

Project Info



21 / 03 / 17



CC8™ Bulk Rolls



2,875m²



Transverse layers



A4060, Dowlais, Merthyr Tydfil, South Wales



ALD Plant Hire



CC8™ was used to remediate a dilapidated channel which runs alongside a stretch of the A4060 in Dowlais, Merthyr Tydfil

ALD Plant Hire & Civil Engineering



Asiant Cefnffyrdd De Cymru
South Wales Trunk Road Agent

AECOM



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Completed section of remediated channel alongside the A4060 in Dowlais, Merthyr Tydfil

In March 2017, Concrete Canvas® GCCM* (CC) was used to remediate a channel which runs alongside the A4060 in Dowlais, Merthyr Tydfil in South Wales.

The A4060 links the A470 Pentrebach roundabout and Dowlais areas of Merthyr Tydfil. The Pentrebach end of the route consists of a 3-lane single carriageway, while the newer stretch which leads towards Dowlais consists of a dual carriageway.

Running adjacent to the A4060 lies a large drainage channel, approximately 410m in length with a variable profile of between 5.5 – 10 linear metres, which takes surface run-off from the hillside, protecting the A4060 from flooding and undermining.

The original earth channel has been remediated using several different methods over the years, including a concrete poured invert, cement filled sandbags to stabilise the batters, concrete slab-work and lean mix grout pours. The dilapidated channel was in disrepair, with significant vegetation growth, collapse and signs of scouring. This would eventually have led to undermining of the embankment on the near side of the A4060.

The works were carried out by ALD Plant Hire, CEMEX's Civils Engineering partner, for SWTRA (South Wales Trunk Route Agent), with design specifications provided by AECOM.

*Geosynthetic Cementitious Composite Mat



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Unlined sections of the channel were overgrown and at risk of blockage



Various methods of remediation had been used over the years



Concrete sections of the channel were badly damaged



The channel was re-graded prior to works to ensure a successful installation

Insitu poured concrete or concrete slabworks would have been the best alternatives to CC for this project; however, CC is much less weather dependent than insitu which reduces programme disruption and is significantly quicker to install. Typically, CC is installed at ten times the rate of poured concrete solutions. CC also has much greater abrasion resistance compared to conventional concrete methods, a minimum design life of over 50 years and excellent chemical and UV resistance.

Compared to slab work, CC involves significantly less manual handling on site and requires less ground preparation. Slab work can also be prone to joint and mortar cracking and subsequent vegetation growth over time which can introduce water blockages and reduce the performance of the channel. CC also provides excellent weed suppression, and can withstand shear forces of 575Pa and flow rates of 8.62m/s.

Weather conditions were a challenge throughout the installation, and although CC can be installed in inclement and wet weather, there were concerns that the preparations made to the channel and substrate would be washed away by the flow of water in the channel. To prevent any further issues, the channel was prepared as works progressed, with the installation of the CC material so that prepared areas were immediately protected. In places, the channel was made wider and less steep to prevent over topping, while anchor trenches were created along the shoulders of the channel.



Each additional layer of CC laid was overlapped by 100mm



Overlaps were jointed using stainless steel screws on soil substrate



CC was fixed in anchor trenches with ground pegs



On concrete infrastructure, overlaps were fixed using Hitli concrete fixings



Each section was hydrated when completed



A transverse layup was used to allow for the varying profile width



The commencement of the channel at its source



The channel widens to accommodate heavier water flow



A junction in the channel



Complex detailing at the commencement of a channel section



Termination of the CC to the existing concrete channel



The CC's flexibility was able to accommodate complex sections of the channel



A completed section of the channel on a return visit

The CC was delivered to site in bulk rolls, which were mounted onto a spreader beam attached to a 14T excavator. The CC was laid transversely to allow for the great variations in the channel's profile and fixed into the concrete substrate using Hilti HUS HR 8 x 65 stainless steel fixings, and pinned within the trench at 1m intervals using 250mm steel ground pegs. Starting downstream, CC layers were overlapped in the direction of water flow, and jointed either with the Hilti concrete fixings or stainless steel 35mm stainless screws depending on the substrate.

Complicated junctions, minor tributary drainage channels, pipework and gabion baskets were easily negotiated by the flexible CC material and cut to fit. The material was cut to individual lengths using a disc cutter, significantly reducing any wastage of material. Once installation was completed, hydration was given using a 1000L IBC container mounted onto the 14T excavator. The anchor trenches were then backfilled to prevent ingress.

A total of 2,875m² of CC8™ were installed over a 4 week period by a team of 6, in inclement and challenging weather conditions. The re-alignment, widening and lining of the channel will protect the A4060 from flooding and closure, which would otherwise cause significant delays and cost to an important trunk route.

“The choice of concrete canvas to line the ditch was a real ‘no brainer’, it allowed us to work in most weather conditions and installation using the tracked excavator and spreader bar meant we were able to install quickly given the challenging conditions underfoot. Definitely a product we would chose to use again.”

Ian Dando
ALD Plant Hire