



## **Building over, under and through: Bypasses for the Voest Bridge in Linz**

**Linz may be known as the Steel City, but concrete will also play a vital supporting role in the refurbishment and expansion of this strategically important traffic route. The construction firms involved in the work are on the right track: in Doka, they have chosen a formwork supplier with the necessary construction expertise and the ability to deliver.**

The Voest Bridge has been in use as part of the A7 Mühlkreis Autobahn for more than 40 years, with around 100,000 motorists using it to cross over the Danube each day. However, the time has come to renovate this heavily used road. To keep traffic flowing during the refurbishment and to increase capacity, bypass bridges are being added to the cable-stayed bridge over the Danube. Once the additional bridges have been constructed, highway traffic will cross over on the existing bridge, and traffic to and from the city centre will be directed over the two new bridges.

### **Solid foundations on land and in water**

Building four oval piers in the middle of the surging Danube poses a technical and logistical challenge. Sheet pile boxes are used to create dry space for the concreting of the base on which the piers will be built in two sections. These massive columns are around 15 m tall, 4.5 m wide and up to 19.7 m long. The formwork comprises wooden boxes made of Top 50 elements, assembled by the Doka pre-assembly service. Exceptionally strong special connection lugs are installed to transfer longitudinal anchor loads, which eliminates the need for tie rods on the longitudinal side and through the curves. The piers are concreted using two different types of concrete to provide an outer area that is particularly resistant to the wear caused by the strong flow of the Danube. Of course, constructing the oval foreshore piers on land is a little easier. Special lugs are also used for the formwork here. The river piers and the oval foreshore piers all have a fine, regularly structured surface as the pier formwork features matrices and trapezoidal bars.

Round piers support the numerous entry and exit ramps. Around 20 of these piers, which measure 1.20 m in diameter, are made from RS steel column formwork in a special design. Pre-assembled wooden box formwork made of Top 50 large-area formwork is used for seven piers with a thickness of 2.0 m.



### **Structures for advanced lane management**

On the Linz waterfront, in construction section **LZ33**, the existing superstructure on both carriageways is being widened by up to 9.5 m over a distance of 350 m. The shoring is provided by a fast and efficient combination of Dokamatic tables with the Staxo 100 load-bearing tower. Where the deck meets the widened support structure, the consortium is building a 165-metre-long retaining wall including a cantilever slab. The Top 50 formwork elements are largely anchored in place without ground support.

Traffic into the city will be separated from through traffic at the Urfahr junction, so various entry slip roads and exits have to be created. A large number of Staxo 100 load-bearing towers are to be used for the superstructure in construction section **LZ35D**. WS10 multi-purpose waling will be mounted to this structure and fitted with H20 top formwork beams and the 3-SO formwork sheet. The concrete for the ramp structure, measuring around 100 m long, is then poured in one step. The subsequent curved passage **LZ35C**, measuring around 250 m in length, will be made up of eight sections, with the base slab constructed in advance. The bottom formwork for the box girder cross-sections here sits on a Xervon falsework. Alu Framax Xlife framed formwork is used as the internal formwork for the sidewalls. Top 50 large-area formwork on Staxo 100 load-bearing tower is used for the outside of the sidewalls and the cantilevers. Doka demonstrates an impressive level of technical sophistication: the site team works using special shifting trolleys on castors to enable fast and efficient manipulation of the Staxo units. The sidewalls and deck slab of the superstructure for sections **LZ35A** and **LZ36A** are also concreted in one pour along their length of approximately 100 m. The steel superstructures over the Danube will link directly to these sections once they are completed. In the coming months, construction sections **LZ35B**, **LZ36B** and **LZ36C** will be constructed as slab superstructures.

A successful combination of steel and concrete, the bypass bridges are expected to be completed by mid-2020. Doka is impressing everyone on the Voest Bridge construction site with its ability to supply large quantities of materials for the superstructure formwork and with the technically sophisticated details of its work.

### **See for yourself:**

Anyone interested in learning more can follow the progress of the construction of the A7 bridges on Facebook, where photographer Mike Wolf is documenting the work in detail. The ASFINAG webcam also displays new images of the bridge construction every day.



**In summary:**

Project: A7 Mühlkreis Autobahn  
Voest Bridge safety upgrade – Construction of bypasses

Location: Linz, Austria

Structure type: Bridge

Client: ASFINAG  
Autobahnen- und Schnellstraßen-Finanzierungs-Aktiengesellschaft

Construction firm: ARGE A7 Voestbrücke HBM (Swietelsky – Granit)

Architect: BERNARD Ingenieure ZT GmbH, RWT plus ZT GmbH,  
SOLID architecture ZT GmbH

Formwork planning: Engineering, Doka Österreich GmbH

In use: Products: Staxo 100 load-bearing tower, Top 50 large-area formwork, RS  
column formwork, Alu Framax Xlife framed formwork, Dokaflex, stair  
tower, XP edge protection system  
Services: Formwork pre-assembly, Concremote concrete monitoring

Bypass construction  
start date: January 2018  
Construction end: Bypasses: Autumn 2020  
Road reconstruction: Autumn 2023

**Photos:**

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Complex traffic routing at the Urfaahr junction.

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The superstructure formwork of construction stage LZ35D is supported by the high-performance Staxo 100 load-bearing tower.

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Superstructure formwork with “mobility guarantee” for rapid construction progress.

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Pier formwork with an extra touch for the challenging construction site.

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Doka stands out, thanks to its ability to deliver and technical expertise.

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Due to the sloped position, the formwork for the cantilever slab has to be anchored in place.

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The bypasses are planned for completion in mid-2020; the refurbishment of the road is expected to be completed in autumn 2023.

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#### **About Doka**

Doka is one of the world's leading companies in the development, manufacture and distribution of formwork technology in all areas of construction. With more than 160 sales and logistics locations in more than 70 countries, Doka has an efficient sales network at its disposal, guaranteeing the rapid and professional provision of materials and technical support. Doka is part of the Umdasch Group and employs 7,000 staff worldwide.

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