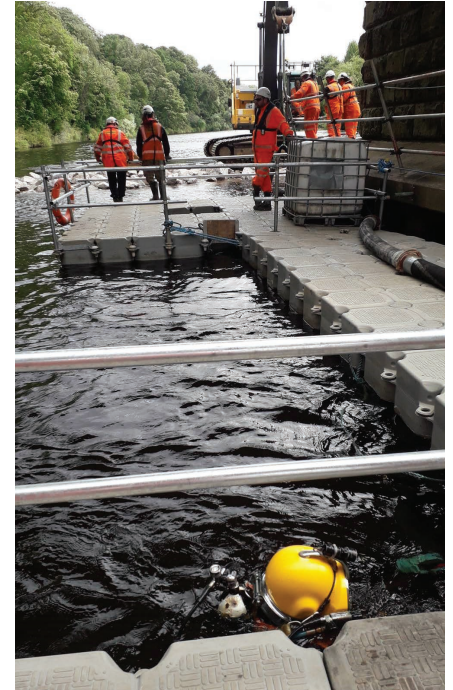


Stabilisation of foundations, River Eden viaducts, Carlisle, Cumbria

Project case study



Product

Underwater concrete

Volume

400m³

Overview

Hanson designed and supplied specialist underwater concrete to stabilise the foundations of two viaducts over the River Eden in Carlisle, Cumbria.

Project description

Fast-flowing water on the River Eden in Carlisle caused parts of the riverbed to wash away, risking the viaducts' foundations. Hanson, working for client Network Rail through engineering specialists WSP, design and supplied specialist underwater concrete to stabilise the foundations and protect the West Coast mainline rail link.

Detailed laser surveys highlighted the deterioration of the riverbed, which led to trains running at a reduced speed over the Victorian and adjacent 1940s-built viaducts to ensure safety. In order to

ensure a stable platform for the viaducts' columns and piers, Hanson designed a bespoke underwater concrete solution incorporating admixtures from Sika.

Research and development work was carried out in Hanson's nearby Carlisle laboratory within 48-hours to ensure the scheme was undertaken on schedule.

In total 400m³ of concrete was pumped over 100 metres and placed by specialist diving teams. The underwater visibility was poor with significant work needing to be done by touch. To complete this safely, the river was temporarily diverted and calmed used 2,200 tonnes of rock. This aided the divers and helped reduce any washout into the river as the concrete was pumped into position.

Terry Balmer, technical manager at Hanson Concrete, said: "We engaged with the Network Rail engineering team to develop a bespoke solution to overcome complex placing difficulties and strict environmental controls.

"In less than 40 hours, the technical team had designed and tested an anti-washout, self-compacting concrete ready for the remedial works. The success of the material relied on concrete admixture

technology to overcome the challenging engineering requirements."

Craig Jackson, works delivery manager at Network Rail, added: "These vital repairs have helped to make the viaducts safe to keep passenger and freight train moving on the West Coast mainline."

The repairs have been made to the structures as part of a £1.3 million Great North Rail Project investment.

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