LeS

Level Spreader

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.

Selection Criteria

Level spreaders can be used for:

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

Design Considerations

The purpose of a level spreader is to convert concentrated stormwater runoff from channelized flow into sheet flow, for the purpose of increasing infiltration and providing water quality treatment. This application is only appropriate for small flows, typically with a design storm flow less than 5 cfs. If stormwater runoff is discharged from a culvert = 12", then a level spreader is not appropriate.

A level spreader (see Figures below) is essentially a widened portion of ditch, constructed at 0% slope, 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 the 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 should be protected from traffic (even riding mowers) in order to maintain a smooth level surface for the overflow weir.

References

N.C. Sate University. Designing Level Spreaders to Treat Stormwater Runoff. http://www.bae.ncsu.edu/cont_ed/main/handouts/lsworksheet.pdf
Main Erosion and Sediment Control BMP. http://www.state.me.us/dep/blwq/docstand/escbmps/escsectione4.pdf.

Figure 1 Level Spreader Conceptual Drawing

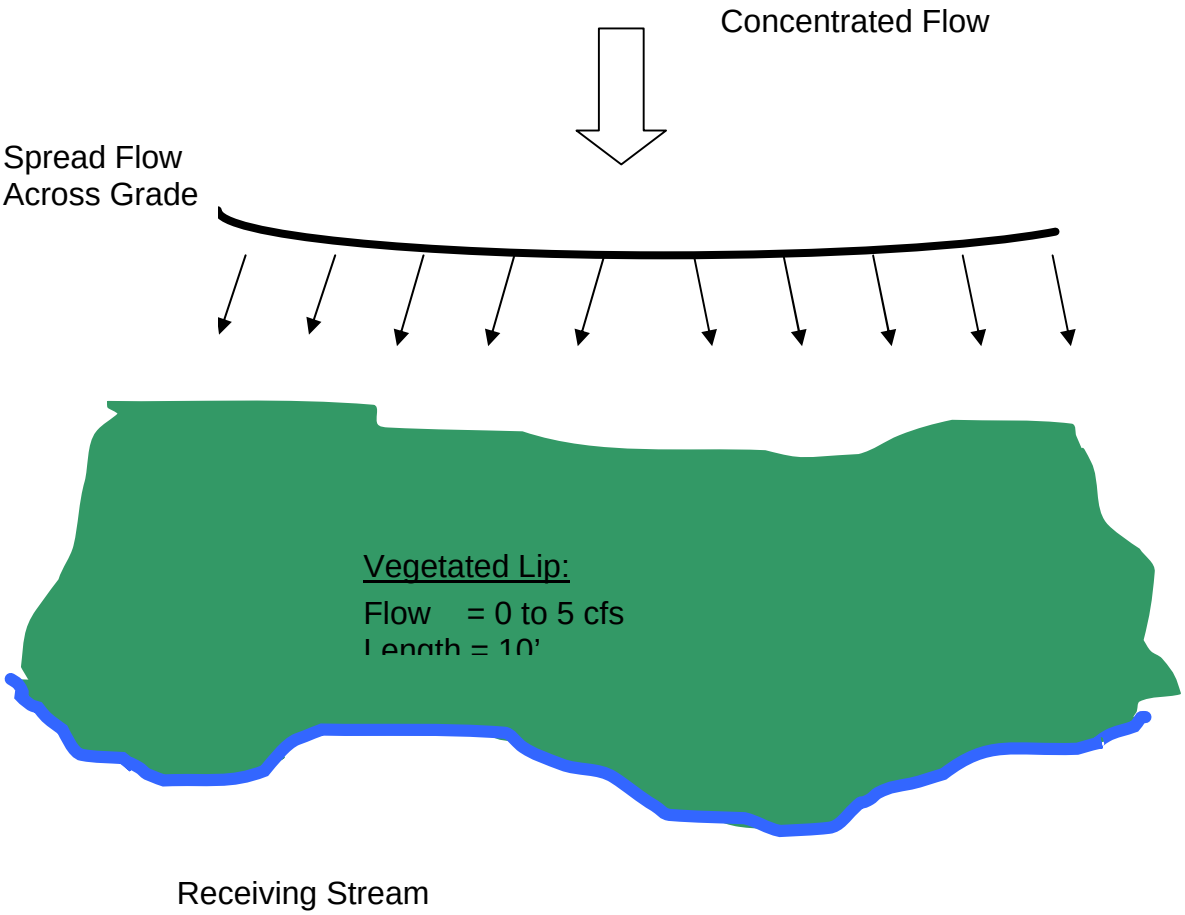
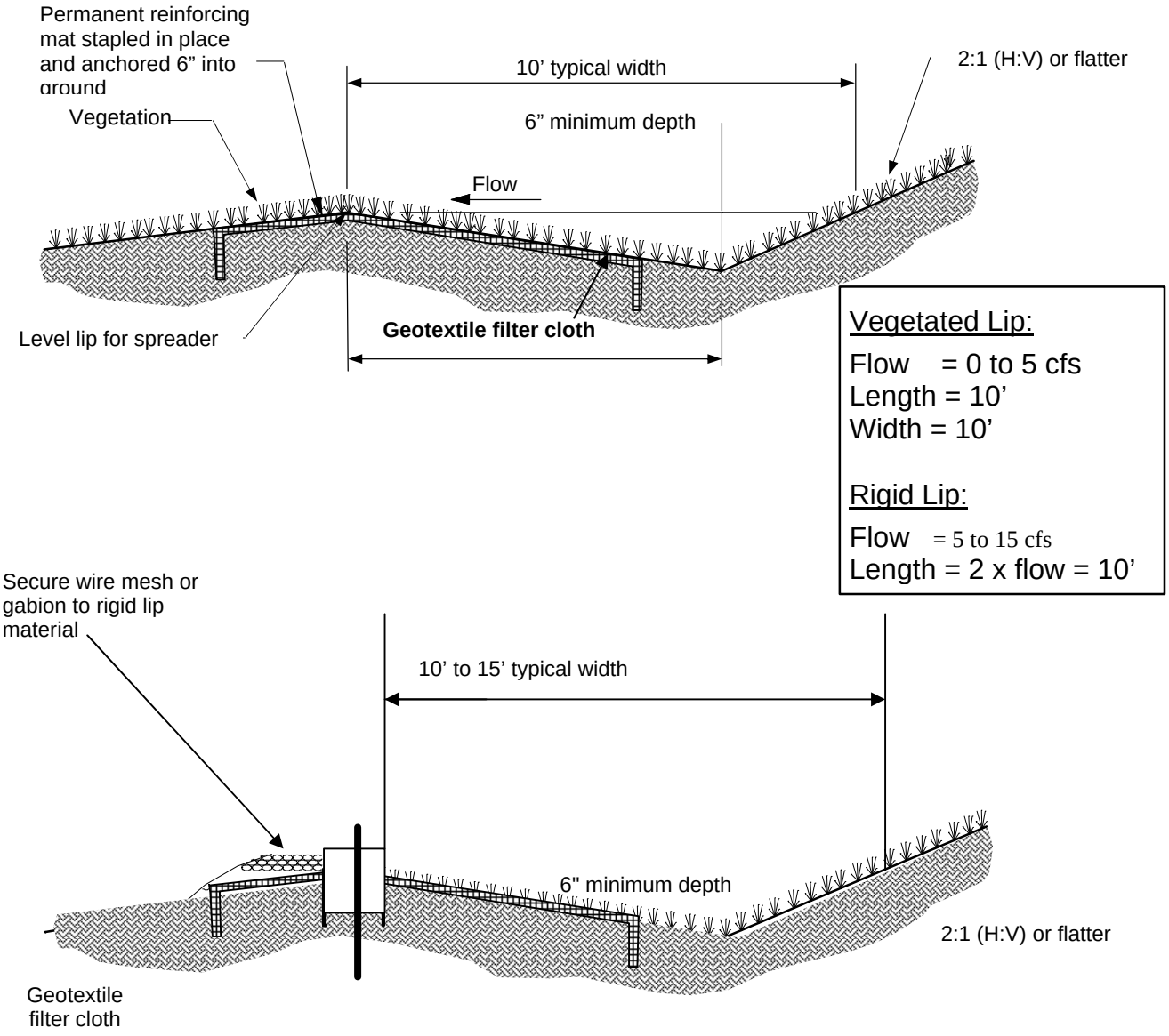


Figure 2: Level Spreader Profile, Section & Spacing



Vegetated Lip:

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

Rigid Lip:

Flow = 5 to 15 cfs
Length = 2 x flow = 10’