



The rules: what you need to know

There are a few rules you need to meet to be able to construct a bridge or crossing (culverts or fords for stock and vehicles) without a consent.

See inside for details on:

- The construction and design of bridges (Rule 13.2.1.7) and culverts (13.2.1.7B);
- disturbance of the bed of a river, lake, or wetlands (waterways) during construction (Rule 13.5.1.3);
- controlling runoff from laneways bridges and culverts (Rule 12.C.1.1);
- impacts of stock crossing through waterways, and;
- design factors to consider.



When installing a crossing, get sound advice from a professional to ensure you get it right first time.

The Otago water quality rules

Bridges and culverts



It is permitted by ORC to build bridges and crossings, provided certain conditions are met. Always check with your district or city council as well to ensure you do not need any additional consents.

The Otago Water Plan does not allow pugging, erosion, or water clarity changes caused by stock crossing through a waterway (rivers, streams, lakes, and Regionally Significant Wetlands).

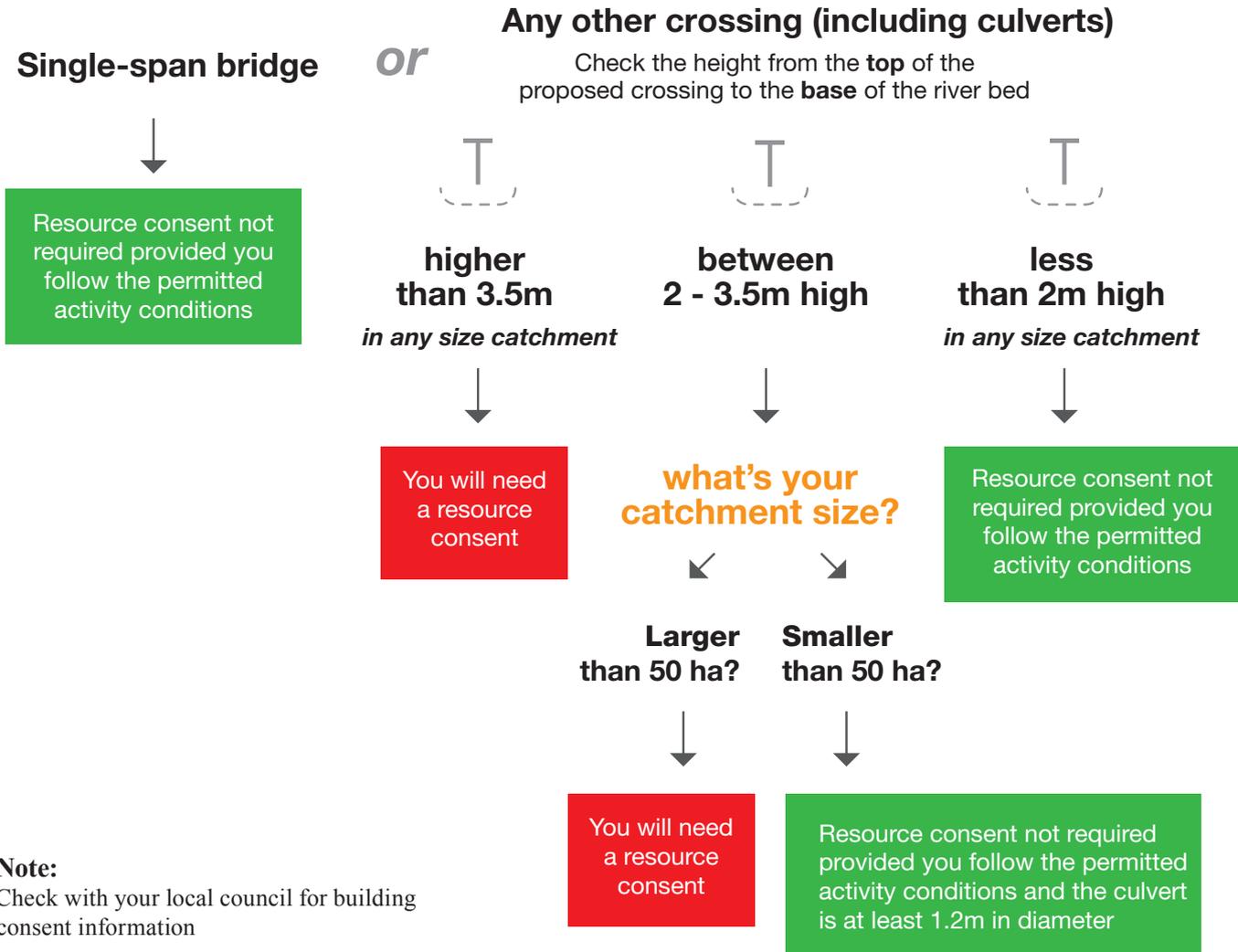
Building culverts and bridges is encouraged. Well-built crossings ensure good water quality is maintained, while simplifying land management.



A stock crossing designed to prevent mud and animal waste getting into the water. Drainage flows need to be dispersed and filtered over vegetation before reaching the waterway.

BEFORE BUILDING A BRIDGE OR CROSSING

1. Check what you are building and its size



This culvert provides fish passage but has no measure to stop animal waste runoff to the stream.



This culvert is too high to allow fish passage.

2. Check for building consent

All structures over 1.5m will need a building consent, and some construction work will also require an earthworks consent.

Before starting construction always check with your local city or district council to ensure the proposed building work meets any district planning requirements.

3. Check you can meet the permitted activity conditions

You can build a *single-span bridge* or a *stock crossing* without a resource consent provided that:

- it doesn't cause flooding, impede flood flows or movement of bed material, and is stable under flood conditions;
- doesn't cause erosion or property damage, and is secure against bed erosion, floodwaters, and debris;
- you adopt measures to prevent animal waste entering water from the structure and adjacent laneway;
- any public access along the river bank is maintained.

ADDITIONAL SINGLE-SPAN BRIDGE CONDITIONS

- there are no more than 20 metres of bridge over any 250 metre stretch of any lake or river.
- the bridge soffit (underside of the bridge) is not lower than the top of the higher river bank.

ADDITIONAL CROSSING CONDITIONS (EXCLUDING SINGLE-SPAN BRIDGES).

- the top of the crossing is no more than two metres above the lowest part of the adjoining bed.
- there is no more than 24 metres of crossing over any 250 metre stretch of lake or river with a minimum of 12 metres distance between each crossing.
- fish passage is preserved if passage was possible before the crossing was built.
- movement of bed material isn't impeded.

For catchments of less than 50 hectares, crossings can be more than two metres high.

The top of the crossing must be less than 3.5 metres and the culvert must have a minimum diameter of 1.2 metres or equivalent cross sectional area.



4. Check you can meet the bed disturbance conditions

When putting in a crossing or bridge you also need to meet permitted activity conditions for disturbance of the bed of a waterway.

Water Plan Rule 13.5.1.3

The disturbance to the bed of a waterway, and any resulting discharge of bed material, for the purpose of constructing a culvert or bridge is permitted provided:

- the structure is legal and;
- the time needed to complete the work within the wetted bed area doesn't exceed 10 hours;
- reasonable steps are taken to minimise the release of sediment to the waterway;
- there is no conspicuous plume or change in colour or visual clarity more than 200 metres downstream of the disturbance;
- there is no damage to fauna or native flora in or on a Regionally Significant Wetland;
- there is no change in the water level range or hydrological function of any Regionally Significant Wetland;
- the site is left tidy upon completion of the work;
- no lawful take of water is adversely affected as a result of the activity; and
- in the case of reclamation or deposition, only cleanfill is used.

If you can't comply with one or more of the conditions above, you must obtain a resource consent before undertaking the work.

5. Check that you can control runoff from laneways, bridges and culverts

Rule 12.C.1.1 Otago Water Plan

Make sure your bridge or culvert is designed to stop runoff entering waterways.

Any runoff from laneways must meet permitted activity conditions including ensuring that there is no conspicuous change in colour or visual clarity, noticeable increase in local sedimentation, floatable or suspended organic materials; and no odour, oil or grease film, scum or foam. From 2020, discharges must meet nutrient and bacteria thresholds (Otago Water Plan, Schedule 16).



The raised edges on this bridge prevent effluent washing into the stream. It is a good idea to extend the kerbs beyond the length of the bridge to channel runoff towards the paddock and not into the waterway.



Stock crossing through waterways like this are a major source of sediment and contaminants.

What is the impact of stock crossing through waterways?

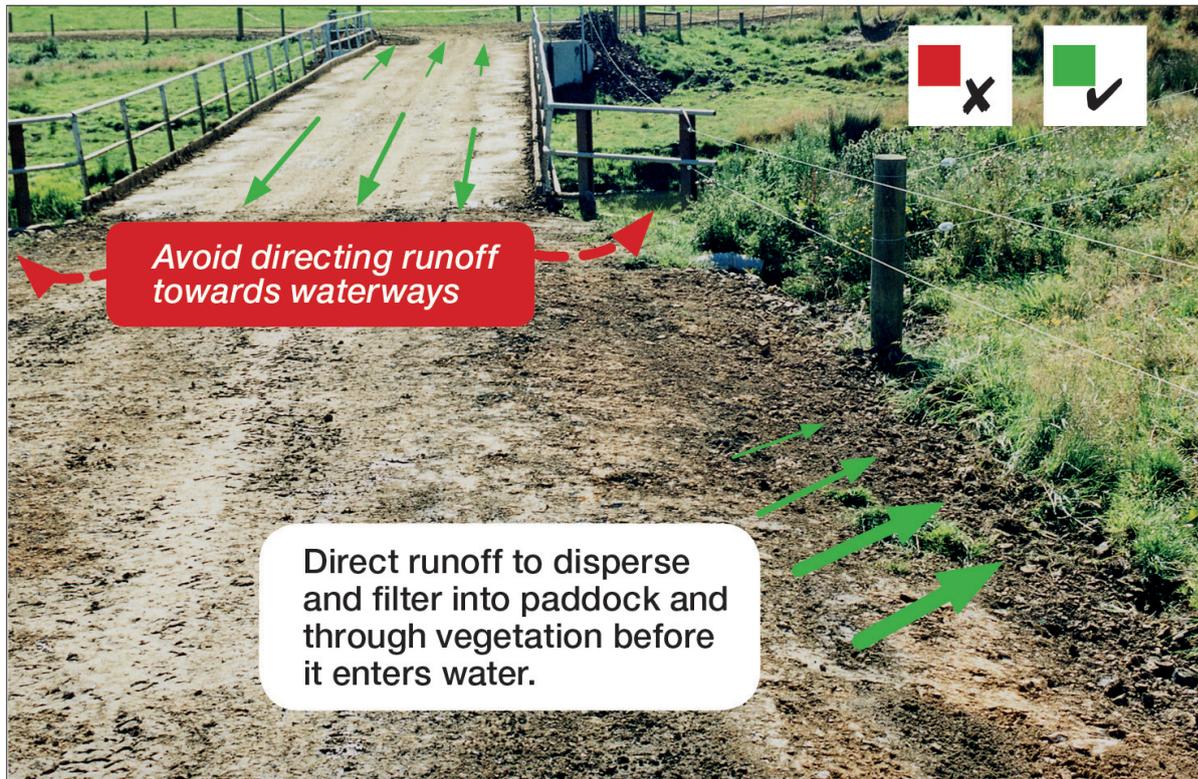
Stock or vehicles crossing through waterways can degrade water quality.

Cows driven through a waterway, poo 50 times more per metre of waterway than on a farm raceway (Davies-Colley et al. 2004).

Herds crossing waterways can cause large sedimentation plumes and high phosphate, nitrogen and *E. coli* contamination of up to 50 000cfu/100ml. Schedule 16 of the Otago Water Plan sets water quality discharge thresholds for *E.coli* to be no greater than 550 cfu/100 ml.

Regular vehicle crossing also causes sediment plumes and disturbs the riverbed.

Well designed waterway crossings have an immediate impact, reducing *E.coli* contamination to improve water quality.



Using a well designed bridge to move stock across a property reduces the risk of water quality being degraded, protects stream life and avoids the need for access restrictions during high flows.



Ensure your culvert is at least as wide as your stream or creek. The bottom of the culvert should mimic the natural bed.



What sort of features should bridges and crossings have?

To avoid breaching the water quality rules you should design certain features into the construction of your bridge or crossing.

These features include:

- a raised lip or kerbing on the side of crossings intended for stock to minimise runoff.
- contouring the deck and approach to a bridge or culvert to direct runoff away from the stream.
- choosing the best location - consider the bank height and channel width, to reduce the need to install solid foundations on the river banks.
- installing culverts in a straight stretch of stream with a low gradient. Bends or changes in gradient near culverts are likely to cause erosion.
- ensuring the bridge or culvert is long and wide enough to safely accommodate stock numbers.
- making sure the length of a bridge is greater than the width of the stream so the abutments don't encroach on the waterway to restrict flows and increase maintenance costs.
- ensuring culvert pipe size is large enough to carry high flows, as a general rule - the bigger the better.
- retention of the natural flow of the streambed to help fish passage - use rocks where possible.
- armouring the banks around culverts to reduce erosion and the risk of sediment getting to the waterway.

The Ministry for the Environment farmers guide on culvert and bridge construction contains good practical advice when planning the construction of culverts and bridges:

www.mfe.govt.nz/publications/land/culvert-bridge-oct04



This is a good example of a well-designed bridge with a raised lip on the side and slightly raised approaches to direct runoff away from the waterway.

Need more information?

Follow this symbol on our website:



Check out these other guide sheets:

- 5. Stock access to waterways
- 7. Working in waterways
- 8. What is a river?
- 9. Resource consents for working waterways.

You can email us on:
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Phone us on

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The information in this pamphlet is intended to provide guidance only and is not a substitute for obtaining professional advice.

Refer to the Otago Regional Plan: Water for Otago for full details of the water quality rules.



Good practice



This bridge is designed to stop runoff from entering the waterway by installing a kerb on the side and maintaining a large a vegetation buffer. Contour the deck to direct runoff away from waterways.

Advantages of well-designed crossings

- ✓ reduced erosion of valuable land
- ✓ reduced need to maintain surrounding roads and fences
- ✓ improved access
- ✓ increased efficiency of stock movement
- ✓ improved stock health (i.e. less stress, lameness, and incidence of liver fluke)
- ✓ improved water quality (less bacteria and sediment, safer for swimming and stock drinking water)
- ✓ better fish habitat and access for fishers
- ✓ improved farm value
- ✓ opportunities arise for more innovative farm management; and
- ✓ reduced crossing damage and maintenance requirements.