



LINK EASTERN RAILWAY - RAILWAY AIRPORT LINE S7



Rotation of object S 5.1



Upset-forged hanger connection

The new, roughly 2.1 km long connecting loop between the Eastern Railway and the suburban railway airport line S7 forms part of the Transeuropean Network (TEN) and directly connects the Vienna International Airport located at Schwechat to the Vienna Central Station, thus linking up the inter urban rail services of the Western and Southern Railway.

In the course of the project, an approx. 585 m long chain bridge was constructed that spans over the Eastern Railway, the central shunting station, the Northern Loop and the S7 with its central component – two network arch bridges. Both superstructures were designed as a network arch bridge with a composite decking slab consisting of in-situ concrete and an overlying ballast bed. The truss-like hangers are positioned in such a manner that they cross each other at least twice when viewed from any direction.

The hangers used are round-steel hangers $d=100$ mm with upset-forged trapezoidal ends. To increase the lateral stability and for aesthetic reasons, the two arches run inclined at an angle of $\alpha = 12.5^\circ$ to the vertical.

The design of the box-shaped arch cross section is rhomboidal with horizontal upper and lower chords as well as inclined web plates.

The stiffening truss girders also consist of box-shaped, welded steel cross sections. The cross girders that support the reinforced concrete decking slab are fish-bellied.

The basic idea behind the construction concept developed by MCE GmbH was to reduce the movement and lifting processes to a minimum. The preassembly of the superstructures and the concreting of the composite decking slab were done at an elevated position parallel to the existing trackage. The completed composite structure was subsequently rotated and lowered. The rotation of the two network arch bridges was done by means of a skidway with an arch-shaped layout and sliding mechanisms. The definite pivot point on the dividing pier was used as the fulcrum for the turning of the superstructures. It also served as an anchor point during construction. The weight to be shifted for object S 5.3 was approx. 2,100 t and for object S 5.1 approx. 2,700 t.

With the construction of the connecting loop between the Eastern Railway and the suburban railway airport line, MCE GmbH built the first network arch bridges in the rail network of the Austrian Federal Railways for the ÖBB Infrastruktur AG.

Facts & Figures:

Steel weight:	1,900 t	Construction:	Network arch bridges
Length S 5.1 / S 5.3:	112.50 m / 88.50 m	Customer:	ÖBB Infrastruktur AG
Width:	15.20 m	Construction period:	2012- 2014
Steel quality:	S355M, S460N		