FACT SHEET

SEPTEMBER 2025

Australian Government

mainroads WESTERN AUSTRALIA

Swan River Crossings
Fremantle Traffic Bridge

Bridge Edge Beam Segment Installation

The installation of edge beams along the outer edges of the existing Fremantle Traffic Bridge marks a significant step in the construction of Australia's first extradosed bridge. This complex process involves meticulous planning to position the 166 individual segments. Edge beams have several roles, including:

- Serving as the primary load-bearing structural components.
- Supporting the majority of the dead loads (permanent structural elements) and live loads (temporary or moving loads) on the bridge.
- Supporting rapid construction of the new bridge deck.
- Forming the base of the new pedestrian and cyclist paths.

All edge beam segments have been made off-site at a pre-cast yard in Hazelmere and are transported individually to site for installation. Each segment is approximately three metres tall, five metres wide and three metres long and weighs between 50 and 85 tonnes. The segments are match-cast, which means each new segment is formed directly against the previous one, resulting in a precise and unique fit.

How segments are lifted into place

Once on site, segments are lifted into place by cranes and are positioned using a custom designed machine called a **Segment Lifting Beam (SLB)**—a special tool engineered to safely lift, balance, and position the segments.

The SLB has a secure clamping mechanism that grips the segment firmly without causing damage. Once the segment is in position and properly supported, the SLB's integrated arms are rotated away, enabling the crane to release without disturbing the segment alignment.

Figure 1: SLB positioning segment into place.

Figure 2: SLB arms rotated away and SLB lifted away from the segment.

How segments are held together

Penetrations have been engineered into edge beams segments to allow installation of stress bars that temporarily tie the segments together.

During installation, a high-strength epoxy adhesive is applied to the face of the previous segment to provide an initial bond for durability and to seal the joints between segments. The stress bars are fitted to initially 'squeeze' the epoxy to ensure proper adhesion. After the epoxy is set, post-tensioning rods are installed, and the temporary stress bars are removed.

Post-tensioning the beams, together with the bridge tower cables, stabilise the edge beams and provide a secure boundary for the new bridge.

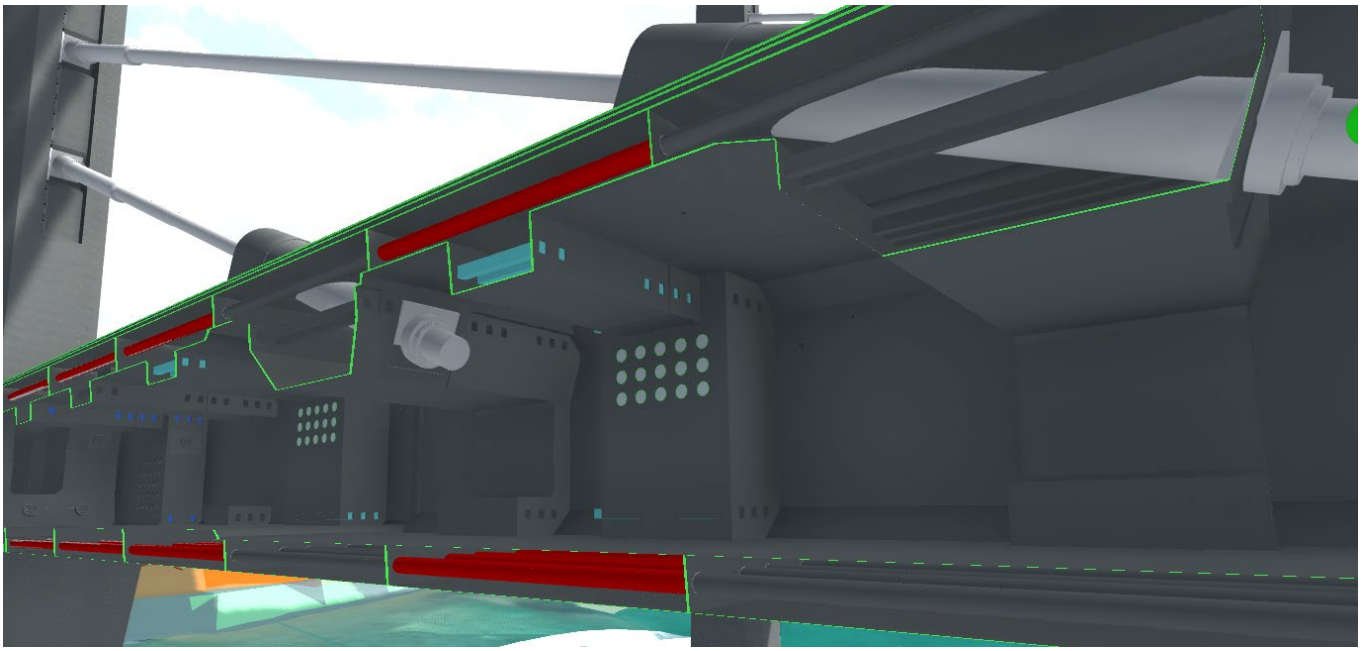

Figure 3: Segments stitched together, and cables installed.

Figure 4: Bridge stay cables installed.

Will segment installation impact road users?

No. Edge beam installation will be taking place whilst the existing bridge is open. Road users are encouraged to drive with care and be aware of construction activity in close proximity.

Figure 5: Road user perspective of segment install.

Figure 6: Segment install.

Further information

For enquiries, please phone 138 138, email enquiries@mainroads.wa.gov.au or click here to learn more about the project. Click here to subscribe for future project updates.