


Project Info

 25 / 11 / 18


 CC5™ Bulk Rolls

 2000m²

 Transverse layers

 Tiszafüred,
eastern Hungary

 KÖTIVIZIG

 CC5™ used to remediate a 200m long section of a damaged concrete canal



Installation team on site following completion of canal remediation

In November 2018, Concrete Canvas® (CC) GCCM* was used to remediate a 200m long section of an existing concrete irrigation channel connected to the river Tisza in Tiszafüred, eastern Hungary.

The section in question is part of a large 36km long canal constructed around 80 years ago, which feeds off onto several smaller canals. The total length of this canal network is more than 80km.

The canal is operated by Middle Tisza District Water Directorate, who manage more than 4300km of canals, rivers and waterways across the area, which are mainly used for irrigation, supplying water to farms, fisheries and so on.

Several stretches of the canal showed severe damage to the concrete in places, which were drastically impacting the hydraulic performance of the canal and causing fairly severe leaks.

This project was carried out on a trial basis to establish how well CC would perform in this application. This particular 200m stretch was chosen as it was closest to urban land facilitating transportation issues. This section of canal is also situated on an embankment, so monitoring the result of the repair would be easy to carry out. Should the trial prove a success, the client will look into using CC for remediation of other damaged sections of the canal network.

*Geosynthetic Cementitious Composite Mat



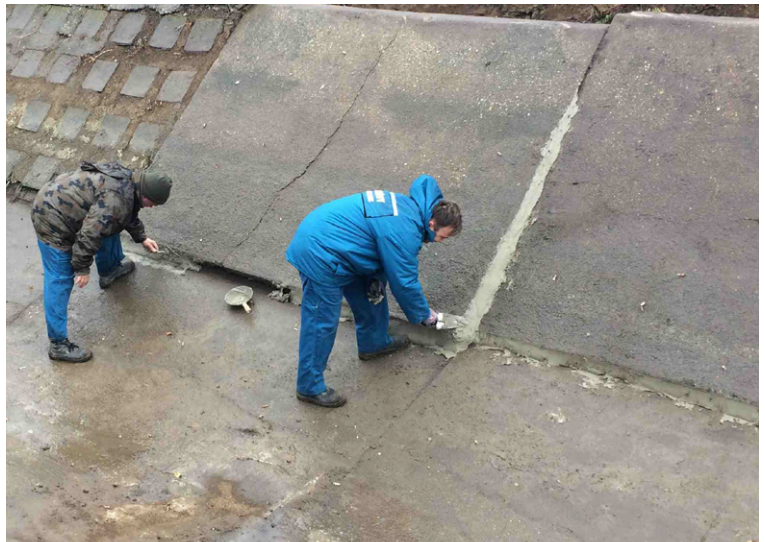
Canal prior to works



Section of canal below a bridge



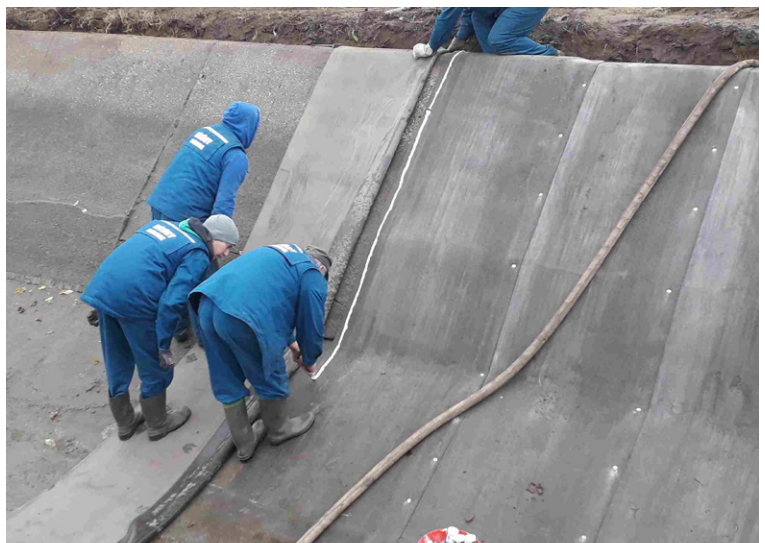
Removing dust and debris with sweeping brush



Filling cracks and voids in concrete canal



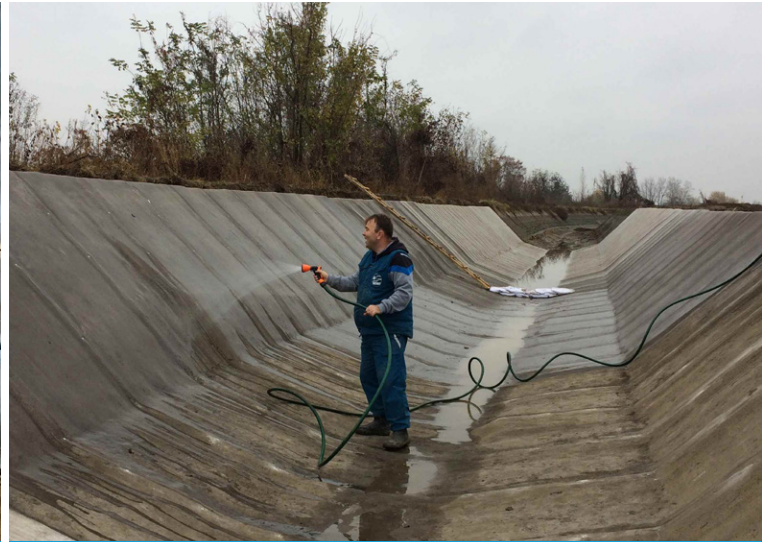
Batching CC for easier delivery to site



Joining CC overlaps with sealant and expanding bolts



Termination of CC to concrete using steel bars and expanding bolts



Hydration of CC



Backfilling anchor trenches



CC termination around bridge

The time allocated for the works to be carried out was limited, with the canal disused and empty for a period of a few months from 10th November, when the irrigation water supply is cut off and the canal emptied. However, cold weather conditions are typical from December, which would make it very difficult to continue with the works during this period. Furthermore, the client was keen to complete the installation in 2018 to prevent the project spilling over into their budget for 2019. As a result, the team had around a month to complete the works.

Having previously heard of CC and knowing the benefits of this technology, the client specified the product for the trial. The main advantages and decisive factors of using CC here were its speed and ease of install; CC's ability to be installed within the tight time-frame given for this repair; and costs, particularly due to the lack of requirement for specialist personnel, training and equipment, which would allow the client to install the material using their own maintenance crews.

To prepare the canal for installation, vegetation and any sections of damaged, crumbling concrete were removed. The concrete was then brushed to remove any further debris and dust, and cracks and voids were filled. Anchor trenches were excavated along the shoulders of the canal, which would later provide a termination point for the edges of the CC material. Once the bulk rolls of CC were delivered, they were deployed from a spreader beam and the material cut to size and brought to site in man-portable rolls for easier on-site transportation, management and installation.

*Completed remediation installation*

The CC was laid transversely across the channel, from shoulder to shoulder, with material edges secured within the anchor trenches using ground pegs. Subsequent layers were overlapped by 100mm, shingled in the direction of water flow. The material below overlaps was hydrated and then sealed with an adhesive sealant and holes drilled through the CC and into the concrete below. Expansion bolts with washers were then inserted to fix the material to the canal. The leading and trailing edges were terminated onto the concrete canal using steel termination plates and expansion bolts. Following installation, the CC was hydrated using 1000L IBCs, pumps and hoses, and the anchor trenches backfilled.

A total of 2000m² of CC5™ were installed in less than 6 days by a team of 10. The installation was a success; the CC will now be evaluated for a season. If the client is happy with CC's performance, the material will be considered for the remediation of other leaking sections on this canal as well as sections of their regional irrigation channels network. The installation was carried out by KÖTIVIZIG's Kisköre Section Engineering's employees. This resulted in cost savings for the client, as they did not have to employ specialist contractors.

"It was an exciting challenge to learn about this new technology and to use it in our own area of service. CC's unique technology enabled us to apply it [with] our own technical team without having to employ any contractors. The installation team enjoyed the work and the change of pace. We are looking forward to further operational experiences. In the meantime, we have already planned the lining of other channel sections."

Lórinç Fejes, MSc
Head of KÖTIVIZIG's Kisköre Section Engineering