

Project Info



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CC5™ Batched Rolls



1700m²



Vertical layers



Uzsabánya, Hungary



MÁV FKG Kft.



CC5™ was used to provide slope protection beside a rail track on an industrial site in Hungary



Completed installation in Uzsabánya, Hungary

At Uzsabánya quarry in Hungary, two slope sections at an industrial railway station were beginning to become overgrown with weeds and were eroding in places. Some years ago, a drainage system for surface runoff was built of precast elements along the track. However, the slopes hadn't been repaired and crest drainage hadn't been put in place. As a result, surface runoff had caused erosion on the slopes, with large areas subsiding and soil being washed into the channels. The slope and drainage system had become difficult to clean and maintain. It was decided that the slope should be protected and a surface drainage system put in place.

A number of factors had to be taken into consideration when searching for a solution for this project. Some of the upper sections of the slopes are owned by the mining site, making access difficult. A solution was required that would allow simple installation, easy transportation without disruption of train traffic or work and movements within the quarry. The contractor gained permission from the mine to access the site, however, there were limitations for working on the mine's land, especially with machinery such as excavators and dozers. As a result, there were several occasions where the team were only able to access the mine site on weekends.

Having previously heard of Concrete Canvas® (CC) GCCM*, the client specified the product to protect the two slope sections. The material would also prevent saturation of the slope surfaces and provide weed suppression, reducing overall maintenance. Batched rolls of the material were chosen for the project due to the ability to easily transport the material by hand on site and to carry out installation without heavy plant.

In the initial design and planning phase, concrete chutes had been specified to be installed to control high volume flows, but following some technical consultations in which the material properties were researched, the specification was changed to use CC for these chutes.

*Geosynthetic Cementitious Composite Mat





Project site



Evidence of erosion, failure and drain blockages on slope section 2



Scour of slope caused by erosion



Slope section following ground works



Anchor trenches created using digger and V-bucket



Ground pegs used to fix CC to substrate



Hilti nails used to fix CC to masonry walls



Termination detail onto concrete wall at slope toe



Section of transversely laid CC sections for surface runoff



The CC slope is able to withstand freeze thaw conditions experienced during colder months in the area



Completed section of CC slope protection installation

In September 2018, works on the project began, with the installation carried out by MÁV FKG Kft. for MÁV Co. - a Hungarian Railway company. In preparation for installation, the slopes were excavated to remove vegetation and any sharp or protruding rocks, then re-graded and levelled before and after laying crushed stone. Anchor trenches were then excavated at the crest of the slopes.

Batched rolls of CC5™ were delivered to site, transported to the slopes by hand and unrolled down the slope faces, with the leading edge captured and secured within the crest anchor trench. Subsequent layers were unrolled and secured in the same way, with overlaps of 100mm created and jointed using screws. Each length of CC was fixed to the ground using ground pegs at 1m intervals along the edges. In some places, the material was fixed to headwalls using masonry nails while lower edges were nailed to the precast concrete elements.

Following installation, the CC was hydrated using a water truck. A 1000L bowser was used to hydrate the lower layers of CC at jointed sections and smaller areas. The anchor trenches were then backfilled and the substrate compacted using a Wacker plate to prevent water ingress. In some sections, where the CC met existing concrete or masonry infrastructure, mortar was used for the backfilling.

The installation was carried out over a period of around three months by a team of between two - four people, depending on the volume of works required elsewhere on site. The team did not work continuously due to other schemes that were required elsewhere on site. However, the project was still completed ahead of the deadline given and CC met all expectations. This project has also been granted approval to be used as a reference for the MÁV Co. Hungarian railway.