

Project Info



03 / 05 / 17



CC5™ Batched Rolls



1,000m²



Vertical layers



Route FT68 KM37.9, Jalan Bentong Lama, Gombak, Selangor, Malaysia



Daengco Sdn Bhd



CC5™ was used to protect a slope which had been damaged by erosion caused by rain water flowing down the slope.



Completed installation above Route FT68 KM37.9 in Sengalor, Malaysia

In May 2017, Concrete Canvas® GCCM* (CC) was used to protect a slope above Route FT68 KM37.9 in Selangor, Malaysia. The slope formed part of a cliff face, adjacent to the road, and had over time, scoured to form a natural collection point of surface rainwater, channeling the water directly onto the road below. This had caused severe erosion over time and during the rainy season, mud, rocks, fallen trees and rain water made the road impassable to vehicles.

To lessen the speed of rain water flowing down from the area above, and to prevent further erosion, JKR (Jabatan Kerja Raya, the Malaysian Public Works department) commissioned the works to protect the slope, and wanted a solution which would last several years and would require minimal maintenance. Several solutions were considered including using gunite and building a rock-fall protection structure and a half tunnel along the curve of the road to protect vehicles using the road. All of the solutions would involved a lot of work, cost, planning and time. Using CC is the cheaper, faster and practical solution. The works were carried out by local contractor, Daengco Sdn Bhd.

In preparation for the installation, debris was removed from the slope and the CC was delivered to site in man-portable batched rolls of CC5™. Batched rolls were specified due to the difficult access on site and steepness of the slope. These were placed at staggered starting points up the slope to reduce manual handling once work had begun.

*Geosynthetic Cementitious Composite Mat



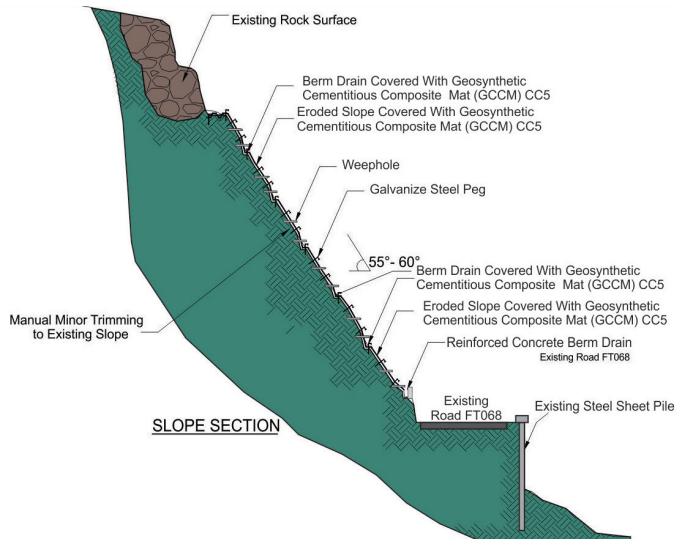


Diagram of slope cross section



Diagram of slope site location



Slope prior to ground preparation



Debris was removed from the slope prior to installation



The CC was delivered to site in man-portable batched rolls



The CC was placed at intervals up the slope to minimise manual handling



A concrete berm drain was also created as part of the works



The berm drain was left to set while CC works were carried out



The CC was laid and overlaps secured using screws



The team started at the toe of the slope, working across and up



The CC was fixed to the substrate using ground pegs



The CC was hydrated following installation



A full view of the completed slope from the road



A view of the completed slope from the toe



The CC was cut to fit around the installed weep holes



An overview of the completed berm drain system



Close up of the concrete berm drain system



View of the completed slope from the road, before removal of berm supports



A view of the completed slope from the road below

Starting at the toe of the slope, which was wider than the crest, the team worked their way across and up the slope, laying the pre-cut batched rolls with layers overlapping by 100mm. The layers were fixed at the overlaps by 200mm using stainless steel screws at regular intervals to prevent ingress. The CC was then fixed to the substrate using steel ground pegs. As part of the works, 9 berm drains were also dug prior to installation, and weep holes created at 2m intervals to release any build-up of hydrostatic pressure within the slope to mitigate the risk of deep slip. Once installation was complete, the material was hydrated.

In total, 1,000m² of CC5™ were installed in less than 3 weeks on a site with difficult access.