

## Project Info



01 / 10 / 18



CC8™ Bulk Rolls



11,750m<sup>2</sup>



Transverse layers



Mariana, Minas Gerais,  
Brazil



Samarco/ Skava Minas



CC8™ used to line  
a newly constructed  
channel for mine and  
rain water management



Completed channel section at a mine site in Mariana, Brazil

CC used to line a large, newly constructed channel at a mine site in Mariana in the state of Minas Gerais, Brazil.

The aim of the project was to create a channel which would direct tailing from mine and rain water through a tailing pond which was under reconstruction. Shotcrete had been considered for the scheme but due to the works being undertaken during the rainy season, this solution was not a viable option as the inclement weather would regularly result in stoppage of works. The client also had time constraints to consider, with a deadline of December 15th 2018. As a result, the 1.5km channel had to be completed within just 2.5 months, ruling out a number of traditional concreting methods due to long lead times and the time required for setting or curing of the concrete. CC was chosen as it was the only viable option given the circumstances, and would allow for rapid installation in all weathers.

The works were carried out by contractor Skava Minas for Samarco, with BVP Engenharia acting as consultant.

Prior to installation, the 3m deep channel was excavated from tailings material which had been compacted over 10 years. The 3m slopes on either side were then profiled and compacted for a smooth finish, allowing the CC to be installed without risk of voids forming below the material. Anchor trenches were then dug on either shoulder of the channel, measuring 20 x 20 cm.

\*Geosynthetic Cementitious Composite Mat







*Excavation of 3m deep channel*



*Channel following ground works*



*CC deployed transversely*



*Jointing of the overlaps*



*Setting CC channel*



*CC termination at rocky section of channel*





*Completed channel and backfilling of anchor trenches using mortar*

The specified CC8™ material was delivered to the site in bulk rolls, transported by truck from a warehouse 15 minutes from the site. The CC was then cut to required lengths of 9.5m on average and manually transported to and deployed transversely across the channel. The edges of the CC material were captured within the anchor trench and fixed using steel ground pegs at approximately 1.5m intervals. Subsequent layers of CC were overlapped by 100mm and double-jointed using 35mm screws set at 200mm intervals following hydration of the lower layer below the overlap. This method was repeated along the full length of the channel before hydration was carried out via a 5000m<sup>3</sup> bowser. Initial hydration was carried out for 15 minutes and repeated an hour later. The anchor trenches were then backfilled using poured concrete. In four sections of the channel, where flow rates were above 10m/s, a concrete column measuring 20 x 20 x 400cm was installed on the base of the channel to dissipate water energy.

A total of 11,750m<sup>2</sup> were installed over 60 days, with the crew working 8-hour days, 6 days per week. On three days, no work was carried out and four other days were worked as half days due to torrential rain which made it impossible for the crew to continue. Despite disruptions, the CC was installed at rates of up to 532m<sup>2</sup>. On the team's most productive day, 3,546 screws were used to joint the material and 399 pegs were used to secure the CC.

As a whole, despite some stoppages in work due to weather, CC was a fantastic option for this project which wouldn't have been completed in the allocated time if traditional concreting methods were used. The project was deemed successful, with the client rating the product highly and commenting that CC and the installation process and results exceeded expectations. The client and contractor were also impressed by the employee safety and overall safety involved with product use.