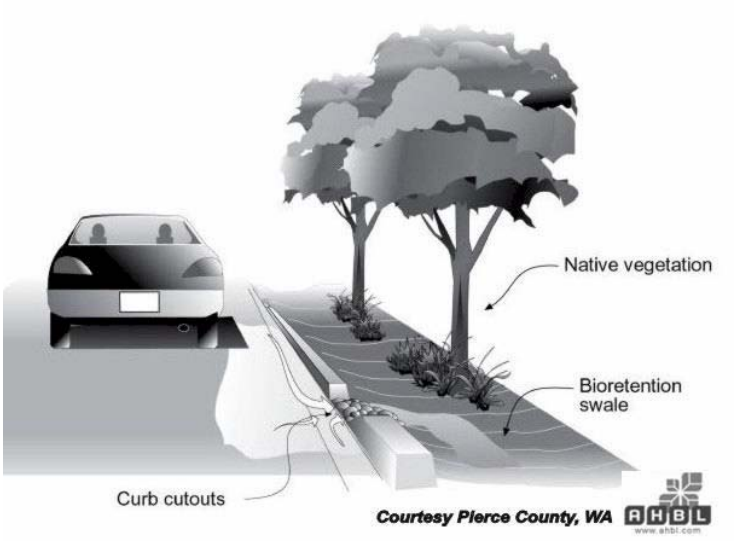
BMP 5.8.2: Disconnection from Storm Sewers



Minimize stormwater volume by disconnecting impervious roads and driveways and directing runoff to grassed swales and/or bioretention areas to infiltrate.

Key Design Elements

- Disconnect road and driveways from stormwater collection systems.
- Redirect road and driveway runoff into grassed swales or other vegetated systems designed to receive stormwater.
- Eliminate curbs/gutters/conventional collection and conveyance.

Potential Applications

Residential:	Yes
Commercial:	Yes
Ultra Urban:	Limited
Industrial:	Limited
Retrofit:	Limited
Highway/Road:	Limited

Stormwater Functions

Volume Reduction:	High
Recharge:	High
Peak Rate Control:	High
Water Quality:	Low

Water Quality Functions

TSS:	30%
TP:	0%
NO3:	0%

Description

Impervious roads and driveways account for a large percentage of post-development imperviousness. These surfaces influence stormwater runoff volume and quality by facilitating the rapid transport of stormwater and collecting pollutants from atmospheric deposition, automobile leaks, and additional sources. Considered a source of more potentially damaging pollution than rooftops, roads and driveways contribute toxic chemicals, oil, and metals to stormwater runoff.

Conventional stormwater management has involved the rapid removal and conveyance of stormwater from these surfaces. The result of this management system has been increased runoff volume, decreased time of concentration, and greater pollutant mobility. Distributed stormwater management through the use of vegetated swales and bioretention areas (discussed in Section 6.4.8 and 6.4.5) can reduce the volume of stormwater runoff while providing on-site treatment and pollutant removal, providing:

- Increased infiltration and evapotranspiration.
- Increased filtration.
- Decreased stormwater runoff volume.
- Increased stormwater time of concentration.

Variations

A variety of alternatives exist for redirecting road and driveway runoff away from stormwater collection systems. In addition to vegetated swales, infiltration trenches or bioretention areas may be utilized. Curbing may be eliminated entirely or selectively eliminated, as shown in Figure 5.8-2. The choice of BMP will depend upon site-specific characteristics including soil type, slope, and stormwater volume.

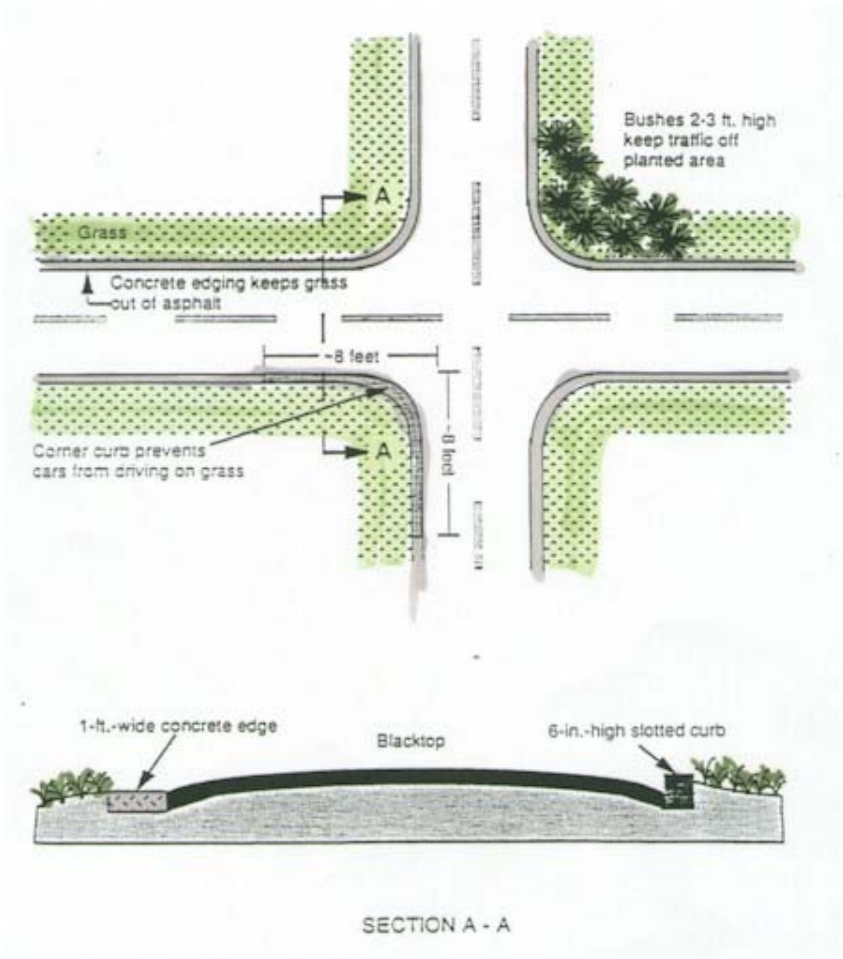


Figure 5.8-2 Example of Concrete Road Edging and Corner Curb (Roesner, ASCE, 1991)

Applications

Routing road and driveway runoff to vegetated swales will reduce runoff volume and peak discharge, as well as improve water quality by slowing runoff, allowing for filtration, and providing opportunity for infiltration and evapotranspiration. Most importantly, in contrast to conventional systems where roads and driveways are connected directly to the stormwater collection and conveyance system, vegetated swales offer the potential for pollutant reductions (see additional discussion in Section 6.8). When stormwater enters the stormwater system directly from road and driveways surfaces, a large variety of pollutants are introduced into the stormwater and eventually the receiving stream. These pollutants include toxic chemicals, oil, metals, and large particulate matter.

The use of vegetated swales, while slowing runoff discharge and permitting infiltration, also allows for pollutant reduction facilitated by the soil media complex and plant uptake. Thus, vegetated swales used in this manner serve a range of functions, intercepting runoff, reducing stormwater volume, and retaining and reducing pollutants. Proper design and implementation still allows stormwater to be quickly removed from road and driveway surfaces alleviating concerns over standing water.

The suitability of vegetated swales depends on land use, soil type, imperviousness of the contributing watershed, and dimensions and slope of the vegetated swale system. Use of natural low-lying areas is encouraged and natural drainage courses should be preserved and utilized.

Maintenance of the vegetated swale should include providing sufficient capacity of the channel and maintaining a dense, healthy vegetated cover. Maintenance activities should include periodic mowing (with plantings never cut shorter than the design flow depth), weed control, watering during drought conditions, reseeding of bare areas, and clearing of debris and blockages.

Cost Issues

See discussion in Chapter 6.4.8. Vegetated swale construction costs are estimated at approximately $0.25 per ft2. By including design costs, this estimated cost increases to $0.50 per ft^2, allowing vegetated swales to compare favorably with other stormwater management practices.

5.9 Source Control

BMP 5.9.1: Streetsweeping

Use of one of several modes of sweeping equipment (e.g., mechanical, regenerative air, or vacuum filter sweepers) on a programmed basis to remove larger debris material and smaller particulate pollutants, preventing this material from clogging the stormwater management system and washing into receiving waterways/waterbodies.

Key Design Elements

- Use proper equipment; dry vacuum filters demonstrate optimal results, significantly better than mechanical and regenerative air sweeping, though move slowly and are most costly
- Develop a proper program; vary sweeping frequency by street pollutant load (a function of road type, traffic, adjacent land uses, other factors); sweep roads with curbs/gutters
- Develop a proper program; restrict parking when sweeping to improve removal.
- Develop a proper program; seasonal variation for winter applications as necessary.

Potential Applications

Residential: Yes
Commercial: Yes
Ultra Urban: Yes
Industrial: Yes
Retrofit: Yes
Highway/Road: Yes

Stormwater Functions

Volume Reduction: Low/None
Recharge: Low/None
Peak Rate Control: Low/None
Water Quality: High

Water Quality Functions

TSS: 85%
TP: 85%
NO3: 50%