



1 Horotiu Paa Bridge Cambridge Pier Connection 2 Horotiu Paa Bridge Cambridge Weathering Steel 3 Horotiu Paa Bridge Cambridge Columns Scour Protection and Shear Piles

Waikato Expressway Cambridge Section – Horotiu Paa (Karapiro Gully) Bridge

Project Location: Waikato

AECOM for HEB Construction

Disciplines: Structural and geotechnical engineering



The Horotiu Paa Bridge is the longest bridge constructed as part of the 16km long Cambridge section of the \$2.1 billion Waikato Expressway. With a total length of 200m, consisting of four 50m long equal spans, it rises an impressive 45m above the Karapiro stream, with a road level just a few metres lower than the Auckland Harbour Bridge.

Horotiu Paa Bridge is one of eight bridges constructed by HEB Construction Limited (HEB) as part of the NZ Transport Agency's Waikato Expressway: Cambridge Section, a Road of National Significance.

The structural design of the bridge was undertaken by AECOM as HEB's Designer, with the AECOM team working closely with Gaia Engineers who provided a significant contribution in relation to geotechnical expertise. Horotiu Paa Bridge is notable for its innovative design solution. As lead structural engineer, AECOM developed a state-of-the-art pier moment connection between the steel superstructure and the reinforced concrete substructure, which dramatically improved the robustness of the bridge, reduced the size of the supporting substructure elements, and significantly reduced the cost of the bridge.

This innovation provides an elegant and efficient outcome to the technical challenges of this complex project, while ensuring excellent social, environmental and safety outcomes are delivered throughout its life cycle. A composite steel-concrete deck ladder bridge, the main structural steelwork is weathering steel. The substructure consists of two abutments and three sets of piers on piled foundations up to 55m in depth. In the longer term, the wider engineering and construction industry will benefit from the experience gained in its design and construction, particularly in relation to design details and the application of design standards which provided valuable learnings. Both the Transport Agency and HEB support the entry of the innovative design of the Horotiu Paa Bridge for the ACENZ Innovate NZ Annual Awards of Excellence.

Judging & Copyright Statement

This project is a Finalist entry in the 2016 INNOVATE NZ Awards of Excellence competition. The winners will be announced on Friday 2 September, 2016.

Images and text remain copyright of ACENZ and the consultant firm entering the project. Users are asked to give credit to the photographer where this is specified. ACENZ and INNOVATE NZ are trademarks of the Association of Consulting Engineers New Zealand.