

# Risk Management Of Road Enhancement Project Implementation On Gogodalem Street - Kalikurmo Street, Sub-District Bringin, District Semarang

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**Abstract:** Road improvement implementation projects will certainly have emerging risks, both small and large scale risks. The Semarang District Government is carrying out infrastructure development, especially in the Bringin Sub-district area, namely the road improvement on Gogodalem Street - Kalikurmo Street. This research was conducted to analyze the possibilities of the risks that will occur, so that the implementation of road improvement can run smoothly and the risks that arise later can be handled properly. The analytical method used is descriptive method. The results of this study, in the implementation of road improvement projects that have the highest risk is the Technical Contractual. The solution is to avoid or avoid risk by changing the project plan to eliminate risks or conditions to protect the project target from its effects / consequences.

**Index Terms:** Bringin Sub-district, Risk Management, Road Improvement.

## 1 INTRODUCTION

long with the development of a country, the community's need for mobility, especially in Semarang District will also increase. To meet these needs, the Semarang District government is carrying out infrastructure development, especially in the Bringin Sub-District area. This development is also intended to realize equitable development and increase the efficiency of distribution services in order to support increased economic sector growth. Gogodalem Street - Kalikurmo Street is a district road which is the main road in Bringin Sub-District as access to mobility in the economic movement of the community. Construction projects are a dynamic and risky field. Risk can affect the productivity, performance, quality and cost constraints of the project. Risk can be said is a result that might occur unexpectedly. Even though an activity has been planned as well as possible, it still contains uncertainty that later it will run completely according to plan. Risks to construction projects, however, cannot be eliminated but can be reduced or transferred from one party to another [1]. If the risk occurs it will have an impact on the disruption of overall project performance so that it can lead to additional costs and time for the implementation of work. Therefore it is necessary to do an analysis of the possibilities risks that will occur, so that the implementation can run smoothly and the risks that arise later can be handled properly. The purpose of this paper is as follows: Identifying the risks that hamper the implementation of the work Conducting qualitative and quantitative assessments of the types of risks that exist Determine management and response to existing risks

## 2 LITERATURE REVIEW

### 2.1 Risk Management

According to Flanagan [2], Risk Management is an organized understanding of the identification and measurement of risk and the development, selection and regulation of actions to deal with these risks. Meanwhile, according to Kerzner [3], Risk Management is all series of activities related to risk, namely planning, assessment, handling, and risk monitoring.

### 2.2 Risk Identification

The first step in the risk management process is to identify risks by identifying risks in implementing the drainage construction project. Risk identification is carried out to find sources of risk that have the possibility of hampering / delaying project implementation in the field. To initiate risk identification, namely conducting a stakeholder analysis. Risk classification according to Godfrey, 1996 [4] carried out into several sources of risk include: political environment planning market economic financial natural project technical Human resources criminal safety Risk identification can also use the classification of Wiguna and Scott [5] where risks can be grouped into: External and Site Risks Economic and Financial Risks Technical and Contractual Risks Managerial Risk

### 2.3 Risk Measurement

The second step in the risk management cycle is Risk Measurement. With reference to two factors, namely the quantity of risk and the quality of risk associated with several many risk-prone values or exposures. The quality of risk is related to the possibility of a risk occurring. The higher the risk likelihood, the higher the likelihood risk. Risk Value / Risk Exposure according to Godfrey, 1996 [4] is determined from the results of multiplication between the probability of the occurrence of risk or frequency or also called risk probability with the impact that will occur if the risk occurs or known as risk impact. Poured in the form of the following equation (1) below:  $Risk\ Value = Risk\ Probability \times Risk\ Impact$  (1)

### 2.4 Risk Mapping

The third step is Risk Mapping, the purpose of which is to set risk priorities based on the interests of service users

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(Semarang District Public Works Department). Priority setting is due to limited resources to deal with all risks. Mapping aims to sort out risks that are able to make a positive contribution and risks that damage / delay implementation if managed. Risk mapping by analyzing risk acceptability which is determined based on the value of risk obtained from the results of the multiplication of probability with impact.

**2.5 Risk Management Modeling**

The fourth step is modeling risk management that can be applied by organizations in the form of conventional risk management, setting risk models and managing organizational structures. If risks arising from an activity have been identified, then further action is taken to reduce the risks that arise. This action is called Risk Mitigation. Conventional risk management is carried out by planning risk mitigation actions and is complemented by establishing the organization / agency that will manage / handle the existing risks. Sometimes these risks cannot be eliminated altogether but can only be reduced so that a residual risk will occur. According to Flanagan & Norman [6], Management of risk is divided into four, namely: Risk Avoidance, namely avoiding or distancing risk by changing project plans to eliminate risks or conditions or to protect project targets from their effects / consequences. Risk Transfer), namely the transfer of risk by seeking the exchange of consequences or consequences of risk to third parties together with ownership of the response. This transfer of risk solely provides management of responsibility to other parties, not eliminating or eliminating it. This form of risk transfer is in the form of insurance by paying a premium. Risk Mitigation, which is conducting an investigation to reduce the probability and / or consequences of adverse risk events to an acceptable level. Risk Acceptance. This technique indicates that the project team decides not to change the project plan related to a risk or is unable to identify other adequate response strategies.

**2.6 Monitoring and Control**

The fifth step is monitoring and control. This is important because the management needs to ensure that the implementation of risk management goes according to plan and ensures that the risk management model is effective enough, meaning that the model implemented is appropriate and achieves the objectives of risk management.

**3 METHODOLOGY**

Risk management is a systematic process of planning, identifying, analyzing, responding, and monitoring the risks of projects. Risk management involves certain processes, technology, equipment, and techniques that will help managers make the right decisions in order to maximize positive possibilities and consequences and minimize the likelihood and negative consequences of an event [6]. Risk management underlines at least 3 things, that is risk identification risk assessment risk minimizing and control that may occur during the process of running activities systematically. From the activities that will be studied in its risk management in this case Road Improvement Activities on Gogodalem Street - Kalikurmo Street by examining and identifying existing contract documents. From the research of the contract documents, processes will be carried out according are shown in Fig. 1 below.

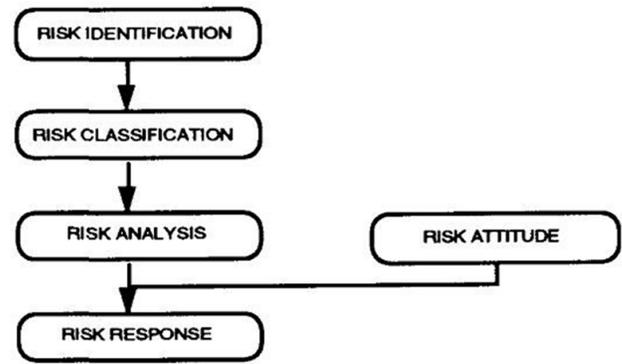
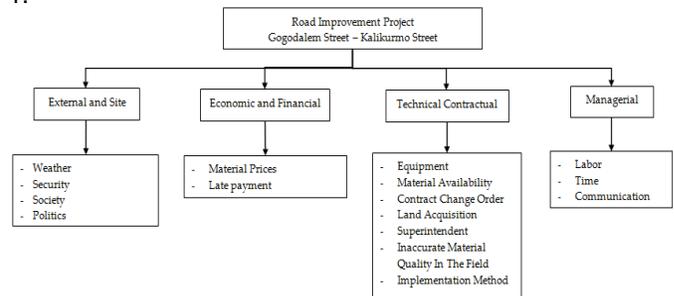


Figure 1. Risk Management Process

**4 RESULTS AND ANALYSIS**

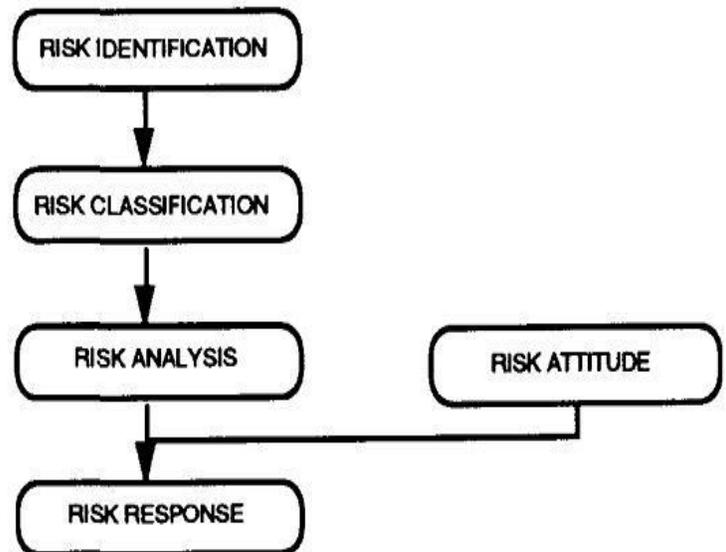
**4.1 Risk Identification by Classification**

Risk identification in the implementation of the Road Improvement project on Gogodalem Street - Kalikurmo Street, can be grouped into several classifications such as Figure 2 below and explained the causes and impacts of risks in Table 1.



Source: Analysis, 2019

Figure 2. Risk Identification on Road Improvement Project on Gogodalem Street - Kalikurmo Street



Gogodalem Street - Kalikurmo Street

**Table 1. Risk Identification on Road Improvement Project on Gogodalem Street - Kalikurmo Street**

Category	Risk	Cause	Impact
A External and Site	Weather	Implementation of the work in the 2nd half where already entered the rainy season.	Probability delay implementation time and quality are not achieved becomes high.
	Security	The lack of security and control execution of the work.	Less material needs and the implementation of the work to be blocked.
	Community	Implementation requires perform foundry work can not be done in part because of limited road width of the road.	Alternative pathway becomes congested and travel time becomes longer.
	Political	The transfer of the design, due to political reasons.	Changes in the design of the original planning and implementation period becomes longer.
B Economic and Financial	Material price	An increase in prices in the second half while planning in the 1st half.	Target job handling not be achieved.
	Late payment	Inaccuracies per quarterly budget planning.	Disbursement quarter disbursement constraints hampered progress.
C Technical Contractual	Equipment	The equipment available in the field does not match the number and specifications of the contract.	Job productivity is not achieved as planned.
	Availability of Materials	Bebarengan project implementation in the 2nd half.	Difficulties procuring materials so that their delay.
	Contract Change Order	DED planning data less accurate.	Frequent design reviews.
	Land acquisition	Widening of the road, where not all the designs on widening the approval of citizens.	Work can not be implemented fully so that the extension of the implementation period.
	Supervisor	Lack of experts so that one supervisory agent used in multiple projects	Lack carefully situations in supervision. The probability of not achieving a high quality according to the contract becomes.
	Quality material inaccuracy in the Field	Materials are available in the field not in accordance with the requirements in the contract documents.	Not achieving the quality of the material in the field.
D Managerial	Methods of Implementation	Inaccuracy implementation of the method of implementation.	Cause lack of quality tercapaian contract.
	Labor	Skilled labor that is placed on the ground are not in accordance with the contract documents.	The work unsatisfactory because the energy is placed less competent.
	Time	Lack of control over the implementation of	Progress of implementation of the work becomes

Category	Risk	Cause	Impact
		the work schedule. Shortage of personnel in the handling of the job, the number of packages too much.	uncontrolled. Misconceptions in the application of design in the field.

Source: Analysis, 2019

**4.2 Risk Measurement and Mapping (Quantitative Analysis)**

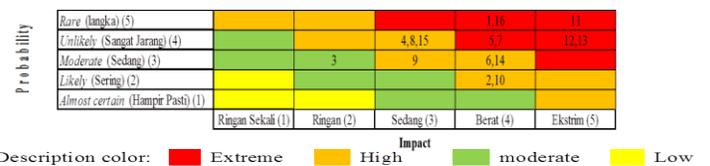
After the identification of risks, the level of risk is measured as in Table 2 and risk mapping as shown in Figure 3 based on the scale of the probability (probability) and the scale of the impact (impact).

**Table 2. Risk Level Measurement on Road Improvement Project on Gogodalem Street - Kalikurmo Street**

No.	Risk	Probability	Impact	Level Of Risk	Ranking	Category Level Of Risk	Risk Impact				
							A	B	C	D	E
1	Weather	5	4	20	4	Extreme	√	√	√		
2	Security	2	4	8	16	High	√	√		√	
3	Community	3	2	2	12	Secondary		√			
4	Political	4	3	12	9	High	√	√			
5	Material Prices	4	4	16	6	Extreme	√				√
6	Late Payment	3	4	12	13	High	√	√			
7	Equipment	4	4	16	7	Extreme			√	√	
8	Availability Of Materials	4	3	12	10	High	√	√	√	√	
9	Changes Contract (Contract Change Order)	3	3	9	15	High	√	√			√
10	Land Acquisition	2	4	3	8	High	√	√		√	√
11	Supervisor	5	5	25	1	Extreme	√	√	√	√	√
12	Quality Material Inaccuracy In The Field	4	5	20	2	Extreme	√		√	√	
13	Methods Of Implementation	4	5	20	3	Extreme	√	√	√	√	√
14	Labor	3	4	12	14	High	√	√	√	√	
15	Time	4	3	12	11	High	√	√		√	
16	Communication	5	4	20	5	Extreme	√	√		√	√

Source: Analysis, 2019 Impact Risk Description:

A: Cost B: Time C: Product Quality D: Work Quality Services Provider E: Quality Of Service User Working



Source: Analysis, 2019

**Figure 3. Matrix Mapping Quantitative Risk Analysis on Road Improvement Project on Gogodalem Street - Kalikurmo Street**

**4.3 Risk Management**

By measurement of the level of risk and risk mapping in the matrix above chart, we can see the results of the analysis of the quantity of risk that shows some of the risks included in the classification level of risk, so we need a risk management so that appropriate decisions as needed. Some strategies for minimizing risk based on the risk rating (rank) with a composition by the highest ranking are shown in Table 3 below.

**Table 3. Risk Management Strategy on Road Improvement Project on Gogodalem Street - Kalikurmo Street**

No.	Risk	Ranking	Category Level of Risk	Risk Response	Strategy
1	Weather	4	Extreme	Risk Avoidance	Implementation of the proposed auction schedule
2	Security	16	High	Risk Avoidance	Placing security officers around the barn and around the project
3	Community	12	Secondary	Risk Acceptance	Conducting outreach with citizens regarding closures
4	Political	9	High	Risk Avoidance	Accommodate the political interests at the beginning of the planning
5	Material prices	6	Extreme	Risk Avoidance	Mengganggu an accommodate price increases with increase in the unit price by 10%
6	Late payment	13	High	Risk Avoidance	More rigorous in budget membuat quarterly disbursement
7	Equipment	7	Extreme	Risk Avoidance	Their checks on the field at the time to come and regular tool
8	Availability of Materials	10	High	Risk Avoidance	1. Penyedia services is expected to create a support material with material suppliers so that their assuredness material availability 2. Look for alternatives to aggregate quarry locations yng eligible quality and quantity Working closely with expert personnel in the field
9	Changes Contract (Contract Change Order)	15	High	Risk Avoidance	perencanaan bersama2 with the owner in order senua design review can soon be resolved.
10	Land acquisition	8	High	Risk Avoidance	Conduct outreach with citizens about the benefits of the job
11	Supervisor	1	Extreme	Risk Avoidance	Hire a consultant outside the district supervisor in Semarang, so that the regulatory requirements can be accommodated
12	Inaccuracy in the material quality of the field	2	Extreme	Risk Avoidance	Do trial and checks in the field on a regular basis
13	Methods of Implementation	3	Extreme	Risk Avoidance	Request progress daily work by supervisors so that the method can be controlled
14	Labor	14	High	Risk Avoidance	Checks in the field and asked for a letter that personnel are placed in accordance with

No.	Risk	Ranking	Category Level of Risk	Risk Response	Strategy
15	Time	11	High	Risk Avoidance	the contract documents Request a service provider implementation schedule for each weekly progress report by watchdog Budgeting and allocation should re-review the work in accordance with the ability of personnel
16	Communication	5	Extreme	Risk Avoidance	

Source: Analysis, 2019

#### 4 CONCLUSION AND RECOMMENDATION

Risk is the cumulative effect of uncertainty that causes a The conclusion of the analysis that has been discussed in this paper can be described as follows: With the uncertainty that is able to pose a risk, to identify the risks that may occur in project implementation Road Improvement Gogodalem - Kalikurmo can be done by identifying risks relating to the classification, such as: External risk and Site: 4 Risk Economic and Financial Risk: 2 Risk Technical Contractual risk: 7 Risks Managerial Risk: 3 Risk In writing this task analyzed 16 risk that may occur in project implementation Road Improvement Gogodalem - Kalikurmo, After performing the risk analysis of 16 risks can be classified: 7 risk classified as extreme, 8 risk is high, 1 risks classified as medium and 0 risk is low Responses/recommendations can be given to the analysis, it can be seen in the summary recommendation in Table 4 below from 16 risks have been analyzed.

**Table 4. Risk Response on Road Improvement Project on Gogodalem Street - Kalikurmo Street**

Ranking	Risk	Risk Response
1	Supervisor	Risk Avoidance
2	Inaccuracy In The Material Quality Of The Field	Risk Avoidance
3	Methods Of Implementation	Risk Avoidance
4	Weather	Risk Avoidance
5	Communication	Risk Avoidance
6	Material Prices	Risk Avoidance
7	Equipment	Risk Avoidance
8	Land Acquisition	Risk Avoidance
9	Political	Risk Avoidance
10	Availability Of Materials	Risk Avoidance
11	Time	Risk Avoidance
12	Community	Risk Acceptance
13	Late Payment	Risk Avoidance
14	Labor	Risk Avoidance
15	Changes Contract (Contract Change Order)	Risk Avoidance
16	Security	Risk Avoidance

Source: Analysis, 2019

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