

**Williamsburg / James City County Courthouse
Bioretention Demonstration Project
Completed: November 17, 2003**

A 3,460 square foot water quality bioretention basin was constructed in an existing low-lying area in front of the Courthouse building. The basin serves a drainage area of 5.3 acres and 1.41 acres of impervious cover. Features include native tree, shrub, ground cover and flower landscaping, mulch, a specialized planting soil layer, non-woven geotextile, a perforated pipe underdrain set in clean-washed stone and pretreatment devices. The project was designed by County Development Management staff with assistance from Watershed Consulting LLC of Richmond, Va. and GET Solutions Inc. of Williamsburg, Va. The contractor was Excavator Services LLC of Suffolk, Va. Total cost of the project including engineering, design and construction was \$63,425 resulting in a unit cost of \$18.33 per square foot.



Photograph of the bioretention demonstration project taken during a rainfall event in June 2004.

Construction – Landscaping plan: moonbeam coreopsis, rose mallow, blue flag, blue cardinal flower, cinnamon fern, switch grass, black-eyed susan, red chokeberry, sweet pepper bush, red osier dogwood, wax myrtle, golden raintree and sweetbay magnolia and existing weeping willows; mulch: 3 inch shredded hardwood; planting soil: 2.5 ft. to 4 ft. depth, 50% sand-30% compost-20% topsoil mixture supplied locally by Yorktown Materials of Yorktown, Virginia; geotextile: non-woven fabric at soil-stone interface; underdrain piping: interconnected dual 6” perforated corrugated polyethylene AASHTO M252 type C pipe at 0.5 percent installed per ASTM D2321 with cleanouts; and drainage stone: clean-washed # 57 coarse aggregate, 20-inch depth, minimum 4” bedding and 6” cover over pipe.

Lessons Learned – It is critical to perform a geotechnical investigation prior to design to determine infiltration properties of underlying soils and to determine soil mix-import-export quantities; research existing utilities prior to construction to avoid conflicts; phased cell installation instead of mass open cut excavation; fully remove any existing cattails to minimize contamination of soil mix; use pretreatment devices at storm inflow locations; immediately stabilize all interior cut slopes adjacent to basin with erosion control matting; keep basin bottom as level as possible to avoid erosion of the mulch layer; perform daily inspections during construction to monitor soil composition and compaction of the planting soil layer; and perform proper as-built and construction certification of basin following construction. Fall construction seemed to work best to get string of dry weather and for plant adaptability.

Monitoring – Currently, only visual monitoring is being performed at the basin after significant rainfall events (0.25 inches or greater). Observations are being documented with written notes and photographs. Working with College of William & Mary to establish a long-term flow and pollution monitoring program.

Maintenance – Full maintenance program outlined on approved site plan. Signed maintenance agreement between the City of Williamsburg and James City County for long-term maintenance to be performed consistent with routine maintenance and landscaping operations at the Courthouse. Courthouse superintendent will oversee routine inspection/monitoring by County staff.

Other Stormwater Management Practices – Low impact energy dissipator device consisting of erosion control matting, seeding and a treated timber used at the west end of the basin. At the east end of the basin a larger riprap stilling basin and pretreatment gravel diaphragm (tied into the underdrain stone layer) was used.



PROJECT CONTACT: Scott J. Thomas, P.E., Senior Engineer, James City County Development Management, 101-E Mounts Bay Road, P.O. Box 8784, Williamsburg, Va. 23187, Phone: 757-253-6639, Fax: 757-259-4032, email scottt@james-city.va.us. Alternate phone 757-253-6670 or 6823.

ACCESSIBILITY: Easy, unobstructed daily access. Park in back of courthouse building where ample parking is available. Walk to front of Courthouse using existing sidewalks along the courthouse side and along the south side of Monticello Avenue. Due to security sensitivity, there is no need to enter the Courthouse building. It is preferred to make arrangements with the above contact prior to visiting the site; however, it is not required.

DIRECTIONS: From Exit 242A (Williamsburg-Jamestown) on Interstate 64 take U.S. Route 199 west about 10 miles. At the Monticello Avenue exit, go east about 1 mile to the Courthouse complex. The Courthouse is situated on the right (south) side of Monticello Avenue just beyond the U.S. Post office and across from the New Town development project. The entrance to the Courthouse is just before the four-way stoplight with Ironbound Road.