

Level Spreader

Level Spreaders are measures that reduce the erosive energy of concentrated flow by distributing runoff as sheet flow to stabilized vegetated surfaces, as well as promote infiltration and improved water quality. There are two applications for level spreaders:

- Inflow level spreaders to evenly distribute flow entering into a structural best management practice.
- Outflow level spreaders, which can stand alone to distribute runoff from an impervious surface or used in conjunction with a structural best management practice.

Level spreaders can take many forms including vegetated filter strips, concrete sills (or lips) curbs, concrete trough, a plastic tile cut in half, rock check dams, and treated lumber.

Limitations

- Level spreaders are not effective treatment by themselves and should be used as part of an integrated, decentralized storm water management system.
- If not designed and / or constructed correctly flow may eventually become concentrated and erosive.
- It is meant for small flows, less than 5 cubic feet per second.
- Level spreaders with a vegetated lip needs to be protected from traffic (lawn mowers) in order to maintain a smooth level surface.

Recommended Guidelines

1. *Design Consideration*

- 1.1. It is easier to keep flow distributed than to redistribute it after it is concentrated.
- 1.2. The length of the level spreader is a function of the calculated flow rate, a rule of thumb:
 - 1.2.1.1. 15 feet for every 0.1 cubic feet per second (cfs) and 10 feet for each 0.1 cfs thereafter to a maximum of 0.5 cfs per spreader.
- 1.3. Multiple spreaders should be used for higher flows.
- 1.4. The width of the spreader should be at least 6 inches deep, uniform across the entire length.
- 1.5. Level spreaders must be LEVEL, constructed at zero grade across a slope.

- 1.6. Vegetated lip for level spreader should not be constructed from fill material.
- 1.7. Level spreaders should not be constructed on newly deposited fill dirt. Native / undisturbed soil is more resistant to erosion than fill.
- 1.8. The downside of the level spreader should be clear of debris.
- 1.9. Discharge area below the level spreader must be uniform with a slope of less than 20%.
- 1.10. The final 20 feet leading to the level spreader shall be less than or equal to 1% to reduce velocities.
- 1.11. Low-growing turf or native grasses can be used as a level spreader in some instances.

Level Spreader Resources

- North Carolina DOT Level Spreader Workshop, 2001
<http://www.bae.ncsu.edu/content/main/handouts/lsworksheet.pdf>
- City of Tacoma Washington, Stormwater Management Manual, 4.2 Runoff Conveyance and Treatment BMP C206: Level Spreader
<http://www.ci.tacoma.wa.us/WaterServices/permits/Volume2/SWMM%20V2-C4b.pdf>
- Pennsylvania Stormwater Best Management Practices Manual, Draft January 2005, BMP 6.20: Level Spreader