

Reference Engineering

Repair of Walchebrücke, Zurich



Problem and task

During the repair of the Walchebrücke in 2006 a mix of different material compositions was found in the existing bridge deck. Project and site management as well as the contractor decided to submit these compositions to a careful examination. As a result of this examination more information on conservation or demolition of these compositions was expected. Another task was the selection of new and appropriate materials for repair.

Solution

The examined materials had their origin in the original construction and in two earlier repairs. Structural concrete as well as a high-strength polymeric mortar and a comparatively low strength cement mortar were found. Layer thickness and distribution of these materials showed extreme variations. For an appropriate sizing of the planned bridge sealing, the moisture diffusion resistance of the different materials was determined. In addition, stiffness and adhesive strength between these materials were examined too. The planned new layer of concrete had to allow extreme variation of layer thickness and had to bridge existing cracks in the base layer. Especially for this purpose a shrinkage compensated concrete was designed. This concrete was reinforced by high modulus polymer fibres, which caused an advanced ductility. To apply sealing and roofing bitumen fast and of good quality the drying process of this fibre concrete was monitored.

Judgement

Thanks to the analysis of the existing composition and to the estimation of its associated deformation

Facts

Duration of the project:
April 2006 to December 2006 (consulting period of Concretum)

Building owner:
Tiefbauamt der Stadt Zürich

Engineers:
Gruner AG Ingenieure und Planer,
ACS Partner AG

Contractor:
ARGE StraBAG / Züblin Strabag (now: Züblin Murer)

Client:
Building owner





behaviour the repair could be achieved very efficiently. On the one hand, a bigger part of the existing composition could be saved and on the other hand, the application of the fibre concrete lead to a repair that was cheaper in comparison to an application of premixed repair mortars. Like this, the durability of the Walchebrücke can be guaranteed efficiently for the next decades.

