



CAUSEWAY PEDESTRIAN AND CYCLIST BRIDGES PROJECT

How are the bridges' deck surfaces prepared for the segregated path for pedestrians and cyclists?

When the bridges are complete, they will provide a 6-metre-wide segregated path, approximately one kilometre long over the Swan River, linking McCallum Park in Victoria Park with Point Fraser in the City of Perth via Heirisson Island.

The bridges' deck surface will be sealed with a special product that will provide waterproofing, as well as a safe, non-slip durable surface to the finished path for pedestrians and cyclists.

The coating bonds effectively to steel bridges compared to other products used on bridge deck surfaces, such as recycled glass. It also includes bauxite, which helps to achieve the required surface characteristics needed for the segregated path.

The coating used on the bridges has been used on offshore platforms in Australia for years and on award winning bridges across Europe, performing flawlessly for many years.

As the bridges are providing a segregated path with dedicated lanes for cyclists (encompassing all faster moving wheeled transportation) and pedestrians (encompassing the slower foot traffic), the lanes will be distinguishable by different coloured coatings, combined with line markings.

Why is asphalt not being used for the bridges' deck surface?

Asphalt is not used on any steel decks across Australia. Asphalt is very difficult to apply to steel decks as it requires multiple special layers to provide a strong, durable bond with the deck.

What design feature(s) have been included in the bridges to manage lightning strikes?

All structural elements, including the deck and pylons, are earthed through the ground via the bridges' supporting piles that go deep into the riverbed. All stainless-steel elements, such as handrails and seats, are isolated from the weathering steel via neoprene (a synthetic rubber) and then connected to the deck with earthing cables.

Why has weathering steel been used to construct the bridges?

The design choice of constructing the Causeway Pedestrian and Cyclist Bridges with weathering steel, provides a range of benefits including a unique architectural finish and greater sustainable outcomes for the project. In total, 1,900 tonnes of weathering steel have been used in fabricating the bridges.

Weathering steel has a higher strength than standard steel, which contributes to the lower weight and slenderness of the bridge decks. During construction fewer temporary supports were required, reducing the disturbance of the riverbed.

Weathering steel has been used since the 1930s in railway wagons, bridges, buildings, sculptures, and landscaping. It has been widely adopted for bridge building and it is estimated up to 45% of new steel bridges globally are constructed using some form of weathering steel.

Here in Western Australia, in addition to these bridges; weathering steel has been used at Yagan Square in Perth's CBD, and on the Sky Walk in Kalbarri National Park.

Will the bridges be painted?

Weathering steel has contributed to improving the sustainability of the project by avoiding the need to paint (and repaint) the bridges.

The enhanced corrosion resistance of weathering steel means that it can be used without the need for expensive paint systems. Removing the need to paint, significantly lowered the fabrication costs as well as ongoing maintenance costs. Eliminating painting reduces chemicals and energy needed to paint the bridges as well as minimising disruption caused to path users by future maintenance.

Weathering steel is very durable, with a long product life, providing the bridges with an expected life of more than one hundred years. At the end of the bridges' life, the weathering steel can be reclaimed and recycled.

Why does weathering steel change colour?

Weathering steel is a high strength, structural steel that in a suitable environment develops an oxide layer or 'patina.' When exposed to alternate wet and dry environmental conditions, the colour of the patina forms and changes organically over time. On the Causeway Bridges, this will result in the steel becoming textured and giving the bridges a unique identity, effectively 'weathering' the steel in a natural way.

Over time, the bridges' patina will evolve and when fully formed and weathered, which can take at least 8 years, the bridges will take on a distinctive natural appearance.

They are likely to become a consistent dark brown to a purple colour, blending in with their environment.

How will the bridges improve access to Heirisson Island?

The new bridges will cross Heirisson Island, providing an opportunity to highlight the important role the Island had in Perth's Noongar heritage. This project will provide improved connection for both pedestrians and cyclists to the river and foreshore area on the island, while enhancing the natural environment through landscaping and showcasing Whadjuk Noongar heritage. It is anticipated that this will result in activation of the island, welcoming visitors and locals alike.

How will you be protecting the kangaroos on Heirisson Island during construction?

The Western Grey Kangaroos that live within the fenced off area on the most western side of Heirisson Island will not be impacted by the works and will remain there during construction. Noise and vibration monitoring has commenced and will be in place on Heirisson Island during construction to ensure the kangaroos inhabiting the area are not adversely affected. A vet will be available to assess the kangaroos regularly throughout the works.

Why are the bridges curved and not straight?

The bridge design is curved to minimise the impact on existing trees, to assist in accommodating the height requirements of the navigation channel and to slow down cyclists traveling downhill when approaching key intersection points.

The design has been extensively workshopped with key stakeholders, and the State Design Review Panel supports the elegant, curved form of the bridge structures, which blend into the natural environment.

What will happen to the path on the existing Causeway traffic bridge?

The existing Causeway traffic bridge is heritage listed and will not be modified as part of this project. The current path will remain and path users will continue to have access, both during construction and once the new bridges are open.

How are the impacts on the Swan River being managed during river works?

The Causeway Link Alliance is managing the works on behalf of Main Roads and has developed a Vessel Management Plan to ensure vessels and other marine operations, are operated without compromising the safety of river users, the Project's workforce, nearby structures or adversely impacting the marine environment.

There are several management controls that will be implemented to minimise potential impacts to aquatic fauna during construction. These include underwater noise and vibration monitoring and the engagement of Marine Mammal Observers during all in-river works. This will ensure that no potentially harmful activities (such as pile driving) are undertaken if fauna is present within the designated exclusion areas.

Other controls include the implementation of a Vessel Management Plan to manage the interface with other river users and a robust water quality program to monitor the health of the river during construction and determine if there are any impacts on the ecology.

What is the duration of the river works?

Works will start in the river, in the southern channel, in November 2023 and are anticipated to be completed in both channels in Spring 2024.

Works will commence in the northern navigation channel in early 2024. Therefore, there will be no impact on commercial and recreational river users prior to 2024.

Works will be undertaken across all seasons however seasonal variations will be monitored and managed including river flows and tidal variance, to mitigate disruption to construction machinery and the passage of river users through the northern navigation channel.

Some construction activities are weather-dependent and therefore the exact timing of specific construction activities may change.

Will river users be able to pass through the northern navigation channel outside of construction hours?

Yes. Whilst working at night is not expected, there is a requirement for safety and navigational lighting to enable the safe passage of vessels through the work zone outside of standard working hours.

During construction shutdowns, such as the Christmas period, construction vessels will be moored near the McCallum Park site in the southern channel or off-site, and the northern navigation channel will be clear for vessels to pass through.

What are the hours of operation for work activities in the river?

Works will be undertaken during daylight hours Monday to Saturday between 7am and 7pm. At times there may be requirements for out of hours work on Sundays and at night. All out of hour's work requires Local Government approval and advance notice will be provided to river users.

Working at night is not expected, however in breakdown or emergency situations working during hours of darkness may be required. Lighting of barges and work vessels will be in accordance with Prevention of Collision at Sea Regulations.

Will access to permanent moorings in the vicinity of the river works be maintained?

Yes, access to the following moorings will be maintained:

- On The Point (306 Riverside Drive East Perth) reserved for private commercial operators.
- The operations of the DBCA Victoria Park Operations Centre
- Trinity College Boat Ramps.

What marine equipment will be used during the works?

There will be multiple work boats, two spotter vessels (to assist river users in navigating safe passage) and up to two barges will be in the water at one time. The main barges consist of:

1. A crane barge with a 400-tonne crawler crane. This barge will be 48m long and 24m wide – almost the size of an Olympic swimming pool!
2. A Jack-up barge (JUB), which is used to hold piles so they are not affected by marine-based influences (e.g. river currents and sea state).

Will the new bridges be high enough to allow boats to pass underneath?

The bridges have been designed to cater for navigational clearance and future sea level rises.

The new bridge on the Point Fraser side will have 6.2 metres of navigational clearance, while the new bridge on the McCallum Park side will have 5.1 metres of navigational clearance, allowing for smooth passage of marine vessels.