

## Project Info



01 / 10 / 19



CC13™ Bulk Rolls



30m²



Vertical layers



River Almond, Lothian,  
Scotland



Northern Divers Ltd



CC13™ was used  
to provide long term  
protection to gabion  
walls on the banks of  
the River Almond



*Completed CC installation on the banks of the River Almond, Scotland*

In October 2019, 30m² of Concrete Canvas® (CC) GCCM\* material was installed by Northern Divers Ltd, on behalf of National Grid, to provide long term protection to gabions walls along the River Almond in Lothian, Scotland.

The River Almond is 28 miles long, rising at Hirst Hill in Lanarkshire near Shotts and running through West Lothian, draining into the Firth of Forth at Cramond, Edinburgh. The existing gabion stepped walls were installed for flood control and erosion protection but had degraded over time and sustained damage from heavy water flows. CC13™ was used to reline the first tier of gabions to provide long term protection and increase the operational life of the gabion structure.

CC was chosen due to its ease and speed of installation. The CC13™ bulk rolls could also be cut to length on site, minimising wastage and allowing installation with simple hand tools on a site with restricted site access, steep banks and high water flows. CC13™ is BBA certified with a durability in excess of 120 years.

The first tier of gabions measured 10m in length and 2m high with a 0.5m step to the second tier. Prior to the works, the contractor positioned bulk bags upstream of the works to help reduce the river flow and divert water away from the work area. The installation began at the downstream end of the gabion structure and the perimeter edges secured to the baskets using pneumatic hog rings. The CC layers were overlapped by 100mm in the direction of water flow and joined together using 30mm stainless steel screws at 100mm intervals.

\*Geosynthetic Cementitious Composite Mat





*Gabion baskets prior to installation*



*Remediation sections of gabion with sandbags*



*CC installation begins on downstream edge*



*CC attached to gabion baskets using hog rings*



*Subsequent layers overlapped by 100mm*



*CC material hydrated*

*Rip rap stone shown on upstream edge*

On the upstream and downstream side sections, CC was terminated into the existing bank profile and fronted with rip rap stone. The CC was then secured to the gabions along the bottom edge using stainless steel lacing wire and then hydrated using river water. CC has a low alkaline reserve and does not adversely affect watercourses. As a result, the hydration water was allowed to discharge in the river.

30m<sup>2</sup> of CC13™ was installed by the contractor in two days by two people. The client was impressed with the ease and speed with which CC was installed, along with its minimal environmental impact and will consider CC for future projects.



Completed installation

*“A solution was required to repair and protect the existing gabion structure which provided protection to the gas pipeline crossing the River Almond. Due to the river being very fast flowing in winter and flood conditions, and also the probability of the carriage of water borne debris, trees etc, a solution had to be applied that not only provided long term protection but also did not encroach on narrowing the water course and possibilities of trapping debris. [CC] was chosen for these reasons; its low profile and smooth facing meant that water flow and possible debris could pass unrestricted and with its strength and durability it would more resilient to strike damage.”*

Martin Shepherd  
**Diving Manager, Northern Divers**

*“The use of CC proved an excellent solution on our gabion reinforcement project, providing the river bank protection we required to prevent future scour and erosion of the gabion wall. Using CC reduced the requirement for more intrusive works and also met the approval of the environmental regulator in this area due to its effectiveness and low environmental impact on the adjacent river. The project team and our stakeholders were all pleased with the final result and CC is a material that could prove useful elsewhere across our gas network.”*

Steve Gilder  
**Environmental Advisor, National Grid**