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LA PASSERELLE DU MARCHÉ – MAISONS-LAFFITTE

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Summary: The market footbridge is one of the four crossings of the railway network that passes through the town of Maisons-Laffitte in the north-west of Paris, France. It is a crucial inter-city link because it is the only crossing dedicated to pedestrians and cycles.

The footbridge is completely made of steel and consists of two staircases and a main span, which create a fluid and elegant outline by means of a “Z” in-plane shape. The lifts, prismatic objects with dark tinted glass panels, are designed as counterpoints in the composition, contrasting with the main structure.

The staircases and the deck form a continuous assembly realized in smooth “U” shape steel box shells. These very slender shells are supported on both sides of the railway tracks by pinned hollow round columns over a free span of 42m.

Special attention has been paid to the pedestrian comfort. Taking into account dynamic effects from the very first stages of design, and throughout the production process, ensured a good anticipation of the dynamic comfort issue. The architectural intention, which was to promote a slender construction with a reduced structural height, has logically led to a solution with tuned mass dampers (TMD). Calculations of the structure and damper devices with precise 3D finite element models, as well as an accurate design of the different details have made their subtle integration possible without any impact on the overall architecture.

Keywords: railways; steel; shells; hollow section; slenderness; fluidity; dynamic comfort; market place link

1. Introduction: importance of the footbridge

The market footbridge is one of the four crossings of the railway network that passes through the town of Maisons-Laffitte in the north-west of Paris, France. Its design comes from a collaborative work between Explorations Architecture and AIA Ingénierie. It is a fundamental inter-city link because it is located halfway between the 2 nearest bridges and it is the only crossing dedicated to pedestrians and cycles that crosses the railway space. It is also directly linked to a major public equipment, the covered market.

2. Site analysis and urban proposal

At the first stages of design, the team has focused on an overall analysis of the public space that should integrate the project and that surrounds it. A spatial analysis of the small place between the covered market and the railways was conducted. Explorations Architecture has focused on the functioning of the market place. Uses and functioning of the market (night and day) articulating with the place were observed on site by the architects at the early stage of the competition.

The proposed overall design, resulting especially from these observations, allowed to maintain the use of the place and the market as it was before, on almost all the existing street bordering the place. The existing floor covering of the place (deactivated concrete) was extended on the roadway to the new technical building to maintain a surface continuity between the place and the street.

3. The new footbridge

The footbridge is implanted in accordance with the feasibility study established in the consultation program. It is designed around 3 strong ideas:

- **To propose a simple bridge in its design, soft in its shapes and contemporary in its image.** The footbridge is completely made of steel shells and consists of two staircases in the direct continuity with the main span, which create a fluid and elegant outline by means of a “Z” in-plane shape. The lifts, prismatic objects with dark tinted glass panels, are designed as counterpoints in the composition, contrasting with the bright main structure;

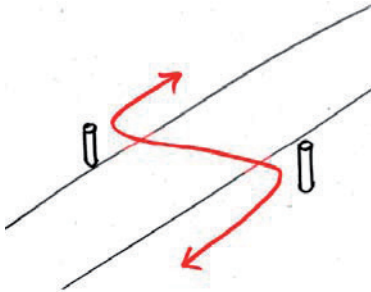


Fig. 1. Footbridge concept: a « Z » and two counterpoints

- **To provide a very high degree of comfort and safety.** Its 2.5m width deck allows the easy crossing of the different modes (bicycles, pedestrians) in particular at the level of changes of direction. The simplicity facilitates the identification and appropriation by each type of user. A passive safety by a panoptic vision at any point of the crossing and a feeling of security with respect to SNCF tracks (catenary protections) are ensured. The structure is designed with a maximum level of comfort regarding dynamic effects by means of a TMD.
- **To develop a rational structure with respect to the site complexity.** The design team proposed to integrate as much as possible the main bearing structure (lateral hollow reconstituted sections), the deck, the stairs and the guardrails in one same component. This is part of a search for visual simplicity with a technical complexity integrated inside the structure.



Fig. 2. View of the footbridge from the market - Photo by Colas

4. Conclusion

The new market bridge crossing the railways that passes through Maisons-Laffitte is the only crossing designed exclusively for soft modes. Its construction allowed to rethink the overall development of the market place thereby to create a more attractive living space and improve the functioning of the market. Thanks to this simple but modern, elegant and notable work, a more fluid and efficient link was created to facilitate the urban travel of a wider range of the inhabitants of Maisons-Laffitte.