

TO WALK ACROSS STATE HIGHWAY ONE SAFELY

The Northern Busway provides a congestion-free route for buses travelling to and from Auckland's CBD to the North Shore and provides connectivity for travel across North Shore City. The new 6.24km roadway runs along the eastern side of the Northern Motorway from Constellation Drive to Akoranga Station, and from there a 2.5km single bus lane (with a capacity to expand to a two-way system in the future) continues southbound to Auckland Harbour Bridge. There are five busway stations along the length of the Busway.

To provide easy access to the Akoranga Station for people on the western side of the motorway, North Shore City Council developed the concept for the Akoranga Footbridge. Opus International Consultants were commissioned to complete the design. "Following our preliminary modelling work," says Opus's Peter Worrall, "we addressed the dynamics of the structure, repositioning the piers to ensure buildability. The flooring system was changed from Hollowcore to Comflor 80 steel decking, manufactured by Corus New Zealand Ltd. Comflor 80 was chosen because it would enable the bridge spans to be lifted into place at a reduced weight, and the concrete topping could be poured after erection."

The piers were sited on piled foundations and formed in steel that was concrete filled.

Auckland Steel Ltd was subcontracted to develop the structural steel detailing, and then fabricate the steel and pre-assemble it in spans. These were given a hot zinc spray treatment as a protective coating. Staff from Composite Floor Decks Ltd brought in the Comflor 80 and fitted it.



Above: With SH1 closed, Auckland Steel and NZ Strong undertake a night erection.

Middle: Come morning, the traffic can at least crawl to the city.

Below: A day at the office for NZ Strong, in the safety of the 11m long trolley specially designed to facilitate staged erection without closing the motorway.

Above right: An interior glance across the footbridge.



The spans were trucked to the site ready for erection. Working at night to minimise traffic disruption, NZ Strong Construction Ltd and Auckland Steel completed the erection in three lifts. State Highway 1, one of the busiest in the country, was closed in both directions from 10.00pm to 4.00am on two nights and in one direction on a third night.

This much was straightforward, but the erection methodology for the glass-walled closed footbridge required some input from the main contractor, NZ Strong. The company's in-house engineers, in close consultation with Occupational Safety & Health (OSH) at the Department of Labour, designed a fully enclosed trolley platform that could roll out across the spans. This allowed work to continue while the motorway was in use (see photograph bottom left).

The trolley or gantry had an 11m long working platform and was constructed on wheels that sat within the external gutter of the bridge. It was equipped with two manual turfers with which it was pulled in stages along the 120m length of the footbridge. NZ Strong chose to operate it manually because of the risk that a power failure would pose.



Akoranga Station.

Supervisor Megan Roberts: “After some careful programming, we worked out that the trolley needed to make only two runs across the bridge spans and back. The staged installation of the roofing, the laminated vandal-proof glass and the handrails all preceded the taking down the edge protection on the final run.”

Transit New Zealand was delighted motorway closures were reduced from an original estimate of 14. So successful was the trolley that Transit New Zealand and Occupational Safety and Health issued NZ Strong with a Certificate of Recognition for Innovative Safety in Construction.

The busy Barry’s Point Road and Fred Thomas Drive, Northcote, the AUT campus and local schools including St Joseph’s and the Rosmini and Hato Petera colleges will be well catered for by the Akoranga Station, thanks to this footbridge, the first fully enclosed bridge in New Zealand.

FOR ESTIMATING DRAUGHTING FABRICATION AND ERECTION



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