



**JOURNAL OF TOURISM,
HOSPITALITY AND
ENVIRONMENT MANAGEMENT
(JTthem)**
www.jthem.com



A PRELIMINARY SURVEY ON SAFETY PRACTICES AT CONSTRUCTION SITE: TOWARDS SAFE ENVIRONMENT FOR PUBLIC

Nurul Ain Shuhada Azil^{1*}, Izatul Laili Jabar²

^{1,2} Centre of Postgraduate Studies, Universiti Teknologi Mara, 40450 Shah Alam, Selangor, Malaysia.
Email: shuhadaazil4596@gmail.com, izatul_laili@uitm.edu.my

* Corresponding Author

Article Info:

Article history:

Received date: 01.10.2021

Revised date: 01.11.2021

Accepted date: 15.11.2021

Published date: 01.12.2021

To cite this document:

Azil, N. A. S., & Jabar, I. L. (2021). A Preliminary Survey On Safety Practices At Construction Site: Towards Safe Environment For Public. *Journal of Tourism Hospitality and Environment Management*, 6 (26), 300-310.

DOI: 10.35631/JTthem.626027.

This work is licensed under [CC BY 4.0](https://creativecommons.org/licenses/by/4.0/)



Abstract:

The construction industry is globally known as one of the most hazardous workplaces. Companies in the construction sector are undeniably often focused on completing projects on time, which results in tight work schedules and increases the risks of regular construction site activities, especially for the public who lives in the area. Inadequate rules and regulations in public safety and construction sites not practicing the safety practices to protect the public from harm are potential to cause public accidents to happen. Additionally, little improvement in safety practices at the construction sites and lack of awareness in implementing proper safety practices at a construction site could cause the increasing the rate of public accidents too. This study merely aims to explore the safety practices to be implemented at a construction site in a way to prevent public accidents from occurring. In order to achieve the aim, this study has two (2) objectives; 1: to determine the experience in handling accident cases involving the public at a construction site, and, objective 2: to explore the safety practices to be implemented at the construction site. For this preliminary survey, the qualitative research design was selected and the total number of five (5) professional individuals specialized in safety and health in construction sites were chosen as interviewees based on their experiences in handling public safety issues in construction sites. The results show the most recommended safety practices that need to be implemented which is barricade all entrances and exits of the construction site to prevent access from the public. This study provides good insights to the Department of Occupational Safety and Health (DOSH), National Institute of Occupational Safety and Health (NIOSH), and Construction Industry Development Board (CIDB) in identifying the need for safety practices to prevent public accidents at the construction site in congested urban areas.

Keywords:

Safety Practices, Public Safety, Construction Site, Construction Accidents

Introduction

Since the 1980s, the advancement of the construction sector in Malaysia has contributed significantly to the country's employment and development targets. Furthermore, the construction building design itself contains architectural, structural, electrical, and mechanical activities that are exposed to workplace dangers, resulting in a significant risk of accidents that impact public (Gharamanzadeh, 2014). Despite the fact that completion of construction sites has a direct positive impact on the growth of national and local economies as well as humans' wellbeing, construction sites generate serious environmental nuisances for the adjacent residents and have unintentional adverse impacts on their surrounding environment. This includes impacts on the public community lives nearby the construction sites (Celik, Kamali, & Arayici, 2017). In essence, public safety holds a reference to the protection of people at large aspects (Young, Smithson, Hernandez, & Hamilton, 2011).

According to Collier (2018), constructions site is a hazardous for public because it is a place for large pieces of machinery, heavy objects, and moving vehicles. There were many issues in public safety in relation with safety practices such as lack of information in public safety guidelines and regulations in construction industry. Regulations from Department of Occupational Safety and Health (DOSH) are only mentioning safety and health to public individuals who are involved in construction sites, such as stakeholder. Public safety, on the other hand, is typically considered secondary and takes a back seat in constructions. Numerous organizations may not have comprehensive accident prevention strategies in place, preferring instead to focus on increasing profits (Shamsuddin, Ani, Ismail, & Ibrahim, 2015) which indicates that construction site is not following the public safety practices to protect public from harms. According to Rosli (2021), contractor and management of construction company should not hesitate to spend more cost on upgrading and improving safety requirements at construction sites. Construction sites for road and highways are tremendously different compared to building construction sites because it is involved public, therefore, it is a must to upgrade and improve safety at construction sites (Hua, 2021). The significant cause to weak safety practices at construction sites was found which is lack of understanding in safety practices, including dislike of wearing Personal Protective Equipment (PPE) (Vitharana, Silva, & Silva, 2015). As stated by Ponnusamy (2019) regarding awareness in safety practices, lack of general safety awareness in working environment subject to meet the failure and causing an accident or incident. Yet, up until today, these issues on public safety at construction site are still continuing.

Therefore, this preliminary survey merely aims to explore the safety practices to be implemented at construction site in way to prevent public accidents occurring. This paper looks forward in appraising the theory of public safety and safety practices at construction sites for a better understanding. This study concludes in analyzing on the need of safety practices for public safety at construction sites.

Literature Review

Safety Practices at Construction Site in Relation to Public Safety

With Malaysia's rapid industrialization and urbanization, the construction sector has become one of the most important industries that has greatly contributed to the country (Taofeeq, Adeleke, & Hassan, 2019). According to the investigation conducted by Yi, Shunjiang and Wenguo (2017), public safety is regarded as a core capability of protecting life and safeguarding property for the public while maintaining economic development at construction site. In order to build a well-off society that is powerful in science and technology, it is urgent to improve public safety at all levels and to carry out research on a public-safety science and technology development strategy (Yi, Shunjiang, & Wenguo, 2017). On the other hand, Infrastructure Health and Safety Association (IHSA) (2020), described safety practices as standard procedures that outline how to complete a task with the least amount of risk to people, equipment, materials, environments, and processes. Therefore, the researcher clarifies this preliminary survey is focusing on people who are not supposed to be in construction site areas and 'public safety' is mentioning to protect them from any harms comes from construction sites. Public safety is the dedicated responsibility of construction organizations to protect innocent people from any kinds of hazards and threats at construction sites by improving and implementing proper safety practices at workplace.

According to OSHA (2016), the best safety practices represent the principles and approaches to implement a safety and health for the entire construction sites. By following the safety practices, construction site can be a safe and efficient place for workers and public. The suggested safety practices are never be enough, the individuals in construction site are always have to take considerations to protect themselves and also public community (West, 2017). The

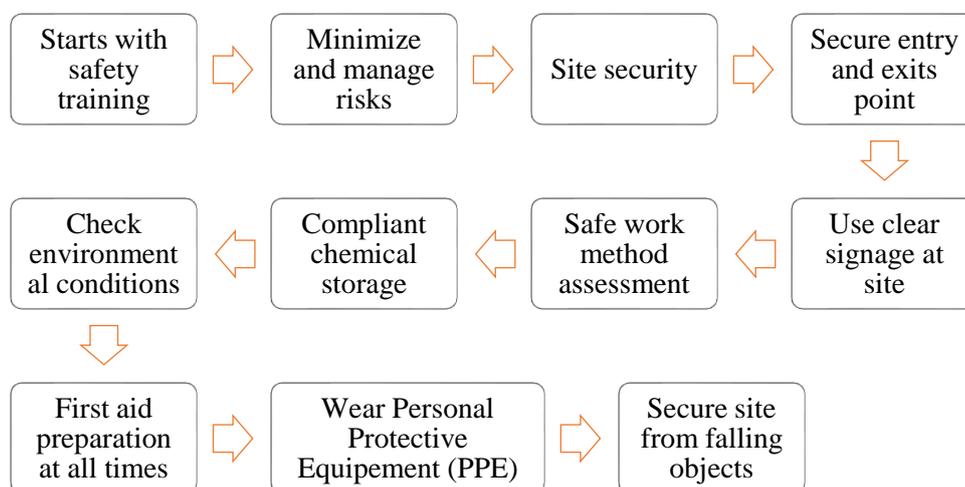


Diagram 1 below indicates the best safety practices at construction site stated by Astralla (2016):

Diagram 1: Best Safety Practices at Construction Site

Source: (Astralla, 2021)

According to Diagram 1, all workers must undergo safety training before commence on work-sites. Every worker must undergo site-specific induction training to identify potential high-risk situations and deliver emergency preparedness instruction for public safety. It is nearly impossible to remove all safety issues due to the nature of construction activities. Several basic safety issues, on the other hand, may be prevented by performing regular safety audits and put in place appropriate systems to report, analyze, and resolve potential hazards. Site access restrictions should be implemented for more than just protecting equipment from damages. To safeguard the public from potential construction risks, security is essential both during and outside of regular working hours. Contractors will also be protected from liability and negligence in the event of a safety incident or security breach if companies strictly follow security and safety procedures. To improve public safety at high-traffic areas, separated entry and exit points for heavy machinery and vehicles should be created.

All safety procedures, including a 24-hour emergency contact number and a map or directions to the site office, should be clearly placed on the construction site's board. For public reference, visible signage must highlight site facilities, access and exit routes, and first aid or emergency fire equipment. Before work commences on any high-risk construction project, a safe work method statement (SWMS) must be developed. The SWMS must include information about the scope of work, any possible safety issues, and how risks will be avoided and managed. Construction work cannot begin unless the SWMS criteria were met, according to the legislation.

Chemicals must be kept with caution on construction sites to avoid fires, explosions, asphyxiation, chemical damage, and pollution. To segregate chemicals and prevent spillage, use high-quality, compliant outdoor storage systems such as explosive storage cabinets. These strategies make a significant contribution to the protection of the public from damage. Extreme weather conditions can put people's lives at jeopardy. In the case of a natural disaster, extreme environmental conditions, or other emergency, an on-site emergency plan should provide clear instructions for personnel who need to stop working.

It is recommended practice in the construction sector to have one first aid officer for every 25 workers. On-site first-aid kits and equipment must be kept in an immediately accessible position. If an incident or injury occurs involving workers or the public, having a first aid kit on hand will help until the emergency team arrives. In many contexts, an employer is obliged to supply Personal Protective Equipment (PPE) to construction site personnel, such as safety vests, safety goggles, and safety harnesses. Working in proper PPE helps to reduce the risks that may arise while starting a project.

The most frequent incidents that occur at construction sites these days are falling objects and public contact. Roof trusses, crane structures, and steel beams are examples of huge objects that often fall, whereas fasteners and small hand tools are examples of small objects. This incident might have been avoided if the work areas had been fenced off and catch nets installed where fall objects poses a danger.

Rules and Regulations for Public Safety in Malaysia

Table 1 below indicated the rules and regulations for Public Safety in Malaysia:

Table 1: Rules and Regulations for Public Safety in Malaysia

Occupational Safety and Health Act (OSHA) 1994	Department of Occupational Safety and Health (DOSH)	National Institute Occupational Safety and Health (NIOSH)	Construction Industry Development Board (CIDB)
<p>The safety and health system is based on the value of evaluating the risks and handling them reasonably, encouraging the employers to stress their energy and resources more on the significant hazards that can cause harm. The main principles of this Act are self-regulation, consultation, and cooperation between employers and employees (DOSH, 2006).</p> <p>The objectives of OSHA 1994 are to secure the safety, health and welfare of persons at work against risks, to protect persons at a place of work other than persons at work against risks, to encourage an occupational environment for individuals at work.</p>	<p>This department is responsible for ensuring the safety, health and welfare of people at work as well as protecting public from the safety and health hazards arising from the activities sectors.</p> <p>As stated by DOSH (2006), this department is responsible for the administration and enforcement of legislations related to occupational safety and health of the country, with a vision of becoming an organization which leads the nation in creating a safe and healthy work culture that contributes towards enhancing the quality of working life.</p> <p>‘Public’ defined by DOSH are mentioned to individuals who are involved directly in construction sites, such as stakeholders.</p>	<p>NIOSH Malaysia conducts regular Occupational Safety and Health-related training around the country. As the “training arm” of the Department of Occupational Safety and Health (DOSH), International Medical Health Organization (IMHO), the courses offered by NIOSH is recognized.</p> <p>In addition, NIOSH is providing training to public in term of several competencies such Site Safety Supervisor, Safety & Health Officer, Authorize Gas Tester, and others (Jamalullah, Rashid, Hanafi, Ulang, Riazi, & Nawi, 2018).</p>	<p>The CIDB is a body corporate which was created by the “Akta Lembaga Pembangunan Industri Pembinaan Malaysia 1994”. Its mission is to change the Malaysian Construction Industry in line with an idea to be a reliable organization in evolving a World Class Construction Industry (Jamalullah, Rashid, Hanafi, Ulang, Riazi, & Nawi, 2018).</p> <p>As mentioned by CIDB in Construction Industry Standard, CIS 27:2019, the contractor must provide, install and sustain the perimeter hoarding to ensure the protection for public. Scaffolding works must comply with regulations. Work platform and catch platform must be under supervision of qualified individual. Sectioning of all work areas and availability of public safety and protective controls when work is carried out beyond the hoarded up areas.</p>

According to Table 1 above, it indicates that there are lacking information in public safety rules and regulations at construction sites. The only agency which focusing on public safety at construction sites in Malaysia is Construction Industry Development Board (CIDB) which mentioning the contractor must provide, install and sustain the perimeter hoarding to ensure the protection for public. Other than that, scaffolding works must comply with regulations. Work platform and catch platform must be under supervision of qualified individual and also sectioning of all work areas and availability of public safety and protective controls when work is carried out beyond the hoarded up areas. This shows that CIDB are greatly put an action to reduce public accidents at construction sites.

On the other hand, OSHA 1994 mentioning on duties and responsibilities for employers and employees at construction sites for safety of workers. The researcher clarifies that OSHA helps in controlling public accidents at construction sites if both employers and employees strongly understand and follows their duties and responsibilities for a safe workplace.

Meanwhile, Department of Occupational Safety and Health (DOSH) is a department under the Ministry of Human Resources which responsible in safety, health and welfare of people at work as well as protecting public from the safety and health hazards arising from the activities sectors. But, 'Public' defined by DOSH are mentioned to individuals who are involved directly in construction sites, such as stakeholders which shows that there is lacking information in public safety rules and regulations in Malaysian construction industry.

Methodology

This research undertakes a preliminary survey as primary data collection using semi-structured interviews to obtain the real situation in safety practices related with public safety at construction site. For secondary data, this research uses a various references of previous studies, websites, conference proceedings, articles and journals in related of the theme of this study to attain a better knowledge and understanding regarding safety practices and public safety at construction sites. This preliminary survey employs qualitative method which is by conducting a semi-structured interview which undertaken at a different construction sites and involving one (1) representative from each case study. The investigation deals principally on the current safety practices at construction sites in protecting public from harms. The use of a case study data collection is important as it facilitates the data and answer to the inquiries.

This preliminary survey covered five (5) different construction sites in Klang Valley area which involving one (1) representative from each case study such as Site Safety Supervisor (SSS) and Site Supervisor for data collection. Diagram 2 below indicates the flow of methodology of this preliminary survey.

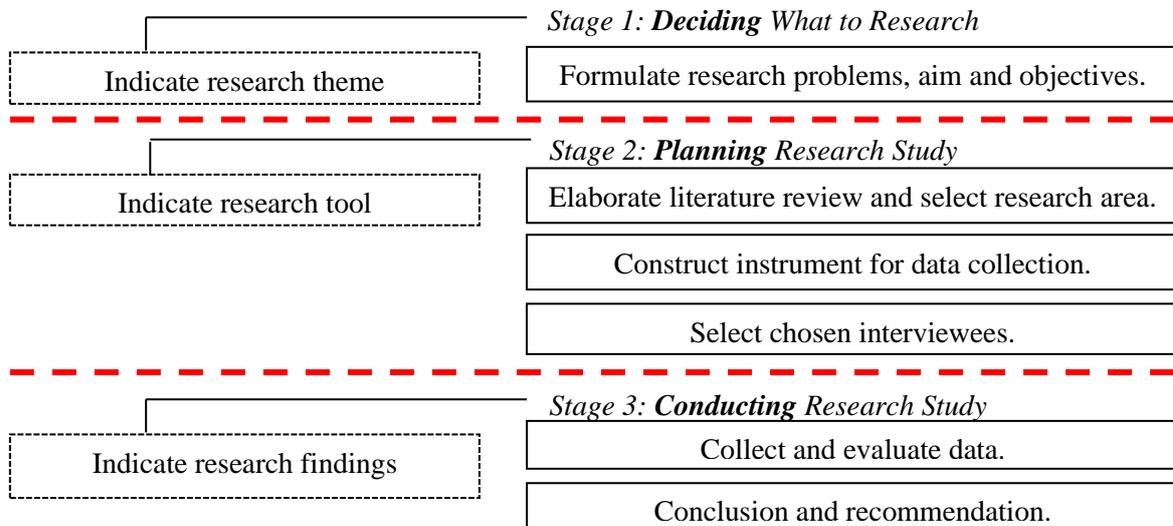


Diagram 2: Flowchart of Methodology for Preliminary Study

There are three (3) stages overall which explained the details flow from deciding what to research until conducting the study. Stage 1 explained on researcher deciding what to research by focusing on problem statement, objectives and aim of this study. For Stage 2, researcher plans this preliminary survey by elaborate the details in literature review, selecting research areas, select method for data collection and deciding targeted interviewees. The last stage, Stage 3, explains the data collection and conclusion recommendation for this preliminary survey.

Findings

Out of five (5) representative who are involved in this preliminary survey, three (3) of them qualified as Site Safety Supervisor, who is responsible in matters of safety in construction site. Meanwhile, the other two (2) of them are Site Supervisor. All of them had an experience in handling public accident case at construction site. With their experiences, the interviewees has come up with their opinions on way of preventing public accidents occurred at construction site. Further details are stated in Table 2 below:

Table 2: Findings of Preliminary Survey

	Interviewees' Experience in Handling Public Safety	Interviewees' Opinions in Preventing Public Accidents
Interviewee A	Public hit the plastic barricade at construction site.	<ul style="list-style-type: none"> • Increase the number of signage at the construction site, including at all entrances and exits, and remind the traffic team to control traffic. • Remind employees to be alert of potential risks at all times.

Interviewee B	Public complaint due to noise and construction site is the place for stray dogs to stay.	<ul style="list-style-type: none"> • In the construction area, barricade all entrances and exits. • Create a public-access temporary walkway and roof. • Assign signal man to control traffic. • Place an appropriate signage in a noticeable way. • Provide public access to a safe environment.
Interviewee C	Public complaint due to noise and vibration, and no hoarding which allows public access.	<ul style="list-style-type: none"> • Toolbox meeting every weeks or days to make sure all workers do the jobs safely. • Barricade all access at construction site.
Interviewee D	Construction waste area located nearby a school with no hoarding and lead to an accident involving one school student which causing a serious head injury.	<ul style="list-style-type: none"> • All construction waste must be kept inside the construction site area, with public access restricted; • Everyone working in the construction site should be knowledgeable of safety precautions. • To keep the public safe from falling objects, construct a catch net and a catch platform.
Interviewee E	Public complaint due to noise. Construction workers hit underground electricity cable and produce a spark at nearby traffic light and cause a blackout to some areas.	<ul style="list-style-type: none"> • Prepare project work schedules and take consideration of public safety. • Hire QAQC (Quality Assessment and Quality Control).

According to the findings, majority of interviewees stated that they are experiencing in public complaint due to noise comes from construction sites. The other experienced in problem of hoarding and barricade construction sites which allow public access. With their experiences, the interviewees' comes up with opinions in preventing public accidents occurring.

During the interview, the researcher has confirmed that all interviewees' involved stated their workplace following the guides of safety rules and regulations at construction sites. This indicates that there is negligence and no improvement in safety practices at construction sites that makes public accidents keep occurring these days.

Majority of the interviewees shared the same opinions on preventing public accidents from occurring, which is barricade all access and exits and put clear signage for public use to prevent

public access. This way also supported by Astralla (2016) in literature review, separate entry and exit points should be established for heavy machinery/vehicle access, to strengthen public safety at high traffic points. The signage at construction site should be clearly displayed, so that all safety protocols are readily available - including a 24 hour emergency contact number and a map or directions to the site office. Visible signage should also indicate site amenities, entry and exit points, and first aid or emergency fire equipment for public references.

Conclusion

This preliminary survey is intended to measure the way of preventing public accidents occurring at construction sites in Malaysia. This study has its own limitations where it only focus on public who is not involve in construction sites at all cost and also focusing on safety practices which relates to public safety only. The semi-structured interview conducted also has a smaller representative involve which might affect the results of findings for this study. The outcome of this study is expected to be used as fundamental data to carry along to the next level of the main research. Further research can be detailed up to the analyzing workers' behavior which gives impact to the public safety at construction sites. This study provide good insights to the Department Occupational Safety and Health (DOSH), National Institute of Occupational Safety and Health (NIOSH) and Construction Industry Development Board (CIDB) in identifying the need of safety practices to prevent public accidents at construction sites in Malaysia.

Acknowledgement

The authors would like to express our gratitude to the Faculty of Architecture, Planning and Surveying (FSPU), Universiti Teknologi MARA (UiTM), and Journal of Tourism, Hospitality and Environment Management (JTHER) for their generous contribution towards this research.

References

- Ambegaonkar, R. (2020, February 13). *The Importance of Safety on Construction Sites*. Retrieved February 7, 2021, from New York Engineers: <https://www.ny-engineers.com/blog/the-importance-of-safety-on-construction-sites>
- Astralla, L. (2021). 11 Safety Measures Every Construction Site Should Have In Place. *Lantham*.
- Celik, T., Kamali, S., & Arayici, Y. (2017). Social Costs in Construction Projects. *Environmental Impact Assessment Review*, 77-86.
- Chong, H., & Low, T. (2015). Accidents in Malaysian Construction Industry: Statical Data and Court Cases. *International Journal of Occupational safety and Ergonomics*, 1.
- Collier, E. (2018, April 25). *Protecting the Public During Construction Projects*. Retrieved February 7, 2021, from Hub from High Speed Training : <https://www.highspeedtraining.co.uk/hub/public-safety-during-construction/>
- David. (2018). 8 Important Safety Measures for Construction Sites. *Commercial Construction Innovation*, 1-2.
- Gharamanzadeh, M. (2014). *Managing Risk of Construction Projects: A Case Study of Iran*.
- Hojati, A. (2018, December 12). 8 Best Practices to Improve Construction Site Safety. Retrieved February 12, 2021, from eSUB Construction Software: <https://esub.com/blog/improve-construction-site-safety/>
- Hua, L. T. (2021). Please Do Not Hesitate to Spend Cost on Safety. *BH Online*.

- Hui-Nee. (2014). Safety culture in Malaysian Workplace: An analysis of occupational accidents. *Health and the Environment Journal*, 5(3), 32-43.
- Ibrahim, F., & Esa, M. (2018). The Implementation of Risk Management Plan: Towards Safer Hillside Development Projects. *International Conference on Applied Science and Technology (ICAST) 2017: Malaysian Construction Research Journal (MCRJ) Vol.3 No.1* (p. 1). Penang: Scopus Elsevier.
- IHSA. (2020, April 14). *Infrastructure Health and Safety Association*. Retrieved February 7, 2021, from Safe Work Practices /Safe Job Procedures: https://www.ihsa.ca/resources/safe_practices_procedures.aspx
- Jamalullah, S., Rashid, Z., Hanafi, M., Ulang, N., Riazi, S., & Nawati, M. (2018). Factors Of Non-Compliance With Occupational, Health And Safety Legal Requirements Among Malaysian Contractors. *International Conference On Applied Science And Technology (Icast): Malaysian Construction Research Journal (Mcrj): Special Issue Vol.3 | No. 1 | 2018*, 114-129.
- Kamar, I., Lop, N., Salleh, N., & Mamter, S. (2014). Contractor's Awareness on Occupational Safety and Health (OSH) Management Systems in Construction Industry. *Research Gate*, 1.
- Low, B., Man, S., & Chan, A. (2018). The Risk-Taking Propensity of Construction Workers- An Application of Quasi-Expert Interview. *International Journal of Enviromental Research and Public Health* 15 (10), 15.
- OSHA. (2016). *Recommended Practices for Safety and Health Programs in Construction*. Retrieved February 11, 2021, from Occupational Safety and Health Administration : www.osha.gov
- Ponnusamy, S. (2019). Lack of General Safety Awareness in the Society. *Android App Development, Safety & Disaster Management*, 1.
- Rosli, F. A. (2021). Please Do Not Hesitate to Spend Cost on Safety. *BH Online*.
- Rubio-Romero, J., Gamez, M., & Carillo-Castrillo, J. (2013). Analysis of the Safety Conditions of Scaffolding on Construction Sites. 160-164.
- Sadeghi, H., Mohandes, S., Hamid, A., Preece, C., Hedayati, A., & Singh, B. (2016). Reviewing the Usefulness of BIM Adoption in Improving Safety Environment of Construction Projects. *Jurnal Teknologi* 78 (10), 78.
- Sarathchandra, M., Perera, B., & Nawarathna, R. (2014). Implications of Insufficient Awareness of Statutory Requirement for Building Construction on Consultant Team of Building Construction Projects. *The 3rd World Construction Symposium 2014: Sustainability and Development in Built Environment*, 294-306.
- Shamsuddin, K., Ani, M., Ismail, A., & Ibrahim, M. (2015). Investigation the Safety, Health and Environment (SHE) Protection in Construction Area. *International Research Journal of Engineering and Technology (IRJET): Volume: 02 Issue: 06* , 624-636.
- Taofoeq, D., Adeleke, A., & Hassan, A. (2019). Factors Affecting Contractor's Risk Attitude from Malaysia Construction Industry Perspective. *Social Science and Humanities Journal*, 1.
- Vitharana, H., Silva, S., & Silva, S. (2015). Health Hazards, Risk and Safety Practices in Construction Sites – A Review Study. *Research Gate*, 35-44.
- Wahab, N. (2017). *Website Department of Occupational Safety and Health Malaysia*. Retrieved February 10, 2021, from Website Department of Occupational Safety and Health Malaysia, DOSH:

<http://www.dosh.gov.my/index.php/en/component/content/article/352-osh-info/accident-case/955-accident-case>.

- West, V. (2017). 5 Safety Construction Tips for Your Workers' Well-Being. *Construct Connect*.
- Williams, S. (2020). Health and safety in Construction 2006. *Health and Safety Executive (HSE)*, 4-38.
- Yi, L., Shunjiang, N., & Wenguo, W. (2017). Development of the Public Safety System and a Security-Guaranteed Society. *Strategic Study of Chinese Academic Engineering: Institute for Public Safety Research, Tsinghua University*, 3.
- Young, J., Smithson, W., Hernandez, M., & Hamilton, T. (2011). *What is Public Safety*. Retrieved 2021, from Community Watch Paper: <https://communitywatchpaper.org/about-us>