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ANALYSIS OF DELAY FACTORS OF RECONSTRUCTION AND REHABILITATION WORK TOMPE-INSIDE ROADS, PALU-SURUMANA CITY

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ABSTRACT

This study aims to analyze the factors that influence the delay in the reconstruction and rehabilitation work of the Tompe-In section of Palu-Surumana City, and to find out the most dominant factors causing the delay in the project work. The type of research used in this research is descriptive quantitative, data analysis is done through validity testing, reliability testing, descriptive statistical analysis and factor analysis. From the research results, it is known that from the results of the factor analysis used to determine the factors causing delays in the reconstruction and rehabilitation project of the Tompe-Dalam Road Section in Palu-Surumana City, it can be concluded that from the 16 questions in the questionnaire representing several factors of delay parameters, grouped in three main factors. The three factors are supervisory and financial management, the situation at the project site, and human and material resources. Supervision and financial management factors are the most dominant factors affecting the delay in the reconstruction and rehabilitation work of the Tompe-Dalam Road Section in Palu-Surumana City with a value of variance of 61.166%.

***KEYWORDS**: Factor Analysis, Delays, Road Section Reconstruction and Rehabilitation*

Article History

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INTRODUCTION

According to Aziz, a successful construction project must be completed by the project's due date and within budget. Therefore, the cause of the time delay is very important for the profitability of most construction projects [1].

Rehabilitation and Reconstruction of the Tompe National Road Section - Dalam Kota Palu - Surumana along 48.39 km, of which 21 bridges with a total length of 634.40 meters are also included in this project. Deputy PUPR Minister John Wempi Wetipo said the road repair activities were intended to improve connectivity between activity centers so that the economy in Palu City would quickly recover and continue to develop.

The location of national road works is carried out at several points, including Jalan Kebun Sari, which is located in the 8.8 km long Tawaeli District. Then the Jalan Kebun Sari section leads to the 6.9 km long Tanah Runtuh area. Furthermore, from the Tanah Runtuh area to YosSudarso, Tondo Village, Mantikulore District, along 1,490 km. For roads in the city of Palu, this will be carried out on the 1,256 Km Abdul Rahman Saleh South Palu road, then on the Basuki Rahmat road, Biromuli Utara Village, South Palu District along 1,754 Km. Finally, the Diponegoro road, Lere Village, West Palu Subdistrict, is 2,675 km long. Furthermore, the Malonda road in the Watusampu Village, Ulujadi District is

10,110 Km long. Then from the Malonda road to the Ampera road section of Donggala Regency along 14,710 km. Finally, from the Ampera road section to Surumana Village, South Banawa District, Donggala Regency with a length of 0.7 Km.

The rehabilitation and reconstruction project for the Tompe National Road section - in Palu City - Surumana is a project that involves many parties in its implementation and costs are very large, of course in the implementation of this project good management is needed in its implementation so that the project can run well and be completed as should be.

Construction projects in Indonesia are often completed experiencing delays from the time specified in the documented contract agreed by the parties involved. Besides the late completion time, project construction is also synonymous with the differences between the designs and plans that have been made, which have an impact on the implementation of work [2].

The purpose of this study is menganalis is factor - what factors affect the delay pengerjaan reconstruction and rehabilitation of Roads Tompe-In Palu-Surumana and u ntuk know factor most dominant cause of delays in the work of reconstruction and rehabilitation Ruas Jalan Tompe-DalamPalu-Surumana.

LITERATURE REVIEW

Flexible Pavement Construction

Flexible pavement is the use of asphalt pavement as connective material between the material. The pavement layers are carried and carry and spread the traffic load to the subgrade. The ideal flexible pavement layer arrangement includes the *subgrade*, the *subbase course*, the *base course*, and the *surface course* [3].

Flexible pavement construction, namely pavement using asphalt as a binder. It is called "bending" because this construction allows vertical deformation due to traffic loads from the surface to the subgrade [4].

Road Reconstruction

Road reconstruction is a structural improvement which is a handling activity to increase the ability of a section of a road that is in a severely damaged condition so that this section of the road has a stable condition again in accordance with the defined plan age or road structure improvement activities including complementary buildings and road equipment, without increasing capacity. Besides that, it can also be in the form of efforts to improve geometric structures, both vertical and horizontal alignments, with considerations of safety and security of road users [5].

Road Rehabilitation

Road rehabilitation is an activity to deal with any damage that is not taken into account in the design, which results in decreased stability in a certain part / place of a road with stable service conditions. This activity is carried out to overcome damage to certain segments which has resulted in an improper decrease in the ability of road services in certain parts.

Project Delay

O'Brien: Construction delay means excess time either outside the contract date or outside the date agreed by the parties for project delivery. In both cases, procrastination is usually a reasonable situation [6].

Important parameters in implementing construction projects, which are often used as project targets, are budget, schedule, and quality. Whereas for owners, delays in the use or operation of the results of construction projects often have the potential to cause disputes and claims between owners and contractors [7].

Delay in completing a project will have an impact on financial problems. While the contractor is the loss of an opportunity to put other projects dayanyake resources, increasing indirect costs (*indirect cost)* due to increased expenses for employee salaries, rent equipment and reducing profit (Lewis and Atherley) [8].

A construction project is usually recognized as successful if it is completed on time, within budget, according to specifications, and with stakeholder satisfaction. However, most of the projects did not finish according to the expected schedule. Instead, they finish it before or after schedule because of the uncertainty of the event and its uniqueness [9].

Factors Causing Project Delay

Projects often experience delays. In fact, it can be said that nearly 80% of projects experience delays [10]. The frequent occurrence of work delays from the planned schedule can be caused by several things, it could be due to internal or external factors that occur. In other words, delays happen a lot. A construction project is said to be successful if it can be completed on time according to schedule, according to budget, according to the desired specifications and to obtain satisfaction from interested parties [11].

Kasimu, said the following main causes of delays in construction / delivery were reported: 1) inadequate data collection and surveys prior to design, 2) higher than expected cost increases due to inflation, and 3) repair / reconstruction work error during construction [12].

According to Fansuris, tardiness is divided into 6 categories, namely:

- Labor, Consisting of:
    - Workforce expertise.
    - Labor discipline.
    - Work motivation of workers.
    - Absence rate.
    - Communication between workforce and advisory bodies
- Material (Material):
    - Material delivery.
    - Availability of materials.
    - Quality ingredients.
- Equipment (*Equipment)* :
    - Availability of equipment.
    - Quality of equipment.

- Characteristics of the Place (Site *Characteristic)* :
    - Storage of materials / materials.
    - Access to the project site.
    - Physical characteristics of buildings around the project site.
- Managerial (*Managerial)*:
    - Project supervision.
    - Quality control of work.
    - Field manager experience.
    - Calculation of material requirements.
    - Design changes.
    - Preparation / determination of site design.
- Finance :
    - Payment by owner.
    - Material prices.
- Factors - Other Factors:
    - Rainfall intensity.
    - Economic conditions.
    - Work accident [13].

RESEARCH METHODS

Research Sites

This research is located in Palu City and its surroundings. This location selection was based on data and information obtained from observations which showed that in the implementation of the Tompe - Dalam Kota Palu - Surumana reconstruction and rehabilitation project there was still a delay, this was influenced by several factors, so it is important to analyze it through this study.

Types of Research

The type of research used in this research is descriptive research, using a quantitative approach.

Operational Research Variables

Operational research variables are the defining limits of a series of variables used in research writing, with the intention of avoiding the possibility of multiple meanings, as well as defining the variables up to the possibility of measurement and the method of measurement [14]. So, operational variables are descriptions or explanations of the existing variables, and are also explanations of the variables that are the study of the study. In this study consisted of several variables totalling 21 variables

Table 1: Operational Research Variables

No.	Variable	Indicator		Scale
1	Labor	-	Lack of workforce skills.	*Likert*
		-	Lack of labor discipline.	*Likert*
		-	The unemployment rate for workers is quite high	*Likert*
2	Materials and Tools	-	Slow delivery of ingredients	*Likert*
		-	Minimal availability of materials	*Likert*
		-	Low quality ingredients	*Likert*
		-	Lack of equipment availability	*Likert*
		-	Low quality of equipment	*Likert*
3	Characteristics of the place	-	Large workspace requirements	*Likert*
		-	Unsupported project locations	*Likert*
		-	Surface and below ground conditions that do not support construction	*Likert*
		-	The physical characteristics of the buildings around the project site that hinder construction	*Likert*
4	Managerial	-	Poor quality of work control	*Likert*
		-	Minimal field manager experience	*Likert*
		-	Incorrect calculation of material requirements	*Likert*
		-	Schedule of work to be completed that is not well structured	*Likert*
5	Finance	-	Inappropriate payment by owner	*Likert*
		-	High material prices	*Likert*
6	Other factors	-	High rainfall intensity hampers the project	*Likert*
		-	Economic conditions also hampered project implementation	*Likert*
		-	Accidents and illness at work hinder project implementation	*Likert*

(Source: Fansuri S in Triarman, 2018)

Data Collection Technique

To obtain the data that is considered, the authors use the following data collection techniques:

a) Questionnaire (Questionnaire)

A questionnaire is a data collection which is done by agreeing to a written question for the respondent to answer. This questionnaire is an efficient data collection technique if the researcher knows exactly what variables to measure and what can be expected from the respondent [15].

b) Documentation

Revealed that documentation is to obtain data directly from the research site, including relevant books, regulations, activity reports, photographs, documentary films, research-relevant data [15].

Data Analysis Technique

This data processing sub-technique describes the analysis methods that will be used to answer the problem formulation , but before that, the initial step that needs to be done is to test the validity and reliability of the research data obtained.

a) Validity test

Validity test is used to measure whether a questionnaire is valid or not. A questionnaire is said to be valid if the questions or statements on the questionnaire are able to reveal something that will be measured by the questionnaire. Measuring validity can be done by correlating the scores between the questions and the total construct or variable scores. [16].

b) Reliability Test

Reliability test is a tool for measuring a questionnaire which is an indicator of a variable or construct. A questionnaire is said to be reliable or reliable if a person's answer to a statement is consistent or stable over time [16]. In this test, the researcher measures the reliability of a variable by looking at the *Cronbach Alpha* with a significance greater than 0.70. A construct or variable is said to be reliable if it gives a *Cronbach Alpha* value > 0.70 [16].

After the validity and reliability testing process is complete, it is followed by statistical tests to answer the problem formulation in this study, while the analysis techniques used include descriptive statistical analysis and *factor* analysis.

c) Descriptive Statistical Analysis

Descriptive statistics are statistics that are used to analyze data by describing or describing the data that has been collected as it is without intending to make generalized conclusions or generalizations. Descriptive statistics include the presentation of data through tables, graphs, pie charts, pictograms, calculation of the mean, *std. deviation* and *skewness*, calculation of deciles, percentiles, calculation of data distribution through the calculation of averages and standard deviation, calculation of percentages [15].

d) Factor Analysis (Factor Analysis)

In factor analysis research was carried out with the help of the SPSS version 21 application. While the sequence of steps in carrying out factor analysis is as follows:

- Formulate problems.
- Construct a correlation matrix.
- Factor extraction.
- Rotating factors.
- Making *factor scores.*
- Interpret Factors.

RESULTS AND DISCUSSION

Research Instrument Test Results

Validity Test Results

To find out the results of the validity test of each statement on the research questionnaire, it can be seen in the following table:

Table 2: Validity Test of Labor Variables

Question	Value of r Count	Value of r Table	Criteria
X1	0.7890	0.2108	Valid
X2	0.7360	0.2108	Valid
X3	0.8720	0.2108	Valid

Table 3: Validity Test of Material and Equipment Variables

Question	Value of r Count	Value of r Table	Criteria
X4	0.9290	0.2108	Valid
X5	0.6640	0.2108	Valid
X6	0.8440	0.2108	Valid
X7	0.7190	0.2108	Valid
X8	0.7640	0.2108	Valid

Table 4: Validity Test of Place Characteristics Variable

Question	Value of r Count	Value of r Table	Criteria
X9	0.9070	0.2108	Valid
X10	0.8700	0.2108	Valid
X11	0.8840	0.2108	Valid
X12	0.8840	0.2108	Valid

Table 5: Validity Test for Managerial Variables

Question	Value of r Count	Value of r Table	Criteria
X13	0.9400	0.2108	Valid
X14	0.8840	0.2108	Valid
X15	0.8490	0.2108	Valid
X16	0.6740	0.2108	Valid

Table 6: Validity Test of Financial Variables

Question	Value of r Count	Value of r Table	Criteria
X17	0.8590	0.2108	Valid
X18	0.7820	0.2108	Valid

Table 7: Validity Test of Other Factors Variable

Question	Value of r Count	Value of r Table	Criteria
X19	0.6810	0.2108	Valid
X20	0.8590	0.2108	Valid
X21	0.8040	0.2108	Valid

Based on the results of the validity test, it is known that all statements are declared valid because they have a calculated r value greater than the r table value, each statement item on this variable is still used in further research related to the analysis of factors for delays in road reconstruction and rehabilitation projects.

Reliability Test Results

The complete results of the reliability test in this study can be seen in the following table:

Table 8: Reliability Test Results

Variable	*Cronbach 'Alpha*	*N of items*	Criteria
Labor	0.81234	3	Reliable
Materials and Tools	0.79743	5	Reliable
Characteristics of the place	0.83590	4	Reliable
Managerial	0.82724	4	Reliable
You're not	0.84630	2	Reliable
Other factors	0.68145	3	Reliable
TOTAL		21	

Based on the summary of the reliability test results as summarized in the table above, it can be seen that the *Cronbach Alpha* value for each variable is greater than 0.60. These results can be concluded that all research instruments can be declared reliable / reliable and can be used for further analysis.

Factor Analysis

The variable selection process in this study is:

KMO Test and Bartlett's Test

A small KMO value indicates that the correlation between pairs of variables cannot be explained by other variables and the factor analysis may not be correct. Factor analysis will be appropriate if the KMO value obtained is> 0.50. To test the accuracy of the factor model, formal statistics are available, namely *Bartlett's test of sphericity*, that the variables are not correlated in the population.

Table 9: KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.573
Bartlett's Test of Sphericity	Approx. Chi-Square	1675,245
	df	210
	Sig.	.000

Table 9 at the top shows the values obtained from the test *Barlett's test of Sphericity* amounted to 1675,245 with a significance of 0.000, it means that the correlation between variables occurs (significant <0.05). The *Kaiser-Meyer-Olkin* (KMO) test results obtained a value of 0, 573 , where the number is already above 0.5. Thus vari- v ariabel in this study can be processed further.

The next step is testing the *Measure of Sampling Adequency* (MSA), where each variable is analyzed to find out which variables can be further processed and which must be excluded. To be processed further, each variable must have an MSA value> 0.5. The MSA value is listed in the *AntiImageMatrice* table in the *Anti-Image Correlation* section , namely the correlation number marked "a" in a diagonal direction from top left to bottom right. (see Attachment). The MSA test results for this research variable are shown in Table 10.

Table 10: MSA Test Results (Measures of Sampling Adequacy)

No.	Factor	MSA Value
1	X1	0.606
2	X2	0.430
3	X3	0.739
4	X4	0.500
5	X5	0.587
6	X6	0.706
7	X7	0.271
8	X8	0.539
9	X9	0827
10	X10	0.690
11	X11	0856
12	X12	0880
13	X13	0.584
14	X14	0.502
15	X15	0.549
16	X16	0.487
17	X17	0.784
18	X18	0.519
19	X19	0.566
20	X20	0.358
21	X21	0.367

From Table 10 above, it is known that there are five variables that do not meet the MSA standard, the five variables include X2 with an MSA value of 0.430 , X7 with an MSA value of 0.271, X16 with an MSA value of 0.487, and X20 and X21 with their respective MSA values. - respectively 0.358 and 0.367. So it is necessary to do a return test whose results can be seen in the following table.

Table 11: KMO and Bartlett's Test Retest Results

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.802
Bartlett's Test of Sphericity	Approx. Chi-Square	1158,623
	df	120
	Sig.	.000

Table 11 above shows the values obtained from the test *Barlett's test of Sphericity* amounted to 1158,623 with a significance of 0.000, it means that the correlation between variables occurs (significant <0.05). The *Kaiser-Meyer-Olkin* (KMO) test results obtained a value of 0,802, where the number is already above 0.5. Thus variabel in this study can be processed further.

Table 12: MSA Ulang Test Results (Measures of Sampling Adequacy)

No.	Factor	MSA Value
1	X1	0.776
2	X3	0.810
3	X4	0.769
4	X5	0.612
5	X6	0.649
6	X8	0.798
7	X9	0.885
8	X10	0.721
9	X11	0856
10	X12	0.910
11	X13	0820
12	X14	0891
13	X15	0868
14	X17	0.789
15	X18	0823
16	X19	0.774

From Table 12 above, it is known that all variables have met the MSA standard, of which the 16 variables have an MSA value above 0.5 so that the data for the 16 variables can be further processed.

Extraction Factor (Factor Extructed)

In factor analysis techniques there are many methods that can be used to extract or reduce factors. In this study, researchers used a *principal component analysis* method using the SPSS version 22 program. The extraction results can be seen in the table below.

Table 13: Factor Extraction Results

Total Variance Explained									
Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative%	Total	% of Variance	Cumulative%	Total	% of Variance	Cumulative%
1	9,787	61,166	61,166	9,787	61,166	61,166	5,266	32,913	32,913
2	1,601	10,004	71,171	1,601	10,004	71,171	4,756	29,722	62,636
3	1,305	8,155	79,326	1,305	8,155	79,326	2,670	16,690	79,326
4	.753	4,709	84,035						
5	.583	3,642	87,677						
6	.473	2,958	90,635						
7	.370	2,314	92,949						
8	.292	1,827	94,776						
9	.262	1,635	96,411						
10	.213	1,332	97,744						
11	.097	.603	98,347						
12	.095	.593	98,940						
13	.081	.506	99,446						
14	.046	.287	99,733						
15	.032	.200	99,933						
16	.011	.067	100,000						

Extraction Method: Principal Component Analysis.

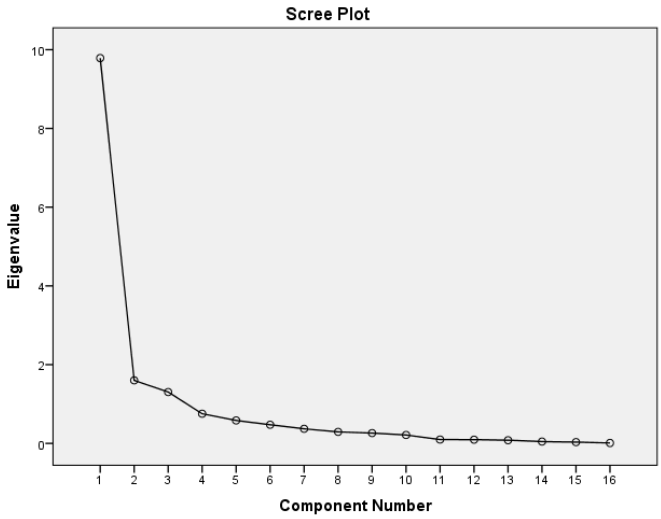

Figure 1: Scree Plot.

As mentioned previously untuk determining factors formed. Then it must be seen that the *eigenvalue* _ must be above one (1). If it is below one (1) then there are no factors formed, from the table above we can see that there are 3 factors formed, because with 1 to 3 factors the *eigenvalues* number is still above 1. But for the three factors the number of *eigenvalues* already below 1, which is 0.753 so the *factoring* process stops at 3 factors only.

Until this process, visible from sixteen variables included in the analysis terbentu factor k three factors. This shows that there is a grouping of a number of variables into certain factors, because there are similarities in the characteristics of certain variables.

Rotation Factor

Initially, the extraction is still difficult to determine the dominant item that is included in the factor because the correlation value is almost the same for several items. To overcome this, a rotation is carried out which is able to explain the distribution of the variable more clearly and significantly. Below is a table that shows the results of the rotation to clarify the position of a variable on a factor

Table 14: Results Rotated Component Matrix

Variable	Symbol	Component		
		1	2	3
Lack of workforce skills.	X1	0.039	0.185	**0.798**
The unemployment rate for workers is quite high	X3	0.492	0.370	**0.556**
Slow delivery of ingredients	X4	0.118	**0823**	0.425
Minimal availability of materials	X5	0.378	0.100	**0.773**
Low quality ingredients	X6	0.037	**0844**	0.292
Low quality of equipment	X8	0.470	**0.792**	0.116
Large workspace requirements	X9	0.568	**0.727**	0.096
Unsupported project locations	X10	0.468	**0.793**	0.141
Surface and below ground conditions that do not support construction	X11	**0.683**	0.331	0.381
The physical characteristics of the buildings around the project site that hinder construction	X12	**0854**	0.247	0.335
Poor quality of work control	X13	**0856**	0.214	0.363
Minimal field manager experience	X14	**0.764**	0.281	0.405
Incorrect calculation of material requirements	X15	0.562	**0.716**	0.201
Inappropriate payment by owner	X17	**0.752**	0.295	-0.110
High material prices	X18	**0.614**	0.279	0.459
High rainfall intensity hampers the project	X19	0.575	**0.654**	-0.039

In this study, the rotation used is the *Varimax* method. *Varimax* rotation mechanism is to make item correlation only dominant to one factor. We can more easily assign to a factor of one, a factor of two and a factor of three. From the results of the table above, the distribution of the existing factors can be described as follows:

Factor 1: Consists of Six Factors, Including

- The condition of the surface and below the ground surface that does not support the construction (X11) with a loading value of 0, 683.
- The physical characteristics of the building around the project site that inhibits processing (X12) with loading of 0, 854.
- Quality control of the work less well (X13) with a value of loading at 0, 85 6.
- Experience minimal field manager (X14) with loading of 0, 764.
- Payment by owners who do not fit (X17) with loading of 0, 752.
- The price of materials were high (X18) with loading of 0, 614.

Factor 2: Consists of Seven Factors, Which are as Follows

- Delivery of materials that slow (X4) with the loading of 0, 823.
- The quality of low material (X6) with the loading of 0, 844.
- The quality of the low equipment (X8) with loading of 0, 792.
- The need for a large work space (X9) with loading of 0, 727.
- Project locations that do not support (X10) with a loading value of 0, 793.
- The calculation of material that is not appropriate (X15) with loading of 0, 716.
- The intensity of heavy rainfall hinder the project (x19) with loading of 0, 654.

Factor 3: Consists of Only Three Factors, Including

- The lack of labor skills (X1) with the loading of 0, 798.
- The absenteeism rate of workers is quite high (X3) with a *loading* value of 0, 556.
- Availability of materials is minimal (X5) with *the loading* of 0, 773.

After the rotation is carried out and three factors are formed, then it is named the factor. The naming of these factors depends on the researcher and can represent the variables. To name each new factor that is formed is subjective, sometimes the variable that has the highest *loading* factor value is used to name the factor [16].

Table 15: Naming Factors

Factor	Symbol	New Factors
Surface and below ground conditions that do not support construction	X11	Supervision and Financial Management
The physical characteristics of the buildings around the project site that hinder construction	X12	
Poor quality of work control	X13	
Minimal field manager experience	X14	
Inappropriate payment by owner	X17	
High material prices	X18	
Slow delivery of ingredients	X4	Situation at the Project Site
Low quality ingredients	X6	
Low quality of equipment	X8	
Large workspace requirements	X9	
Unsupported project locations	X10	
Incorrect calculation of material requirements	X15	
High rainfall intensity hampers the project	X19	
Lack of workforce skills.	X1	Human and material resources
The unemployment rate for workers is quite high	X3	
Minimal availability of materials	X5	

Interpretation

Based on research conducted by the author, can be explained that factors that impact on the delay p engerjaan reconstruction and rehabilitation of Roads Tompe-In Palu-Surumana are three factors of the newly formed from the results of the factor analysis, to three factors, among others, the factors management supervision and finance, the situation at the project site, as well as human and material resources.

The amount of *variance* on these factors cannot be separated from the perception of the respondents in this study to assess that the various variables contained in this factor is considered very affecting the delay of delay reconstruction and rehabilitation of Roads Tompe-In-SurumanaPalu. This condition means that the traffic load working on the road is not supported by the ground strength, the working load is greater than the soil bearing capacity.

Then in addition Tiu k Quality of control work less well also be a variable that drives the magnitude of the influence of supervisory management and finance to delay reconstruction and rehabilitation of Roads Tompe-In Palu-Surumana, from observations in the field researchers considered that a lack of oversight or control of workers in the field makes many workers sometimes late and also performs tasks outside the procedure, so this hinders the implementation of the project as expected. In addition to the problem of unsuitable pay.

Then the last factor is the problem number of human resources and materials that cause delays reconstruction and rehabilitation of Roads Tompe-In Palu-Surumana with a value of *variance* of 8,155%, this factor caused by minimnyalabor skills, indeed In the implementation of the project there are still some workers who are less skilled, so that sometimes they still make mistakes in carrying out their duties.

CLOSING

Conclusions

- From the analysis of the factors used to determine the factors that cause delays in project p engerjaan reconstruction and rehabilitation of Roads Tompe-In Palu-Surumana , it can be concluded that of the 16 questions in the questionnaire which represents several factors parameters of the delay then it can be classified into three factors main. The three factors are supervisory and financial management, the situation at the project site, and human and material resources.
- The results showed that f actor management and financial control to factor of the most dominant influence on the delay p engerjaan reconstruction and rehabilitation of Roads Tompe-In Palu-Surumana value with the value of *variance* of 61,166%.

Suggestion

- Looking at the results of the research which shows that the quality factor of job control is not good enough to be the most dominant actor, it is hoped that the need to improve the quality of supervision in the next project, especially regarding the reconstruction and rehabilitation of roads, both the *owner* and the company implementing the project.
- It is hoped that this research can be taken into consideration for companies engaged in the construction sector to be able to avoid delays in the completion of construction projects

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