trees, shrubs and wildflowers.

In what ways are naturalized basins better than traditional basins?

- The deeper root systems of trees, shrubs and wildflowers encourage water infiltration and thereby recharge ground water tables and increase stream base flows.
- Plants increase water quality by trapping sediment and many pollutants found in runoff.
- The density of vegetation in a naturalized basin helps to slow the stormwater velocity, reduce flooding impacts and cool the water temperature.
- Wildflowers, trees and shrubs planted in basins create an improved visual appearance. They can help beautify a neighborhood and increase property values.
- Naturalized basins tend to have vegetation that requires only annual mowing. By decreasing maintenance costs your tax dollars can be diverted to more important township services.



A natural low flow channel, reinforced with a TRM (turf reinforcement material) helps to remove pollutants from stormwater, and is more aesthetic.



Wildflower and tall grass meadow plants have deeper root systems. Storm water can be filtered by these plants and slowed down.



A basin with a naturalized low flow channel and additional landscaping.