



Design and Construction of Pont Schuman, Lyon

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Abstract

Pont Schuman is an elegant new crossing of the River Saône in Lyon, France. The scheme, with an overall cost of around €20Million, was developed as part of an international design competition. The bridge carries a two lane dual carriageway and features a shallow concrete deck suspended from slender un-braced arches. Triangular in cross section, the arches are particularly striking in that they are twisted continuously along their length. This requires two of the main plates that form the arches to be warped, leading to significant challenges in design and fabrication.

A unique erection method was used in which the arches were temporarily hinged at their springing points to enable the spans to be transported via a barge from a preassembly area along the Saône under a number of existing crossings.

Keywords: arch bridge; warped steel plates; buckling; river transportation; fabrication;

1 Introduction

Lyon is located in east-central France, approximately 450km from Paris. The city has a population of 500,000 and is a thriving cultural and economic centre that has been designated an UNESCO World Heritage Site. The local municipality of Lyon has looked to build upon the city's historic roots, by commissioning several landmark public architectural and infrastructure developments in recent years.

In 2010 the municipality of Lyon, Grand Lyon, held an international design competition for a new mixed use vehicle and pedestrian/cycle bridge. Required to ease congestion on the city's existing crossings, the bridge also formed part of an urban re-development of the riversides. Grand Lyon wanted to improve the public space along the river and extend the promenade that runs through the city centre. Consequently, the client's brief asked for a bridge of exceptional quality, which

would complement the city's existing crossings and give equal importance to road and pedestrian users. Furthermore, the Grand Lyon wanted the bridge to form a destination in itself, drawing pedestrians from the riverside out into the centre of the river.

The winning design, by a team led by Flint & Neill together with French firms, Explorations Architecture, AGIBAT Ingénierie and lighting designers Les Eclairagistes Associés, consisted of a tied arch bridge, in which the arches form a distinctive gull shape.

This paper describes the design of the bridge superstructure with particular emphasis on the arches and the methods used to verify the buckling behaviour of the twisted arches. It also describes the novel erection method which enabled the steelwork to be assembled off-site and then floated up the river beneath several existing bridges.