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# PROVIDING PUBLIC, PRIVATE AND LIVESTOCK ACCESS

## 8.1 Fords and stock watering point

### RIVER COLE

LOCATION – Coleshill, Oxon/Wilts border, SU 234935
DATE OF CONSTRUCTION – Autumn 1995
LENGTH – 4 fords and 1 watering point
COSTS – Fords £1k each. Watering point £1k

Stock watering point at ch. 100m

### DESCRIPTION

Two new fords and a stock watering point were created in the restored reach of the river downstream of Coleshill mill. Upstream of the mill two new fords were created *(see Part 1, figs. 1.1.1 – 1.1.2)*. Each ford enables livestock to cross the river easily, as well as doubling as a drinking place. Those upstream of the mill are also used by farm vehicles and those downstream form part of an equestrian trail. Although all are similar in concept the configuration of each is significantly different to take advantage of local topography.

### DESIGN

*Downstream of mill*
All three features were created at locations where the old, straight river course was crossed by the newly excavated meandering course. Each is formed within the old backfilled river course where the soils are loose and susceptible to erosion. Rather than protecting the banks with revetments, each was set back from the true line of the new river by incorporating stoned access ramps (1:6 or flatter) to form either a ford or a stock watering point. As the new river bed at each point is filled to c. 1m above the old bed this too needed to be protected with stone surfacing.

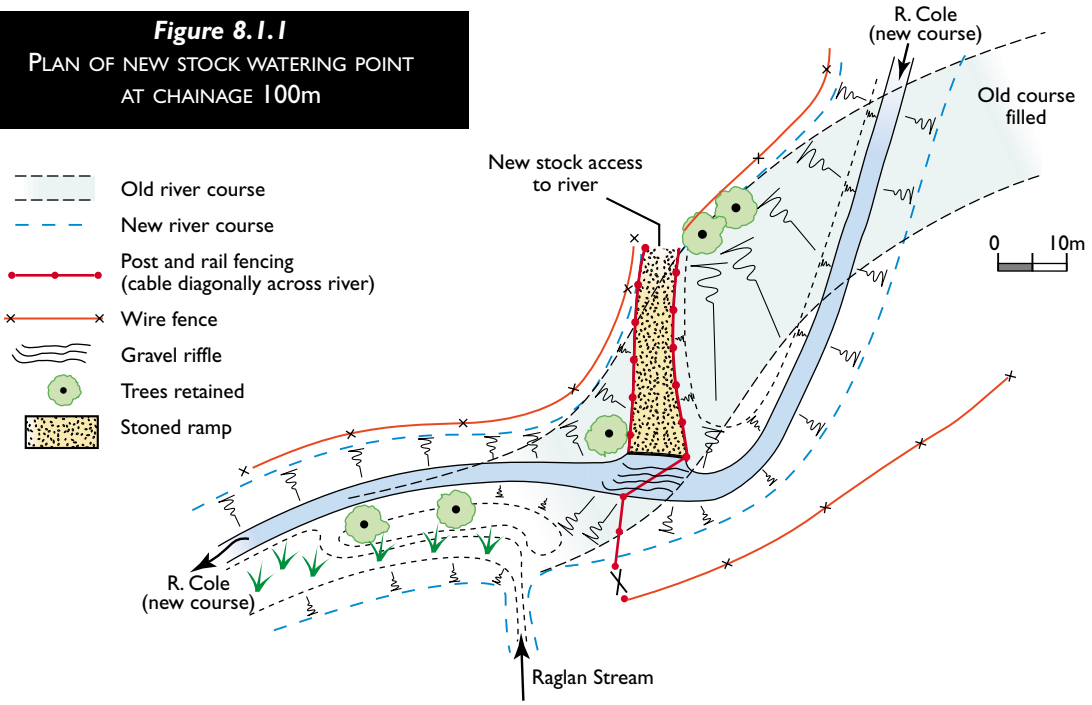
*Stock watering point at ch. 100m (fig.8.1.1)*
Located at ch. 100m just downstream of a sharp bend in the new river course where a fast flowing riffle of gravel was expected to form. This hydraulic condition, combined with the careful contouring of the adjacent river banks, helps to avoid the risk of siltation that all too often renders watering points useless. The post and rail fencing around the ramp is tied into bank top fencing on either side, as well as across the river, to form a secure field boundary point.

The river fencing comprises a single heavy wire cable strained tightly across on a diagonal line (see photograph). The extra length of the diagonal renders the cable less likely to form a complete blockage of the river if floating debris becomes snagged on it. The angle of the diagonal is aligned to direct turbulence caused by its presence towards the mouth of the watering point, further reducing the risk of siltation.

The ramp, its upstream flank, and the river bed are all formed over compacted fill, and flat surfaces are covered with stone over a filter fabric.

*The ford at ch. 280m (fig.8.1.2)*
Aligned between three mature trees on the old river bank to create an 'S' shaped feature, it crosses the new river bed on a long diagonal (c. 15m compared

***Figure 8.1.1***
PLAN OF NEW STOCK WATERING POINT AT CHAINAGE 100m

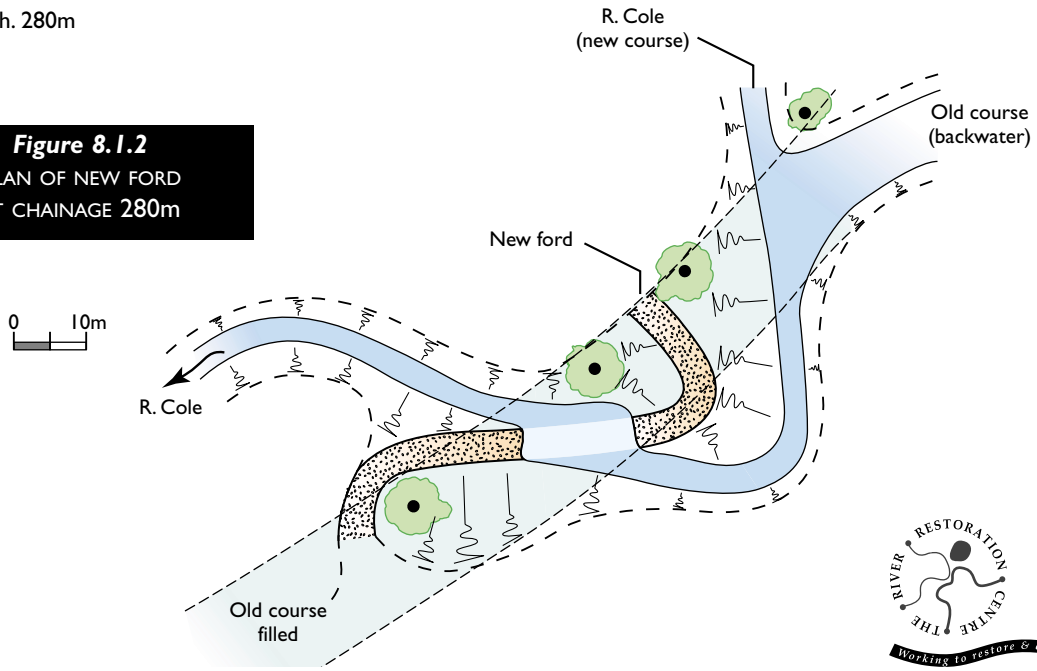



Ford at ch. 280m

with the typical bed width of c. 3m). The position of this diagonal approximates to the likely position at which a self-sustainable point bar of gravel would form, because of the sharp bend just upstream.

Most of the ford is formed within the old backfilled river channel, which is carefully contoured to create smooth transitions with undisturbed ground on both sides of the river, as well as with the root levels of the three trees and with the newly excavated channel. The river bed and ramps are surfaced with stone over a filter fabric to suit livestock rather than heavy vehicles.

***Figure 8.1.2***
PLAN OF NEW FORD AT CHAINAGE 280m



*The ford at ch. 620m (fig.8.1.3)*
This ford incorporates an old bankside willow on one side and crosses the new river course tangentially. This is not a natural gravel deposition point in the river (unlike the examples above) so the ford needed to be artificially strengthened if it was to remain in position. Another reason for strengthening was that the ford helps to avoid the risk of the new river channel down-cutting at this vulnerable point *(see 1.2)*.

The ford was formed to provide an 'overwide' river bed (c. 6m compared with c. 3m typical) and was elevated above the mean bed by c. 0.3m. This configuration was necessary to ensure that the normal river base flows 'weir' over at shallow depths so that it remains passable without being unduly sensitive to small increases in flow. During floods, the ford is completely 'drowned' and has no significant effect on water levels.

The old river bed was infilled to a depth of 1m and reinforced with a 400mm thick layer of 150mm sized stone that was run-out downstream to provide a gently sloping 'riffle' effect. The ramps each side were sloped at 1 in 6 and smoothly contoured into the bank lines of both old and new channels, as indicated in the figure. This contouring resulted in flat bank slopes that did not need revetting, although largely formed within fill.

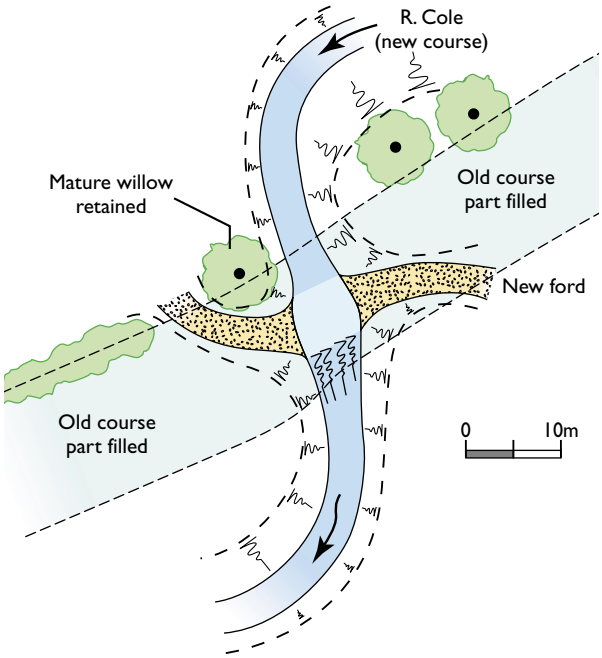
*Upstream of the mill*
Two fords are incorporated into the new meandering river channel excavated in undisturbed ground throughout its length.

*Ford at ch. 0m*
This is integrated into a new drop weir and is fully described in 5.2. The ford is not essential to the restoration project but given the small cost additional to the building of the weir it represents a worthwhile extra for the tenant farmer.

*Ford at ch. 250m*
The ford is shown diagrammatically in 2.2, Figure 2.2.1. Its purpose is to provide vehicular access across the river in conjunction with the nearby crossing over the mill leat *(see 8.2)*. The ford is configured as a point bar located downstream of a sharp bend in the river. It crosses the river diagonally such that the ramp on the inside of the bend could take the form of a natural shoal of gravel that gently rises up to field level, mimicking the geomorphology of upland rivers where point bars and shoals of gravel often serve as crossing points. Because there is no significant bed load of gravel in the River Cole, the bar and shoal had to be artificially created using crushed stone and aggregate.

Equestrian ford at ch 620m

***Figure 8.1.3***
PLAN OF NEW FORD AT CHAINAGE 620m



The ramp on the outside of the bend was simply graded up to the new crossing over the leat and its flanks were contoured to form smooth transitions with the river banks on both sides. A flood spillway on the side of the mill leat is located near to the ford (spillway **S2** *see 6.1*) so the hydraulics at the location are fairly complex. The bank contouring needed to reflect this by ensuring that all slopes were flatly graded and rounded off to minimise the risk of scour damage from turbulence during high flows.

## SUBSEQUENT PERFORMANCE 1995/98

All of the structures described have established well without the need for any adjustments or maintenance. This is particularly important since each is designed to be sustainable within the natural hydraulics of the new river channel.

Despite the commonality of the design concept, each is individually configured to take advantage of local conditions and this is evident in the variety of visual interest and habitat diversity that has resulted. Of particular note, water crowfoot is thriving in the tailstone of the equestrian ford and ch. 620m.

The fords and stock watering point downstream of the mill were created in preference to forming reveted river banks and have proved to be a practical option. As the marginal cost differences of this approach are small it should be worthy of consideration at other similar locations.

Vehicular ford upstream of mill at ch. 250m