



DESIGN AND CONSTRUCTION OF MT HENRY BRIDGE

- TWO BRIDGES, TWO ERAS, DIFFERENT SOLUTIONS -



HISTORY

The Mt Henry Bridge is the longest bridge in Western Australia. This bridge provides the Kwinana Freeway with a vital crossing of the Canning River, linking Perth with its southern residential suburbs, the Kwinana industrial area, Mandurah and the Forrest Highway to the southwest region.

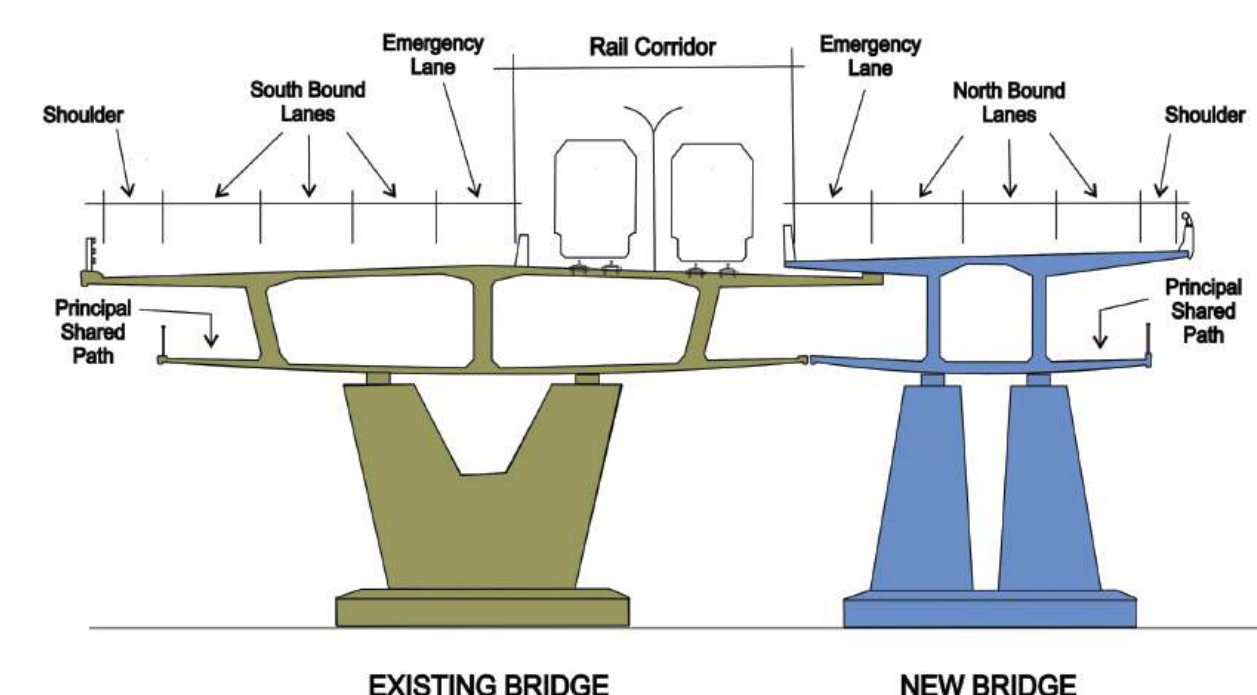
The bridge comprises two separate side-by-side structures which overlap without touching.

The second bridge was constructed 25 years after the first bridge and was architecturally designed to retain the key features of the first bridge and allow the two bridges to appear as one. Both bridges were designed and built using the latest technology of their time and provide a unique example of advances in bridge building technology over that period.

The first bridge was completed in 1982 and carries the southbound traffic and the Perth to Mandurah rail lines.

The second bridge was completed in 2007 and carries the northbound lanes.

Both bridges were sensitively designed and built, allowing for the retention of a wide strip of foreshore with its good spread of Nuytsia floribunda (Western Australian Christmas Tree) and the large and very old paperbarks in that area.



Cross section through the two bridges



MT HENRY 1982 BRIDGE

Mt Henry 1982 Bridge was built as a series of 110 tonne hollow precast concrete boxes, temporarily supported on a steel framework until they were stressed together to become self-supporting.

The steel framework was supported on the pile caps as well as by a large temporary guyed tower which also acted as a hoisting system to lift and manoeuvre the concrete boxes.

The 1982 Bridge was one of the last major bridges designed in-house by Main Roads engineers. The design introduced, for the first time, cantilevered pedestrian walkways and cycleways on the bottom flange which enabled the complete separation of vehicle and pedestrian traffic.



A 110 tonne unit for the 1982 Bridge



MT HENRY 2007 BRIDGE

Mt Henry 2007 Bridge was designed to provide extra width to the existing crossing of Canning River to accommodate the new Southern Suburbs Railway between Perth and Mandurah. Rather than just widening the existing bridge, the engineers devised an innovative solution to build a second bridge in the narrow road reserve "corridor" on the west side and overlap its cantilevered deck over the existing bridge.

The 2007 bridge was constructed by incremental launching. Sections were constructed on the Southern abutment and then pushed out to advance the bridge. A launching 'nose' was attached to the leading edge in order to reach the next pier.



Launching of the 2007 Bridge



UNIQUE FEATURES OF THE BRIDGE(S)

The use of the cable-stayed falsework system to construct Mt Henry 1982 Bridge had never previously been used in Australia and has never been used again since.

The construction of Mt Henry 2007 Bridge was unique in that no other incrementally-launched prestressed concrete bridge has ever been constructed in Australia to integrate and overlap (but not touch) an adjacent "parent" bridge.

The first bridge, which had to be strengthened to accommodate the additional loadings imposed by the two sets of railway lines, was kept operational at all times during the construction of the second bridge.

BASIC DATA

Length: 660m	No. of pedestrian paths: 2
Width: 40m	No. of traffic lanes: 6
Min clearance: 8.5m	No. of rail tracks: 2
No. of spans: 9	
1982 Bridge: Started 1979, completed 1982	
2007 Bridge: Started 2005, completed 2007	

THE PARTICIPANTS

The 1982 Bridge

Designer and Principal: Main Roads Western Australia
Architectural Consultant: Prof Gordon Stephenson
Constructor: Clough Engineering Group
Temporary Works Design: Cepas Plan AG (Zurich) and Clough
Prestressing Systems: BBR Australia

The 2007 Bridge

Principal: Main Roads Western Australia
Design and Construction: Leighton Contractors Pty Ltd
Structural and Civil Design: Wyche Consulting and GHD Pty Ltd
Temporary Works Design: Hawkins Engineering TW Pty Ltd
Architectural Consultant: Parry and Rosenthal
Geotechnical Consultant: Coffey Geosciences



An Engineering Heritage Marker was awarded to Main Roads WA on the 4th March 2024



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