Project Info

17 / 10 / 18

CC8™ Bulk Rolls

14,000m²

Transverse layers

Mutanda Mine, Kolwezi, Democratic Republic of Congo

REX

CC8™ used to line a newly constructed storm water drain designed to carry water away from a mining area

Completed channel installation

In October 2018, Concrete Canvas (CC) GCCM was specified to line a large storm water drain on the Mutanda Mine (Mumi) site in Kolwezi, Democratic Republic of Congo.

The objectives of the project were to carry storm and pumped pit water away from the mining area, and to prevent water seeping back into the ground and pits. In order to achieve these objectives, a solution was required to provide a low permeability, durable and long-lasting channel lining method.

Contractor REX worked closely with the client, Glencore, and consultants from the Internal Environmental Mine Survey team to find a solution which would address the client's requirements and create a design specification.

Traditional concreting methods, CC and geosynethetics were all considered for the project. Concrete was found to be the most expensive and time-consuming option in terms of installation, while geosynthetics would still require an additional concrete layer for protection following installation. CC was established as the most cost-effective and easily installed option. CC would also provide quality support and advice, as well as on-site representation. The company was also able to provide extensive case studies to show the material's versatility and the speed at which it could be installed. As a result, Concrete Canvas was chosen as the solution for this project.

*Geosynthetic Cementitious Composite Mat

Installation for the project began in October, when the region's rainy season starts. During the course of the installation, downpours were experienced each afternoon. As a result, the installation crew were only able to work for 5-6 hours each day, as working during the afternoon was impractical.

Prior to installation, any vegetation growth was removed from the drainage channel before it was excavated and graded to establish the required slope angles and cut shape. A compactor was used on the base of the drain and the soil hydrated if it hadn't been raining to moisten it before installation.

The CC was deployed from bulk rolls and laid transversely across the drain with layers overlapping in the direction of water flow to prevent ingress. Galvanised pegs were used to anchor each layer to the last through the overlap. Pegs were secured at the base of the channel along the toe of the side slopes to resist any potential movement resulting from drying conditions. Once the material was hydrated and hardened, pegs were also installed in the anchor trench which was then backfilled. 25mm stainless steel screws were installed at 200mm intervals along each overlap.

Channel marked out prior to ground works

Channel excavated

Compacting substrate following excavation of side slopes

Moistening substrate prior to installation

Bulk rolls stationed along channel shoulder

CC was laid transversely, using an excavator and spreader beam

CC layers jointed using screws at corner section

Inlet section of channel

Hydration of material at end of work day

Completed channel section following hydration

Wide angle view of completed channel section

Due to the high temperatures, the CC was hydrated first before the joints were screwed, and a second hydration given 10-15 minutes later following jointing. A third hydration was then given until the material was saturated, and repeated at the end of each day. To ensure sufficient hydration and counteract any drying that may have occurred overnight, the material was hydrated again the following morning before further installation.

The installation was completed within 11 days, with 5-6 hours worked per day, in comparison to the estimated 2-3 months for completion using conventional concrete. A total of approximately 14,000m² of CC8™ were installed during this period.

The client is considering using CC for future projects, which are currently being planned. The client's sister company, KCC, have also been to the site to inspect the outcome and are hoping to use CC for an installation in the coming months, while a nearby mine are also due to conduct a site visit in order to inspect the material and are expecting to specify CC for a trial installation later in 2019.

The installation was completed on time and within budget and without compromising on quality of installation or occupational health and safety aspects of the works on site. It has been estimated that the client has directly saved 50% compared to conventional concrete when considering logistical costs, installation, labour and time required for concrete to set.

Channel re-visited 3 months after installation