



CASE STUDY:

KENT STORAGE DETENTION TANK

WINGFIELD, SOUTH AUSTRALIA

AUGUST 2019

ECO AID™

ecoAID is an underground modular stormwater management system used to detain, infiltrate or harvest stormwater runoff and also provides stormwater treatment by utilising an internal gross pollutant and sediment trap via a designated inlet row called a 'Catch-All-Row' (C-A-R). The dual function of stormwater collection and treatment allows the engineer to optimise their drainage layout by minimising the number of external manhole pits required on site with the added benefit of omitting any need for upstream gross pollutant and sediment traps.

ecoAID is an exceptionally strong and robust water storage and treatment system that is designed to be used under public roads and highways, car parks, sports fields and public open space providing the engineer with opportunities to save valuable land space and protect our natural waterways from the damaging effects of pollution from new and existing developments.

A site used by Kent Storage for container storage required an underground detention tank due to limited above ground space. Due to the extreme loads associated with containers and frequent movements of heavily loaded forklifts, a reinforced subsurface concrete tank was the initial choice. However, other options were considered due to the high cost associated with supply and installation of the concrete tank.

Davison Earthmovers tendered the project with an alternate system in ecoAID Stormwater Chambers. EcoAID was approximately half the cost to install than the proposed concrete tank and therefore was preferred. There were some questions around ecoAID's load capacity and structural performance when installed under containers and within pavements that were likely to cater to 25 T axles loads. Any concerns were alleviated as Geofabrics were able to produce an independent Finite Element Analysis (FEA) report which was able to illustrate the EcoAID system could withstand the proposed loads.

The FEA report detailed that if the pavement was sealed with reinforced concrete then the 600 mm cover was acceptable, however the pavement would need to be stabilised with a layer of Tensor TX170 geogrid. If the cover was increased to 800 mm then no additional stabilisation was required.

> Kent Storage Detention Tank



HDPE liner being laid out above cushion geotextile prior to welding of HDPE seams.



Drainage rock being laid over and in between the arches.



Drainage rock filled to the inside top of the tank. Cushion geotextile and HDPE liner shown ready to wrap and seal the tank.

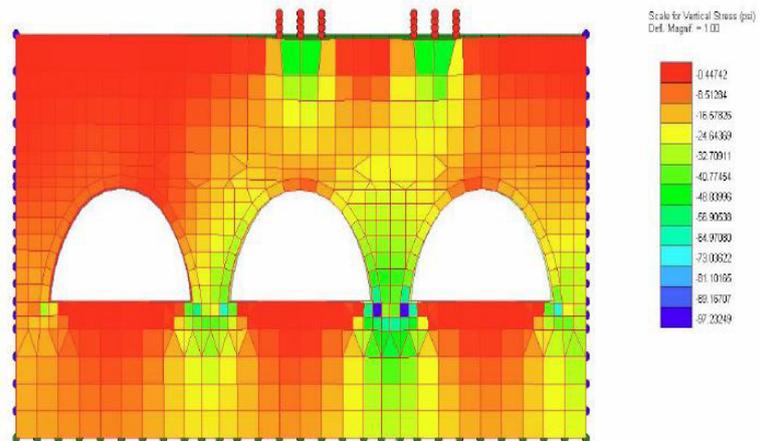
It was noted that if the surface comprised a flexible asphalt seal then more pavement improvements would be required. In this case the pavement was concrete, however in order to limit risk, the extra cover of 800 mm was implemented, and two layers of geogrid was placed at 300 mm centres within the pavement.

Geofabrics were able to assist the designers and the contractor with sizing up the system to suit the available footprint and provide adequate information to prove the system could withstand the given loads. Geofabrics were also able to assist on site to ensure the arches were placed in accordance with the manufacturers specification.

Davison Earthmovers were able to install the system extremely quickly while the impermeable 1.5 mm HDPE liner was installed and welded insitu by Polydam.

The site is still under construction, but the system is already carrying heavy construction loads with minimal deflections observed on the surface.

The result was an economical alternative to a concrete tank that could withstand the proposed loads for the 50 year design life of the system.



Finite Element Analysis (FEA) modelling for container load structural assessment.

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