CONCRETE CANVAS®

CHANNEL LINING

Project Info

- 01 / 10 / 14
- CC13™ Bulk Rolls
- 1,680m²
- Transverse layers
- Mirny Airport, Yakutia, Russia
- Undisclosed
- CC13™ was used to create a more efficient water management system at an mine airport

Completed channel

In October 2014, Concrete Canvas® GCCM* (CC) was used to line a newly excavated drainage channel at Mirny Airport, Yakutia, Russia.

The airport serves Mirna Diamond Mine and is the main means of transport in and out of the mine due to the remote location. Yukutia's severe weather conditions mean that there are only 3 months of the year during which construction is possible, making speed of installation vital. Additionally, even during this 3 month window, the temperatures remain very low. This, along with the expense of transporting raw materials to such a remote location, rules out almost all other channel lining options.

Traditional concreting methods were considered, however these would require much longer installation times and would be halted by any precipitation or low temperatures. These methods had been tried before and proved to be unsuitable. The loose ground conditions resulted in undermining, and freeze thaw weathering was also a major issue.

CC was chosen because it could be installed rapidly, in low temperatures and in adverse weather conditions, freeing up more time for other necessary construction works on site. CC is also more resistant to freeze thaw weathering due to the 3D fibre matrix within the material preventing crack propagation.

*Geosynthetic Cementitious Composite Mat

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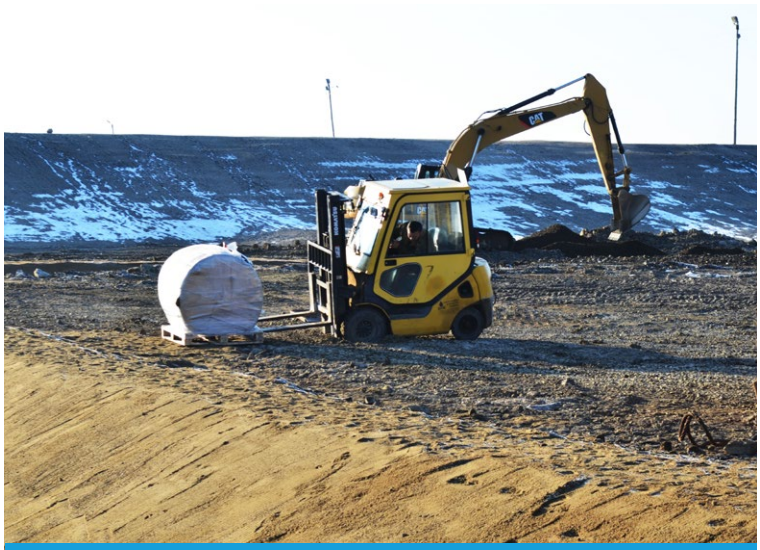
Channel following excavation



Bulk rolls of CC13™ were transported on site by forklift

CC mounted onto a spreader beam and hung from a crane for deployment

24 bulk rolls of 13mm thick CC (CC13™) were delivered to Mirny airport and transported to site using a forklift. The channel was excavated to profile using a 20T excavator. An anchor trench was created at the crest of the channel to allow the leading edge of the CC to be buried so as to prevent undermining.

The CC was mounted onto a spreader beam and hung from a crane, unrolled across the channel before being cut to specific profile length with a utility knife, minimising wastage. The contractor laid the CC transversely, overlapping layers by 100mm in the direction of water flow. The overlaps were screwed at 200mm centres with 30mm screws and 400mm groundpegs were inserted through every overlap at the crest of the channel to secure the CC to the substrate.

One longitudinal layer of CC was used to cover the leading edge of the transverse layers and then buried into the anchor trench as an extra precaution against undermining. The CC was hydrated using a hose with spray nozzle attached and a 6000L water carrier. After hydration, the CC was protected with plastic sheeting due to the expected low overnight temperatures.

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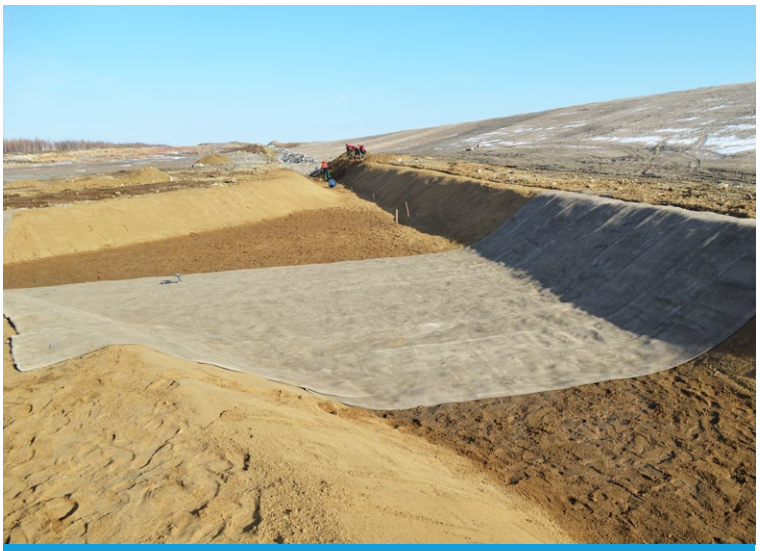
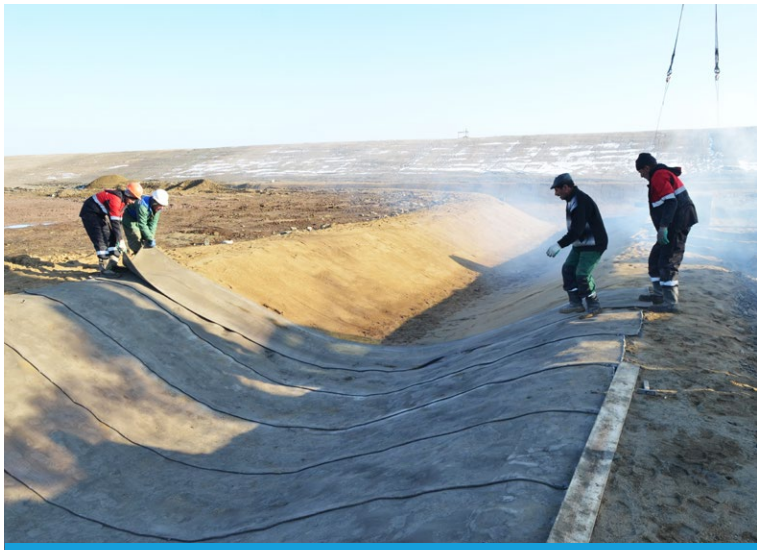
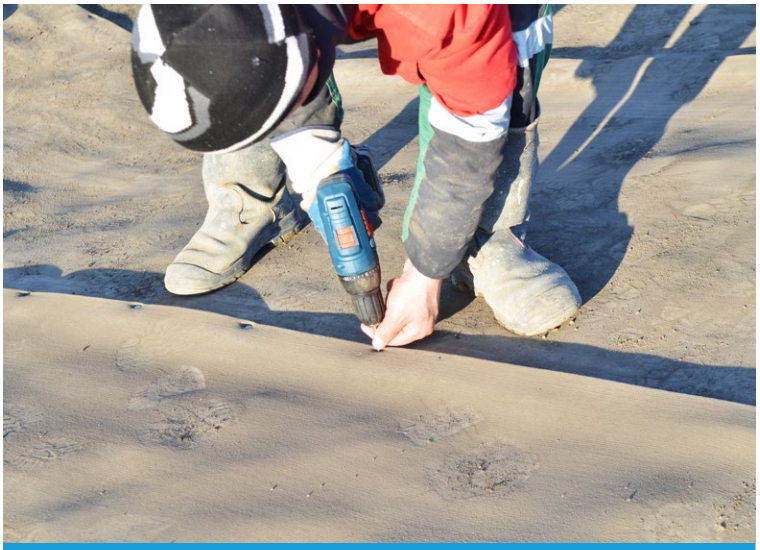
Bulk roll of CC13™ lowered into position for deployment



CC laid transversely across the channel



CC layers overlapped by 100mm



Jointing overlaps with stainless steel screws

Hydration

Covering CC with plastic sheeting to protect from frost

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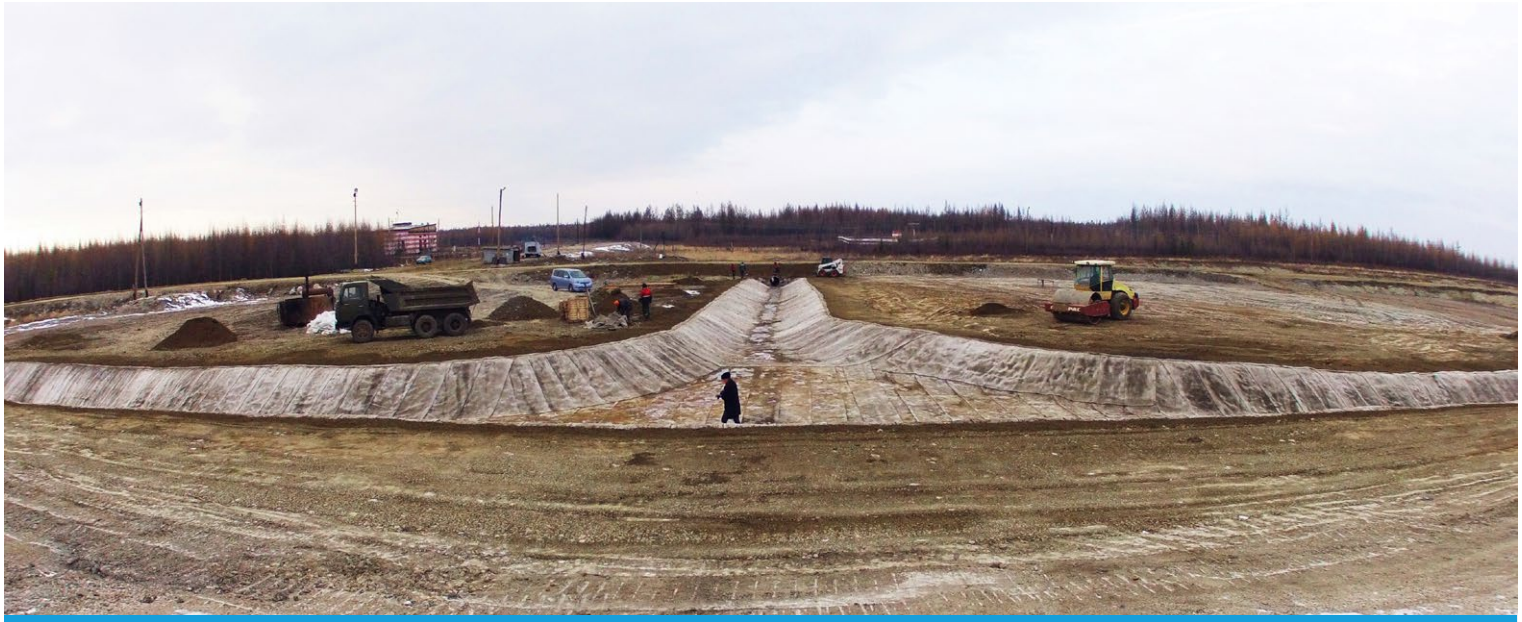

Completed installation

Channel T-junction

A total of 1,680m^2 of CC13™ were installed in just three days, compared to the estimated one month it would have taken to install a traditional solution, meaning CC was ten-times faster to install.

Installation was carried out during the day when temperatures averaged around 5°C. During the night, temperatures dipped to -4°C.

A material saving of around 90% was achieved, meaning a much lower logistical cost and minimal plant requirements, allowing other works to run consecutively.

The client was satisfied with the product and is considering placing another order for the next construction period.

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