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PASSERELLE DE LA PAIX, LYON

A STORY ABOUT THE EFFORT TO APPEAR EFFORTLESS.

Andreas KEIL

Director
schlaich bergemann partner
Stuttgart, Germany

a.keil@sbp.de

Sebastian LINDEN

Sr. Project Manager
schlaich bergemann partner
Stuttgart, Germany

s.linden@sbp.de

Michael ZIMMERMANN

Managing Director
schlaich bergemann partner
Paris, France

m.zimmermann@sbp.de

1. Design approach

Passerelle de la Paix blends in harmoniously with the bridge building tradition of arch bridges in Lyon. The footbridge provides a direct link between the conference centre *Cité Internationale* and the neighbouring quarter *St. Claire*, and forms a landmark that is first seen from the high-speed rail track entering Lyon. Together with *DFA Dietmar Feichtinger Architectes*, Paris, and the support of the client *GRAND LYON*, a technically challenging bridge design could be realized and adapted to local conditions.

The 220 m long footbridge spans in a very smooth way over the 160 m wide river *Rhône*. Two arch-like cantilevers are built of a three-dimensional asymmetric tube structure. The steel structure is covered with light wooden planks. The bridge is extremely slender and offers maximum transparency. Without any structural elements above the deck, the direct, straight connection towards *Cité Internationale* is visually not disturbed for any pedestrian or cyclist.



Fig. 1. *Passerelle de la Paix*, Photo by Michael Zimmermann

2. Structural concept

The footbridge can be divided into two areas: the main span across the *Rhône*, as well as the side span with four bays of slender columns in the park *Saint Clair*. The structure of the main span consists of a three-

dimensional steel arch, spanning over the 160m wide *Rhône* without intermediate supports and a very low rise of only approximately 8 m.

The bridge is longitudinally fixed at both ends, resulting in constraining forces from temperature loads, but stabilizing the arch significantly in the longitudinal direction. This stabilization and stiffening is important for the hybrid structural behaviour made of cantilever arms and arch effect. Bearings and expansion joints are thus omitted completely, which makes the bridge robust and reduces maintenance cost to a minimum.

The foundations of this long-span bridge possess a particularly important function. At the arch base points, the large thrust forces resulting from the low rise are introduced into the ground using composite slurry wall foundations with a depth of up to 20 m.

3. Construction and installation

The construction of the bridge was carried out within 22 months from July 2012 to March 2014, at the end of which the prefabricated 160 m long superstructure, equipped with a temporary suspension system, was floated in and jacked down into position using pontoons and trestle towers.



Fig. 2. Temporary suspension system and pontoons, Photo by Michael Zimmermann

4. Conclusion

The process of designing and realizing this bridge was never as easy and effortless as the final structure appears. In fact, huge efforts were necessary to finally bring the great idea of a pure, open passage across the *Rhône* to the site: during the design, during construction, and finally, during installation.



Fig. 3. Passerelle de la Paix, Photo by Michael Zimmermann

Passerelle de la Paix undoubtedly is a beautiful, elegant footbridge. It is a landmark in near-perfect surroundings, proof of engineering at its best, and a great example of dedicated interdisciplinary cooperation between engineer, architect, client, and contractor. It is a structure that everyone involved should be proud of, as it exquisitely fulfils its purpose. In the end, it was worth it – despite all the efforts and struggles and doubts. We would do it all again!