

Broad-Based Dips

Forest Management Practices Fact Sheet Managing Water Series #6

Introduction

Broad-based dips are gentle waves on the surface of forest roads. They minimize erosion by directing water movement off the road. Water flows into the bottom of the dip and drains into stable, vegetated areas at the side of the road.

Best Management Practices (BMPs) can prevent or minimize the impact of forestry activities on rivers, lakes, streams, groundwater, wetlands, and visual quality.

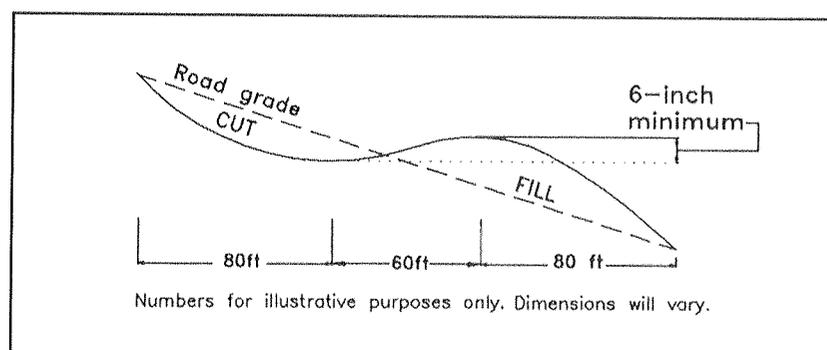
Where Used

Broad-based dips can serve two functions: 1) to divert surface flow off a traffic surface, and 2) to permit water to drain across it. They are best suited for grades of less than about 10 percent. They don't discourage traffic—the gradual nature of the dip assures that vehicles can safely use the road or trail.

Application

Include broad-based dips in the initial construction of a road, trail, or landing. The basic idea is to excavate a dip, build up a berm, and make sure there is an outlet for the water. If possible, use the assistance of a qualified engineer. When building a broad-based dip:

- ▶ Excavate at a 30- to 45-degree angle to the road.
- ▶ Allow at least 150 feet for the entire dip.
- ▶ Build the top of the berm at least 18 inches higher than the bottom of the dip.
- ▶ Dig the outlet of the dip at least 3 inches lower than the upper end. Water will flow across it and out into the adjoining vegetated area instead of pooling in the bottom of the dip.
- ▶ Space broad-based dips the same as cross-drainage culverts. Individual spacing recommendations vary from state to state. See your state's water quality BMP guidelines for spacing information.



Broad-based dip installation

- ▶ Where rutting is a concern, use gravel or other crushed stone on the berm and dip of the structure to protect the road surface.

Advantages

Broad-based dips work well on actively used roads or trails. They require less maintenance than water bars and culverts. They do not inhibit normal vehicle traffic. They eliminate the need for water bars when the road is closed.

Disadvantages

Broad-based dips require more advance planning than water bars or open-top culverts. They should not be used for grades of more than 10 percent or where large or frequent water flows are expected.

Maintenance

Make sure side drainage areas are vegetated, and that water does not drain directly into streams, lakes, or wetlands.

Related Fact Sheets in This Series

Project Planning: Locating Roads, Landings, Skid Trails, and Crossings (FS-6970); Managing Water on Roads, Skid Trails, and Landings (FS-6971); Earth-Berm Water Bars (FS-6972); Using Logging Debris or Logs to Build Water Bars (FS-6973); Conveyor Belt Water Bars (FS-6974); Open-Top Culverts (FS-6976); Shaping Roads and Trails (FS-6977); Roadside and Diversion Ditches (FS-6978); Cross-Drainage Culverts (FS-6979); Project Closure (FS-6980); Making and Using Measurement Tools—Basal Area (FS-6981); and Making and Using Measurement Tools—Slope (FS-6982).

Cooperators

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