

**BUSINESS**


# Geelong engineering firm Austeng tests 100-year maintenance free bridge

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Dave Cairns, Geelong Advertiser

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 City of Greater Geelong, Austeng Nth Geelong. Fibre Reinforced Geopolymer pedestrian bridge demonstration. Cogg's Chris Marston, Luke Smith, Austeng, Ross George, Austeng and Aaron McGlade from Cogg on the Bridge

Although it is thought to be the largest structure of its type in the world, the grey pedestrian bridge sitting in the yard of a Geelong engineering firm makes for an unimposing sight.

But it's what you can't see that matters.

Immune to concrete cancer, the 11m fibre reinforced geopolymer bridge packs a host of structural and environmental benefits.

As the bridge passed one of its final tests last week, Austeng managing director Ross George outlined the benefits of its construction from a concrete made with fly ash that was reinforced using carbon and glass fibre, rather than steel.

"We are standing on a bridge that's got greater flexural strength than concrete," Mr George said.

"It's acid resistant, salt resistant, caustic resistant and thermally stable, so it's a far superior engineering product."

The bridge uses less energy to make with its total energy efficiency extended by its design life at least 100 years without maintenance.

Mr George said fly ash, a by-product of coal combustion, was currently a prescribed waste product.

“The greenhouse footprint of the bridge I am standing on is approximately 20 per cent that of conventional concrete,” he said.

With further research, Mr George hopes more recycled materials, such as using glass to replace sand, can be used in the fibre reinforced geopolymer.

The consortia behind the bridge – engineering firm Austeng, Deakin University and concrete manufacturer Rocla – won a City of Greater Geelong tender in 2017 to build two maintenance free pedestrian bridges at Cowies Creek.

The latest testing involved stacking five 1050kg weights at the peak of the beam.

The deflection of the beam was measured after each weight was placed to obtain a force-deflection diagram that was compared with the calculated range of deflection.

The weights were left on the beam for two days to assess the creep of the geopolymer and the deflection and cracks were remeasured.

Austen reported that at every stage of the testing, the beams performed as expected, or better than expected.

More comprehensive tests, with greater forces, are yet to be completed.

Installation of the bridges at Cowies Creek has required further work on the footings with soil testing revealing a high acidic content at the site. To solve this problem, the piers and footings for the bridge will now also to be made of fibre reinforced geopolymer.