

A Study on Non-Compliance by Work Package Contractor at RTS Link Project

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DOI: <https://doi.org/10.30880/peat.2025.06.01.069>

Article Info

Received: 20 January 2025

Accepted: 06 February 2025

Available online: 30 April 2025

Keywords

Construction, Non-compliance

Abstract

The construction industry in Malaysia has experienced significant growth, benefiting both the sector and the economy. However, it remains one of the most hazardous industries, with high rates of accidents, injuries and fatalities, as highlighted by recent statistics from the Department of Occupational Safety and Health (DOSH) Malaysia. Addressing these safety concerns and improving safety measures is crucial to protect workers and enhance overall productivity at the construction sites. Therefore, this study aims to identify the most prevalent non-compliance issues faced by contractor and analyse the factors contributing to non-compliance. Data will be collected from Corrective Action Requests (CARs) issued and the findings during Safety, Health and Environment (SHE) site inspections. The literature review will support the analysis of the contributing factors to contractor non-compliance. Additionally, the research also seeks to gather insights on improving the implementation of safety practices to enhance compliance. The study will also propose control measures to address these non-compliance issues, ultimately enhancing safety standards at the construction sites.

1. Introduction

The construction industry is a vital and influential economic sector with significant size that plays a crucial role in contributing to the nation's economy [1]. However, it is also regarded as one of the most dangerous sectors due to high levels of accident, injury and fatality risks [2]. According to Ibrahim [3], Malaysia is one of the fastest-developing nations in the world, and as the industry grows rapidly, it will become more prosperous. Furthermore, the rapid economic growth in Malaysia has led not only significantly growing in the construction industry, but also increases in the number of deaths and injuries at work [4]. The statistics on accident rates at construction sites reveal that the Malaysian construction industry is one of the crucial industries urgently in need of improvement in current site safety practices as it has the highest rate of accidents, resulting in numerous cases of major and minor injuries as well as work-related fatalities among construction workers.

The significant growth enjoyed by the construction industry in Malaysia over the past few years has benefitted both the industry itself and the Malaysian economy. Unfortunately, this success has come at significant cost to the health and safety of the industry's workforce. Despite its significant contribution to the economy, the construction industry witnesses alarmingly high rates of accidents, injuries and fatalities, raising concerns about the overall safety performance within construction sites. Recent statistics from DOSH underscore the severity of the situation, with the construction sector recording the highest number of fatalities among all industries. This trend not only poses risks to the lives and wellbeing of construction workers but also hampers project performance, completion timelines and overall productivity. The urgent need to address these

safety concerns and enhance the industry's safety culture is evident, requiring targeted interventions to mitigate risks and improve safety outcomes.

Moreover, the issue of safety in the construction industry has received a lot of attention, yet the occurrence rate of accidents is still high. According to Yiu et al. [5], safety and health issues are extremely important to be concerned about in all branches of industry, especially in the construction industry. One of the major factors responsible for the high rate of accidents on construction sites is the issue of non-compliance with safety regulations involving high-risk activities like working at height and on scaffolds. Furthermore, the non-compliance by contractor during Safety, Health and Environment (SHE) site inspections emphasise the contractors' compliance with safety standards, with Corrective Action Requests (CARs) or Non-Conformance Reports (NCRs), serving as a key indicator for measuring the safety compliance. CARs or NCRs issued will track the non-compliance with safety requirements throughout the project, providing valuable data to evaluate contractors' safety performance over time. Despite the various terms used for describing non-compliance, the fact remains that failure to comply with safety rules and requirements will result in accidents.

Neglecting safety compliance can directly lead to accidents, thereby compromising the well-being of workers. Hence, this study will focus on identifying the most significant non-compliance issues faced by contractor engaged in construction activities. The outcome of this study will provide a clear picture of how non-compliance occurs during the construction works. By analysing the existing safety practices, identifying gaps and assessing the safety performance of contractors engaged in such activities, the gaps, areas of strength and opportunities for improvement can be identified and will further enhance the safety compliances of contractor. Prior to this, proactive actions must be taken by industry players, along with further control measures, to prevent a drastic increase in construction accidents each year caused by contractor non-compliance.

2. Methodology

The research process will encompass the background of the study, the research problem and research objectives, the scope and significance of the study, followed by the research methodology. All information to strengthen the purpose of this research is obtained through data collection from secondary data and literature review. The data collected from Corrective Action Requests (CARs) issued and the number of findings during Safety, Health and Environment (SHE) site inspections will be analysed. These data will then be used to identify the most prevalent non-compliance issues in construction activities. For the literature review, journals, theses and articles from past studies will be used to support the objectives of analysing the contributing factors of contractor non-compliance.

2.1 Research Design

This study employs a qualitative research method to obtain data and information to fulfil all the research objectives. The qualitative method involves analysing the secondary data obtained from the number of CARs issued and findings from SHE site inspections. CARs are issued to contractors who fail to comply with safety requirements, including the general specifications outlined in the project. Meanwhile, SHE site inspections are conducted to ensure the contractors are adhering to the safety regulations. These sources of data provide direct insights for this study and serve as detailed records of non-compliance by the contractor. By analysing the data, this study will identify the most prevalent types of non-compliant activities at the construction site, thereby addressing the first objective of this study.

In addition, a literature review is conducted to identify the factors contributing to non-compliance by contractor. This involves reviewing previous research to identify the factors that contribute to non-compliance in the construction project. Therefore, based on the research carried out, this study analyses whether the non-compliance issues observed on-site align with the factors identified in other past research, as this will be further supported by the research. This approach will meet the second objective, which is to analyse the factors contributing to non-compliance in the work activities conducted.

In essence, the study also proposed mitigation measures to address these non-compliance issues, with the aim of achieving the third objective of this study. This will be done by analysing the non-compliance issues identified from the data analysed through the number of CARs issued and findings from SHE site inspections, while also considering the factors contributing to the non-compliance outlined in the literature review. The mitigation measures tailored to the nature of work at the construction site will be proposed based on the discussions held with the safety team in reference to the results of the analysed data. These proposed mitigation measures aim to improve the safety of workers at the construction site by ensuring stricter enforcement of safety compliance, thereby reducing the likelihood of accidents. The research flowchart for this study is as indicated in Fig. 1 below.

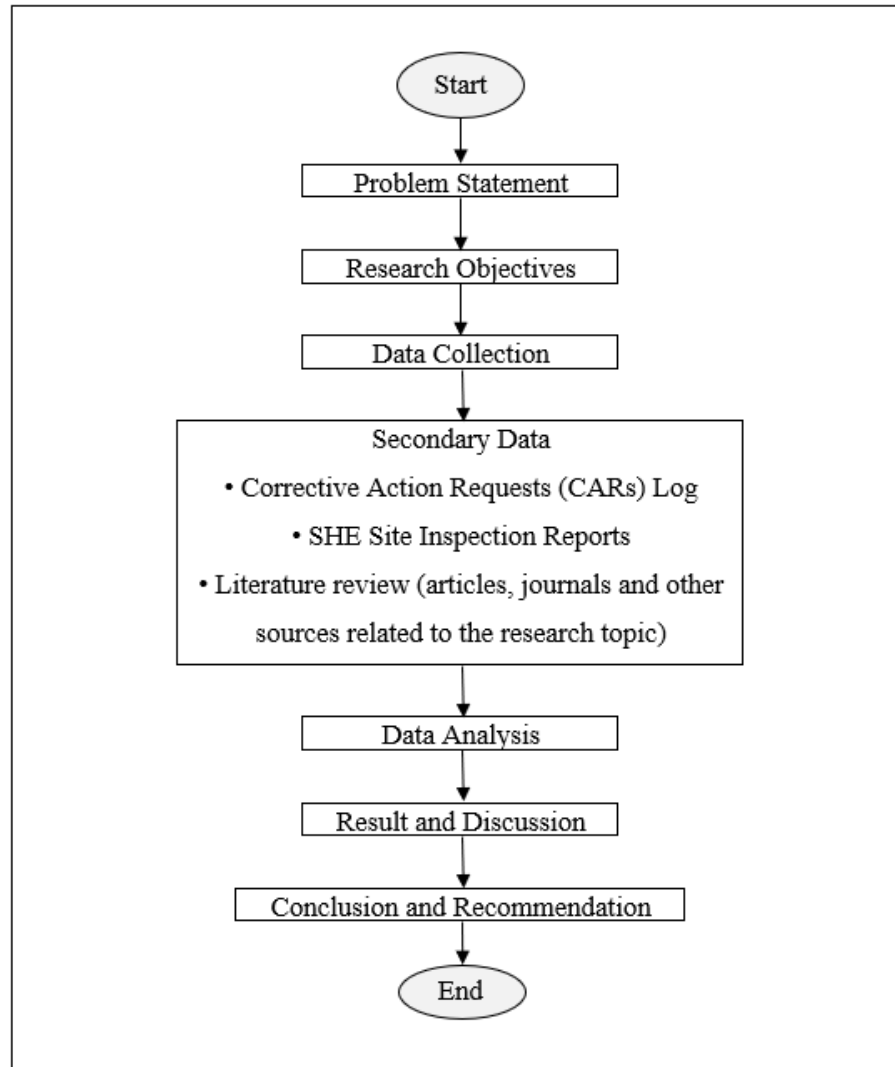


Fig. 1: Research flowchart

2.2 Data Collection

The primary data in this research is derived from qualitative study. It is obtained directly from identified sources, namely Corrective Action Requests (CARs) issued to contractors and findings from Safety, Health and Environment (SHE) site inspections. This data was used to gather and analyse on non-compliance by contractor. The data collection timeframe spans from January 2024 to October 2024. The analysis will focus on the frequency and nature of non-compliance related to work activities on-site. This will help identify trends and patterns in the most prevalent types of non-compliance by the contractor, which will address the first objective of this study. Moreover, the discussion held with the safety team on the control measures that can be implemented to reduce the number of non-compliance issues provides direct insight for the third objective of this study.

The secondary data conducted in this study also involves literature review. Literature review is an essential part of any research process and it contributes significantly to every step of the research. Secondary sources help gather information as they provide a more comprehensive picture of a problem or topic under consideration. The data are used to strengthen knowledge of an idea or opinion gained from a journal, article, reports, documents, thesis, book, magazine and newspapers. In this study, the literature review will include past research to identify the contributing factors of non-compliance in construction projects. By reviewing this data, the study will determine whether the non-compliance issues observed on-site reflect with the factors identified in previous research. This will further support the second objective, to identify the factors contributing to non-compliance in the work activities conducted. This research is then expanded to achieve the third objective by incorporating insights from previous studies to support the proposed mitigation measures for non-compliance issues.

2.3 Data Analysis

Data analysis was performed on the data gathered to address the study's primary objectives. All data obtained from the number of CARs issued and findings during SHE site inspections will be analysed in accordance with the research objectives. The issuance of CARs and findings from SHE site inspections were extracted from January 2024 until October 2024. CARs will be issued based on non-compliance identified, as outlined in the general specification of this project. The non-compliance observed during SHE site inspections will also be documented in the inspection reports. This allowed for the identification of patterns and types of non-compliance, providing a clear picture of the most prevalent non-compliance activities by contractor.

The analysis was done based on the frequency of each non-compliance issues, categorising them according to the specific violations outlined in the project's general specifications. Next, the categorisation for each non-compliance issues will be ranked from highest to lowest, which will provide a clear indication of the most critical areas needing attention. This analysis will help in identifying which non-compliance are recurring and significant, allowing for focused recommendations for the third objective in this study on improving the compliance and safety standards at the construction site. Regarding data presentation, statistical methods such as bar charts will be used to present this research data.

The analysis of the non-compliance data will provide insights that are essential for the next steps in this research, particularly in identifying factors contributing to non-compliance, as outlined in the second objective of this study. Based on the data, the study will analyse whether the observed non-compliance issues on-site and the contributing factors identified in previous studies are reflected. This will also help to contextualize the findings and provide a deeper understanding of the underlying causes of non-compliance, by categorising them under the relevant factors. Upon completing the analysis, the study will provide an overview of the non-compliance issues and their contributing factors, as well as the proposed mitigation measures for contractor engaged in the construction activities.

3. Result and Discussion

The results obtained through data gathered from number of CARs issued and number of findings during SHE site inspections. Research from previous researchers were gathered to support the factors contributing to non-compliance on-site. These factors imply the underlying reasons that lead to violations of safety regulations at construction site. The factors contributing to the non-compliance among contractors indicates the safety practices and adherence of contractor with safety and health requirements. This could also potentially serve as a basis for a value-added system to identify credible contractors for future projects with a strong commitment to safety.

3.1 Number of CARs Issued

Non-compliance of contractors can be tracked through the issuance of CARs, which are issued when contractors fail to comply with safety requirements and adhere to the general specifications outlined in the project contract. From January 2024 to October 2024, a total of 145 CARs were issued, highlighting the non-compliance of contractors. Table 1 shows the number of CARs issued based on the scope of construction work activities.

Table 1: Total number of CARs issued based on the scope of work

Scope of work	Number of CARs issued
Electrical	6
Chemical	2
Excavation	2
General requirement	11
Housekeeping	7
Scaffolds	51
Lifting operation	22
WAH	34
Machinery and Equipment	10
Total	145

The breakdown of the total number of CARs issued based on the work activities on site is shown in Fig. 2 below.

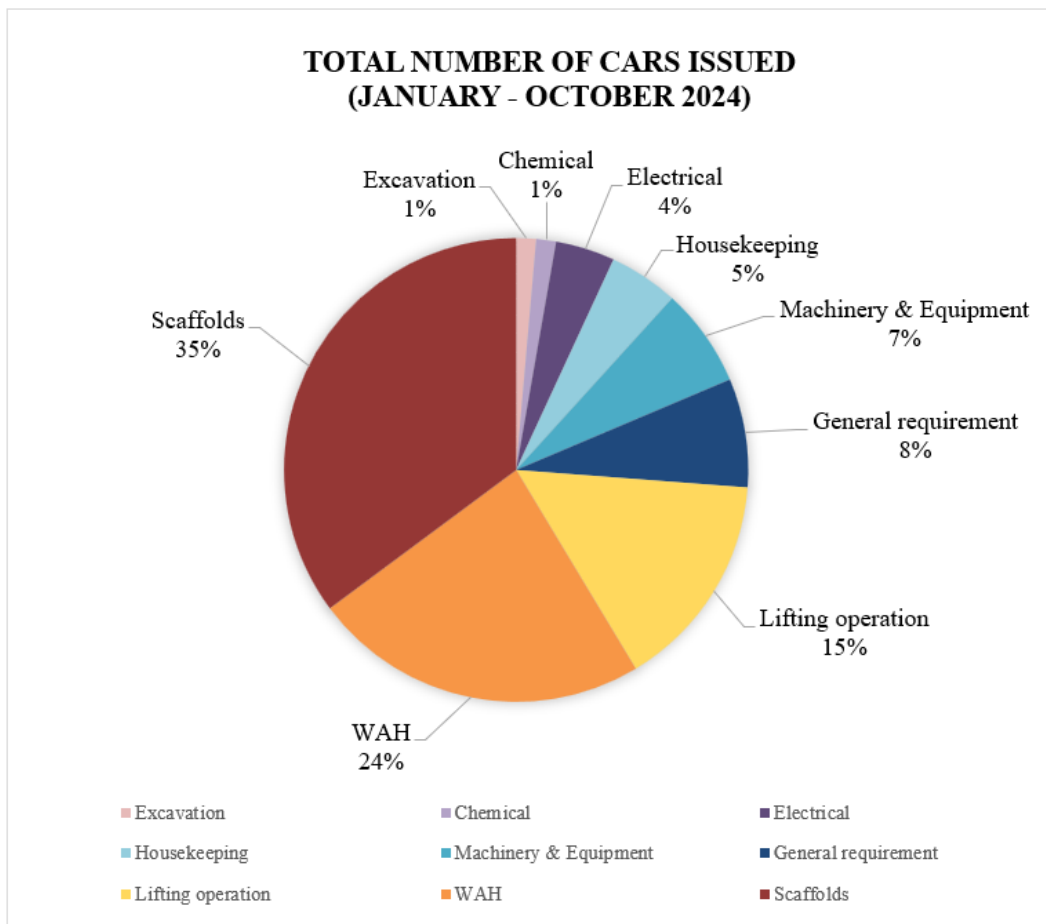


Fig. 2: Total number of CARs issued (January - October 2024)

Based on Fig. 2 above, the distribution of CARs issued was categorised according to various construction work activities. As shown in the chart, the highest number of CARs were issued for scaffolds, while the lowest were for chemical and excavation works. The data indicates that scaffolding works accounted for 35% of the total CARs issued, followed by WAH at 24% and lifting operation at 15%. This clearly shows that the most significant non-compliance issues were observed on scaffolds.

Table 2: Total number of CARs for scaffolds from January to October 2024

Month	Number of CARs issued for scaffolds
January	2
February	3
March	2
April	1
May	10
June	11
July	5
August	3
September	3
October	11
Total	51

Table 2 above indicates the total number of CARs issued to contractors for non-compliance observed during SHE site inspections for scaffolds from January to October 2024.

3.2 Number of Findings during SHE Site Inspections

Moreover, the number of findings on the non-compliance during SHE site inspections can be obtained from the SHE site inspection reports. Table 3 below shows the total number of findings during SHE site inspections on scaffolds from January to October 2024.

Table 3: Number of findings during SHE site inspections on Scaffolds (January - October 2024)

Month	Number of findings on scaffolds
January	2
February	6
March	9
April	1
May	8
June	10
July	5
August	9
September	5
October	10
Total	65

3.3 Discussion on Factors Contributing to Non-Compliance on Scaffolds

Based on the findings from number of CARs issued and SHE site inspections from January 2024 to October 2024, the highest non-compliance based on the work activities conducted is on scaffolds. It recorded the highest number of CARs issued which is 45, followed by WAH and lifting operation with 38 and 22, respectively. Meanwhile, the number of findings during SHE site inspections on scaffolds is 65. The factors contributing to the non-compliance on scaffolds can be categorised into PPE usage, unsafe act and unsafe conditions. Table 4 below shows the breakdown of non-compliance related to PPE usage, unsafe act and unsafe conditions based on CARs issued. The details of non-conformity on scaffolds are as attached in Appendix A.

Table 4: Contributing factors to non-compliance on scaffolds

Contributing factor	Number of non-compliance on scaffolds
PPE usage	6
Unsafe act	20
Unsafe condition	25
Total	51

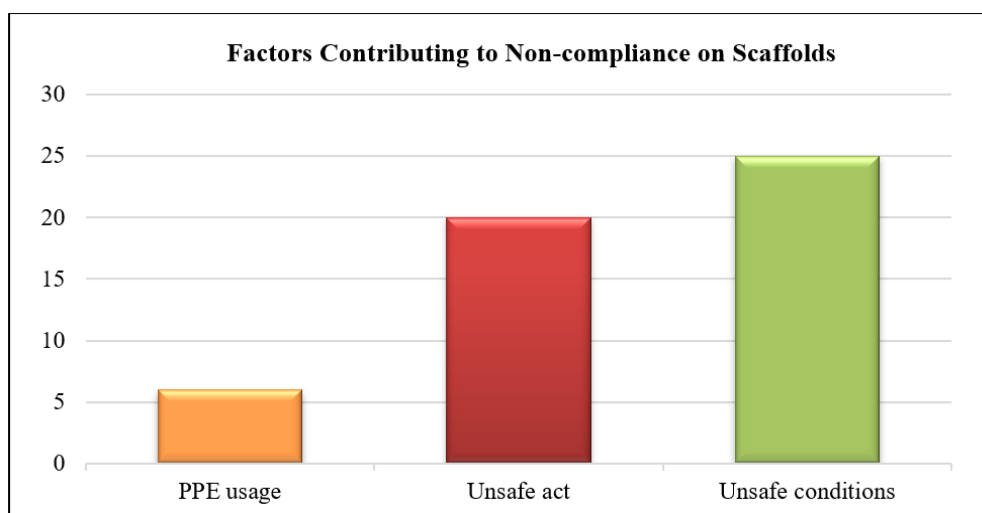


Fig. 3: Factors contributing to non-compliance on Scaffolds

Based on Fig. 3 above, the data highlights the contributing factors to non-compliance in scaffolding activities. A total of 51 non-compliances were recorded based on data from CARs issued for scaffolds. Of these, 6 were due to PPE usage, 20 were related to unsafe act and 25 were caused by unsafe conditions. The number of CARs issued

and findings from SHE site inspections indicates that the issues on non-compliance related to scaffolds are the most significant as it may lead to accidents. According to Rafindadi et al. [6], financial constraints, the complexity of work at height, dangerous work procedures, unprotected edges of holes, and rush to finish work are sub-factors that contribute to fatal accidents related to falls from heights. Other studies added that the factors contributing to 621 fatal accidents due to work at height had been identified from individual factors, including age, gender, experience, and use of personal protective equipment (PPE). Based on the literature review conducted, it is found that the most significant factors contributing to non-compliance on scaffolds is improper use of personal protective equipment (PPE). Reflecting on the findings in this study, similar issues related to non-compliance on scaffolds were observed, where improper use of PPE was one of the factors. It was found that a body harness with single lanyard is being used by workers at site during the erection of scaffolding. The requirement for this project has been outlined in the General Specification (GS), where the contractor shall ensure that an adequate number of safety harness are provided and that all are fitted with a 2 metres lanyard and shock absorber.

In addition, CARs were also issued due to non-compliance by workers due to their unsafe act. Workers were found working at height without hook their body harness. Other than that, they were found standing on mid-rail without having a proper working platform. In the GS, it was stated that, all users of scaffolding shall inspect their work area on daily basis to ensure that the ladder, working platform, toe board and guardrails remain in place. This requirement has set to ensure the workers are always working safely. However, due to their unsafe act, this may lead to incidents. According to Rasmussen's model, workers' motivation to achieve high levels of productivity pushes them to work 'near the edge' in terms of their exposure to hazards (i.e. beyond the zone of control or recovery). This is strongly supported by the research conducted by Rafindadi et al. [6] that fatal accidents at work at height occur mainly due to contributing factors to risky behaviour carried out by workers. According to Nawi et al. [7], the irresponsibility and carelessness of the workers will lead to accidents on the site. Another study also supported this, where unsafe human attitudes are the cause that records almost 80% of construction accidents [8].

Furthermore, the non-compliance on scaffolds issue was due to workers working under unsafe condition. It was found that there are no safe working platform and the scaffolds was not inspected by competent scaffolder as there were no evidence on inspection tagging provided at the scaffold access. The contractor shall implement a Scaffold Tagging System (Green Tag and Red Tag) for every scaffold structure and shall be display at appropriate location for information and inspection, as outlined in the GS. Moreover, most of the site workers neglect the safety rules and procedures when they are not being supervised by the safety supervisor [9]. The same issues were also reflected in this study, where the non-compliance occurred as workers were carried out erection and dismantling of scaffolding without any supervision from a competent scaffolder. This non-compliance clearly violates the GS requirements, in which, all scaffold to be erected must be under the supervision of competent scaffold supervisor. Workers must be closely supervised by their supervisor to ensure the compliance towards safety requirements, as injuries and fatalities were often occurring due to supervisors fail to fulfil their responsibility of ensuring workers are working in a safe environment.

4. Recommendation

In Malaysia, the construction industry has a weak safety record which results from a lack of safety concern among the management and the workers such as inadequate self-preparation, insufficient safety compliance, insufficient safety equipment, unsafe methods or sequencing, unsafe site conditions, failure to use safety equipment, a poor attitude toward safety and isolated, abrupt deviations from prescribed actions have cause and contribute in the safety records [10]. Construction work has a relatively high fatality and accident rate among other industries. Understanding the management of health and safety issues could maintain the construction workforce's productivity. Successful methods in the life-cycle of the project could increase workforce productivity [11].

In this study, the contractor has enforced a penalty system to any sub-contractor that failed to comply with legal and project safety and health requirements. The issuance of penalty amount according to the schedule and deduction from the subcontractor's claim. However, the non-compliance issue was found still repeating. Therefore, this study proposed to implement a hefty amount of penalty, as the new Occupational, Safety and Health (Amendment) Act 2022 imposed the new amount of penalty from RM50,000 to RM500,000. The contractor believes that by having a penalty system, it is not absolute approach to ensure compliance, but they are looking forward on the commitment from all sub-contractors appointed to take ownership and proactive measure to control their work activities from any risk that could arise in the workplace.

Besides that, Heng et al. [8] stated that face-to-face interviews with the workers who have unsafe attitudes need to be conducted by the safety supervisors and the report regarding the safety on the site needs to be submitted to the safety officers weekly to ensure that it can assist the safety officers. This implementation in every project can improve their attitudes toward the good application of safety and health on construction sites.

5. Conclusion

Given the dynamic nature of construction industry, it is challenging to assess the safety performance especially on non-compliance issues among contractors working at construction site. Therefore, by exploring the factors influencing non-compliance of contractors during construction activities, this research unveils the pivotal role they play in shaping safety outcomes within the construction industry. With the insights gained from this study, industry players can work towards fostering a culture of safety compliance, thereby ensuring the well-being of workers in the construction industry. This focused approach not only sets a precedent for future studies in this research domain but also lays the groundwork for improvements aimed at enhancing safety standards in the construction industry.

Acknowledgement

The author would like to thank the Faculty of Engineering Technology, Universiti Tun Hussein Onn Malaysia and those who have supported directly or indirectly during the whole research journey.

Conflict of Interest

Authors declare that there is no conflict of interests regarding the publication of the paper.

Author Contribution

*The authors confirm contribution to the paper as follows: **study conception and design:** Marsya Fakhira Mohd Farid, Amir Haziq Abdul Razak; **data collection:** Marsya Fakhira Mohd Farid; **analysis and interpretation of results:** Marsya Fakhira Mohd Farid, Amir Haziq Abdul Razak; **draft manuscript preparation:** Marsya Fakhira Mohd Farid. All authors reviewed the results and approved the final version of the manuscript.*

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