



Description

Energy dissipaters are control measures used to reduce stormwater runoff velocity and erosion potential. Dissipaters interrupt and reduce energy of surface water flow at points where flows are concentrated. Stone pitching consists of medium sized rock set into mortar exposing the stone and is designed to spread the flow across the hard surface and around the protruding rock.

Dissipaters may also take the form of solid concrete structures constructed in the flow line or at the outlet of a high velocity drain.

These control measures are used to reduce water flow velocity and erosion potential by interrupting the passage of surface water at concentrated points, particularly at culverts and around the headwalls.

Application and Function

Stone pitching is used around the inlet and outlet of culverts within a constructed drain. Stone pitching can be installed around culvert headwalls to protect batters from erosion as a result of concentrated runoff.

Examples of areas that will benefit from stone pitching are culverts, driveway access points (rural areas) and in other areas where changes or obstructions in the direction of flow occur. Dissipaters are often used at the base of open drains to reduce water velocity prior to sheet flowing into adjoining vegetation.

Limitations

Poor design and construction may lead to erosion occurring around the outer edge of stone pitching.

Dump rock dissipaters must be underlaid with geotextile fabric to reduce the potential for the underlying soil to erode.

It is critical to ensure dissipaters reduce the potential and do not contribute to erosion by a failure to carefully consider all aspects of both design and construction. High rainfall events may limit the effectiveness of rock dissipation controls.

Alternatives

Reno mattresses, rock filled wire mattresses and gabions can be used in similar circumstances.

Rip-rap lined aprons are one of the quickest and easiest outlet protection measures, however they

have limitations. Dump rock of assorted sizes can be utilised for protection around headwalls. The use of loose rock in these instances is limited due to the unstable nature of the rock. Rocks can be dislodged by traffic or high rainfall events causing scouring of the unprotected surface.

Advantages

Stone pitching provides protection around the headwall of culverts where erosion often results from concentrated road runoff. By protecting soils using stone pitching the total amount of suspended sediment down stream will be reduced. Additionally, costly ongoing maintenance and rectification is reduced.

Rock dissipation structures are a permanent erosion control measure. Reduced flow velocity will minimise the potential for down stream erosion.

Construction

Refer to approved plans for design, location, extent and detailed specifications for dissipaters and stone pitching. Refer any questions regarding location, extent or methods of installation to the responsible on-site supervisor.

When installing stone pitching care must be taken to ensure the edge of the stone pitching matches the adjoining surface level. Should stone pitching be laid higher than the adjoining surface, scouring will occur and result in the failure and undermining of the works. It is recommended that the works area is over-cut to ensure a smooth transition from surface level to pitching.

- Stone for pitching should be a clean, hard, dense and durable rock free from cracks, seams or other imperfections.
- Stone pitching is recommended to be constructed with an assortment of dump/trap rock sizes with average diameter of rock being 100mm to 300mm.
- The stone should be hand placed with closed joints into freshly spread cement mortar with proportions generally 1:3 (cement:sand).
- Construct face joints with a nominal width of 25mm. Do not use mortar once initial set has occurred.

- The mortar should be finished with a neat flush to the surrounding surfaces and stones left clean of all mortar.

- Dump rock dissipaters require an underlying apron of geotextile fabric. Rock thickness should be 1.5 times the maximum rock size. This will provide a stable structure for water movement.

Maintenance

Inspect dissipaters, stone pitching and drainage lines after each major rain event to assess the stability of structures and to carry out any repairs as required. Repair damage immediately. If erosion occurs around any structures, further protection may be required.

Remove debris from dissipaters and replace stone as necessary.

Check for channel scour downstream of structure.

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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