

Beltway Plaza Expansion Retrofit

Prince George County, Maryland (1993)

Background:

The Beltway Plaza Expansion project demonstrated the application of bioretention techniques for an infill development project. Infill development projects are very commonplace in existing urban areas. Often these sites have an existing storm drainage infrastructure designed to convey the 2 or 10-year storms, but typically lack either storm water management or water quality control. This was the case at the Beltway Plaza located in Prince George's County, Maryland. The County determined that this site would receive a waiver for peak discharge control due to the existing storm drainage system, but that additional measures would be required to adequately manage water quality.



The entire parking lot for the expansion received water quality control through the use of bioretention cells as shown in figure on right. This site proved to be a significant milestone for the use of LID technology for a number of reasons. First it demonstrated that the bioretention concept could be used to control a large parking lot area by breaking the area up into a number of small drainage catchments, each approximately $\frac{1}{4}$ to $\frac{1}{2}$ acre in size; the micro-scale management concept. Second it provided crucial information on the durability of this practice. The bioretention cells have been in operation since 1993 and have required virtually no maintenance to date. Third, it provided a site that could be monitored to document the pollutant removal performance of bioretention cells as described below. Fourth, it has provided actual data that verifies the very low and simple maintenance requirements and costs of these practices which are approximately \$200.00 per site per year.



Monitoring:

The pollutant removal performance of the bioretention cells at the Beltway Plaza location were field monitored and verified that they not only met the water quality control criteria, but actually ranked as the most effective pollutant removal BMP available at that time.

Pollutant Removal Performance of Bioretention Practices
(% Removal Rates)

	Cu	Pb	Zn	P	TKN	NH4	NO3	TN
Upper Zone	90	93	87	0	37	54	-97	-29
Middle Zone	93	99	98	73	60	86	-194	0
Lower Zone	93	99	99	81	68	79	23	43

Source: Davis et al., 1998

Conclusions:

The success of this site suggests that bioretention could be an effective retrofit technique for many existing urban areas.

The drawbacks of this example include failure to achieve a “zero release” level for contaminants impacting water quality, and to address water quantity issues at all. It is likely that runoff reductions were realized by the use of LIDs, but there is no data available to support that conclusion, nor to quantify it.