

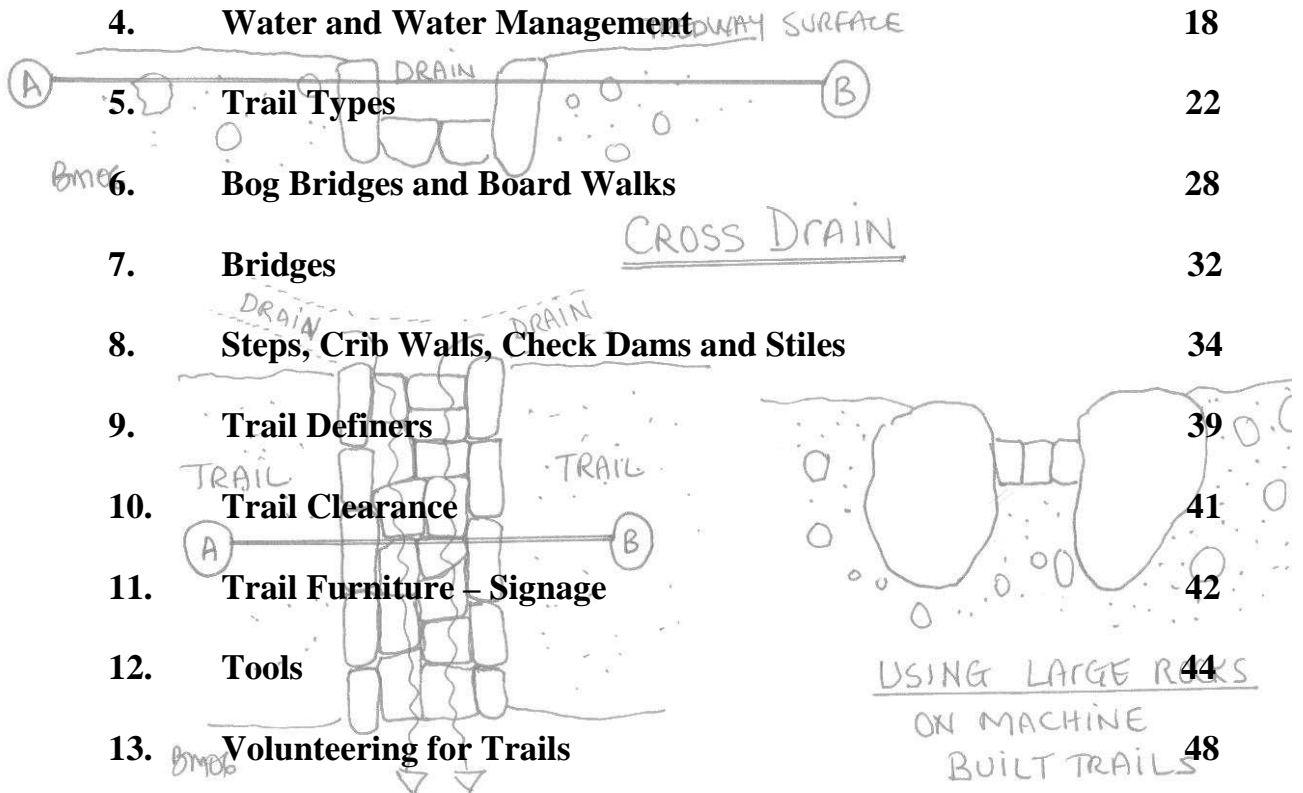
The Mountain Meitheal Guide to Trail Design and Construction in Ireland



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CONSTRUCTING STONE WATERBARS

First dig a trench and place rocks for the water bar in the trench to about 2/3 of their depth. See **Figure 17**. (Rocks should typically be about 300mm deep.) Line the drain in the bottom with small stones to protect the upper side of the water bar from rutting - these also help to wedge the water bar in place. Use the excavated material to backfill on the lower side of the water bar.

To ensure the full capture of water on the trail make sure that the bar extends slightly beyond the edges of both sides of the trail.

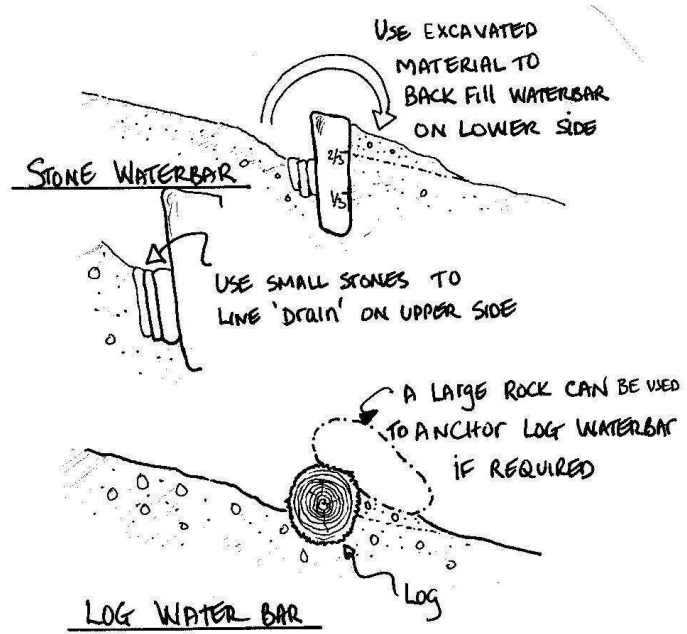


Figure 3 Cross section of Water bars

TIMBER WATERBARS

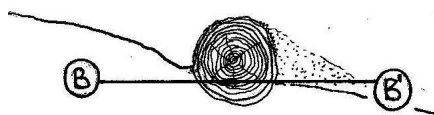
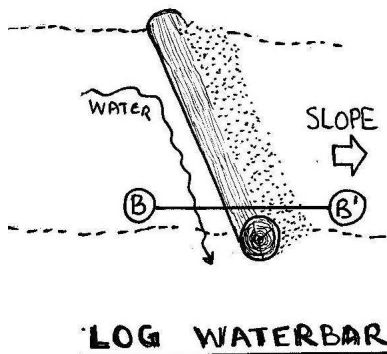


Figure 4 Log Water bars

Timber water bars (**Figure 18**) are a very effective method of constructing water diversion in areas where stone is limited or where the water bars are not subject to constant wetting (and therefore rotting).

Typically the log should be approximately 200 – 300 mm in diameter and of a durable timber such as larch.

Dig a trench approximately 150 to 200 mm in depth (see **Figure 17/18**). Place the log in the trench and back fill on the lower side with the excavated material.

Large rocks are often required to anchor the water bar at one or both ends.

Timber water bars are cheaper and faster to install.

How far apart should water bars or grade reversals be placed?

The simple rule of thumb is to divide the distance by the gradient of the slope in degrees. Therefore if a trail has an 8° slope on a 100m section of trail then the waterbars should be constructed approximately 12.5 m (12 m) apart.

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Mountain bike trail water bars

Although trail dips or grade reversals are the preferred method for dealing with water on mountain bike trails or on multiple use trails, on some trails in the US use has been made of **fabricated timber/rubber water bars**. These are fabricated by sandwiching a length of rubber between two lengths of treated timber (100mmX 25mm). These are placed flush with the trail surface with the rubber section protruding above the trail surface diverting the water. (See **Figure 22**)

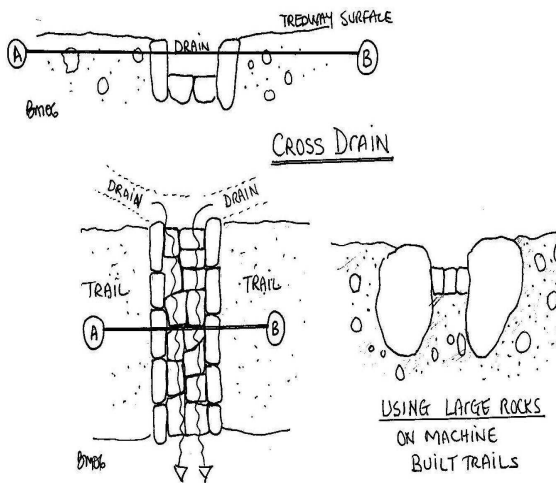


Figure 5 Cross Drains

Fabricated Water bars

In developed sites, fabricated water bars (see **Figure 23**) can be used in place of more rustic stone or log solutions. These can be fabricated by constructing a box like structure from treated timber and burying flush with the surface of the trail. Concrete fabricated drainage systems with a grate cover are available on the market.

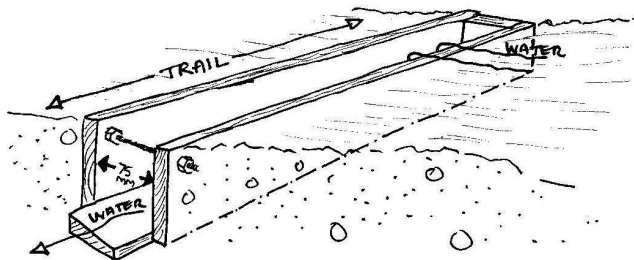


Figure 6 Fabricated timber water bar

Culverts

Culverts are an excellent method of taking water across a trail where fast flowing water is not going to present a problem or where obstacles such as water bars are not acceptable.

Culverts can be constructed using flags as the roof over a stone drain or using concrete pipes. See **Figure 24**.

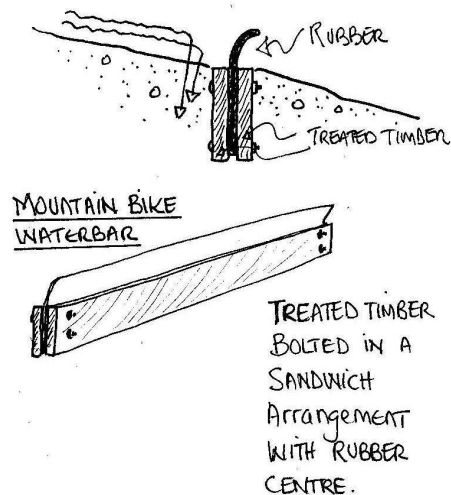


Figure 7 Fabricated Timber/Rubber Water Bars

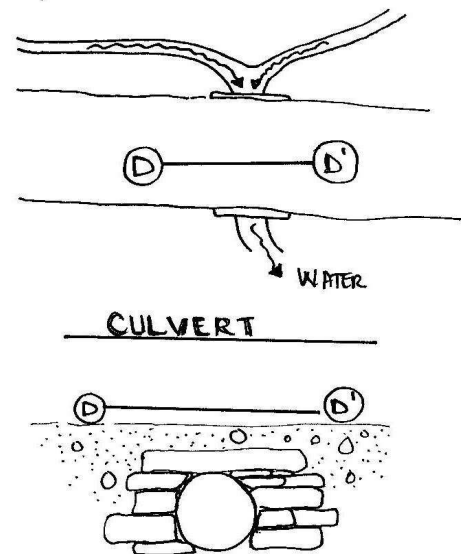


Figure 8 Culverts