

Land Notes

Natural Resource Management

ROAD DRAINAGE – WHOA-BOY CONSTRUCTION

Whoa boys (sometimes called check, cross, or roll over banks) are trafficable diversion banks. They are constructed to divert water off the track with out causing erosion and allowing vehicles or people to cross over them. Banks of different shapes and heights are used depending on the situation and the water diversion requirement.

Whoa boys can vary in size. They can be a few metres long and 10–30cm high on walking tracks. They may be large, gently sloping banks up to 30-40m and up to 3m high on deeply eroded areas.

WHOA BOYS ON VEHICLE TRACKS

Whoa boys can be constructed in two ways:

1. By cut and fill – Lines are ripped across the area at a grade of 0.3 %. A shallow channel should be cut along this line. Excavated material is dumped on the down slope side of the channel, then compacted and smoothed out to form a bank with even batters and a level top (See Figure 1).
2. Using imported soil material to construct a bank with a grade of between 0.3 and 0.5% along the up slope edge of the bank.

To aid trafficability, an approach and departure ramp can be cut into the bank (See Figure 2).

The bank should be run off into undisturbed vegetation or into an existing drain (care needs to be taken to ensure that erosion does not occur where the water runs down into the drain).

Alternatively a level sill can be constructed at the end of the bank to enhance the spread of water.

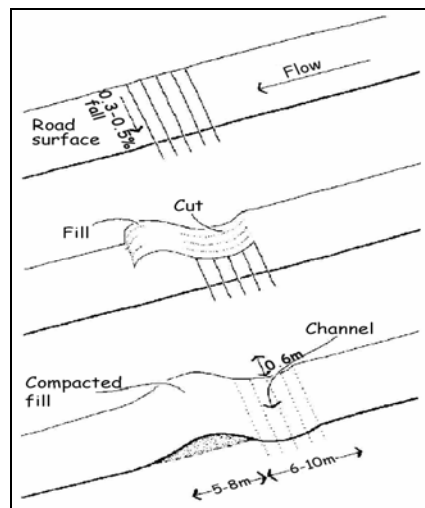


Figure 1 Whoa boy construction

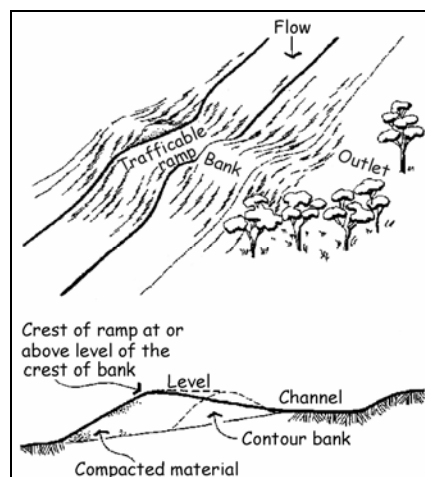


Figure 2 Whoa boy – vehicle track

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WHOA BOYS WITH LEVEL SILL

A level sill is a shallow excavation at the end of the bank, typically 5 – 7m long by 3m wide and 0.3m deep allowing water to flow out evenly along the length of the sill. There should be no disturbance to the ground surface down slope of the sill outlet. A cross-bank and level sill is illustrated in Figure 3.

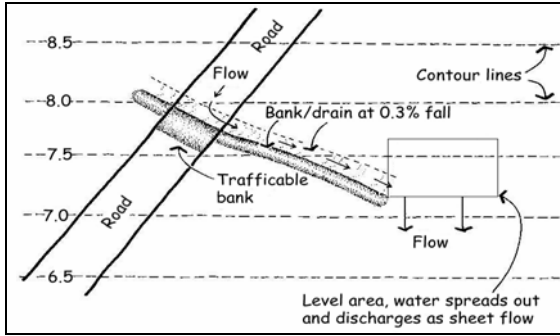


Figure 3 Whoa boy with level sill

If cross-banks are designed properly they reduce the need for table drains and other cross drainage works such as floodways and culverts. This helps to keep maintenance and construction costs to a minimum.

Bank design depends on slope, catchment, soil erodability and expected peak flows.

Table 1 presents bank spacings for various slopes. Where soils are more stable, banks can be spaced further apart.

Slope		Whoa Boy/Mitre Drain Spacing (m)
%	Gradient	
0.5	1 : 200	170 - 180
1	1 : 100	120 - 130
2	1 : 50	90 - 100
3	1 : 33	70 - 80
4	1 : 25	60 - 70
5	1 : 20	55 - 60
6	1 : 17	50 - 55
10	1 : 10	40 - 45
18	1 : 5.5	25 - 30

Table 1 Whoa boy spacings

WHOA BOYS ON WALKING TRACKS

One way to divert water off walking tracks is to construct small whoa boys 10-30cm high at appropriate spacings or locations.

Whoa boys on walking tracks can be constructed using logs, wooden planks, rocks, sandbags. Specially-made geotextile bags filled with locally derived rock or soil is a simple method of constructing whoa boys on remote walking tracks where getting materials into the site is difficult. Some methods of constructing whoa boys on walking tracks are shown in Figure 4.

Whoa boys on walking tracks need to extend a metre or so out beyond the edge of the track, as water needs to be spilled on to stable ground. Outlet protection such as rip-rap may need to be provided if ground is not stable.

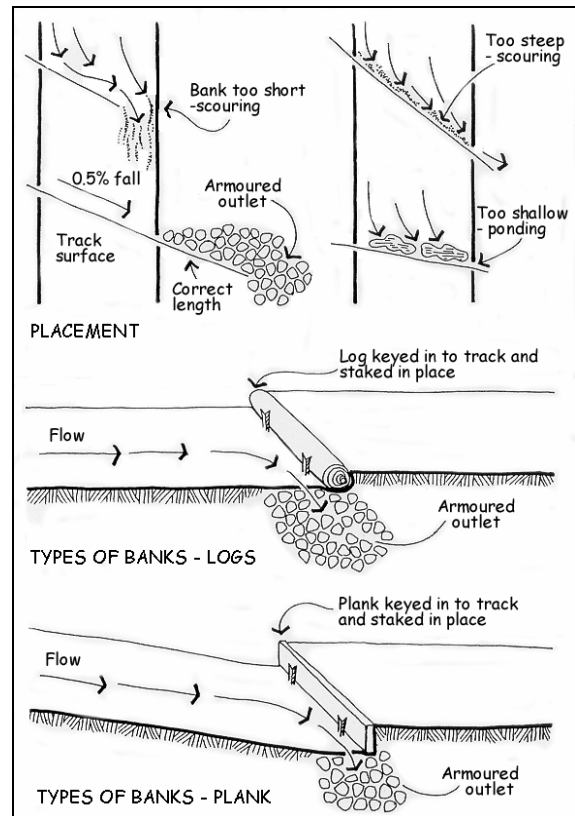


Figure 4 walking track whoa boy construction

For further information about controlling erosion in the southern region of the NT contact Advisory and Regulatory Services or visit our website

www.nreta.nt.gov.au/advis/land/soils.htm



Northern Territory Government
Department of Natural Resources, Environment and the Arts