

BICYCLE AND PEDESTRIAN BRIDGE SITTARD-GELEEN

Rob TORSING

Architect
ZJA Architects
Amsterdam, Netherlands

rjt@zja.nl

Ralph KIEFT

Architect
ZJA Architects
Amsterdam, Netherlands

rvk@zja.nl

Jack BAKKER

Expert parametric design
ZJA Architects
Amsterdam, Netherlands

jtb@zja.nl

Summary

The steel bicycle and pedestrian bridge crossing the railway line Sittard-Maastricht intends to simplify and increase contacts between the city, business park Fortuna and sports area Limburg. The bridge is firmly embedded in the green roadside scenery along both railroad tracks, and has an elegant shape and subtle details. The chosen form of the hourglass invites people to come closer and cross the bridge. Comfort and accessibility of the crossing were the main principles of the design.

The bridge offers a natural and smooth connection to the bike paths from four directions. By basing the design on a reduction of the overhead wire height, the maximum difference in height on accessible surfaces could be reduced to just over three meters. Therefore, and because the bridge widens from 4,5 meters in its mid to over 12 meters at the bases, the slopes are gradual and comfortable.

The skin of the bridge is part of the load-bearing structure, and the curved shape of the middle part enhances the fluent character of the bridge. The parapet is a seamless extension of the bridge surface. All safety and guidance features as well as the linear LED lamps that light up the bridge deck are integrated into it. The skin of the parapet is perforated as much as possible to achieve transparency. The steel outer skin of the bridge has a blue-grey-green colour and blends into the vegetation of the bridge ramps. The white-grey inner skin provides a spatial and fresh appearance and is reflective to light. Thus, the inner skin forms a contrast with the outer skin of the bridge.



Fig. 1&2. Impression of the preliminary design by ZJA Architects

The inviting hourglass form and the curved skin, that also extends in height, constitute the basis of a unique and, at the same time, challenging design. The hourglass shaped, three-dimensional reference surface is double curved everywhere. In order to achieve an affordable and feasible design, a centuries old technique from traditional shipbuilding industry known, as the 'carvel planking' (in Dutch 'gangenbouw'), was used. With this technique, the original volume is approximated by a set of developable surfaces. The individual elements are single curved strips, the number of which can be varied depending upon the desired 'resolution'. The more strips used, the smoother the appearance of the overall surface becomes. With the aid of tailor-made software, ZJA was able to develop the proper geometry in a relatively simple manner and thereby generate the necessary templates for a practical and affordable production method.

Keywords: Parametric design, computational design, coding in design, double curved surfaces, file to factory, bicycle bridge



Fig. 3. Bicycle and pedestrian bridge Sittard-Geleen