



Analysis of the Availability of Occupational Safety and Health Support Facilities in Building Construction Projects

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Abstract. The rapid development of construction project activities, especially building construction projects, is in line with the increase in the incidence of accidents and work-related illnesses. This can be seen from the increasing number of employment insurance claims for both health and death. One of the ways to deal with this problem is the provision of facilities to support occupational safety and health in the hope of reducing the number of accidents and illnesses due to work. The purpose of the study is to analyze the value of the level of occupational safety and health support facilities, attitudes and awareness for the equipment provided, and the amount of costs needed to provide support facilities according to field conditions. The method for the research uses quantitative description with data collection through observation and interviews. The research shows that the value of the availability of occupational safety and health support facilities is 86.67% with the category of “Good Implementation”. Work personnel have been disciplined in using occupational safety and health facilities but these have not been fully maximized.

Keywords: Construction Projects, Occupational Safety and Health, Supporting Facilities

1 Introduction

A construction project is a relationship between work items that are carried out with several resources and are limited by the time of implementation (Yuliana, 2021). Construction projects have 2 (two) types of projects, namely building construction projects and civil construction projects. Every project implementation involves a workforce that is generally not certified except for heavy equipment operators, heavy equipment that is at risk of work accidents, limited time, and requires a lot of labor (Habir & Purwanto & Nanda Mardianti, 2022). According to data from the Employment Social Security Administration Agency (BPJS Ketenagakerjaan), the data number of work accidents in 2020 amounted to 221,740 cases, in 2021 it was 234,370 cases, in 2022 it was recorded 265,334 cases and in 2023 it touched 360,635 cases (Yuliana et al., 2022). Due to the high number of cases of work accidents, it is necessary

to implement occupational safety and health comprehensively from the top of the leadership to the lowest workforce as a direction for the implementation of the project (Mustafa et al., 2022). The Indonesian government has established a law on OSH and requires all industrial sectors to implement it (Putra & Saraswati, 2023). The regulations that have been issued are Government Regulation of the Republic of Indonesia No. 50 of 2012 concerning the Implementation of the Occupational Safety and Health Management System (SMOSH) which has 3 (three) categories of the number of criteria in the implementation of SMOSH, namely the initial level of 64 (sixty-four) criteria, the transition level of 122 (one hundred and twenty-two) criteria and the advanced level of 166 (one hundred and sixty-six) criteria (Roshal et al., 2022). The International Standards Organization (ISO) has also published an international standard for occupational health and safety management systems (ISO 45001:2018) which contains the requirements for the fulfillment of SMOSH. The regulation is applied to the industry in general so the construction sector issued a special regulation concerning Construction Safety Management System Guidelines which contain 86 criteria that must be obeyed by parties participating in the implementation of a construction project (Sapitri, Faizan Dalilla, Firdaus Agus, 2023). Construction safety is understood as all technical activities that assist construction work to meet safety, health, and sustainable building standards that ensure the safety and health of workers, public safety, property, materials, equipment, construction, and the environment (Erlangga, 2021). The fulfillment of SMKK is expected to ensure project performance by legal requirements and create Zero Accidents (Suhjarja & Abdullah, 2021). Previous research related to the availability of occupational safety and health support facilities shows that the results of the analysis of the completeness of PPE and OSH facilities in the BeSS Mansion Apartment project received an average score of 95.55%, the Ciputra World Building project with an average score of 93.67%, and the Building C and Perbanas II Campus Mosque projects received an average score of 73.33% (Priyono & Harianto, 2020). One of the characteristics of construction projects is unique so that even though they are working on the same type of project, namely building construction projects, the scope, power supply, and time determined are not the same as each other so the potential for accidents and illnesses due to work is also different and of course produces a variety of values for the level of implementation of occupational safety and health support facilities. Bali as a tourist destination also builds many building construction projects and its implementers have been required to provide occupational safety and health facilities. Therefore, research is needed to determine the level of application of occupational safety and health support facilities and the costs incurred to provide occupational safety and health support facilities for the project. The novelty of this study is the analysis of the costs needed in the context of the implementation of OSH by the frequency of replacement of OSH facilities and infrastructure, in addition to the analysis of the percentage of OSH implementation rate in the field.

2 Methodology

2.1 Research Design

The research was carried out in a building construction project in the Jimbaran Area, Badung, Bali which is currently in the implementation stage. This study uses a quantitative research method with a descriptive format. Research is carried out in the form of observations, checklists, interviews, and documentation. Observation aims to carry out and monitor the results obtained in the workplace, a checklist is carried out to see a list of occupational safety and health support facilities provided and used by workers in the field, interviews to find out the supporting facilities provided and documentation to document the supporting facilities and the process of using them.

2.2 Research Data

This study uses 2 (two) types of data, namely primary data and secondary data. Primary data in this study were obtained from observations, checklists, interviews, and documentation in the project that was the object of the research. The primary data in this study is a list of occupational safety and health support facilities provided. The secondary data used in this study is previous research and the Regulation of the Minister of Public Works and Housing Number 10 of 2021 which contains a list of supporting facilities that must be provided that are tailored to the type of project, scope, and resources used.

2.3 Data Analysis

If all the necessary data has been obtained, then the stages of analysis of the data are carried out, namely: Compiling an observation sheet checklist for OSH supporting facilities. The observation sheet is made in the form of a checklist concerning the details of the supporting facilities for SMK implementation activities to the needs of the project; Observation and documentation related to the conformity between the checklist and field data. Field observation is carried out based on a checklist that has been prepared to check the conformity between the criteria and the application in the field and check the condition and availability of OSH supporting facilities. Conformity is checked by checking each criterion whether it is following or not following the scale of application. The scale of application is divided into (5) five, namely (1) unavailable; (2) available, unsuitable, and incomplete; (3) available, feasible, incomplete; (4) available, unfeasible, complete; (5) available, feasible, complete; Calculating the percentage level of availability of OSH facility support facilities. The calculation is carried out by adding the value obtained compared to the maximum score/value and multiplied by 100% so that the percentage of the value of the availability of OSH supporting facilities is obtained. The level of implementation is determined through 3 (three) scales according to Table 1 which is sourced from the research journal of Sapitri et al. in the year 2023.

Table 1. Implementation scale

Achievement percentage	Implementation rate
0% – 59%	Not Good
60% – 84%	Good Implementation
85% – 100%	Satisfactory Implementation

3 Result and Discussion

3.1 Analysis of Criteria for Occupational Safety and Health Support Facilities

The data from the identification of the availability of OSH supporting facilities above is then used as a reference for carrying out observations in the field to check the adjustments between the criteria and their application in the field as well as to check the condition and availability of OSH supporting facilities. Conformity is checked by checking each criterion. The observation results are shown in the following Table 2. Based on Table 2, the percentage of availability of Occupational Health and Safety supporting facilities is 83.48% and included as “Satisfactory Implementation” because it has a percentage value of meeting the criteria between 85% – 100%. The percentage value of 13.04% falls into the category of “available, feasible, incomplete”, because some PPE, namely masks, are provided per day, only 1 mask for 1 worker with a mask condition that is still good on the first day of work. In addition, gloves, full-body harnesses, and safety goggles are also provided for workers who need these facilities but not for all workers. The remaining value of 0.87% is held by medical beds because in the project there are medical beds in the P3K room but only in the form of long benches that are not following standard medical beds. The implementation of project activities involves 85 workers and to prevent accidents and illnesses due to work, OSH facilities are provided in the hope of eliminating accidents or illnesses that may occur. This is following research from Fidli et al. in 2021 who explained that the availability of supporting facilities is quite optimal in protecting the workforce (Suhjarja & Abdullah, 2021). This is evidenced by the zero number of work accidents during the implementation of the project. Table 2 also shows that the company has tried to provide most of the facilities well and according to the needs of the field although some are not suitable. At the time of the observation, it was also found that the safety officer always patrolled to ensure that the workers wore PPE Work Protective Equipment was properly installed and the workers were also disciplined in using the PPE that had been provided. The garbage cans provided are also divided into 3 (three) types to accommodate various types of waste so that chemical and organic waste is not mixed into one.

Table 2. Checklist of criteria for availability of supporting facilities

No.	OSH Facilities	Scoring				
		1 Not Available	2 Available, not feasible and incomplete	3 Available, feasible, incomplete	4 Available, not feasible, complete	5 Available, feasible, complete
A	Personal Protective Equipment					
1	Project helmet					V
2	Mask			V		
3	Glove			V		
4	Full Body Harness			V		
5	Safety vest					V
6	Safety shoes					V
7	Safety goggles			V		
B	Work Protective Equipment					
1	Safety net					V
2	Safety fence					V
3	Area Dividers					V
C	Other Facilities					
1	OSH information board					V
2	Signage					V
3	Prohibition signs					V
4	Warning signs					V
5	Obligation signs					V
6	Information signs					V
7	Evacuation route signs					V
8	Light Fire Extinguisher (APAR)					V
9	OSH Flag					V
10	Health Room		V			
11	P3K Box			V		
12	Medical Beds		V			
13	Trash Can					V
Total		0	1	15	0	80
Max score				115		
Percentage		0.00%	0.87%	13.04%	0.00%	69.57%
Total percentage				83.48%		

3.2 Budget Plan for the Implementation of Occupational Safety and Health Support Facilities

The analysis of the implementation budget plan was carried out by multiplying the volume of each supporting facility by the average unit price obtained through a survey at stores that sell OSH equipment and interviews with safety officers to determine the unit price of the cost of building a health room. In addition, interviews were also conducted to find out the frequency of replacement of these supporting facilities. The results of the cost analysis of the provision of OSH supporting facilities are shown in the following Table 3.

Table 3. Checklist of criteria for availability of supporting facilities

No.	OSH facilities	Vol	Unit	Total unit price	Replacement frequency	Total price
A	Personal Protective Equipment					
1	Project helmet	85	pcs	78,750.00	3 times replacement	20,081,250.00
2	Mask	20	pcs	68,250.00	Every day	1,365,000.00
3	Glove	85	pcs	42,000.00	2 times replacement	7,140,000.00
4	Full Body Harness	5	pcs	267,750.00	worn during the life of the project	1,338,750.00
5	Safety vest	85	pcs	52,500.00	2 times replacement	8,925,000.00
6	Safety shoes	10	pcs	210,000.00	2 times replacement	4,200,000.00
7	Safety goggles	25	pcs	57,750.00	worn during the life of the project	1,443,750.00
B	Work Protective Equipment					
1	Safety net	209	m'	26,250.00	worn during the life of the project	5,486,250.00
2	Safety fence	126.18	m'	83,652.19	worn during the life of the project	10,555,233.02
3	Area Dividers	1	Ls	525,000.00	worn during the life of the project	525,000.00
C	Other Facilities					
1	OSH information board	4	pcs	157,500.00	worn during the life of the project	630,000.00
2	Signage	8	pcs	157,500.00	worn during the life of the project	1,260,000.00
3	Prohibition signs	8	pcs	157,500.00	worn during the life of the project	1,260,000.00
4	Warning signs	8	pcs	315,000.00	worn during the life of the project	2,520,000.00
5	Obligation signs	8	pcs	157,500.00	worn during the life of the project	1,260,000.00

6	Information signs	8	pcs	157,500.00	worn during the life of the project	1,260,000.00
7	Evacuation route signs	8	pcs	157,500.00	worn during the life of the project	1,260,000.00
8	Light Fire Extinguisher (APAR)	15	pcs	144,375.00	worn during the life of the project	2,165,625.00
9	OSH Flag	3	pcs	15,750.00	worn during the life of the project	47,250.00
10	P3K Room	1	pcs	46,000,000.00	worn during the life of the project	46,000,000.00
11	P3K Box	1	pcs	97,125.00	worn during the life of the project	97,125.00
a	Itching Relievers	2	pcs	12,600.00	3 times replacement	75,600.00
b	Pain medication (Paracetamol)	2	pcs	299,25	3 times replacement	1,795,50
c	Flu and Cough Medicine	2	pcs	21,000.00	3 times replacement	126,000.00
d	Eye Drops	2	bottle	15,750.00	3 times replacement	94,500.00
e	Thermometer	1	pcs	57,750.00	3 times replacement	173,250.00
f	Bandage	3	pcs	6,300.00	3 times replacement	56,700.00
g	Betadine	2	bottle	7,350.00	3 times replacement	44,100.00
h	Cotton	1	box	36,750.00	3 times replacement	110,250.00
i	Sterile Gauze	2	pcs	6,300.00	3 times replacement	37,800.00
12	Medical Beds	1	pcs	231,000.00	worn during the life of the project	231,000.00
13	Trash Can	18	pcs	126,000.00	worn during the life of the project	2,268,000.00
Total						122,039,228.52
Rounded						122,000,000.00

The amount of costs incurred to provide K3 supporting facilities is Rp 122,000,000.00 (One Hundred and Twenty-Two Million Rupiah) with various frequencies of facility replacements. Most of the supporting facilities are used once during one project period, while primary personal protective equipment such as protective helmets, masks, gloves, safety vests, and safety shoes are replaced periodically considering that these supporting facilities are always used for work every day and are prone to damage so they need to be replaced periodically.

4 Conclusion

The results of the study can be concluded that the company has provided a large number of K3 supporting facilities and has been well implemented, as evidenced by the zero number of work accidents. The percentage for the availability of K3 supporting facilities is 83.48% with the category of “Good Implementation” and the provision of K3 supporting facilities requires a cost of Rp. 122,000,000.00 which has covered the periodic replacement of facilities.

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