



## Aesthetic Design of Large Bridges—From some personal involvement

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### Summary

In this article, some examples of aesthetical design of large cable-supported bridges in Japan, in which the writer was somehow involved, are illustrated. And in addition, the collaboration of engineers and architects/industrial designers in bridge design is discussed.

**Keywords:** aesthetic design, suspension bridge, cable-stayed bridge, bridge tower

### 1. Introduction

It would be needless to confirm that the basic requirements for bridge design are safety and durability, serviceability (function etc.), economy and visual pleasantness. David Billington expresses these requirements by 3Es; namely, efficiency, economy and elegance [1]. The practical difficulty lies in harmonizing these requirements having different nature. Although these requirements may be common to design of other civil and architectural engineering structures, visual factors in bridge design shall be contemplated in light of the following specific characters of bridges: 1) they are usually used by unspecific users, 2) they are public infrastructures constructed by taxes, 3) they mostly expose their structure itself without cladding, 4) their life is expected to be longer than other engineering structures, and 5) their appearance is given prominence as compared with other civil engineering structures because they attract visual attention.

Because of the conditions 4) and 5) cited above, the visual pleasantness, or at least to be not ugly or boring, is strongly requested in bridge design. On the other hand, when the bridge is very large, it becomes not easy to satisfy all the afore-mentioned requirements. In the area where design conditions from the nature are very severe as in Japan, it is considerably hard to adjust between safety and aesthetics. In addition, the trend of design may change according to the age, but the basics for the contemporary bridge design shall be to pursue simple, intelligible and pleasing form by satisfying functional and structural necessity and avoiding excessive ornaments.

In this presentation, some examples of aesthetical design issues in large cable-supported bridges in Japan, in most of which the writer was somehow involved, are going to be illustrated, and in addition, the collaboration of engineers and architects/industrial designers in bridge design will be discussed. The writer would like to excuse myself, however, for that he is a little afraid that the content in this article is mainly based on