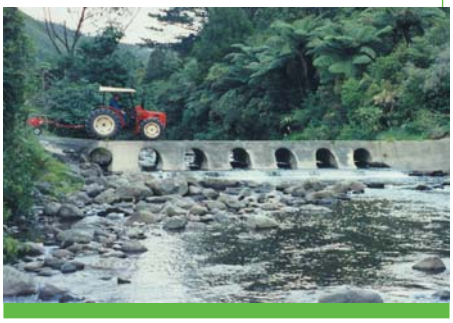
Stream Crossings

Introduction

Farm access often requires stream crossings, which may be bridges, culverts and fords. Correctly constructed bridges have the least impact on stream flow but not all sites are suited to bridge crossings. It is necessary to design a stream crossing that is practicable and will have minimum impact on stream values.

Within the Bay of Plenty the Regional Land Management Plan allows for *small scale* stream crossings to be installed and maintained as a **permitted activity**, without the need for a resource consent. Specific conditions still need to be followed to ensure that adverse effects are controlled.



A well designed battery ford

Permitted Activity Conditions for All Crossings

Crossings may be constructed as a permitted activity provided they are not located within an Erosion Hazard Zone as identified by the Regional Land Management Plan, and that they are not installed on a channel, which is part of a Catchment Control Scheme.

Check with Environment Bay of Plenty regarding the status of proposed crossing sites. To qualify as a permitted activity the proposed crossing should not alter the natural course of the stream or divert flood water. If located within 50 metres of a boundary, written consent from the neighbour is required. Crossings can not be installed as a permitted activity if sited within one kilometre of an urban area or settlement.

In addition, there are standard conditions for all permitted activities (check with Environment Bay of Plenty) plus specific conditions for stream crossings as follows:

- Culverts and bridges must be designed to accommodate a ten year flood event (seek professional engineering design advice).
- Construction should avoid any adverse effects on fish spawning and migration. This can be achieved by:
  - construction outside the spawning/migration season;
  - using techniques to avoid material entering water; and
  - the structure and associated works not impeding fish passage.
- Approaches, abutments, inlets and outlets should be stabilised and protected against erosion.
- Sediment releases must be minimised during construction allowing no conspicuous changes in visual clarity of water.
- All materials used during construction that are not part of the stream crossing must be removed.
- Crossings must be maintained so that there is no accumulation of flood debris.

A crossing which does not conform to any of the previous conditions will require an application for a resource consent.

Bridges

Bridges offer a number of advantages. Continuous use is possible during heavy floods, while bridges have minimal impact on streams and create no impediment to fish passage. They can be expensive to construct however, and design weight restrictions apply.

Bridges can be installed as a permitted activity subject to standing conditions as described above. Such bridges must be single span structures and are subject also to the following specific conditions.

- The catchment area above the bridge shall be equal to or less than 100 hectares.
- There should be no excavation or infilling of the stream bank.
- Bridge abutments or foundation should be constructed parallel to the stream flow.
- Bridges should be anchored to prevent washing away by floods.

- Approaches and abutments should be stabilised and appropriate runoff controls installed to protect them against erosion.

Culverts

Culvert crossings are commonly used in minor streams and offer the advantages of high weight loading capacity and low maintenance, if constructed properly. They should be designed and sited with care to avoid impeding fish passage, and may be susceptible to blockage if located in channels carrying a high volume of debris.

Culverts can be installed as a permitted activity in accordance with standard conditions, and specific conditions as follows:

- There is only one culvert pipe per crossing, of the appropriate length.
- Minimum culvert diameter is 300 mm and the maximum is 900 mm.
- Maximum fill height over the culvert is 1.5 metres.
- Fill batters are stabilised on completion of installation.
- The culvert is installed on a hard, stable bed.

Fords

There are several options with ford crossings. These are dry or wet fords or natural streambed crossings. The choice is often dependent on the streambed substrate.

Sites with a hard ignimbrite base are suited to streambed crossings. Gravel and soft substrate streams are more suited to either a battery (dry) ford or a concrete pad (wet) ford. Construction of fords is a permitted activity provided the standard conditions, and the following, are complied with:

- Fords are constructed on a hard stable bed.
- Prevent concrete and concrete ingredients from entering the stream flow.
- Streambanks on either side are less than 1 metres high.
- The water body shall have a maximum water depth no greater than 600 mm calculated with reference to the mean annual low flow for the stream (seek professional engineering design advice).

Natural bed crossings

This type of crossing is suited to hard rock streams or where infrequent crossing of the stream is required. Such crossings are inexpensive, offer no impediment to stream flow or fish passage and can have high weight loadings if sited carefully. The suitable (stable) crossing point may shift after a flood however, and access is completely disrupted during floods. Water quality will also suffer as a result of bed disruption and animal wastes.

Battery or Dry Fords

These suit wide shallow streams where the option of a bridge or a culvert is too expensive.

These fords are only inundated in heavy flood flows and otherwise allow continuous access. Battery fords have a high weight loading capacity but may impede fish passage if not designed carefully.

Construction of battery fords (multiple culverts and the pouring of concrete in a waterway) requires a resource consent.

Concrete pad or wet fords

These are suited to wide shallow streams where it is too expensive or not necessary to maintain a dry crossing. Concrete pads are relatively inexpensive, do not impede stream flow and have high weight loadings. They may impede fish passage however, and small floods will disrupt access.

Assistance with Stream Crossings

Environment Bay of Plenty staff can advise land owners on crossing type and location. Detailed engineering advice will require the services of a consulting engineer. Also, crossings may need to be identified as possible farm hazards under Occupational Safety & Health legislation.

Environment Bay of Plenty
REGIONAL COUNCIL

For further information and advice, contact your local land management officer at Environment Bay of Plenty:

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