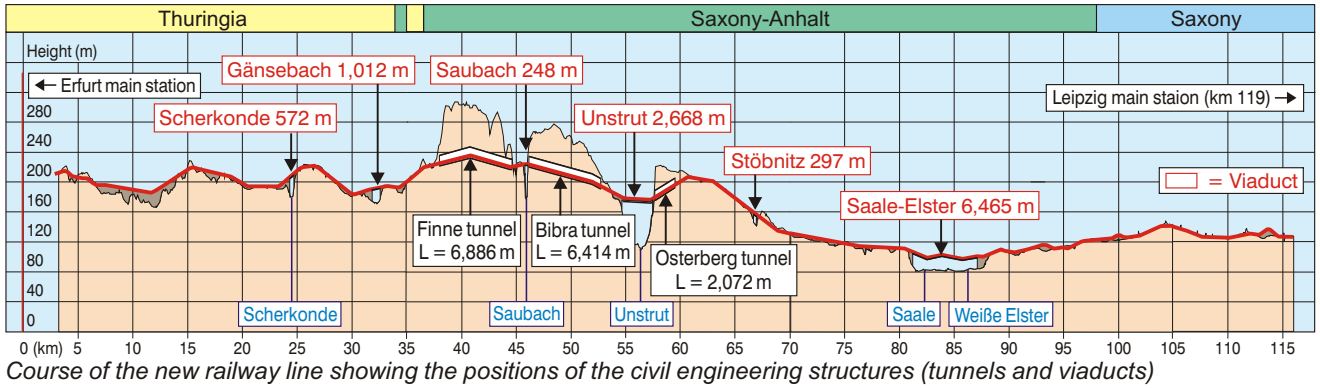


Viaducts New Erfurt - Leipzig/Halle railway line



Photomontage of Scherkonde viaduct



Photomontage of Gänsebach viaduct

The course of the new Erfurt - Leipzig/Halle railway line includes six viaducts with a total length of 13.4 km. The viaducts were planned as single-cell prestressed concrete box girders in accordance with DB design specifications for new lines.

The 572 m long **Scherkonde viaduct** crosses the Scherkonde valley and the Großbrennbach reservoir at a maximum height of 35 m.

The superstructure consists of two continuous box girders with piers at 44 m intervals and rail expansion joint devices at the pier in the middle of the bridge. The

foundations are drilled piles in closed sheet pile boxes, which are set in Lettenkohle below the highest water level of the reservoir.

The **Gänsebach viaduct** is 1,012 m long and crosses a shallow valley north of the town of Buttstädt at a maximum height of 25 m.

The superstructure here consists of three continuous box girders with piers at 44 m intervals. Rail expansion devices are positioned on the piers with the bridge joints. As in the case of the Scherkonde viaduct, the foundations consist of large drilled piles set in Lettenkohle.

Owner

Deutsche Bahn AG

Client

DB ProjektBau GmbH,
originally Planungs-
gesellschaft Bahnbau
Deutsche Einheit (PBDE)

Overall planner

Krebs und Kiefer

Processing time

1991 - 2010 continuous

Construction costs (viaducts only)

Ca. 340 million EUR

Project data

- 6 viaducts
- Total length: 13.4 km
- Longest viaduct: 6.5 km
- Height: up to 50.0 m
- Single-track and two-track superstructure in accordance with DB AG design specification
- Special features:
 - Cantilever erection
 - A-shaped trestles
 - Bowstring bridge
 - Rolled girders set in concrete

Viaducts

New Erfurt - Leipzig/Halle railway line



Photomontage of Unstrut viaduct



Photomontage of Stöbnitz viaduct

The **Saubach viaduct**, which is 248 m long and has a maximum height of 40 m, crosses the steep Saubach valley between the Finne and Bibra tunnels.

Because of the two single-track tunnel tubes directly adjacent to each side of the bridge, the bridge itself is made up of two parallel single-track super structures with a distance of 20 m between the centers of the tracks.

Both bridge structures consist of continuous box girders over six spans. On the slopes, the foundations are shallow, while in the valley area, they consist of drilled piles in mottled sandstone.

The 2,668 m long **Unstrut viaduct** crosses the wide Unstrut valley north of Karsdorf at a maximum height of 50 m.

The superstructure is made up of 3- and 5-span continuous box girders with piers at intervals of 58 m. Four A-shaped trestles transfer the horizontal loads, and rail expansion devices are installed between the superstructure systems.

The pile foundations were designed on the basis of loading tests. In some areas, the piles pass through the leaching edge of the gypsum in the Salinarrot layer and are set in the mottled sandstone beneath. In the area subject to leaching, slee-



Photomontage of Saubach viaduct

ved piles are necessary to avoid negative skin friction.

The **Stöbnitz viaduct** is 297 m long and crosses the shallow Stöbnitz valley north-east of Oechlitz. It is necessary for ecological reasons.

Because of its low height of only 15 m, the “rolled girder set in concrete” method was used, in accordance with DB design principles. In the three subsystems with column intervals of up to 24 m and structural / load-bearing lengths of up to 102.5 m, two pairs of double columns serve as fixed points, each pair being connected by a beam.

The foundations of this viaduct also consist of large bored piles set in the decomposed claystone of the Late Mottled Sandstone era.

Krebs und Kiefer services

- Basic planning
 - Structural design
 - Design surveying
 - Cost and schedule planning
 - Construction supervision
- In the phases:
- Preliminary design planning
 - Land use procedure planning
 - Outline design planning
 - Design planning
 - Authorization planning
 - Tender procedure
 - Construction

Viaducts New Erfurt - Leipzig/Halle railway line

The **Saale-Elster viaduct** crosses the Saale-Elster river meadows south of Halle in a west-east direction over a length of 6,465 m. The bridge is forked, with a branch towards the north (towards Halle) that is 2,112 m long. The highest point (measured up to the upper side of the rails) is 21 m on the bridge towards Leipzig and 18 m on the branch towards Halle.

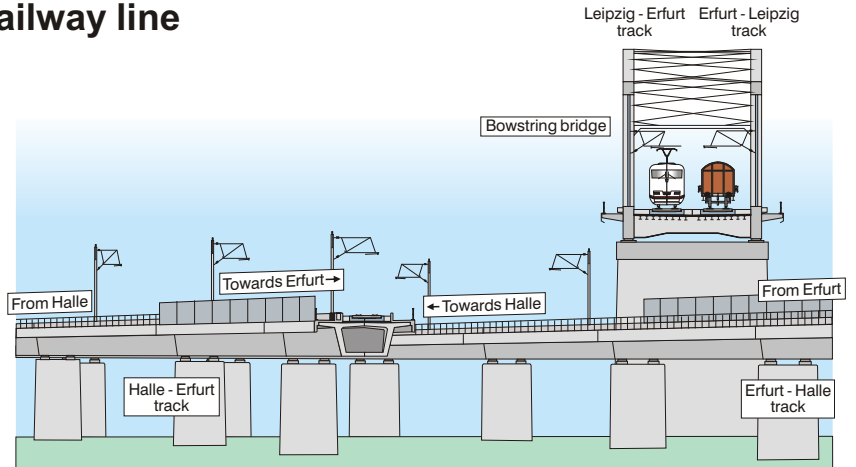
The superstructure consists mostly of single-span box girders with piers at intervals of 44 m and continuously welded rails. Only where there are point switches, widened sections of track or greater distances to be spanned (crossing the river Saale and the B 91 road) continuous box girders with spans of up to 70 m are required. The crossing structure, which allows the viaduct to pass over the Erfurt-Halle branch line, is a steel bowstring bridge with a span of 110 m. Rail expansion joint devices are required at the transitions between the continuous box girders.

The Saale-Elster river meadows are periodically flooded and represent an extensive landscape of supraregional importance and great biodiversity. Crossing the meadows by means of a viaduct minimizes disruption to the complex ecological fabric of the biotope system.

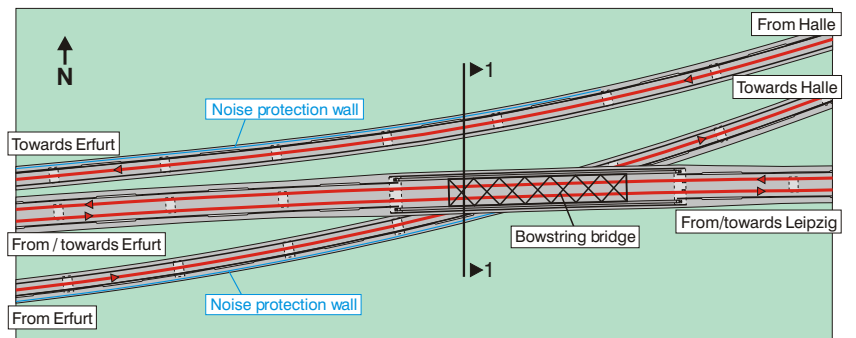
Some parts of the viaduct cross the drinking water protection zones associated with the Beesen waterworks. By relocating the infiltration basins and redefining the protection zones, it was possible to ensure that the viaduct lies outside the most sensitive water protection zones (I and II).

To protect the ground water, the shallow foundations are encased in watertight sheet wall boxes that extend into the less permeable layers in the weathered zone of the mottled sandstone and/or the tertiary sediments.

A load-transferring connection between the foundations and the sheet piling activates a significant load transfer via the sheet wall box; this reduces settling and increases the torsion resistance of the foundations.



Saale-Elster viaduct in the crossing area (cross-section 1 - 1)



Saale-Elster viaduct in the crossing area (location plan)

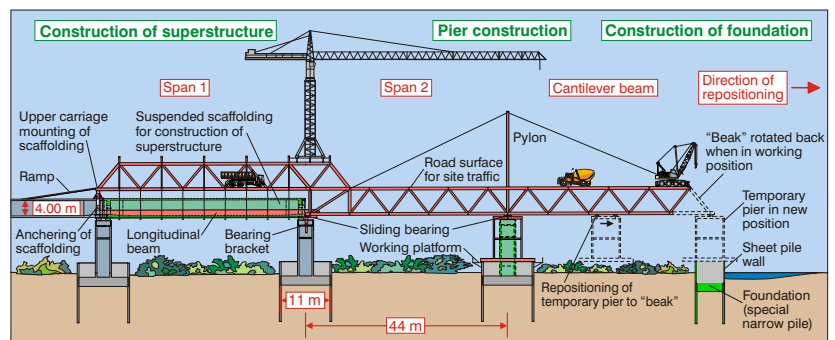


Diagram showing the "Vor-Kopf" construction method

A special method developed by Krebs und Kiefer was used in the construction of the bridges in some ecologically very valuable areas. In this "Vor-Kopf" method, the foundations, piers and superstructure are built by working from those parts of the bridge already erected, in order to avoid damage to the surrounding terrain. In other sensitive areas, the temporary access roads to the construction site were elevated above ground level to minimize environmental impacts.



Photos of models