

Contact author: John McNeil, john.mcneil@arecongroup.com

WESTGATE TUNNEL, MELBOURNE FAMILY OF FOOTBRIDGES FOR A TUNNEL PROJECT

Authors: John MCNEIL¹, Daniel PILLOT², Armin VOELSKE³, Rowland BURKE⁴

Affiliation: ¹ Technical Director, Aurecon, Auckland, New Zealand – John.McNeil@arecongroup.com

² Senior Bridge Engineer, Jacobs, Melbourne, Australia - Pillot, - Daniel.Pillot@jacobs.com

³ Associate Director Wood Marsh, Melbourne, Australia - av@woodmarsh.com.au

⁴ Professional Engineer, Aurecon, Tshwane, South Africa - Rowland.Burke@arecongroup.com

Keywords: Major projects; aesthetics; dynamics; wind; veloway; consistency.

Westgate Tunnel is Australia's largest single infrastructure contract. It provides a new motorway connection for Melbourne's western suburbs to the CBD. The project includes 7km of twin bored tunnel and over 20km of bridge viaducts. Also included are 14km of new walking and cycling paths with associated footbridges.

The project includes 12 new footbridges. These include large span trusses over creeks (Fig. 1), rail and motorways (Fig 2.), a 2.5km long cyclist only "veloway" (Fig. 3) which hangs from parallel viaducts and a 120m span curved cable stay bridge (Fig. 4).

Detailed analysis was undertaken to understand how veloway users' experience would be affected by both static and dynamic responses from traffic on the supporting structures. For the cable-stayed structure, studies were undertaken to investigate both pedestrian and wind induced dynamics. These included aeroelastic wind tunnel testing of a 7m long scale model.

The urban design response was to define architectural themes which connect structures, and create a uniform user experience. Bridge designs were developed to provide an identity to different routes. For clear span footbridges over traffic, curved organic forms were adopted. A route over a busy rail corridor adopted a more industrial functional aesthetic with weathering steel finishes. The veloway comprises a unique hanging continuous tube. The cable stay bridge also adopts similar finishes to connect this route.

The paper will present the project wide approach, to define the user experience across multiple bridges.



Fig. 1. 60m truss span over Moonee Ponds Creek



Fig. 2. 70m clad truss over 12 traffic lanes

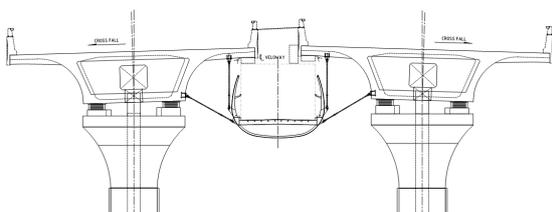


Fig. 3. Hanging 2.5km long veloway

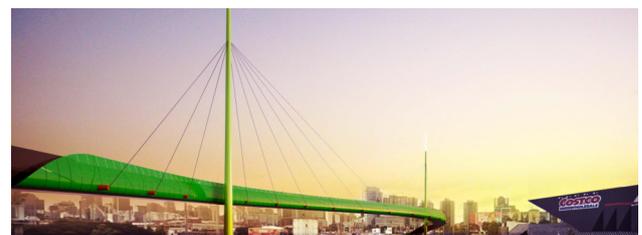


Fig. 4. 120m span cable stay footbridge