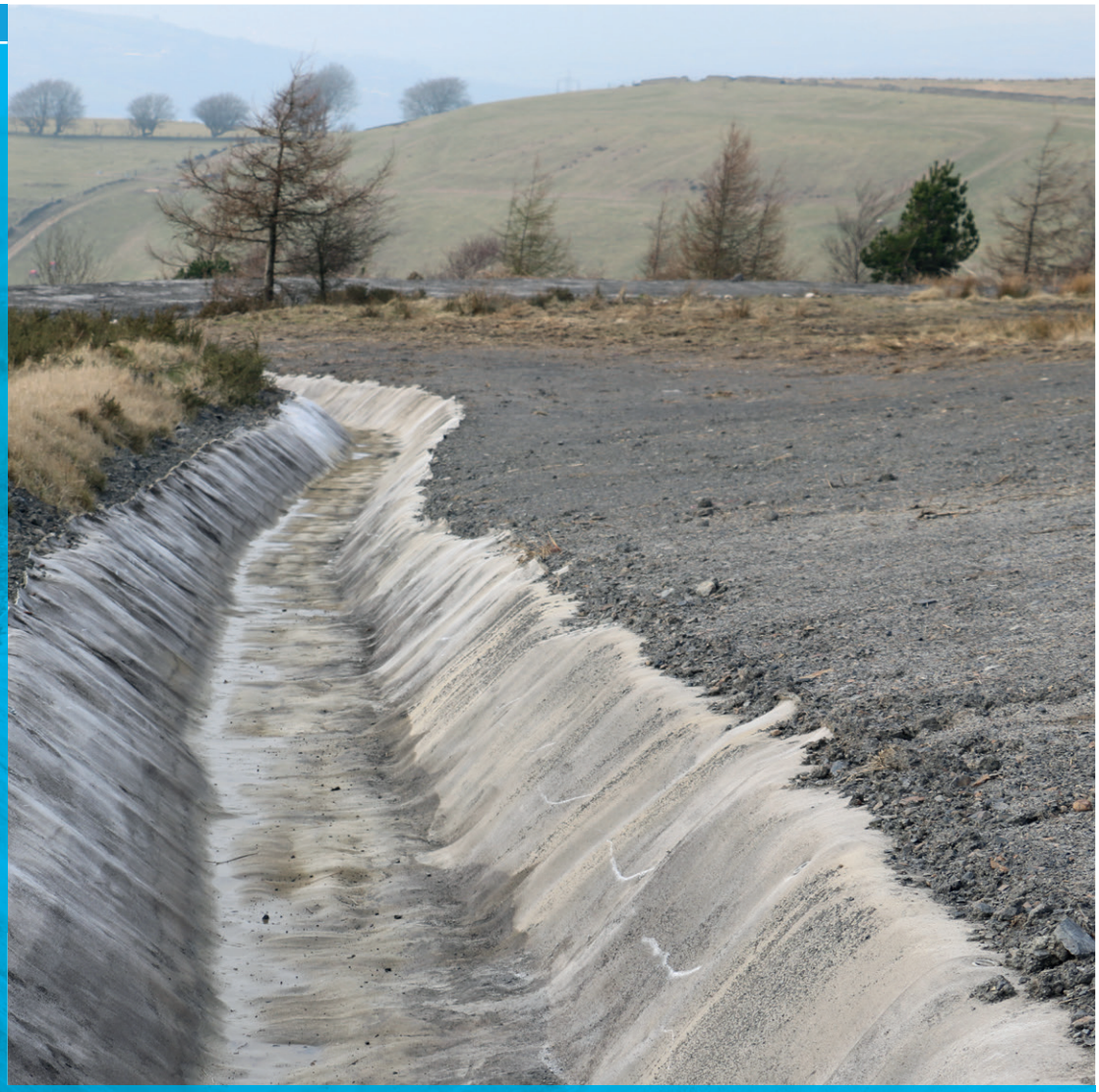
CONCRETE CANVAS®

CHANNEL LINING

Project Info

- 11 / 02 / 11 & 12 / 01 / 16
- CC13™ Bulk Rolls
- 3,640m²
- Transverse and Longitudinal layers
- Bedwas, South Wales, UK
- Jim Davies Engineering / Cosslett Engineering
- CC used to provide scour protection to a series of spoil tip drainage channels at a former colliery site in Suth Wales.

CIVIL ENGINEERING LTD.
JIM DAVIES



Completed CC lined drainage channel

In January 2016, Concrete Canvas® GCCM* (CC) was used to complete a two-phase project to line a series of drainage channels at Bedwas Colliery in South Wales, UK.

The Colliery is a 20 hectare spoil tip situated approximately 2 miles north of the town of Bedwas, and forms part of the historical mining legacy within the Caerphilly Basin in South Wales. Bedwas Colliery opened in 1913 and produced up to 675,000 tonnes of coal per year before its closure in 1985. The resultant overburden and waste rock generated by the mining activity of the colliery formed the basis of the existing spoil tip. Now managed by Caerphilly County Borough Council, the site has a network of drainage channels to deal with surface run-off.

To prevent erosion of the inverts, 3640m² of these channels were lined with CC, in two phases. The first phase, where 2000m² of CC material were installed, was completed in early 2011. The second phase lined the remaining 1640m² and was completed in January 2016.

CC has excellent resistance to acids, alkalis and sulphates commonly found in mining, quarrying and landfill sites, significantly prolonging the life and serviceability of site drainage channels. By providing effective weed suppression, CC also reduces or negates the need for costly maintenance of these channels, which are typically located in remote areas and where any blockage and resultant overspill may have a significant environmental impact.

*Geosynthetic Cementitious Composite Mat

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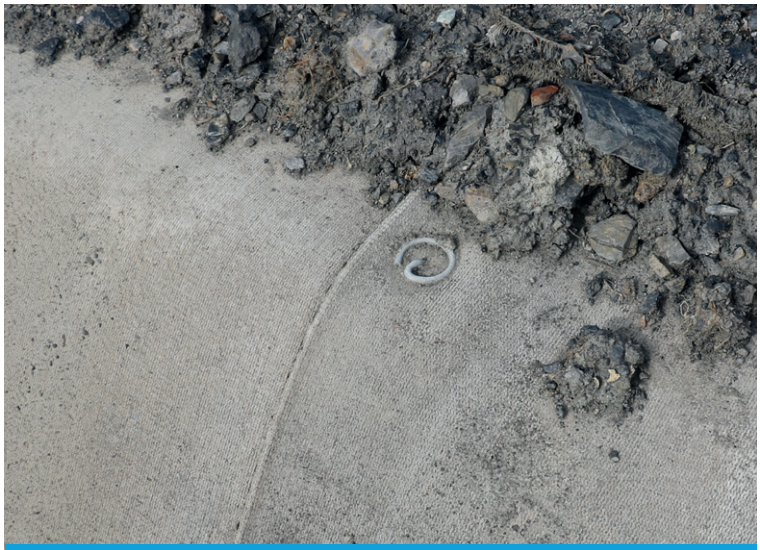
Satellite imagery of site and surrounding area provided by Google Maps

Phase 1 - CC13™ bulk roll deployment

Phase 1 installation carried out in very wet weather conditions



Fixing pins were used to secure material in anchor trenches

Screws were used to joint overlaps

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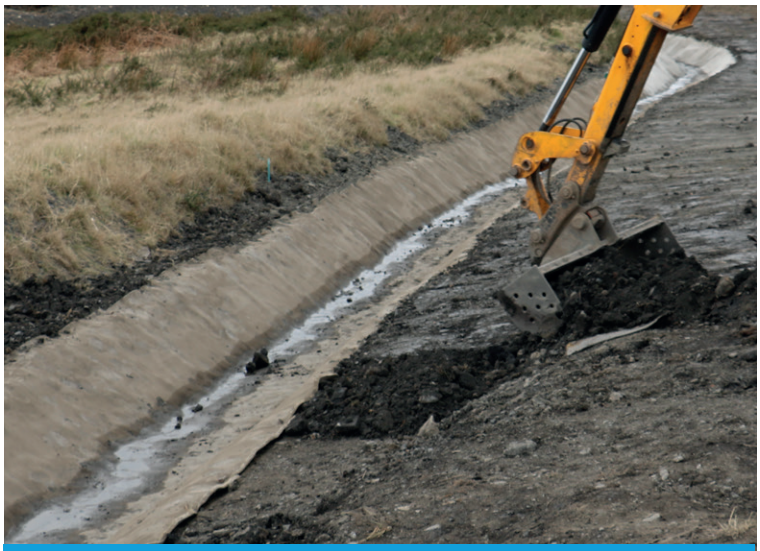
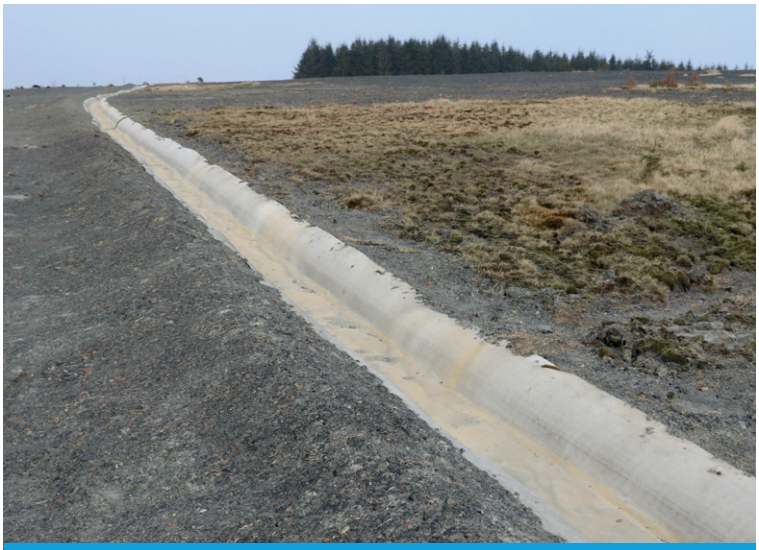
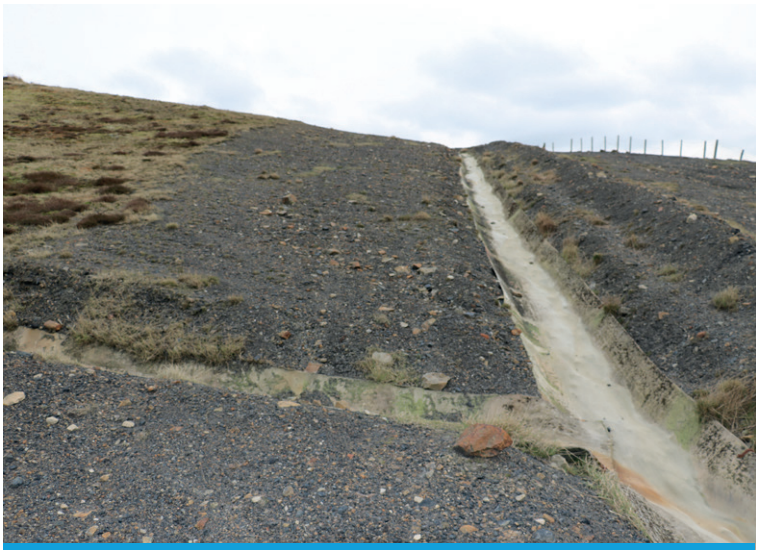


Anchor trenches were backfilled using diggers

Backfilled anchor trenches



Longitudinal layup section



Junction/ corner detail in Section 1 channel

The second phase of works, installed by Jim Davies Civil Engineering, saw the installation of CC13™ in both transverse and longitudinal layups to accommodate two sections of channel with distinct profiles.

The first section measured approximately 1m in width and 300m in length. This section was lined using a single longitudinal layup, with bulk rolls of material deployed via a spreader beam in continuous lengths. The edges of this section were benched and backfilled to prevent water ingress undermining the channel.

The second section was significantly wider, measuring approximately 2-3m wide and approximately 1m in depth. It also incorporated a wide corner and several junctions with the incumbent phase 1 lined channels. CC13™ was laid transversely in this section, with the cut edges anchor trenched and backfilled. In both sections the CC was secured to the substrate using fixing pins and overlapped layers were screwed together at regular intervals using stainless steel screws.

The 2 hour delayed setting window meant that installation could continue in inclement weather, which would normally prevent conventional concrete solutions from being used. This was a particular advantage during phase 1 when the contractors, Cosslett Engineering, experienced torrential downpours during installation. Delays were avoided as installation was able to continue even in the extremely wet conditions.

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CC's flexibility allowed for easy accomodation of bends and corners

Completed Section 1 channel and site overview

Manufactured less than 10 miles from the site, CC has provided an effective and long lasting lining solution, preventing scouring of the drainage network across the spoil tip. The first phase of works, and its robustness demonstrated over the course of five maintenance free years, provided the confidence for Caerphilly County Borough Council to commission the second phase of works.

In total, 3640m^2 of CC were installed in two phases, during inclement weather and on a remote, rural site. Both the contractors and the client appreciated the speed and ease of installation. The solution is now being considered across a number of other similar sites in the South Wales region.

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