Brückenbauwerke [1]

Autoren:

Indumap

Handbuch zum Umgang mit dem Industriedenkmal

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Abstract

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A scientifically tenable basis of long-span structures should be discussed according to bridges structural operating principle (arch bridges, beam bridges, cable-stayed structures and movable bridges) and to the inner support structure systematics. Further distinctions are according to the material, and to the aspects location, purpose and size. The larger the span, the lower the potential deviation from the pure structural forms.

A rundown in chronological order is also a history of span maximisation. The most remarkable bridge structures were often those that created a milestone in terms of span at their time. In Antiquity, the essential principals (beam, arch, suspension bridges) were developed. The periods from Antiquity, Middle Ages up to Modern Age (~ 1750) were determined by the arch and the use of stones as material. Also, remarkable wooden bridges were realized. Industrial developments in the field of iron and steel facilitated the decisive step towards long-span, filigree structures.

The steel bridge designs of the 19th century are examples for the ability of the upcoming civil engineers to understand the inner structure and stands for new designs in bridges.

Suspension bridges have turned out to be the best-performing supporting structures for long spans (up to 2000 m span). The development of the material concrete and pre-stressed reinforced concrete bridges led to a Renaissance of beam design in bridge construction, which again underlines the achieved engineering feat.

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Keywords: long-span structures, structural operating principles, arch bridges, beam bridges, cable-stayed structures, steel bridge designs, pre-stressed reinforced concrete bridges

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