

## Project Info



18 / 09 / 19



CC8™ Bulk & Batched Rolls



700m²



Transverse layers



Coalcleugh, Hexham, Northumberland, UK



JN Bentley



CC8™ was installed as an erosion control solution for a newly formalised channel on a mine adit site

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*Upstream view of the completed CC lined channel*

In September 2019, Concrete Canvas® (CC) GCCM\* was specified for use on a project at the former Coalcleugh mine near Hexham in Northumberland, UK.

The project involved the formalisation of a channel to divert the river away from heaps of metal-contaminated wastes left by mining activities in the 19th and early 20th century at the very top of the River West Allen. Situated within the North Pennines Area of Outstanding Natural Beauty, more than 40km of river is heavily polluted by historical metal mining. This intervention will help prevent about half a tonne of lead, cadmium and zinc polluting the river each year.

A lining solution was required for the formalised channel to provide erosion control in order to ensure the channel is able to accommodate high water levels and rapid flow rates. Having previous experience of Concrete Canvas®, the client - the Coal Authority - included CC in the project designs from the offset with no alternatives considered. This was due to the rapid installation rates of the material and the ease of install in such a remote location. The works were carried out by JN Bentley, who are also familiar with CC having installed the material on numerous Coal Authority projects.

The ground conditions on the project site were very difficult as the channel had been eroded away over time. A small excavator was used to create the profile of the channel as per the designs, while rock rolls were then used to create the exact shape of the channel where the excavator was unable to reach to profile the channel to the correct dimensions.

\*Geosynthetic Cementitious Composite Mat







*Installation site*



*Channel prior to formisation*



*Small excavator used to create the channel profile*



*Installation began downstream, working up the channel*



*Ground pegs secured CC to substrate and screws used to joint overlaps*



*Anchor trenches used to capture CC edges where possible*





Where anchor trenches were not possible, rock rolls and stones were used



Upstream headwall



Channel terminating into downstream sandbag headwall



CC provides erosion control, particularly in high flow events



Upstream view of channel - CC able to conform to varying channel profile



Completed channel





*The site was revisited five months after the installation - the CC had begun to blend in with its surroundings and was performing as expected*

The specified CC8™ material was delivered to site in both bulk and batched roll formats. In easy to access areas, the bulk rolls were deployed from a spreader beam and cut to required lengths to suit the profile of the channel. In areas where access was a little more complex, man portable batched rolls were transported manually to the channel section requiring lining, cut to length and installed.

The material was laid transversely with stainless steel screws used to joint the overlaps at 200mm centres. At the end of the channel, the material was terminated into a drystone wall and at the top of the channel, the material was terminated into a sandbag headwall. Where traditional anchor trenches could not be formed, rock rolls were placed on top of the material and secured in place using metal stakes to secure the edge of the material. Where anchor trenches had been prepared, the CC edges were captured using ground pegs and then backfilled. Water was constantly flowing through the stream, which was diverted during the placement of CC but provided an easy solution for hydration of the material, removing the requirement for sending a bowser to site.

The installation was carried out by a team of four over several weeks. One of the advantages of using CC in a transverse layup is that the installation can be halted quickly if needed, which was necessary on this scheme as several extreme weather events and floods required the channel to be quickly reopened. A total of 700m<sup>2</sup> of CC8™ was successfully installed in difficult weather conditions.

The project was funded through the Water and Abandoned Metal Mines Programme, a partnership between the Coal Authority, the Environment Agency and the Department for Environment, Food and Rural Affairs (Defra). The North East Local Enterprise Partnership contributed funding from their Local Growth Fund, part of the Northern Powerhouse.

*“The use of Concrete Canvas on the scheme at Coalcleugh was certainly the right material for the job in what was a remote site with difficult topography under some extremely challenging weather conditions. Where ground conditions varied and required quick modifications to the design, the team at Concrete Canvas supported and provided advice for solutions very quickly so as to mitigate any potential delays to the project.”*

**Rob Culledge, Contracts Manager at JN Bentley**