INVOTEK

Jurnal Inovasi Vokasional dan Teknologi

http://invotek.ppj.unp.ac.id/index.php/invotek

Vol. 22, No. 1, Feb 2022

ISSN: 1411 – 3411 (p)
ISSN: 2549 – 9815 (e)

Analysis of Contractor's Knowledge Level about Construction Safety Management System Budget Plan Components (Case Study: Construction Project in Padang City)

Prima Zola[1*] , Viola Paramita Susanti[1] , M. Giatman[1], Annisa Prita Melinda[1], Fitra Rifwan[1]

[1] Department of Civil Engineering, Padang State University
Jl. Prof. Dr. Hamka Kampus UNP Air Tawar Padang, Indonesia-25131

Corresponding author: primazola@ft.unp.ac.id

Doi : https://doi.org/10.24036/invotek.v22i1.954

Abstract

Work accident prevention is cheaper than responding responsively after an accident. Common problems are weakness and a lack of predicted levels of risk for a job that could potentially be a work accident. Risk Control is undoubtedly something that must be designed before the work is done. This control must be supported by costs to run a Construction Safety Management System (SMKK). The initial observations and references that have been conducted and collected indicate the problem that the financing does not appear in the Budget Plan of the contractors in several construction projects when participating in the tender auction at the research site, namely: The City of Padang. There are limitations of information media, socialization, and implementation instructions become challenges in running it. This fundamental problem gave rise to an idea to carry out research. This research has been conducted to explore the problem of the level of knowledge of contractors about the financing of smkk. The data in this study was obtained by survey, in detail, disseminating questionnaires online to samples, namely: contractors in the city of Padang. The questionnaire has been analyzed, resulted the level of knowledge of this contractor is quite good in the level of knowledge about the components of the budget plan of SMKK. There is no problem with the contractor's knowledge related to the budget plan, except: readiness and planning for the system of budget.

Keywords: Contractors, Construction Safety Management System (SMKK)

1. Introduction

Many types of research were conducted related to a work accident in Indonesia. The researchers always gave the results about how to manage safety and health in the work environment. However, the number of work accidents increases until now.The main causes of work accidents in construction projects are those related to the unique characteristics of the construction project, different work locations, open and influenced by weather, limited execution time, dynamic and demanding high physical endurance, moderate to many. In addition, employing untrained workers and weak management of working safety is in the construction project cause they work with high-risk construction methods [1]. One aspect that is believed to improve work safety conditions is the availability of an appropriate budget and specifically allocated for the implementation of the construction safety management system (SMKK) in the project. Generally, SMKK is the one of parts of top management that influenced a culture of Occupational Health and Safety (OSH) in the work environment[2]. Its achievement needs the leadership skill based on a knowledge[3]. Also, The visible leadership commitment in the form of mastery of adequate human resources is the main factor in the implementation. Management plays a very important role in accident prevention[4]. Technically, planners and contractors always think risk control which is the only important thing in the management of accident prevention[5]. Effectiveness management must include many parts guided by a regulation [6]. It can control either technically or budget in a construction project.

Received date 09/07/2021, Revised date 29/11/2011, Accepted date 07/03/2022

P-ISSN: 1411-3414
E-ISSN: 2549-9815

In most cases, service users delegate all OHS matters to the contractor because they consider it to be included in the contractor's responsibility, and it is natural to include these costs in the project budget plan. When they think related to the budget, there is its addition that makes no profit for them[7]. However, the service user/project owner should supervise the use of the budget so that it is effectively used for the implementation of SMK3 in construction projects [8]. The purpose of this study was to determine the contractor's level of knowledge about the components of the SMKK cost budget plan for construction projects in Padang City.

Construction Safety is always present in the world of construction work. However, construction safety in the world of education is also present in the form of work safety in laboratories or workshops that support the course of the learning process in the educational institution itself. The Places have high level of risk in their operations. In this condition construction safety in the form of work safety is present [9][10][11].

1.1 Knowledge

Knowledge is the result of knowing, and this occurs after people perceive a particular object. Knowledge of cognition is a fundamental domain for the formation of one's actions [12].

1.2 Elements of Project Manager

The following are the elements of a project manager :

1.2.1 Project owner

According to [13] the project owner or also called the assignor, the owner is a business entity or individual, both government and private who have, provide work, and finance a project in the process of building a project. Here are the duties, authorities, and responsibilities of the project owner:

1. Appoint and appoint representatives for planning and implementation needs
2. Certify decisions concerning cost, quality, and time of implementation
3. Resolve disputes regarding projects that occur between subordinates and the contractor.

1.2.2 Planning consultant

According to [13], consultant planners have obligations or tasks that plan a plan in structural, architectural, and mechanical / electrical planning, with the provisions desired by the project owner. Here are the duties or activities of consultant planners:

1. Sketch and give an idea of the work overview, including the division of space, implementation plan, and more.
2. Create a detailed image / complete explanation with construction calculations.
3. Create a work plan and conditions and Cost Budget Plan
4. A place to consult if there are any dubious things in the field of architecture, structure and ME.

1.2.3 Supervising consultants

According to [13] Supervisory consultants are multidisciplinary organizations or individuals working for and on behalf of project owners. Supervisors must be able to work with consultant planners on a project. Here are the duties or activities of supervisory consultants:

1. Determine periodic supervision and provide briefings, instructions and explanations to construction implementers and research the results that have been done.
2. Provide recommendations for the progress report of the executor's work to ask the project owner for funds to finance the implementation of the next work.
3. Provide warnings and//au warnings to the implementer of the construction if in the implementation of the work there is a deviation from the specifications and technical drawings
4. Prepare, supervise and report the results of project implementation to the project owner.

1.2.4 Contractor

According to [13] The implementing contractor is an incorporated company engaged in the implementation of the distribution. The contractor can be an individual or legal entity, both government and private that has been determined from the project owner and has signed a Letter of Employment Agreement. This implementing contractor works by referring to the work drawings, work plans, and conditions (RKS) that have been prepared in advance. Here are the activities of the implementing contractor :

1. Implement all agreements in the employment contract, both in terms of scheduling of implementation and maintenance period.

P-ISSN: 1411-3414
E-ISSN: 2549-9815

2. Comply with and implement all instructions provided by the board of directors
3. Provide the necessary labor, materials, equipment, and services in accordance with the technical specifications and images that have been determined with regard to the cost of implementation, implementation time, quality of work, quantity of work, and job security.

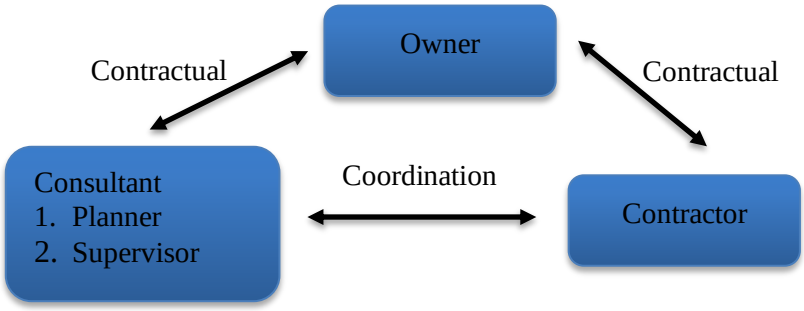

Figure 1 Working Relationship between Project Elements

Contractual is a professional relationship based on agreements in a contract that requires the expertise of each profession according to the field, and Coordination is the goal to realize the wishes of service users, which can technically be measured through the efficiency and effectiveness of the quality of the product produced. [13].

1.3 Determining the Level of Construction Safety Risk

Determination of the Level of Construction Safety Risk is determined from the parameters of the type of reference construction, or the guidelines used can be seen from the Regulation of the Minister of Public Works No. 10 the Year 2021 [14]

1.4 Work Pay Items

The payment currency used has four types as follows:

a. Common Payment Points Mata
b. Payment Points for Implementation of Construction Safety Management System
c. Main Payout Points
d. Other Payment Items

2. Methods

This research uses the qualitative research method. According to add name please [15] qualitative method is a research method based on the philosophy of postpositivism, used to examine natural objects, where the researcher is the key instrument, sampling of data sources is done purposively and snowball, triangulation research techniques (combined), data analysis is descriptive. Inductive/qualitative and qualitative research results emphasize meaning rather than generalization.

The population of this research is a contractor company that is under the auspices of the association GAPENSI Padang City. The sample of this research is the contractor company itself and obtained 17 respondents (one respondent for one company). The sampling technique used is purposive sampling. The reason for using this technique is because of the sampling technique with specific considerations [15]. Specific consideration to what?

This research data collection method has several stages starting from the stage of making a questionnaire, testing the validity by expert judgment, and distributing the questionnaire, distributing the questionnaire online by distributing it through the Whatsapp application. The sub-indicators of this research are preparation, socialization, promotion, and training, work protective equipment and personal protective equipment, insurance and licensing, K3 personnel, health facilities, infrastructure and equipment, signs, consultation with experts related to construction safety, activities, and equipment related to construction safety risk control. Based on these indicators, the questionnaire statements in this study were as many as 40 items. The rating scale in this study uses the Guttman scale, with the most extensive rating score of 1 and the most minor being 0.

P-ISSN: 1411-3414
E-ISSN: 2549-9815

The following is a picture of the research flow:

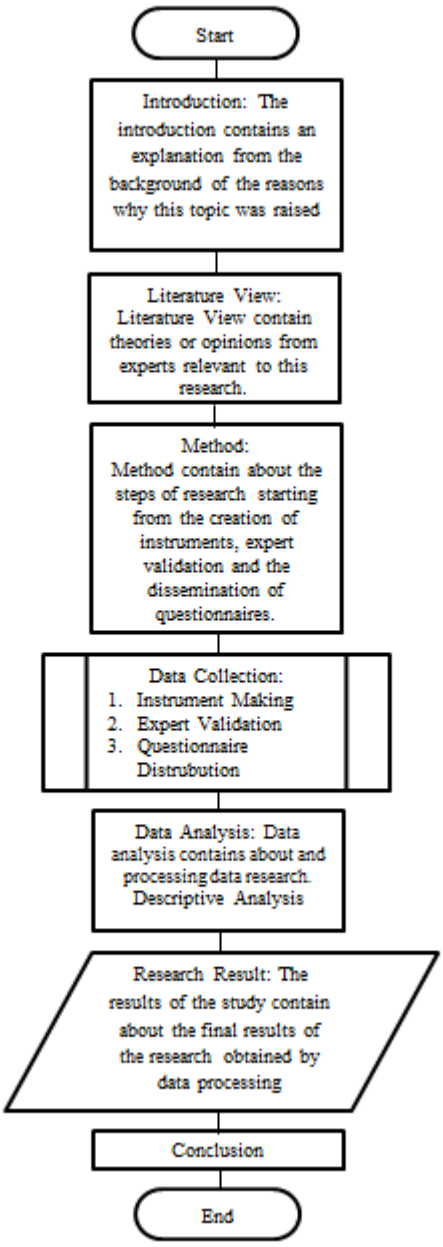

Figure 2 Flow Chart of Research

The data analysis technique used in this research is using descriptive analysis data processing techniques with the help of the Microsoft Excel 2010 program. Descriptive analysis calculations used in research using the formula of degrees of achievement from are [15] as follows:

$$DP = \frac{\sum \mathbf{X}}{\mathbf{n \times \sum item \times highest\ scale}} \times 100\% \qquad \text{Eq.(1)}$$

Where :

DP	:	Degree of Achievement
∑X	:	Total value of sub-indicators
n	:	The total number of samples
∑butir	:	Number of statement items

P-ISSN: 1411-3414
E-ISSN: 2549-9815

The percentage of DP value is given an interpretation using the table of achievement degrees categories as follows: [15]:

Table 1 Category Achievement Percentage

No	Percentage	Category
1	90-100%	Very Good
2	80-89%	Good
3	65-79%	Moderate
4	55-64%	Not Good
5	0-54%	Low

Source: [15]

3. Result and Discussion

3.1. Characteristics of Respondents

Respondents in this study occupy positions that are considered experts in answering questions on the questionnaire. Each respondent answered each question in the Analysis of Contractors' Knowledge Levels of the Components of the Construction Safety Management System (SMKK) Budget Plan on Construction Projects under the auspices of the Padang City Association of GAPENSI. There were 39 questionnaires distributed, but only 17 (accidental sampling) questionnaires received responses and answered questionnaires. The number of questionnaires that can be processed according to the criteria is 17 questionnaires. The following are the results of the research on the characteristics of the respondents :

Table 2 Respondents by Gender

Gender	Frequency	Percentage (%)
Man	16	94 %
Women	1	6 %
Total	17	100 %

Based on the research results on gender characteristics, it has no effect on the contractor's level of knowledge regarding the costs of implementing SMKK. Respondents who most dominantly participated in filling out the questionnaire in this study were men as many as 16 respondents, with a percentage of 94%.

Table 3 Respondents by Education Level

Level of education	Frequency	Percentage (%)
Senior High School (SMA)	3	17.65 %
D3 (Diploma)	5	29.41 %
S1 (Bachelor)	9	52.94 %
Total	17	100.00 %

Source: Processed Primary Data, 2021

Based on the table, respondents who most dominantly participated in filling out the questionnaire in this study were Strata 1 (S1) and nine respondents with a percentage of 52.94%.

P-ISSN: 1411-3414
E-ISSN: 2549-9815

Table 4 Respondents by Work Experince

Working Experience	Frequency	Percentage (%)
< 5 Years	6	35.29 %
6-10 Years	7	41.18 %
11-15 Years	3	17.65 %
>15 T Years	1	5.88 %
Total	17	100 %

Source: Processed Primary Data, 2021

Based on the research results on the characteristics of tenure, it has an influence where the longer the tenure, the more experience the respondent has. Respondents who most dominantly participated in filling out the questionnaire in this study were 6-10 years of service, with a percentage of 41.18%.

Table 5 Respondents by Position in the Project

Position	Frequency	Percentage (%)
Director	6	35.29 %
General Superintendent	2	11.77 %
Site Manager	4	23.53 %
Pelaksana	4	23.53 %
Staff	1	5.88 %
Total	17	100 %

Source: Processed Primary Data, 2021

Based on the research results, the characteristics of the position in the project have an influence, where the higher the position in the project, the better the level of knowledge. Respondents who most dominantly participated in filling out the questionnaire in this study were director positions as many as six respondents with a percentage of 35.29%.

3.2. Knowledge Level Analysis Data on the SMKK Budget Plan

The data of this study includes 17 respondents spread across several contractor companies in the city of Padang. Respondents provide answers by filling out a questionnaire distributed online about the cost components of implementing SMKK based on the sub-indicators that have been described previously.

Table 6 Calculation of Statistics for Sub-Indicators of RKK Preparation

No	Item	Score
1	Mean	0.73
2	Median	1.00
3	Mode	1.00
4	Standard Deviation	0.45
5	Maximum	1.00
6	Minimum	0.00
7	Sum (∑X)	37.00

Source: Processed Primary Data, 2021

P-ISSN: 1411-3414
E-ISSN: 2549-9815

Based on data processing from the RKK Preparation item, the percentage result for each questionnaire sub-indicator is 73%. This shows that the study results fall into the pretty good category with a percentage range of 65-79%.

Table 7 Calculation of Statistics for Sub-Indicators of Socialization, Promotion, and Training

No	Item	Score
1	Mean	0.76
2	Median	1.00
3	Mode	1.00
4	Standard Deviation	0.43
5	Maximum	1.00
6	Minimum	0.00
7	Sum (∑X)	91.00

Source: Processed Primary Data, 2021

Based on data processing from Socialization, Promotion, and Training, the percentage results for each sub-indicator of the questionnaire were 76%. This shows that the study results fall into the pretty good category with a percentage range of 65-79%.

Table 8 Calculation of Statistics for APK and APD Sub Indicators

No	Item	Score
1	Mean	0.56
2	Median	1.00
3	Mode	1.00
4	Standard Deviation	0.50
5	Maximum	1.00
6	Minimum	0.00
7	Sum (∑X)	19.00

Source: Processed Primary Data, 2021

Based on data processing from Work Protective Equipment and Personal Protective Equipment items, the percentage results for each sub-indicator of the questionnaire are 56%. This shows that the study results fall into the poor category with a percentage range of 55-64%.

Table 9 Calculation of Statistics for Insurance and Licensing Sub-Indicators

No	Item	Score
1	Mean	0.53
2	Median	1.00
3	Mode	1.00
4	Standard Deviation	0,50
5	Maximum	1.00
6	Minimum	0.00
7	Sum (∑X)	36.00

Source: Processed Primary Data, 2021

P-ISSN: 1411-3414
E-ISSN: 2549-9815

Based on data processing from Insurance and Licensing items, the percentage results for each sub-indicator of the questionnaire are 53%. This shows that the research results are in the wrong category with a percentage range of 0-54%.

Table 10 Calculation of Statistics for OHS Personnel Sub-Indicators.

No	Item	Score
1	Mean	0,87
2	Median	1.00
3	Mode	1.00
4	Standard Deviation	0.34
5	Maximum	1.00
6	Minimum	0.00
7	Sum (∑X)	89.00

Source: Processed Primary Data, 2021

Based on data processing from OHS Personnel items, the percentage results for each questionnaire sub-indicator are 87%. This shows that the research results are in the good category, with a value range of 80%-89%.

Table 11 Sub-Indicators of Facilities, Infrastructure, and Medical Devices

No	Item	Score
1	Mean	0.78
2	Median	1.00
3	Mode	1.00
4	Standard Deviation	0.42
5	Maximum	1.00
6	Minimum	0.00
7	Sum (∑X)	53.00

Source: Processed Primary Data, 2021

Based on data processing from the items Facilities, Infrastructure, and Medical Devices, the percentage results for each sub-indicator of the questionnaire are 78%. This shows that the study area results in the pretty good category, with a value range of 65%-79%.

Table 12 Calculation of Statistics for Sub Indicators of Signs

No	Item	Score
1	Mean	0.74
2	Median	1.00
3	Mode	1.00
4	Standard Deviation	0.37
5	Maximum	1.00
6	Minimum	0.00
7	Total (∑X)	63.00

Source: Processed Primary Data, 2021

P-ISSN: 1411-3414
E-ISSN: 2549-9815

Based on data processing from the Signs item, the percentage result for each sub-indicator of the questionnaire is 74%. This shows that the results of the study are in the fairly good category, with a value range of 65-79%.

Table 13 Sub-Indicator Consultation with Experts Regarding Construction Safety

No	Item	Score
1	Mean	0.50
2	Median	1.00
3	Mode	1.00
4	Standard Deviation	0.51
5	Maximum	1.00
6	Minimum	0.00
7	Sum. (∑X)	17.00

Source: Processed Primary Data, 2021

Based on data processing from the Consultation with Experts related to Construction Safety, the percentage results for each sub-indicator of the questionnaire are 50%. This shows that the research results are in the bad category with a percentage range of 0-54%.

Table 14 Activities and Equipment related to Construction Safety Risk Control

No	Item	Score
1	Mean	0.43
2	Median	1.00
3	Mode	1.00
4	Standard Deviation	0.39
5	Maximum	1.00
6	Minimum	0.00
7	Sum. (∑X)	51.00

Source: Processed Primary Data, 2021

Based on data processing from Activities and Equipment items related to Construction Safety Risk Control, the percentage results for each sub-indicator of the questionnaire are 43%. This shows that the research results are in the bad category with a percentage range of 0-54%.

Based on the analysis of the results of research data processing, each sub-indicator can be seen briefly as follows:

Table 155 sub-indicator

No	Sub-indicator	Degree of Achievement	Category
1	RKK preparation	73%	Moderate
2	Socialization, Promotion and Training	76%	Moderate
3	Work Protective Equipment and Personal Protective Equipment	56%	Not Good
4	Insurance and Licensing	53%	Low
5	K3 personnel	87%	Good

P-ISSN: 1411-3414
E-ISSN: 2549-9815

6	Facilities, Infrastructure and Medical Devices	78%	Moderate
7	Signs	74%	Moderate
8	Consultation with Construction Safety Experts	50%	Low
9	Activities and Equipment related to Construction Safety Risk Control.	43%	Low

Source: Processed Primary Data, 2021

From the research results on 17 contractor companies under the auspices of the Padang City GAPENSI association, the contractor's level of knowledge was obtained using the degree of achievement formula

Tabel 16 Sub-Indicator Overall Score

No	Sub Indicator	**X**
1	RKK preparation	37
2	Socialization, Promotion and Training	91
3	Work Protective Equipment and Personal Protective Equipment	19
4	Insurance and Licensing	36
5	K3 personnel	89
6	Facilities, Infrastructure and Medical Devices	53
7	Signs	63
8	Consultation with Construction Safety Experts	17
9	Activities and Equipment related to Construction Safety Risk Control.	51
	∑X	456

Source: Processed Primary Data, 2021

The data processing of the overall results obtained for each sub-indicator percentage of the questionnaire is 67%. This shows that the study results fall into the pretty good category with a percentage range of 65-79%.

4. Conclusion

Based on the results of data analysis, discussion, and the purpose of this study, namely to determine the contractor's level of knowledge about the components of the SMKK budget plan (Case Study: Construction Projects in Padang City), that the contractor's level of knowledge about the components of the SMKK budget plan is quite good. Therefore, it can be concluded that the contractors on construction projects in Padang City are pretty good in their level of knowledge about the components of the SMKK budget plan. Because of the higher percentage score than others, The SMKK budget must be planned and conducted to reduce work accidents. It is a part of OHS management to make increasing productivity and quality in construction work[16].

References

[1] W. Y. Christina, D. Ludfi, and A. Thoyib, "Pengaruh Budaya Keselamatan Dan Kesehatan Kerja (K3) Terhadap Kinerja Proyek Konstruksi," *J. Rekayasa Sipil*, vol. 6, no. 1, pp. 83–95, 2012, [Online]. Available: https://rekayasasipil.ub.ac.id/index.php/rs/article/view/193.

[2] B. Endroyo, "Faktor-Faktor Yang Berperan Terhadap Peningkatan Sikap Keselamatan Dan Kesehatan Kerja (K3) Para Pelaku Jasa Konstruksi Di Semarang," *J. Tek. Sipil dan Perenc.*, vol. 12, no. 2, pp. 111–120, 2010, doi: 10.15294/jtsp.v12i2.1344.

[3] B. Endroyo, "Peranan Manajemen K3 Dalam Pencegahan Kecelakaan Kerja Konstruksi," *J. Tek. Sipil Unika Soegijapranata*, vol. 3, no. 1, pp. 8–15, 2006.
[4] H. Alexander, S. Nengsih, and O. Guspari, "Kajian Keselamatan dan Kesehatan Kerja (K3) Konstruksi Balok Pada Konstruksi Bangunan Gedung," *J. Ilm. Poli Rekayasa*, vol. 15, no. 1, p. 39, 2019, doi: 10.30630/jipr.15.1.140.
[5] B. Endroyo, "Keselamatan Konstruksi: Konsepsi dan Regulasi," *J. Tek. Sipil dan Perenc. UNNES*, vol. 11, no. 2, pp. 169–180, 2009, doi: 10.15294/jtsp.v11i2.1725.
[6] T. D. Rawis, "Perencanaan Biaya Keselamatan dan Kesehatan Kerja (K3) pada Proyek Konstruksi Bangunan (Studi Kasus: Sekolah St . Ursula Kotamobagu)," *J. Sipil Statik*, vol. 4, no. 4, pp. 241–252, 2016.
[7] S. A. Susanti B, "Alokasi Biaya Penyelenggaraan Sistem Manajemen Keselamatan Dan Kesehatan Kerja Pada Proyek Konstruksi Jembatan Di Kota Palembang," *Avoer XI*, pp. 23–24, 2019.
[8] F. Rifwan, P. Zola, and M. Yunila, "Tinjauan Tingkat Risiko Menggunakan Metode Job Safety Analysis (JSA) pada Workshop Konstruksi Jurusan Teknik Sipil Fakultas Teknik Universitas Negeri Padang," vol. 1, no. 1, pp. 23–32, 2019.
[9] A. Alfarid, Y. Gusmaret, and F. Rifwan, "Tinjauan Penerapan K3 Oleh Mahasiswa Jurusan Teknik Sipil Dalam Fakultas Teknik Universitas Negeri Padang Cived Issn 2302-3341," *Tek. Sipil*, vol. 6, no. 2302–3341, 2018.
[10] N. Syah, J. Mardizal, F. Rifwan, and Z. G. Arianto, "Hubungan pengetahuan k3 dengan hasil praktikum mahasiswa di workshop konstruksi teknik sipil ft unp," *J. Rekayasa Konstr. Mek. Sipil*, vol. 7, no. 3, pp. 133–139, 2020.
[11] S. Notoatmodjo, *Metodologi Penelitian*. Jakarta: Rineka Cipta, 2010.
[12] Dimyati and H. & N. Kadar., *Manajemen Proyek*. Bandung: Pustaka Setia, 2014.
[13] PUPR, "Penentuan Tingkat Resiko Keselamatan Konstruksi." pp. 358–371, 2021.
[14] Sugiyono, *Metode Penelitian Kuantitatif, Kualitatif, R&D*. Bandung: Alfabeta, 2016.
[15] N. Sudjana, *Penelitian Hasil Proses Belajar Mengajar*. Bandung: Remaja Rosdakarya, 2011.
[16] N. Aini *et al.*, "Peningkatan Produktivitas Kerja Melalui Penerapan Program K3 Di Lingkungan Konstruksi," *Bangun Rekaprima*, vol. 5, no. 1, pp. 1–12, 2019, doi: 10.32497/bangunrekaprima.v5i1.1404.

P-ISSN: 1411-3414
E-ISSN: 2549-9815