

Creating creek crossings

FACT SHEET | 2016

What are the benefits of creek crossings and fenced waterways?

- » improve access when creeks are running high
- » improve stock management
- » improve water quality
- » prevent and control creek bank erosion
- » establish riparian zones to buffer creeks from paddock activities
- » enhance stock health through access to clean water
- » improve biodiversity.

Design options

Culverts

A good and cheaper option for creeks that carry little sediment and don't flood regularly.



Box Culverts

Have the advantage of being stronger than circular culverts and pipes, allowing more fill height, providing a good base for the crossing.



Low level crossings or fords

Constructed to allow normal flows of water to pass through the culverts, whilst allowing floods and peak flows to flow over the top of the crossing.



Bridges

Generally have less impact on stream banks and water flows than culverts. Bridges need to be constructed high enough to avoid obstruction of high stream flows and a raised lip to prevent run off.



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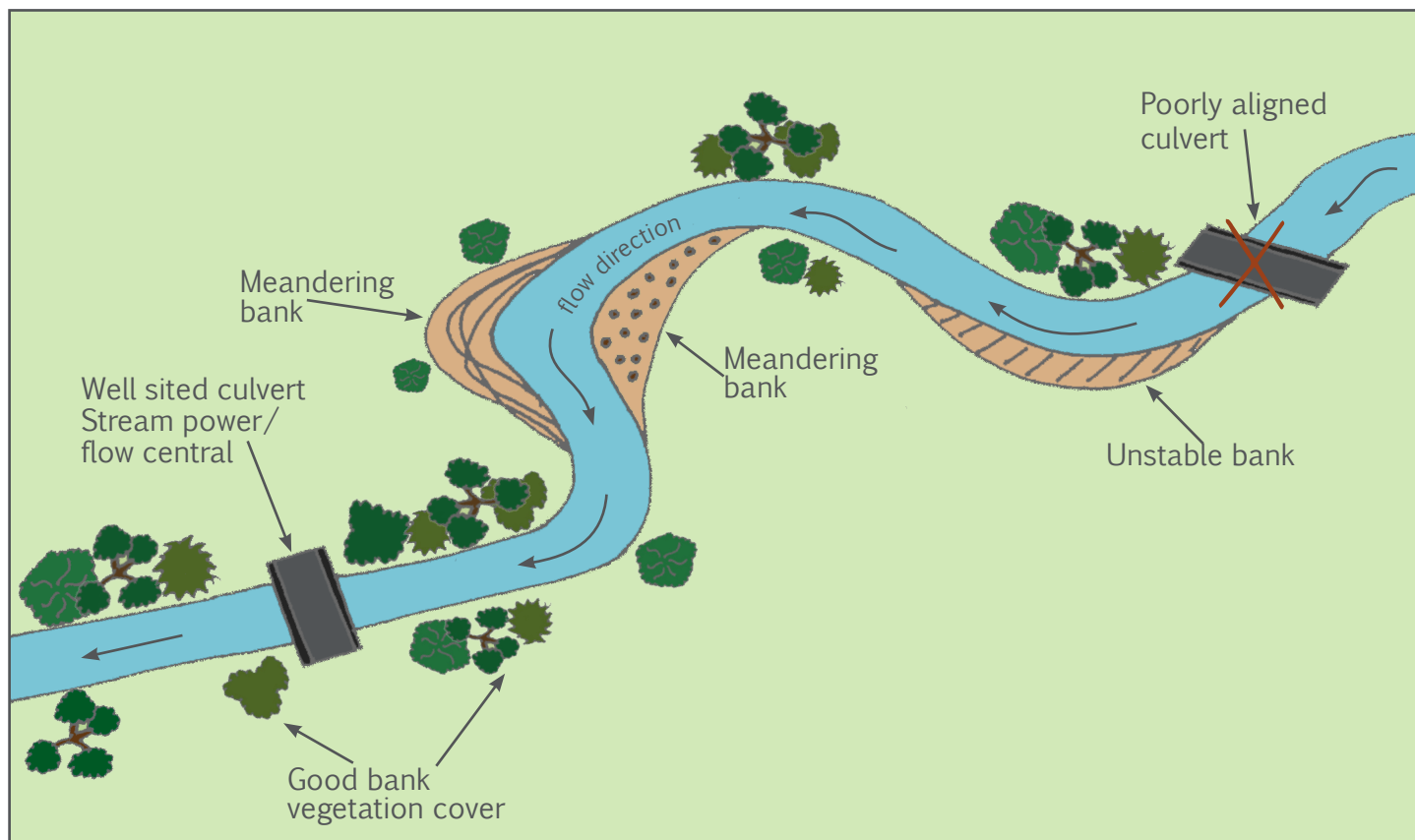
General principles for all culvert types

Take care with the construction of creek crossings so they don't cause erosion or wash away with floods. Getting the size and installation right the first time will save you money in the long term, avoiding failures and expensive maintenance work. When it comes to culvert size, bigger is generally better!

Positioning

Place the culverts along a straight stretch of the watercourse where the flow line and streams power are concentrated in the center of the stream. Placing a culvert at a sharp angle to the stream, near sharp bends or unstable banks may cause erosion and the risk of the crossing being washed out.

Figure 1. Siting of a culvert



Excavate approximately 150 mm beneath the creek base over the length/width of the crossing and 2 m out from the outlet of pipes/culverts.

Setting the floor of the culvert below the base of the creek bed will avoid vertical drops (hence erosion) at the outlet and prevent ponding (water stagnation) at the top side.

Erosion prevention

- » Use rubble or rocks at both ends to reduce erosion.
- » Well positioned headwalls will help prevent erosion at the entrance and outlet.

To protect the streambed, rock/rubble should be placed directly downstream of the culvert at the end of the scour pool. The end of the scour pool is defined as the distance of ten times the height of the culvert. If more than one pipe is used, 13 times the height.

For more information

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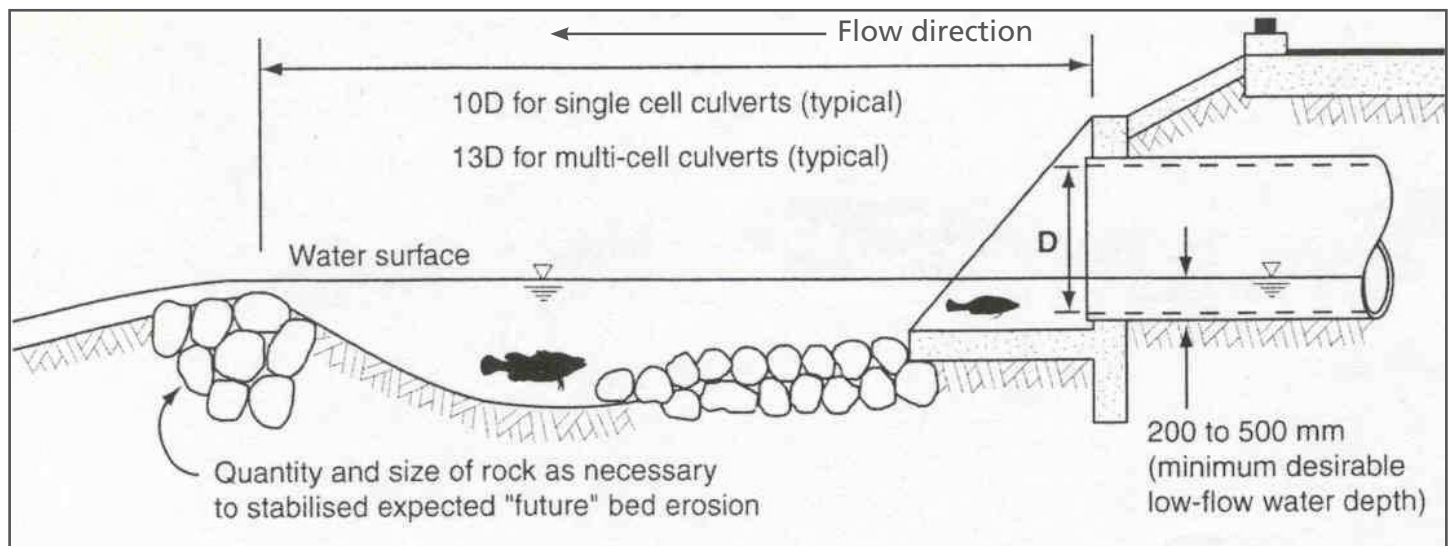
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Figure 2. Culvert design



Height of the crossing

- » The middle section of the crossing should be lower than the left or right bank to enable higher flows to remain in the channel and not back up around the structure.
- » The top of the culvert pipes must also be as close as practical to the top of the crossing, to allow overtopping and preventing the flow from backing up.

Construction of the crossing

- » Construct crossings in early summer allow to stabilisation prior to winter.
- » Lay sand or screenings on the bed and compact before laying the pipes/culverts.
- » Place large (50 cm) rocks around and between the pipe for stabilisation. Smaller rock (10–20 cm) can be used to provide fill for the width of the crossing. Ensure all layers are well compacted.
- » A small (<2%) cement mix can be added to the gravel surface over the crossing. This helps stabilise surface material and reduces the risk of erosion.
- » The rubble surface / raceway over the crossing should stretch further than the top of the creek banks as this area may be boggy during winter months.
- » Build a spill way to cope with extreme flows ensuring any overflow can 'flood out' naturally and re-enter the stream without causing erosion

Maintenance

- » Check culverts for debris build up at regular intervals, particularly after rain.
- » Fence the creek line to exclude stock. Place your stock fence 5 m back from the top of the bank.
- » Revegetate the riparian zone by planting native trees and shrubs along the margin of the creek line

Regulations

- » Check with Natural Resources Kangaroo Island about design and consent requirements including any native vegetation clearance. Creek crossings should not alter the natural flow regimes.



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