

Kanderviadukt



Location: Frutigen, Switzerland

Date: 2018

Contractor: Walo Bertschinger

Solution and technologies : Overlay

Introduction

A new life for an emblematic structure: The Kanderviadukt was stabilised using a protective coat of Ductal®.

Description

Built in 1911 at Frutigen, on the Lötschberg line, the Kanderviadukt is an emblematic structure in the valley. This stone masonry bridge, 274 m long, acts as a link between the north and south of Europe for the transport of people and goods.

Challenge

During regular inspections of the structure, it was discovered that the polymer bitumen sealing (PBD), applied sixty years before, was no longer able to protect the structure against water infiltration resulting in the first damage to be suffered by the bridge. A new protection was required in order to guarantee its integrity for the coming decades. The engineering company in charge of this project therefore proposed a like-for-like replacement of the PBD coat as well as a variant in Ductal® ultra-high performance fibre-reinforced concrete (UHPFRC).



Performances

The extremely dense matrix of Ductal® Overlay solution not only guarantees that the 30 mm layer poured onto the bridge is completely waterproof, but has a very high mechanical performance thus avoiding the need to protect the sealing layer. As the installation of UHPFRC is only marginally dependent on weather conditions, execution lead times, very important in the rail transport sector, may be guaranteed and the total duration of projects is of ten shortened. The durability of the material avoids the need to replace the sealing up to the end of the life of the supporting structure which reduces maintenance costs and costs associated with line closures.

Application

30 mm of Ductal® was poured onto the whole of the upper section of the trough. A liquid formulation was used to fill the edge formwork while a firmer formulation, taking the slope into account, was poured onto the deck and the horizontal section at the top of the edging pieces. The whole of the exposed part of the bridge was thus protected against water infiltration. The condition of the supporting concrete was significantly worse than predicted, but the Ductal® Overlay solution enabled the work to be finished on time, especially with the whole of the horizontal surface being poured in a single day. Pouring in a single step in this way also avoided having joints in the section where water runs off into the drainage systems.

Optimization

For a structure on such a scale, the question of cost is clearly high on the agenda. The UHPFRC solution provides a more durable structure and limits the need for future maintenance work. The ability to guarantee deadlines was also a determining factor in the project owner's choice, all the more so since the Ductal® UHPFRC variant studied added only 1% to the total cost of the project. This type of project allows project owners to use the properties of UHPFRC to best advantage, to limit costs over the lifetime of the structure and limit the impact on the user by reducing the time needed for closures due to the works.

