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Forms and Aesthetics of Bridges

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Research
Bridge Engineering—Feature Article
Forms and Aesthetics of Bridges

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ABSTRACT

The objective of a bridge design is to produce a safe bridge that is elegant and satisfies all functionality requirements, at a cost that is acceptable to the owner. A successful bridge design must be natural, simple, original, and harmonious with its surroundings. Aesthetics is not an additional consideration in the design of a bridge, but is rather an integral part of bridge design. Both the structural configuration and the aesthetics of a bridge must be considered together during the conceptual design stage. To achieve such a task, the bridge design engineer must have a good understanding of structural theory and bridge aesthetics.

1. Introduction

Humans are separated from wild animals by the existence of civilization. Elephants today still roam the earth with lives that are similar to those of elephants of thousands of years ago, but we humans have significantly improved our lifestyles—thanks to civilization!

What is civilization? The Merriam-Webster Dictionary defines “civilization” as “modern comforts and conveniences, as made possible by science and technology.” Convenience can thus be achieved through technological advancement. Comfort, however, can only be achieved by improving the quality of our environment, which includes the form and aesthetics of the things surrounding us. Without quality in our environment, we cannot have quality and comfort in our life.

Approximately 2000 years ago, the great architect Marcus Vitruvius Pollio advised the Roman Emperor that “Structures shall be safe, functional, and beautiful!” [1]. Although these requirements are still valid today, we must add economy to the list. Therefore, today’s standard should be that “Structures shall be safe, functional, economical, and beautiful!”

Cost was less important for Vitruvius because he worked for the Emperor. We engineers of today do not have that kind of luxury. Aside from that, not much has changed in how we define a successful bridge, or any successful structure. Beauty has never ceased to be one of the basic requirements of a successful bridge.

A successful bridge that is “safe, functional, economical, and beautiful” will provide both comfort and convenience.

2. Form follows function

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