

Appendix C: Suggested river management techniques

The following section outlines environmentally sensitive and sustainable alternatives to hard engineering, as recommended for example by the River Restoration Centre (RRC) and the New Rivers & Wildlife Handbook (NRA, 1994). Full details reading construction techniques are not provided here but are referenced accordingly.

Bank revetting and support measures

For locations where bank revetting and support are considered essential, recommended revetment techniques appropriate to relatively high-energy and laterally active river bank types (comprising cobbles and gravels in a sand and silt matrix) take the form of regraded and redistributed bed and bank material that is reinforced with willow and alder saplings (locally sourced if possible).

Alternative designs include 'Willow Mattress Revetments' (Fig. C1) and 'Log Toe and Geotextile Revetments' (Fig. C2) (RRC, 1999). Both techniques seek to dissipate stream energy by re-profiling banks at c. 30-45° and deploying willow branches or slips to encourage rooting and stabilisation of the bank structure. They may also be enhanced with the use of below-water stone, rock or timber foundations and tree planting along the upper bank.

Relatively shallow banks may be protected by the simpler techniques of 'Willow Spiling' which takes the form of a vertical retaining wall constructed with willow stakes and wound spiling (Fig. C3). While this constitutes a less-costly measure and takes up less space, it is less resistant to bank settlement by comparison to the above techniques.

Actively or potentially eroding banks may also benefit from the dissipation of stream energy by deflectors (which may also serve to increase the in-stream habitat diversity), especially on the outside of unstable meander bends. The use of blockstone groynes is commonly applied in UK rivers, but for the Breamish locally sourced willow or alder logs (accepting that these may be in short supply) are likely to constitute a more environmentally sensitive and acceptable measure. Detailed advice on the deployment of log deflectors has already been provided for the Breamish by the RRC (2006).

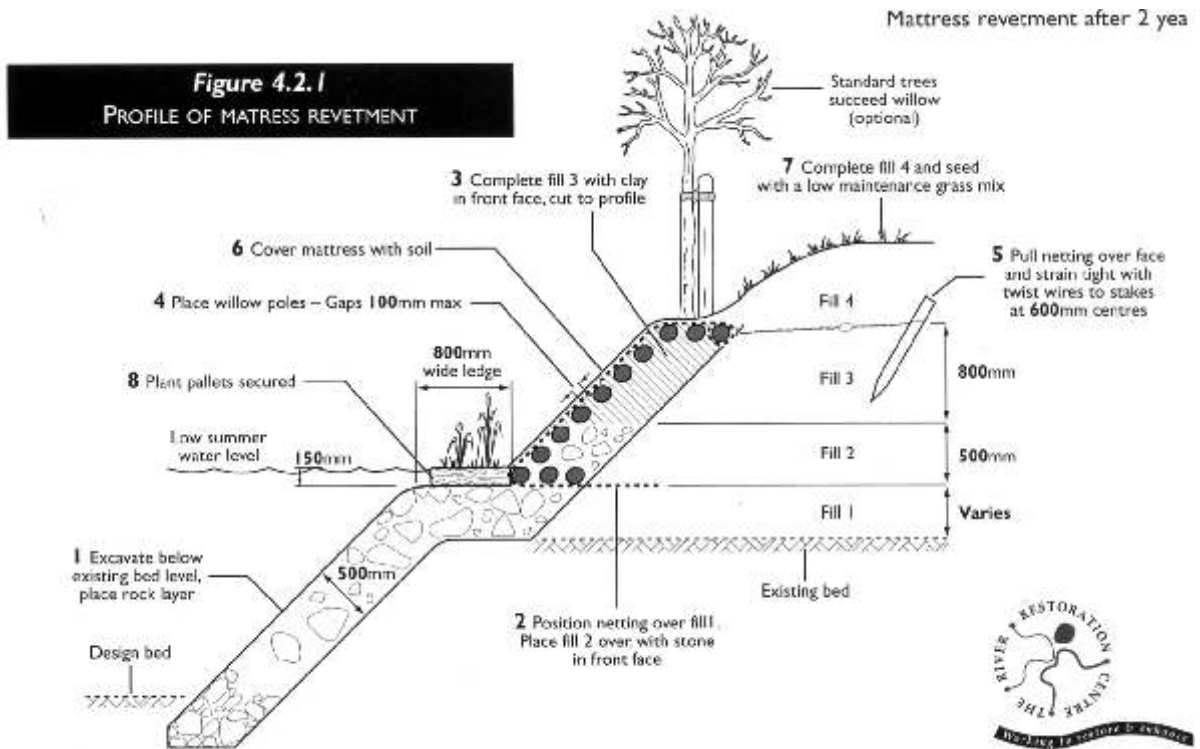


Figure C1: Profile and construction of a Willow Mattress Revetment (RRC, 1999)

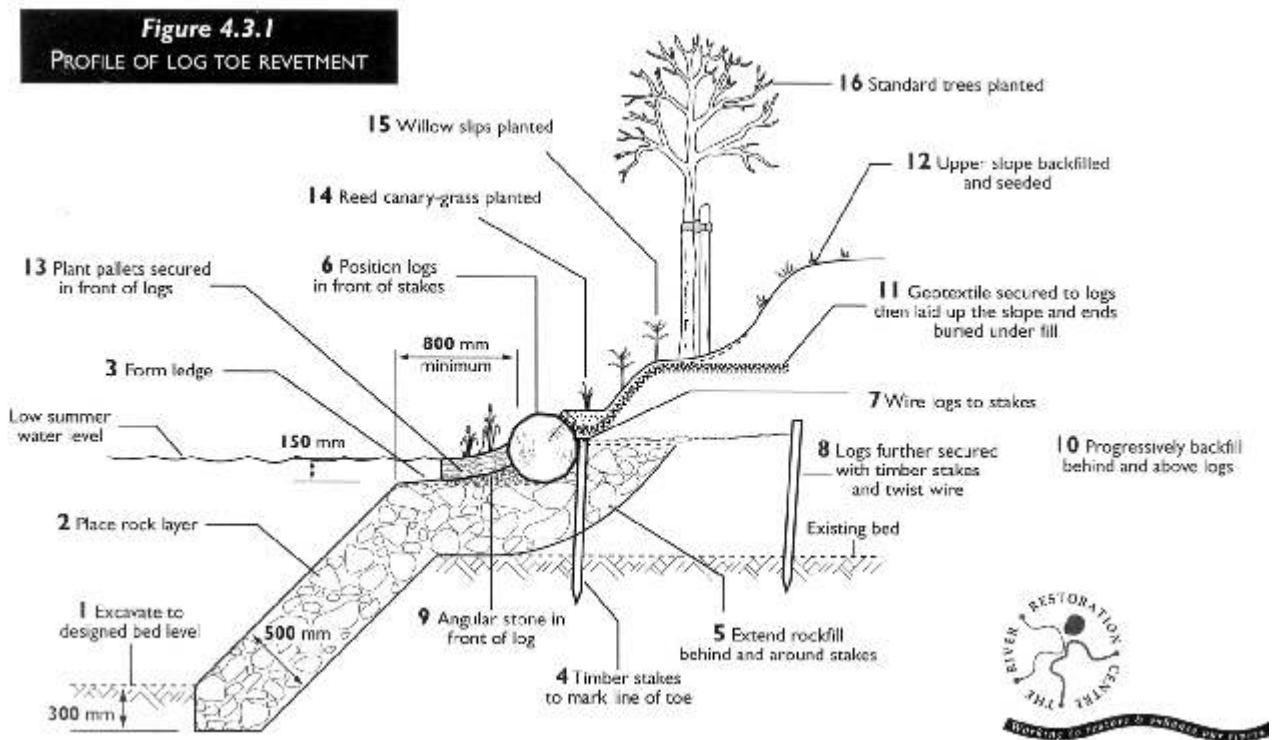


Figure C2: Profile and construction of Log Toe and Geotextile Revetment (RRC, 1999)

Figure 4.1.1
PROFILE OF SPILING REVETMENT

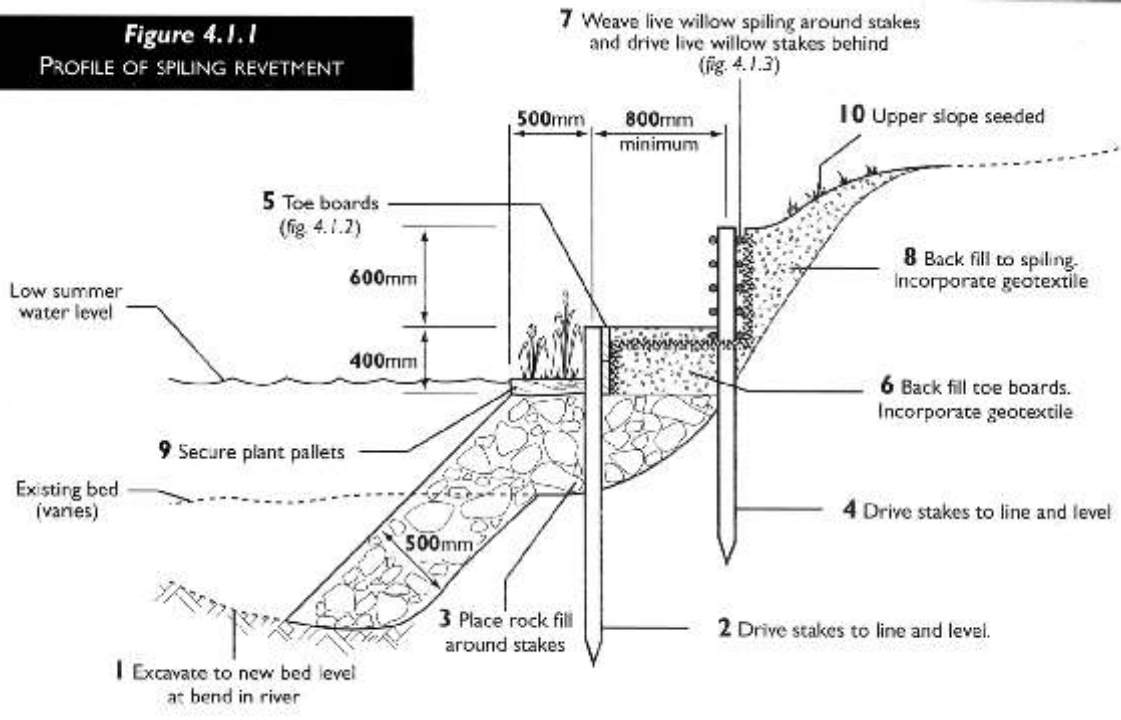


Figure C3: Profile and construction of a Willow Spiling Revetment (RRC, 1999)