

WATER & SOIL

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NO 6

A GUIDELINE FOR THE CONSTRUCTION OF ACCESS TRACKS AND FIREBREAKS



**NATIONAL WATER AND SOIL
CONSERVATION ORGANISATION**

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**A GUIDELINE FOR
THE CONSTRUCTION OF
ACCESS TRACKS AND FIREBREAKS**

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A GUIDELINE FOR THE CONSTRUCTION OF ACCESS TRACKS AND FIREBREAKS

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This guideline provides for information on protection and conservation of water and soil for makers of access tracks and firebreaks associated with soil conservation and forestry work on farms, in the form of suggested minimum standards for the alignment, grade and width of track, batters, water tables, stream crossings, culverts, cut-offs, revegetation and safety. The guideline also explains when approvals are required and where to go for information.

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FOREWORD

This guideline has been prepared by the former Mountain Lands Committee of the Soil Conservation and Rivers Control Council. Both New Zealand Forest Service and the Department of Lands and Survey have been consulted in the guideline preparation.

The Soil Conservation and Rivers Control Council and the Water Resources Council approved the guideline in March 1979.

This guideline will be reviewed from time to time should this be necessary.



A.W. Gibson
DIRECTOR OF WATER AND SOIL CONSERVATION

GUIDELINE FOR THE CONSTRUCTION OF ACCESS TRACKS AND FIREBREAKS

1. SCOPE

This guideline sets out in broad terms the general requirements for tracks and firebreaks normally associated with soil conservation and forestry work on farms.

2. GENERAL COMMENT

Conditions vary widely in the country and differing construction standards will be required depending on type of country to be traversed.

In considering the placement of tracks and associated works the type of land needs to be considered; if it is porous cut-offs will be minimal; if it is a heavy clay, cut-offs must be frequent. The side slopes are likely to vary too - if the track is cut out of stable rock, batters can be very steep, as is also the case in cemented pumice. If on clay or other land subject to slipping, then uphill batters should be flatter where possible.

Grades must be considered. Anything over 1:5 or 1:6 can be dangerous in wet weather, but this again depends on the country. However, even for limited access tracks grades of greater than 1:6 should be avoided.

Over the first few years after a track or firebreak is constructed maintenance is usually high until the country settles down.

In many instances when firebreaks are constructed it is not possible to locate them where erosion will be minimal - a safe location may mean that the firebreak will not be effective. This would apply more in the North Island forest situation than in the South Island tussock country.

When such firebreaks are constructed, ancillary works such as debris traps should be constructed to intercept run-off and sediment before it reaches any watercourse.

As with most things, careful planning will avoid or minimise problems later on.

The following sets out the main points to be considered when tracks and fire-breaks are to be constructed. These requirements relate to tracks and fire-breaks which are required mainly on farms or those associated with small afforestation projects where the use of the tracks will not be heavy and is principally for farmer use.

3. APPROVALS REQUIRED

- 3.1 The prior approval of the catchment authority must be obtained before construction begins where work is to be supported by a Soil Conservation and Rivers Control grant and where required by catchment authority bylaws or controls under the Soil Conservation and Rivers Control Amendment Act 1959.
- 3.2 The catchment authority is also able to give advice and assist with flagging the most appropriate route for the track and help supervise construction.
- 3.3 The statutory requirements regarding watercourses must be observed, in particular, requirements for water rights. These should be checked with the local catchment authority.
- 3.4 The approval of the Commissioner of Crown Lands must be obtained before construction begins on areas of land where the Department of Lands and Survey is the land administering agency. In these cases field officers from the department will be associated with flagging the most appropriate route and help supervise construction.
- 3.5 An environmental impact assessment or report may need to be completed by those promoting the construction where the land administering agency requires this to be done, or where the expenditure of public money is involved.

4. PLANNING

Is the proposed track really necessary, and is it the best way of achieving the desired objective? Careful consideration of location and type of track or firebreak can minimise adverse effects such as slipping, slumping, scouring and flooding.

5. USE

The type of vehicles that will use the track and the season of use can be important factors affecting the standard of track required. This guideline applies more particularly to 4-wheel drive vehicles, tractors, etc.

6. ALIGNMENT

Track alignment should take into account the existing landform. The track should be sited and constructed to cause minimal disturbance to the landscape, and the natural contour and vegetation cover should be used to conceal it from obvious viewing points, if possible. Remember a well-graded track is better to look at than one with haphazard grades.

The route of the track must be competently sited and adequately flagged to avoid potentially unstable or other likely problem areas before construction commences.

7. CONSTRUCTION

7.1 Grade

7.1.1 The grade of the track should be kept as low as possible, generally not greater than 1:6 and with a maximum grade of 1:5. Grades should be reasonably even to avoid excessive gear-changing, though minor rising and falling sections help reduce water runoff velocities.

7.1.2 Where appropriate, the surface of the track should usually have a crossfall grade of approximately 1:25 towards the bank or water table.

7.1.3 Corners should generally be flat, or gently climbing; corners and bends round ridges are good places to account for irregularities in grade, avoiding rock outcrops etc.

7.2 Width

The minimum track width should be 2.5-3 metres, with the total formation width including fills and water tables being a minimum of 1 metre wider.

7.3 Batters

Where possible, the uphill batters should be sloped back or struck off to a stable gradient to minimise slumping and to allow grassing down. Batter slopes should generally not exceed 35° except in hard rock.

7.4 Water Tables

A proper water table should be constructed along all sidecut portions of the track. The water table must be capable of carrying the sub-surface drainage as well as runoff during storms, without adversely affecting the track.

7.5 Stream Crossings

The crossings of all streams should be constructed to a hard bottom, rock filled or culverted. Be sure to allow adequate capacity for flood flows and possible diverting of stream down track.

7.6 Culverts and Cutoffs (other than crossings)

The water table must be adequately served by culverts and cutoffs to remove runoff and sub-surface drainage water. On a steep grade of 1:5, culverts or cutoffs should occur at least every 20 m, while on a grade of 1:10 they could be up to 60 m apart.

The culverts must be of sufficient size to handle at least the expected volume of water and must be designed and placed to avoid blockages. The culverts need to be long enough so that they project beyond the base of the side-casting or fill slope. A splash pad to absorb the impact of the water will usually be required. If at all possible, avoid having culverts or cutoffs emptying directly onto any noticeably damp area or into existing watercourses.

8. REVEGETATION

Once construction is completed, disturbed areas should be oversown and top-dressed immediately with suitable material, where this is an appropriate follow-up step. Germination of seed is better on fresh cuts and fills.

9. TRACK SURFACE

- 9.1 In some places the oversown plants may not be sufficient to prevent scouring and erosion of the track surface and some metalling may be required. A rate of 1 m³/10 m of track is usually sufficient to provide traction.
- 9.2 The track surface should be free of corrugations and debris so that it is readily negotiable.

10. MAINTENANCE

The track should be inspected periodically, particularly after storms, to ensure that it is in good condition, that the culverts are clear and able to function correctly, no scouring on the track surface, no batter slump, etc. Any required remedial work should be carried out as soon as possible to prevent further deterioration.

11. SAFETY

Always take into account safety requirements. These relate particularly to gradient, track surface, track width and the ease of negotiating corners. Slipping tracks are dangerous, so either metal them or do not use them where they are wet - take this into account when planning them. Do not make corners too sharp - make them easily negotiable. Where there are gates across the track, make sure there is a flat place on which you can stop a vehicle.

WATER AND SOIL MANAGEMENT PUBLICATIONS

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|--|-------------------|
| 1. Regional planning and development by water and soil conservation agencies | 1975 |
| 2. Wetlands | 1975 |
| 3. Urban land development (provisional) | 1975 |
| 4. Sand and shingle extraction | Not yet published |
| 5. Forest operations guideline | 1978 |
| 6. Construction of access tracks and firebreaks guideline | 1980 |
| 7. Skifield development guideline | 1980 |

