



Swan River Crossings - Fremantle Traffic Bridge



Building the new Fremantle Traffic Bridge

The Swan River Crossings Project will replace the existing Fremantle Traffic Bridge, creating a striking gateway to Fremantle (Walyalup). The new bridge will:

- be built on the existing traffic bridge alignment
- maintain two traffic lanes in each direction
- improve navigational safety for boats, kayaks and other river users
- have new, wider and safer pedestrian and cycling paths (up to four metres wide) on both sides to connect into the existing path network

An innovative construction approach has been developed to allow parts of the new bridge to be built while the existing bridge stays open. Four large crawler cranes will be used for all construction stages – two with a 320-tonne lift capacity and two with a 480-tonne lift capacity. The cranes will:

- Lift heavy material (including pre-cast concrete built off-site)
- Hold the hammer used for piling
- Assist with existing bridge removal and bridge deck installation



Stage 1

Temporary jetty installation

The cranes will sit on four temporary jetties that will be built at both ends of the bridge and on each side. Temporary jetties provide a safe, stable base and minimise the impact to river users during construction. These jetties will be used for the duration of the project and will be removed when bridge construction is complete.



Picture 1: Crane constructing the temporary jetty



Picture 2: Two temporary jetties complete



Stage 2

Bridge foundation piling

The bridge structure has three key components:

- Piles: long steel poles which are hammered into the riverbed
- Pile caps: these rest on the piles to provide a stable foundation
- Pylons: known as support towers, which are made of concrete

Once temporary jetties are in place, bridge foundations are constructed. This involves a crane and piling hammer attachment driving piles approximately 60m deep into the riverbed.

Once the piles are installed, a pre-cast concrete shell is placed on top of the piles. Steel reinforcements and concrete are placed in the shell to form the final pile cap, creating a solid foundation for the bridge pylon.



Picture 3: Hammering of piles



Picture 4: Pile caps complete



Stage 3

Pylon construction

The base of the pylons, from the pile caps to the bottom of the new bridge, will be constructed in one concrete pour, followed by smaller segments. Pylon construction includes the installation of saddles, which clamp the bridge cables securely to the pylon. The pylons will be approximately 38 metres high. To maximise efficiency and reduce construction timeframes, all four pylons will be built at the same time.



Picture 5: Formation of the pylon



Picture 6: Completed pylons



Stage 4

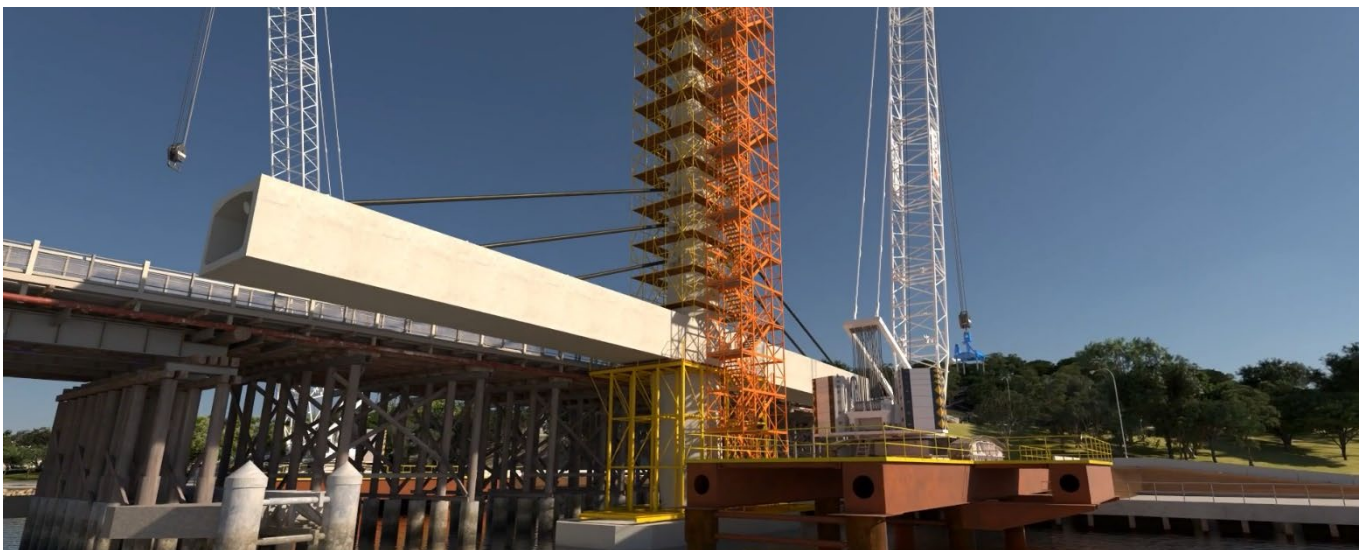
Edge beam installation

The cranes carry individual edge beam segments and install them on opposite ends of the pylons. Two cranes will work simultaneously to construct each edge beam from the north and south until they meet in the centre. This allows installation and attachment of cables to the edge beams and pylons.

Construction of the northern and southern abutments happens at the same time to tie the edge beams into the abutments.



Picture 7: Edge beam segment



Picture 8: Construction of the edge beams

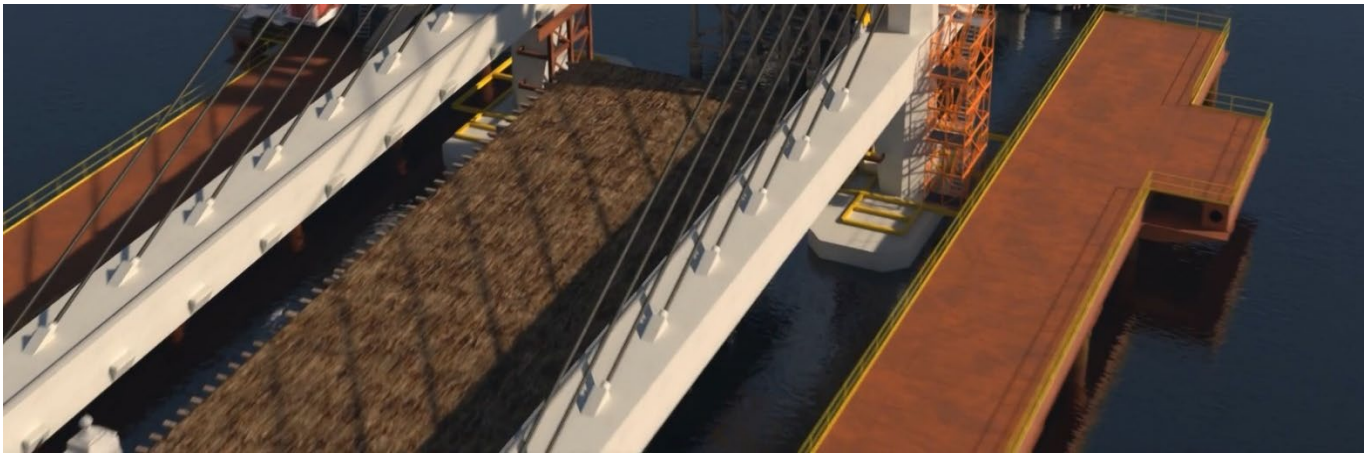


Stage 5

Removal of the existing bridge

Following construction of the pylons, edge beams and abutments, the old bridge will close for approximately 12 months. The first segments of the old bridge, next to the newly constructed pylons, are removed. Other segments are removed while the main structural element of the bridge, also known as the diaphragm, is constructed.

The central abutments on both sides of the new bridge will also be constructed and bridge beams will be delivered to Beach Street for deck installation.



Picture 9: Structural element of the bridge (bridge diaphragm)



Picture 10: Removal of the existing bridge



Stage 6

Bridge beam and deck installation

Bridge beams will be lifted into place by the cranes and fixed into the edge beams by post-tensioning bars. The bridge deck is constructed with steel reinforced concrete panels also lifted into place.

Once the bridge deck and abutments are constructed, final pavements are laid and all finishing touches are complete, allowing the bridge to re-open to traffic, pedestrians and cyclists.



Picture 11: Bridge beams installed



Picture 12: New bridge complete