

## BIORETENTION SWALES

### Brunswick, Medina County

**Date Completed:** October, 2009

**Description:** Open road ditches were converted to subsurface storm sewers in the City of Brunswick as part of a storm sewer improvement project. Bio-retention swales were included at three sites in the project in order to reduce the amount of storm water that enters into the sewer system and thus assist communities downstream such as Strongsville.

**Project Size:** 1,350 square feet included within three sites and 135 linear feet of perforated underdrain.



*Below: Bioswale Cross-section  
(photo: Department of Public Utilities; City of Columbus, Ohio)*





## Bio-retention Swales

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**Client:**  
City of Brunswick

**Client Contact :**  
Mayor Gary F. Werner  
4095 Center Road  
Brunswick, Ohio 44212

**Location:**  
Brunswick, Ohio

**Approximate Project Budget:**  
\$20,000

**Start Date:**  
July, 2009

**Completion Date:**  
October, 2009

This project was created as part of an overall storm sewer improvement project along Boston Road and Ashleigh, Oakleigh and Briarleigh Drives. The project, which required an Ohio Environmental Protection Agency NPDES Construction General Permit (OHC000003), converted existing open road ditches into subsurface storm sewers, many of which ultimately drain to the City of Strongsville, the neighboring community to the north. The City immediately recognized the increased impact the improvements could have on the City of Strongsville's own receiving streams and storm sewer system, and as a result, incorporated three bioretention areas on Ashleigh Drive into the overall design of the new storm sewer system. Additionally, the City desired to implement a demonstration project from which to learn from and illustrate to others how these types of practices can be incorporated in conjunction with traditional site designs.

The three bioretention areas are designed to meet standards contained within the State of Ohio's *Rainwater & Land Development Manual*. The primary design features include a 6-inch ponding depth, use of double-shredded hardwood mulch, a 30-inch soil media layer for filtration, and a 6-inch underdrain. Each is designed to allow the calculated water quality volume (WQv) to drawdown through the soil profile over the course of 40 hours. Plant types were selected based on salt tolerance, nutrient absorption characteristics, aesthetic appeal, low maintenance requirements and non-invasive qualities. Soil mixes and fabrics were installed to provide mechanical filtering of storm water and adequate water retention to maintain healthy plantings.

The portion of the total project cost was \$20,000.00. The long term maintenance will be approximately \$500.00 per year for removing excess plant growth and occasional plant replacement. Combined, the bio-retention swales for all three sites cover approximately 1,350 S.F., with three precast concrete structures and approximately 135 L.F of perforated underdrain.

***Developer/Client/Owner:***

City of Brunswick  
[www.brunswick.oh.us](http://www.brunswick.oh.us)

***Designer/Consultant:***

Chagrin Valley Engineering, Ltd.  
22999 Forbes Road, Suite B  
Cleveland, OH 44146-5667  
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***Key Features:*** These are standard bioretention cells per ODNR Rainwater manual standard design. Initially, owners of properties on which these cells were placed were open to the idea of a “free” landscaping feature. However, over the first few years, homeowners have lost interest in maintaining them and they have for the most part reverted back to a turf cover. They still function as bioretention cells, just without the traditional landscaping with perennial flowers and grasses.

***Project Cost:*** \$20,000

***Maintenance Cost:*** \$500 per year for removing excess plant growth and occasional plant replacement. Costs have been considerably less than anticipated. For maintenance, normal operating funds (service department’s annual budget) are used.

***Funding Sources/Incentives:*** City of Brunswick paid for entire expenses related to the swales.

***Applicable Zoning Regulations:*** The project was meant to serve as a stormwater demonstration BMP within the existing road ROW for the purpose of treating the associated water quality volume (WQv). Therefore there are no zoning regulations that apply to the project.

***Additional Comments:*** No matter how good the intentions are by homeowners to maintain an “inherited” BMP, maintenance must be performed by the entity installing them in order for them to remain in place as designed. However, turf-covered bioretention cells are being used more frequently and studies indicate they perform very well in removing pollutants.