










**Project Info**

-  25 / 04 / 21
-  CC5™ Bulk Rolls
-  18,922m<sup>2</sup>
-  Vertical layers
-  Ras Al Khair, KSA, Saudi Arabia
-  FOQSCO
-  CC5™ used to provide bank erosion protection to an RSA pond required for Bauxite liquor storage.





Completed works

In April 2021, Concrete Canvas® GCCM for the second phase of the embankment side wall erosion protection works in Ras Al Khair, Saudi Arabia.

As with the [Phase 1 works](#) the client, Ma’aden Aluminium (a joint venture between mining company Ma’aden and American aluminium production company ALCOA), required a solution which could provide bank erosion protection to a newly constructed RSA (residue storage areas) pond which would be used to store Bauxite liquor produced by the company.

The phase 1 works has proven to be successful at preventing the embankment erosion in one of the Bauxite ponds, so CC5™ was again specified to line this new pond.

CC5™ is a [Type I GCCM](#) and is defined in [ASTM D8364](#), it is suitable for use on slope protection applications and was chosen for this project to suit the abrasion, wear and loading requirements.

Prior to CC5™ being installed the slope was smoothed out and compacted to remove any protrusions or voids. The contractor also dug anchor trenches at the crest of the slope in preparation for securing the CC material. With care taken to prevent damaging the underlying lining below the soil cover.

\*Geosynthetic Cementitious Composite Mat



*CC5™ Deployed using boom truck*



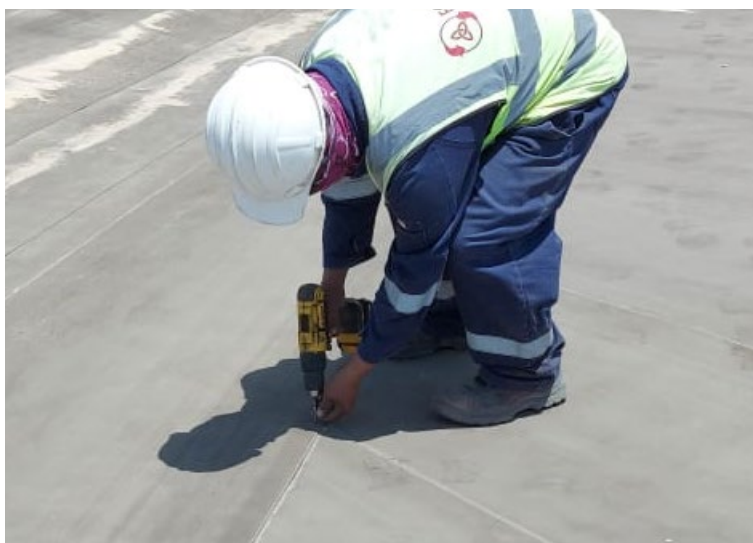
*CC5™ Material suspended using spreader beam*



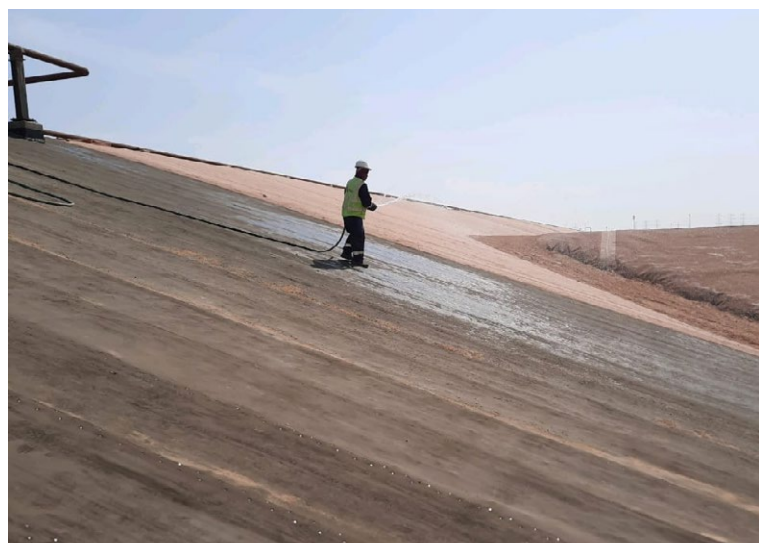
*CC5™ Material laid vertically down the slope*



*CC5™ Material laid vertically down the slope*



*Overlapped layers secured using stainless steel screws*



*CC5™ being hydrated with hose*



*Completed slope protection works*

Once the slope was prepared, Bulk Rolls of CC5™ were brought onto site and mounted onto a spreader beam. With the Bulk Rolls of CC being suspended from a boom truck at the crest of the slope for easy and rapid deployment. The Bulk Rolls were unrolled manually and laid vertically down the length of the slope. Each layer was then cut to the desired length to reduce wastage with the subsequent layers overlapping by 100mm. Each overlapped layer was then jointed using stainless steel screws applied in a zig-zag pattern at a distance of 50mm from each other.

At the crest of the slope the leading edge of the CC5™ material was terminated inside anchor trenches and pegged using stainless steel pegs at a distance of 500mm from each other. The anchor trenches were then backfilled with marl. When terminating to concrete sleepers, the CC5™ material was terminated using stainless steel batten strips and bolts. At the toe of the slope CC was laid over a HDPE lining and covered with sand. The material was then hydrated at the end of every shift using a water tanker and hose.

A total of 18,922m<sup>2</sup> of CC5™ was installed in 21 days with an average of 10 hours of work was carried out each day. The installation was a success and the client pleased with the overall process and timescale to complete.