PVJIS-2020

ABS-171

[Abstract ID: ABS-171]

Search on Ifory

Analysis of Occupational Safety and Health Systems in Bridge Construction Development Logistics Systems : Case Study at Cibeureum Bridge, Sukabumi

*Ichwan N.E1 , Akhmad Sutoni*2 , Siti Tsana Khoerunnisa1 , and Mujiarto 3*

1Teknik Sipil, Universitas Suryakancana, Cianjur, Indonesia.
2Teknik Industri, Universitas Suryakancana, Cianjur, Indonesia.
3Department of Mechanical Engineering, Universitas Muhammadiyah Tasikmalaya, Indonesia

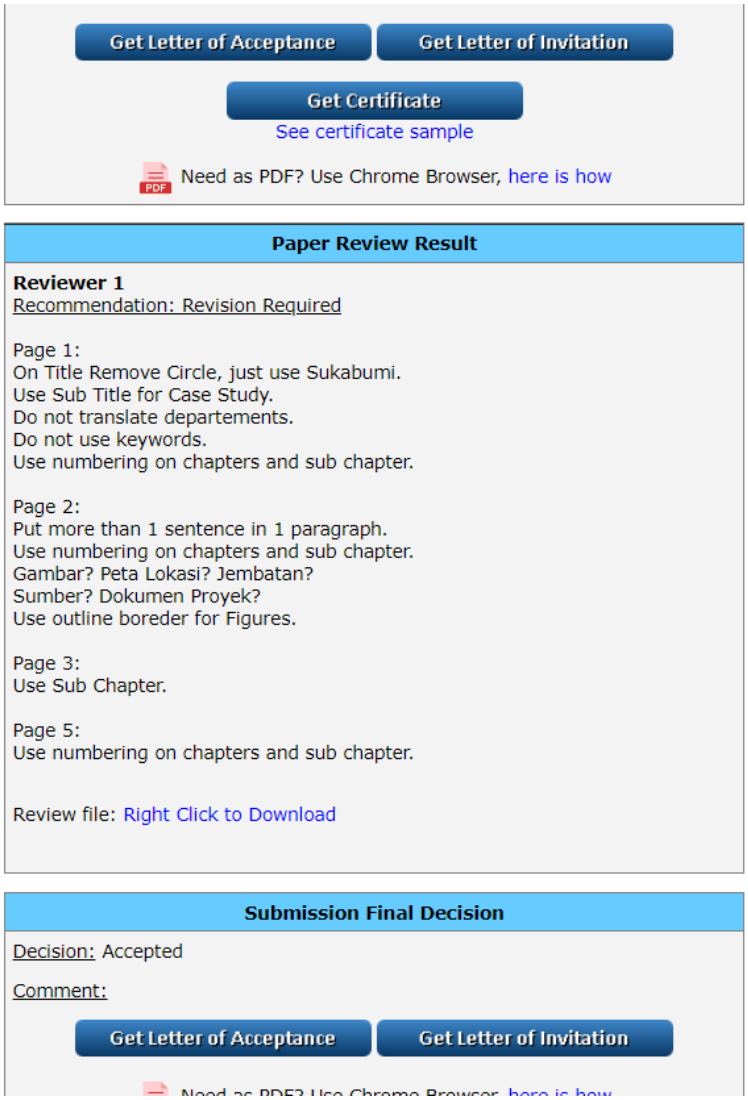
*tbungsu13@gmail.com

Abstract

The implementation of the Occupational Safety and Health System in general is still often overlooked. This is indicated by the high number of work accidents that occur. in Indonesia. One of the factors that influence the level of work productivity is the safety and health of workers. Therefore, the application and evaluation of the Occupational Safety and Health System can reduce the level of work accidents. The case study was carried out at the Cibeureum bridge, Sukabumi Circle Segment-3. This study uses qualitative methods, namely by descriptive analysis based on data and observations in the field. The results obtained, the safety and health system has been quite well planned by the company ... But there must be an improvement in the planning process in forming a Special Committee on Safety and Occupational Health and Safety Officer. Standards and guidelines used to regulate the implementation of the Occupational Safety and Health System are compiled in an integrated Work Safety Plan from the Contract Quality Plan. This refers to the applicable laws and regulations. Made based on customer requirements. This can be seen based on the existence of commitments and policies, planning, implementation in the construction phase, performance monitoring and evaluation, as well as reviewing and improving the performance of the Occupational Safety and Health System carried out by management. **(Approx. 218 words)**

Keywords: Occupational Safety and Health- Logistics Systems- Project Management- Construction

Topic: Engineering and Technology



URL JPCS-1764: https://iopscience.iop.org/issue/1742-6596/1764/1

URL pdf: https://iopscience.iop.org/article/10.1088/1742-6596/1764/1/012173/pdf

URl abstract: https://iopscience.iop.org/article/10.1088/1742-6596/1764/1/012173

Link indexing: https://www.scimagojr.com/journalsearch.php?q=130053&tip=sid&clean=0

Print this page

PVJ-IS 2020

Paris Van Java International Seminar 2020
Aston Pasteur Hotel, 15-16 July 2020
Website: https://pvj-is.umtas.ac.id
Email: pvj-is@umtas.ac.id

Date: 11 October 2022

Letter of Acceptance for Abstract

Dear Authors: Ichwan N.E1 , Akhmad Sutoni*2 , Siti Tsana Khoerunnisa1 , and Mujiarto 3

We are pleased to inform you that your abstract (ABS-171, Oral Presentation), entitled:

"Analysis of Occupational Safety and Health Systems in Bridge Construction Development Logistics Systems : Case Study at Cibeureum Bridge, Sukabumi"

has been reviewed and accepted to be presented at PVJ-IS 2020 conference to be held on 15-16 July 2020 in Tasikmalaya, Indonesia.

Please submit your full paper and make the payment for registration fee before the deadlines, visit our website for more information.

Thank You.

Best regards,

Dr. Mujiarto, S.T.,M.T.
PVJ-IS 2020 Chairperson

Print this page

PVJ-IS 2020

Paris Van Java International Seminar 2020
Aston Pasteur Hotel, 15-16 July 2020
Website: https://pvj-is.umtas.ac.id
Email: pvj-is@umtas.ac.id

Date: 11 October 2022

Letter of Acceptance for Full Paper

Dear Authors: Ichwan N.E1 , Akhmad Sutoni*2 , S T Khoerunnisa1 , Mujiarto 3

We are pleased to inform you that your paper, entitled:

"Analysis of Occupational Safety and Health Systems in Bridge Construction Development Logistics Systems : Case Study at Cibeureum Bridge, Sukabumi"

has been reviewed and accepted to be presented at PVJ-IS 2020 conference to be held on 15-16 July 2020 in Tasikmalaya, Indonesia.

Please make the payment for registration fee before the deadlines, visit our website for more information.

Thank You.

Best regards,

Dr. Mujiarto, S.T.,M.T.
PVJ-IS 2020 Chairperson

Konfrenzi.com - Conference Management System

Print this page

PVJ-IS 2020

Paris Van Java International Seminar 2020
Aston Pasteur Hotel, 15-16 July 2020
Website: https://pvj-is.umtas.ac.id
Email: pvj-is@umtas.ac.id

Date: 11 October 2022

Letter of Invitation

Dear Authors: Ichwan N.E1 , Akhmad Sutoni*2 , Siti Tsana Khoerunnisa1 , and Mujiarto 3

We are pleased to inform you that your abstract (ABS-171, Oral Presentation), entitled:

"Analysis of Occupational Safety and Health Systems in Bridge Construction Development Logistics Systems : Case Study at Cibeureum Bridge, Sukabumi"

has been reviewed and accepted to be presented at PVJ-IS 2020 conference to be held on 15-16 July 2020 in Tasikmalaya, Indonesia.

We cordially invite you to attend our conference and present your research described in the abstract.

Please submit your full paper and make the payment for registration fee before the deadlines, visit our website for more information.

Thank You.

Best regards,

Dr. Mujiarto, S.T.,M.T.
PVJ-IS 2020 Chairperson

Print this page

PVJ-IS 2020

Paris Van Java International Seminar 2020
Aston Pasteur Hotel, 15-16 July 2020
Website: https://pvj-is.umtas.ac.id
Email: pvj-is@umtas.ac.id

Date: 11 October 2022

Letter of Invitation

Dear Authors: Ichwan N.E1 , Akhmad Sutoni*2 , S T Khoerunnisa1 , Mujiarto 3

We are pleased to inform you that your paper, entitled:

"Analysis of Occupational Safety and Health Systems in Bridge Construction Development Logistics Systems : Case Study at Cibeureum Bridge, Sukabumi"

has been reviewed and accepted to be presented at PVJ-IS 2020 conference to be held on 15-16 July 2020 in Tasikmalaya, Indonesia.

We cordially invite you to attend our conference and present your research described in the paper.

Please make the payment for registration fee before the deadlines, visit our website for more information.

Thank You.

Best regards,

Dr. Mujiarto, S.T.,M.T.
PVJ-IS 2020 Chairperson

Analysis of Occupational Safety and Health Systems in Bridge Construction Development Logistics Systems (Case Study : Cibeureum Bridge, Sukabumi Circle)

Ichwan N.E[1] , Akhmad Sutoni[*2] , Siti Tsana Khoerunnisa[1], and Mujiarto [3]

[1]Teknik Sipil, Universitas Suryakancana, Cianjur, Indonesia.

[2]Teknik Industri, Universitas Suryakancana, Cianjur, Indonesia.

[3]Department of Mechanical Engineering, Universitas Muhammadiyah Tasikmalaya, Indonesia

[*]tbungsu13@gmail.com

Abstract. The implementation of the Occupational Safety and Health System in general is still often overlooked. This is indicated by the high number of work accidents that occur. in Indonesia. One of the factors that influence the level of work productivity is the safety and health of workers. Therefore, the application and evaluation of the Occupational Safety and Health System can reduce the level of work accidents. The case study was carried out at the Cibeureum bridge, Sukabumi Circle Segment-3. This study uses qualitative methods, namely by descriptive analysis based on data and observations in the field. The results obtained, the safety and health system has been quite well planned by the company ... But there must be an improvement in the planning process in forming a Special Committee on Safety and Occupational Health and Safety Officer. Standards and guidelines used to regulate the implementation of the Occupational Safety and Health System are compiled in an integrated Work Safety Plan from the Contract Quality Plan. This refers to the applicable laws and regulations. Made based on customer requirements. This can be seen based on the existence of commitments and policies, planning, implementation in the construction phase, performance monitoring and evaluation, as well as reviewing and improving the performance of the Occupational Safety and Health System carried out by management.
Keywords: Occupational Safety and Health, Logistics Systems, Project Management, Construction.

Introduction

Occupational accidents although small in nature but can disrupt the smoothness of a development project and can cause losses (both minor injuries to death and damage to complementary facilities and infrastructure), while indirect losses that will cause a decline in the company's image [1].
The Cibeureum bridge construction project (45.80 m) in Sukabumi Circle Segment-3 is one of the construction projects that has a high risk of work accidents. One of the reasons is the use of heavy equipment and sophisticated machinery as well as the work carried out on an active road, the Sukaraja-Baros Development Road which requires expertise to use it properly. The purpose of this study was to determine the application and evaluation of Occupational Safety and Health Systems in the construction of the Cibeureum bridge (45.80 m) in the Sukabumi Circle Segment-3.
An occupational accident will only occur if there are a variety of causative factors simultaneously at a workplace or production process. From some studies the experts give an indication that an occupational accident cannot happen by itself, but occurs by one or several factors causing an accident at the same time [2].
Unsafe condition is a condition in the work environment in the form of tools, materials or environment that is not safe or dangerous. Unsafe conditions in question such as slippery floors, broken and broken stairs, poor lighting or noise that exceeds the safety limit allowed [3].
Based on the results of the planning continued with the implementation and operation through the mobilization of all available resources and carrying out various programs and supporting steps to achieve success. Overall, the results of the implementation of Occupational Safety and Health must be reviewed periodically by top management to ensure that Occupational Safety and Health Systems are

running in accordance with business policies and strategies and to identify constraints that can affect their implementation, so the organization can immediately make improvements and other correction steps [3].

Personal protective equipment is a set of safety equipment that is used by workers to protect all or part of their body from the possibility of exposure to potential occupational hazards to work accidents and diseases [1].

In previous research [4]-[7] regarding the Analysis of Occupational Safety and Health Systems on Bridge construction. The purpose of this study was to determine the application and evaluation of Occupational Safety and Health Systems in bridge construction. Research [8] studies on evaluating the implementation of safety and health in road construction company. Research [9]-[10] conducted research on the role of occupational safety and health management in the construction industry. Research [11]-[13] conducted research on work accident risk analysis on construction work. From [14] his research on Risk Analysis in Construction Supply Chain. The purpose of this study is to determine what risks are likely to occur in three flows (flow of material, flow of information and flow of funds) in the building construction project supply chain system and to find out how much risk in the flow of information, risk of material flow and risk of flow of funds.

Methods

The method of data collection is by direct observation of the object being reviewed and recording the required data in accordance with the discussion. Data collection activities carried out by interviews and direct surveys.

The observations made are as follows:

1. Reviewing the process of implementing Occupational Safety and Health Systems in the Cibeureum bridge construction project (45.80 m) in the Sukabumi Circle Segment-3.
2. Conducting interviews with staff of contractor companies and Occupational Safety and Health staff on the Cibeureum bridge construction project (45.80 m) in Sukabumi Circle Segment-3.
3. Collecting data on Occupational Safety and Health Systems from various sources, such as books and journals.

Results and Discussion

.

Gambar 1. Peta Lokasi Jembatan Cibeureum
Sumber : Dokumen Proyek

The Time Schedule used in the Cibeureum bridge construction project is the S Curve S. The S curve is a curve that is arranged to show the relationship between the cumulative value of costs or man hours that have been used or the percentage (%) of work completion against time. Estimation of the construction of the Cibeureum bridge project (45.80 m) in the Sukabumi Circle Segment-3 is 185 days, starting from 3 July 2019 to 15 December 2019. However, due to the many obstacles, the project works will be 250 days until 18 February 2020 based on 4th addendum. Schedule control is part of the integrated control change process under project management integration. Quality control is the task of Quality Control, quality control of materials in the field includes inspections and tests, control of

products that are not appropriate, and control of quality records, tests carried out during the implementation of practical work are:

1) Slump Test

This test aims to determine the concrete water content associated with ease of implementation in the field. In this bridge construction project the slump value used is 10 ± 2 cm. Testing is done using the Abrams cone. Slump test is carried out for ready mix concrete carried out on the first and middle cars of each concrete mixer truck coming from the bacthing plant.

2) Compression Test (Compression Test)

This strength test aims to determine the compressive strength of concrete characteristics (maximum compressive strength that can be accepted by concrete until the concrete is destroyed). The specimen in the field is cylindrical with a diameter of 15 cm and a height of 30 cm. Tests carried out on a mixer truck by taking specimens of 4 pieces. Compressive test was carried out on 4 specimens, from this specimen the compressive strength was tested for ages 7, 21 and 28 days.

As for the potential hazards that can be identified in this project in terms of various types / types of work, namely, accidents due to heavy equipment and / or auxiliary operations, exposed to mortar splash and distant stones, buried by minerals and deposits, respiratory disturbances due to material, skin irritation occurs and lungs by dust in the laying process, accidents due to exposure to asphalt mixtures, exposed to hot material (hotmix), accidents during formwork installation, overwritten girder during the declining process, accidents during girder installation, accidents when installing diaphragm concrete, exposed cutlery / steel and injured due to the remaining pieces of iron / steel, accidents due to traffic activities at the work site, fell from a height due to work that is above the height (above the abutment), and hit by precast buffers at the time of installation.

Occupational Safety and Health Systems on this project, arranged into one unit with a quality management system and environmental management. In planning all system standards and guidelines are compiled in the Work Safety Plan procedures that are integrated from the fulfillment of the Contract Quality Plan as outlined in the procedures that can be used to see, examine, assess, assess, measure effectiveness, know the compliance or compliance of officers during the project implementation process.

Concern for occupational safety and health is an inseparable part of the company's operational and business activities. Implementation is the responsibility of all levels of the company. The aim is to increase the expectations and satisfaction of stakeholders by establishing, implementing and maintaining a management system.

This Occupational Safety and Health Policy applies to all workers involved in the project, both by contractor employees and sub-contractors, who aim to minimize workplace accidents on the project. This Occupational Safety and Health Policy has also been communicated to all project staff through direction and outreach. Its function is to notify all parties to care about the obligations of Occupational Safety and Health.

The source of danger does not only have an internal impact on the organization, but also can affect the environment around the workplace. The identification of external project activities carried out is to approach the licensing of the implementation of project activities for community leaders around the project, identify the conditions of access roads to the project, the conditions of the houses surrounding the project, the approach to mass organizations, and recognize community activities in the project environment.

The findings or identification of hazards are assessed and compared with applicable laws and regulations. And used as a reference in implementing Occupational Safety and Health Construction Systems in the Field of Public Works in order to achieve the required quality targets. This can be proven by looking at the standards and regulations that have been used. The company has carried out all the requirements that have been adjusted to existing standards. This is proven by the action plan (targets and Occupational Safety and Health programs) contained in (Appendix to the Construction Safety Plan). But the results of interviews with Occupational Safety and Health officials and from observations on the ground showed that the workers apparently did not fully know about the targets that had been set and were intended to be achieved. This is proven by the fact that there are still

workers who do not obey the policies and regulations that have been made. Workers do not use personal protective equipment in accordance with their work.

In the process of implementing Occupational Safety and Health Systems, the Company has compiled a project organization structure whose tasks are tailored to the responsibilities of personnel authorized by the project manager. But it does not specify the organizational structure of the Occupational Safety and Health specifically and separately from the existing project organization. There is also no formation of a Committee for Guiding Occupational Safety and Health as an auxiliary body at work. Which is a forum for cooperation between employers and workers in the application of occupational safety and health.

Commitment and Occupational Safety and Health policies that have been set by the leadership of the company, as a service provider company that implements this project is to have allocated a budget that has been calculated for the implementation of Occupational Safety and Health as a whole based on the needs of all risk control. This is in accordance with the construction safety plan, as well as the provision of supporting facilities for occupational safety and health such as Light Fire Extinguishers, Stretches, Signs and Occupational Safety and Healt Signs, First Aid for Accidents and the provision of Personal Protective Equipment for all interested parties concerned located at the project site. An interview with the head of Occupational Safety and Health on this project stated that there were no work accidents and occupational diseases that occurred at the time the project was started. So there is no preparation of minutes of work accidents that occur in the project.

Submission of information has been done well. All information about Occupational Safety and Health is discussed and consulted with management for a review. Namely in the form of discussions, coordination meetings and operational meetings. Which discusses the issues that occur in the field. Especially regarding Occupational Safety and Health. Also regarding problem solving and corrective actions.

Operation control is carried out monitoring directly into the field, and is controlled quickly. The activities carried out are daily occupational safety and health inspection, house keeping, safety induction, safety talk, and safety meeting

The documentation system is arranged in the form of administrative documentation and visual documents. The reports include Work Safety Plan, Occupational Safety and Health daily report, monthly report, attendance list of each activity, work permit, HSE induction. While reports in the form of visual photos and videos.

In improving worker competency, training is carried out. Occupational Safety and Health training program in accordance with needs, the aim is to be able to implement in the field properly and correctly and in accordance with the requirements. The company also provides insurance for all employees. Every employee has been registered to join the Work Accident Insurance Program for the construction services sector. Implement a work permit system as an effort to prevent work accidents. A work permit system is a preliminary procedure that will identify hazards. Routine activities such as Safety Induction, Safety Talk, Daily Safety and Health Inspection are also carried out.

The company has carried out preparations for handling emergencies. This is done in the form of making emergency procedures. In addition, it has also prepared emergency response needs. Such as the installation of traffic signs at the project site, Occupational Safety and Healt (Safety signs) signs. This serves as a medium of information aimed at everyone who is present / passes the project site to the existence of occupational safety and health hazards. Also a vehicle inspection and heavy equipment inspection is carried out periodically. To avoid environmental pollution, the projects have carried out waste management. . Namely the use / selection of environmentally friendly materials, materials that are easily broken down by nature, and can be recycled. This is carried out on an ongoing basis. Provide a special place for used oil storage. Temporary collection of waste originating from solid materials that cannot be recycled or reused in certain locations in the project area. Disposal of liquid waste, such as sewage sludge resulting from foundation excavation work carried out to the sewer that has been provided.

Monitoring and evaluating Occupational Safety and Health performance including Inspection, Testing and Measurement; Occupational Safety and Health System Audit. Occupational Safety and Healt Performance Review and Improvement in the form of an evaluation of the activities carried out during

the Occupational Safety and Health implementation process. In its evaluation, the Occupational Safety and Health Systems performance review and improvement activities took the form of a meeting. This meeting discussed the findings of conducting an audit of the implementation of Occupational Safety and Health Systems by looking at the documents recorded.

Conclusion

In the implementation of the Cibeureum bridge project (45.80 m) in the Sukabumi Circle Segment-3, Occupational Safety and Health Systems was well planned by the service provider company. But there needs to be an improvement in the planning process in forming a Special Occupational Safety and Health Committee and Safety Officer. In the process of implementing Occupational Safety and Health Systems at the project site has not been implemented to the fullest. This is due to delays in procurement and the unavailability of supporting facilities. The planned goals and Occupational Safety and Health have not yet been fully achieved.

References

[1] Suma'mur PK. 2009. Higiene Perusahaan dan Kesehatan Kerja (Hiperkes). Jakarta: CV Sagung Seto.

[2] Tarwaka. 2004. Keselamatan dan Kesehatan Kerja. Surakarta: Harapan Press.

[3] Ramli, Soehatman. 2010. Sistem Manajemen Keselamatan dan Kesehatan Kerja (OSHAS 18001), Seri Manajemen K3, PT Dian Rakyat. Jakarta.

[4] Maulida, N.A., Solechan, Suhartoyo. 2015. Pelaksanaan Keselamatan dan Kesehatan Kerja (K3) dalam Pembangunan Jembatan Sigandul oleh Divisi Konstruksi VII P.T. Adhi Karya (Persero) Tbk. Di Desa Tlahab, Kecamatan Kledung, Kabupaten Temanggung, Jawa Tengah. Jurnal Diponegoro Law Review, Vol. 4(4). Universitas Diponegoro, Semarang.

[5] Pangkey, Febyana. 2012. Penerapan Sistem Manajemen Keselamatan dan Kesehatan Kerja (SMK3) pada Proyek Konstruksi di Indonesia. (Studi Kasus : Pembangunan Jembatan Ir. Soekarno-Menado). Jurnal Ilmiah Media Engineering, Vol. 2(2), p100-113.

[6] Hardono, Setyo, dkk., 2009. Manajemen Keselamatan dan Kesehatan Kerja Proyek Uji Coba Skala Penuh Jembatan Cable Stayed untuk Lalu Lintas Ringan, Puslitbang Jalan dan Jembatan, Vol.26 No.1.

[7] Bole, G.A., Kurniawan, Fredy. 2019. Studi Kasus Pelaksanaan K3 (Kesehatan Dan Keselamatan Kerja) Konstruksi Jembatan Di Sumba. E- jurnal: Spirit Pro Patria, Vol. 5(1), p30-40.

[8] Iqbal, M., Isyab, M., Ranic H.A. 2018. Implementasi Keselamatan Dan Kesehatan Kerja Pada Pekerjaan Pemeliharaan Rutin Jalan Nasional Blangkejeren – Laweaunan Secara Swakelola. Jurnal Arsip Rekayasa Sipil dan Perencanaan (JARSP), Vol 1(2), p138-147.

[9] Endroyo, B. 2006. Peranan Manajemen K3 Dalam Pencegahan Kecelakaan Kerja Konstruksi. Jurnal Teknik Sipil, Vol. 3(1), p8-15.

[10] Kanchana, S, Sivaprakash, P., Joseph. S. 2015. Research Article Studies on Labour Safety in Construction Sites. Hindawi Publishing Corporation, World Journal, Volume 2015, Article ID 590810, 6 pages http://dx.doi.org/10.1155/2015/590810.

[11] Suparman, Fitriani, H. 2016. Analisa Risiko Kecelakaan Kerja Pada Proyek Konstruksi Jembatan Musi VI Palembang. Jurnal Cantilever, Vol. 5(2). P31-40.

[12] Soputan, G.E.M., Sompie, B.F.,Mandagi, R.J.M. 2014. Manajemen RisikoKesehatan Dan Keselamatan Kerja (K3) (Study Kasus Pada Pembangunan Gedung Sma Eben Haezar). Jurnal Ilmiah Media Engineering, Vol. 4(4), p229-238.

[13] Amick, B.C., Hogg-Johnson, S., Latour-Villamil,D., Saunders, R. 2015. Protecting Construction Worker Health and Safety in Ontario, Canada. JOEM Vol. 57(12). P1337-1342.

[14] A. Sutoni and D. R. Kurniadi, "Analisis Risiko Dalam Construction Supply Chain : Studi Kasus Pada Proyek Renovasi Gedung Kantor Vedca," *J. Media Tek. dan Sist. Ind.*, vol. 3, no. 2, p. 81, 2020, doi: 10.35194/jmtsi.v3i2.772.

Print this page

PVJ-IS 2020

Paris Van Java International Seminar 2020
Aston Pasteur Hotel, 15-16 July 2020
Website: https://pvj-is.umtas.ac.id
Email: pvj-is@umtas.ac.id

Date: 11 October 2022

Payment Invoice

Submission Title	Analysis of Occupational Safety and Health Systems in Bridge Construction Development Logistics Systems : Case Study at Cibeureum Bridge, Sukabumi
Authors	Ichwan N.E1 , Akhmad Sutoni*2 , S T Khoerunnisa1 , Mujiarto 3
Registration Type	Indonesian (Non-Student)
Payment Amount	IDR 2,850,000 (**Not Paid**)

Payment Account	
Bank Name	Bank BNI Syariah
Account Number	0613340113
Account Holder	Anggia Suci Pratiwi
Info	BNINDJA

Note that this document is NOT receipt of payment, please make the payment and then upload your payment proof to the online system.

Best regards,

Anggia Suci Pratiwi, M.Pd.
PVJ-IS 2020 Finance Manager

Konfrenzi.com - Conference Management System

Print this page

PVJ-IS 2020

Paris Van Java International Seminar 2020
Aston Pasteur Hotel, 15-16 July 2020
Website: https://pvj-is.umtas.ac.id
Email: pvj-is@umtas.ac.id

Date: 11 October 2022

Payment Receipt

The organizing committee of PVJ-IS 2020 acknowledges the following payment for registration fee,

Abstract ID	ABS-171 (Oral Presentation)
Title	"Analysis of Occupational Safety and Health Systems in Bridge Construction Development Logistics Systems : Case Study at Cibeureum Bridge, Sukabumi"
Authors	Ichwan N.E1 , Akhmad Sutoni*2 , S T Khoerunnisa1 , Mujiarto 3
Paid Amount	IDR 2,650,000
Paid By	Mr. Moch. Ichwan NE

Thank You.

Best regards,

Anggia Suci Pratiwi, M.Pd.
PVJ-IS 2020 Finance Manager

Konfrenzi.com - Conference Management System

Analysis of Occupational Safety and Health Systems in Bridge Construction Development Logistics Systems : Case Study at Cibeureum Bridge, Sukabumi

Ichwan N.E[1] , Akhmad Sutoni[*2] , Siti Tsana Khoerunnisa[1], and Mujiarto [3]

[1]Teknik Sipil, Universitas Suryakancana, Cianjur, Indonesia.

[2]Teknik Industri, Universitas Suryakancana, Cianjur, Indonesia.

[3]Department of Mechanical Engineering, Universitas Muhammadiyah Tasikmalaya, Indonesia

[*]tbungsu13@gmail.com

Abstract. The implementation of the Occupational Safety and Health System in general is still often overlooked. This is indicated by the high number of work accidents that occur. in Indonesia. One of the factors that influence the level of work productivity is the safety and health of workers. Therefore, the application and evaluation of the Occupational Safety and Health System can reduce the level of work accidents. The case study was carried out at the Cibeureum bridge, Sukabumi Segment-3. This study uses qualitative methods, namely by descriptive analysis based on data and observations in the field. The results obtained, the safety and health system has been quite well planned by the company. But there must be an improvement in the planning process in forming a Special Committee on Safety and Occupational Health and Safety Officer. Standards and guidelines used to regulate the implementation of the Occupational Safety and Health System are compiled in an integrated Work Safety Plan from the Contract Quality Plan. This refers to the applicable laws and regulations. Made based on customer requirements. This can be seen based on the existence of commitments and policies, planning, implementation in the construction phase, performance monitoring and evaluation, as well as reviewing and improving the performance of the Occupational Safety and Health System carried out by management.

1. Introduction

Occupational accidents although small in nature but can disrupt the smoothness of a development project and can cause losses (both minor injuries to death and damage to complementary facilities and infrastructure), while indirect losses that will cause a decline in the company's image [1]. The Cibeureum bridge construction project (45.80 m) in Sukabumi Segment-3 is one of the construction projects that has a high risk of work accidents. One of the reasons is the use of heavy equipment and sophisticated machinery as well as the work carried out on an active road, the Sukaraja-Baros Development Road which requires expertise to use it properly. The purpose of this study was to determine the application and evaluation of Occupational Safety and Health Systems in the construction of the Cibeureum bridge (45.80 m) in the Sukabumi Segment-3.

An occupational accident will only occur if there are a variety of causative factors simultaneously at a workplace or production process. From some studies the experts give an indication that an occupational accident cannot happen by itself, but occurs by one or several factors causing an accident at the same time [2]. Unsafe condition is a condition in the work environment in the form of tools, materials or environment that is not safe or dangerous. Unsafe conditions in question such as slippery floors, broken and broken stairs, poor lighting or noise that exceeds the safety limit allowed [3].

Based on the results of the planning continued with the implementation and operation through the mobilization of all available resources and carrying out various programs and supporting steps to achieve success. Overall, the results of the implementation of Occupational Safety and Health must be

reviewed periodically by top management to ensure that Occupational Safety and Health Systems are running in accordance with business policies and strategies and to identify constraints that can affect their implementation, so the organization can immediately make improvements and other correction steps [3]. Personal protective equipment is a set of safety equipment that is used by workers to protect all or part of their body from the possibility of exposure to potential occupational hazards to work accidents and diseases [1].

In previous research [4]-[7] regarding the Analysis of Occupational Safety and Health Systems on Bridge construction. The purpose of this study was to determine the application and evaluation of Occupational Safety and Health Systems in bridge construction. Research [8] studies on evaluating the implementation of safety and health in road construction company. Research [9]-[10] conducted research on the role of occupational safety and health management in the construction industry. Research [11]-[13] conducted research on work accident risk analysis on construction work. From [14] his research on Risk Analysis in Construction Supply Chain. The purpose of this study is to determine what risks are likely to occur in three flows (flow of material, flow of information and flow of funds) in the building construction project supply chain system and to find out how much risk in the flow of information, risk of material flow and risk of flow of funds.

2. Methods

The method of data collection is by direct observation of the object being reviewed and recording the required data in accordance with the discussion. Data collection activities carried out by interviews and direct surveys.

The observations made are as follows:

1. Reviewing the process of implementing Occupational Safety and Health Systems in the Cibeureum bridge construction project (45.80 m) in the Sukabumi Segment-3.
2. Conducting interviews with staff of contractor companies and Occupational Safety and Health staff on the Cibeureum bridge construction project (45.80 m) in Sukabumi Segment-3.
3. Collecting data on Occupational Safety and Health Systems from various sources, such as books and journals.

3. Results and Discussion

Figure 1. Location Map of the Cibeureum Bridge
Source: Project Documents

3.1 Quality Control

The Time Schedule used in the Cibeureum bridge construction project is the S Curve S. The S curve is a curve that is arranged to show the relationship between the cumulative value of costs or man hours that have been used or the percentage (%) of work completion against time. Estimation of the construction of the Cibeureum bridge project (45.80 m) in the Sukabumi Segment-3 is 185 days, starting from 3 July 2019 to 15 December 2019. However, due to the many obstacles, the project

works will be 250 days until 18 February 2020 based on 4th addendum. Schedule control is part of the integrated control change process under project management integration.

Quality control is the task of Quality Control, quality control of materials in the field includes inspections and tests, control of products that are not appropriate, and control of quality records, tests carried out during the implementation of practical work are:

a. Slump Test

This test aims to determine the concrete water content associated with ease of implementation in the field. In this bridge construction project the slump value used is 10 ± 2 cm. Testing is done using the Abrams cone. Slump test is carried out for ready mix concrete carried out on the first and middle cars of each concrete mixer truck coming from the bacthing plant.

b. Compression Test (Compression Test)

This strength test aims to determine the compressive strength of concrete characteristics (maximum compressive strength that can be accepted by concrete until the concrete is destroyed). The specimen in the field is cylindrical with a diameter of 15 cm and a height of 30 cm. Tests carried out on a mixer truck by taking specimens of 4 pieces. Compressive test was carried out on 4 specimens, from this specimen the compressive strength was tested for ages 7, 21 and 28 days.

3.2 Potential Hazard

As for the potential hazards that can be identified in this project in terms of various types / types of work, namely, accidents due to heavy equipment and / or auxiliary operations, exposed to mortar splash and distant stones, buried by minerals and deposits, respiratory disturbances due to material, skin irritation occurs and lungs by dust in the laying process, accidents due to exposure to asphalt mixtures, exposed to hot material (hotmix), accidents during formwork installation, overwritten girder during the declining process, accidents during girder installation, accidents when installing diaphragm concrete, exposed cutlery / steel and injured due to the remaining pieces of iron / steel, accidents due to traffic activities at the work site, fell from a height due to work that is above the height (above the abutment), and hit by precast buffers at the time of installation.

Occupational Safety and Health Systems on this project, arranged into one unit with a quality management system and environmental management. In planning all system standards and guidelines are compiled in the Work Safety Plan procedures that are integrated from the fulfillment of the Contract Quality Plan as outlined in the procedures that can be used to see, examine, assess, assess, measure effectiveness, know the compliance or compliance of officers during the project implementation process.

Concern for occupational safety and health is an inseparable part of the company's operational and business activities. Implementation is the responsibility of all levels of the company. The aim is to increase the expectations and satisfaction of stakeholders by establishing, implementing and maintaining a management system.

3.3 Occupational Safety and Health Systems on Project

This Occupational Safety and Health Policy applies to all workers involved in the project, both by contractor employees and sub-contractors, who aim to minimize workplace accidents on the project. This Occupational Safety and Health Policy has also been communicated to all project staff through direction and outreach. Its function is to notify all parties to care about the obligations of Occupational Safety and Health.

3.4 Hazard Identification

The source of danger does not only have an internal impact on the organization, but also can affect the environment around the workplace. The identification of external project activities carried out is to approach the licensing of the implementation of project activities for community leaders around the project, identify the conditions of access roads to the project, the conditions of the houses surrounding the project, the approach to mass organizations, and recognize community activities in the project environment.

The findings or identification of hazards are assessed and compared with applicable laws and regulations. And used as a reference in implementing Occupational Safety and Health Construction Systems in the Field of Public Works in order to achieve the required quality targets. This can be proven by looking at the standards and regulations that have been used. The company has carried out all the requirements that have been adjusted to existing standards. This is proven by the action plan (targets and Occupational Safety and Health programs) contained in (Appendix to the Construction Safety Plan). But the results of interviews with Occupational Safety and Health officials and from observations on the ground showed that the workers apparently did not fully know about the targets that had been set and were intended to be achieved. This is proven by the fact that there are still workers who do not obey the policies and regulations that have been made. Workers do not use personal protective equipment in accordance with their work.

3.5 The Process of Implementing Occupational Safety and Health Systems

In the process of implementing Occupational Safety and Health Systems, the Company has compiled a project organization structure whose tasks are tailored to the responsibilities of personnel authorized by the project manager. But it does not specify the organizational structure of the Occupational Safety and Health specifically and separately from the existing project organization. There is also no formation of a Committee for Guiding Occupational Safety and Health as an auxiliary body at work. Which is a forum for cooperation between employers and workers in the application of occupational safety and health.

3.6 Commitment and Occupational Safety and Health policies

Commitment and Occupational Safety and Health policies that have been set by the leadership of the company, as a service provider company that implements this project is to have allocated a budget that has been calculated for the implementation of Occupational Safety and Health as a whole based on the needs of all risk control. This is in accordance with the construction safety plan, as well as the provision of supporting facilities for occupational safety and health such as Light Fire Extinguishers, Stretches, Signs and Occupational Safety and Healt Signs, First Aid for Accidents and the provision of Personal Protective Equipment for all interested parties concerned located at the project site. An interview with the head of Occupational Safety and Health on this project stated that there were no work accidents and occupational diseases that occurred at the time the project was started. So there is no preparation of minutes of work accidents that occur in the project.

3.7 Submission of Information

Submission of information has been done well. All information about Occupational Safety and Health is discussed and consulted with management for a review. Namely in the form of discussions, coordination meetings and operational meetings. Which discusses the issues that occur in the field. Especially regarding Occupational Safety and Health. Also regarding problem solving and corrective actions.

Operation control is carried out monitoring directly into the field, and is controlled quickly. The activities carried out are daily occupational safety and health inspection, house keeping, safety induction, safety talk, and safety meeting The documentation system is arranged in the form of administrative documentation and visual documents. The reports include Work Safety Plan, Occupational Safety and Health daily report, monthly report, attendance list of each activity, work permit, HSE induction. While reports in the form of visual photos and videos.

3.8 Improving Worker Competency

In improving worker competency, training is carried out. Occupational Safety and Health training program in accordance with needs, the aim is to be able to implement in the field properly and correctly and in accordance with the requirements. The company also provides insurance for all employees. Every employee has been registered to join the Work Accident Insurance Program for the construction services sector. Implement a work permit system as an effort to prevent work accidents.

A work permit system is a preliminary procedure that will identify hazards. Routine activities such as Safety Induction, Safety Talk, Daily Safety and Health Inspection are also carried out.

3.9 Emergency Response Needs

The company has carried out preparations for handling emergencies. This is done in the form of making emergency procedures. In addition, it has also prepared emergency response needs. Such as the installation of traffic signs at the project site, Occupational Safety and Healt (Safety signs) signs. This serves as a medium of information aimed at everyone who is present / passes the project site to the existence of occupational safety and health hazards. Also a vehicle inspection and heavy equipment inspection is carried out periodically. To avoid environmental pollution, the projects have carried out waste management. . Namely the use / selection of environmentally friendly materials, materials that are easily broken down by nature, and can be recycled. This is carried out on an ongoing basis. Provide a special place for used oil storage. Temporary collection of waste originating from solid materials that cannot be recycled or reused in certain locations in the project area. Disposal of liquid waste, such as sewage sludge resulting from foundation excavation work carried out to the sewer that has been provided.

3.10 Monitoring and evaluating

Monitoring and evaluating Occupational Safety and Health performance including Inspection, Testing and Measurement; Occupational Safety and Health System Audit. Occupational Safety and Healt Performance Review and Improvement in the form of an evaluation of the activities carried out during the Occupational Safety and Health implementation process. In its evaluation, the Occupational Safety and Health Systems performance review and improvement activities took the form of a meeting. This meeting discussed the findings of conducting an audit of the implementation of Occupational Safety and Health Systems by looking at the documents recorded.

4. Conclusion

In the implementation of the Cibeureum bridge project (45.80 m) in the Sukabumi Segment-3, Occupational Safety and Health Systems was well planned by the service provider company. But there needs to be an improvement in the planning process in forming a Special Occupational Safety and Health Committee and Safety Officer. In the process of implementing Occupational Safety and Health Systems at the project site has not been implemented to the fullest. This is due to delays in procurement and the unavailability of supporting facilities. The planned goals and Occupational Safety and Health have not yet been fully achieved.

References

[1] Suma'mur PK. 2009. Higiene Perusahaan dan Kesehatan Kerja (Hiperkes). Jakarta: CV Sagung Seto.

[2] Tarwaka. 2004. Keselamatan dan Kesehatan Kerja. Surakarta: Harapan Press.

[3] Ramli, Soehatman. 2010. Sistem Manajemen Keselamatan dan Kesehatan Kerja (OSHAS 18001), Seri Manajemen K3, PT Dian Rakyat. Jakarta.

[4] Maulida, N.A., Solechan, Suhartoyo. 2015. Pelaksanaan Keselamatan dan Kesehatan Kerja (K3) dalam Pembangunan Jembatan Sigandul oleh Divisi Konstruksi VII P.T. Adhi Karya (Persero) Tbk. Di Desa Tlahab, Kecamatan Kledung, Kabupaten Temanggung, Jawa Tengah. Jurnal Diponegoro Law Review, Vol. 4(4). Universitas Diponegoro, Semarang.

[5] Pangkey, Febyana. 2012. Penerapan Sistem Manajemen Keselamatan dan Kesehatan Kerja (SMK3) pada Proyek Konstruksi di Indonesia. (Studi Kasus : Pembangunan Jembatan Ir. Soekarno-Menado). Jurnal Ilmiah Media Engineering, Vol. 2(2), p100-113.

[6] Hardono, Setyo, dkk., 2009. Manajemen Keselamatan dan Kesehatan Kerja Proyek Uji Coba Skala Penuh Jembatan Cable Stayed untuk Lalu Lintas Ringan, Puslitbang Jalan dan Jembatan, Vol.26 No.1.

[7] Bole, G.A., Kurniawan, Fredy. 2019. Studi Kasus Pelaksanaan K3 (Kesehatan Dan Keselamatan Kerja) Konstruksi Jembatan Di Sumba. E- jurnal: Spirit Pro Patria, Vol. 5(1), p30-40.
[8] Iqbal, M., Isyab, M., Ranic H.A. 2018. Implementasi Keselamatan Dan Kesehatan Kerja Pada Pekerjaan Pemeliharaan Rutin Jalan Nasional Blangkejeren – Laweaunan Secara Swakelola. Jurnal Arsip Rekayasa Sipil dan Perencanaan (JARSP), Vol 1(2), p138-147.
[9] Endroyo, B. 2006. Peranan Manajemen K3 Dalam Pencegahan Kecelakaan Kerja Konstruksi. Jurnal Teknik Sipil, Vol. 3(1), p8-15.
[10] Kanchana, S, Sivaprakash, P., Joseph. S. 2015. Research Article Studies on Labour Safety in Construction Sites. Hindawi Publishing Corporation, World Journal, Volume 2015, Article ID 590810, 6 pages http://dx.doi.org/10.1155/2015/590810.
[11] Suparman, Fitriani, H. 2016. Analisa Risiko Kecelakaan Kerja Pada Proyek Konstruksi Jembatan Musi VI Palembang. Jurnal Cantilever, Vol. 5(2). P31-40.
[12] Soputan, G.E.M., Sompie, B.F.,Mandagi, R.J.M. 2014. Manajemen RisikoKesehatan Dan Keselamatan Kerja (K3) (Study Kasus Pada Pembangunan Gedung Sma Eben Haezar). Jurnal Ilmiah Media Engineering, Vol. 4(4), p229-238.
[13] Amick, B.C., Hogg-Johnson, S., Latour-Villamil,D., Saunders, R. 2015. Protecting Construction Worker Health and Safety in Ontario, Canada. JOEM Vol. 57(12). P1337-1342.
[14] A. Sutoni and D. R. Kurniadi, "Analisis Risiko Dalam Construction Supply Chain : Studi Kasus Pada Proyek Renovasi Gedung Kantor Vedca," *J. Media Tek. dan Sist. Ind.*, vol. 3, no. 2, p. 81, 2020, doi: 10.35194/jmtsi.v3i2.772.

Analysis of Occupational Safety and Health Systems in Bridge Construction Development Logistics Systems: Case Study at Cibeureum Bridge, Sukabumi

Analysis of Occupational Safety and Health Systems in Bridge Construction Development Logistics Systems: Case Study at Cibeureum Bridge, Sukabumi

Ichwan N.E[1], Akhmad Sutoni[*2], Siti Tsana Khoerunnisa[1], and Mujiarto[3]

[1]Teknik Sipil, Universitas Suryakancana, Cianjur, Indonesia.
[2]Teknik Industri, Universitas Suryakancana, Cianjur, Indonesia.
[3]Department of Mechanical Engineering, Universitas Muhammadiyah Tasikmalaya, Indonesia

[*]tbungsu13@gmail.com

Abstract. The implementation of the Occupational Safety and Health System in general is still often overlooked. This is indicated by the high number of work accidents that occur. in Indonesia. One of the factors that influence the level of work productivity is the safety and health of workers. Therefore, the application and evaluation of the Occupational Safety and Health System can reduce the level of work accidents. The case study was carried out at the Cibeureum bridge, Sukabumi Segment-3. This study uses qualitative methods, namely by descriptive analysis based on data and observations in the field. The results obtained, the safety and health system has been quite well planned by the company. But there must be an improvement in the planning process in forming a Special Committee on Safety and Occupational Health and Safety Officer. Standards and guidelines used to regulate the implementation of the Occupational Safety and Health System are compiled in an integrated Work Safety Plan from the Contract Quality Plan. This refers to the applicable laws and regulations. Made based on customer requirements. This can be seen based on the existence of commitments and policies, planning, implementation in the construction phase, performance monitoring and evaluation, as well as reviewing and improving the performance of the Occupational Safety and Health System carried out by management.

1. Introduction

Occupational accidents although small in nature but can disrupt the smoothness of a development project and can cause losses (both minor injuries to death and damage to complementary facilities and infrastructure), while indirect losses that will cause a decline in the company's image [1]. The Cibeureum bridge construction project (45.80 m) in Sukabumi Segment-3 is one of the construction projects that has a high risk of work accidents. One of the reasons is the use of heavy equipment and sophisticated machinery as well as the work carried out on an active road, the Sukaraja-Baros Development Road which requires expertise to use it properly. The purpose of this study was to determine the application and evaluation of Occupational Safety and Health Systems in the construction of the Cibeureum bridge (45.80 m) in the Sukabumi Segment-3.

An occupational accident will only occur if there are a variety of causative factors simultaneously at a workplace or production process. From some studies the experts give an indication that an occupational accident cannot happen by itself, but occurs by one or several factors causing an accident at the same time [2]. Unsafe condition is a condition in the work environment in the form of tools,

materials or environment that is not safe or dangerous. Unsafe conditions in question such as slippery floors, broken and broken stairs, poor lighting or noise that exceeds the safety limit allowed [3].

Based on the results of the planning continued with the implementation and operation through the mobilization of all available resources and carrying out various programs and supporting steps to achieve success. Overall, the results of the implementation of Occupational Safety and Health must be reviewed periodically by top management to ensure that Occupational Safety and Health Systems are running in accordance with business policies and strategies and to identify constraints that can affect their implementation, so the organization can immediately make improvements and other correction steps [3]. Personal protective equipment is a set of safety equipment that is used by workers to protect all or part of their body from the possibility of exposure to potential occupational hazards to work accidents and diseases [1].

In previous research [4]-[7] regarding the Analysis of Occupational Safety and Health Systems on Bridge construction. The purpose of this study was to determine the application and evaluation of Occupational Safety and Health Systems in bridge construction. Research [8] studies on evaluating the implementation of safety and health in road construction company. Research [9]-[10] conducted research on the role of occupational safety and health management in the construction industry. Research [11]-[13] conducted research on work accident risk analysis on construction work. From [14] his research on Risk Analysis in Construction Supply Chain. The purpose of this study is to determine what risks are likely to occur in three flows (flow of material, flow of information and flow of funds) in the building construction project supply chain system and to find out how much risk in the flow of information, risk of material flow and risk of flow of funds.

2. Methods

The method of data collection is by direct observation of the object being reviewed and recording the required data in accordance with the discussion. Data collection activities carried out by interviews and direct surveys.

The observations made are as follows:

1. Reviewing the process of implementing Occupational Safety and Health Systems in the Cibeureum bridge construction project (45.80 m) in the Sukabumi Segment-3.
2. Conducting interviews with staff of contractor companies and Occupational Safety and Health staff on the Cibeureum bridge construction project (45.80 m) in Sukabumi Segment-3.
3. Collecting data on Occupational Safety and Health Systems from various sources, such as books and journals.

3. Results and Discussion

Figure 1. Location Map of the Cibeureum Bridge
Source: Project Documents

3.1 Quality Control

The Time Schedule used in the Cibeureum bridge construction project is the S Curve S. The S curve is a curve that is arranged to show the relationship between the cumulative value of costs or man hours that have been used or the percentage (%) of work completion against time. Estimation of the construction of the Cibeureum bridge project (45.80 m) in the Sukabumi Segment-3 is 185 days, starting from 3 July 2019 to 15 December 2019. However, due to the many obstacles, the project works will be 250 days until 18 February 2020 based on 4th addendum. Schedule control is part of the integrated control change process under project management integration.

Quality control is the task of Quality Control, quality control of materials in the field includes inspections and tests, control of products that are not appropriate, and control of quality records, tests carried out during the implementation of practical work are:

a. Slump Test

This test aims to determine the concrete water content associated with ease of implementation in the field. In this bridge construction project the slump value used is 10 ± 2 cm. Testing is done using the Abrams cone. Slump test is carried out for ready mix concrete carried out on the first and middle cars of each concrete mixer truck coming from the bacthing plant.

b. Compression Test (Compression Test)

This strength test aims to determine the compressive strength of concrete characteristics (maximum compressive strength that can be accepted by concrete until the concrete is destroyed). The specimen in the field is cylindrical with a diameter of 15 cm and a height of 30 cm. Tests carried out on a mixer truck by taking specimens of 4 pieces. Compressive test was carried out on 4 specimens, from this specimen the compressive strength was tested for ages 7, 21 and 28 days.

3.2 Potential Hazard

As for the potential hazards that can be identified in this project in terms of various types / types of work, namely, accidents due to heavy equipment and / or auxiliary operations, exposed to mortar splash and distant stones, buried by minerals and deposits, respiratory disturbances due to material, skin irritation occurs and lungs by dust in the laying process, accidents due to exposure to asphalt mixtures, exposed to hot material (hotmix), accidents during formwork installation, overwritten girder during the declining process, accidents during girder installation, accidents when installing diaphragm concrete, exposed cutlery / steel and injured due to the remaining pieces of iron / steel, accidents due to traffic activities at the work site, fell from a height due to work that is above the height (above the abutment), and hit by precast buffers at the time of installation.

Occupational Safety and Health Systems on this project, arranged into one unit with a quality management system and environmental management. In planning all system standards and guidelines are compiled in the Work Safety Plan procedures that are integrated from the fulfillment of the Contract Quality Plan as outlined in the procedures that can be used to see, examine, assess, assess, measure effectiveness, know the compliance or compliance of officers during the project implementation process.

Concern for occupational safety and health is an inseparable part of the company's operational and business activities. Implementation is the responsibility of all levels of the company. The aim is to increase the expectations and satisfaction of stakeholders by establishing, implementing and maintaining a management system.

3.3 Occupational Safety and Health Systems on Project

This Occupational Safety and Health Policy applies to all workers involved in the project, both by contractor employees and sub-contractors, who aim to minimize workplace accidents on the project. This Occupational Safety and Health Policy has also been communicated to all project staff through direction and outreach. Its function is to notify all parties to care about the obligations of Occupational Safety and Health.

3.4 Hazard Identification

The source of danger does not only have an internal impact on the organization, but also can affect the environment around the workplace. The identification of external project activities carried out is to approach the licensing of the implementation of project activities for community leaders around the project, identify the conditions of access roads to the project, the conditions of the houses surrounding the project, the approach to mass organizations, and recognize community activities in the project environment.

The findings or identification of hazards are assessed and compared with applicable laws and regulations. And used as a reference in implementing Occupational Safety and Health Construction Systems in the Field of Public Works in order to achieve the required quality targets. This can be proven by looking at the standards and regulations that have been used. The company has carried out all the requirements that have been adjusted to existing standards. This is proven by the action plan (targets and Occupational Safety and Health programs) contained in (Appendix to the Construction Safety Plan). But the results of interviews with Occupational Safety and Health officials and from observations on the ground showed that the workers apparently did not fully know about the targets that had been set and were intended to be achieved. This is proven by the fact that there are still workers who do not obey the policies and regulations that have been made. Workers do not use personal protective equipment in accordance with their work.

3.5 The Process of Implementing Occupational Safety and Health Systems

In the process of implementing Occupational Safety and Health Systems, the Company has compiled a project organization structure whose tasks are tailored to the responsibilities of personnel authorized by the project manager. But it does not specify the organizational structure of the Occupational Safety and Health specifically and separately from the existing project organization. There is also no formation of a Committee for Guiding Occupational Safety and Health as an auxiliary body at work. Which is a forum for cooperation between employers and workers in the application of occupational safety and health.

3.6 Commitment and Occupational Safety and Health policies

Commitment and Occupational Safety and Health policies that have been set by the leadership of the company, as a service provider company that implements this project is to have allocated a budget that has been calculated for the implementation of Occupational Safety and Health as a whole based on the needs of all risk control. This is in accordance with the construction safety plan, as well as the provision of supporting facilities for occupational safety and health such as Light Fire Extinguishers, Stretches, Signs and Occupational Safety and Healt Signs, First Aid for Accidents and the provision of Personal Protective Equipment for all interested parties concerned located at the project site. An interview with the head of Occupational Safety and Health on this project stated that there were no work accidents and occupational diseases that occurred at the time the project was started. So there is no preparation of minutes of work accidents that occur in the project.

3.7 Submission of Information

Submission of information has been done well. All information about Occupational Safety and Health is discussed and consulted with management for a review. Namely in the form of discussions, coordination meetings and operational meetings. Which discusses the issues that occur in the field. Especially regarding Occupational Safety and Health. Also regarding problem solving and corrective actions.

Operation control is carried out monitoring directly into the field, and is controlled quickly. The activities carried out are daily occupational safety and health inspection, house keeping, safety induction, safety talk, and safety meeting The documentation system is arranged in the form of administrative documentation and visual documents. The reports include Work Safety Plan, Occupational Safety and Health daily report, monthly report, attendance list of each activity, work permit, HSE induction. While reports in the form of visual photos and videos.

3.8 Improving Worker Competency

In improving worker competency, training is carried out. Occupational Safety and Health training program in accordance with needs, the aim is to be able to implement in the field properly and correctly and in accordance with the requirements. The company also provides insurance for all employees. Every employee has been registered to join the Work Accident Insurance Program for the construction services sector. Implement a work permit system as an effort to prevent work accidents. A work permit system is a preliminary procedure that will identify hazards. Routine activities such as Safety Induction, Safety Talk, Daily Safety and Health Inspection are also carried out.

3.9 Emergency Response Needs

The company has carried out preparations for handling emergencies. This is done in the form of making emergency procedures. In addition, it has also prepared emergency response needs. Such as the installation of traffic signs at the project site, Occupational Safety and Healt (Safety signs) signs. This serves as a medium of information aimed at everyone who is present / passes the project site to the existence of occupational safety and health hazards. Also a vehicle inspection and heavy equipment inspection is carried out periodically. To avoid environmental pollution, the projects have carried out waste management. . Namely the use / selection of environmentally friendly materials, materials that are easily broken down by nature, and can be recycled. This is carried out on an ongoing basis. Provide a special place for used oil storage. Temporary collection of waste originating from solid materials that cannot be recycled or reused in certain locations in the project area. Disposal of liquid waste, such as sewage sludge resulting from foundation excavation work carried out to the sewer that has been provided.

3.10 Monitoring and evaluating

Monitoring and evaluating Occupational Safety and Health performance including Inspection, Testing and Measurement; Occupational Safety and Health System Audit. Occupational Safety and Healt Performance Review and Improvement in the form of an evaluation of the activities carried out during the Occupational Safety and Health implementation process. In its evaluation, the Occupational Safety and Health Systems performance review and improvement activities took the form of a meeting. This meeting discussed the findings of conducting an audit of the implementation of Occupational Safety and Health Systems by looking at the documents recorded.

4. Conclusion

In the implementation of the Cibeureum bridge project (45.80 m) in the Sukabumi Segment-3, Occupational Safety and Health Systems was well planned by the service provider company. But there needs to be an improvement in the planning process in forming a Special Occupational Safety and Health Committee and Safety Officer. In the process of implementing Occupational Safety and Health Systems at the project site has not been implemented to the fullest. This is due to delays in procurement and the unavailability of supporting facilities. The planned goals and Occupational Safety and Health have not yet been fully achieved.

References

[1] Suma'mur PK. 2009. Higiene Perusahaan dan Kesehatan Kerja (Hiperkes). Jakarta: CV Sagung Seto.
[2] Tarwaka. 2004. Keselamatan dan Kesehatan Kerja. Surakarta: Harapan Press.
[3] Ramli, Soehatman. 2010. Sistem Manajemen Keselamatan dan Kesehatan Kerja (OSHAS 18001), Seri Manajemen K3, PT Dian Rakyat. Jakarta.
[4] Maulida, N.A., Solechan, Suhartoyo. 2015. Pelaksanaan Keselamatan dan Kesehatan Kerja (K3) dalam Pembangunan Jembatan Sigandul oleh Divisi Konstruksi VII P.T. Adhi Karya (Persero) Tbk. Di Desa Tlahab, Kecamatan Kledung, Kabupaten Temanggung, Jawa Tengah. Jurnal Diponegoro Law Review, Vol. 4(4). Universitas Diponegoro, Semarang.
[5] Pangkey, Febyana. 2012. Penerapan Sistem Manajemen Keselamatan dan Kesehatan Kerja (SMK3) pada Proyek Konstruksi di Indonesia. (Studi Kasus : Pembangunan Jembatan Ir. Soekarno-Menado). Jurnal Ilmiah Media Engineering, Vol. 2(2), p100-113.

[6] Hardono, Setyo, dkk., 2009. Manajemen Keselamatan dan Kesehatan Kerja Proyek Uji Coba Skala Penuh Jembatan Cable Stayed untuk Lalu Lintas Ringan, Puslitbang Jalan dan Jembatan, Vol.26 No.1.
[7] Bole, G.A., Kurniawan, Fredy. 2019. Studi Kasus Pelaksanaan K3 (Kesehatan Dan Keselamatan Kerja) Konstruksi Jembatan Di Sumba. E- jurnal: Spirit Pro Patria, Vol. 5(1), p30-40.
[8] Iqbal, M., Isyab, M., Ranic H.A. 2018. Implementasi Keselamatan Dan Kesehatan Kerja Pada Pekerjaan Pemeliharaan Rutin Jalan Nasional Blangkejeren – Laweaunan Secara Swakelola. Jurnal Arsip Rekayasa Sipil dan Perencanaan (JARSP), Vol 1(2), p138-147.
[9] Endroyo, B. 2006. Peranan Manajemen K3 Dalam Pencegahan Kecelakaan Kerja Konstruksi. Jurnal Teknik Sipil, Vol. 3(1), p8-15.
[10] Kanchana, S, Sivaprakash, P., Joseph. S. 2015. Research Article Studies on Labour Safety in Construction Sites. Hindawi Publishing Corporation, World Journal, Volume 2015, Article ID 590810, 6 pages http://dx.doi.org/10.1155/2015/590810.
[11] Suparman, Fitriani, H. 2016. Analisa Risiko Kecelakaan Kerja Pada Proyek Konstruksi Jembatan Musi VI Palembang. Jurnal Cantilever, Vol. 5(2). P31-40.
[12] Soputan, G.E.M., Sompie, B.F.,Mandagi, R.J.M. 2014. Manajemen RisikoKesehatan Dan Keselamatan Kerja (K3) (Study Kasus Pada Pembangunan Gedung Sma Eben Haezar). Jurnal Ilmiah Media Engineering, Vol. 4(4), p229-238.
[13] Amick, B.C., Hogg-Johnson, S., Latour-Villamil,D., Saunders, R. 2015. Protecting Construction Worker Health and Safety in Ontario, Canada. JOEM Vol. 57(12). P1337-1342.
[14] A. Sutoni and D. R. Kurniadi, "Analisis Risiko Dalam Construction Supply Chain : Studi Kasus Pada Proyek Renovasi Gedung Kantor Vedca," *J. Media Tek. dan Sist. Ind.*, vol. 3, no. 2, p. 81, 2020, doi: 10.35194/jmtsi.v3i2.772.