

## Project Info



10 / 09 / 16



CC13™ Bulk Rolls



320m²



Transverse layers



Machen, South Wales,  
UK



JD Civils on behalf of  
Celtic Ltd



CC13™ was used to  
provide a temporary  
erosion protection layer  
to a channel at a former  
paint factory site in  
Machen, South Wales



**AECOM**



Completed section of channel at paint factory site in Machen

In September 2016, Concrete Canvas® GCCM\* (CC) was used to provide a temporary erosion protection layer for an open channel, replacing a collapsed section of flood overflow for pipework at a former paint factory site in Machen, South Wales.

It is believed that the pipework had ruptured due to insufficient top cover and/or negative buoyancy to resist a rising water table and flood-logged ground conditions. The proposed solution was to remove the ruptured pipework section and re-profile the subgrade to an equal hydraulic capacity open channel. The replacement section of channel was approximately 60 linear metres in length with an approximate overall profile width of 7m.

The ruptured overflow pipework and associated flooding was in danger of compromising the excavations on other areas of the site due to the heavy rains experienced, which would have caused programme delays at great expense.

The works were carried out by JD Civils on behalf of Celtic Ltd, with input from Consultant Engineer, AECOM.

\*Geosynthetic Cementitious Composite Mat







*Existing ruptured pipework*



*Early stages of excavation work for channel*



*Overgrown existing channel section*



*Pipework outflow leading into the new channel*

Alternative methods for repair considered were replacement of the pipework, which would have been too costly and would be likely to rupture again; construction and insertion of pre-cast concrete sections, which again would be expensive, would cause difficulties with regards to accommodating the rising water table, produces a high mass of material to dispose of at the end of its life, and requires a significant amount of preparatory work; and vegetation mats, which are unlikely to seed, would not be durable enough or provide enough scour protection, and is not resistant to chemicals. Another issue which had to be considered was the limited site access, which made many of these alternatives unfeasible.

The advantages of CC, in comparison, are low mass of material to recover at the end of the channel's life; required durability and scour protection; quick to install; no requirement for specialist contractor; less channel preparation required; resistant to chemicals.





*CC bulk rolls mounted to a spreader beam for easy deployment*



*The graded channel*



*CC laid transversely and cut with a disc cutter*



*Material edges fixed within anchor trenches using ground pegs*



*Overlaps were jointed using screws and an auto-fed screwdriver*



*Bagwork headwall termination*





*Up-stream view of the completed channel in use*

The overflow channel was excavated and graded prior to installation to ensure the CC material had a flat, even surface on which to be laid. Vegetation and debris, including sharp stones and rocks, were also removed in order to avoid voids below the CC membrane.

Once ground preparations had been completed the CC was delivered to site in bulk rolls of CC13. The CC was mounted onto a spreader beam and excavator, and laid transversely across the width of the channel to account for any variation in the profile width. The material was then cut to length using a disc cutter and the edges of the CC were secured in the anchor trenches using ground pegs. Additional layers of the material were laid with edges overlapping by 100mm and secured in the same way. Overlaps were then jointed using screws and an auto-fed screwdriver at intervals of approx. 200mm.

This was repeated along the full length of the newly excavated channel. The terminating edges of the material at either end of the channel were fixed in the anchor trenches and buried, while the original pipelines at one end were protected using plastic grids and sandbags which created a headwall, also protecting the edges of the CC from ingress. Once the installation was complete, the CC was hydrated.

A total of 320m<sup>2</sup> of CC13™ were installed in 10 days in inclemental weather conditions, offering commercial and logistical advantages over the alternative options.