

Construction site safety in malaysia



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The coverage of the construction industry is very wide-ranging; it consists of residential construction, commercial building construction, heavy engineering construction, civil engineering, industrial construction and infrastructure.

Construction site is considered to be the most hazardous working place. In the construction site, safety and quality are always concerns by the people. In the recent years, construction industry is facing environmental problem due to the pollution and the hazards mostly establish by the construction activities.

In Malaysia, the construction industry is acknowledge generating the country development and also improves the country economic. The frequencies of site accidents and property damage which create a great impact to the construction organization. During construction period, when happening of accidents and injuries or deaths of workers will cause delays to the construction project. The delay of the project directly and indirectly will incur the cost. As a result, all the construction organization must provide a good and safe working environment for the workers.

1.3 Background

Working in the construction site is very dangerous. Most of the accidents happen in construction site are caused by lack of training, carelessness, communication problem and not following basic safety rule during working in the site. The company need to comply with any requirements in addition to any security policy is to create them to meet federal, state and local laws. Safety policy and regulations are use to train the construction worker for safety practices and to warning about hazards on the site during

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construction period. Nowadays, construction site accidents became serious and known is an important to the organization involved. Most of the construction activity is difficult, dangerous, dirty, and considered as dangerous occupations compared with other type of industries. Most of the construction workers need to work in adverse conditions during rain, heat, dust, noise and at night. Some of the construction site accident happen is obvious work with the heavy machinery and scaffolding high above from the ground level. The most serious accidents happen are resulting in injuries and death. The machinery need to be seriously handle and timely monitoring as it may affect the organization in high cost to repair and maintenance the machinery. Beside that the construction company will become bad reputation and need to pay for medical treatment for the construction workers that involved in accident during construction period. When an accident happens, it should be immediate report to the office of Safety and Health department to ensure that the suitability action could be taken by the relevant organization. For the inspection also need to be taken to identify the factors which cause the accident and the way to prevent it from happen again in the future. Construction worker need to report any injuries or accidents to their supervisors or Safety and Health Department.

1. 4 Problem Statement

Site accident is one of the significant and key issues that seriously happen in the construction site that control its daily operation using machineries at the construction site. The numbers of site accident occurred each year at the construction site and also increasing from every year resulted in variable cost items of the project. If the construction company no way taken for

prevention, it can become more serious and bad reputation to the construction company.

1.5 Aim and Objective

To study the site safety in construction site during the construction period

In the scope of this research, it contains the following objectives:

- To analysis of type of accident occurrence and causes of accident in the Malaysia construction site
- To study safety management and hazard in Malaysia construction site
- To identify the duties of various party of the site safety in construction site

Research Methodology

- A study on site safety in Malaysia construction site
- To study safety management and hazard in Malaysia construction site
- To identify the duties of various party of the site safety in construction site
- To analysis of type of accident occurrence and causes of accident in the Malaysia construction site

Stage 1

Literature Reviews

(Secondary source)

Stage 2

Technique of Data Collection

(Primary source, Questionnaires)

Stage 3

The Result of Analysis and Findings

A case study about the fire protection system in commercial building

A set of question will be distribute to the commercial building's users to dertermine their knowledge about fire safety

An interview would be carry out to the fire safety professional

Stage 4

Conclusion and Recommendation

Before conducting this assignment, an appropriate method to get the information is determined.

Interview

We also carry out interview to achieve our research goal. This is reason because it takes place with interviewees known to have been involved on the previous experience on the site safety in construction site in Malaysia. However, it needed to focus on the interviewers that have experiences regarding the site safety. The interview will be carried out face-to-face with 1-10 consultants who having previous experiences of this site safety in construction site. The data collected of interview will be summary and comprise in appendix of my dissertation.

Questionnaires

The general research approach is based on questionnaires. This is chosen because it will enhance the knowledge for my research topic. The questionnaires will be given out to 1-15 respondents who are the contractor, supervisor, etc that involve in the site safety in construction site. Besides that, this is an effective alternative to interviews because it is enabling to increase the information in my research.

Literature Review

A literature review is a critical and in depth evaluation of previous research. The main purposes of applying literature review method in my research are to achieve my goal and to convey the knowledge and ideas have been established with regarding to my topic. The literature review serves to demonstrate and more understanding and knowledge of theoretical and research issues related to my topic. Related literature refers to writing in publication such as books, journals, magazines, articles, newspaper and finding information on the internet. Furthermore, literature review helps and guide me to discovered more knowledge and helpful in my research.

Case Study

Case study consists of a detailed investigation, often with data collected over a period of time, of phenomena, within the context. This method is useful for trying to test theoretical models by using them in real world situations.

Basically, a case study is an in depth study of particular situation rather than a statistical survey. The case study is also useful for testing whether scientific theories and models actually work in the real world. Furthermore, I will plan and design how I am going to address the study and make sure that

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all collected data is relevant to my research topic which is site safety in construction site.

1. 7 Scope & limitation of study

This study focuses on site safety in a Malaysian construction site. On the primary research, I will focus on the case study of according to my objectives which are review the history of accident and study safety management in construction site, and literature review of types of accident and hazard in construction site, duties of various party of the site safety in construction site. For my secondary research, I will do a questionnaire to TAR college SOT lecturers and Construction Company (related to site safety on construction site) in Kuala Lumpur only.

The scope of this study is many types; there is literature review due to the quantity of published journals, article, textbooks and the information on the internet so that can find out the information according to my objectives within the limited time frame. Besides that, the construction company which related to site safety in construction site in Malaysia need to get permission so that can go there to visit and get the information about site safety in construction site.

2. 0 LITERATURE REVIEW

2. 1 Introduction

The construction site involves a lot of operations which may be dangerous, risky and unhealthy. The number of injuries, accident, and work related illness will contribute to additional costs and delays on projects. Construction site is the most dangerous and hazardous compare with other type of industry. Nowadays, site accident is keep happened in construction site and <https://assignbuster.com/construction-site-safety-in-malaysia/>

the accident percentage is kept rising every year. When accident happens in construction site it will cause the project delay and loss of project cost.

In this chapter will discuss about the review accident occurrence and safety management in Malaysia construction site. Site safety is very important because when accident happen on construction site not only people injury and also will affect the project in term of cost and time.

2. 2 Type of accidents occurrence in Malaysia construction site

Site accident is an unplanned, unexpected and uncontrollable occurrence, which results in injury or death to the construction workers damage the equipment. All accidents, regardless of the damage or loss of the nature, should be concerned about. The accidents that not result damage to materials or equipment or injury to worker may presage future of unexpected accidents.

Although site accident could not totally prevent from happening but still need to find the way to minimize the rate of accident by providing a safe working conditions and insisting on the use of safe working methods and procedures.

In Malaysia, the number of accident occurring at the construction site is keep increasing every year due to the unpredictable reported. So the site accident has captured the attention and concern from the relevant organization. The table 1 show in below is the summary of major accident happen in Malaysia construction site.

2005

2006

2007

2008

1) Tower crane broke into two and fell

onto four Indonesian construction workers at a construction site building apartment located at Batu 14, Puchong.

1) Landslide occurred at a construction site located at Taman Desa, Kuala Lumpur buried; killed a 35 year old Indonesian man at about 3. 30pm while he was working on some iron steel beam foundations for the five block 609 units' condominium complexes.

1) Death of two workers and severe injuries on ten workers at The Pavillion Kuala Lumpur, Jalan Bukit Bintang construction site where the cables of the workmen's lift at the posh condominium and shopping complex project snapped and plummeted 15 metres to the ground.

1) Two Malaysian construction workers were buried alive by excavated sand pile in a 3. 6m-deep sewer trench at Taman Merbau phase two construction site in Changlun

2) Iron mould weighing almost two tonnes fell from 20 storey condominiums under construction onto Dr. Liew Boon Horng's BMW; killed him and severely injured his wife and the driver at Plaza Damas located along Jalan Hartamas.

2) Negligence of three construction companies, led to the death of another Indonesian worker on 15 May 2006 located at Lot 206, Section 63, Lorong Binjai where a 32-storey of 100 units apartment was to be built.

2) Death of two Malaysian construction workers, buried alive four meters deep in a landslide while working on the fencing located at Taman Merbau 2, Fasa III at Kubang, Pasu.

2) Twenty five foreign workers escaped without major injuries when the structure they were standing gave way in one of the construction sites in Kuching.

3) Two sides collapsed of a bridge that was under construction at 3. 2 kilometers of the Klang Valley Highway that caused the death of two Bangladesh workers.

3) One foreign construction site worker died; another colleague severely injured at the construction site of the prestigious KK Times Square commercial complex after piles of sand fell on them in Kota Kinabalu.

4) Three Indonesian construction workers fell from scaffolding to their deaths when they slipped from the top floor of a 21-storey condominium under construction and landed on the fifth floor at Taman Tampoi Indah

5) Bricks fell from the construction site in Taman Bukit Angkasa, Kerinchi on several cars parked at the nearby flats during a threehour downpour

6) Eight huge concrete beams with a measurement of at least 40m long and 70 tonnes weight of an uncompleted flyover near Nilai collapsed, which narrowly missed a motorist and his aged parents

In the construction site, it can be said that there are many different types of accidents occurred at the construction sites everyday during the construction period. The types of accident in construction site, which are scaffolding, fall of people, struck by falling objects and so on. The Department of Occupational Safety and Health Ministry of Human Resources find out the rise of accident occurring almost every month in the year 2007 and 2008.

Falling of people

Falling of people also is the one of higher percentage happening accidents in the construction site. People working in the construction site has the risk exposed to fall in any place of the site especially at the high level. Most of the worker fall from the higher level mostly resulted in death. The type of accident is always happen in construction which is fall from scaffolding.

Causes

The people who falling from the higher level because lack of safety measure at the construction site. The workers will not be protected by safety measure when accident occurs.

According to the Vincent G. Bush in his " Safety in the Construction Industry: OSHA", an incident can result in an accident if fright makes a man take

unsafe action. For an example, if one scaffold rope fails, the man may be saved if he just hangs on. The other common causes are:

Improper netting for scaffolding cause workers falls from the scaffold.

The used of timber ladder is in poor condition. The ladder may broken and cause the worker fall down

The ladder is not securely fixed to prevent against slipping and slide movement.

Inadequate lighting during construction of basement had caused many falling of construction workers.

Cases

Cases 1

<http://cdn.theborneopost.com/newsimages/A2537.jpg>

Source: Borneo Post Online December 29, 2011, Thursday

Construction site

Kuching

Event

The workers body injury after falling down from the scaffolding . The accident happened at around 4pm when his colleague foot support him was standing on suddenly broke, causing him fall to the ground.

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Consequences:

A construction worker was killed.

2. 2. 3 Prevention

For the prevention of fall of people, there are two areas that must be emphasized during construction period. The two areas are:

Scaffold protection

Every construction worker on a scaffold more than 2 meter above a lower level must be protected from falling to that level; workers on a walkway situated within a scaffold must be protected by the use of a personal fall arrest system or guardrail system. It is important for those workers performing plastering and painting operation for using the scaffold. The guardrail system must be installed along all open sides and end of platforms, and they must be installed completely before the scaffold use by workers.

Safety net

The safety net must be provided when the workplaces are more than 25 ft above the surface where the use, scaffold, catch platforms, temporary floors and so on. The safety net is required, shall not operate until the net is in place and has been tested. The safety net must extend about 8 ft outside the edge of the work.

The employer should provide a safety training program for every worker who might be exposed to fall hazards. The safety training must let every worker to be familiar the hazards of falling order to minimize these hazards. So that

employer must assure that every construction worker been trained. Some critical hazard areas at the high-rise building construction like lift shaft and edge of the structure must also provide with a proper guardrail system.

2.3 Struck by falling objects

It can be said that the events of struck by falling objects are quite same with the fall of people. The only thing different is falling objects may not necessary cause injured or fatality. Whereas, in fall of people it definitely caused injury or fatal of people.

Causes

Not proper netting for the scaffolding. Some workers may not hold the tools and equipment properly during superstructure work and cause the tools and equipment fall out from the netting.

Falling of scaffolding components during the erection and dismantling.

Not carry the work the proper manner. For instance, the workers throw the rubbish directly from the edge of the building at the high level as shown in Appendix.

Material fall during handling by the crane due to improper stacking

The too heavy load to carry in the handling will cause the broken of rope, where the rope is not able to withstand the loading. Thus falling of material occur.

The ropes used in the handling not securely tied are always cause the material fall during the operation.

2. 3. 5 Causes of Accident

Accident don't just happen, they are caused. According to Ridley 99 per cent of the accident are caused by either unsafe acts or unsafe conditions or both (Ridley, 1986). As such, accidents could be prevented. The unsafe act is a violation of an accepted safe procedure which could permit the occurrence of an accident. The unsafe condition is a hazardous physical condition or circumstances which could directly permit the occurrence of an accident. Most accident results from a combination of contributing causes and one or more unsafe acts and unsafe condition. Accident theories and models discussed in the previous section have evolved from merely blaming workers, conditions, machineries into management roles and responsibilities. Nowadays, accident models are being used to better explain the causes of accident so that appropriate actions could be taken to make improvement. However, in order to effect permanent improvement, we must deal with the root causes of accident. A review of the literature indicates that finding the factors and causes that influence construction accidents has been the passion of many researchers. Kartam and Bouz (1998) did a study in Kuwaiti construction and noted that the causes of accidents were due to worker turnover and false acts; inadequate safety performance; improper cleaning and unusable materials; destiny; low tool maintenance; supervisory fault; and misplacing objects. Abdelhamid and Everett (2000) conducted a more comprehensive study in the USA and classified the causes into human and physical factors. Human factors were due failed to secure and warn; Failed to wear personal protective equipment (PPE); horseplay; operating equipment without authority; operating at unsafe speed; personal factor; remove safety device; serviced moving and energized equipment; took unsafe position or

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posture; used defective tool or equipment; and other unsafe action. While, physical factors were due to; unsafe act of another person(s); disregard known prescribed procedures; defects of accident source; dress or apparel hazard; environmental hazard; fire hazard; hazardous arrangement; hazardous method; housekeeping hazard; improper assignment of personnel; inadequately guarded; public hazard; and other unsafe conditions.

Lubega et al (2000) did a study in Uganda and concluded the causes of accidents were mainly due to lack of awareness of safety regulations; lack of enforcement of safety regulations; poor regard for safety by people involved in construction projects; engaging incompetent personnel; non-vibrant professionalism; mechanical failure of construction machinery/equipment; physical and emotional stress; and chemical impairment. Pipitsupaphol and Watanabe (2000) did a study in Thailand construction sites and classified the causes into the most influential factors i. e. unique nature of the industry; job site conditions; unsafe equipment; unsafe methods; human elements; and management factors. They further concluded that major immediate causes were due to failure to use personal protective equipment; improper loading or placement of equipment or supplies; failure to warn co-workers or to secure equipment; and improper use of equipment.

Toole (2002) also did a study in the USA and suggested that the causes of accidents were due to lack of proper training; deficient enforcement of safety; safety equipment not provided; unsafe methods or sequencing; unsafe site conditions; not using provided safety equipment; poor attitude toward safety; and isolated and sudden deviation from prescribed behavior.

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Tam et al (2004) did a study in China and noticed that the causes of accidents were due poor safety awareness from top leaders; lack of training; poor safety awareness of project managers; reluctance to input resources for safety; reckless operation; lack of certified skill labor; poor equipment; lack of first aid measures; lack of rigorous enforcement of safety regulation; lack of organizational commitment; low education level of workers; poor safety conscientiousness of workers; lack of personal protective equipment (PPE); ineffective operation of safety regulation; lack of technical guidance; lack of strict operational procedures; lack of experienced project managers; shortfall of safety regulations; lack of protection in material transportation; lack of protection in material storage; lack of teamwork spirits; excessive overtime work for labor; shortage of safety management manual; lack of innovative technology; and poor information flow.

2. 3. 1 Accident Causation Models

The accident causality model is not a new model to determine the root causes of safety problems in the construction and other industries. The accident causation model is a tool that providing better industrial accident prevention program. As described by Heinrich (1980) accident prevention is an integral program, a series of coordinate activities, directed to the control of unsafe personal performance and unsafe mechanical conditions, and based on certain knowledge, attitudes, and abilities. The famous models that were developed that relate to accident causation are namely domino theory that was invented by Heinrich in 1930 and multiple causation theory that was developed by Petersen in 1971.

2. 3. 4 Human Error Theories

The practice of this theory is pointed out that the worker as a major factor in the accident. This theory as mentioned by Abdelhamid (2000) studies the tendency of humans to make mistake in a variety of conditions and circumstances, with the blame mostly fall on human characteristics. This theory does not mean to blame the workers as the main problem for accident, other factors such as workplace design and tasks without considering the limitation of the worker as the reason why accident happened in construction site. The objective of human error theory is to establish a good design of workplace, tasks, and tools that suitable with human limitation. The theory is that it comes to human error theory, which is a model of patterns of behavior and human factors. Most of these theories describe that the human (worker) is the main problem caused an accident happen, which is permanent feature of human and human capacity overload and human conditions that often make mistake.

2. 4 Root Causes of Accident

The root causes mean the main causes of accident happen in the construction site. There are some roots causes of accident happen in the construction site. The causes of accident can separate in 4 parts, which are:

1. People's role
2. Organization and management
3. Nature of construction industry
4. Material and Equipment

2. 4. 1 People's Role

2. 4. 1. 1 Worker Attitude and Behaviour

One of the roots causes of an accident is the poor attitude and bad behaviour of the workers which difficult to control (Teo et al., 2005). The original manual workers in the industrialization of agriculture, and reduce the risk of awareness with the construction industry. Furthermore, most of the workers are low educated. Most of them are only concern with the contract wages than importance of personal safety. This negative attitude and behaviour have stimulated most workers not to use the personal protective equipment during working on construction site. The reason of not putting their protective equipments is inconvenient for their operation. Rasmussen (1997) identified that 70%-80% of accidents happened arise from worker attitude and behaviour.

2. 4. 1. 2 Worker Attitude and Behaviour

Previous studied have pointed out that the designer play an important role in determined causation of an accident (Gibb, (1999, 2001); McKay et al., 2002; Loughborough University & UMIST, 2003; Wright et al., 2003). The accident was mainly due to the widespread use of manual handling. As a result, it introduces a lot of manual handling hazards. For examples, cast in-situ method.

Furthermore, the design complexity has dedicated to the causation of accident. The design complexity is referring to the intricate aesthetic qualities. Base on Loughborough University and UMIST (2003) studied, the

more complexity of design tend to have a greater potential to influence accident occurrence in workplace.

2. 4. 2 Organization and Management

2. 4. 2. 1 Poor Management Commitment

After the Health and Safety Executive (HSE), (2009b) conducted a survey, the result shown 75% of all fatal accidents in the building and civil engineering industries in the United Kingdom are caused by the ineffective of management. Nowadays, the contractor is more reliance on the insurance, contractor tends to passed most of the damages and liability to insurance company (Lingard H, Rowlinson S, 1997). As a result, contractor may not provide appropriate training and focus on workplace safety and health issues. The workers involved in site activities may not be aware of the danger zone.

In some cases, safety and health officers are threatened by their employer no to report an accident to Department Safety and Health (DOSH, 2011). Many accidents do not report because the project manager is trying to cover up their own fault and protect company image. Normally, the safety management process require site supervisor to carry out on-site inspection and prepare a number of safety and health checklist.

However, many contractors only put in commitments on paper, act differently in the site (Ding et al., 2000). For examples, the OSHA 1994 personnel protective equipments record in Malaysia.

2. 4. 2. 2 Poor Communication and Coordination

In the construction site, the effective communication and information transfer between management and staff are the effective way to reduce the number of accidents.

However, there are many site workers came from foreign country. Some of the workforce does not speak and understand native language. As a result, the safety committee need to convey the danger zone and potential accidents may occur on the site.

Furthermore, Debrah YA, Ofori G (2001), the large number of involvement of sub-contractor, the possibility of accidents occurrence is increase as well. It is because going to increase the complexity in coordinate and control among the sub-contractor. Besides that, the main contractor may shift the safety responsibility toward sub-contractor without ensure the sub-contractor is capable to provide the safety workplace (Wilson, Kohen E, 2000).

2. 4. 2. 3 Company Size

The company size has determined the implementation of safety and health within an organization. The big company has more budget and systematic system in allocation of resources for each department. As a result, the safety and health department have sufficient resources to implement and promote the importance of safety and health at the construction site. Unfortunately, the small company has limited and lack of budgets to implement the effective safety and health approaches within the construction site (Abel Pinto et al., 2001). For examples, a small contractor company cannot afford to provide a set of standard safety equipments for every workforce. A

studied by McVittie et al. (1997) indicated that accident rates decrease as the sizes of firms increase.

2. 4. 2. 4 Poor Organization Safety Culture

The contractor fails to introduce the culture of safety among the members of the organization. The safety organization chart setup due to the purposes of the law require by the government. However, the safety and health officer does not have mandatory requirement for autonomy in the workplace (Construction Research Institute of Malaysia (CREAM)). It is because some of the safety officer is employee for the contractor and developer.

The researchers Diaz and Cabrera (1997) pointed out that an organizational climate is built up through the interaction of organizational factor and individual factors. Many studies had conducted (Coyle, Sleeman, & Adams, 1995; Diaz and Cabrera, 1997; Felknor, 1997; Krispin, 1997; Seppala, 1992) the lower the score of a safety climate, the worst the safety performance. It is because the members within an organizational will never pay attention to the safety and health level. Beck & Woolfson (1999), emphasize that it is important in control workforce beliefs, attitude and behaviours with regard to safety. As a result, poor organization safety culture is one of the roots causes lead to the occurrence of an accident.

2. 4. 3 Nature of Construction Industry

2. 4. 3. 1 Economic and Time Pressure

Economic and time pressure had come from the high demand in property market (Abel Pinto et al., 2001). The developer required contractor to complete a construction project within a short period of time. In order to

complete the project on time, the contractors relax rules and procedure for safety and health. For example, carry out reckless operations. Furthermore, the workforce is required to work overtime. It is easy to cause the accident due to the fatigue of worker (Haslam et al., 2005).

2. 4. 3. 2 Constantly Changing Worksite

The construction industry is not same to others type industry. For the manufacture industry, the workers repeat and control the machine every day. However, construction industry involves the movement of manual workers in the workplace (Abel Pinto et al., 2009). The more movement in the site, the possibilities of accident will be keep increasing.

2. 4. 3. 3 Site Restriction

A restricted site has implied insufficient space on site. Thus, there is limited space for machine, plant and storage of building material. The restricted site will have been introduced as an unexpected persistent cause of accidents (Gibb, (1999, 2001); McKay et al., 2002; Loughborough University & UMIST, 2003; Wright et al., 2003). A congested site condition not only implied of dual processing of work. However, it causes an accident as a result of a worker struck by a moving vehicle (HSE, 2009b).

2. 4. 3. 4 Worker Specialization

Every construction project is involved structural, architectural, brick wall, M&E and plumbing work. Each kind of