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**Autor:** Pfohl, F.
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# 15. The new Floridsdorf Bridge across the Danube in Vienna

*Owner: Vienna Municipal Council – Bridge Department*

*Architect: W. Windbrechtinger*

*Engineer: A. Pauser*

*General contractor:*

Stahlbauarge Wiener Donaubrücken:
*Waagner-Biro AG, VOEST-Alpine AG, and Wiener Brückenbau und Eisenkonstruktions AG*

*Subcontractor for civil engineering:*

Arge Tiefbau Floridsdorfer Brücke:
*Allgemeine Baugesellschaft A. Porr AG, Universale Hoch- und Tiefbau AG, Wiener Betriebs- und Baugesellschaft mbH, and Neue Reformbau GmbH*

*Construction period: 1977-1978*

*Commissioned: October 3, 1978.*

## Introduction

In view of inadequate traffic capacities, the damage to superstructure and deck, and the need for large scale renovations made necessary by anti-flood measures, experts had been studying for quite some time the possible improvement of the old Floridsdorf bridge. Two alternatives emerged as a result: either comprehensive reconstruction, including overall repair, of the old bridge, or construction of a new one.
A thorough examination by way of probe boring and inspection by divers decided the issue in favour of the construction of a new bridge.

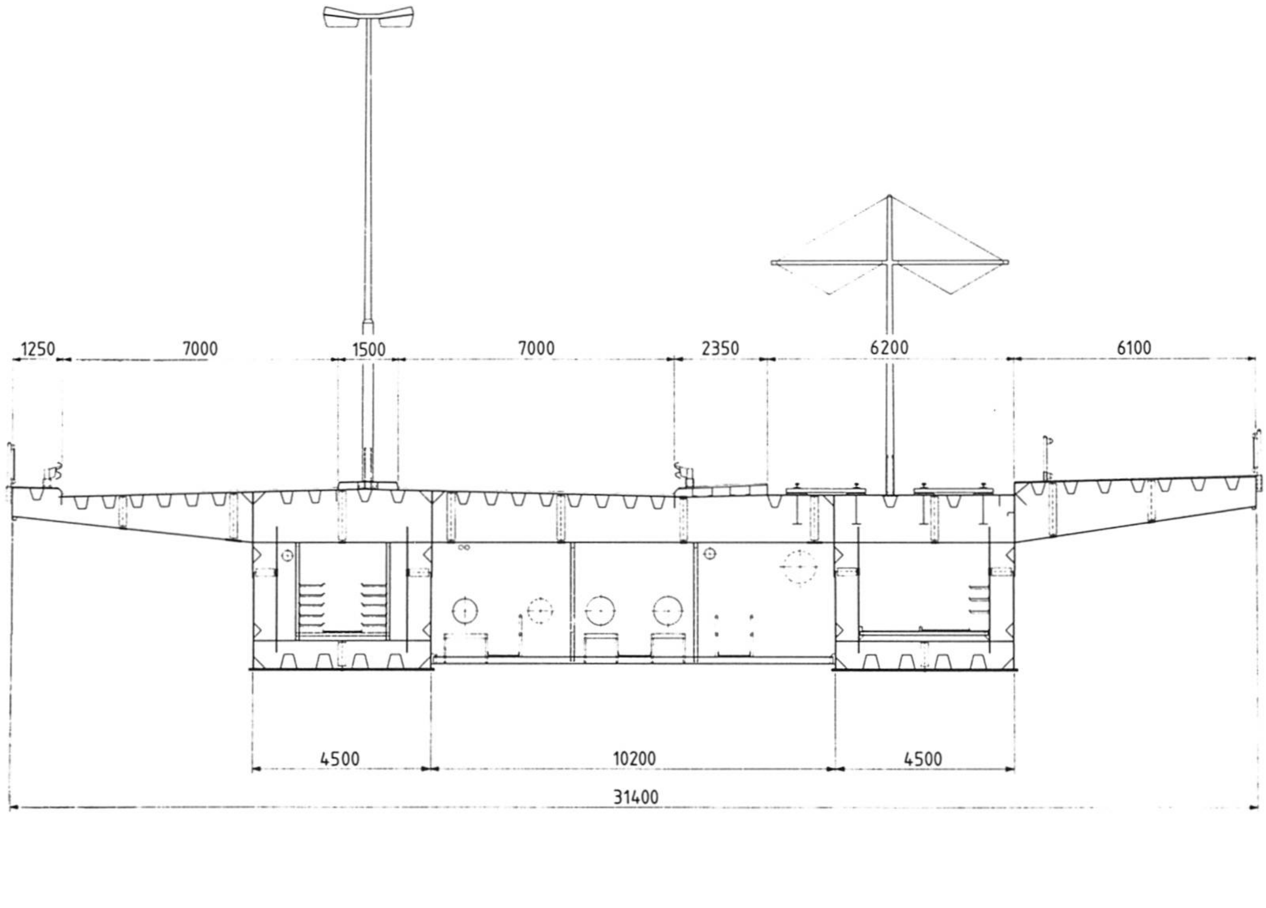
Basing its work on a general project submitted by Pauser's civil engineering office. Stahlbauarge Wiener Donaubrücken proposed steel superstructures across the Danube and the flood channel, as well as prestressed concrete superstructures over the river bank areas. Pressed by the critical traffic situation after the collapse of Reichsbrücke, the town authorities promptly decided to accept this offer which promised the briefest period of construction.

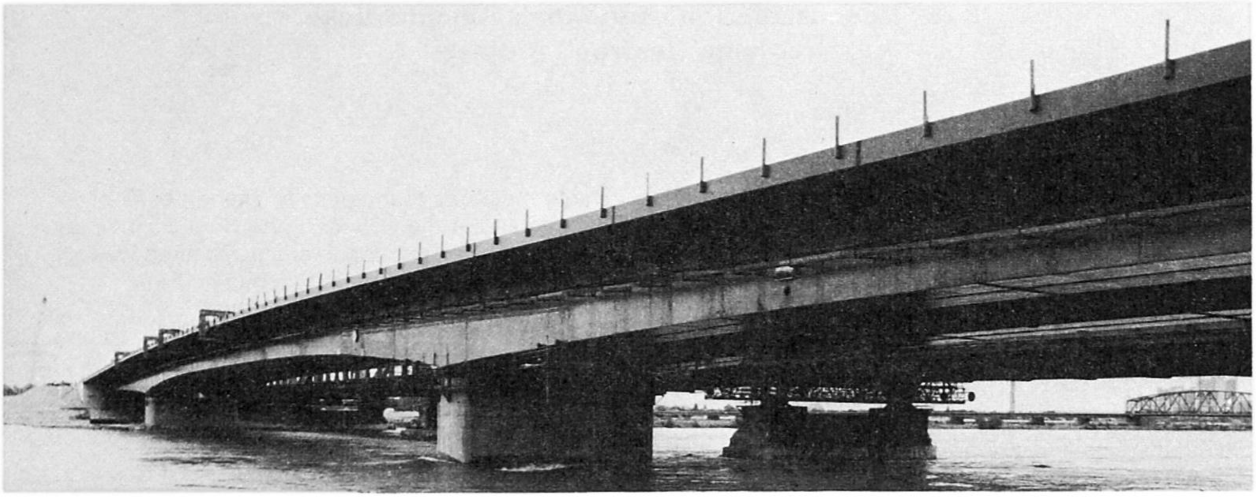
Work on the bridge began on April 13, 1977. Stahlbauarge promised that traffic across the river could be resumed within eighteen months. After a building period of exactly 544 days the job was completed and the bridge reopened to traffic.

The most notable feature of this construction is to be seen in the fact that nowhere in the world has a bridge with such complex requirements for public and private traffic and such a considerable amount of installations for inter-city pipe and emergency lines been built in so short a time.

## Bridge piers

The typical Viennese soil conditions, i.e. a very fine, moderately clayey silt going by the name of "Wiener Tegel", decided the design of the bridge piers just as much as the high flow velocity and the strong transport of sediment of the Danube which–even in Vienna after flowing some 900 km–still presents the characteristics of an alpine river.





A grillage comprising 40 drilled piles, each 17 m long with a diameter of 1.2 m, was made for the river piers. At river bed level the piles were joined by means of a reinforced concrete slab. An apron made of sheet pile wall planks was sunk down to a depth of 8.5 m to counteract floodwater pit formation and erosion. The reinforced concrete river pier was built upon this base structure and protected against erosion from sediment transport by a specially wear-resistant facing layer.

### Bridge superstructures

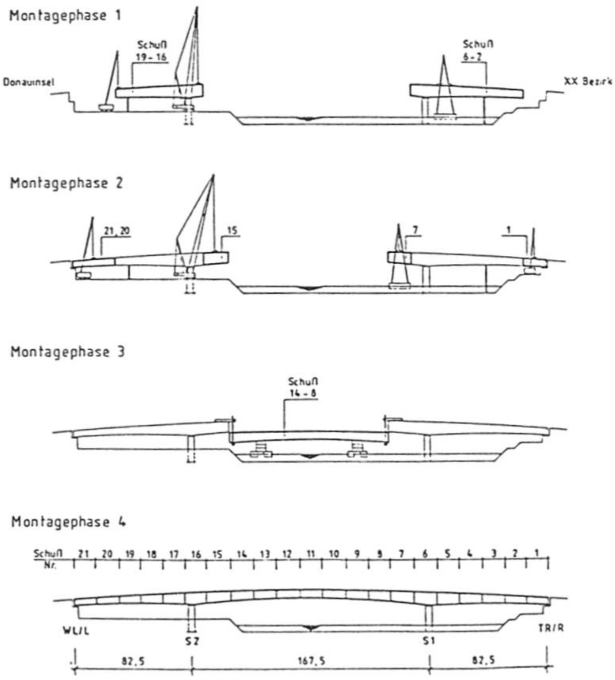
Steel bridges comprise the river span (length 332.5 m) and the tide bridge (length 215 m) across the relief channel. The bridges are separated by the embankment of the Danube isle (length approx. 200 m). The bridge has four traffic lanes (2×2), two streetcar rails, and a combined walkway and cycle track with a width of 5.25 m. The superstructure is characterized by two box girders (width each 4.5 m) joined by an orthotropic deck slab. The box girders of the river span are inclined haunch structures, the maximum structural height above the piers being 6.4 m and 4.4 m at the bridge centre. The flood bridge is a parallel flange construction, with a structural height of 3.4 m. The bearing systems of both bridges consist of three-span beams. The spans of the river bridge total 82.5+167.5+82.5=332.5 m. Those of the flood bridge 65.5+84+65.5=215 m. Both bridges have varying widths, i.e. 31.4 m above the river and 37.4 m above the flood channel.

The structural weight of both bridges totals 7070 t. The cross-sectional drawing of the bridge shows numerous installations for the city's pipe and energy lines which extend along the bridge.

The superstructure is considered as a continuum in the structural analysis and calculated as a plane grid structure with torsion-stiff box main girders.

### Steel bridge construction on site

Workshop fabrication was distributed among three plants of the joint venture companies. This ensured the required capacity for delivery and thus a continuous and very closely-timed erection process. Thanks to the modern methods offered by electronically controlled fabrication machinery, the high precision demanded in up-to-date steel bridge engineering presented no problems.




Work on the site started in 1978. After the preliminary assembly of box girder halves on the site, the bridge elements located above water level were floated in by means of a 200 t floating crane and precisely set down on the predetermined bearing points. After completed assembly, the central element of the box girders (length 116 m, weight 570 t) was transported on four barges which–aided by tugboat and floating crane–were then manoeuvered exactly to the required location, whereupon the element was lifted into position. By the end of May the separated river banks were linked, i.e. 4½ months after the start of work on site. The elements of the orthotropic deck slabs were set in place by means of a gantry crane. The deck flooring and bridge equipment was subsequently applied or mounted.

Normal traffic flow across the bridge was resumed by October 3, 1978.

*(F. Pfohl)*