

## Stuttgart Main Station



Location  
Stuttgart, Germany

Built  
Under construction

International competition 1997, 1st prize

GFA: 185,000 m<sup>2</sup>

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## A railway station project of the 21st century

The new main railway station designed by ingenhoven architects forms the centerpiece of the Stuttgart 21 transport and urban design project. The new light-flooded underground through station is to replace the existing Stuttgart terminus station.

In 1997, the comprehensive concept by ingenhoven architects won first prize in the international architectural competition for the project. The state-of-the-art railway station, which is currently under construction, will provide Stuttgart with a better connection to the European rail network. In addition, by moving the new tracks underground, space is being created for a new city center. In this way, the new main railway station will become the interface between the old and new heart of the city and the departure point towards further urban development. Construction work started on February 2nd, 2010.

The extensive Stuttgart 21 (S21) project comprises urban design and transport planning aspects. It is a joint-venture project set up in 2009 between the Federal State, the State of Baden-Württemberg, the State capital Stuttgart, Verband Region Stuttgart, Flughafen Stuttgart GmbH, and Deutsche Bahn, which also acts as client. The plans of ingenhoven architects for the main station include the construction of the new station building and the conversion of the existing

building.

In addition, the Düsseldorf firm is responsible for the design of the landscaping around the new station, the relocation of the "Staatsgalerie" SSB station, the construction of the new technology building and the utility building.

Whereas the Stuttgart railway hub is being rearranged, with tracks being moved underground, the existing station building, which was designed by Paul Bonatz and Friedrich Eugen Scholer in 1922 and is listed as a historic monument, will be retained as an entrance building. The jury's verdict in 1997 stated: "A major urban design landmark will be placed in the city layout, without any monumentality and without—in any way—competing with the building by Bonatz."

In addition, the Schlossgarten—Stuttgart's green heart and most important public park—will be extended above the new railway station in the course of the abolition of the aboveground track field and the Cannstatter road.

Stuttgart, in the south-west of Germany, lies in a topographic basin, which presents a special challenge regarding the connection of the existing terminus station to the growing European high-speed rail network. In addition, the ground-level tracks have become a major impediment to urban development. In the heyday of railway stations in the 19th century, these were usually constructed on the edges of the historic urban centers. Stuttgart is a typical example of how, in subsequent years, the city grew around the railway station and how, in the topographical situation, urban space became increasingly scarce. This is the main reason why the relocation of the tracks underground gives rise to a special opportunity. At a right-angle to the existing tracks, a new high-speed line will be created in an underground tunnel up to twelve meters below the existing rail network; this will free up the space of the former ground-level tracks for the new Rosenstein district.

In spite of its position underground, the station will appeal with its brightness and visual openness, which is esthetically pleasing and enhances safety. During the day, the station hall will be flooded with natural daylight via large "light eyes". At the same time, these light eyes communicate the presence of the underground railway station to passers-by at ground level. The 16 tracks and 17 platforms of the current terminus station will be reduced to eight tracks and four platforms, thus increasing efficiency and reducing travel time.

The new station consists of a white concrete structure with minimum construction depth. The thickness of the optimized

shell structure was reduced to almost one hundredth of the span, which results in significantly less material being used. The efficiency of the construction work was further increased by choosing re-usable concrete formwork and modular prefabricated components. By developing a special concrete material, it was possible to leave the fair-faced concrete surfaces exposed, without fire protection cladding, so that the architectural structure is fully open to view.

The new Stuttgart main railway station will be a "zero-energy railway station". By making intelligent use of natural energies and resources it is possible to avoid CO2 emissions. The building does not require any energy input for heating, cooling, or mechanical ventilation; instead, heat is used from the groundwater and the air flow in the tunnels. In addition, it is planned that the station building will generate its own electricity from PV modules installed on the roof.

The integration of the new railway station, with the new public spaces and park areas, in the urban fabric gives a new quality to Stuttgart's city center. The unique biomorphic design of the station hall results in a timelessly elegant and esthetically pleasing loadbearing structure. The new centerpiece of Stuttgart 21 is a fitting expression of the new era of railway transport.

## Awards, Nominations

2016

Iconic Awards, Architecture – Public, Winner

2007

International Architecture Award 2007, Chicago Athenaeum  
Museum of Architecture and Design

2006

Global Holcim Award Gold for Sustainable Construction 2006

2005

MIPIM Architectural Review Future Project Award 2005, Best  
of Show and Big Urban Projects

Regional Holcim Award Silver for Sustainable Construction  
2005

2004

BE Bentley Empowered Award 2004, nominated

## Team

Client

Deutsche Bahn AG, Berlin represented by DB ProjektBau  
GmbH, Stuttgart

Master planner

ingenhoven architects, Düsseldorf

Architect

ingenhoven architects, Düsseldorf

Team ingenhoven architects

Christoph Ingenhoven, Klaus Frankenheim, Hinrich  
Schumacher, Michael Rathgeb, Bjørn Polzin, Peter Pistorius,  
Prof. Dieter Henze, Martin Gehrmann, Elvan Urungu, Huub  
Donkers, Peter Georg Vahlhaus, Barbara Bruder, Peter Jan  
van Ouwerkerk, Michael Reiß, Pavlos Antoniou, Arghavan  
Afshar, Marc Böhnke, Jörg Bredenbröcker, Matthias  
Bockstruck, Lutz Büsing, Ralf Dorsch-Rüter, Ben Dieckmann,  
Matej Ferenc, Vanessa García Carnicero, David Großefeld,  
Roland Grube, Stefan Höher, Torsten Horn, Marco Huberts,  
Anemone Ingenhoven-Feld, Christian Kawe, Heike Kerbs,  
Ursula Köcker, Arkadij Kublin, Yi Li, Bastian Müller, Viktor  
Oldiges, Laura Polaczek, Alexander Prang, Frank Reineke,  
Ulrike Schmälter, Takeshi Semba, Maximo Victoria, Johannes  
Patrick Vogel, Sira Warneke, Thomas Weber, Tom Wendlinger,  
Harald Wennemar, Philip H. Wilck, Julian Blönnigen, Mathias  
Mahncke, Laura Pinckvos

Scientific support for form-finding, shape, construction, and  
structure

Frei Otto, Leonberg

Project management

DB Projekt Stuttgart Ulm GmbH, Stuttgart

Structural design

Werner Sobek, Stuttgart / Engineering consortium  
Tragwerksplanung S21 Hauptbahnhof GbR, Leonhardt, Andrä  
and Partners, Stuttgart with Happold Engineering, Berlin

Facade design

Werner Sobek, Stuttgart

## Services installations

**DS-Plan, Stuttgart / NEK Ingenieure, Frankfurt a.M. / HL-Technik AG Beratende Ingenieure, Frankfurt a.M.**

## Building physics

**DS-Plan, Stuttgart**

## Fire protection

**BPK Brandschutz Planung Klingsch, Düsseldorf**

## Landscape design

**ingenhoven architects, Düsseldorf / WKM Weber Klein Maas landscape architects, Meerbusch**

## Transport engineering

**Durth Roos Consulting, Darmstadt**

## Lighting design, natural and artificial light

**Tropp Lighting Design, Weilheim**

## Air flow analysis

**IFI Institute for Industrial Aerodynamics, Aachen**

## Construction supervision

**DB Projekt Stuttgart Ulm GmbH, Stuttgart**