



Building creek crossings

Looking after all our water needs

Key things that need to be thought about when planning to build creek crossings are outlined below. For advice on structural design you will need to contact a qualified engineer.

Consider how and when the crossing will be used

1. If you do not need all-weather access and the creek does not stay deep for long periods then an in-bed ford crossing should be considered as this is usually the cheapest and easiest crossing to build.
2. Where all-weather access is required, an open-span or box culvert crossing is recommended.
3. If stock will use the crossing, fencing will be required to prevent the stock having free access to other areas of the creek bed and banks. If the crossing is used by stock only at specific times then temporary fencing is recommended.

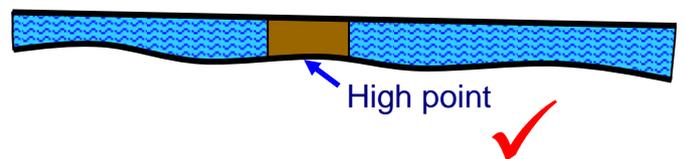
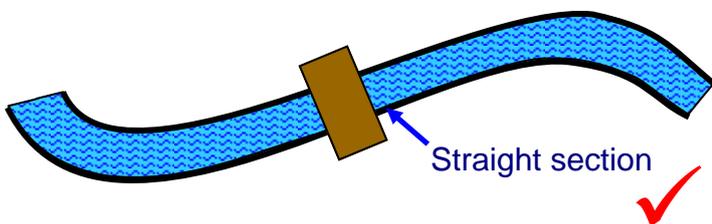


Selecting the best location



1. The amount of material and work needed to reduce the risk of slumping and erosion depends on the soil type. Sandy soils are more at risk and even more so when disturbed. Both the upstream and downstream bed and banks will need to be protected.
2. If the creek bed or the banks are showing signs of slumping or erosion the reason for this erosion needs to be looked into and considered when locating and designing a crossing.
3. Crossings should be located on straight sections and not on bends, as shown in the image to the left (straight section).

4. Creek beds have high and low points. Crossings should be located on high points to reduce the amount of materials needed, as shown in the image to the right (high point).



Mimic the shape and area of the natural channel

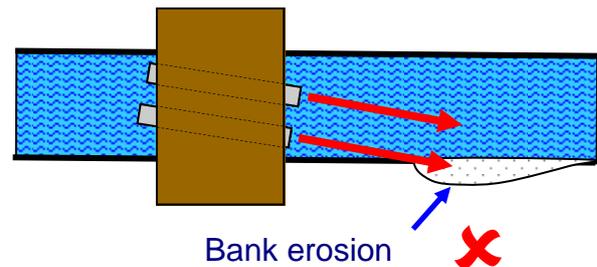
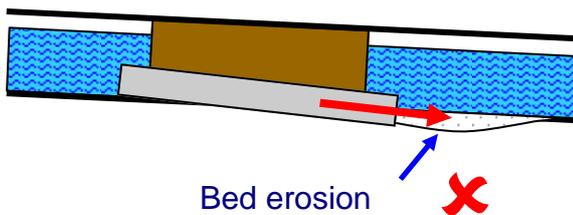
1. Wherever possible, use a spanning structure or box culverts to replicate the shape and area of the creek. If the area through which water passes under the crossing is less than the area of the existing creek then:

- water is likely to back up during large flow events and could lead to flooding and possibly damage if the water passes over the top of the crossing
- if water backs up it will be pushed through the box culvert or pipes at an increased velocity and is likely to lead to erosion of the creek
- to reduce the chance of the crossing being damaged and the creek being eroded rock or similar protection should be placed in areas at risk.



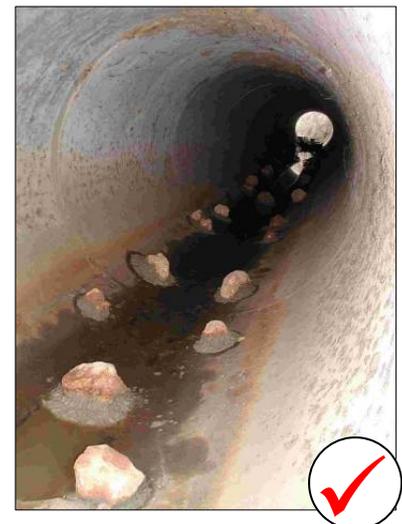
2. If the slope of the box culverts or pipes is not the same as the slope of the creek, erosion will occur, as shown in the left hand image below.

3. If the crossing directs water into the bank of the creek, erosion will occur, as shown in the right hand image below.



Make the crossing friendly for aquatic animals

1. Aquatic animals can only overcome small drops in height, but not large ones. Large drops in crossings, such as shown in the image below, create a barrier for aquatic animals so crossings should be built with no large drops in height.
2. Aquatic animals can not move upstream in fast moving water and water velocities in crossings with smooth bases are likely to be too high. Therefore, the velocity needs to be reduced. One option is to recess the culvert below bed level. Alternatively, randomly placed rocks can be fixed to the base of the culvert, as shown in the image to the right.



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