









**Project Info**

-  27 / 05 / 18
-  CC5™ Bulk Rolls
-  620m<sup>2</sup>
-  Transverse layers
-  A'ali, Bahrain
-  FOQSCO
-  CC5™ was used to provide erosion protection to a channel and slope section at a roadside in Bahrain



Completed channel and slope installation

Concrete Canvas (CC) GCCM\* was used to provide a channel lining and slope protection solution at a roadside in A'ali, Bahrain.

The aim of the project was to provide erosion protection. Alternative options such as conventional concrete and rip-rap were considered for the slope, as this was already partially lined with rip-rap. However, the cost and time required to carry out this installation would have been too great for the client, and would have caused significant disruption to road users.

The channel measures approximately 100m in length, with an average width of 3m. CC was selected for this project as it would be easy and quick to install, could accommodate the varying width of the channel, and was a safe option for installation on the slope, particularly in such close proximity to the road.

The works began on 27th May 2018, and were carried out by FOQSCO for the Ministry of Works Bahrain.

\*Geosynthetic Cementitious Composite Mat





Channel following preparatory works



Deployment of CC material



Joining overlaps using stainless steel screws



Hydration of the CC



Filling anchor trenches with cement



Painting completed installation





*Completed installation*

Prior to installation, vegetation and sharp rocks were cleared by hand using a backhoe and shovel. The channel was then levelled and compacted to ensure an even substrate. The CC5™ material specified for the project was then delivered in bulk rolls, cut to required lengths on site to reduce wastage, and unrolled down the slope. The edges of the material were buried within pre-dug anchor trenches and secured with ground pegs. CC was then laid transversely along the inverts of the basin and across the channel. Stainless steel bolts were used to joint the overlapped layers of CC through the existing rip-rap and headwalls while stainless steel screws were used within the channel. Cement mortar was then used to seal the CC edges where they met the rip-rap slope. The anchor trenches were then back-filled with concrete to provide a neat termination and prevent water ingress. Following installation, the CC was hydrated and then painted when set.

The installation took a total of 10 days to complete, in very hot and dry conditions and an average of 10 hours worked each day. This included preparatory works, installation, setting and painting. A total of 620m<sup>2</sup> were installed for this project.

The project was a great success, particularly when considering the time savings and the ease of installation in comparison to conventional methods. As a result, the client also saw significant cost savings due to reduced time on site and no requirements for road possession.