

RECOMMENDATIONS RESULT ANALYSIS CONSTRUCTION PROCESS OF FLY OVER NON-TOLL CILEDUG - TENDEAN – INDONESIA

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Abstract

Observing the portrait of South Jakarta and Tangerang City environmental conditions is very solid, it is necessary infrastructure that can anticipate the risks that occur every day. One solution is to provide infrastructure for the public interest, in this case the construction of roads for public transport, which is expected to reduce and break down the congestion that occurred. Therefore, it is necessary to study Risk Management in preventing and mitigating the impact of the risk of fly over Non-Toll Ciledug-Tendean-Indonesia.

The overall research problem is: to identify and analyze the risk of construction fly over Non-Toll Ciledug-Tendean-Indonesia, analyzing the cause of the risk of fly over Non-Toll Ciledug-Tendean-Indonesia. However, the writing of this research will be focused until the process of solving the problem of identifying and analyzing the initial risks of fly over Non-Toll Ciledug-Tendean-Indonesia.

The relevant literature review of this research will discuss: risk management, construction process, portrait of the fly over Non-Toll Ciledug-Tendean-Indonesia project, and relevant research results. Relevant research results will be limited in the review of the last 10 years.

This research is complete using Research Methodology which starts from identification of research problem, research analysis, research findings study, and recommendation that expected to produce the necessary improvement. In particular, this writing is limited to before the analysis process. The method used in this research is qualitative method.

Through this research is complete will be expected to produce improvement recommendation from research study. However, this paper will specifically recommend various identification of factors and risk variables from various literature studies, expert opinions, and existing project review. It is hoped that through the results of this paper, which is an early part of the whole research series, will recommend various risks that may occur, so that all parties concerned can have vigilance in order to prevent the risk that can occur.

Keywords: risk, identification, cause, construction, flyover Non-Toll Ciledug-Tendean-Indonesia

A. BACKGROUND OF RESEARCH PROBLEMS

Construction is one type of work that has a relatively high risk potential compared to non-construction work. The complexity of the project tends to increase the level of risk, judging by the number of stakeholders involved, including the use of new methods and technologies. This development is particularly evident in large-scale projects in Indonesia, such as tall buildings, bridges, telecommunications, power generation, mining, mineral processing, petrochemicals.

Risks can have an effect on the productivity, performance, quality and cost limits of the project. The risk can be said to be a result that may occur unexpectedly. Although an activity has been planned as well as possible, it still contains the uncertainty that it will run entirely as planned. If the risk occurs it will have an impact on the disruption of the overall performance of the project so that it may cause harm to the cost, time and quality of work.

In handling risk, it can be done through risk avoidance, risk reduction / mitigation, risk retention and risk transfer. These four methods can be combined, depending on the strategy applied to the construction project.

Except for risk aversion, risk management can be done through risk financing mechanism. The form of risk reduction can be in the form of training and provision of safety equipment, in order to reduce the impact of occupational risk. Risk containment is a common form of contractors in addressing risks through allocation of funds within the contingency cost of the proposed cost budget plan when tendered. While the method of risk transition is intended to provide financial compensation to the guarantor who is willing to bear a risk. This method of transfer of risk allows owners and contractors to transfer risks that can not be overcome or controlled by themselves to other parties, in the form of insurance and or guarantee.

The risk associated with this uncertainty occurs because of insufficient or unavailable information about what will happen. Something uncertain may result in a disadvantage or disadvantage. According Wideman, the uncertainty that raises the possibility of profit is known by the term opportunity (opportunity), while the uncertainty that cause adverse effects is called the term risk (risk). Prior to the construction process construction actors can think and tackle the risks that may occur in the environment surrounding the project. However, in reality the Ciledug-Tendean Non-Tol Crescent Road construction process is less able to cope with the various impacts of risks experienced by the environment and the people around the construction project. As reported in the electronic media sindonews.com and news.okezone.com the project provides some negative impacts such as congestion is getting worse at the stage of project implementation.

B. RESEARCH PROBLEMS

This research will focus on solving the problem:

1. How is the result of risk analysis of fly over Non-Toll Ciledug-Tendean-Indonesia construction?
2. What is the recommendation result of risk assessment of fly over Non-Toll Ciledug-Tendean-Indonesia construction?

C. LITERATURE REVIEW

1. Construction Project

A construction project is an activity of establishing a building or infrastructure whose process activities have a beginning and end time and will not repeat itself on other projects. This is because the conditions of a construction project differ from one another. The life cycle of a construction project consists of six basic phases in developing a project from idea to reality. The life cycle of the construction project also shows that each construction project will coincide between one stage and another. The following are the six stages of the construction project (Donald S Barrie "Professional Construction Management"): concepts and feasibility studies, engineering and design, procurement, construction, start-up and deployment, operation and use.

From the stages above, the stage that many risk is the construction phase. For that event that allows the occurrence of risk in this study was taken at the construction stage. In addition, the construction phase also involves many parties, so it is possible to risk.

2. Construction Process

The construction process is a process whereby the plans and specifications of the designers are converted into structures and physical facilities. This involves the organization and coordination of all sources for the project: labor, construction equipment, fixed and temporary materials, general inventories and purposes, funds, technology and methods and time to complete projects on time, within budget constraints and in accordance with the standards of quality and performance / performance specified by the designer.

An important role at this stage is held by contractors and subcontractors and construction workers. Also lots of inputs for inspection and interpretation from architects / engineers. Supporting roles are provided by suppliers of materials and equipment, apesialist consultants, shipping and transportation organizations and others.

3. Fly Over Non-Toll Ciledug-Tendean-Indonesia Project Portrait

Here is a portrait of the Ciledug-Tendean Non Toll Road project technically and project administration.

Project Name	: Construction of Fly Over Non-Toll Ciledug-Tendean-Indonesia2
Service User	: Department of Public Works of DKI Jakarta Province
Contractor	: PT. Adhi Karya (Persero) Tbk, PT. Yasa Patria Perkasa, PT. Jaya Konstruksi MP Tbk, PT. Hutama Karya, PT. Waskita Karya, PT. Istaka Karya – PT. Agrabudi KARYA Marga JO, PT. Wijaya Karya (Persero) Tbk, PT. PP (Persero) Tbk
Contract value	: Rp 2.331.929.170.000
Wide	: 9 m
Long	: 9.8 km
Number of <i>Bored Pile</i>	: 1540 point
Number of <i>Pile Cap</i>	: 275 point
Number of <i>Pier</i>	: 270 point

4. Fly Over

Fly over is a way out that is widely used by an urban that has a minimal highway, but the number of vehicles there are very many. The low number of roadways is also exacerbated by land that has been converted as a highway. The flyover itself is divided into two kinds, namely toll road fly over and non toll overpass.

The construction of flyovers or fly over itself is more focused on areas susceptible to congestion at certain times. Like the construction of skyscraper buildings or other construction, the construction of flyovers or fly over also has a positive impact and negative impact on the life of the community around the flyover project, the following will be discussed on the impact of the construction of flyovers both toll and non toll.

Based on the main and first objectives of this flyover construction, the positive impacts that are ascertained or more accurately expected are the decreasing volume of congestion caused by the increasing volume of vehicles. With this fly over, then the congestion that occurs on some road segments will be diverted to pass this fly over or fly over. Given the flow of vehicles in this fly over smoothly then the fly over is not going to happen congestion.

In addition to having a positive impact, Fly Over Road Development also raises many new problems in the community, including: congestion during the process of fly over will grow worse, damage the beauty and beauty of the environment, poor management will result in abandoned projects, the amount of volume vehicles will increase.

5. Project Management

Project Management can be interpreted "As a science and art in relation to lead and coordinate human and material resources by using modern management techniques to achieve predetermined targets: scope, quality, timeliness and cost, as well as meeting the interests of stakeholders" . In principle, project management is: Implementation of knowledge, skills of "tools and techniques" (tools / tools and techniques) on project activities so that the requirements and project needs are met.

Objectives / benefits of project management ie, efficiency in terms of cost, resources and time, better control of the project, so the project can be in accordance with scope, cost, resources and time specified, improve quality, increase productivity, can reduce risk which arise as small as possible, better internal coordination and improve team spirit, responsibility and loyalty to the project, with a clear assignment to each team member.

6. Risk Management

According to Wikipedia Indonesia states that risk management is a structured approach / methodology in managing uncertainty related to threats; a series of human activities including: risk assessment, development of strategies for managing them and risk mitigation using resource empowerment / management. Strategies that can be taken include transferring risks to others, avoiding

risks, mitigating the negative effects of risk, and accommodating some or all of the consequences of certain risks.

In general, the main objective of risk management is to prevent or minimize adverse effects due to unforeseen events through risk aversion or preparation of contingency plans related to those risks. In project risk management project is an event or condition that is uncertain, and if happened have a positive influence or it could be negative on the project objectives. A risk has a cause and when it happens it will have an impact, therefore risk can be expressed as a function of possible impact.

7. Risk Identification

Risk identification is a process for identifying, discovering, or identifying risks. Risks can be identified through the source of the risks and impacts of losses incurred. Based on these impacts can be assessed what risks are potentially large in causing losses.

After identifying the risks, the next step is the measurement of risk by looking at the potential severity and probability of occurrence of the risk. Determining the probability of occurrence of an event is very subjective and more based on reason and experience. Some risks are easy to measure, but it is very difficult to ascertain the probability of a very rare event. Thus, at this stage it is important to determine the best guess so that we can prioritize well in the implementation of risk management planning.

The difficulty in measuring risk is determining the possibility of a risk because statistical information is not always available for certain risks. In addition, evaluating the impact of damage (severity) is often quite difficult for immaterial assets.

8. Risk Monitoring

Identifying, analyzing and planning a risk is an important part of project planning. However, risk management does not stop here. The practice, experience, and occurrence of a loss will require a change in plans and decisions regarding the handling of a risk. It is important to monitor the process from the very beginning from risk identification and risk measurement to determine the effectiveness of the selected response and to identify new and changing risks. Thus, when a risk occurs the selected response will be appropriate and implemented effectively.

9. Risk Analysis

The objective of risk analysis is to reduce the risks where remedial action is taken on a project, scheduling, budget, project price / quality. Risk analysis includes consideration of the source of the risks, the consequences and the likelihood of those risks. Risks are analyzed by combining likelihood values (probability or frequency) and consequences (impact or effect). Likelihood and consequences of each risk will determine the level of risk.

To conduct an effective risk analysis, according to Burby (1991) in Duffield and Trigunaryah (1999) should consider the following:

- a. a. The analysis should focus on direct financial losses from disruption to service or death and loss
- b. b. The degree of uncertainty in any output estimate should be assessable
- c. c. The accuracy of the analysis should be consistent with the accuracy of the data and the project stages
- d. d. The cost and effort in doing the analysis should be as low as possible that can be absorbed by the project budget.anggaran proyek.

10. Risk Allocation

Once the risks are identified in a project, those risks must be allocated to the contracting parties. This allocation is based on an assessment of the relationship between the parties involved with the risk. Risk allocation is the determination and delegation of responsibility for a risk.

Bunni (1968) states a more appropriate method for risk allocation is based on the control of the presence and the effects it generates when the risk occurs. For some cases it is more appropriate to allocate risk based on the nature of the risk or on the basis of a party's ability or inability.

11. Risk Response

Risk response is the action taken against the risk that may occur. Important known risks need to be followed up with the responses made by the contractor in handling those risks. Methods used in dealing with risks (Flanagan & Norman, 1993):

a. Withholding risk (Risk Retention)

Is a form of risk management which will be detained or taken alone by a party. Usually this is done if the risk faced does not incur a loss that is too large or the likelihood of loss is small, or the cost incurred to overcome the risk is not too large compared with the benefits to be gained.

b. Reduce risk (Risk reduction)

That is action to reduce the risk that will likely occur by:

- Education and training for workers in risk
- Protection against possible loss
- Protection of people and property
- Risk transfer (Risk transfer)

c. This transfer is done to transfer the risk to the other party. The form of risk transfer in question is insurance by paying a premium.

d. Avoid risk (Risk avoidance)

Avoiding the risk is the same as refusing to accept a meaningful risk of refusing to accept the project.

12. Relevant research results.

Here are the various literature reviews that are relevant to this research:

- a. Manlian Ronald A.Simanjuntak, Ismeth S Abidin, M. Rifqi HM, Risk Analysis of Construction Implementation to Improve Cost Performance on Toll Road Projects. Journal of Faculty of Science and Technology, Universitas Pelita Harapan. The purpose of this research is to identify the risk of the dominant construction implementation on the decrease of cost performance in the development of Toll Road in Java. This journal is useful in the author's research methodology.
- b. Ayunita Indria Dewi, Cahyono Bintang Nurcahyo, Risk Analysis on Underpass Development Project at Simpang Dewa Ruci Kuta Bali. Journal of the Technical Faculty, Sepuluh Nopember Institute of Technology. The purpose of this research is to know the risk of underpass development project at Simpang Dewa Ruci Kuta Bali. This journal is useful in the author's research theory.
- c. Ferry Wantouw, Robert J. M. Mandagi, Risk Management of High Voltage Air Traffic Construction Project (SUTT) 150 Kv Lopana-Teling. Journal of Engineering Faculty, Sam Ratulung University. The purpose of this research is to identify, analyze and determine the risk response caused by the construction of SUTT 150 Kv Lopana-Teling. This journal is useful in collecting research data of journal authors.
- d. Ari Sandhyavitri, Mmuhammad Zulfiqar, Risk Analysis of Toll Road Construction of Tahapa Konstruksi (Pekanbaru-Dumai Toll Road Case Study). Journal of Faculty of Engineering, University of Riau. The purpose of this study was to identify and analyze project risks (during the construction phase project). This journal is useful in the author's literature review.
- e. I Gede Putu Joni, Project Management Risks. Journal of Faculty of Engineering, University of Udayana. The purpose of this research is to know the risks of project management. This journal is useful on the author's background.

C. RESEARCH METHODOLOGY

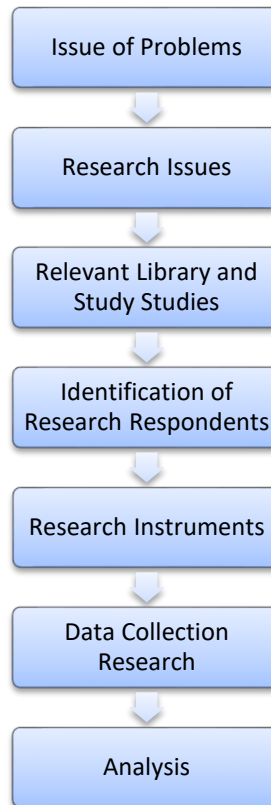
1. Research Process

1.1 Research Design

The approach to achieve research objectives is done through risk analysis method which is a decision-making system supported by various methods of analysis, simulation and optimization are done measured. These assessments are intended to identify all types of risks that arise during the non-toll road overpass project stage that may affect the performance of the construction project. This research method will use qualitative methods to find out the risks that most influence the project

objectives on the contract and the discussion of risk handling. The following stages of research on this writing:

Diagram 1. Research Stages



1.2 Data Collection

Data to be collected and used in this research is secondary data derived from various references and relevant research journals.

1.3 Operational Research Model

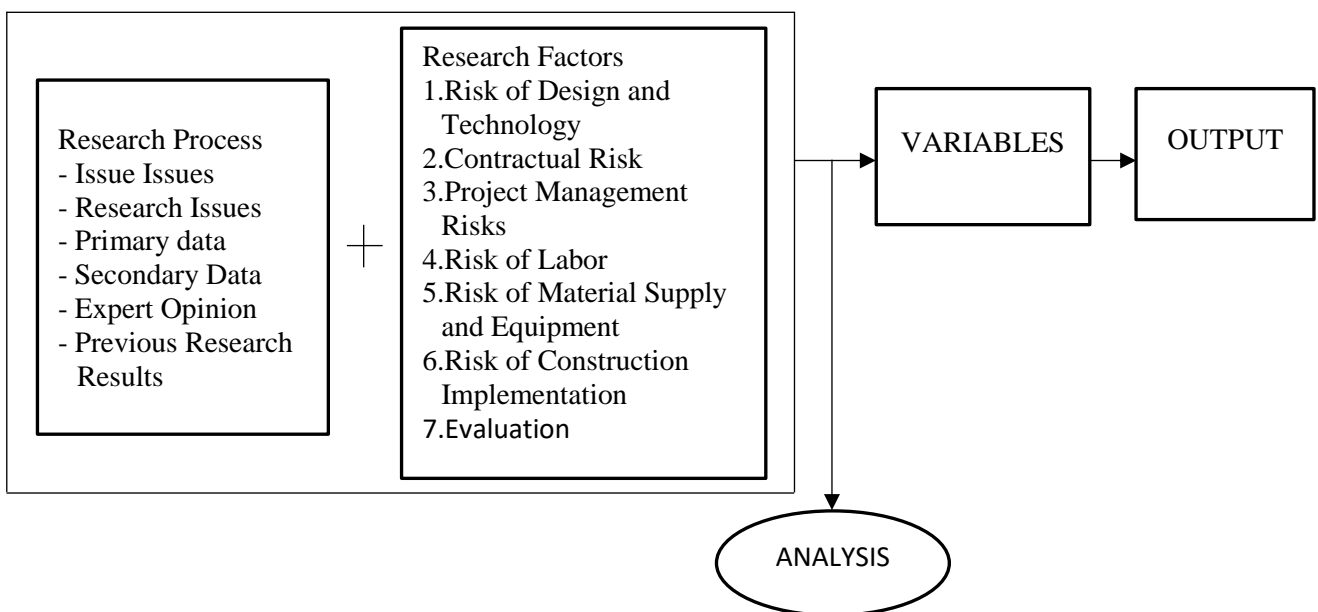


Diagram 2. Operational Research Model

D. DISCUSSION OF RESEARCH RESULTS

This research started from the data collection process through literature study with the output of 6 research factors with each research variables as follows:

a. Research Factors

The factors in this study are:

1. Design and Technology Risks
2. Contractual Risk
3. Project Management Risks
4. Risk of Labor
5. Risks of Material and Equipment Supply
6. Risk of Construction Implementation
7. Evaluation

b. Research variable

- Design and Technology Risks
 1. Design error
 2. Design changes
 3. The use of untested designs
 4. The use of new technologies that have not been applied
 5. The wrong method of execution
 6. Incomplete design data
 7. Inadequate and non-conformity specification on design details
 8. Error in structural calculation and analysis
 9. Mistakes of technical assumptions at the planning stage
 10. What is the difference between the owner's and the contractor's specific perceptions
 11. Incomplete job documents
 12. Late payment by owner
 13. Termination of unilateral work by the owner
 14. What is the dispute between owner and contractor
 15. Late payment to specialist contractor through main contractor
- Project Management Risks
 1. Cost estimation error
 2. Time estimation error
 3. Lack of team control and coordination
 4. The presence of less experienced staff in the contracting team
 5. Inability of project management planners
 6. Performance of a poor specialist contractor
 7. Lack of responsibility of the main contractor on the quality of the work of the specialist contractor
 8. Non-complete daily reports
 9. Low level of management discipline
 10. There is an internal conflict within the project management ranks
 11. Claim
 12. Changes in the scope of work
 13. Changes in construction methods that have been made
 14. No receipt of work by the owner
 15. Inaccuracy of construction works (schedule and quality)
- Labor Risk
 1. Disputes between workers
 2. Removal of potential workers
 3. Unskilled labor
 4. Unavailability of the number of field workers
 5. Low labor productivity
 6. Requests for overtime hiring by workers
 7. Demand for salary increases

- Risks of Material and Tool Supply
 1. Limited material availability
 2. Damage or loss (material theft) at construction site location
 3. Lack of material storage at construction site location
 4. Lack of landfills on site construction sites
 5. Delay of material delivery from supplier to construction project location
 6. Increase in material prices that are not fair
 7. Insufficient volume of material shipped can
 8. Damage to machine tools and project equipment can
 9. Equipment that is not in accordance with the working conditions of the project
 10. If the lack of proper procurement of materials and equipment (volume, schedule, price and quality)
- Construction Construction Risk
 1. Site accessibility conditions are difficult
 2. Embezzlement of project assets
 3. Error in survey
 4. Destruction and sabotage
 5. Security disturbance at project site
 6. Quality of material that is not in accordance with the specifications
 7. Uneven compaction at the time of casting
 8. Quality of concrete not in accordance with the specifications
 9. Damage that occurs during maintenance period
 10. Changes in unplanned scheduling of work
- Evaluation
 1. No coordination with the local government
 2. Lack of coordination with experts and skilled personnel
 3. The absence of K-3 education and training (occupational safety health)
 4. Absence of equipment maintenance and completeness of K-3 (occupational safety health)
 5. Not involving residents around the project
 6. No social approach to the local government, community leaders and religious leaders who are in the project environment

E. CONCLUSION

1. Risks can be identified through the source of the risks and impacts of losses incurred. Based on these impacts can be assessed what risks are potentially large in causing losses. Risks are analyzed by combining likelihood values (probability or frequency) and consequences (impact or effect). Likelihood and consequences of each risk will determine the level of risk.
2. The risk associated with this uncertainty occurs because of insufficient or unavailable information about what will happen. In handling risk, it can be done through risk avoidance, risk reduction / mitigation, risk retention and risk transfer.

F. BIBLIOGRAPHY

- Andi, Eko and Ida. 2014. Risk Management Analysis of Cisumdawu Toll Road Project (Case Study: Development Of Cileunyi-Sumedang Dawuan Toll Road Phase I). Garut. ISSN: 2302-7312 Vol. 11 No. 1
- Ari and Muhammad. 2014. Risk Analysis of Toll Road Development At Construction Stage (Case Study: Pekanbaru-Dumai Toll Road). Pekanbaru. Journal of Civil Engineering Volume 10 No. 1
- Ayunita and Cahyo. 2013. Risk Analysis on Underpass Development Project at Simpang Dewa Ruci Kuta Bali. Surabaya. Journal of Engineering Pomits Vol. 2 No. 2
- Barrie, Donald., Ed. 1981. Directions in Managing Construction, John Wiley and Sons, New York.
- Barrie S. Donald, JR Paulson C. Boyd and Sudinarto. 1987. Professional Construction

- Management. Erland. Jakarta
- Duffield, C & Trigunarsyah, B. 1999. Project Management-Conception to Completion. Engineering Education Australia. (EEA). Australia.
- Ervianto, A. U and Joshua, M. (2001). Construction Project Management. Andi, Yogyakarta.
- Ferry and Robert. 2014. Risk Management of High Voltage Air Traffic Construction Project (SUTT) 150 Kv Lopana-Teling. Sam Ratulangi. Scientific Journal of Media Engineering Vol.4 No. 4 (239-256)
- Husen Abrar. 2011. Project Management. C. V Andi Offset. Yogyakarta.
- Husan Suad and Muhammad Suwarsono. 2000. Project Feasibility Study. UPP STIM YKPN. Yogyakarta.
- Joni Putu I Gede. 2012. Construction Management Risks. Denpasar. Journal of Civil Engineering Vol. 16 No. 1
- Nurlela and Suprpto Heri. 2014. Identification and Analysis of Risk Management on Infrastructure Development Project of Multi-storey Building. West Java. Journal of Construction Design Volume 13 No. 2
- Nasrul. 2015. Risk Management In Construction Projects Viewed From The Side Of Time Management. West Sumatera. Journal of Momentum Vol. 17 No. 1
- Simanjuntak A. Ronald Manlian, Abidin S Ismeth and Hm Rifqi M. 2009. Risk Analysis of Construction Implementation to Improve Cost Performance on Toll Road Projects. Jakarta. National Civil Engineering Conference (KoNTekS 3)
- Soeharto, I. 1995. Project Management from conceptual to operational. Erland. Jakarta.