Site A3/4: F Lot

Terraced Parking Lot Bioretention

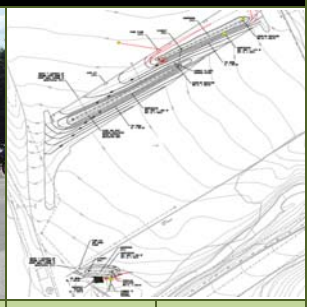
Project Summary		
		
Parameter	A3	A4
Impervious Cover Treated (acres)	1.64	1.13
Runoff Reduction Volume (cu ft per 1" rain event)[1]	1130	550
TN Removal (lb/yr)	19.91	13.75
TP Removal (lb/yr)	2.31	1.6
TSS Removal (lb/yr)	500.81	345.9
Estimated Cost	$89,000	$41,000
[1] Although this project has no actual infiltration a reduced level of runoff reduction is calculated to account for extended filtration and evapotranspiration.		

Figure 1. Drainage areas to proposed bioretention cells.

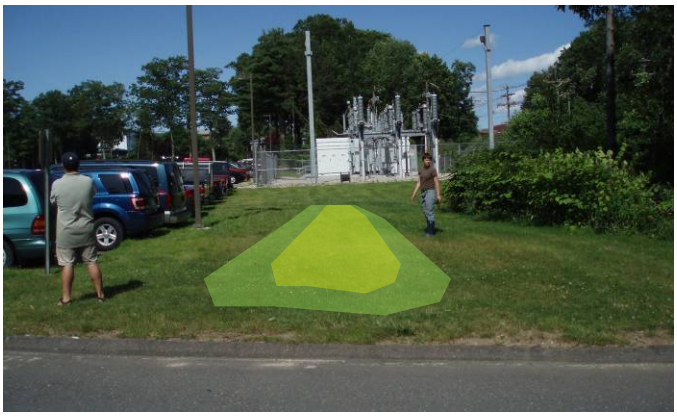


Figure 2. Location of terraced A3 bioretention down slope between two parking areas (upper photo), Location of A4 bioretention cell near entrance to parking lots (lower photo).

Site Description

The proposed retrofit concept is located on the UConn Campus in the F Lot. The site is a terraced parking lot, with an upper and lower parking area separated by a grassed slope (Figure 1). The site is over a former landfill with an impervious cap.

Existing Conditions

Runoff from both lots is captured in an enclosed storm drain system, which discharges directly to Eagleville Brook. Grassed areas, including a sloped island between the upper and lower parking areas and below the lower parking area, currently receive no runoff from the parking lot.

Proposed Concept

Install two bioretention areas, one in the sloped island between the upper and lower parking area (Site A3), and one below the lower parking area (Site A4). Figure 2 shows locations of proposed practices as seen in the field. Convey runoff to each practice using paved flumes. Each of the filters will allow 6-9" of ponding depth above the filter. Two bioretention filters, constructed in fill (i.e., above the landfill cap) will capture runoff from the upper parking lot. The filter bed will be sloped, ranging from 6" to 18", constructed above the existing grade. An underdrain will be installed at the lower

end of each filter. This underdrain will tie into an overflow structure which will then convey stormwater to a very deep storm drain system.

At the lower site A4, the practice will be excavated to a filter depth of 12", then captured in an underdrain and conveyed to Eagleville Brook. The site.overflow for this practice is a spillway which allows overland flow to the Brook.

Preliminary Concept Designs

A 25% concept design for the proposed retrofit can be found in attachment B, which includes preliminary plan views, cross sections and project details. These initial plans will require field survey and more information on drainage pipes, utilities, and soils (among other things) before going to construction plans.

Preliminary Hydrologic Calculations

Preliminary sizing of the bioretention area was completed based on guidance provided in the *2004 Connecticut Stormwater Quality Manual*. These computations are summarized in the following table.

Sizing Calculations for Sites A3/A4		
Parameter	**Value**	
	A3	A4
Drainage Area, A (acres)	1.64	1.13
Imperviousness, I (%)	100	100
Volumetric Runoff Coefficient, Rv	0.95	.95
Rainfall Depth, P (in)	1	1
Water Quality Volume, WQv (cf)	5,648	3,901
Depth of the Filter Bed, d (ft)	1	1
Hydraulic Conductivity, k (ft/day)	1	1
Max. Ponding Depth, hmax (in)	9	9
Average Ponding Depth, h (ft)	0.375	0.375
Drawdown Time, t (days)	2	2
Surface Area Required, Af (sq. ft)	2,054	1,418
Surface Area Provided (sq ft)	3,125	500
Treatment Provided (% of 1")	100	35

Design Considerations

For site A3, the greatest design constraint is the landfill cap below the filter proposed in the sloped median between the two parking areas. The proposed design assumes that the filter is completely in fill, with the bottom of the filter adjacent to the existing ground surface. Designers should investigate the possibility of excavating slightly into the landfill cap, providing a flat filter bottom at a depth of 18".

Three potential constraints need to be investigated:

- Electric lines are in the vicinity of the proposed filter, and their locations need to be confirmed.
- The filter is shallow due to potentially high groundwater table. Need to confirm depth of high groundwater.
- Available mapping suggest that the landfill cap does not extend to this area of the F Lot site. Need to confirm.

Maintenance

Maintenance is important for bioretention areas, particularly in terms of ensuring that they continue to provide measurable stormwater management benefits over time. The routine maintenance activities typically associated with bioretention areas are summarized in the table below.

Maintenance Activities for Sites A3/4	
Activity Schedule	**Frequency**
• Water once a week during the first two months, and then as needed and depending on rainfall to promote plant growth and survival. • For the first six months following construction, the site should be inspected at least twice after storm events that exceed a half-inch. Inspectors should look for bare or eroding areas in the contributing drainage area or around the bioretention area, and ensure they are immediately stabilized with grass cover.	As Needed (following construction)
• Prune and weed bioretention area to maintain appearance. • Remove accumulated trash and debris.	Regularly (Monthly)
• Inspect inflow area for sediment accumulation and remove any accumulated sediment or debris. • Inspect bioretention area for dead or dying vegetation. Plant replacement vegetation as needed.	Annually
• Remove and replace existing mulch	Every 2 to 3 Years