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Design and construction of an urban pedestrian bridge over river Lee in Central Cork. Mary Elmes, from competition to opening.

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In September 2016, Cork city council launched a competition for a pedestrian crossing over river Lee between historic bridges of St. Patrick's (a stone arch form 1860's) and Brian Boru (a former rolling bascule from 1920'). Constrained by heavy trafficked quay roads, the design of a single span 66m crossing was a real challenge when taking into account that the flooding level for the 200years return is 400mm higher than the existing footpaths.



Figure 1. River Lee and St. Patrick's bridge in the background. The location for the new footbridge is at the bottom of the picture.

The competition, won by ARUP Ireland and Wilkinsone Eyre, proposed a shallow slender spine beam fully constrained at the abutments which are hidden behind the quay walls and by means of a concrete pilecap and two rows of piles provide stiffness to the structural system. The steel beam, with a L/42 slenderness ratio at midspan and L/36 at supports, takes advantage of the arching effect by varying its vertical position relative to the pedestrian walkway and membrane contribution of the steel plate of the transversal cantilevers which are both an integral part of the structural system and the architectural personality of the bridge. The slenderness achieved required a significant analysis effort, combining static, construction, dynamic analysis under pedestrian loading.

With a curved geometry both in plan and elevation and a careful consideration of its urban placing not only as a crossing but as a place, the bridge has been extremely successful since opening in July 2019 praised by pedestrian, cyclist and idlers alike.

The architectural illumination and the integration of the railing into the bridge appearance were also considered carefully, allowing the bridge to express its own personality without overshadowing the existing historic bridges.

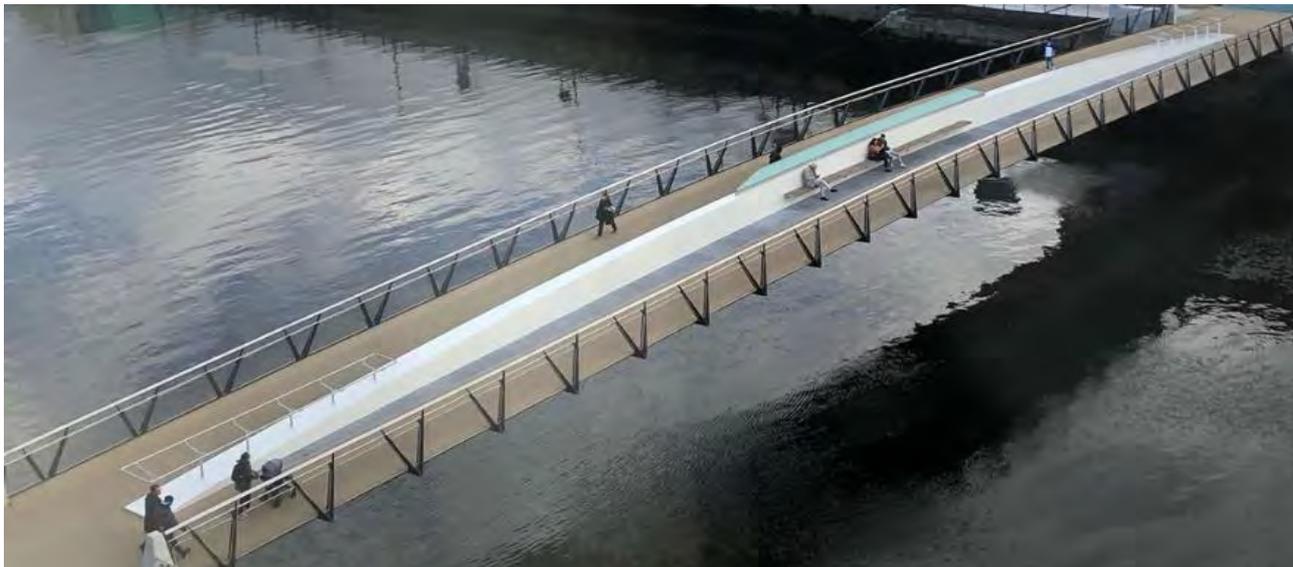


Fig. 2. Aerial view of the bridge.



Fig. 3. Bridge elevation during dusk with architectural lighting on.



Fig. 4. Elevation of the bridge from Brian Boru's bridge with St. Patrick's bridge in the background