



ACO StormBrixx®/ HydroCon® Pipes

Sydney Avenue, Umina Beach - Central Coast NSW

The Challenge

Central Coast Council recently redeveloped an existing, aging skate park. Due to regular flooding from blocked and undersized pipes, this required the existing carpark to undergo major stormwater remediation. The site was heavily constrained by the existing stormwater network, dunes, insufficient pavement falls and environmental restrictions on ocean outflows. It was imperative that the solution would overcome these factors and be designed to function with the area's high annual precipitation and worsening summer storms.

To rectify this and effectively manage the stormwater, Central Coast Council sought to integrate an underground infiltration tank with an upstream treatment device. Treating stormwater directly 'at the source' was deemed as the only feasible solution compared with the conventional approach for an 'end of pipe' design.



Site prior to remediation

The sandy soils in Umina enable high infiltration rates, making it ideal for an infiltration tank. These tanks hold collected stormwater during a storm event. When the natural water table begins to drop, the stored water can be released back into the groundwater without any downstream effects.



Client/Initiative:

Central Coast Council were redeveloping a regionally significant skate park with grant funding.

Project location and description:

Umina, NSW. Sandy soils with high infiltration rates (verified by geotechnical engineers). High annual precipitation with worsening summer rainfall storms.

Project Brief:

1. Improve drainage in an existing carpark where stormwater flooding had regularly occurred from blocked and undersized pipes.
2. Redevelop an aging park to include a new 'pump track' skate facility.

Civil Engineers:

Sustainability Workshop, ADW Johnson

Contractors: TGB & Sons

Suppliers: ACO, HydroCon Australasia



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Intelligent Products

The tank needed to store the stormwater volume generated by a one in five-year storm event (266m³).

The ACO StormBrixx® HD infiltration tank was specified for the application. The system is a unique plastic geocellular stormwater management system designed for surface water storage and infiltration.

- ACO StormBrixx® is strong and quick to assemble. It is installed in a brick bonded and cross bonding configuration for optimal stability.
- The open cell structure permits completely free access for CCTV and jetting equipment which allows the whole system, including all the extremities, to be inspected and maintained from a few access points.
- ACO StormBrixx® HD offers optimum storage capacity with 95% void ratio of total volume.

Each tank is 63m in length, installed in a twin configuration, adjacent to the existing concrete footpath running alongside Sydney Avenue.

In conjunction with the tank, designers specified the HydroCon® pipe system to treat the stormwater. HydroCon® permeable pipes are manufactured from a no-fines concrete mix and are fully porous across the entire pipe circumference. This allows treated water to exfiltrate through the wall of the pipes.

Used around the world, ACO StormBrixx® and HydroCon® pipes are particularly suited to applications where stormwater needs to be treated 'at the source' without burdening the downstream stormwater infrastructure. The infiltrated water through the soil has the add benefit of replenishing the local ground water close to the tanks.

Both products are structurally tested to European design standards and are engineered for short term and long-term loads. This is key for a long design life.

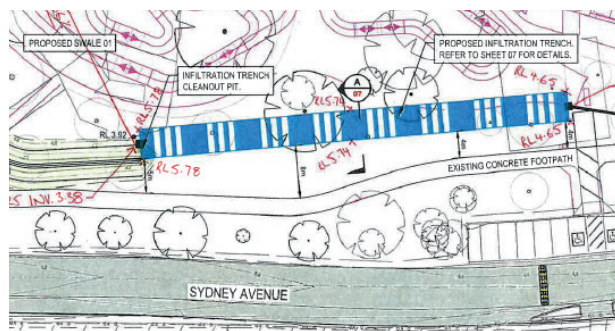
Whilst these products are often used independently, this project is the first in Australia bringing two manufacturers together to create an intelligent solution for sustainable stormwater management.



ACO StormBrixx®
video



HydroCon® pipe
system video



Extract of proposed layout (ADW Johnson)

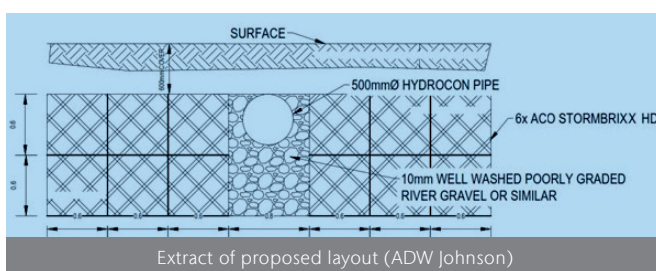




A System Solution

How does it work?

- 1) Stormwater is collected from the roadway and carpark through conventional kerb inlet pits, each connected by a pipe network.
- 2) The collected water flows through the HydroCon® pipes. Gross pollutants and other contaminants (oils, grease, sediment, particulate nutrients, dissolved phosphorus and heavy metals) are filtered out in the process and become trapped within the HydroCon® pipe system. The treated stormwater then exfiltrates through the permeable structure of the HydroCon® pipes.
- 3) The exfiltrated water then flows through the gravel surrounding the HydroCon® pipes and through the geotextile wrapped ACO StormBrixx® HD tanks for temporary storage.
- 4) During a storm event, the water table in the tank rises. The tank allows excess water to be stored until the water table begins to drop after the storm event. The stored stormwater then exfiltrates through the geotextile wrap and drains naturally into the earth and water table beneath.



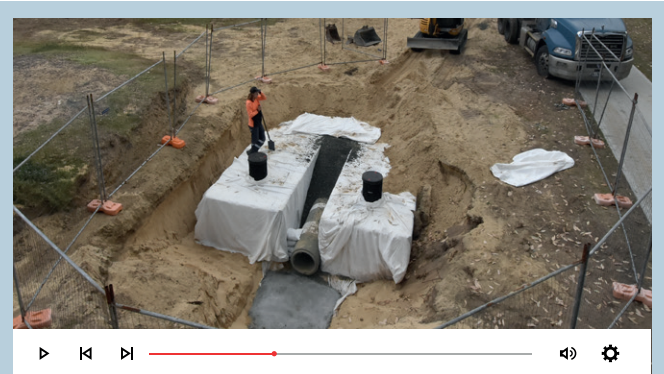
Maintenance

The ACO StormBrixx® and HydroCon® pipe system offers easy maintenance and inspection throughout its design life with easy access for high-pressure water jets, vacuums and remote CCTV.

The HydroCon® pipe system can be easily cleaned with access provided through a junction pit.

The open structure of ACO StormBrixx® allows the system to be accessed either through the inlet connection, access chambers, inspection points or pipe entries/exits.

This solution provides Central Coast Council with an easy to maintain and cost-effective infiltration system. The HydroCon® pipe system functions similarly to a high quality GPT and removes 100% of gross pollutants and very high rates of total suspended solids. This in turn reduces the maintenance burden on the ACO StormBrixx® system by allowing maintenance cycles to be extended.



Installation video

*Sustainability Workshop carried out the modelling and concept design. ADW Johnson carried out the drawing documentation.

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