

Exploration of Cable-Supported Pedestrian Bridges

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Abstract

The variety of transparency, lightness, and shape of cable-supported bridges is being actively utilized in the design of pedestrian bridges. Moreover, the pedestrian bridge, which is demanded to play a key role as a harmonious structure with surrounding landscape, is being reborn as a landmark sculpture. Considering that understanding design trends is very important step to establish design guide lines for future design, existing cable-supported pedestrian bridges developed until recently have been investigated considering structural material, structural system, and architectural styles. The visual inspiration of the pedestrian bridge is felt in the sense of the structure and the structural form is determined to satisfy the geometric design requirements while considering the efficiency and stability of the cable structure. Therefore, it is needed to identify the main variables affecting the cable-support structures and understand the true beauty of bridges by comparing and analyzing various bridge cases based on major variables. This paper will focus mainly on the following issues: (1) the classification of types of cable-supported pedestrian bridges; (2) the identification of the important factors affecting structural forms and (3) an integrated framework for future pedestrian bridges considering form, function, and behavior. Note that the relationship between structural form and visual form is explained using graphical approach. It is expected that this study will help to explore future pedestrian bridges considering bridge aesthetics.

Keywords: pedestrian-bridges; design-trend; cable-supported; suspension; cable-stayed; aesthetics.

1 Introduction

Urban regeneration also called urban redevelopment is on the way to improve the environment in and out of the city to improve the quality of life. Looking at the examples of urban regeneration projects, we can see that such a process has a great influence on urban landscape. Among them, the attractiveness of social infrastructures that occupy the urban space is used as a measure of the success of urban regeneration. Especially, the role of pedestrian bridge has been

recognized as a sculpture that reveals the pride of the community in addition to the original function of pedestrian passage. In this relation, cable-supported bridges are proposed as appropriate design alternatives for pedestrian bridges with pleasing visual shapes considering various site conditions. Upon such design requirements, a number of different types of cable-supported pedestrian bridges have been emerged till now [1].

Unlike the road bridges which are designed mainly for automobiles, the pedestrian bridges should be designed considering the safety for the people's