DOI: 10.24904/footbridge2017.09676

“LA BELLE LIÉGEOISE”, THE NEW FOOTBRIDGE IN LIÈGE

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Keywords: footbridge; slender; dissymmetry; welded; dynamic

The new footbridge in Liège, known as "La Belle Liégeoise", was opened on 2nd May 2016. Located upstream of the landscape window created by the new Guillemins esplanade, this bridge provides a connection for soft transport modes from the railway station across the Meuse to La Boverie park, maintaining clearance for navigation.

The site presents a dissymmetry: an urban bank faces a wooded bank. Reflecting this, the structure of the main section on the left bank develops a suspended typology, while the second section on the right bank is supported by struts.

The main span over the Meuse is 163 metres for a total length of 294 metres. The 5.5 metre wide decking is positioned laterally to the supporting structure.

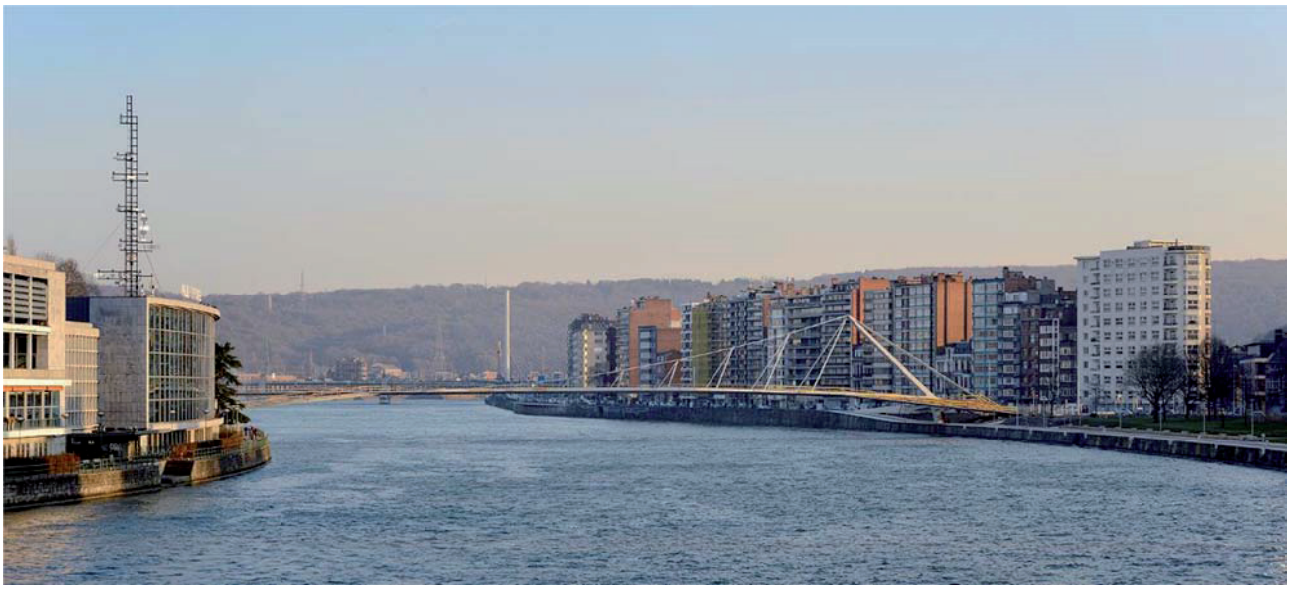

Fig. 1. General view of the span above the Meuse

The footbridge is accessible to “soft” transport modes via the provision of ramps made of variable height steel boxes, supporting the 3.5 metre wide deck of azobé wood.

On the left bank, a wide, open staircase takes pedestrians onto the bridge and across the river. PRM and cyclists can use a ramp with a maximum gradient of 4% on the upstream side. This arrangement was chosen so as not to obstruct part of the landscape window onto the park. This ramp then splits into two to join the roadway – one in the direction of the Fragnée Bridge and the other to the foot of the staircase.

Fig. 2. View of the ramps and stairs on the left bank

On the right bank, the bridge crosses La Boverie park through the canopy, offering a new vision of this urban park. As on the left bank, a direct link to the RAVel slow-way is provided for cyclists. The maximum gradient of this ramp is 10%. Cyclists can also use the gentler gradient of the extension into the park.

Fig. 3. Right bank landing

Construction needed 740 ton steel. Structural elements 15 metres long were trucked onto a temporary assembly site. These elements were assembled on the ground in six sections. These six sections were finally transported by barge, lifted and positioned by three floating cranes. The most impressive section, consisting of the suspended part, was transported horizontally before being re-erected on site.

Finite element analysis was used to determine the reduction elements and check for strength and stability. Funicular geometry tends to maximize the axial forces of elements. For some critical elements (hangers, suspension, pylon, etc.) non-linear calculations were performed. The same applied for determining the reverse deflection, which reaches 160 cm in the main span.

Adopting a minimalist design for the nodes, the hanger connections are welded, meaning the screed or assembly members do not have to be visible.

This particularly slender type of structure is sensitive with respect to its vibratory dynamic behaviour. Tuned mass dampers were designed to allow the project to meet the required conditions of comfort.

Bureau Greisch, in association with the landscape architect Corajoud, was responsible for the complete design mission for the bridge, from the sketch phase through to construction supervision.