

Project Info



07 / 05 / 15



CC5™ Batched Rolls



130m²



Vertical layers



Porto, Highway A41/
IC24, Lango Freixieiro/
Alfena, Portugal



Mota Engil



CC5™ used to line a
slope and remediate a
concrete wall next to a
highway



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Completed installation

In May 2015, Concrete Canvas® GCCM* (CC) was used to protect a slope and remediate a concrete wall located in Porto, Highway A41/IC24, Lango Freixieiro/Alfena, Portugal.

The original sprayed concrete installation had suffered from severe erosion which caused debris to fall onto the road, posing a risk to the highway traffic. A repeat shotcrete installation was considered, however this would have necessitated two lanes to be closed, specialist labour and heavy plant, as well as being more time consuming and expensive in comparison to CC. CC required only one lane to be closed, a limited amount of plant and no specialist labour. Additionally CC allowed for a much cleaner install, with none of the issues associated with the rebound from shotcrete, as well as providing a much more organic and natural looking finish. CC also negated any programme disruption due to inclement weather as, unlike conventional concreting methods, CC can be installed in the rain.

The works were carried out by Mota-Engil and the subcontractor Newinfra, the client was Ascendi.

To prepare the slope for CC installation, any large or protruding rocks were removed, along with any failed shotcrete debris. The erosion experienced resulted in several large cavities in the slope which were filled with aggregate, to reduce void space under the CC. The concrete wall needed no preparation.

*Geosynthetic Cementitious Composite Mat





Erosion occurred under the previous shotcrete installation



Large voids filled with aggregate



Batched rolls delivered to site and mounted onto a spreader beam



Unrolling first layer of CC

Batched rolls of 5mm thick CC (CC5™) were delivered to site and hung from a spreader beam attached to a truck mounted crane. The leading edge of the CC was fixed to an existing concrete drainage channel at the crest of the slope using concrete bolts. The CC was then unrolled down the slope, with the installation team ensuring a 100mm overlap was created between adjacent layers. The material under the overlap was hydrated before pegs were inserted through the joints and on either edge of the installation at 2m intervals, with holes being cut for the existing pipe infrastructure and for the insertion of soil nails. The joints were screwed at 200mm centres before hydration was completed using a 1000L bowser and hose. Concrete bolts were used to fix the CC to the existing concrete wall at the base of the slope.

In total 130m² of CC5™ were installed in just 6 hours by a team of 4, despite rain and a difficult to access site. Additionally CC allowed for a faster, cleaner, more cost effective install whilst simultaneously reducing the number of lane closures needed from 2 to 1 and providing a more natural looking finish.



Fixing to existing concrete channel with wedge anchors



Fixed to substrate with ground pegs



Subsequent layers overlap previous by 100mm



Hydration under overlap



Ground pegs inserted through the overlap



Anchor plates used to profile CC



Overlaps were screwed at 200mm centres



Hydration



Pipe protrusion accommodation



Completed project

"For me it was impressive - the hardness obtained by a thin layer of 5mm and in such a [short] time. I also like the more natural and organic look of CC against the shotcrete. It's super-fast! Nowadays the companies are always on top of cost savings, and with the shotcrete solution [it would have been] much greater in terms of logistics and time. It's super easy!"

Mr. Macedo
Project Manager, Mota-Engil

"I am very pleased with the fast and easy install and its finish. Also with the impervious surface of the material and its hardness. It is a good alternative for shotcrete in terms of speed and simplicity, with the same final result. The work site is much cleaner, [and there is] less need of plant and other specialized equipment. It's also cost effective because we can install more square meters per day than with shotcrete, and being this the first installation, I'm sure we be faster on the next works, now that we have the experience."

Mr. Belmiro Fidalgo
Project Manager, Newinfra