

# Extending the life of a historic railway bridge



Northern Explorer,  
Waiteti Viaduct Railway Bridge  
Photo Credit: J Heremaia

**Client:** KiwiRail

**Location:** Te Kuiti, New Zealand

New Zealand's 125-year-old Waiteti Viaduct has an impressive history. The 128.6m multi-span, railway viaduct has carried heavy loads across the Waiteti Gorge since 1888. Throughout its time, and as the traffic became heavier and more frequent, the bridge underwent strengthening and repainting work. The latest repair work, in 1983, included the re-application of red lead primer as the main form of corrosion protection.

In 2016 KiwiRail was advised that the viaduct required select strengthening work for ongoing viability and in general a full replacement should be considered from 2020. Opus, in conjunction with Traction Room, were commissioned by KiwiRail in 2015, to undertake an engineering assessment of the condition of the viaduct, and its protective coating system, to determine the fate of the magnificent bridge.

Our Materials and Bridge Engineers undertook a detailed inspection of the bridge's condition and its coating system. It was found that overall the condition of the coating was satisfactory, except for localised areas of delamination and breakdown, estimated to be less than 20% of the structure, as well as small localised areas of section loss.

We were also asked to develop life extension strategies aiming to maintain and extend the practical life of the historic viaduct beyond 2020. Our inspection confirmed the need for select repair work in the short

term, while the detailed structural assessment found that the structure has sufficient capacity under the current railway loading. Based on our findings; we developed several refurbishment scenarios ranging from a 'do minimum' scenario to the full refurbishment and strengthening of the bridge. Ultimately our multi-disciplinary approach proved that there is still useful life in the 125-year-old railway bridge which, by postponing its replacement, could save KiwiRail up to \$10.8M and allow for its continued use for many years to come.

**Services provided:**

Infrastructure Condition & Performance Assessments  
Infrastructure Lifecycle Optimisation, & Efficiency  
Specialised Infrastructure Valuations  
Steel Durability and Coatings Condition Assessment  
Infrastructure Demand Assessment & Management  
Risk & Resilience Services

➤ [opus.co.nz/projects/Waiteti Viaduct Railway Bridge](https://opus.co.nz/projects/Waiteti_Viaduct_Railway_Bridge)