

## Project Info



10 / 07 / 17



CC5™ Bulk Rolls



6,400m²



Transverse & Vertical layers



Athens, Greece



Perendes Technologies-Anelxis Constructions



CC5™ was used to line a bund and tank farm which required protection from further weathering erosion, and weed suppression.



*The completed installation in Athens, Greece*

In September 2017, Concrete Canvas® GCCM\* (CC) was used for bund lining at a petroleum tank farm in Athens, Greece. The existing bunds of the petroleum tank farm were subject to weathering and erosion affecting the ground's integrity and failure of stability. The client required a long-term, durable and cost-effective solution to combat the issue. In addition, Athens is subject to extremely hot weather in summer months, with temperatures often hitting highs of 48 degrees, which was putting the heavily vegetated bunds in danger of causing fires. As a result, a weed suppression solution was also required to prevent fires on the site, which could be incredibly dangerous on a site containing highly flammable fuel. The chosen solution also had to be easily installed without interfering with the existing complex pipe infrastructure, while providing stability to infrastructure site-wide.

Traditional concrete combined with Shotcrete was considered; however, there was a risk of rebound from shotcrete affecting the infrastructure and site environment, whereas CC would be totally safe and would provide a clean install. There were also site access issues, and traditional concrete methods would have required the use of heavy plant on site, which would not have been possible. As a result, CC was specified.

The works were carried out by Perendes Technologies-Anelxis Constructions for Elin Oil Hellenic Petroleum Company SA, with consultation services provided by PowerServe Ltd Greece.

\*Geosynthetic Cementitious Composite Mat







*The existing bunds had been affected by weathering erosion*



*Heavy vegetation growth was at risk of causing fires in the summer heat*



*A solution was required that could accommodate the complex pipework*



*All vegetation was removed prior to installation*



*And the ground levelled*



*CC5 was delivered to site in bulk rolls*





The CC was mounted onto a spreader beam and crane for easy deployment



CC was unrolled down the slope and along the tank farm floor



CC was fixed to a concrete slab at the crest of the slope with masonry nails



Additional layers were overlapped by 100mm



Overlaps of CC were sealed using Everbuild Clearfix adhesive sealant



The CC was fixed and jointed using screws and anchor bolts





*J Pegs (seen right) were also used to fix the CC*



*CC was cut using hand tools to negotiate storage tanks*



*The team also had to negotiate corners*



*CC easily accommodated for the complex pipework*

In preparation for the installation, all vegetation, rocks and debris were removed, and the ground re-levelled. Bulk rolls of CC5™ were then delivered to site, mounted onto a spreader beam and lifted using a crane to the crest of the bund slope. The CC was then unrolled, guided by two of the installation team, down the length of the slope, and two others continued to unroll the CC along the tank floor with the same continuous layer.

The CC was fixed at the crest to a concrete slab poured for this project using masonry nails. This process was repeated along the length of the slope, with additional layers overlapping by 100mm. Each overlap was sealed using Everbuild Clearfix adhesive sealant, and jointed using Hilti collated screws at 50mm intervals down the slope, and at 200mm intervals along the tank floor.

The slope's rocky surface was drilled and 12mm x 17mm anchor bolts were inserted along with 12mm x 250mm J pegs to secure the material to the slope, and then the floor surface. For the other end of the material, where it meets the wall, the same method was used, fixing the CC onto the existing concrete infrastructure using masonry nails.





*The CC was hydrated using a hose attached to fire pipes*



*Completed installation around a storage tank*



*Birdseye view of the completed installation*





*The installation was completed in 9 days*

Infrastructure such as the petroleum storage tanks and pipework were easily accommodated due to the drape characteristics and flexibility of CC. The CC around the walls of the storage tanks, corners and other complex shapes from protruding infrastructure, was cut using hand tools, and where needed, an extra layer of CC was fitted around the item, then sealed. Once the installation was complete, the CC was hydrated using hoses attached to fire pipes. This was repeated three times due to the high temperatures of around 45 degrees on site, to ensure adequate hydration.

6,400m<sup>2</sup> of CC5™ were installed in 9 days by a team of 10 people, including 8 workers and 2 supervisors, in consistently high temperatures of around 45 degrees, on a site with restricted access. Elin Oil Hellenic Petroleum Company SA were impressed with the simple and rapid installation of CC as well as its immediate effectiveness after laying. The client and contractor also commented on the cost efficiency of CC, the ability to install the material with minimum and basic equipment, as well as the cleanliness of install compared to shotcrete. The use of CC will also mean the client's need to carry out regular maintenance on the site will be significantly reduced in future. They have now begun looking into the suitability of CC for further installations on their other tank farms around Greece.