



Rapid demountable platform (RDP)—A device for preventing fall from height accidents

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ABSTRACT

The prevention of fall from height accidents has long been a popular topic in the field of construction safety. Previous research has indicated one of the potential hazards was induced by the use of steel bracket as scaffold support. While researchers are focusing to improve the existing scaffolding system, this research introduces a newly developed device to minimize fall accidents. The working platform, namely Rapid Demountable Platform (RDP) can be applied across window frames without fixing anchor bolts. Emphasizing on the rapid installation/dismantling, the RDP provides another safer option for working at height. The development of the RDP has incorporated modular concept and aesthetic factor into the design, achieving a more user-friendly platform. Although the RDP is not intended to totally replace the traditional bamboo truss-out scaffold, it is designed to act as an alternative or a supplement to the existing bamboo truss-out scaffold. The RDP is the first of this kind to minimize fall from height accidents especially in cities similar to Hong Kong where external working at height is frequently encountered.

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1. Introduction

The ageing of buildings in Hong Kong has become an increasing concern for the government and the general public recently. In order to keep residential buildings in good condition, there is an increasing demand on proper repair and maintenance of existing housing stock. The Hong Kong construction industry has shown significant improvement in safety performance in the last decade. The number of industrial accidents in the construction industry has decreased from 14,078 in 1999–3033 in 2008, which demonstrates an encouraging drop of almost 80% (Labour Department, 2009). However, fall of person from height has always represented a large proportion of the fatal accidents, almost half of the total number of fatal accidents in the construction industry (Labour Department, 2008). In Hong Kong, residential building repair and maintenance works very much rely on the bamboo truss-out scaffold supported by steel brackets. Due to height and the existing conditions of the high-rise buildings, external wall repair and maintenance works are extremely difficult to undertake. For example, it would be impractical to use scaffolding towers or equivalent devices which need to be erected from the ground, to reach a flat say on the 28th floor, for

a small job such as changing an air conditioner. However, a lot of fall from height accidents are related to the use of the bamboo truss-out scaffold/bamboo scaffold (Ming Pao Newspaper, 2005; Oriental Daily Newspaper, 2005; Apple Daily Newspaper, 2006; Sing Tao Newspaper, 2007).

The current practice for performing external maintenance work in Hong Kong is to erect a temporary platform by means of a bamboo truss-out scaffold supported by steel brackets (Chan et al., 2008). However, the practice appears to be highly unreliable and a number of fatal accidents have occurred (Fig. 1). During 1998–2007 there were a total of fifty-three fatal fall from height accidents which occurred during repair and maintenance works; amongst these almost half were related to bamboo scaffolds (Labour Department, 2008). The number of fatal accidents associated with the bamboo truss-out scaffold has shown that this practice is highly unreliable. Chan et al. (2009) identified a number of problems with this practice. Firstly, there are no standards or specifications for the steel bracket design. As a result, the strength and quality cannot be assured or unified. Often workers will make the steel brackets themselves, or they may purchase them but there are so many different variations available on the market the quality cannot be predicted. The steel brackets are supposedly secured by three anchor bolts but the distance of the third anchor bolt is difficult to reach and hence often workers do without securing it. The quality of anchor bolts can also vary and workers often opt for those cheaper versions where the quality cannot be guaranteed. The conditions of the external walls are unpredictable so the use of the truss-out scaffold

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