Greenville County Technical Specification for:

SC-04 Rock Ditch Check

1.0 Rock Ditch Check

1.1 Description

A rock ditch check is a small, temporary or permanent rock fill dam constructed across a drainage ditch, swale, or channel to lower the speed of concentrated flows. Rock ditch checks shall be designed to have an 80 percent design removal efficiency goal of the total suspended solids (TSS) in the inflow.

1.2 Design Criteria

Rock ditch checks should be used only in small open channels. The checks should not be placed in Waters of the State or USGS blue-line streams (unless approved by Greenville County, State, or Federal authorities).

The center section of the rock ditch check should be lower than the edges.

Spacing varies with the bed slope of the ditch. The maximum spacing between the rock checks should be such that the toe of the upstream check is at the same elevation as the top of the downstream check.

In the case of grass-lined ditches and swales, ditch checks should be removed when the grass has matured sufficiently to protect the ditch or swale unless the slope of the swale is greater than 4 percent. The area beneath the ditch checks should be seeded and mulched immediately after dam removal. Geotextile filter fabric shall be installed under all rock fill.

The Design Aids located in Figures 8-14 through 8-16 in Appendix K may be used to properly design rock ditch checks.

1.2.1 Requirements

- a. 80 percent design removal efficiency goal for TSS
- b. Maximum Drainage Area 5 acres
- c. Maximum Height 2-feet
- d. If the rock ditch check is not properly sized, the flow will overtop the structure and the Trapping Efficiency is assumed to be 0 percent when this failure takes place.
- 1.2.2 When and Where to Use It

A rock ditch check should be installed in steeply sloped swales, or in swales where adequate vegetation can not be established. Rock ditch checks should be used only in small open channels. Rock ditch checks should not be placed in Waters of the State.

1.3 Installation

A non-woven geotextile fabric shall be installed over the soil surface where the rock ditch check is to be placed.

The body of the rock ditch check shall be composed of 12-inch D50 Riprap.

The upstream face of the rock ditch check shall be composed of a 1-foot thick layer of 1-inch D50 washed stone.

Rock ditch checks should not exceed a height of 2-feet at the centerline of the channel.

Rock ditch checks should have a minimum top flow length of 2-feet.

Stone shall be placed over the channel banks to prevent water from cutting around the ditch check.

The rock must be placed by hand or mechanical placement (no dumping of rock to form dam) to achieve complete coverage of the ditch or swale and to ensure that the center of the check is lower than the edges.

The maximum spacing between the dams should be such that the toe of the upstream check is at the same elevation as the top of the downstream check.

1.4 Inspection and Maintenance

Inspect rock ditch checks every 7 calendar days and inspections are recommended within 24-hours after each rainfall event that produces ½-inches or more of precipitation until final stabilization is achieved. Inspect for sediment and debris accumulation. Inspect ditch check edges for erosion and repair promptly as required.

Sediment should be removed when it reaches 1/3 the original check height.

In the case of grass-lined ditches and swales, rock ditch checks should be removed when the grass has matured sufficiently to protect the ditch or swale unless the slope of the swale is greater than 4 percent.

After construction is complete, all stone should be removed if vegetation will be used for permanent erosion control measures.

The area beneath the rock ditch checks should be seeded and mulched immediately after dam removal.

1.4.1 Typical Damage or Failure

- Flow around edges of rock check dams
- Rock check dams blown out as a result of not enough rock
- Rock check dams blown out as a result of not large enough rock
- Runoff undermining center of rock check dam
- Rock check dams settling/sinking into underlying bare soil
- Rock check dam center higher than edges