

Project Info



27 / 01 / 20



CC8™ Bulk Rolls



400m²



Transverse layers



Lisburn, Northern Ireland



McLaughlin & Harvey Ltd



Concrete Canvas® was used to line an overflow conveyance channel to provide long term erosion control and mitigate future maintenance



Completed CC lined channel

In January 2020, 400m² of Concrete Canvas® (CC) GCCM* was specified to line a 50 linear metre trapezoidal overflow conveyance channel to provide long term erosion control and mitigate future maintenance.

The overflow channel, located in Lisburn in Northern Ireland, runs adjacent to the Belfast–Dublin Main Line which is the busiest railway route in Northern Ireland.

The existing watercourse collected surface run off from upstream and transported it beneath the railway track through a brick culvert where it was safely discharged downstream into a local watercourse. During heavy rainfall the channel and culvert didn't have sufficient capacity to handle the volume of water, causing flooding and potential issues with the slope stability near the railway track.

The overflow channel was designed to alleviate these issues by diverting water during flood events along the conveyance channel into a 2.1m precast pipe located 50 metres away.

As part of the remedial works on site, an 8mm thick CC variant (CC8™) was specified by Amey Consulting, on behalf of Translink NI Railways, for the channel lining section of works and the installation was completed by McLaughlin & Harvey Ltd.

*Geosynthetic Cementitious Composite Mat



The site conditions and inclement weather presented several challenges for the contractor. Firstly, the channel was located on a difficult to access site between a boundary fence and steep slope. The channel was positioned in a flood-plain and the ground was saturated due to heavy rainfall during the installation. The restricted access and soft substrate prevented traditional concrete options which require a mixing truck to be present on-site. CC was ultimately chosen as it needs no such machinery and the material can be easily installed in areas which may be hard to access for traditional methods. The material also provides a long-term erosion control solution for the client and has been granted a 120-year durability certificate from the BBA.

Three standard bulk rolls of CC8™ and a fourth, custom bulk roll measuring 25m² were delivered to site and the channel was excavated with a Komatsu 13T excavator. The bulk rolls were mounted onto a spreader beam and hung from the excavator before being deployed transversely across the channel. The site crew then cut to material to length using a utility blade which eliminated material wastage. The CC layers were overlapped by 100mm, shingled in the direction of water flow, and screwed together at 200mm intervals with stainless steel screws. To mitigate water ingress beneath the material, the edges of the CC were terminated into 150mm anchor trenches on either side of the channel, with the material pinned with 250mm galvanised pegs and backfilled with as dug material.



Flood-plain area prior to works



Site prior to works



Existing channel during low flow



Channel excavation adjacent to railway track



Channel excavation



CC8 bulk roll dispensed on spreader beam



Hydrating underneath the overlap & screwing CC overlap at 200mm centres



Before - Conveyance channel



After - Conveyance channel



Precast headwall - CC interface



View from railway track



Works completed



Completed channel



Completed CC lined channel - works were carried out despite inclement weather and restricted site access

On the upstream and downstream sides, the CC8™ material was terminated into an anchor trench at the precast concrete headwall interface and the trench was backfilled with poured concrete to ensure no water ingress and provide a smooth transition from the headwall into the CC lined channel.

The material was hydrated as the contractor moved upstream using a pump and hose with a diffused spray nozzle from a local watercourse. Unlike most concretes, CC uses a specialist high early strength concrete with a limited alkaline reserve. It has a very low wash out rate and when combined with the volume of water required for hydration these characteristics mean that CC run-off can be directly discharged into the local water course without the need for prior treatment.

400m² of CC8™ was installed within 1 week with an installation crew of 4 people despite the difficult to access site and inclement weather conditions. The material will provide long-term erosion control for the channel and significantly mitigate any future maintenance. The contractor and client were impressed with the ease and speed of installation and the material is being considered for similar schemes in the future.