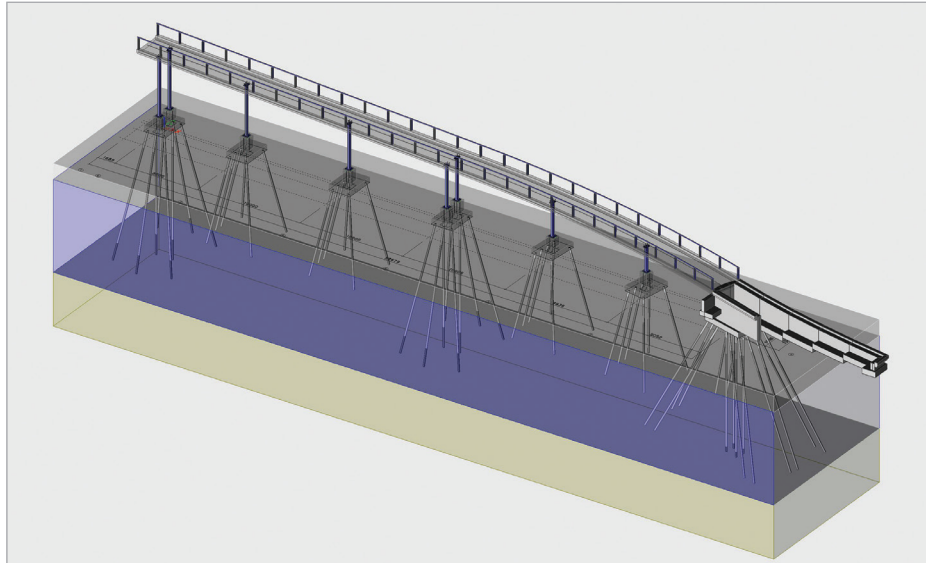


Barrier Free Pedestrian Connection - Mannheim, Germany



Client

Mannheim is a city in south-western Germany. With approximately 315,000 inhabitants, Mannheim is the second-largest city in the Bundesland of Baden-Württemberg, following the capital city of Stuttgart. The name of the city was first recorded as Mannenheim in connection with a legal transaction in the year 766, surviving in a twelfth-century copy in the Codex Laureshamensis from Lorsch Abbey. The name is interpreted as "the home of Manno", where Manno is a short form of a Germanic name such as Hartmann or Hermann. Mannheim remained a mere village throughout the Middle Ages. Mannheim lies on the junction of the river Neckar by the river Rhine and it contains a lot of traffic- and pedestrian bridges.

The Order

After the reconstruction of the Friedrich-Ebert Bridge across the river Neckar in 2007, the Mannheim City Government decided to improve the traffic situation and build a barrier free connection from Neckar Bank Way to the bridge allowing handicapped people in wheelchairs or cyclists to get on to the bridge directly without any help. The architectural design of the new part should conform with the old structure.

Technical data

The connection is about 70 m long and 2.5 m wide and it lies about 6.0% in grade. In the ground view the structure line is half bended to get far away from the Neckar Bank Way. It consists of the solid beam (120 m³ of concrete, 21 t of reinforcement) based on the slim steel columns (24 t of steel) with supporting walls at the entry with deep injection piles foundation (altogether about 600 m long). The bad soil conditions were responsible for the deep piles foundation by the existing bridge structure too.

Software and Model

Scia Engineer was used for design and optimisation. The planned new structure was built up as a 3D model, including the supporting walls and foundation with deep injection piles. The appropriate loads and combination

were implemented in line with the current DIN rules. Due to the width of 2.5 m, additional evacuation vehicle loads had to be considered.

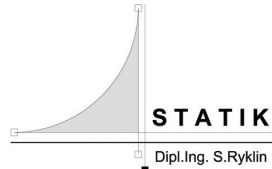
Calculation

Calculation of the structure was processed according to Theory IId Order. Dynamic calculation due to Earthquake Zone I was considered too. The required optimised length of the injection piles was settled due to the piles' reactions regarding the given appropriate soil conditions. Design and optimisation of the solid beam was done with required reinforcement regarding concrete creeping.

Execution

The planning began in February 2010. The opening of the structure took place on 21.11.2011. The building costs of the structure are about 600,000 euros.

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Sergej Ryklin - Born in 1963 in Moscow
 1981-1985: Civil Engineering; "Bridges/Tunnels"; Since 1993: Structural designer and verifier at "Römhild & Hecker" Consulting Engineers in Landau, Germany; Since 1997: Structural designer; 2008-2009: Master's Study at the Institute for Membrane and Shell Technologies, Anhalt University of Applied Sciences, Germany.

Range of Capacity: Planning and optimisation of steel, aluminium, solid, composite, timber and membrane structures; Project consultancy; Building physics calculations; Dynamics calculations, Project verification.

Philosophy: Flexibility in planning due to integral 3D design with the ability to find feasible and low-cost solutions from the draft stage on.

Experience: Residential and industrial buildings, parking spaces, pedestrian bridges, swimming pools, silos, membranes...

References: Daimler, John Deere, SAP, DB...

Project information

Owner	Mannheim City
Architect	Mannheim City Planning Department
General Contractor	King Ingenieure Ludwigshafen, Germany
Engineering Office	Dipl. - Ing. S. Ryklin STATIK
Location	Mannheim, Germany
Construction Period	02/2011 to 11/2011

Short description | Barrier Free Pedestrian Connection

The City Mannheim lies on the junction of the river Neckar by the river Rhine and contains a lot of traffic- and pedestrian bridges. After the reconstruction of the Friedrich-Ebert Bridge across the river Neckar in 2007, the Mannheim City Government decided to improve the traffic situation and build a barrier free connection from Neckar Bank Way to the bridge. The connection, implemented in 2011, is about 70 m long and 2.5 m wide and it lies about 6.0% in grade. The structure consists of the solid beam based on the slim steel columns with supporting walls at the entry and deep injection piles foundation. The very bad soil conditions were responsible for the deep piles foundation by the old bridge structure too. The new structure was built up as a 3D model in Scia Engineer, including the supporting walls and foundation with deep injection piles. Calculation of the structure was processed according to Theory IId Order. The required dynamic calculations due to Earthquake Zone I were considered too. The building costs of the structure are about 600,000 euros.

