

Level Spreader (LVS)



Practice Description

A level spreader provides a non-erosive outlet for concentrated runoff (diversions) by dispersing flow uniformly across a stable slope. They are relatively low-cost structures designed to release small volumes of water safely.

Planning Considerations

Level spreaders are designed to be used where sediment-free storm runoff is intercepted and diverted away from graded areas onto undisturbed stabilized areas. This practice applies only in those situations where the spreader can be constructed on undisturbed soil and the area below the level crest is stabilized by natural or pre-established vegetation. The water should not be allowed to re-concentrate after release.

The drainage area for a level spreader should be limited to 5 acres, and the size of the spreader based on design runoff. When the level spreader is used as an outlet for temporary or permanent diversions, runoff containing high sediment loads must be treated in a sediment trapping device before release into a level spreader (see *Sediment Basin Practice*).

Design Criteria

Capacity

The capacity of the spreader crest shall be limited to those drainage areas producing no more than 40 cfs from a 10-year storm.

Length

By estimating the flow, the spreader crest length can be determined from the following table.

<u>Design Flow (CFS)</u>	<u>Minimum Depression Depth (Feet)</u>	<u>Minimum Length (Feet)</u>
0-10	0.5	10
10-20	0.6	20
20-30	0.7	30
30-40	0.8	40

Width

The minimum acceptable width of the depressional area along the level crest shall be 6 feet.

Grade

The grade of the channel for the last 20 feet of the dike or diversion entering the level spreader shall be less than or equal to 1%. The grade of the depression along the level spreader shall be 0%.

Outlet

The release of the stormwater will be over the level crest onto an undisturbed stabilized area. The level crest should be of uniform height and zero grade over the length of the spreader crest.

Setback

Level spreader setbacks should be a minimum of 10 feet from property lines and receiving water features. Sheet flow depth at property lines shall be consistent with pre-development flow.

Construction**Site Preparation**

Level spreaders must be constructed on undisturbed soil (not fill material).

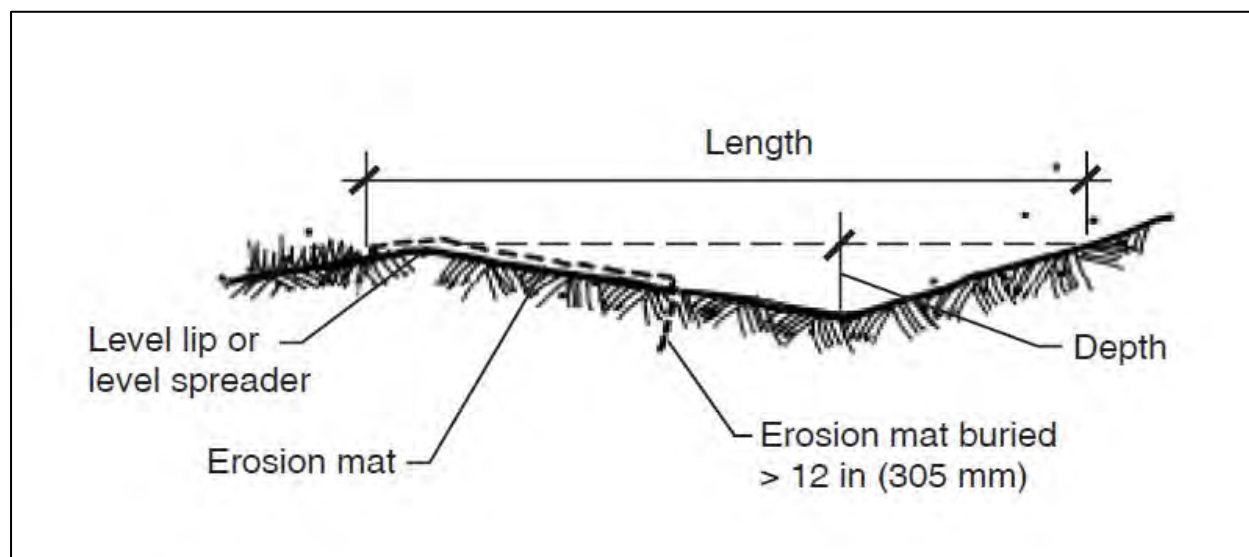


Figure LVS-1 Level Spreader, Sectional View (Source: NRCS)

Level Spreader Crest

The level spreader crest shall be constructed to a uniform height and zero grade over the length of the spreader. For flows of 4 cfs or greater, a rigid crest of non-erodible material shall be used. For flows less than 4 cfs, a vegetated crest may be used. An erosion control blanket should be used with a vegetative crest (see *Erosion Control Blanket Practice* for blanket requirements). The erosion control blanket should be a minimum of 4 feet wide and extend at least 1 foot downstream. Secure the blanket with heavy duty staples and bury the upstream and downstream edges in a trench at least 6 inches deep.

Erosion control blankets should be used for rigid crest level spreaders as well. The erosion control blanket should be entrenched a minimum of 4 inches below existing ground and securely anchored to prevent displacement. An apron of coarse aggregate should be placed along the rigid crest and extended downslope at least 3 feet.

Vegetation

The natural buffer-area vegetation is important to improve infiltration function, protect from rain and wind erosion and enhance aesthetic conditions. The level spreader itself does not need vegetation. The lower buffer area should be protected from disturbance during construction.

Filter Strip

Level spreaders used in conjunction with a filter strip should have a capacity designed based on the filter strip specifics (See *Filter Strip Practice*). The spreader shall run linearly along the entire width of the filter strip to which it discharges. The ends of the spreader should be tied into higher ground to prevent flow around the spreader.

Common Problems

Consult with a qualified design professional if any of the following occur:

Variations in topography on site indicate practice will not function as intended; changes in plan may be needed.

Design specifications cannot be met; substitution may be required. Unapproved substitutions could result in failure of the practice.

Maintenance

Annual inspection is required. Trees and shrubs that have established on the level spreader crest should be removed.

Inspection should occur annually for the presence of debris and sediment buildup on the level spreader.

Regulation inspection, especially after significant rain events (greater than 3-4 inches in 24-hours), should be done to address possible erosion and gully formation.

References

BMPs from Volume 1

Chapter 4

Erosion Control Blanket (ECB)	4-33
Permanent Seeding (PS)	4-53
Temporary Seeding (TS)	4-103
Diversion (DV)	4-131
Outlet Protection (OP)	4-199
Sediment Basin (SBN)	4-298