Safety Considerations in Facade Design for Residential Building Repair and Maintenance


Research Project funded by The Hong Kong Polytechnic University

Background

The nature of construction activities inevitably involves dangerous operations which may lead to construction accidents and these accidents may (1) cause injuries/fatalities to the workers; (2) reduce the productivity/efficiency of the construction works; and (3) induce a poor image to the construction company. Due to the nature of the construction industry, the number of occupational accidents related to construction trades is substantially higher in comparison with other industries. For instance, in 2003, there were 17,249 industrial accidents in Hong Kong, of which 4,367 accidents occurred in the construction industry (LD, 2005). In terms of fatalities, there were 28 industrial fatalities in 2003, of which 25 were construction-related. In 2004, a marked improvement in both the number of construction accidents and fatalities was recorded. The number of industrial accidents in 2004 was 17,533, of which 3,833 (22%) were construction-related. The number of industrial fatalities was also decreased from 25 to 24 (LD, 2005) as shown in Table 1 and Figure 1 below.

Table 1: Statistics on fatal accidents from 1998 to 2004 (Hong Kong Annual Digest of Statistics)

<table>
<thead>
<tr>
<th>Year</th>
<th>Total Number of Construction Accidents</th>
<th>Number of Fatalities</th>
</tr>
</thead>
<tbody>
<tr>
<td>1998</td>
<td>19,588</td>
<td>56</td>
</tr>
<tr>
<td>1999</td>
<td>14,078</td>
<td>47</td>
</tr>
<tr>
<td>2000</td>
<td>11,925</td>
<td>29</td>
</tr>
<tr>
<td>2001</td>
<td>9,206</td>
<td>28</td>
</tr>
<tr>
<td>2002</td>
<td>6,239</td>
<td>24</td>
</tr>
<tr>
<td>2003</td>
<td>4,367</td>
<td>25</td>
</tr>
<tr>
<td>2004</td>
<td>3,833</td>
<td>24</td>
</tr>
</tbody>
</table>

Fig.1: Industrial Accident Rate from 1998 to 2003 (Occupational Safety and Health Branch, Labour Department)

Among these construction accident statistics, a significant number of accidents were related to maintenance and repair works. A current study on construction accidents related to fall of person from height for public projects (ArchSD) by Chan et al. (2005) illustrates that 29% of the constructions accidents from 1995-2004 was related to building repair and maintenance (BRM) works.

To alleviate the severity of the high accident rate of BRM work, permanent BRM safety measures should be incorporated into buildings. The best time to incorporate safety features is during the design phase of the building so that the impact on the aesthetic of the building can be minimized. Hence, this research project is initiated which focuses on the investigation of safety considerations for residential building repair and maintenance work on facade during design phase in Hong Kong.
Significance of the Project
In this study, safety measures which can be integrated in the building during the design phase will be identified and hence the risk of construction accidents related to BRM works on facade will be reduced and safety performance will be improved.

Aims and Objectives
The aim of this study is to improve the performance of construction safety related to residential building maintenance and repair works on facade in Hong Kong.

The project objectives are:
1. To review the construction accidents in Hong Kong related to residential building maintenance and repair works on facade.
2. To identify the main concerns of designers for designing residential building, existing measures for safety considerations, and barriers to implement design for safety.
3. To identify the factors that can be included in residential building design for improving the construction safety related to maintenance and repair works.
4. To propose, if possible, design for safety suggestions that can be integrated into a residential building to reduce the risk of construction accidents related to maintenance and repair works involving facade.

Outcome and Deliverables
This project will provide a better understanding of the causes of construction accidents related to BRM works involving facade to the Hong Kong construction industry. The findings of this study are significant in providing new knowledge of safety considerations for residential building repair and maintenance work on facade in Hong Kong. A list of design suggestions will be proposed for use by designers to consider construction worker safety in the design phase.

The proposed deliverables of this project include:
 a) Progress report will be prepared by the research team at an interval of 6 months.
 b) A final research monograph will be produced.
 c) Refereed papers will be prepared and presented at international conferences.

References