

Project Info

 08 / 01 / 15


 CC5™ and CC8™ Bulk Rolls

 12,000m²

 Transverse layers

 Undisclosed, Oman

 Undisclosed

 CC8 and CC13 were used to line and prevent erosion of a water lagoon bund, line a drainage channel and create holding pits for excess water.



Completed installation in Oman

In January 2015, Concrete Canvas® GCCM* (CC) was used to line a water lagoon bund at an oil field site in Oman. The bund was subject to periodic severe erosion, when the water lagoon would flood and send water cascading down the sides of the bund. The water then posed a flooding risk to the production area. As a result there was also a requirement to create drainage channels on the outside toe of the bund to direct any water overflow to holding pits, also lined with CC. Shotcrete was considered, but it would have taken considerably longer to install with much more complex logistics. There were also numerous pieces of existing infrastructure such as pipework which would have made a shotcrete installation challenging.

The site is located 600km from the nearest town so getting raw material to site can be very costly. The bund ranged from 6m to 9m in height and created a rectangular perimeter for the lagoon, measuring 276m x 115m. The location is such that there were large climate and weather variations throughout the install; temperatures ranged from 6°C to 27°C and there was rain, fog, mist and sand storms on various days, with visibility dropping to <5m several times. Some of the existing pipework could be lifted to allow installation underneath, however it was not possible to lift all the pipework or move the stairways and electrical trays, creating access issues. On the 276m long north side of the lagoon the presence of pipe lines nearby prevented any plant access, and on the east and west sides more pipe lines limited the access options.

*Geosynthetic Cementitious Composite Mat



The bund was severely eroded in some areas prior to works



Pipework on the northside of the lagoon prevented plant access



The bund was graded prior to installation



An anchor trench was created prior to installation



Bulk rolls were mounted on a spreader beam for easy dispensing



A pre-cut piece of CC being laid under existing pipework



The CC was jointed with screws



The CC was cut to shape accomodate existing infrastructure



The CC edges were buried in pre-dug anchor trenches



Five water collection pits were created

*Completed installation*

The bund wall was graded and erosion damage repaired to ensure there would be no voids under the CC. On the north side of the lagoon the bund was raised by 500mm to repair extreme erosion and increase the lagoon capacity. A drainage channel was constructed at the base of the bund by creating a small berm, and an anchor trench was cut into the top of the berm.

29 bulk rolls of CC8™ and 42 bulk rolls of CC5™ were delivered to site. Where weather and access allowed, the bulk rolls were mounted onto a spreader beam hung from a telescopic handler and unrolled down the berm and cut to length with a utility knife. On days where the wind was too strong or in locations where there was no plant access, the CC was unrolled on the flat and cut to specific profile lengths then transported to the berm by hand. The leading edge of the CC was placed into an anchor trench, unrolled down the berm and across the drainage channel at the toe. Each layer of CC was overlapped by 100mm, and overlaps were then sealed and jointed with an offset double row of screws applied at 200mm centres with an auto-fed screw driver. Following installation, hydration was given using a 45,000L water truck and hose. At 5 locations around the berm, water collection pits were created to collect the water carried by the drainage channel; these were lined with transverse layers of CC. Where pipes couldn't be lifted, smaller sections of CC were cut to size and fitted around the pipes, with sealant used to create an impermeable joint.

A total of 12,000m² of CC were installed at rates of up to 1500m²/day. The installation was carried out over 14 days by a team of 14 people, in high temperatures and difficult environmental conditions. The installation has directly led to CC being specified on two further projects.

CC was 3 times faster to install than the shotcrete alternative and the client has estimated CC provided a cost saving of \$250,000 - \$500,000 over shotcrete. During this installation another water lagoon overflowed and caused extensive erosion to its bund. The client had been so impressed with the CC installation they immediately specified CC to re-line this bund as an emergency response installation, during which the bund had to be raised by a further 500mm.