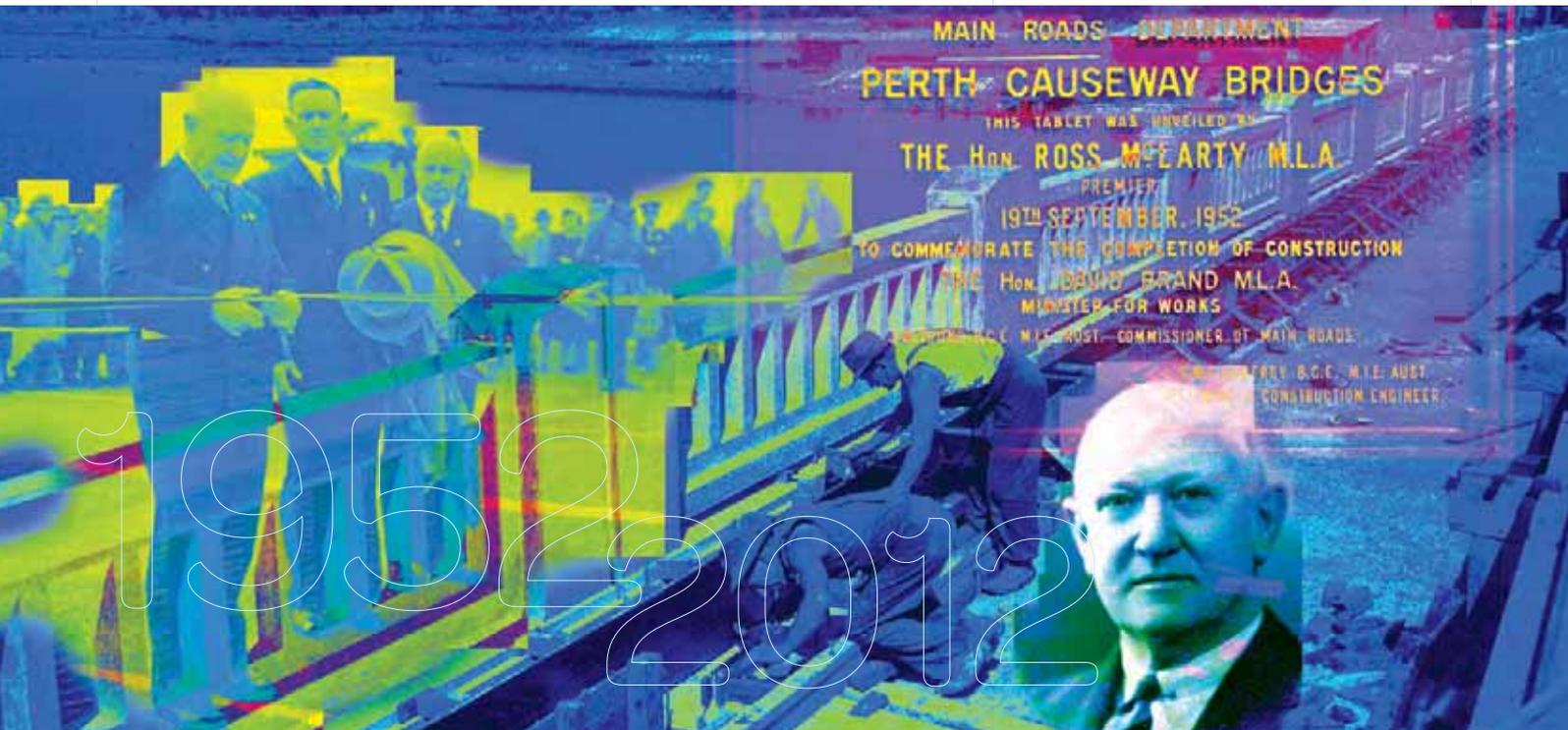


Celebrating the 60th Anniversary and Engineering Heritage Recognition of The Perth Causeway Bridges



On 19 September 1952 following a colourful history spanning more than a century Perth's modern concrete and steel Causeway bridges were officially opened to traffic by the Premier Ross Mc Larty.

Recently Engineering Heritage Western Australia advised that its nomination of Perth's Causeway bridges for Engineering Heritage Recognition had been successful.





History of the Causeway site

When Western Australia's first governor Captain James Stirling established the Swan River colony in 1829 he founded two initial townships, the port settlement of Fremantle, on the south bank of the river, and an administrative capital upstream on the north bank of the river, below Mt Eliza, which he named Perth.

As a consequence of these perhaps hasty decisions the river was for some years the only real 'highway' for the movement of passengers and goods between Fremantle and Perth. The obvious place for a bridge to facilitate road traffic between the two townships was at North Fremantle, but the colony did not have the technical and financial resources to build a bridge there for at least 20 years. Travellers by road from Fremantle to Perth had to follow the south bank of the river to the location where Canning Bridge now stands, use a slow and expensive ferry crossing, then continue overland to a location approximating to the east end of the existing Causeway bridges, then traverse a series of mud flats to firm ground at East Perth.

In February 1831 the colony's Civil Engineer, Henry Reveley, was requested by Governor Stirling to "remove the inconvenience of the Flats" to allow boats to travel upstream.

Various attempts were made to dig canals through the flats but it was 1840 before a successful canal was constructed. As a consequence over the period 1840 to 1843 two wooden bridges and earth embankments were constructed over the canal and mud flats to finally complete the crossing of the Swan River at the Causeway location.

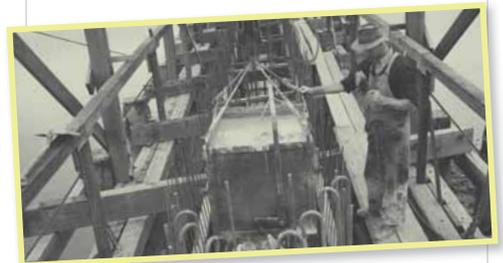


The first Canning bridge was completed in 1849 allowing complete roadway access from Fremantle to Perth along the south bank of the Swan River. A high level bridge over the river at North Fremantle, built by the Royal Engineers using convict labour, was open to traffic in November 1866, permitting road access between the two townships by the more direct route following the north bank of the river.

A second Causeway timber bridge crossing was completed in 1867 after the first bridge crossing was almost destroyed by major flooding in the river in June 1862.



The current Causeway bridges were constructed by the Main Roads Department, Western Australia between 1947 and 1952.



Engineering Heritage Marker

In August 2012 Engineering Heritage Australia advised Engineering Heritage WA that its nomination of Perth's Causeway Bridges met the assessment criteria set down in Engineering Heritage Australia's Heritage Recognition Guidelines and the bridges had been awarded an Engineering Heritage Marker.





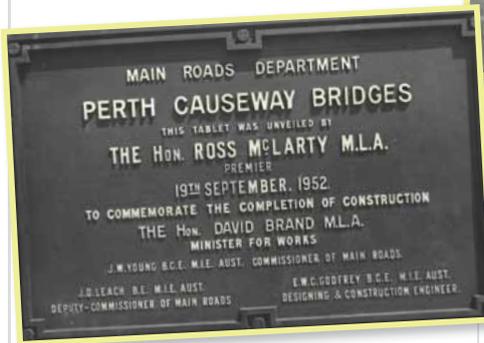
Planning, Design and Construction of the 1952 Bridges

In September 1944, Main Roads WA Bridge Engineer E. W.C. (Ernie) Godfrey (who had been appointed in 1928), submitted a proposal to Commissioner J.W. Young to build two new bridges upstream of the existing ones with a deck 19 metres (62 feet) wide, allowing for one tram lane, two vehicle lanes in each direction, a 2.4m (8 feet) pedestrian footway on the downstream side and a narrow 0.7m (2.25 feet) footway on the upstream side. The combined length of the bridges was to be 341m (1119 feet). Timber piles were to be used and the deck was to be of composite steel and concrete construction. This method of construction had been pioneered in Australia in the 1930s by Mr Alan Knight, Chief Engineer of the Public Works Department of Tasmania. It involved tying steel support girders to the concrete deck with steel stirrups welded to the top flanges of the girders. In order to have sufficiently high clearances over river channels at high tide, the bridges were to have graded approaches and the roadway surfaces follow vertical curves. Although the design concept as detailed above was adopted in 1944, with minor changes, wartime shortages of money, materials and manpower delayed commencement of construction until May 1947. Postwar shortages of materials continued to delay the project.

Vital supplies of cement were double ordered to try and ensure timely deliveries. As well as the local supplier, Swan Cement, supplies of cement came from England, Sweden, Poland, and Japan.

The construction workforce consisted mainly of Main Roads employees, supervised by Main Roads engineers.

A steam powered floating crane was used to lift the superstructure 1.22m (4 feet) deep plate girders into position. The girders were fabricated at the Welshpool factory of Forwood Downs Pty Ltd. It is worth noting that the late delivery of the steel for the girders was a prime cause of the delay in the project completion. Steel ordered from BHP for the girders in August 1948 was not delivered until the end of 1950.



According to J.G. (Gilbert) Marsh, who as a young engineer worked on the Causeway project (and succeeded Ernie Godfrey as Main Roads Bridge Engineer), the Causeway Bridges had a significant difference to the Eastern States composite

concrete bridges in that the deck concrete was "prestressed". This was achieved by securing the ends of the simply supported girders, and jacking up beneath the girders at the third points prior to casting the deck slab. When the concrete had cured sufficiently the jacks were lowered, transferring compression into the concrete. Steel jacking trusses supported the jacks. This procedure prevented shrinkage cracking from developing into more serious cracking under heavy traffic loads.



The bridges were officially opened on September 19, 1952, with considerable fanfare, by the Premier, The Hon Sir Ross McLarty, MLA. He presided over a gathering of VIPs including The Hon David Brand, MLA, Minister for Works, The Right Hon. J. Totterdell MLA, Lord Mayor of Perth, Mr J.W. Young, Commissioner of Main Roads, Mr J. D. Leach, Deputy Commissioner for Main Roads, Mr W. A. Mc. I. Green, Perth Town Clerk, Mr E.W.C. Godfrey, Designer and Construction Engineer and Mr C.S. Paterson, Perth City Engineer.

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Bridge Statistics Modern Day Causeway

- Perth's Causeway cost 1,752,000 million pounds
- 49 thousand feet of piles had been driven for the bridge foundations
- 9500 cubic yards of concrete had been used
- 500 tons of reinforcing steel had been used
- Looking back to 1843 there was a toll to cross the then Bridges and Causeway which ranged from one penny for pedestrians to sixpence for certain animals, with soldiers and mail-carriers to cross free of charge.



Written September 2012, extracts supplied from "Perth Causeway Bridges nomination for Engineering Heritage Recognition by Engineering Heritage Western Australia, "Perth Causeway 1830's to 1952" by Lloyd Margetts 2002 and "The Perth Causeway celebrating 50 years 1952 - 2002"

Eminent Persons Associated with The Project



Sir Ross McLarty, KBE, MM, MLA
Premier of Western Australia,
1947 - 1953



Mr J.D. Leach, CBE, B.E. FIEAust
Commissioner of Main Roads WA,
1953 - 1964



Mr J.W. Young, B.C.E. M.I.E.Aust
Commissioner of Main Roads WA, 1941 - 1953
Director of Works, Public Works
Department of WA, 1953 - 1962



Mr E.W.C. Godfrey, B.C.E. M.I.E.Aust
Bridge Engineer, Main Roads WA, 1928 - 1957
Causeway Designer and Construction Engineer

