

ROCK CHECK DAM

(no.)
CODE 905



(Source: VA Erosion and Sediment Control Handbook)

DEFINITION

A small rock dam constructed across a grassed swale or road ditch.

PURPOSE

The purposes of this practice are to reduce the velocity of concentrated stormwater flows, thereby reducing erosion of the swale or ditch, trap sediment generated from adjacent areas or the ditch itself and to increase infiltration when suitable soils are present.

CONDITIONS WHERE PRACTICE APPLIES

This practice, utilizing a combination of rock sizes, is limited to use in small grassed swales or open channels that drain 10 acres or less. It shall not be used in a perennial stream where protection of the flowing stream is the objective.

Some specific applications include:

1. Temporary ditches or swales that, because of their short time of

service, cannot receive a non-erodible lining but still need protection to reduce erosion

2. Permanent ditches or swales that cannot receive a permanent non-erodible lining for an extended period of time
3. Either temporary or permanent ditches or swales that need protection during the establishment of grass linings
4. An aid in the sediment trapping strategy for an active construction site. This practice is not a substitute for major perimeter trapping measures such as practice standard TEMPORARY SEDIMENT TRAP 960.

CRITERIA

The drainage area of a ditch or swale being protected shall not exceed 2 acres when rock meeting IDOT CA-1, CA-2, CA-3 or CA-4 gradation is used alone and shall not exceed 10 acres when rock meeting IDOT RR-3 or RR-4 gradation and Quality Designation A is added on the downstream side of the dam.

The maximum height of the rock check dam shall be 3.0 feet. The top of the rock check dam shall be a minimum of 1.0 feet below the top of the ditch or swale.

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

The rock check dams shall be placed such that the resultant ponding will not cause inconvenience or damage to adjacent areas or structures.

The center of the rock check dam shall be at least 6 inches lower than the sides. Hand or mechanical placement will be necessary to achieve complete coverage of the ditch or swale and to assure that the center of the dam is lower than the sides. Rock shall be placed according to construction specification 25 ROCKFILL using Method 1 placement and Class III compaction.

CONSIDERATIONS

For added stability, the base of the rock check dam should be keyed into the soil to a depth of 6 inches.

Filter fabric may be used under the rock to provide a stable foundation and to facilitate removal of the rock. The filter fabric shall meet or exceed the requirements of material specification 592 GEOTEXTILE Table 1 or 2, Class I, II or IV.

Rock check dams are effective in reducing flow velocity and thereby the potential for channel erosion. It is usually better to establish a protective

vegetative lining before flow is confined or to install a structural channel lining than to install rock check dams. Field experience has shown rock check dams to perform much more effectively than silt fences or straw bales in the effort to stabilize "wet-weather" ditches.

Rock check dams installed in grass-lined channels may kill the vegetative lining if submergence after rains is too long and/or siltation is excessive.

If temporary rock check dams are used in grass-lined channels that will be mowed, care should be taken to remove all the rock when the rock check dam is removed. This should include any rocks that have washed downstream.

Field experience has shown that many rock check dams are not constructed with the center lower than the sides forming a weir. Stormwater flows are then forced to the rock-soil interface, thereby promoting scour at that point and subsequent failure of the structure to perform its intended function.

PLANS AND SPECIFICATIONS

Plans and specifications for installing rock check dams shall be in keeping with this standard and shall describe the requirements for applying the practice to achieve its intended purpose. At a minimum include the following:

1. Location where the practice will be installed
2. Dimensions, elevations, and spacing between the dams
3. Rock gradation and quality
4. Fabric specification if used

All plans shall include installation, inspection, and maintenance schedules with the responsible person identified.

Standard drawing ROCK CHECK DAM IL-605CA or IL-605R may be used as the plan sheet.

OPERATION AND MAINTENANCE

On active construction sites, the rock check dams shall be inspected at least once every 7 days and within 24 hours of a rainfall of 0.5 inches or more. If any erosion has taken place around or below the rock check dam or if rocks have been dislodged, repairs shall be made to prevent further damage. Sediment shall be removed once it has accumulated to one-half the height of the rock check dam. The center of the rock check dam shall also be inspected periodically to insure that the center of the dam is lower than the sides.

Unless they will be incorporated into a permanent stormwater management control, rock check dams must be removed when their useful life has been completed. In temporary ditches and swales, rock check dams should be removed and the ditch filled in when they are no longer needed. In permanent structures, rock check dams should be removed when a permanent lining can be installed. In the case of grass-lined ditches, rock check dams should be removed when the grass has matured sufficiently to protect the ditch or swale. The area beneath the rock check dams should be seeded and mulched immediately after they are removed.

For rock check dams that are made a part of a permanent stormwater management control, regular

inspections should be made to see if any erosion has occurred around or below the dam and if any rock has been dislodged. Immediately make all needed repairs to prevent further damage. If sediment trapping is to be a continuing function of the rock check dam, the sediment shall be removed when it has accumulated to one-half the depth of the rock check dam.

REFERENCES

Illinois Department of Transportation, 1997. Standard Specifications for Road and Bridge Construction. IL

Virginia Department of Conservation and Recreation, Division of Soil and Water Conservation, 1992. Virginia Erosion and Sediment Control Handbook, 3rd ed., VA

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