

Project Info



March 2019



CC5™ Batched Rolls



390m²



Vertical layers



Taman Warisan,
Tasek Merimbun, Brunei



Normila Sdn Bhd



CC5™ used to provide
slope protection below
Balai Purun hall



Completed slope protection installation

A slope below one of Brunei's first and only ASEAN heritage buildings, Balai Purun hall in Tasek Merimbun, Brunei was suffering an erosion problem which was so severe there was a risk of the building having to be closed down as the erosion was making the structure unsafe. The hall is typically used for school activities, and sometimes used for university students to carry out research works such as surveying. As a result, something had to be done to save the building and prevent further erosion.

The Public Works Department in the area looked into solutions for providing rapid erosion protection to the slope. Introducing vegetation to the slope was not possible as the slope's position below the building meant it had no exposure to sunlight. Poured concrete and shotcrete were also considered, but would have been difficult to install cleanly and in a timely manner.

As a result, the client specified Concrete Canvas® (CC) GCCM*. CC's proven speed of installation and the lack of requirement for heavy equipment when specifying batched rolls of the material were key factors in the client's decision. The ease of installing the material was also a significant advantage due to the lack of headspace at the crest of the slope, reducing logistical and installation issues for the contractor.

Works began in March 2019, with 390m² of CC5™ delivered to the site in batched rolls following ground works which involved reprofiling the substrate. Gullies were backfilled with soil in order to provide a smooth surface, while side drains were created and later lined with CC to divert surface water away from the slope to prevent ingress and saturation.

*Geosynthetic Cementitious Composite Mat





View of slope from crest



Installing CC within the drain at the side of the slope



Laying the first batched roll



Cutting CC to accomodate existing concrete columns



Applying sealant



Installation around a concrete drain 100m from the hall



View of completed installation from toe of slope

The CC batched rolls were installed in a vertical layout. The contractors began the installation by covering the earth drain next to the slope, and then working their way across the slope itself, from crest to toe. Edges of the material were secured within an anchor trench using ground pegs at the crest, with each additional layer laid so as to overlap the previous by 100mm.

Screws and sealant were used to joint overlapped layers of CC following hydration of the lower overlapped section. Where pipes and existing columns had to be accommodated, CC's flexibility allowed for the installation crew to cut the material to fit around the infrastructure and sealed with adhesive sealant to prevent water ingress.

Once installation was complete, the CC was hydrated using a portable water tank. Hydration was given twice to ensure adequate saturation in the hot weather conditions, with a one-hour interval between hydrations.

The project was completed in 5 days by a team of 6. Works were carried out by Normila Sdn Bhd for the Public Works Department (PWD) in Tutong, Brunei. The PWD was please with the performance of the material in terms of both speed and ease of installation.

"Definitely, there is an ease of construction under an existing structure like buildings on stilts, efficient with less mobilization problems and upon completion, the result is a neat concrete slope protection surface finish compared to conventional non-suspended slab construction on slopes with limited headroom."

**Engineer,
Public Works Department (JKR), Tutong**