

Further Discussions on Unsafe Scaffolding and Importance of Safety Culture

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Abstract

An example of poor fire safety management with a scaffold erected along public access in a residential estate of Hong Kong was reported. Upon complaints, there was a refurbishment. However, two more problems are identified. These together with the other three points identified earlier are suggested to be considered in the next round of scaffolding codes review. The reported example reflects the problem of not yet considering construction safety properly to prevent having so many accidents. Inadequate control and lenient punishment are possible reasons. Safety culture appropriate to this part of the world should be promoted. The approach might not necessarily follow overseas practice due to different environment and challenges under tight schedule here in Hong Kong.

1. Introduction

Scaffolding is important in building construction and refurbishment but with many problems as reported [1-3]. Traditional bamboo scaffolding has a long history [4] with many safety problems identified: Scaffoldings are always not taken care of [5] because of the low construction and operation cost. There were many incidents related to scaffolding [5,6]. Some big scaffolds swung under strong wind and had to be taken away to prevent falling down or collapse.

Scaffolding must not block the public access. An example [7-9] of poor fire safety management with a scaffold erected along public emergency access in a residential estate of Hong Kong was presented. Such erection would lead to possible violation of at least three parts in the local fire codes of practice [10-14], bringing hazardous consequences. Fire safety management should be implemented earlier to ensure all fire safety provisions, such as a clear emergency pathway, are maintained properly.

Implementing appropriate fire safety management with other facility management schemes [15-18] is essential. Occupants should be evacuated quickly to outside [19,20]. Facility

management staff must be trained to handle all safety aspects such as noise and gases, particularly in refurbishment works of existing buildings where occupants and construction workers are mixed up. The management should control the improper behavior of the workers. Approved fire safety management schedule must be passed to the facility management staff clearly for execution.

Further, inherent problem in construction safety is reflected. On top of fire, falling down under wind is another threat [5]. Tighter regulations must be implemented with due consideration of heavier punishment. Promoting safety culture [8] is important in minimizing accidents. To ensure building safety, safety culture [8] must be promoted to control both safety management and fire safety technology. Higher responsibility should be dedicated to the facility management officer with proper training.

2. An Example inside a Residential Estate

A scaffold was erected along the public staircase to a car park one level below [7,8]. It blocked the passage in an estate as shown in Fig. 1a. Such arrangement is cheap but very unsafe, well-demonstrating that safety is not considered. At least three points might be in conflict with the firefighting access, occupant evacuation and fire service installations (FSI) requirements [12,13]. This was not handled immediately upon complaints. The estate management might be challenged eventually on allowing such construction works, particularly after unexpected incidents.

As reported [7,8], the guide on scaffolds issued in 2006 by Buildings Department [14] did not mention how to erect a scaffold in staircase, nor about not blocking any public staircase access. Requirements specified in the old means of access (MoA) [10] and means of escape (MoE) [11] codes, now all put in Fire Safety (FS) code [13] are not mentioned clearly. These three points were recommended to be considered in the next review [14], if any.

There are some changes of the scaffold after several months [7,8]. The scaffold is no more blocking the stairs with a structure [9] as shown in Fig. 1b. However, there are at least two additional points to consider:

- Structure safety and roof to protect people below.
- Termites in bamboo scaffold erected for over five months.

It might be worthwhile to discuss the above two points while updating the BD code [14] on bamboo scaffolds on safety provisions [4] in addition to the three points identified earlier [7-9].

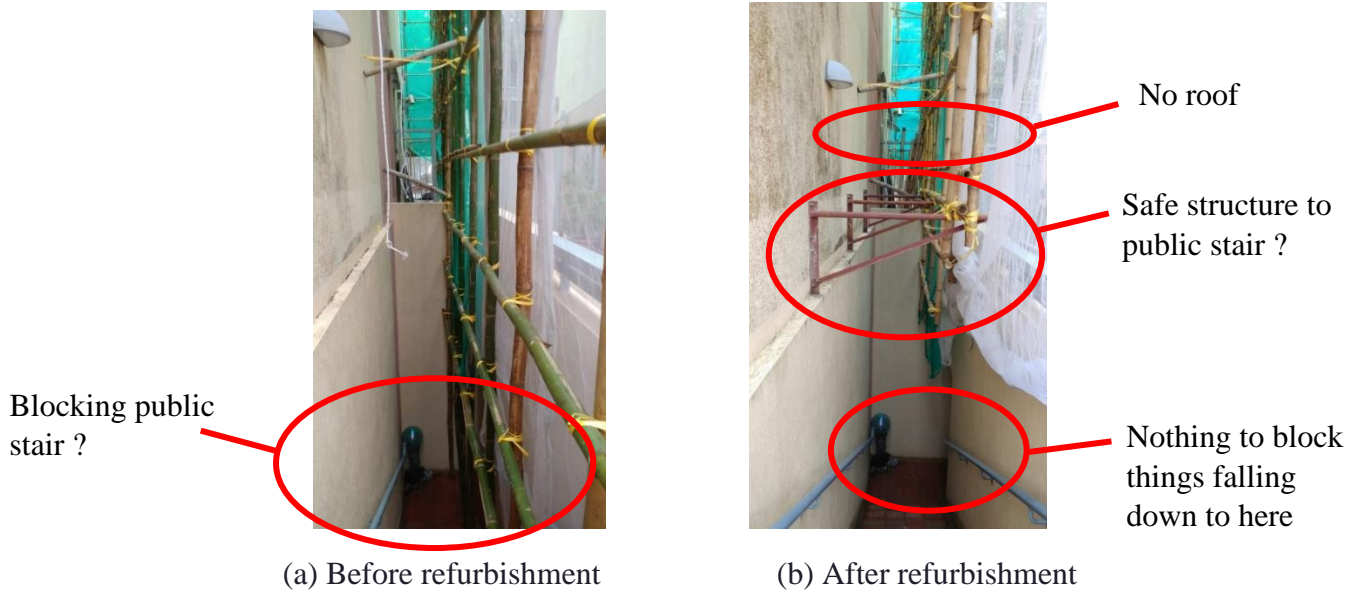


Fig. 1: Bamboo scaffold in staircase

3. Importance of Safety Culture

Appropriate fire safety management was proposed [8,9]. Safety culture [21-24] is recommended [8,9] to work with safety technology and safety management to cope with the challenges under different local environment.

Safety-related factors and dimensions in a smaller scale were further investigated [25] from the perspective of safety culture. Safety models with indicators [26,27] including safety procedures, management safety commitment, safety attitude, and safety behaviour were developed. An overall conceptual model of safety culture known as The Egg Aggregated Model (TEAM) was proposed by integrating those approaches [25]. Different safety factors and dimensions constituting the safety culture are related in a cyclic way. Measurable outcomes under three domains are worked out on safety culture with terms classified as [25]:

- Person Domain: knowledge, skills, abilities, intelligence, motives and personality;
- Behavior Domain: complying, coaching, recognizing, communicating, demonstrating and “Actively caring”;
- Environment Domain: equipment, tools, machines, housekeeping, heat/cold and engineering.

This approach might be appropriate for smaller teams. The safety manager might get a clear picture of the interactions between the various safety aspects set out in overarching building blocks. Different goals and sub-goals, questionnaires and the like can then be linked to the different building blocks or their aspects. However, the terms in the above safety culture

approach [25] are difficult to interpret. Applications should be watched by elaborating the technological domain, organisation domain, and personal psychological domain as pointed out [25].

The approach is difficult to implement quickly in other parts of the world with tight constructions schedule, tight budget and shortage of trained laborers. A more viable approach on safety culture in handling public safety [21-24] strategically in a bigger scale is to put on top safety technology and safety management. This is because safety technology and management are better understood to most people. It is much easier to operate under the three elements as a tripod [21,22], rather than involving complicated terms in overseas approach [25].

4. Tighter Control

In some places such as the Hong Kong Special Administrative Region (HKSAR), the execution of the regulations is not that strict. For example, even driving over 70 km/hr in downtown with speed limit of 50 km/hr seldom gets caught. But keep driving at 50 km/hr used to be horned by cars behind. This kind of illegal and irresponsible speeding would be punished almost immediately by radar camera in places with strict monitoring. Some countries have even contracted out those activities to privately owned companies. Even several hundreds of vaccination exemption certificates issued by a single doctor a day without in-depth inspection were unnoticed [28].

Safety culture must be promoted properly in this part of the world to alert the public. Carelessness leading to severe accidents in construction sites might be liable to a fine of a few hundred US dollars only. Tighter monitoring should be considered and stricter punishment might be needed.

The SAR government is attempting to implement much tighter control if there is any violation of codes [10-14]. As cost is always a concern, punishment is a key point to consider. Government actions on having tighter occupational safety and health control and punishment [29,30] were raised at Legislative Council recently, after the accident of tower crane collapse [31] and falling down of a huge screen in a concert [32]. The persons concerned are prepared to face numerous challenges in Legislative Council hearing and public consultation.

Safety management appears acceptable here, after some painful lessons almost 30 years [33]. Crowd movement and control are properly implemented by uni-directional flow, restricting the number of people, and ensuring smooth motion without sudden stops. This would give safer crowd movement in festival gatherings and mass demonstrations as in 2019 [34] involving millions of people. There are even more challenges on crowd movement and control in developing the Guangdong-Hong Kong-Macao Greater Bay Area [35] to avoid having disasters recently in Korea [36]. There were several serious incidents at construction sites [37,38] in

November 2022. Tighter control, harder punishment (not just a few hundred US dollars) and more responsibility to safety management must be implemented.

5. Conclusions

There are three points to watch:

- Firstly, a better working schedule for scaffolding safety for a building should be worked out and included in the current Code of Practice. In this way, there is no excuse not to provide safe scaffolds.
- Secondly, safety management to control improper action with appropriate safety culture, including tighter punishment. Otherwise, nobody cares about it if the punishment is lenient. Under tight budget, it is difficult to take the safety issues seriously if the fine is only a few hundred US dollars.
- Thirdly, safety culture has to be implemented. However, current situation on safety culture with so many terms might not even work for smaller organizations. Further modifications are required for practice use. Note that the construction professionals are familiar with how to implement safety technology and safety management in a practical fashion, in the presence of feasible codes. Proposal of putting safety culture together with safety technology and safety management is a feasible approach to consider in this part of the world.

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