

## Toward 21st Century Bridge Design through Collaborative Design Process

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### Summary

Nowadays when structures are defined by their unique forms, innovative use of materials, context-sensitive integrity that create dramatic points, they are acknowledged to be world-class designs. It is very difficult to design bridge structures that offer so manifold rewards, which demands a new set of design environment in which multi-disciplinary experts collaborate each other. Above all the issues to address to develop new design environment, a strategic coordination among architects and engineers might play a key role to elevate modern bridge design to an artistic level. This paper has focused on how the common platform is being evolved for a true collaboration for architects and engineers toward new design paradigm for 21st century bridge design. In association with the collaboration work, a new Silkworm pedestrian bridge was studied as a representative case that was completed through a strong collaboration between artists and engineers as well as community agent. A collaborative design process was developed based on this study. It is expected that architects and engineers can get together through the proposed design platform from conception to completion to create a powerful and efficient structural system and form as well.

**Keywords:** bridge design trend, collaborative design process, aesthetic evaluation.

### 1. Introduction

While industrialized materials have been introduced to civil engineering industry since the great Industrial Revolution, new type of education had been established to solve engineering problems focusing mainly on safety, lightness and economy. This in part had caused a split between architecture and engineering. For several decades, majority of bridge appearances failed to satisfy pleasing taste of the public. Thus multi-disciplinary experts and stakeholders as clients for public bridge design have tried to direct the way of aesthetic bridge design. However, the two groups are more diverse now in ability and education than ever before, since they have been educated pursuing to obtain highly technical skill and knowledge in their respective domain separating each realm distinctly. The objective of this study is to develop a collaborative design paradigm to reduce the gap among the different groups toward creative and artistic bridge design in the 21st century. This study started by investigating design trend in structural bridge forms to understand major factors that enabled well-known bridges to make their fames in bridge aesthetics and to predict what things must be prepared for the future bridge design. And then the new Silkworm pedestrian bridge was studied as a representative case that was completed through a strong collaboration between artists and engineers as well as community agent. When this bridge was studied, the aesthetic evaluation of the bridge was performed considering whose activity affected the bridge form to draw a collaborative design process proposed in this study. It is expected that the proposed collaboration