CC HYDRO™
Concrete Impregnated Containment

TANK LINING

Project Info

- 24 / 07 / 23
- CCHT1™ Bulk Rolls
- 2,400m²
- Transverse and Longitudinal layers
- Petroineos Grangemouth Refinery, Scotland
- Contractor: idverde & Sean Carr Lining Technology (SCLT) on behalf of Petroineos
  Client: Petroineos
  Consultant: IKM Consulting
- CCHT1™ used to provide secondary containment to a tank floor at an oil & gas refinery.

Completed installation

In July 2023, 2,400m² of CC Hydro (GCCB*) was used to provide secondary containment for a tank lining remediation project at the Petroineos Grangemouth Refinery in Scotland. Installed by idverde and Sean Carr Tank Lining (SCTL) on behalf of Petroineos, the tank was lined in less than 10 days using a five-man crew. This was the second tank lining application for the material at the refinery, following on from the initial successful installation in 2017.

Petroineos have 40-60 tanks constructed in the 1950's and 1960's with steel floors. Over time repairs and remediation works were carried out to prevent deterioration of the tanks and potential leaks. In 2018 Tank 434, which stored Jet A-1 aviation fuel, was identified as one of the tanks that required a solution for these leaks.

As part of tank overhaul works, the consultant engineer, IKM Consulting, proposed jacking the existing tank by 2m, re-profiling of the tank floor and using CC Hydro to provide an impermeable barrier which tied into a new leak detection system below the new tank floor. The CC Hydro™ material was chosen as an alternative to 2mm HDPE liner due to its puncture resistance and cured rigidity, minimising thermal wrinkling.

*Geosynthetic Cementitious Composite Barrier

CONCRETE CANVAS®
+44 (0) 345 680 1908 info@concretecanvas.com www.concretecanvas.com

CCHYDRO™
Concrete Impregnated Containment

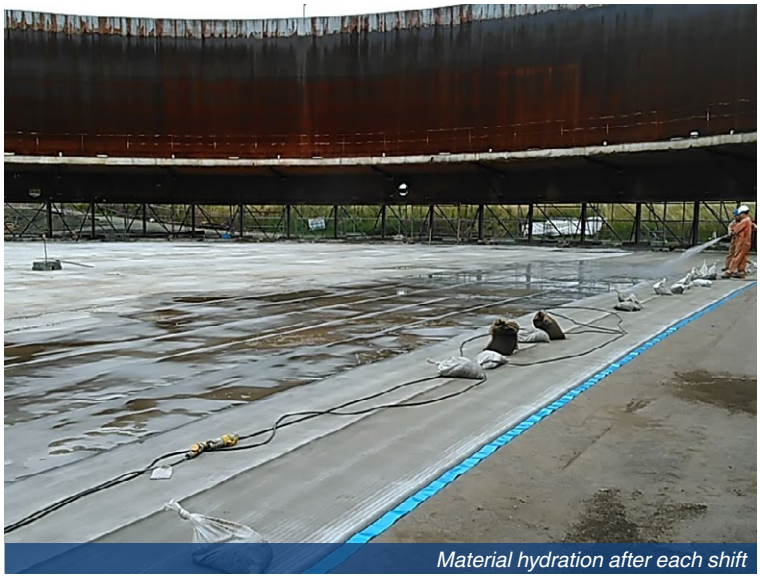
TANK LINING

CCHT1™ Bulk Rolls delivered inside tank

Bulk Rolls deployed with spreader beam

CCHT1™ cut to form tank profile

CCHT1™ layers terminated 100mm outisde tank shell



Material hydration after each shift

CCHT1™ material fully hydrated

CONCRETE CANVAS®
+44 (0) 345 680 1908
info@concretecanvas.com
www.concretecanvas.com

CC HYDRO™
Concrete Impregnated Containment

TANK LINING

Completed installation of CC Hydro™ prior to additional layer and new steel floor

Placement of Type 1 material on top of CC Hydro™

CONCRETE CANVAS®

+44 (0) 345 680 1908 info@concretecanvas.com www.concretecanvas.com

CC HYDRO™
Concrete Impregnated Containment

TANK LINING

Material compacted prior to installation of new tank floor

CC Hydro™ is a revolutionary containment product from Concrete Canvas Ltd. It combines the company's concrete filled geosynthetic technology with a high impermeability, chemically resistant geomembrane backing. The geomembrane provides a high performance liner with a testable joint for quality assured containment applications. The liner incorporates a hi-visibility welding strip allowing joints to be thermally welded providing an air channel for on-site testing, providing a minimum impermeability of k = 1 x 10^{-12} m/s which satisfied the permeability requirements for the project.

In comparison to the HDPE alternative, CC Hydro™ GCCB has its own hard armour protection providing excellent puncture resistance where the overlying concrete surface protects the integrated geosynthetic membrane. Essentially it is an all-in-one solution, combining the impermeability of a containment liner with the hard armour protection and durability of concrete.

To prepare for the deployment of CC Hydro™ GCCB , the substrate of the tank floor was filled and compacted with Type 1 granular material to achieve the required foundation profile. This was then covered with a 25mm layer of sharp sand blinding and compacted for a smooth substrate and to ensure intimate contact between the CC Hydro™ and the surface of the tank floor.

The CC Hydro™ Bulk Rolls were deployed via a spreader beam suspended from an excavator within the tank shell. In order to reduce wastage, the Bulk Roll format allowed the contractors to cut lengths of CC Hydro™ using basic hand tools to match the dimensions of individual sections of the tank diameter.

Following the welding and testing of the joints, the CC Hydro™ was hydrated at the end of each day via the local on site water mains. CC Hydro™ cannot be overhydrated so an excess of water was used to ensure full saturation. The CC Hydro™ was then covered in a layer of sharp sand, 150mm Type 1 granular material and finally 50mm of compressible Bitsand, then the new steel tank floor was installed over this improved formation.

In a tank area of extremely limited access, the entirety of the 2,400sqm of CC Hydro™ was installed over a 10-day period by a crew of 5 operators. The project was deemed a success and CC Hydro™ is being considered for similar tank

CONCRETE CANVAS®
+44 (0) 345 680 1908 info@concretecanvas.com www.concretecanvas.com