

Tamar Bridge resurfacing project briefing note

Work on a vital project to resurface the deck of the Tamar Bridge is due to begin in April 2021.

The complex resurfacing project is expected to take approximately six months to complete, with all three lanes on the main deck and both the north and south cantilevers being resurfaced. As well as resurfacing the bridge deck, Tamar Crossings are also taking the opportunity to resurface the toll plaza area and the bridge approaches, and will also be replacing all six of the bridge expansion/movement joints.

The project is currently due to be finished by the end of September, when all the lanes will be re-opened to traffic.

Three traffic lanes will be kept open throughout the works to help minimise disruption to bridge users, with the south cantilever used as an additional traffic lane when necessary. This means that the south cantilever will be closed to pedestrians, cyclists and mobility scooter users for the duration of the works. As with the kerb replacement project, a free bus service will be provided to enable these groups to cross the bridge.

Constructed between 1959 and 1961, the iconic suspension bridge was last fully resurfaced at the time of the strengthening and widening project in 1999-2001. As part of that project the original concrete deck was replaced by an orthotropic steel deck – this uses steel plate with stiffening ribs underneath.

The purpose of the bridge deck surfacing is to provide a safe durable running surface for vehicles and also to protect the orthotropic steel deck from wear due to corrosion and fatigue. Just like standard road construction, bridge deck surfacing has a limited lifespan as the millions of loading cycles from traffic eventually cause deterioration, and the deck of the Tamar Bridge needs to be resurfaced every 20 to 25 years to prevent damage occurring to the steel deck. In the last 20 years the Bridge has carried around 300 million vehicles.

Routine inspections of the bridge surfacing are carried out every four months and during the last two years these inspections have revealed that the existing surface is nearing the end of its serviceable life and requires replacement.

A specialist, thin asphalt material will be used to resurface the bridge deck. At just 45mm thick, this material is much thinner and lighter than the materials used in standard road construction. It is also more expensive due to other factors and processes required during the resurfacing process.

The £6m cost of the project is being met by Tamar Crossings funded from toll income.

The project was originally due to be carried out during 2020, but was postponed until this year because of the coronavirus pandemic and the need to complete the kerb replacement works. Delaying the project again could result in further damage to the surfacing material, leading to cracks which then enables water to

penetrate onto the steel plates underneath with the potential for corrosion to occur. Patching repairs are difficult to carry out on steel bridge decks and would not be as durable as full resurfacing. Adopting this approach would also require more frequent repairs to be carried out, leading to closures of lanes over a longer period, and increasing the potential disruption to bridge users.

The scheme is being carried out by VolkerLaser, a specialist civil engineering contractor with extensive experience of working on bridges, It will be overseen by Tamar Crossings' Engineering Manager, Richard Cole.

While work on the project will officially begin at the beginning of April, significant preparation work needs to take place before the contractor starts work on the bridge deck. As a result lane restrictions will not be introduced until the middle of April.

Resurfacing the steel bridge deck involves a series of highly complex processes , the majority of which need to be carried out in dry and mild weather conditions. These processes are:

- removing the majority of the thickness of the existing surfacing material using a road planer. A thin layer is left bonded to the steel deck so that the steel deck is not damaged by the aggressive teeth on the road planer
- removing the remaining thin layer either by hand using mechanical hand tools or using a large flat blade on a suitable digger/dozer machine
- blasting the steel deck with grit/shot using an enclosed mobile blasting machine - this process removes any stubborn remains of existing surfacing and deck waterproofing material, and provides a clean deck, enabling engineers to thoroughly inspect the steel deck and welds for cracks or damage
- carrying out repairs to damage on the deck as required
- applying paint 'primer' to the bare steel deck to protect the steel from corrosion
- applying a two-layer waterproofing system on to the primer - this provides vital corrosion protection to the steel deck
- applying a 'tack-coat' on to the waterproofing - the 'tack-coat' helps the surfacing material bond to the waterproofing material creating a composite surfacing system
- laying the surfacing material in two thin layers using a special surfacing machine that runs on rails - the rails are set up to ensure that the contractor achieves the correct material thickness while also providing a smooth running surface
- applying road markings and installing a replacement illuminated road stud system.

All of the works will be carried out in a Covid-secure manner, with contractors required to adhere to contemporary Government guidance. Tamar Crossings will also ensure that the latest Construction Leadership Council Site Operating Procedures are rigorously enforced.

The timing of the project means that the resurfacing will be continuing over the summer period. As the majority of the work needs to be carried out during dry and mild weather the project cannot be moved to the winter months. Delaying it

until next year would lead to further deterioration of the surfacing material, potentially causing the surface of the deck to crack and break up.

It is not possible to carry out the works solely at night as the lanes cannot be re-opened to traffic until the resurfacing has been completed. Working at night also introduces other issues, such as worker safety and noise. Using heavy plant and machinery at night would have a major impact on the lives of the people living close to the bridge.

While the crossing will remain open throughout the works, the traffic management arrangements and lane restrictions mean that drivers of 'abnormal loads' will be required to use an alternative route. Tamar Crossings are working closely with Highways England, Devon and Cornwall Police and local councils to sign the diversion routes which will be shared with hauliers and other organisations as soon as possible.

Advanced warning signs will be placed at key locations on the A38 and the local traffic network, as well as on the main motorway junctions.

Regular updates on the project will be posted on the Tamar Crossings website and social media channels, and provided to motoring organisations and the local media. This will include details of any traffic congestion or delays which will also be displayed on electronic messaging signs along the A38 at Manadon Junction and Trerulefoot Roundabout.

Tamar Crossings are very aware of the importance of the Tamar Bridge as a vital transport link between Cornwall and Devon. This is a major once in 20-25 year scheme which is essential for the safety of bridge users and in ensuring the ongoing service life of the structure.

Tamar Crossings staff are committed to working with contractors and partners to deliver the resurfacing project as safely as possible with as little disruption to bridge users as possible.

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