**AMK : Abdi Masyarakat UIKA**
**Universitas Ibn Khaldun Bogor, Indonesia**
Vol. 4, No. 2, June 2025, pp. 105~111
ISSN: 2964-366X, DOI: 10.32832/amk
http://ejournal.uika-bogor.ac.id/index.php/amk



# Implementation of Safety Management System to Improve Safety Performance of Construction Workers: Literature Review

**Suci Maghfirah *, M. Hadin Zakwan, Fadhlan Al Hafiz Marpaung, Abdurrozzaq Hasibuan**
Fakultas Kesehatan Masyarakat, Universitas Islam Negeri Sumatera Utara
Jl. Lap. Golf No. 120, Kab. Deli Serdang, 20353, Medan, Sumatera Utara, Indonesia

**Article Info**

***Article history:***

Received April 30, 2025
Revised May 9, 2025
Accepted May 25, 2025

***Keywords:***

Construction
OHS
Safety Management System
Safety Performance
Systematic Literature Review

**ABSTRACT**

The construction industry, known as one of the industries with the highest risk of workplace accidents, emphasizes the importance of occupational safety and health (OSH).One of the best ways to improve safety performance on site is by implementing a Safety Management System (SMS).The focus of this research is to collect and analyze various relevant studies on safety management systems and safety performance in the construction sector.The systematic literature review (SLR) method is used to collect and analyze various relevant studies regarding the implementation of SMS in the context of construction projects and its impact on worker safety performance.The analysis results show that the systematic and planned implementation of SMS can improve worker safety performance.



***Corresponding Author:***

Suci Maghfirah
Universitas Islam Negeri Sumatera Utara
Email: sucimaghfirah3@gmail.com

## INTRODUCTION

Infrastructure, housing, and public facilities are greatly supported by the construction industry, which is one of the main pillars of global economic development.Behind its significant contributions, this industry is also considered one of the most hazardous for occupational safety.According to data from the International Labour Organization (ILO), workplace accidents in the construction sector cause around 60,000 deaths each year worldwide.These figures highlight how difficult it is for this industry to maintain the safety and health of its workers.Therefore, the implementation of a good safety management system is very important to protect workers and reduce the risk of accidents.(Mustaqim, 2023)

Occupational health and safety (OHS) is a shared responsibility of all parties involved in a construction project, including management, workers, and other stakeholders.In this case, the Safety Management System (SMS) emerges as a systematic and structured approach to identify, evaluate, and control risks related to occupational safety.SMS is intended to create a safer work environment, increase workers' awareness of safety, and reduce the number of accidents that occur.Construction

companies can create a strong foundation for workplace safety by incorporating the principles of the Safety Management System into the organizational culture.(Lahamid et al., 2022)

Although safety management systems have been used by many construction companies, there are still issues in their implementation.One of the main issues is the understanding and awareness of the importance of occupational health and safety (OHS) among management and workers.Many employees still consider safety more important than completing the project on time.The pressure to meet deadlines often leads to the neglect of safety procedures, resulting in a risky work environment.To address this issue and improve safety performance in the field, it is important to study how the Safety Management System can be effectively utilized in this context.(Elisabeth et al., 2024)

The involvement of top management is an important component in the implementation of the Safety Management System.By proactively supporting and implementing safety policies, management can create a safe working environment.It is important for management not only to establish safety policies but also to be directly involved in the implementation and evaluation of the K3 program.Previous research shows that companies with a high commitment to occupational health and safety (OHS) tend to have lower accident rates.(Salasa et al., 2024)

To improve safety performance, training and education in occupational health and safety (OHS) are also very important.Well-trained workers are more likely to adhere to safety procedures and identify potential hazards in the workplace.Studies show that safety awareness and workplace accident rates can be improved through ongoing training programs.As a result, construction companies must allocate time and resources to create useful and relevant training programs.(Ramadhani et al., 2024)

A positive safety culture also plays an important role in the successful implementation of the Safety Management System.A strong safety culture can encourage workers to be more active in reporting potential hazards and participating in safety programs.Research shows that companies with a strong safety culture tend to have lower accident rates.Therefore, it is important for companies to create an environment where safety is considered a top priority.(Hendriyanto et al., 2025)

To achieve the objectives of this research, it is crucial to understand the various factors that influence the implementation of Safety Management Systems in the construction industry.By reviewing previous studies, this research is expected to provide valuable insights for construction companies on how to develop and implement an effective SMS.Additionally, this research is expected to help develop better OHS policies in the construction industry and raise awareness of the importance of workplace safety for management and workers.(Mursidi & Sarjito, 2025)

Overall, the background of this research emphasizes the importance of implementing a Safety Management System to improve safety performance in the construction sector.

Based on the explanation above, the researcher will discuss the Implementation of the Safety Management System to Improve Safety Performance among construction workers that has been carried out at a construction site in Indonesia, to support the information management needs within it based on previous research conducted in the North Sumatra region.

## METHOD

This literature research uses a literature study.To obtain data on literacy research, you can refer to scientific writings, books, local and international research journals, and studies conducted by others.A literature review is a summary of previous literature on a topic and provides information on the latest advancements in the field.A literature review also allows researchers to introduce certain techniques, develop certain techniques, and recognize their relationship with specific topics or research outcomes.The research tool queries current research data to identify journals published from 2019 to 2025.This is done through mobile devices, laptops, and Wi-Fi networks.To search for literature, look for or use publication sources, and use Google Scholar and relevant references to conduct the search..(Putro et al., 2023).

ISSN: 2654-8127

## RESULTS AND DISCUSSION

Based on the search results regarding the Implementation of Safety Management System to Improve Safety Performance among construction workers, there are several relevant journals related to this research.The results of the analysis of these journals will be described in Table 1 below.

| Tittle | Year | Result |
|---|---|---|
| Implementation of the Occupational Health and Safety Management System Occupational Safety and Health (OSH) in the Construction Sector in the Revitalization SMA Negeri 5 Medan School Building (Tambunan et al., 2023) | 2023 | According to this research, occupational safety and health affect the performance of construction workers.Workplace processing strategies have been used by experienced companies to reduce workplace accident rates and prevent occupational diseases.To ensure that the workplace is safe and healthy, supervisors and employees must be educated on how to think about safety and health.In the revitalization project of SMAN 5 Medan, the occupational health and safety management system (OHS) is integrated with the quality management system and environmental management system.And the SMK3 audit is conducted to measure the effectiveness of system implementation in the long term, while K3 inspections are carried out in the short term to identify the compliance of the objects. |
| Effectiveness of Implementing Contractor Safety Management System (CSMS) on the Reduction of Accident Rates Work at PT X (Pradani et al., 2021) | 2021 | In this study, it was found that the implementation of CSMS in physical training (PT X) is quite effective in reducing the number of accidents that occur.The results show that there were no work accidents caused by the contractor or by PT X itself, but the implementation of the CSMS cycle must be carried out according to the CSMS guidelines at PT X and with consistency at each stage to prevent unwanted accidents. |
| Analysis of the Implementation of the Safety Management System Construction on the Buffer Area Development Project at Sunda Port (Sendy & Simanjuntak, 2025) | 2025 | The results of this study, based on Government Regulation number 50 of 2012, show that the overall classification level of SMKK implementation reaches 95% and the overall classification level is "Satisfactory."This percentage level indicates that the project has been well-managed in terms of construction safety and that all parties involved have implemented SMKK. |
| IMPLEMENTATION OF WORK SAFETY IN PROJECTS CONSTRUCTION BASED ON ISO 45001(Lahay et al., 2025) | 2025 | According to this research, the implementation of the Occupational Health and Safety System (OHS) in the mining industry based on the ISO 45001 standard is the right choice to create a safe and healthy work environment for workers.ISO 45001 provides clear and structured guidance for implementing effective OHS practices in this sector.ISO 45001 certification aims to provide a robust framework for managing efforts to prevent death, injury, and work-related illness.The goal of this certification is to make the workplace safer and healthier and to reduce the risk of safety and health-related failures.This certification also supports better workplace safety practices. |
| ANALYSIS OF THE CONSTRUCTION SAFETY MANAGEMENT SYSTEM (CSMS) ON THE TANK CONSTRUCTION PROJECT AT THE INTEGRATED TELUK KABUNG TERMINAL (Hotter et al., 2024) | 2024 | The research results show that the elements of SMKK, namely a. Leadership and Worker Participation in Safety, are in accordance with the level of SMKK implementation in the construction of storage tanks at the Integrated Teluk Kabung Terminal. Construction with a total achievement of 83.71%, categorized as High; Construction Planning and Safety Support Element with a total achievement of 83.76%, categorized as High; Construction Safety Performance Operation and Evaluation Element with a total achievement of 89.38%, categorized as High; and Construction Safety Performance Evaluation Element with a total achievement of 84.62%, categorized as High. It seems there is no text provided for translation. Please share the text you'd like me to translate, and I'll be happy to help!In other words, SMKK is influential and has a relationship with construction safety. |
| Implementation of the systemSafety Management CONSTRUCTION OF BORED PILE WORK FOR RAILWAY FACILITY PROJECT (Oleh, n.d.) | 2022 | The research results show that the average level of SMKK implementation for bored pile work is 87 percent.Thus, this level of implementation can be considered satisfactory.In the railway facility construction project, the main inhibiting factor for the SMKK bored pile work is the limited budget for occupational safety and health (OSH) with the highest mean value.Other factors that pose obstacles are the assessment of construction safety performance, safety support, and construction safety planning.In the railway facility construction project, the bored pile work stage has moderate and low risk values, with the highest being the crossing path of the bored pile work |

| | | |
|---|---|---|
| | | over the railway tracks.Therefore, at the bored pile work stage in the Railway Facility Construction Project, safe work is intended because the highest risk level falls into the moderate category. |
| Study on the Implementation of the Health, Safety, Security, and Environment (HSSE) Management System Based on ISO at PT. PELINDO IV (Persero) Terminal Petikemal Bitung (Marthinus et al., 2024) | 2024 | The results of direct field research and questionnaires given to the Executive Committee of Health, Safety, Security, and Environment (HSSE) of the company indicate that the research results on the implementation of the ISO-based HSSE Management System at PT. Pelindo IV (Persero) Bitung Container Terminal are categorized as "good" for Leadership and Worker Participation, "good" for Planning, "good" for Support and Operations, and "good" for work evaluation. |
| Proposal for the Implementation of Contractor Safety Management System at the Pre-Qualification Stage at PT. UES Using Gap Analysis (Rizki et al., 2024) | 2024 | In terms of the Worker Safety Management System requirement clauses, a comparative analysis of documents and gap questionnaire results with the informants found that the comparison of requirement documents has increased from 54 documents fulfilled in 2018 to 60 documents in 2024, which is 89% of the total 65 documents.The results of the questionnaire with the informants indicate that clause 9 (additional regulations) has the highest percentage at 80%, and clause 7 (emergency situations).Additionally, PT. UES must make improvements to meet the CSMS implementation standards of the employer company.These improvements include completing the required documents and striving to improve clause 7 with the lowest score and the clause with the lowest score, such as consistently carrying out activities, evaluating existing procedures, and conducting reviews and documentation. |
| Review of the Implementation of the Construction Safety Management System (CSMS) for Construction Workers on the Preservation of the Kayulangi Road Segment, Central Sulawesi Border (Okki et al., 2024) | 2024 | This research found that, based on the risk levels present in work activities, there are 55 hazard identifications; 8 hazards fall into the medium risk level (16%), 40 hazards fall into the high risk level (80%), and 6 hazards fall into the extreme risk level (4%). |
| Implementation of the Occupational Safety and Health Management System (SMK3) in Concrete Work for the Ameroro Dam Construction Project (Sukman, 2023) | 2023 | Considering the results and discussion above, it can be concluded that the performance of workers in the construction project of the Ameroro Unaaha dam in Konawe Regency, Southeast Sulawesi, is influenced by the implementation of the occupational health and safety management system.In other words, the implementation of the Minister of Public Works and Public Housing Regulation No. 10 of 2021 regarding construction management system guidelines on the project is at 67.35%. |

Discussion and Analysis of the Implementation of a Safety Management System to Improve Safety Performance among Construction Workers

Various studies have been conducted to determine how effective the Safety Management System (SMS) is in improving safety in the construction industry.The analysis of ten relevant journals provides an in-depth understanding of how the Safety Management System (SMS) is used and how it impacts workplace safety.The first study on the Implementation of the Occupational Safety and Health Management System (K3) in the Revitalization of the SMA Negeri 5 Medan School Building (2023) shows that better performance of construction workers can be achieved by integrating K3 with quality and environmental management.According to the OHS audit conducted to evaluate system performance, effective workplace management strategies can reduce the number of work accidents and occupational diseases.Furthermore, research shows that the Contractor Safety Management System (CSMS) successfully reduced the rate of work accidents at PT X (2021).However, this research emphasizes the importance of consistently adhering to CSMS guidelines to prevent negligence that could jeopardize safety.

Analysis of the Implementation of the Construction Safety Management System in the Buffer Area Development Project at Sunda Port (2025) found that the compliance level with the CSMS reached 95%, indicating that the project was well-managed in terms of safety because all parties involved understood and had a strong commitment to implementing the CSMS, resulting in better work safety.Additional study, Implementation of Occupational Safety in ISO 45001-Based

ISSN: 2654-8127

Construction Projects (2025), emphasizes that the application of ISO 45001 standards in the construction industry can create a safe and healthy work environment.ISO 45001 provides clear guidelines for managing efforts to prevent death and injury and supports better occupational safety practices.

The results of the Construction Safety Management System (CSMS) analysis on the Bulk Storage Tank Construction Project at the Integrated Terminal Teluk Kabung (2024) show that CSMS elements, such as leadership and workforce participation, have achieved high levels.This shows the importance of involving all parties in construction safety to achieve optimal safety performance.According to research on the implementation of the Construction Safety Management System for Bored Pile Facility Work (2022), the implementation rate of the CSMS reached 87% in bored pile work.However, the main factor hindering this implementation is the budget limitation for occupational health and safety, which indicates that safety programs require greater investment.A study on the implementation of the ISO-based Health, Safety, and Environment (HSE) Management System at PT. PELINDO IV (Persero) Bitung Container Terminal (2024) shows that the ISO-based HSE management system is categorized as good in various aspects, such as worker management and their participation.This shows that safety performance in the construction industry can be improved with a good management system.

The proposal for the Implementation of the Contractor Safety Management System at the Pre-Qualification Stage at PT. UES Using Gap Analysis (2024) shows that there has been an increase in the fulfillment of CSMS requirement documents from 54 documents in 2018 to 60 documents in 2024.However, there is still a need for improvement, especially in clauses with the lowest percentages, indicating the necessity for periodic evaluation and review.A Review of the Implementation of the Construction Safety Management System (CSMS) for Construction Workers on the Preservation of the Kayulangi Road Segment, Central Sulawesi Border (2024) found 55 hazards in work activities, with most of them at a high-risk level.This indicates that to improve worker safety, more attention should be given to identifying and controlling risks on-site.As part of the Ameroro Dam Development Project (2023), the implementation of the Occupational Safety and Health Management System (SMK3) reached 67.35% of concrete work, with work disruptions as the main factor.This shows that a friendly work environment is very important for the successful operation of the safety management system.

Based on the analysis above, it can be concluded that the implementation of the Safety Management System in the construction sector has a significant impact on safety performance.The success of the safety management system depends on management involvement, effective training, and a positive safety culture.Furthermore, previous research shows that companies with a high commitment to occupational health and safety (OHS) tend to have lower accident rates.These findings align with the idea that proactive management in supporting safety policies can create a safer work environment.However, despite some issues, such as budget constraints and a lack of understanding of occupational health and safety (OHS), this research shows that with a systematic and in-depth approach.(Ikhwan Al Baqir Hb, 2025). Further research is needed to find better ways to address this issue and improve workplace safety in construction.By incorporating the principles of the Safety Management System into the company culture, it is expected that the rate of work accidents will be reduced and worker welfare will be improved. (Lase et al., 2025)

Overall, the results of this analysis provide an important contribution to the development of occupational health and safety practices in the construction sector, as well as opening up opportunities for further studies on the factors influencing the successful implementation of Safety Management Systems in various contexts and types of construction projects.

## CONCLUSION

According to the analysis of ten relevant journals, this research shows that the implementation of a Safety Management System (SMS) in the construction industry can improve occupational safety performance and reduce the number of work accidents.Additionally, better safety performance is achieved through the integration of occupational health and safety (OHS) with quality and environmental management.This research shows that top management involvement is crucial in supporting and implementing safety policies.Proactive management can help make the workplace safer and increase workers' commitment to safety procedures.Continuous and effective training programs are also very important for improving safety performance.Well-trained workers are more likely to adhere to safety procedures and identify potential hazards in the workplace.

Overall, the findings of this study indicate that management, workers, and other stakeholders must collaborate to create a safer and more sustainable work environment.They also make significant contributions to the development of occupational health and safety (OHS) practices in the construction sector.By incorporating the principles of the Safety Management System into the organizational culture, it is hoped that the rate of workplace accidents and worker welfare can be reduced.

## REFERENCES

[1] Elisabeth, P. N., Simanjuntak, C. R., & Yuverda, R. (2024). DO HUMAN CAPACITY DEVELOPMENT AND COMPANY PERFORMANCE AFFECT TAX AVOIDANCE NEW EVIDENCE FROM MANUFACTURING SECTOR COMPANIES IN INDONESIA. INCOSHET 2024, 1(1), Article 1.

[2] Hendriyanto, N., Eduard, E., & Winoto, H. (2025). Peran Safety Leadership dalam Meningkatkan Kesadaran K3 di Kapal Tanker melalui Pendekatan Sistematis Studi Literatur. Journal of Occuptional Health and Safety, 1(1), Article 1.

[3] Hotter, R., Thressia, M., & Sazali, A. (2024). ANALYSIS OF CONSTRUCTION SAFETY MANAGEMENT SYSTEM IN THE CONSTRUCTION PROJECT OF STORAGE TANK AT INTEGRATED TERMINAL TELUK KABUNG. Journal of Scientech Research and Development, 6(2), Article 2. https://doi.org/10.56670/jsrd.v6i2.846

[4] Ikhwan Al Baqir Hb, 190106082. (2025). Tanggung Jawab Perusahaan Terhadap Keselamatan dan Kesehatan Kerja Pekerja Non Karyawan Ditinjau Menurut Pasal 86 UU No. 13 Tahun 2003 Tentang Ketenagakerjaan (Penelitian Pada PT. Agro Sinergi Nusantara Kecamatan Johan Pahlawan Kabupaten Aceh Barat) [Other, UIN Ar-Raniry Banda Aceh]. https://repository.ar-raniry.ac.id/id/eprint/43016/

[5] Lahamid, Q., Pitaloka, G. D., & L, S. (2022). PRODUKTIVITAS KERJA KARYAWAN: DITINJAU DARI KESELAMATAN DAN KESEHATAN KERJA (K3) DAN PENGAWASAN KERJA PADA PT X ERA COVID-19. Jurnal Al-Iqtishad, 18(1), Article 1. https://doi.org/10.24014/jiq.v18i1.14536

[6] Lahay, F., Mustaman, S., Tongko, M., Dee, M. L., Baehaki, K., Enteding, A., & Syahrir, M. (2025). IMPLEMENTASI KESELAMATAN KERJA PADA PROYEK KONSTRUKSI BERBASIS ISO 45001. MagnaSalus: Jurnal Keunggulan Kesehatan, 7(1), Article 1. https://journalpedia.com/1/index.php/jkk/article/view/4153

[7] Lase, D., Absah, Y., Lumbanraja, P., Giawa, Y., & Gulo, Y. (2025). Model Kerja Hibrida: Kajian Teoretis dan Implikasinya terhadap Dinamika Kerja Modern. Tuhenori: Jurnal Ilmiah Multidisiplin, 3(1), Article 1. https://doi.org/10.62138/tuhenori.v3i1.130

[8] Marthinus, A. P., Tjakra, J., & Malingkas, G. Y. (2024). KAJIAN PENERAPAN HEALTH, SAFETY, SECURITY AND ENVIRONMENT (HSSE) MANAGEMENT SYSTEM BERBASIS ISO PADA PT. PELINDO IV (PERSERO) TERMINAL PETIKEMAL BITUNG: Study of the Implementation of the ISO-Based Health, Safety, Security, and Environment (HSSE) Management System at PT. PELINDO IV (Persero) Bitung Container Terminal. Publikasi Riset Orientasi Teknik Sipil (Proteksi), 6(2), 177–182. https://doi.org/10.26740/proteksi.v6n2.p177-182

[9] Mursidi, M., & Sarjito, A. (2025). Implementation Strategy of Ship Engine Maintenance Management System to Improve Operational Efficiency. JURNAL APLIKASI PELAYARAN DAN KEPELABUHANAN, 15(2), Article 2. https://doi.org/10.30649/japk.v15i2.137

[10] Mustaqim, D. A. (2023). STRATEGI PENGEMBANGAN PARIWISATA HALAL SEBAGAI PENDORONG EKONOMI BERKELANJUTAN BERBASIS MAQASHID SYARIAH. AB-JOIEC: Al-Bahjah Journal of Islamic Economics, 1(1), Article 1. https://doi.org/10.61553/abjoiec.v1i1.20

[11] Okki, T., Fikri, M., & Sudirman, S. (2024). Tinjauan Penerapan Sistem Menajemen Keselamatan Konstruksi

ISSN: 2654-8127

(SMKK) Terhadap Para Pekerja Kontruksi Pada Preservasi Ruas Jalan Kayulangi Batas Sulawesi Tengah. Jurnal Ilmiah Ecosystem, 24(3), Article 3. https://doi.org/10.35965/eco.v24i3.5417

[12] Oleh, D. (n.d.). PENERAPAN SISTEM MANAJEMEN KESELAMATAN KONSTRUKSI PEKERJAAN BORED PILE DI PROYEK PEMBANGUNAN FASILITAS PERKERETAAPIAN.

[13] Pradani, M. R., Maharani, M. D. D., & Ramli, S. (2021). Efektifitas Implementasi Contractor Safety Management System (CSMS) Terhadap Penurunan Tingkat Kecelakaan Kerja Di PT X. Jurnal Migasian, 5(1), Article 1. https://doi.org/10.36601/jurnal-migasian.v5i1.146

[14] Putro, A. N. S., Wajdi, M., Siyono, S., Perdana, A. N. C., Saptono, S., Fallo, D. Y. A., Khoirotunnisa, A. U., Ningtyas, Kma. W. A., Leuwol, F. S., Pationa, S. B., Kumalasanti, R. A., & Setiyatna, H. S. (2023). Revolusi Belajar di Era Digital. Penerbit PT Kodogu Trainer Indonesia. https://publisher.kodogutrainer.com/index.php/isbn/article/view/3

[15] Ramadhani, N. N., Nasrul, Syaifuddin, D. T., Maharani, S. W., & Putera, A. (2024). ANALISIS MEDIASI KEPUASAN KERJA PADA PENGARUH KESEHATAN KERJA, KESELAMATAN KERJA, DAN LINGKUNGAN KERJA TERHADAP KINERJA KARYAWAN. HOMANIS: Jurnal Halu Oleo Manajemen Dan Bisnis, 1(1), Article 1.

[16] Rizki, Y., Imran, R. A., Muhammad, K., Kusuma, H. I., & Ridho, A. F. (2024). Usulan Penerapan Contractor Safety Management System Pada Tahap Pra Kualifikasi di PT. UES Menggunakan Gap Analysis. G-Tech: Jurnal Teknologi Terapan, 8(3), 1959–1968. https://doi.org/10.33379/gtech.v8i3.4617

[17] Salasa, M. A. H., Sumitro, E. S., Alfianto, A., Anam, K., & Pramono, A. Y. (2024). Penilaian Kinerja Keselamatan Pertambangan di PT Putra Perkasa Abadi: Dampak Implementasi Sistem Manajemen Keselamatan Pertambangan (SMKP) terhadap Kesehatan dan Keselamatan Kerja. Jurnal Sosial Teknologi, 4(11), 980=987-980=987. https://doi.org/10.59188/jurnalsostech.v4i11.27627

[18] Sendy, & Simanjuntak, M. R. A. (2025). The Analysis Implementation of the Construction Safety Management System in the Buffer Area Development Project at Sunda Kelapa Port. Jurnal TESLINK : Teknik Sipil Dan Lingkungan, 7(1), Article 1. https://doi.org/10.52005/teslink.v1i1.517

[19] Sukman, A. A. A. (2023). Penerapan Sistem Manajemen Keselamatan dan Kesehatan Kerja (SMK3) pada Pekerjaan Beton Proyek Pembangunan Bendungan Ameroro. JUITEK: Jurnal Ilmu Teknik, 1(1), 13–26. https://doi.org/10.17891/juitek.v1i1.100

[20] Tambunan, N., Manik, D. V., Hutagalung, J. F. G., Tobing, W. S. L., & Hidayat, N. (2023). Penerapan Sistem Manajemen Keselamatan Dan Kesehatan Kerja (K3) Pada Bidang Pekerjaan Konstruksi Pada Revitalisasi Bangunan Sekolah SMA Negeri 5 Medan. Jurnal Sains Dan Teknologi, 5(2), 502–509.