Cable-Stayed Bridges with Special Features

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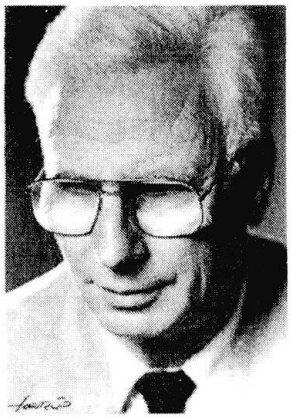

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Abstract

Usually if we speak of cable-stayed bridge design parameters, we have their cable-arrangement, pylon-geometry, the cross-sections and the materials of their deck etc. in mind. But the overall layout is considered to be more or less invariable: a three-span arrangement with two pylons, a main-span and two holding down side-spans, and occasionally half of that with one pylon.

However, the cable-stayed bridge concept offers more and can adapt to very special boundary conditions, from local availability of only certain materials or wires to unusual topographical conditions.

The outcome may be e.g. one out of a large number of feasible multi-span arrangements, or a combination of cable-stayed and cable-supported. Other situations may call for cable- stayed bridges, where the deck is not straight in plan but curved, resulting in a horizontal arching action or even for convertible or folding decks.

The author has collected some experience with such special features and will exemplify them by several projected or really built large and small cable-stayed bridges such as the Hooghly Bridge in Calcutta (the first composite-deck cable-stayed bridge with a rivetted steel deck), the Evripos Bridge in Greece (with a solid concrete slab deck), the Argen Bridge in Germany (combining cable-stayed with cable-supported), the Ting Kau Bridge in Hong Kong (with 3 masts and 4 spans), the Fjörde Bridge in Kiel, Germany (a cable-stayed folding bridge) etc..

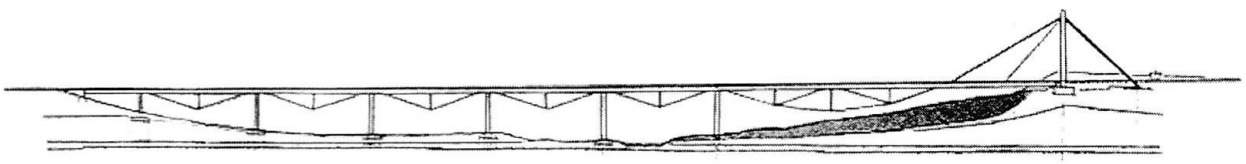

Fig. 1: "Obere Argen Bridge": Proposal

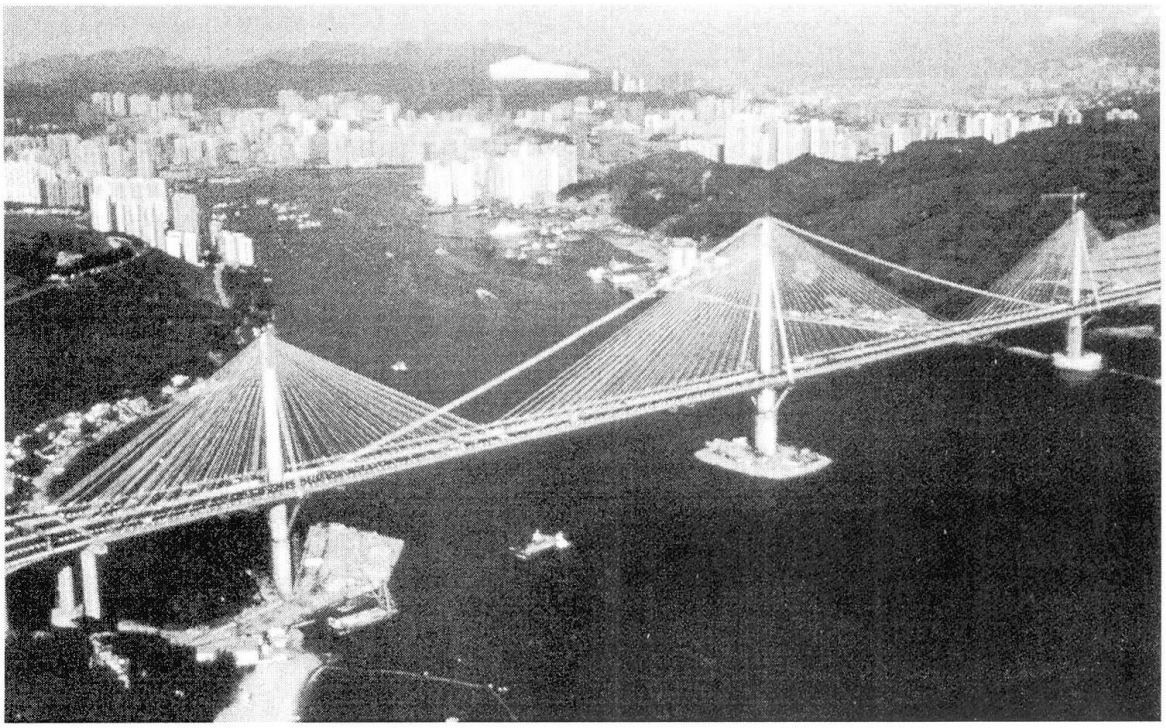

Fig. 2: Ting Kau Bridge, Hong Kong, completed 1998

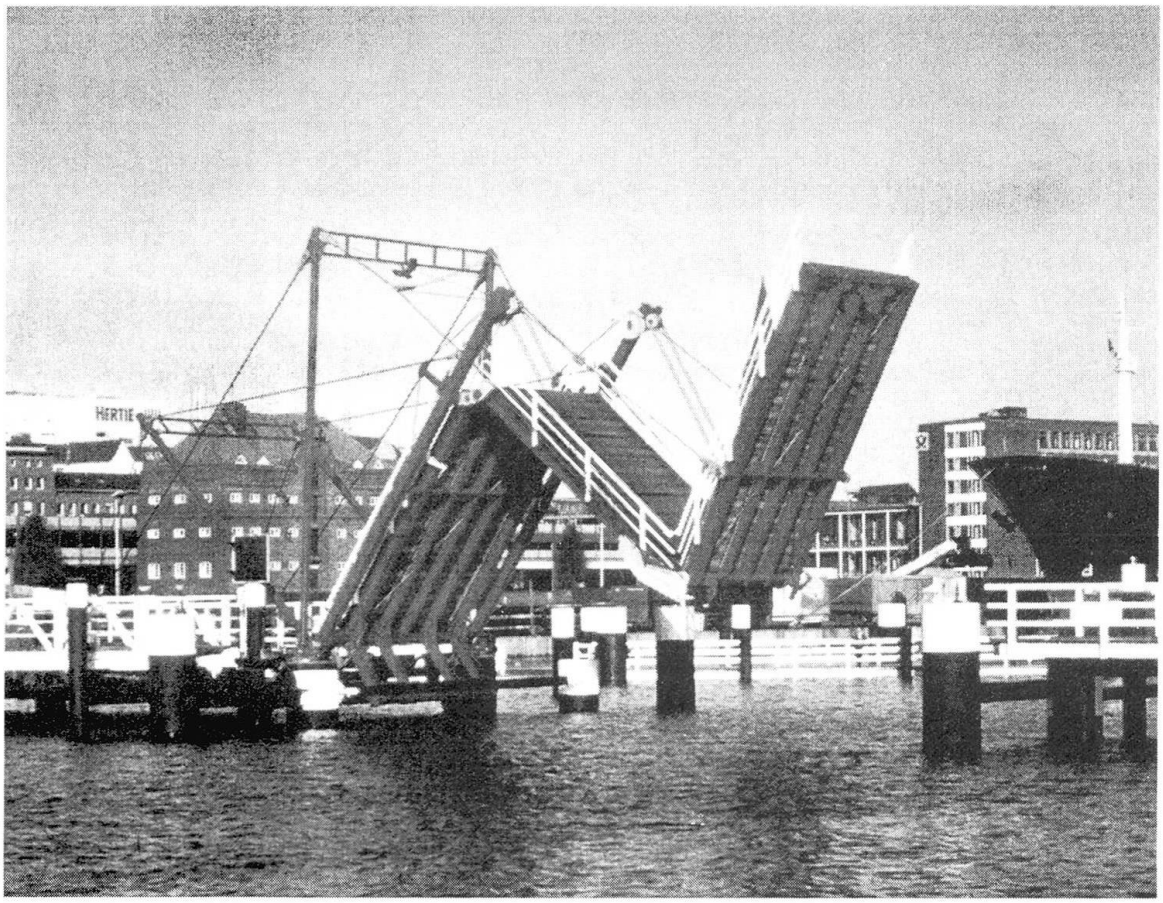

Fig. 3: Folding Bridge, Kiel, completed 1998