Restoring riverbank stability with a vegetated retaining wall

We restored an eroded riverbank with a vegetated wall solution to improve stability and biodiversity.

In **summary**

- → A collapsed sandstone wall left the riverbank unstable and in need of repair
- → A Flex MSE vegetated retaining wall was installed within a three-week window, coordinated alongside another contractor's works
- → The sustainable design re-used existing sandstone aggregate and incorporated seeded soil bags to create a durable and natural finish

The **need**

A sandstone retaining wall had eroded, leaving a section of riverbank unstable and at risk of further collapse.

Replacing the wall like-for-like would have required a longer programme, carried a higher carbon cost and resulted in significant future maintenance requirements. A more sustainable solution was needed to provide permanent stability while delivering ecological benefits.

The **solution**

The team was provided with a short three-week window to complete the programme while a permit was in place for another contractor to repair an outfall for the same client.

During this period, we liaised closely with the other contractor to coordinate movements and deliveries through a challenging earth ramp, which had to be modified to allow safe access for machinery.

Enabling works included litter clearance, vegetation removal and installation of filter mats and screens to capture debris. A 9-tonne tractor excavator fitted with bucket and fork attachments was then used to reshape the riverbank and offload palletised deliveries before construction of the new retaining wall began.

Old sandstone aggregate from the failed structure was re-used where possible, reducing the need for imported material. Five courses of Flex MSE soil bags were interlocked with steel gripper rods. The lower courses were filled with gravel to provide strength, while the upper courses were filled with soil pre-mixed with grass seed to create a natural finish.

Each layer was reinforced with geo mesh, and the wall's central void was filled with Type 1 stone and compacted for stability.

The completed structure provides a permanent hybrid green engineering system that utilises nature's own resources to provide resilience to future erosion. The vegetation provides a robust root network to stabilise the bank and gives a natural aesthetic to visually improve the surroundings and increase biodiversity.biodiversity and provide long-lasting environmental benefits.

The **benefits**

- Creates sustainable, nature-based flood defences in sensitive locations
- Improves river habitats and supports fish migration and spawning
- Reduces reliance on hard engineering and supports circular material use

4 large woody structures installed	**1** upland river enhanced	**100%** natural materials used