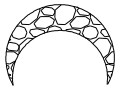
Rock Sediment Dikes

Plan Symbol



Description

Rock sediment dikes are semi-circular sediment control structures constructed across drainage ditches, swales, low areas or other areas that receive concentrated flow. A rock sediment dike consists of a half-circular shaped rock embankment with a sump area constructed for sediment storage. Design rock sediment dikes to have an 80 percent design removal efficiency goal of the total suspended solids (TSS).

When and Where to Use It

Rock sediment dikes are most effective in areas where sediment control is needed with minimal disturbance. Use as a sediment control structures for the outfalls of diversion swales, diversion dikes, in low areas or other areas where concentrated sediment laden flow is expected. Use rock sediment dikes for drainage less than 2.0 acres. Do not place rock sediment dikes in Waters of the State (unless approved by SCDHEC, State, or Federal authorities).

Rock Sediment Dike Design Criteria

Design Aids

The Design Aids located in the rock check dam section of this handbook may be used to properly size rock sediment dikes. Sedimot III, SEDCAD4, Pond Pack and other computer models that utilize eroded particle size distributions and calculates a corresponding trapping efficiency may also be utilized.

General Design Requirements

a. Maximum Drainage Area – 2 acres
b. Maximum Design Life - 18 months
c. Maximum Rock Dike Height – 2-feet
d. Discharge and treatment capacity for the 10-year 24-hour storm event.
e. 80 percent design removal efficiency goal for TSS
f. Determine required sediment storage volume and ensure sediment dike sump provides the volume.
g. Size rock sediment dike to handle the receiving peak flow rates. Flows that overtop the structure have an assumed Trapping Efficiency of 0 percent.

Installation

Install a non-woven geotextile fabric over the soil surface where the rock sediment dike is to be placed.

Construct the body of the rock sediment dike with minimum 9-inch D_{50} Riprap. Construct the upstream face with a 1-foot thick layer of ¾-inch to 1-inch D_{50} washed stone placed at a slope of 2H:1V.

Construct rock sediment dikes with a minimum top flow length of 3-feet (two-foot flow length through the riprap and one-foot flow length through the washed stone).

Place the rock by hand or mechanical placement (no dumping of rock to form the sediment dike) to achieve the proper dimensions.

Install a sediment sump with a minimum depth of 2-feet on the upstream side of the structure to provide sediment storage. Install the upstream side of the sediment sump with a slope of 5H:1V to inhibit erosion of the sediment storage area.

Mark the sediment cleanout level of the sediment dike with a stake in the field.

Seed and mulch all disturbed areas.

Inspection and Maintenance

- The key to a functional rock sediment dike is continual monitoring, regular maintenance and regular sediment removal.
- Inspect every 7 calendar days and within 24-hours after each rainfall event that produces ½-inches or more of precipitation.
- Remove sediment when it reaches 50 percent of the sediment storage volume or the top of the cleanout stake. Removed sediment from the sump should be removed from, or stabilized on site.
- Remove rock sediment dikes within 30 days after final site stabilization is achieved or after they are no longer needed. Permanently stabilize disturbed areas resulting from the removal.

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Preventive Measures and Troubleshooting Guide

Field Condition	Common Solutions
Sediment reaches 50 percent of the sediment storage volume or the top of the cleanout stake.	Remove accumulated sediment to recover holding capacity.
Rock sediment dikes wash away.	Replace rock sediment dikes using larger stone.
Final site stabilization is achieved.	Remove rock sediment dikes from site within 30 days after stabilization, and permanently stabilize the areas that were disturbed by the dikes.