GOULBURN BROKEN CATCHMENT MANAGEMENT AUTHORITY

Works on
Waterways Notes No. 3

Ford

Ford type crossings may be used in waterways where the frequency of crossing is low. Fords are not acceptable for regular stock movements such as on dairy farms due to animal wastes being directly discharged to the waterway.

3.1 Potential Waterway Impacts

Impacts of ford crossings can include:

- Reduced capacity for fish and aquatic fauna movement;
- Reduction in fauna habitat in the vicinity of the crossing;
- Contaminants from vehicles reduce water quality;
- Increased sediment input during construction and use.

3.2 Assessment Criteria

Ford crossings are to be a defined crossing point using rock or concrete, generally set at or near bed level to maintain natural flow velocities. Natural stream "cross overs" or riffles are often selected as fords.

Where the ford is raised above the bed level to improve trafficability, the downstream side of the ford is to be a graded rock chute adequate to provide fish passage. The rock chute is to extend the full width of the stream and include an apron zone installed to control headward erosion in streams. They are normally designed in accordance with the *Guidelines for Stabilising Waterways 1991* (SCRC) (available from the CMA).

Acceptable works are shown in **Table 3.1** below and an example of a typical ford shown in **Figure 3.1**.

Table 3.1: Rock Chutes

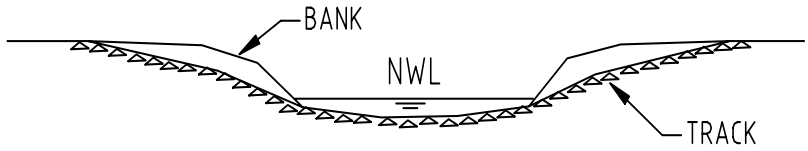
Criteria	Waterway Category	Acceptable Works
Height		1 metre preferred limit
Downstream slope	Class 1, 2 and 3	1:18 maximum
	Class 4	1:5 maximum
Downstream apron elevation		At or below downstream bed level
Downstream apron length		3 metres minimum
Rock size D_{50}		300 to 500 mm

Criteria	Waterway Category	Acceptable Works
Rock thickness 2 x D_{50}		600 to 1000 mm, keyed min. 600 mm into foundation
Rock Cutoff		1m deep under and up each side
Bank protection		Extend at least 33% of bank height, or at least 1m above crest.

(Reference: SCRC 1991 and Lewis et al 1999)

Provision for fish passage can be achieved by using flat batter slopes and dishing the crest and apron with a 300mm dip in the centre. Incorporating large rocks staggered along the length of the chute is also useful. Alternatively, a separate fishway channel could be incorporated into one side of the structure. It should be noted that the design of these works are continuing to be developed and some flexibility and innovation should be allowed.

Figure 3.1: Rock Ford



NWL = Normal Water Level

Depth indicators and signage should be provided. These are mandatory if the crossing is open to public access.

Drainage from the site and access roads should be directed to sedimentation basins or grassed filter zones to trap sediments, rather than discharging directly to the stream. Where outfall directly to the waterway cannot be avoided, piped or rock chute outfalls may be needed.

On dairy farms, the tracks are to be graded away from the waterway to a drainage recycling system to prevent animal wastes directly discharging to the waterway. There should be no direct connection of any dairy track to a stream or connected drain.

The batters of the access track excavated into the stream bank should be on a slope of 1(v):2(h) or flatter to facilitate the establishment of a grass cover. Table drains at the toe of the batters should be stabilised with graded rock.