4

REVETTING AND SUPPORTING RIVER BANKS

4.4 Plant roll revetment

RIVER SKERNE

LOCATION – Darlington, Co Durham, NZ 301160
DATE INSTALLED – Oct 1995 to June 1996
LENGTH – 119 metres
COST – £130/metre

NOTE: A full description of this technique is provided in the Environment Agency R & D Technical Report W83:– *Revetment Techniques used on the River Skerne Restoration Project* (1998)

Transitonal revetment at installation (water level artificially low in photo)

DESCRIPTION

This technique demonstrates the use of proprietary revetment materials in a situation where the potential for erosion is not severe. A flexible revetment is provided within the water's edge zone at the toe of the bank utilising rock rolls and plant rolls to resist undercutting. At this site, it is used to form a smooth transition between the un-reveted river banks and the fully reveted banks described in 4.1 to 4.3.

DESIGN

Rock rolls are flexible 'sausages' of crushed rock contained within nylon netting, whereas plant rolls are of dense coir within which selected marginal aquatic species can be pre-grown. Plant rolls fixed over rock rolls will become homogeneous as roots penetrate downwards into the rock and the adjacent soil. The design provides inbuilt flexibility whilst allowing the plants to develop in stable conditions.

Rock rolls are set out below water on ledges cut to suit and secured by driving posts through the netting. Long term stability and flexibility is achieved by pulling the rolls tight against the posts using twist wires anchored to stakes set well back.

Plant rolls are set out at low water level and wedged tight up against the rock rolls by driving stakes at a suitable angle along the rear of these.

Pre-planted flat pallets of coir were added above the plant rolls to increase the extent of marginal vegetation although this is largely an aesthetic measure.

The toe of the bank needs to be permanently damp

for this to be worthwhile, which is most likely in situations where undercutting has already occurred and the bank toe is being reinstated, e.g. through boat wash.

SUBSEQUENT PERFORMANCE 1995/98

Several lengths of this revetment were installed in various alignments, e.g. entry and exit of bends and in backwaters. All have established well with reed canary-grass proving to be the most dominant plant best suited to the habitat niche created. Growth is generally limited to within 500mm of river level where the bank is damp. Above this the pallets have been colonised by ruderial plants such as himalayan balsam, which is being controlled by mowing before seed heads form.

Children walking along the bank toe, behind the plant rolls, have created ledged paths, which are stable, and are accreting significant amounts of silt due to eddy currents set up as floods pass over the stands of reed grass. This desirable situation contrasts with the erosion of river bank toes that typified pre-works conditions in the straight trapezoidal river.

Figure 4.4.1
PROFILE OF TRANSITIONAL REVETMENT