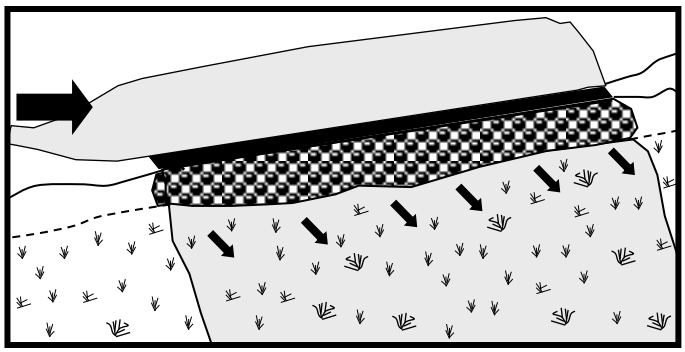
ACTIVITY: Level Spreader | ES – 26



CITY OF KNOXVILLE

Targeted Constituents

● Significant Benefit ◗ Partial Benefit ○ Low or Unknown Benefit

● Sediment	○ Heavy Metals	○ Floatable Materials	○ Oxygen Demanding Substances	
○ Nutrients	○ Toxic Materials	○ Oil & Grease	○ Bacteria & Viruses	○ Construction Wastes

Description

A level spreader handles concentrated runoff from a ditch or temporary diversion channel and turns it into sheet flow. It should be used only for small flows where a gentle stabilized grass slope is available. A level spreader will significantly reduce erosion and sediment by reducing flow velocities.

Suitable Applications

- Temporary diversion channels with an adjacent gentle stabilized slope, for which downstream drainage infrastructure may not be completed.
- Permanent drainage channels with small flows and an adjacent gentle stabilized slope, for which downstream infrastructure may not be warranted.

Approach

The purpose of a level spreader is to turn concentrated stormwater runoff from a ditch into sheet flow, for the purpose of increasing infiltration and reducing volume of runoff. It is meant for use on small flows, typically with a design storm flow less than 5 cfs. If stormwater runoff is discharged through a culvert as large as 12" diameter, then this runoff is usually too large to be a candidate for a level spreader.

A level spreader (Figure ES-26-1) is essentially a widened portion of ditch, constructed at zero percent grade, with a carefully constructed side-release weir. Do not use fill material to construct a vegetated lip for a level spreader. The widened portion of ditch is triangular in shape, which increases the wetted perimeter and slows down the water.

Maintenance

Inspect temporary level spreaders weekly and after rainfall events. Look for excessive sediment, scour or undercutting, and for concentrated flows downhill from level spreader. Since the level spreader is not a sediment-removing device, additional erosion controls may be necessary. Note any problems and correct promptly.

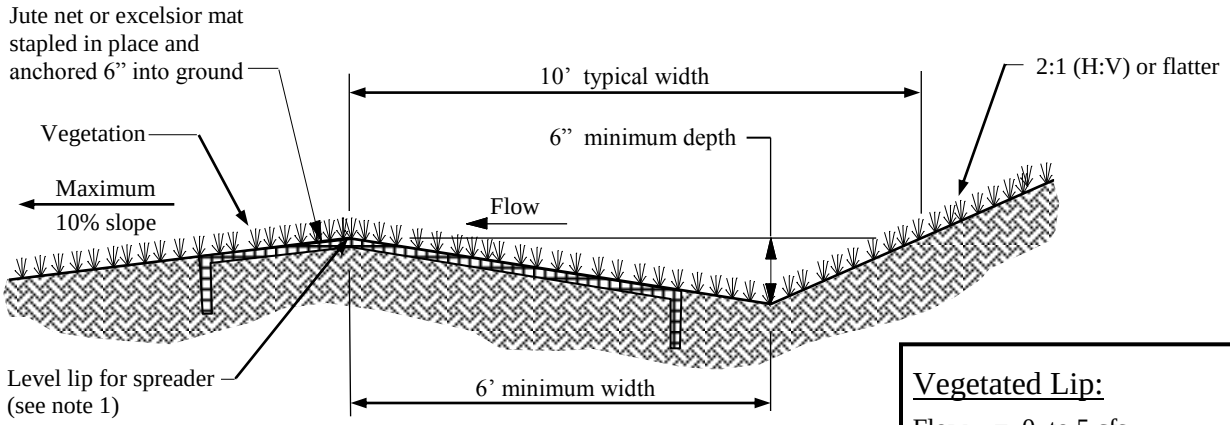
Inspect permanent level spreaders periodically for scour, undercutting, settlement, and for concentrated flows downhill from level spreader. Repair or replace level spreader if it is damaged or inadequate to prevent erosion.

Limitations

A level spreader can only handle small flows from ditches or channels. It may be prudent to have additional measures (or an emergency overflow or bypass) to handle larger storms. A level spreader with vegetated lip needs to be protected from traffic (even riding mowers) in order to maintain a smooth level surface for the overflow weir.

References

33, 141, 162, 167, 179 (see BMP Manual Chapter 10 for list)



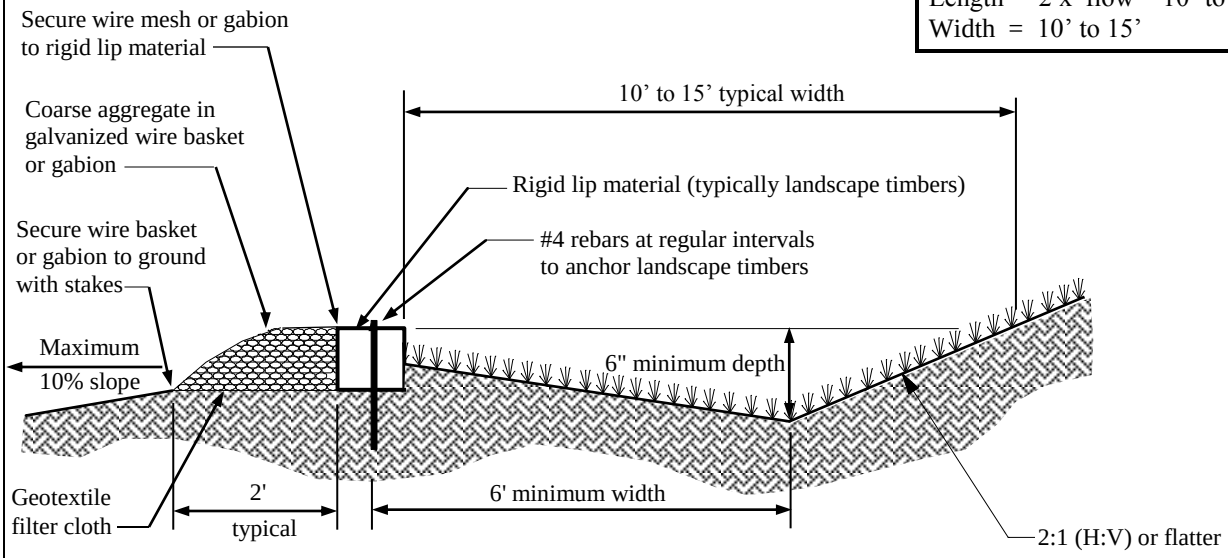
Level Spreader - Vegetated Lip

Vegetated Lip:

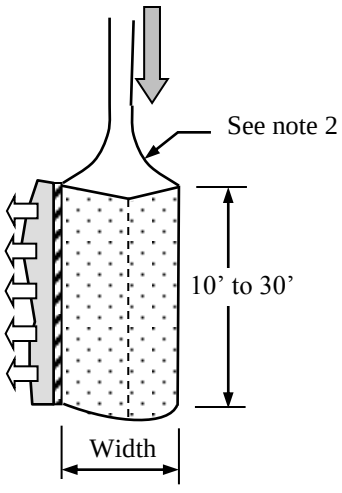
Flow = 0 to 5 cfs
Length = 10'
Width = 10'

Rigid Lip:

Flow = 5 to 15 cfs
Length = 2 x flow = 10' to 30'
Width = 10' to 15'



Level Spreader - Rigid Lip



Typical Layout

NOT TO SCALE

Notes:

1. Vegetated lip for level spreader should not be constructed from fill material. Do not allow any traffic (even riding mowers) onto vegetated lip.
2. The last 20' of approach channel should have a grade less than 1%.

Figure ES-26-1
Level Spreaders