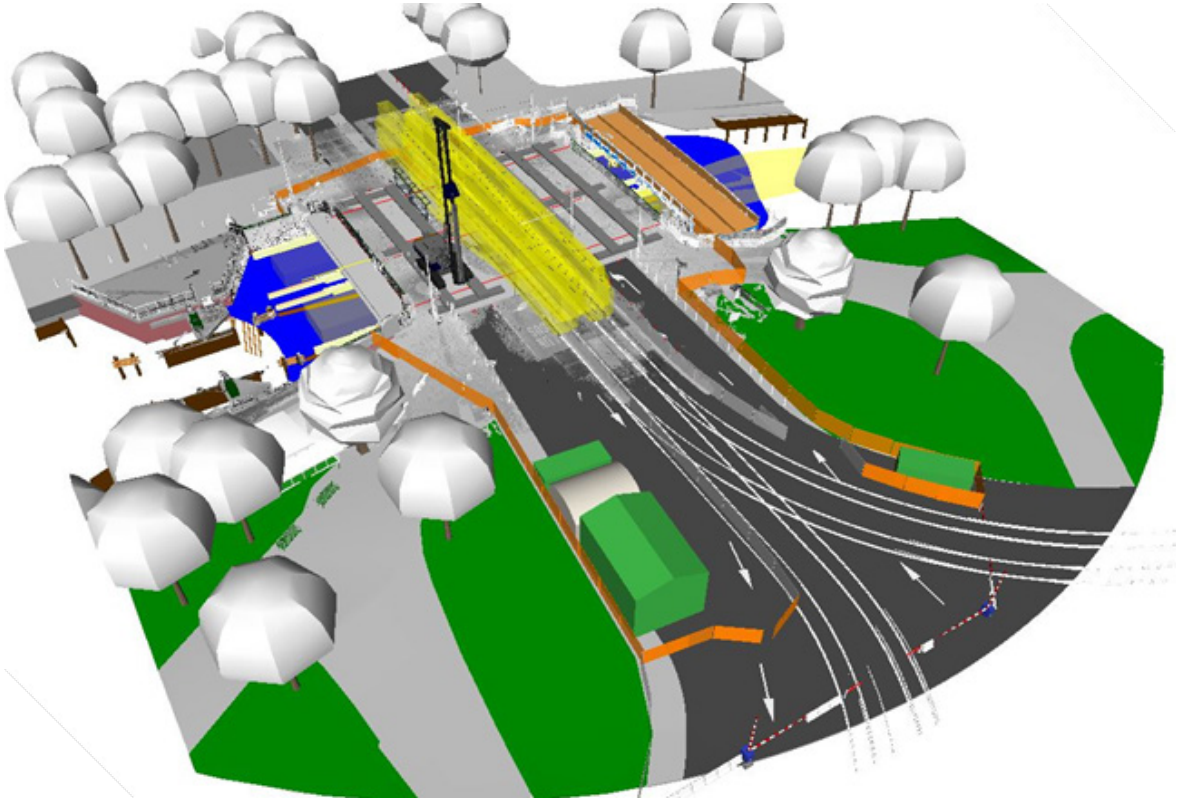
Renovation of Leidsebrug, Amsterdam

Renewal of the deck slab and renovation of the monumental parts of Leidse bridge



Located next to Leidse Square in the heart of Amsterdam, the Leides Bridge (Leidsebrug) - which dates from 1876 - is an important arterial road for cyclists, cars, buses, trams and pedestrians. In order to maintain its monumental status, the bridge's deck slab is being replaced along with the stone blocks and the wrought iron works, on and around the structure.

The construction schedule is an important aspect of the project. Due to its central location the traffic on and under the bridge is an important consideration for the construction team. More than 50 trams cross the bridge every hour and the track splits the building site in two. In addition marine traffic going under the bridge must not be hindered. The client requires that the trams remain functional for the duration of the renovation works, apart from a single period of 5 days, when the bridge can be closed to traffic. During this time the old bridge's deck slab will be completely removed and replaced by a new one.

BIM is applied in this project in order to facilitate the following aspects:

- Optimizing the design and construction scheduling
- Safety considerations
- Building site and surroundings management
- Coordination among the subcontractors
- Risk management
- Informing the client

Client:
Amsterdam Municipality

Contractor:
BAM Infra

Design team:
BAM Infraconsult
Bartels Infra

Supply chain:
Schakel & Schrale

Value: €5m

Completion: Summer 2017

Key Features:

- Central Amsterdam location
- Various traffic flows (above and below the bridge) needs to continue unhindered during the construction process
- Protected monument status
- Renewal of the bridge's deck
- Renovation of the monumental parts
- Only closed to traffic once for a period of 5 days
- Extremely small construction site which is split into two parts by the tram rails

BIM stage and approach

During the design process the digital model was continuously being updated and worked on. The construction and design team used it to optimise the design and construction planning. Design meetings were carried out weekly in order to review and manage the points of interest, the intersecting and overlapping points and any unresolved issues, which were registered in the model.

In order to record the existing state of the site, a 3D scan was taken from above and from below the bridge. This scan was used to give the exact location of the monumental parts as well as the steel girders inside the bridge's deck. The subcontractors in charge of the deck's slide-in system, used this information to accurately determine the position of the temporary supports, which were to be placed underneath each girder. Only then could the slide-in system be installed, to remove the old deck and put the new deck in. This data is delivered in the form of a 3D model, which includes the different building phases.

During construction the model was used to show subcontractors the construction progress. It is also used to ensure safety at the building site. The heavy traffic above and below the bridge, coupled with a small construction site and the monumental status of the bridge, has meant that a large amount of precaution is required. The model helps the team to precisely determine where construction works could take place.

In addition to the traffic issues, there bridge's surroundings also had to be considered. A number of famous hotels are situated in close proximity to the site and animations and visualisations showing of the various design solutions have helped to relieve their concerns about the project. These have also been used by the tram and traffic authorities to understand the scheme.