ROCK CROSSINGS

by D. Phillips-Jones

These crossings have been tried in one of the Southern Divisions, and have been found to have certain advantages over the conventional pile or bed-log type bridge, viz:

1. Cost - To survive flooding a bridge has to be built big enough to cope with the maximum expected flow. Therefore to bridge rivers of the size of the Frankland, Deep, Shannon etc., structures costing thousands of pounds have to be contemplated. A low level crossing costs far less.

2. Simplicity of Construction - Nothing really technical is involved. All material except spikes can be found in the bush close to the job.

3. Maintenance - Maintenance is easy, usually consisting of clearing debris, refilling minor washouts with rock etc.

This type of crossing of course applies to fire lines and forest tracks that are not used extensively all the year round; where one has need of easy access into country over rivers or large streams to carry out fire prevention or suppression.

THE SITE:

It is best to pick a site where there is a natural rock foundation or shallow crossing. These are generally picked out anyway from the aerial photos, when doing the preparatory selection. If a site of this nature is not available, then the banks can be cut down to conform with the width of the track, care being taken to sweep the banks well away and out on the immediate approach to the stream, otherwise in flooding the water will rise up the cutting like a drain and wash out the walls of the track. (See Fig. 1).

METHOD:

Select 18" to 24" diameter logs long enough to cross stream from bank to bank + 6' overlap each end. If one log cannot be found long enough then two logs joggled together are adequate. Tie logs in line with outside of cutting and down stream from track, care being taken to sink logs in stream bed until fairly level, otherwise the water concentrates at the lowest spot and has a greater tendency to cause gouging.

If on rock, logs to be bored every 6 ft. and a hole jackhammered in the rock. The log is then spiked down with heavy bed log spikes, or spikes of longer length made up in the workshop.

In the case of there being no rock foundation the logs are held in position by a balustrade of sleepers or jarrah posts sunk in the stream bottom every 4 ft. to 6 ft. depending on the width of the stream. If difficulty is encountered here through flowing water while digging the holes, then the stream could be temporarily dammed by earth wall up stream until posts are in position. (See Fig. 2).

The posts are sunk 4 ft. deep and then strutted with either sleepers or jarrah struts.

When retaining logs are secured into position, rock - either laterite or granite - is dumped in the crossing and formed to half way up side of logs, the rock being sloped into stream on the up-side to ease the passage of water over the crossing (see Fig. 3) and carried across stream for at least 6 ft. up track on each side gradually tapering off. Further rock is then dumped on this foundation and knapped into bottom layer to finish up about three-quarter way up side of retaining logs. Some rock dumped on the down stream side of the logs tends to reduce erosion and under cutting of the logs by the water fall thus formed

This finishing top layer must be well knapped in and levelled, and can with care be made if not quite as smooth as the Freeway, at least trafficable. Gravel and quartzite screening has been tried, but it has been found to wash too readily and entails more maintenance.

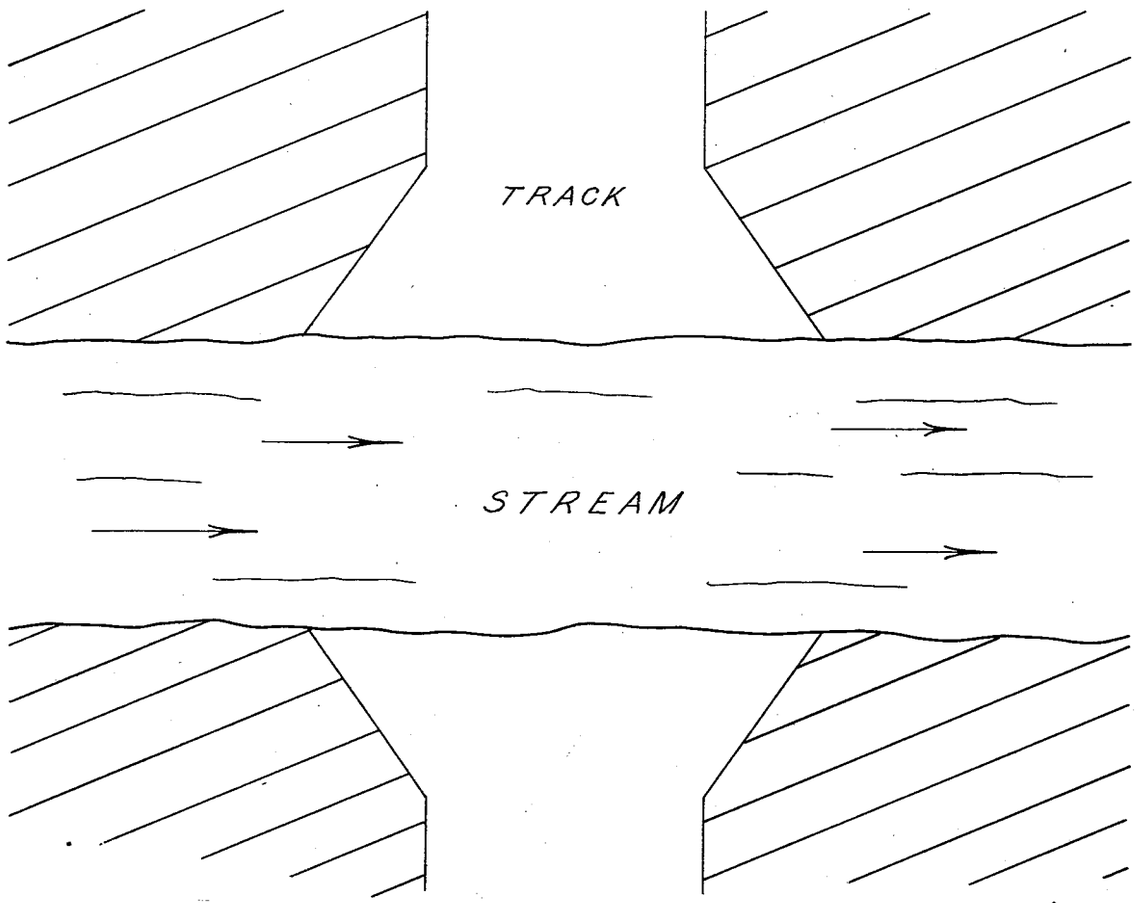

Fig. 1

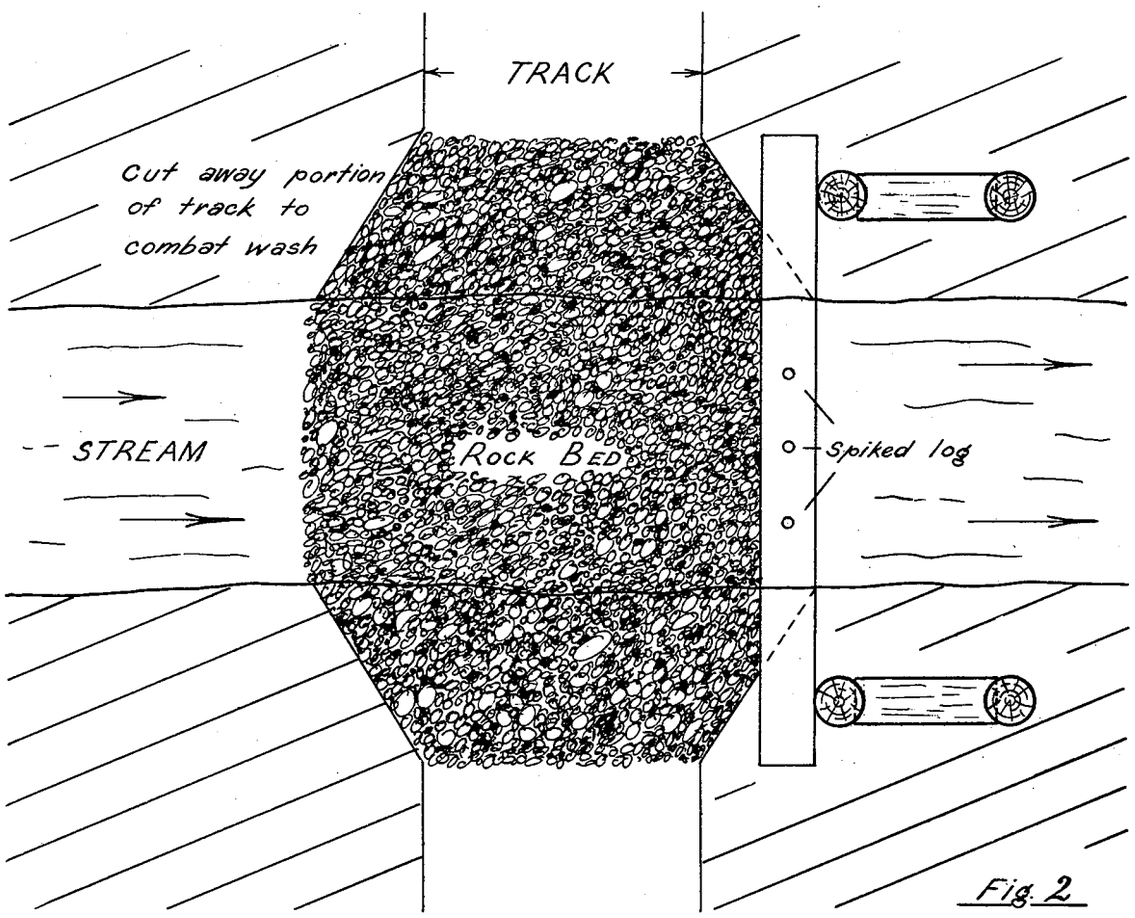

Fig. 2

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SINGLE LOG CROSSING

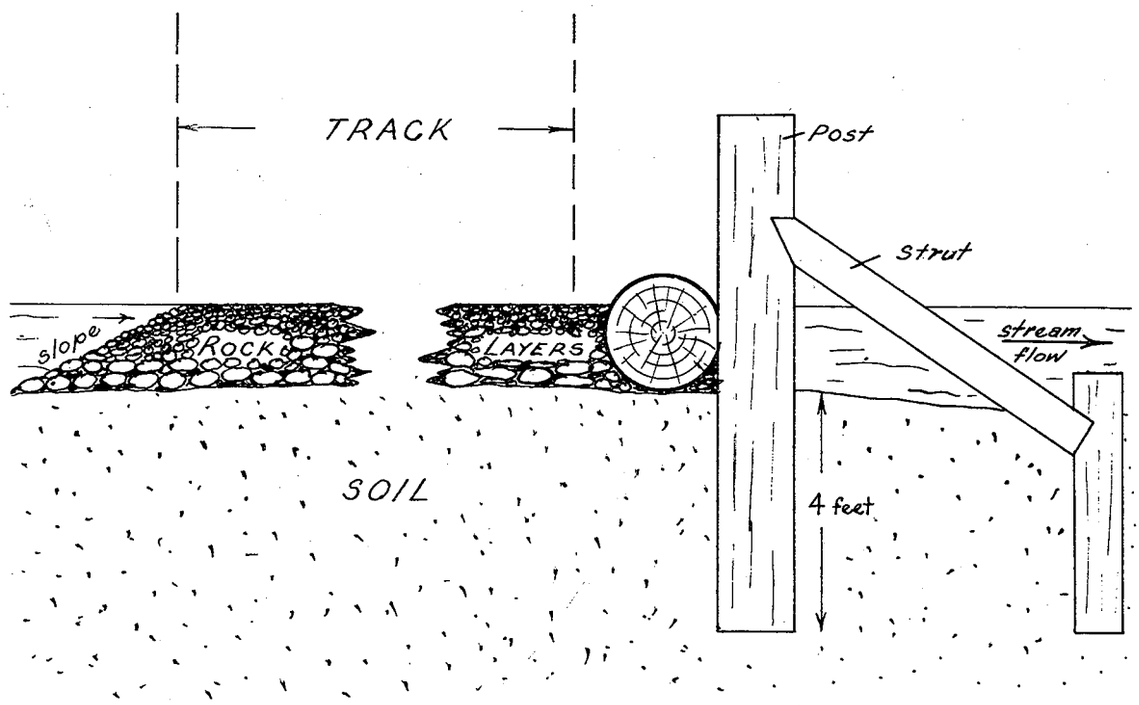

Fig 3

DOUBLE LOG CROSSING

(used where stream channel is deep and has to be brought up to relative road level.)

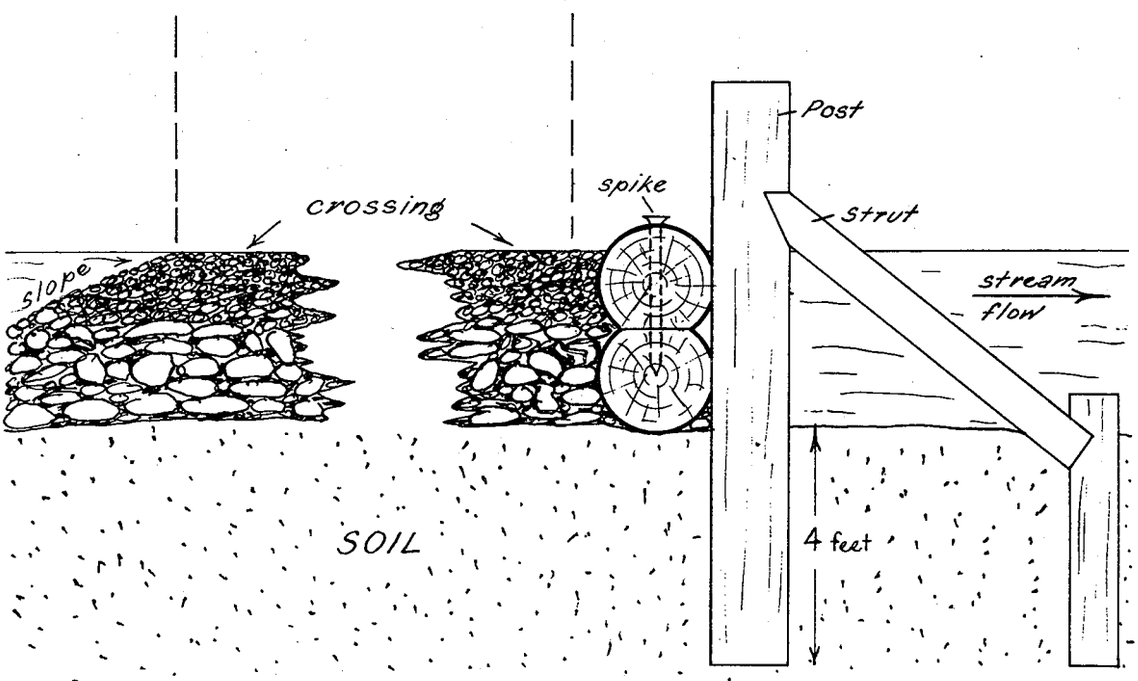

Fig. 4

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Quite often a good water point is created by these crossings through the slight damming effect with the lift reduced to a minimum.

Approximate Comparison of Costs

CROSSINGS.

1. Over Frankland River on Roe Road.
   Completed on the 21.5.59.
   80' long - 18" deep 1 log high balustrade
   O/S & 3 men 197 hours.
   Wages £77.10.0.

2. Over Deep Stream on old Thompson H/Way.
   Completed 11.2.60.
   30 ft. long, 2 log high balustrade.
   O/S + 5 men 96 hours.
   Wages £38.

BRIDGES.

1. Bed log type Bridge over Shannon River, Chesapeake Road.
   90' long - 6 men 3 weeks
   4½ loads decking.
   Wages £315. Decking £72
   Cost £387.

2. 4 Stringer Bridge Pingarup
   18 ft. long.
   4 men - 2 days.
   Wages and decking £44.

It can easily been seen that the cost and easy construction and readily available material to hand is well worth further investigation. But it must be borne in mind, as stated earlier, that these type crossings are only applicable to tracks and fire lines that are not all weather roads and are only seldom used, where the cost of conventional type bridges is prohibitive.
