Site A-11: Lot 9

Parking Lot Bioretention

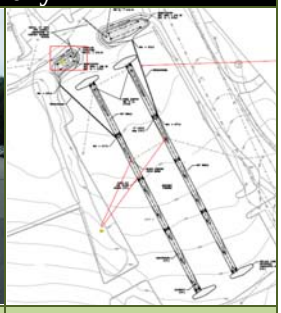
Project Summary	
	
Parameter	***A11a-d***
Impervious Cover Treated (acres)	1.39 acres
Runoff Reduction Volume (cu ft per 1" rain event)	1,538 cf
TN Removal (lb/yr)	16.02 lb/yr
TP Removal (lb/yr)	1.90 lb/yr
TSS Removal (lb/yr)	409.61 lb/yr
Estimated Cost	$51,700

Figure 1. Total drainage area to proposed retrofit practices in Lot 9.

Figure 2. Current parking configuration looking north

(above), and existing northeast landscaped area to be converted to bioretention (below).

Site Description

The proposed retrofit concept is located on the UConn Campus in Lot 9, across from the Visitors Center. The parking lot is heavily used, and in relatively poor condition.

Existing Conditions

Runoff from the site is captured in an enclosed storm drain system, and conveyed to the north. Small landscaped areas to the north receive no drainage from the lot or other impervious areas.

Proposed Concept

Install linear bioretention areas (grassed swales) in medians between existing parking areas. Convey stormwater to these swales using curb cuts. Install 6" check dams along the swale. Existing storm drain structures will act as overflow for large storm events.

Construct two small bioretention cells in the existing landscaped areas. Use curb cuts to receive direct parking lot runoff. In addition, capture small storm runoff from swales in the median via a 6" dip within the swale. Yard drains in these structures will be tied in to existing storm drain structures in the road.

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 need to be further refined as this project proceeds towards construction.

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 Site A11		
Parameter	**Value***	
	A-11c/d (Swales)	**A-11a/b (Bio)**
Drainage Area, A (acres)	1.41	1.41
Imperviousness, I (%)	98	98
Volumetric Runoff Coefficient, Rv	0.93	0.93
Rainfall Depth , P (in)	1	1
Water Quality Volume, WQv (cf)	4,790	4,790
Depth of the Filter Bed, d (ft)	--	2.5
Bottom width (ft)	2	--
Side slopes	3:1	--
Hydraulic Conductivity, k (ft/day)	--	1
Drawdown Time, t (days)	--	2
Max. Ponding Depth, hmax (in)	--	9
Average Ponding Depth, h (ft)	0.5	0.375
Cross-Sectional Area (ft)	1.75	--
Length Required (ft)	*2,740*	--
Length Provided (ft)	650	--
Surface Area Required, Af (sq ft)	--	1,495
Surface Area Provided (sq ft)	--	1,550
Treatment Provided (% of 1")	24	75
*Note: Table summarizes total length of both swales and bios		

Design Considerations

Some key design considerations include the following:

- Confirm location of underground electric lines at northeast filter area.
- The proposed filters will require a parking lot reconfiguration. Angled parking, combined with one-way traffic, may be needed to accommodate these swales.
- Available mapping does not indicate how storm drainage from the parking lot connects to the storm drain network in the street and needs to be field-verified.
- The Sasaki Landscaping Plan indicates that tree plantings at the eastern edge of Lot 9 may reduce the lot size. This design does not account for that parking lot loss. An alternative design may utilize only one swale, or an alternative to parking lot swales, such as parking lot tree planters.

Maintenance

Maintenance is important for bioretention areas and grassed swales. The routine maintenance activities typically associated with bioretention areas are summarized in the following tables below.

Maintenance Activities for Site A-11	
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 make sure 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