CONCRETE CANVAS®

REMEDIATION

Project Info

- 08 / 09 / 14
- CC5™ and CC8™ Bulk Rolls
- 7,225m²
- Transverse layers
- Pogo Mine, Alaska, USA
- Pogo Mine staff
- CC5™ and CC8™ used to remediate a dilapidated shotcrete drainage ditch

Completed section of ditch

In September 2014, Concrete Canvas® GCCM* (CC) was used to remediate a drainage ditch at the base of a slope at Pogo Mine, Alaska, USA.

The ditch is needed to prevent surface and storm water coming into contact with the adjacent mining tailings field. Pogo Mine is owned and operated by Sumitomo Metal Mining. Due to the mine location and surrounding terrain there are challenges with storm and surface water management.

Re-lining the ditch with shotcrete was considered, however 2 miles of shotcrete lined ditches had been installed in the previous two years and proved this was not a long term solution. Storm water had undermined the ditch which, when coupled with freeze-thaw weathering and heavy spring rains, had caused extensive cracking of the shotcrete leading to failure.

CC allowed the installation to be undertaken in September when temperatures are already near freezing and there is regularly frost in the mornings - conditions which prevent the use of conventional concrete. Additionally CC will negate the costly maintenance requirements associated with other drainage solutions.

The works were carried out by and for Pogo Mine and Sumitomo Metal Mining.

*Geosynthetic Cementitious Composite Mat

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Site location

Slope causing the runoff undermining the shotcrete ditch

CC mounted to Caterpillar small wheel loader

33 Bulk rolls of CC5™ and 5 bulk rolls of CC8™ were delivered to Pogo Mine. The existing shotcrete ditch was cleaned of debris such as rock and vegetation to ensure intimate contact between the CC and the incumbent shotcrete lining. An anchor trench was created at the crest of the ditch adjacent to the slope, above the level of the existing shotcrete, to prevent runoff water from the slope infiltrating under the CC. The opposite side of the ditch is located next to a road, for which the bank was graded and the ditch was re-profiled using a Volvo EC360C and a Caterpillar 320C excavator.

The CC was mounted onto a Caterpillar small wheel loader with a spreader beam, unrolled and cut to specific profile length with a utility knife to avoid wastage. The mine staff then laid the CC transversely, overlapping layers in the direction of water flow. The outer edges on the side adjacent to the slope were fixed with 305mm Galvanized Ardox spikes into the previously created anchor trench. The overlaps were screwed every 300mm with 20mm truss head stainless steel full thread screws. The roadside edge of the CC was then sealed with a bead of Sikaflex 1A and fixed into the existing shotcrete liner with 15mm x 10mm steel mushroom anchors. The material was hydrated via a water truck with a 50mm adjustable nozzle.

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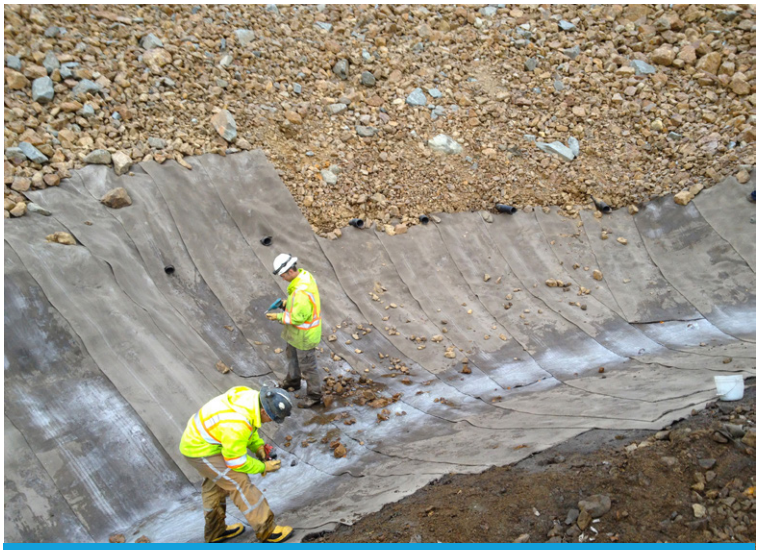
Existing shotcrete ditch

Unrolling the CC5

Fixing the CC to the existing concrete



Joining the CC overlaps

Hydration

CC post-hydration

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A section of the completed ditch

A section of the completed ditch

Corner and infrastructure accommodation

Water inlet

A total of 7,225m^2 of CC was installed in 11 days at rate of up to 1000m^2 per day by a team of 6, in low temperatures. The install was deemed a success due to the speed of install and a huge cost saving of 90%.

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