

Evaluation on Hazards and Risks Related to Scaffolding Activity at Construction Site

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Abstract

This study aims to evaluate the effectiveness of scaffold safety practices in the construction industry, with a focus on identifying common safety issues and potential areas for improvement. The research will utilize a comprehensive checklist to assess supported scaffold safety practices at construction sites, considering technical, human, and organizational factors. Additionally, the study will examine the impact of the revised scaffold safety standards on accident prevention and overall safety performance in the industry. The findings are expected to contribute to the development of enhanced safety management systems and the identification of key areas for further research and intervention to mitigate scaffold-related accidents at construction sites. This abstract is based on the evaluation of scaffold safety practices in construction, the effectiveness of the revised scaffold safety standard in the construction industry, and the factors influencing scaffold-related accidents at construction sites.

1. Introduction

As the demand for high-rise building projects develops, increases the number of construction The construction industry plays an important role in the development of Malaysia's economy and it is one of its major industries. However, the construction industry is also one of the most hazardous Based on the Social Security Organization (SOCISO) report in 2000, the accident rate in the construction industry in Malaysia was 3 times higher in comparison to other workplaces. Construction industry is one of the industries that play an important role in developing and enhancing economic sector and the development of one's country. Further, the national laws or regulations shall provide that workers shall have the right and the duty at any workplace to participate in ensuring safe working conditions to the extent of their control over the equipment and methods of work and to express views on the working procedures adopted as they may affect safety and health and comply with the prescribed safety and health measures. Although the construction industry contributes to the development but at

the same time this is not an environmental friendly activity because a lot of problems may exist if the progress and development of this industry are not well planned.

Scaffolding is an important tool used on construction sites. According to the Occupational Safety and Health (OSHA), an estimate of over 2 million or 65 percent of construction sites use scaffolding. Based on Blazik, the main role of scaffolding is to support the building construction work at heights and places with poor access. According to the same study, scaffolding is widely used in not only in construction sites but also other fields such as renovation works of processing lines, in shipyards, as a supporting construction of billboards, a stage, a hall and also as decoration element. Herber states that scaffolding provides facilities for workers with both a place to work and the means to reach areas that they could not access on their own. Workers can easily access their workstations using scaffolding (scaffolding here refers to any platform or ramp which makes it easier to move building materials and equipment). Scaffold safety refers to the measures and practices put in place to ensure the safety of workers who are used to support workers and materials during construction, maintenance or repair of buildings, bridges and other structure. Beside the important role of scaffolding as a temporary structure, accidents involving scaffolding accounts for a large number of injuries and deaths on the construction site.

Performing a risk assessment is an essential step in ensuring scaffold safety practices. It involves identifying potential hazards associated with scaffolding activities and evaluating the risks they pose to workers. When assessing scaffold erection and dismantle work, it is important to consider various factors to ensure the safety of workers involved in these activities. In addition, the key aspects of assessment can be evaluated from competency and training of personnel involved in scaffold erection and dismantle work for improvement of knowledge to workers as they have received proper training on scaffold assembly, disassembly and relevant safety procedures. By conducting a thorough assessment of risks and hazards for activity related to scaffold, all potential hazards and implementation of appropriate control measures should be identified to ensure the safe and efficient execution of performing scaffold at construction sites.

1.1 Background study

The company that involved for this study is a reputable construction company which specialised in the development and construction of construction of high-rise residences is a topic of significant interest and importance in the field of architecture, engineering and urban development. High rise building, typically defined as structures with multiple floors above a certain height threshold, have become increasingly prevalent in urban areas due to limited availability of land and the growing population density. A township is what property developers call a particular kind of master planned, self-contained mixed-use development where residents are given access to facilities not only for living, but for working and playing, as well. In townships, residential units are developed among corporate offices, retail shops, leisure establishments, and sometimes even schools. What makes the township's value proposition so appealing is the obvious fact that it offers convenience not usually found in traditional gated subdivisions and stand-alone high-rise condominiums.

1.2 Problem statement

The construction industry is experiencing a high number of fall-related incidents, including falls from height, which pose a significant risk to the safety and well-being of workers. Despite existing safety regulations and practices, there is a persistent problem of inadequate fall protection measures, insufficient training and lack of proper supervision on construction sites. These factors contribute to an alarming rate of accidents and injuries, leading to human suffering, loss of productivity and legal and financial consequences for construction companies. It is imperative to address this issue effectively by implementing comprehensive and robust fall prevention strategies to ensure the safety of workers and create a safety culture within construction industry.

1.3 Significance of the study

A study on scaffold use for good practice is crucial as it helps employees understand and follow guidelines to prevent accidents, falls, and injuries. Proper scaffold usage reduces the likelihood of accidents and injuries, leading to improved workplace safety and reduced costs associated with injuries, such as medical expenses and lost productivity. Knowledge of scaffold good practices enhances efficiency, reduces errors, and minimizes disruptions, leading to increased productivity. This study aims to equip employees with necessary skills, empower them for safety, and foster a sense of engagement, improving morale, job satisfaction, and overall well-being. A study on scaffold safety can improve the industry's reputation, signaling a commitment to employee well-being and safety. This boosts trust, improves relationships, and opens up business opportunities. Proper scaffold practices contribute to a safer work environment for employees.

2. Methodology

The composition of the regular research should be carried out at this stage that the goal of the investigation is not missed much and achieve the objectives. This chapter will explain the following aspect:

Fig. 1 *Data Collection Procedures*



2.1 Research instrument

A study instrument is a tool used by a researcher to obtain data and information that will serve as evidence for the study and achieving a set objective. The study has used a questionnaire in the Google Form platform as a survey tool. The purpose of using this method is to obtain more accurate sources and valid findings from respondents. A total of 50 respondents were involved in this study, involving construction workers and site employee representatives, as to obtain the necessary information and data from the construction industry that correlates with high-rise buildings.

2.2 Data analysis method

Table 1 *Likert Scale*

Scale	Score
Strongly Disagree	1
Moderately Disagree	2
Slightly Disagree	3
Moderately Agree	4
Strongly Agree	5

Data collection is defined as "a systematic approach to gathering and measuring information from various sources in order to obtain a complete and accurate picture of an area of interest." A person or organisation can assess results, predict future probability and trends, and find relevant answers by gathering data (Rouse, 2020). According to Hakim (2000), this approach is the most suitable for evaluating respondents' reports of their attitudes, motivations, and behaviours in relation to events and objects, as well as their level of understanding, perception, beliefs, views, and feelings, meanings and interpretations assigned to them. Since it enables researchers to locate and gather pertinent data to advance and finish their study, data collecting is an essential step in the research process. Different study fields will require different information, hence the approach to data collecting will vary accordingly. Therefore, all of the information was acquired to find out what the respondents thought about the hazards and risks based on scaffolding activities at a work site.

Using a Likert scale, respondents can express a neutral response or indicate how much they agree or disagree with a given proposition. It is not required of respondents to select "agree" or "disagree" in a binary manner. They are utilised to generate quantitative data for analysis in surveys with Likert scales.

2.3 Hazard Assessment (HIRARC)

This study has performed by using the Hazard Identification Risk Assessment and Risk Control (HIRARC) approach, which is a method to prevention of hazards or that can minimise accidents at construction site. Using this technique, the risk is ascertained by first identifying the sequence of work activities and then determining the source of risk. Hence, based on results of HIRARC will produce input which obtain the objectives target related to study purposes. The total of 50 workers from the Kuala Lumpur/Selangor region, according to the average sample size from previous research.

3. Results and Discussion

During the data collection process, 50 respondents were collected which has involved with site personnel of high-rise building construction to participate the study. The poll was completed by qualified respondents who are safety officers, site staff, and general worker with experience addressing safety issues in high-rise building construction projects.

3.1 Demographic

Table 2 Respondent's Profile

Classification		Frequency	Percentage %
Age	20 - 25 years old	21	34
	26 - 30 years old	30	48
	31 - 35 years old	11	18
	Above 40 years old	0	0
Gender	Male	41	67
	Female	20	33
	Single	34	55
Marital Status	Marriage	27	43
	Divorce	1	2
Education Level	Secondary School	0	0
	Diploma	26	42
	Bachelor/Master/PHD	36	58
Race	Malay	38	61
	Chinese	24	39
	Indian	0	0

Table 2 shows the frequencies and percentages of respondents' profiles, where there are four classifications which are age, gender, marital status, race, and education level of the respondent. As the table shows, there were more male respondents than female respondents.

3.2 Occupational info

Table 3 Occupational Information

Classification	Scale	Frequency	Percentage %
Working Experience	1 - 3 Years	30	49
	3 -5 Years	25	40
	5 Years Above	7	11
Working Duration	0 -8 Hour	9	15
	8 – 12 Hour	42	63
	12 Hour Above	11	18

Table 3 shows the frequencies and percentage of respondent social occupational information where there are two classifications which are working experience and working duration.

3.3 Identifying hazard

This section shows the survey of identification hazards and risks

Table 3 *Descriptive Statistics of Hazards and Risks*

Classification	Mean
Instability and structural integrity	92.5
Struck by falling object	82.5
Electrocution	52.5
Safe and unsafe access	80
Movement of mobile or rolling scaffolding (trestle)	47.5

Table 4 *Identification and Preventive Measure*

Scale	Frequency	Percent (%)
Safety signs	38	95
Inspection and maintenance	35	87.5
Fall preventives measure	31	77.5
Electrocution protection	18	45
PPE usage	36	90
Total		100

The result of study has been conducted at high-rise building projects, which in progress for residences and township development are at least able to analyse and give a proper working condition based on the survey result of analysis. The HIRARC assessment demonstrated the connection between the control measure and the hazard.

4.0 Conclusion and recommendation

Through indirect contributions, this project helps improve scaffold safety and lower scaffold-related accidents. Because of this, scaffolds may turn out to be a safe tool or equipment to operate on if construction companies prioritised safety over profit and provided things like personal protection equipment and training programmes for workers on the job site. The quality of the building that we do locally will improve if we can stop unsafe acts and unsafe condition. In order to reduce the incidence of accidents on construction sites and maximise worker safety, this initiative may help to build a safe scaffolding environment.

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