



Description

Drop structures convey water from one elevation to another without causing erosion. A drop structure is a low wall constructed with a channel across its entire width. Different shapes, heights and construction materials are used depending on their location and purpose. They are often referred to as grade controls, grade stabilisers, weirs, dams or sills.

Application and Function

Drop structures are constructed in gullies, waterways, drainage lines and formalised drains. The purpose of drop structures is to reduce water velocity to non-erosive rates by reducing and stabilising the grade of the drain, watercourse or gully floor. When water flows the reduced water velocity allows sediment to be dropped between the structures subsequently raising and stabilising the floor levels.

Limitations

Depending on size and location, drop structures can be expensive and time consuming to construct.

Advantages

Drop structures can be a very effective means of stabilising a relatively steep grade, especially in environments where revegetating drains and floodways will not be sufficient to prevent erosion. Provided drop structures are installed correctly, the structures are long lasting and can negate the necessity of having other erosion control structures such as diversion banks.

Alternatives

In some situations, the use of flumes and chutes is more suitable. The construction of flumes and chutes can also be expensive and time-consuming, but they are usually used for steep drops of 2 metres or greater. See Technical Note No. 7: Chutes & Flumes.

Construction

Before constructing drop structures, it is important that they are designed correctly.

The recommended grade for installing drop structures is 0.3%. If the drain floor is any steeper it may be susceptible to erosion. Drop structures can be constructed from a variety of materials including rock, logs, concrete, or any combination of the above.

Drop structures should be constructed with particular attention to anchoring or 'keying in' of the structure to the drain walls. Installation of run-on and run-off aprons (upstream & downstream) is necessary to prevent scouring of the floor.

Install cut-off walls at the upstream end of the run-on apron and at the downstream end of the run-off apron. This is necessary to prevent under and side-cutting as flow velocity increases when water passes over each structure. Wing walls and energy dissipaters will also need to be installed as part of the construction.

Maintenance

Check drop structures periodically for signs of under and side cutting. Additionally check to see if there is any erosion of the drain floor (between drop structures) and rectify immediately before the next rain event.

Contact details

For further information contact the DLRM Land Management Unit in your region. Additional Technical Notes and Erosion and Sediment Control Guidelines are available on the website: <http://www.lrm.nt.gov.au/soil/management>

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