

Bank Benches

BANK BENCH - A slightly insloped step or terrace on a road bank that slows overland flow and reduces the amount of run-on water reaching the road, while diverting the water to a stable outlet.



Photo 1

A newly installed bank bench on Red Rose Rd., Huntingdon County. This bench was constructed without leaving the roadway.



Photo 2

The same bank bench as seen in Photo 1 after native vegetation has been re-established.

PURPOSE

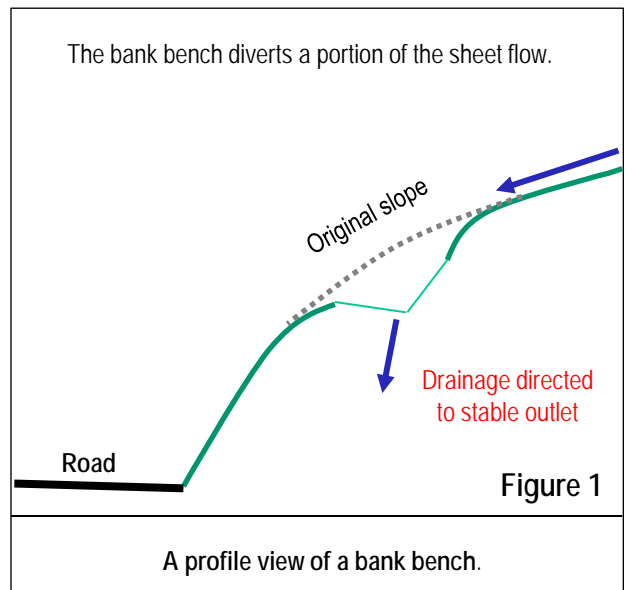
To stabilize eroding road banks that are compromised by upslope sheet flow and to reduce the volume of run-on water that reaches the road drainage system. Run-on flow is slowed and redirected to a stable outlet point before reaching the road ditch, increasing infiltration and sediment capture. This means road ditches and culvert pipes function more efficiently and maintenance costs decrease.

HOW THEY WORK

Bank benches slow and divert run-on sheet flow that would otherwise reach the upslope road ditch (Fig. 1). Diverting water before it reaches the road minimizes the volume of water and sediment carried in the road drainage system. Slowing and redirecting the water to a stable outlet location reduces bank erosion, promotes infiltration, and potentially reduces sediment delivery to streams and wetlands.

WHERE TO USE

Bank benches should be considered on steeper slopes where run-on sheet flow causes rill erosion or contributes a significant amount of water to the road drainage system. Drainage should be directed away from the stream to a stable, well vegetated outlet where flow will not return to the roadway.



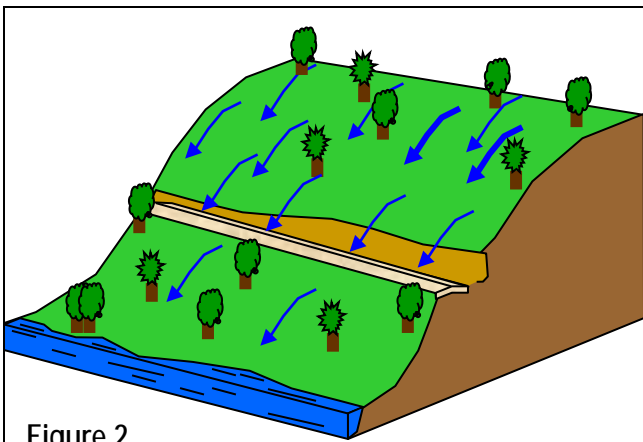


Figure 2

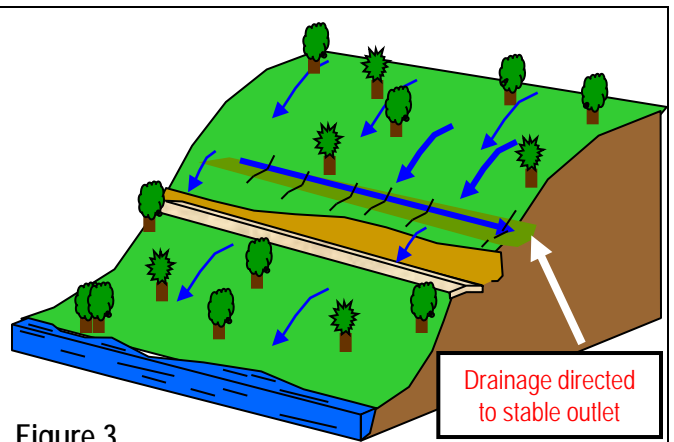


Figure 3

Bank benches are relatively easy-to-install. In Figure 2 above, water travels uninterrupted down the length of the slope and concentrates in the roadway and ditch. Dividing drainage with a bank bench directs flow away from the road, as shown in Figure 3. The volume of water reaching the road is reduced, and erosive flows concentrated in the ditch are eliminated.

IMPORTANT CONSIDERATIONS:

EQUIPMENT : A backhoe is generally sufficient to build this structure. A grading bucket may be handy.

SLOPE: The bank bench must have continuous fall lengthwise toward a stable outlet location. The slope should be sufficient enough to move the water, but gentle enough not to cause erosion.

WIDTH & SHAPE: The base of the bank bench should be wide and angled slightly into the bank with a smooth transition (see Figure 1 on front).

LOCATION: Bank benches can often be located where construction and maintenance can be done from the roadway, at times within the right-of-way. If deemed beneficial, multiple bank benches may be installed to slow and divert flow on steep or high-reaching up-slope banks.



STABILIZATION: Seeding and mulching of the newly constructed bank bench is critically important. The quicker vegetation can be established, the less erosion will occur on the disturbed areas. A diverse mix of native vegetation adapted to existing site conditions should be used whenever possible. When seeding with native plants is not possible, select vegetation suited to site conditions (i.e.- consider plants adapted to moist soils in this application).

OUTLETS: Where possible, outlets should be located in flat, stable, and well-vegetated areas. This approach will filter sediment, maximize infiltration, and help recharge groundwater. It is very important to ensure flow will not return to the road corridor.