



GEOFABRICS CASE STUDY



CULVERT UPGRADES IN MENTONE BEACH USING PARALINK WITH ELCOROCK

PRODUCTS USED

MACCAFERRI® PARALINK® HIGH STRENGTH GEOGRID

- Tough and durable polyethylene sheath is resistant to physical, chemical and biological conditions found in basal reinforcement applications and reinforced soil structures, including micro-organisms, UV radiation and mechanical damage
- High modulus and low creep characteristics, sustaining over 64% of their initial strength over a service life of 120 years compared with geogrids made from polypropylene or polyethylene
- Quick and easy installation as they are lightweight, flexible and can be easily cut to the required lengths
- BBA certified for use as basal reinforcement under road embankments constructed on or over soft foundation soils; piled foundations and areas prone to subsidence

ELCOROCK® GEOTEXTILE SAND CONTAINER

- A shoreline protection system that consists of sand filled geotextile containers built to form a stabilising, defensive barrier against coastal erosion
- Long-term outdoor durability in exposed applications due to high quality virgin polypropylene Texcel non-woven fibres which have a unique stabiliser and antioxidant formula
- A more cost-effective alternative to traditional coastal erosion protection systems made from concrete, rock armour, steel or timber

PROJECT DESCRIPTION

In an Australian first, Melbourne Water employed international technology to successfully complete major upgrades to a vital outlet drain at a popular beach strip in Mentone, Victoria. Located north of Mentone Lifesaving Club, the drain was crucial to managing stormwater runoff, which mitigated potential flooding further up the drainage network. These upgrades were imperative to ensure the safety and proper function of the drain following a series of events leading to its failure, including sand blockage at the drain opening and flooding from heavy rainfall.

OUR SOLUTION

The concrete culverts faced flotation issues during heavy and prolonged rainfall events. Flotation refers to the failure of a culvert due to uplift forces caused by buoyancy. This buoyant force is produced when the pressure outside the culvert is less than the pressure within the barrel, typically occurring in a culvert with inlet control and a submerged upstream end. To counteract this buoyancy effect, an ultra-high-strength geogrid with excellent damage resistance, was required to anchor the culverts down and resist upward movement.

After careful consideration, the designers, CMP Consulting Group chose Maccaferri ParaLink 1500 for its UV, chemical and damage resistance properties. Additionally, its ability to provide an extended design life and suitability to marine environments was also assessed. ParaLink is certified by the British Board of Agrément (BBA) with an installation damage reduction factor of only 1.01 for a D90 particle size of 150mm. This unparalleled performance is attributed to the high tenacity polyester yarn tendons encased in a durable polyethylene sheath.

ParaLink 1500 was installed along the sides of the culvert, effectively covering both the rock beaching and top of the culverts. Elcorock geotextile sand containers were deployed to anchor and tension the ParaLink into its position. To provide added protection and support, Texcel 600R was utilised as a cushioning layer between the ParaLink, rock beaching and the concrete culverts.

This project was a collaboration with the City of Kingston, Mentone Lifesaving Club, local residents, businesses, and the Department of Environment, Land, Water and Planning. The feedback from the community has been positive, expressing satisfaction and gratitude for the now operational drain and rehabilitated area.

Installation damage
reduction factor
1.01

BBA
Certified



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