

PC-1 CHANNEL PROTECTION—CHECK DAMS

Refer to: ITD Standard Specifications, Section 212.
ITD Standard Drawing P-2-B.

**BMP Objectives**

- Perimeter Control
- Slope Protection
- Borrow and Stockpiles
- Drainage Areas
- Sediment Trapping
- Stream Protection
- Temporary Stabilizing
- Permanent Stabilizing

Definition and Purpose

A check dam is a small dam constructed in an open channel, swale, or drain way to reduce or prevent excessive bank and bottom erosion by reducing the gradient or runoff velocity. Check dams are normally made of rock; however, other materials may be used. (Rock check dams are often used with channel liners to prevent formation of rills and gullies, or to interrupt their growth, and/or to provide grade control in the channel.)

Bank barbs are similar to rock check dams in construction and materials. Bank barbs are a measure to guide the force of the stream or channel flow away from the bank to reduce bank erosion. Bank barbs may be required under an Idaho Department of Water Resources Stream Alteration Permit, are beyond the scope of this manual, and require guidance from a Professional Engineer.

Appropriate Applications

Check dams are often used in channels or ditches where adequate vegetation cannot be established for controlling erosion and may be used below small drainage structures or culverts.

Limitations

- Check dams are not to be used in live streams, except with proper permitting in place (Idaho Department of Water Resources, U.S. Army Corps of Engineers).
- Use of check dams below the high water mark of a stream or other water body (waters of the U.S.) should be carefully evaluated due to Section 404 permit requirements.
- Section 404 permitting and an Idaho Department of Water Resources Stream Alteration Permit may be required. These are required for the use of bank barbs in live streams.

Design Parameters

- Maximum height should be 24 inches. The center of the check dam must be 6 inches lower than either edge, to form a weir at the overflow.
- The sides should also be lower than the adjoining banks, roadway, or backslope. The top of the outside edges should be 6 inches lower than the roadway surface to prevent water from flowing onto the roadway or undercutting the banks.
- The drainage area above the check dam should not exceed 10 acres.
- The dams must be spaced so that the toe of the upstream dam is never lower than the overflow of the downstream dam. Excavating a sediment basin immediately upstream from the check dam improves its effectiveness.
- Check dams composed of rock may be placed on erosion control geotextile to avoid undercutting. Be sure to check that the overflow will handle large volumes of water and that the sides are high enough to form a weir.
- Within the safety clear zone, all rock check dam face slopes shall be 6H:1V or flatter relative to the roadway grade. Overflow channel slopes may be 3H:1V or flatter.
- Outlet stabilization should be provided below each check dam, and the use of channel liners or protection such as riprap should be considered where there is potential for significant erosion or prolonged submergence.

Materials

- Rock size should vary from 1 to 8 inches with the 8-inch material making up approximately 30 percent of the mix.
- Erosion control geotextile shall meet the requirements of the Standard Specifications.

Construction Guidelines

- The rock check dams shall be constructed according to the plans and specifications.
- The rock shall be placed on erosion control geotextile either by hand or using appropriate equipment. Rock shall not be dumped directly on the geotextile.
- The upstream side of the dam shall be lined with a layer of 0.75- to 2-inch Coarse Aggregate for concrete 6 inches deep if necessary for additional channel protection.
- Riprap and erosion control geotextile may be necessary on the downstream side of the dam to protect the streambed channel from scour.
- Rock check dams within the safety clear zone shall have a slope of 6H:1V or flatter relative to the roadway grade.

Maintenance and Inspection

- Conduct inspections as required by the NPDES permit or contract specifications during construction.
- Periodic inspection and maintenance will be required based on post-construction site conditions.

- Make any repairs necessary to ensure the measure is operating properly.
- Remove accumulated debris and sediment from behind the dam when the debris or sediment reaches a depth of one-half the original height of the dam. Properly dispose in an approved location.
- Restore rock as necessary to maintain the correct dam height.