



Client:
Jackson Civils
Environment Agency

Contractor:
GeoGrow

Completed:
2023

Rootlok® Vegetated Wall System installed to stabilise a failing section of the River Kenwater, implementing a soft, engineered solution to create greener infrastructure along the river.

The River Kenwater in Leominster has long experienced issues with fast flows, high water levels and floods, particularly during the winter months. The new works was to take place on a section of the River Lugg bypass channel that had been a cause of concern for a considerable time due to the poor condition of existing retaining structures placing the adjacent flood bund at risk. The watercourse is designated as both a Site of Special Scientific Interest (SSSI), Special Area of Conservation (SAC) as well as an important salmonid (brown trout and Atlantic salmon) river.

The Problem

The poor condition of the existing river retaining wall along this stretch of the river Lugg was threatening the stability of the flood bund, making the area unsafe for both the local community and fixed assets within the bund. The footpath above the bund was becoming unstable. Due to the sensitive location of the site, the Environment Agency were keen to implement a more natural solution, engineered to stabilise and restore the flood defence asset and improve the environment for both people and wildlife. It was key the solution was also resilient to potential changes in the flood regime that may occur from potential climate change. Existing assets including drainage and properties, as well as the need to maintain the flood bund in the temporary case, meant that there was limited space on site to install a solution. This was a key driver within the design and build process.





The Solution

As part of Jackson Civil Engineering Supply Chain, GeoGrow's Technical Director, Dan Roberts, worked alongside Jackson's, Arup, Arcadis and Craig Baker of the Environment Agency to provide a soft, engineered solution that was more environmentally friendly and incorporated options that maximised biodiversity and wildlife habitats.

A Rootlok reinforced slope system was designed to provide a long-term, vegetated solution that would deliver all the requirements of the project team:

- Long-term design life (120-years)
- Engineered flexible green solution
- Riverbank erosion protection (encapsulated)
- Scour protection
- Functioning ecosystem – wildlife habitat
- Biodiversity, sustainability

The Rootlok system would need to take into account how to build around several existing assets along its 40LM length and 3.2M height including, stairs, walkways, pipe outlets and headwalls.

The Works

The works were split over two phases, the first phase beginning on the 17th of July 2023 and finished on the 4th of August. Jackson's installed the watercourse management, and subsequently, an in-situ concrete walkway was cast at the base of the slope to allow for post maintenance to be carried out.

After forming the base a vertical tie-back wall was installed up against and up to the top of the concrete walkway. Geogrids were incorporated into the wall build at intervals of 420mm, creating a reinforced structure. Each level of Rootlok bags was backfilled with a compacted angular stone, with interlocking plates placed between every bag at every level in the wall. This, combined with the geogrid, interlocks the entire system together.

Above the concrete walkway, the Rootlok system was installed as a reinforced slope, inclined at a 45° angle, up to the finished height. Bags were installed around existing assets – a concrete headwall and concrete stairs. Additionally, pipe sleeves were installed to enable the easy installation of a steel tubular fencing system. After the first phase of construction, the Rootlok bags were hydroseeded by GeoGrow's in-house environmental team with an EA approved riverbank seed mix, with grass growth visible within a few weeks. To ensure safety during the winter period, a temporary Rootlok solution was installed to protect the bank from potential erosion in the event of a flood.



The second phase started on 24th October and finished on 31st October 2022. The temporary covering was first removed to allow construction of the permanent works. Given the space constraints on this phase, the concrete toe was omitted and replaced with the Rootlok system itself. The Rootlok solution was brought forward into the water course with the concrete access then cast on top. This solution provided the maintenance access needed while minimising the space required. The lower, vertical part of the solution was installed with geogrid wrapped around face of the wall for additional stability. The upper wall seamlessly integrated with the first phase build, and the installation continued under the same processes up to the required height.

On completion of the concrete pathway, 500-900mm rip-rap was placed along the full length of the wall for additional scour protection, reusing stone from the existing river bed where possible to help reduce the works environmental impact and help maintain the ecology of the water course. The structure was then completely hydroseeded to create a sustainable green solution.

A nature brick surface was used to face the concrete walkway installed below the Rootlok slope, the cracks and fissures on each brick helping to disperse flow and provide shelter for invertebrates like white-clawed crayfish. Plants

can also establish themselves within the cracks, creating more habitat niches that would not be possible if smooth concrete was used. Furthermore, wood wasps quickly made a home nestled between the Rootlok bags.

Results

The location of this project attracted the attention of various stakeholders, including local residents and councillors, who were eagerly invested in the progress and final outcome of the works. Implementing a thoughtful approach, the construction process received positive feedback from the residents, who expressed satisfaction with the achieved results thus far. The Rootlok Vegetated Wall System will provide long-term erosion protection to the riverbank along the bypass, strengthening flood defences for years to come. Furthermore, the vegetated nature of the system, combined with additional habitat creation will massively improve biodiversity within the area.

Find Out More

If you wish find out more information on the Rootlok Vegetated Wall System and other services for increasing biodiversity within construction projects, please contact our sales office on 01543 224800 or visit our website: www.geogrow.com.

