
Restoration of Robert Maillart's Reinforced Concrete Bridges in Switzerland

Eugen Brühwiler, Professor, EPFL – Swiss Federal Institute of Technology, Lausanne, Switzerland

Introduction

Bridges of high cultural value and aesthetic quality deserve respectful treatment and, consequently, construction interventions must balance these assets with the severe requirements of utilization. This is particularly relevant to structural engineers and bridge owners involved in rehabilitation or modification interventions. This contribution presents, by means of restoration of bridges designed by the famous Robert Maillart, how interventions can be performed with adequate respect for cultural value while complying with the demands of modern traffic use. It demonstrates how noninvasive and thus low-cost interventions can be performed on “old” concrete structures with adequate respect for cultural and aesthetic values in order to improve them in view of a second service duration. This goal of noninvasive interventions can only be achieved by using advanced engineering methods (as allowed in standards valid for existing structures) and intervention technologies specifically suited for existing concrete structures.

Robert Maillart



Robert Maillart (1872–1940) was a Swiss civil engineer who strongly influenced design and construction using reinforced concrete. Robert Maillart was born in Berne, Switzerland, and studied at the Swiss Federal Institute of Technology (ETH) in Zurich. His main mentor was Professor Wilhelm Ritter from whom he learned to develop structural shapes that could be easily handled by structural analysis. Maillart could rarely test his original designs prior to construction, and thus former EMPA director Mirko Ros who performed load testing on many of Maillart's bridges, held an important role in validating Maillart's original design approach. Maillart's main inventions are the three-hinged arch and the deck-stiffened arch designs for bridges, as well as the beamless floor slab for