



INDIGENOUS AND SIGNATURE CABLE-STAYED BRIDGES – ATTITUDES TOWARDS IMPROVEMENT OF INFRASTRUCTURE

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Summary

Designing a bridge so that the local context is taken into consideration allows for indigenous construction, i.e. employing local methods, materials and labour. Several cable-stayed bridges are described to exemplify that design based on local context may lead to a large variety of structural solutions. Following such principles the present trend towards signature bridges frequently requested by clients can be used to improve our infrastructure with elegant and economic bridges.

Keywords: cable-stayed bridges, conceptual design, structural design, signature structures, context

1. Introduction

Minimising material quantities by logical design and cost by indigenous construction while achieving stability, durability and beauty at the same time is the classic approach to the design of engineering structures. These principles will stay though in recent years and perhaps triggered by the Millennium Projects in Great Britain or the desire to profit from the “Bilbao effect”, the vocabulary of clients has changed. In bridge design “iconic” structures and “landmark” or “signature” bridges have become frequent requests. This trend specifically affects the design of cable-stayed bridges, which today are perhaps the most elegant and economic solution to cover long spans.

In principle, the request for signature bridges in specific locations is a positive trend, because it demonstrates that bridges have moved into the public consciousness as structures with the potential to shape, influence or even improve/enrich our infrastructure. In any case bridges are part of the building culture converting infrastructure into civilisation. Engineers have always strived for progress and have always used the given context to derive new designs. We engineers should use this trend to show that bridges as all engineering structures play an important role in the building culture and to prove that good design can generally be achieved with little extra cost. However, this “signature” trend may also confront bridge designers with a conflict because more and more clients are not satisfied anymore with the classic approach. “Form follows function” is often reversed in architecture these days.

Treating all bridge types in this context is not possible and, therefore, the cable-stayed bridge with its potential for indigenous construction and signature properties is taken here as an example. In the following sections first the characteristics of cable-stayed bridges will be summarised. A description of context as the basis for conceptual design follows. The next section elaborates on the issues of conceptual design and signature structures by comparing seven cable-stayed bridges in Germany and in India such as the classic Second Hooghly Bridge in Kolkata built in the 80s, and the signature Yamuna Bridge in New Delhi that will be constructed in 2007. These examples show that cable-stayed bridges and the large variety of possible structural solutions allow to positively avoid the conflict described above.