

Current Status and Thinking of Chinese Ancient Bridges Protection

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Abstract

Since China is one of the major origins of human civilization, the wisdom of the ancients plays a prominent role in the field of bridge construction. On one hand, many ancient bridges on behalf of the construction level, historical features and architectural arts in different historical periods vanished because of structural degradation, natural disasters, man-made destruction or other reasons. On the other hand, the existing ancient bridges are faced with repair, reinforcement and renovation in varying degrees. There can be little doubt about the historical value of the existing ancient bridges, which can be seen as the walking encyclopedia of bridge construction. Therefore, it has become a heated issue on how to protect the ancient bridges to make it permanent and how to utilize their potential values. The history of Chinese ancient bridges is combed and the technical contribution to the world about bridge development are expounded in this article. According to investigation of existing ancient bridges, especially the bridges served as cultural relics, technical status is reflected and major problems faced in process of protection as well as restoration are proposed. Then, with the introduction to actual cases of protecting and utilizing ancient bridges, the experiences and lessons are summarized, which simulates the public discussion of ancient bridges protection. Finally, consideration and suggestions about ancient bridges protection are proposed regarding legislation, principles, techniques and culture.

Keywords: Chinese ancient bridges; repair; reinforcement; protection; case study.

1 Introduction

A bridge is a structure built to span physical obstacles such as rivers or valleys for the purpose of providing passages. In addition to traffic requirement, bridges have become a carrier of culture and art in the long history for ancient literati wrote down articles about bridges, equipping bridges with humanism and aesthetic values. Many ancient bridges remain today in China after hundreds of years, through which an insight into historical vicissitude and spiritual features of an ancient civilization could be obtained. Unfortunately, most of the ancient bridges in China share poor health condition due

to great antiquity, hence the repair and protection of ancient bridges have become a pressing issue. Various problems appeared in current protection of Chinese ancient bridges are analysed based on investigation and research in this article, besides achievements and challenges are concluded from practical cases, which could provide some reference for Chinese ancient bridges protection.

2 Development of Chinese ancient bridges

Bridge construction in China has a long history of thousands of years, which could be divided to four