

A New Bridge for London

Our proposal is a slender suspension bridge, designed so that the pedestrians and cyclists appear to float on a ribbon above the river Thames. The bridge's form is intentionally symmetrical, with 25m tall sculptural 'weathering steel' totems either side of the span, which give equal significance to both landing points.

Our ambition is to form the most direct route across the Thames and improve the places where the bridge lands. Each end has a very different urban condition; Pimlico Gardens, a lovely but underused pocket park is reinforced as a place to meet with new purpose – the bridge meets the park on an elevated grass mound, activating the park as part of a chain of routes towards Victoria, Hyde Park and Central London.

On the south bank, the bridge meets a carefully graduated hard landscape – intended to link desire lines from the new public realm and green links around the US embassy, into Nine Elms and Battersea. A ramp rises gently along the existing river walk to meet a generous terraced stair to form a seamless connection to the bridge. Along the river wall, a new lowered terrace affords wonderful elevated views over the Thames, a place to stop and enjoy the movement of people and water.

On both sides, cyclists and pedestrians are treated equally, with easy connections onto the bridge – meaning there are no needs for lifts and guaranteed step free access on both sides.

On the bridge, pedestrians and cyclists share the deck safely, with pedestrians walking along the outside and cyclists enjoying a direct faster route in the centre of the 8m wide deck. Each user is treated to wonderful views across the Thames. The proposal also mitigates disruption of the river traffic; spanning a clear 150m and maintaining a height of over +10.9m AOD across its centre.

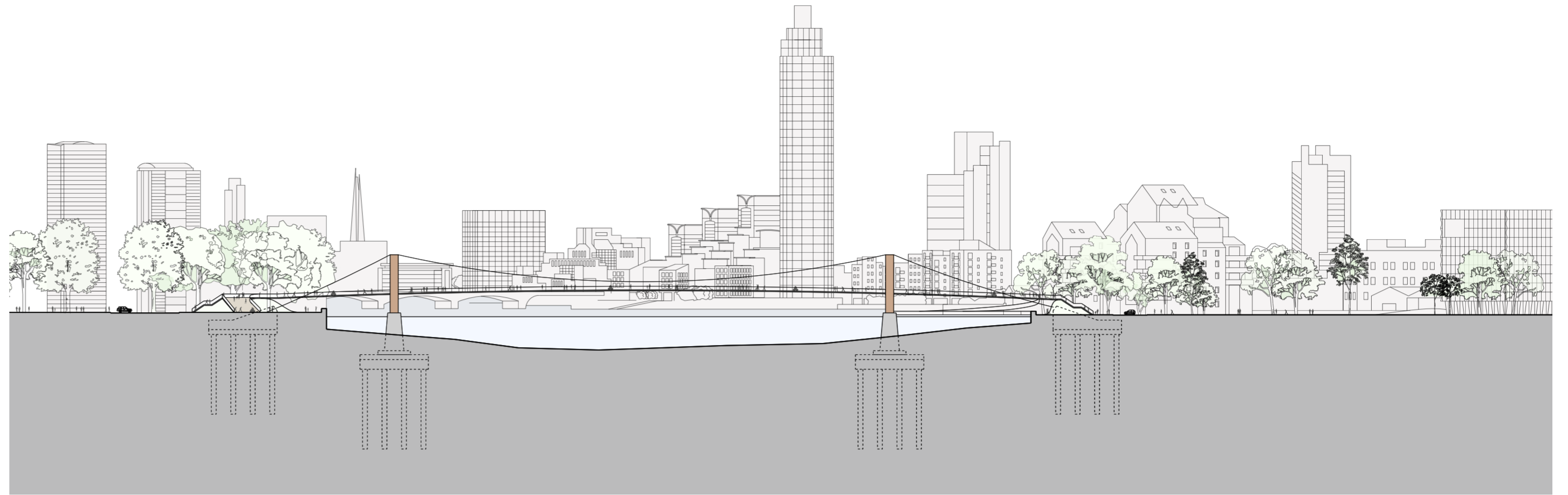
The 'weathering steel' totems mark your passage from one side to the other, and are lit at night to reveal a distinct and unique texture. The totems give the bridge a sculptural identity by counterpointing the heavy and lightweight elements, the solid elemental totems contrast intentionally against the delicate bridge deck, a slender sculptural ribbon that allows all to view the river and city uninterrupted.

Structure

The structural design of the bridge has been developed around the strong aspiration of achieving the most elegant and thin deck possible which spans almost effortlessly across the river and maximises clear sightlines along the river as well as minimising the requirement for any additional length of ramps at the abutments. The bridge typology of a suspension bridge seems the most appropriate, capable of achieving an upwards curvature of the deck to give additional clearance and a thin structure hung from closely spaced suspender cables.

The deck is formed of a tapered steel stiffened box supported by suspender cables at each side of the deck. The decking consists of transverse Accoya timber planks with carborundum strips which give the bridge a natural feel whilst at the same time providing a durable and slip-resistant surfacing. The suspender cables are hung from the main cables at each side of the deck and carry the load back to the steel towers. The tower position has been set to achieve the 150m navigation width required, whilst at the same time minimising the main span leading to greater structural efficiency and reduced tower height. The towers are conceived as both functional and sculptural objects which wrap around the deck at either side; they are made of a steel hollow rectangular sections filled with concrete for additional structural capacity. The towers are connected to concrete pedestals which extend out of the water at their base; these are designed to resist ship impact and are shaped in plan to minimise hydraulic impact. The pedestals sit on reinforced concrete pile caps and piles which carry the loads into the ground. The main cables are anchored into the ground at each abutment through a reinforced concrete piled foundation.

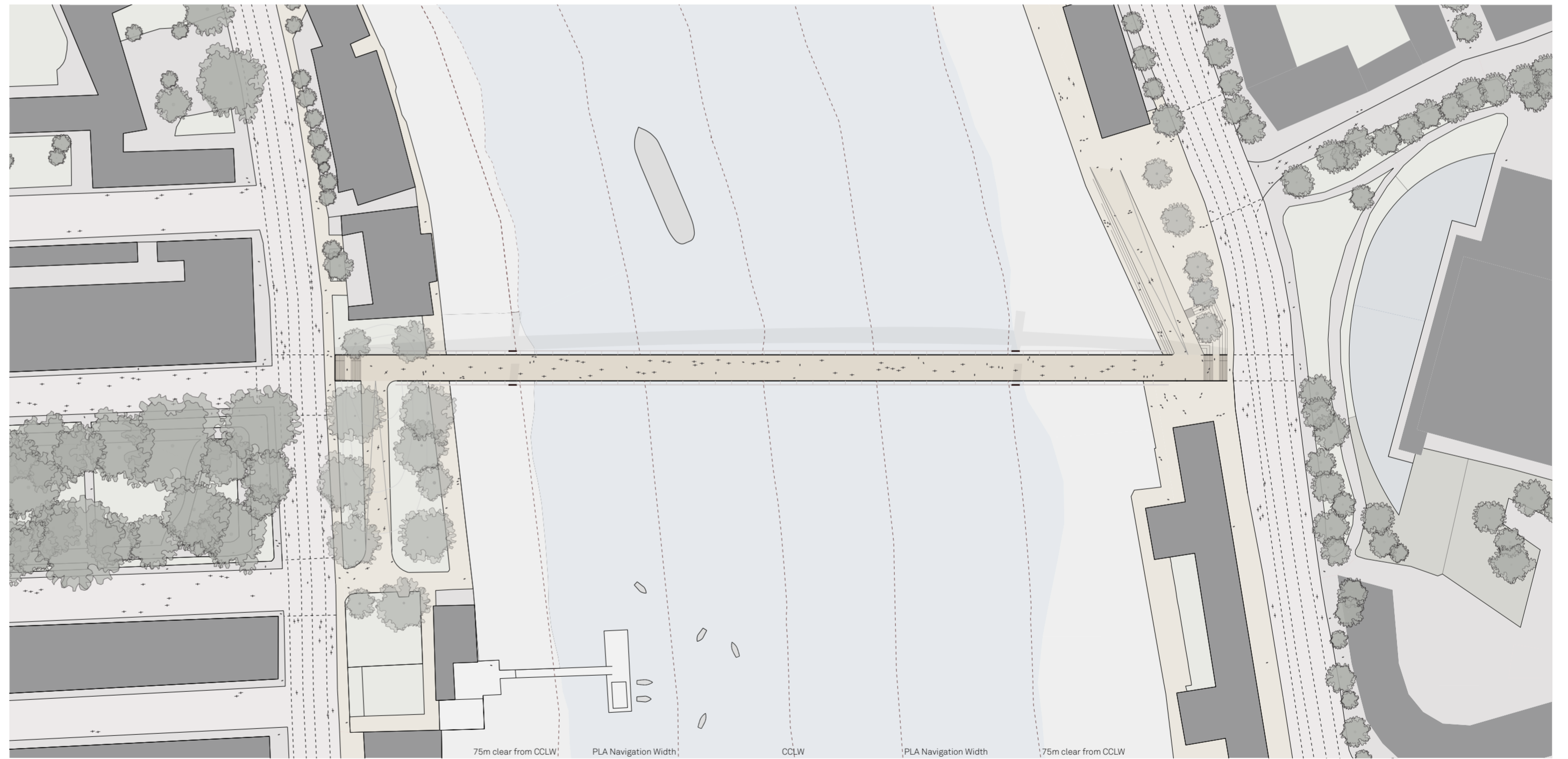
The bridge construction allows for a phased installation of the deck which safeguards river navigation throughout the construction phase. All concrete structures are envisaged to be constructed using recycled aggregates and cement replacement. The steel deck and tower structure will be optimised to reduce overall material use and formed from highly durable, high-strength weathering steel that will have limited maintenance requirements during its 120 year design life.



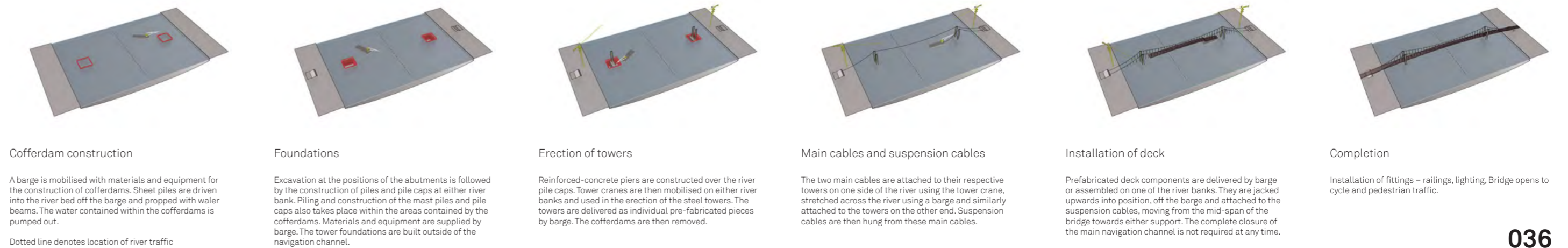
Above: Section looking east towards Vauxhall bridge. Below: Plan of the new bridge. Scale 1:1250



Sketch showing the pedestrian and cyclist view across the bridge between the portal 'totems'.



Below: Proposed construction sequence that mitigates any disruption to the Thames.



Cofferdam construction

A barge is mobilised with materials and equipment for the construction of cofferdams. Sheet piles are driven into the river bed off the barge and propped with water beams. The water contained within the cofferdams is pumped out. Dotted line denotes location of river traffic

Foundations

Excavation at the positions of the abutments is followed by the construction of piles and pile caps at either river bank. Piling and construction of the mast piles and pile caps also takes place within the areas contained by the cofferdams. Materials and equipment are supplied by barge. The tower foundations are built outside of the navigation channel.

Erection of towers

Reinforced-concrete piers are constructed over the river pile caps. Tower cranes are then mobilised on either river bank and used in the erection of the steel towers. The towers are delivered as individual pre-fabricated pieces by barge. The cofferdams are then removed.

Main cables and suspension cables

The two main cables are attached to their respective towers on one side of the river using the tower crane, stretched across the river using a barge and similarly attached to the towers on the other end. Suspender cables are then hung from these main cables.

Installation of deck

Prefabricated deck components are delivered by barge or assembled on one of the river banks. They are jacked upwards into position, off the barge and attached to the suspender cables, moving from the mid-span of the bridge towards either support. The complete closure of the main navigation channel is not required at any time.

Completion

Installation of fittings – railings, lighting, Bridge opens to cycle and pedestrian traffic.



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