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ROLE OF PROJECTRELATED PARTIES ON QUALITY CONTROL (CONCRETE STRUCTURE) AND PROJECT PERFORMANCEACHIEVEMENT

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Abstract

For the data processing process the researcher use help the method ofStepwise Regression Test and Hypothesis Test.The result of this research is very positive influence of concrete quality control factors and the role of project related party influence to the achievement of construction project performance, that is proved by stepwise regression test and hypothesis test where Quality performance (Fi = 21,758> Ft = 2,060), Time performance (Fi = 14,950> Ft = 4,496), Cost performance (Fi = 15,379> Ft = 4,496).For Quality performance is shown: coefficient of determination or R square = 0,876, influencing variable is implementation aspect (x1), and aspects of human resources (x2), with Y1 = 0,285 + 0,148.x1 + 0,071.x2. Related to Time performance: coefficient of determination or R square = 0.537, the variable that influences is monitoring times chedule (x1), with Y2 = 2,166 + 0,415.x1. Related to Cost performance: coefficient of determination or R square = 0.481, the influencing variable is the acceleration of implementation (x1), with Y3 = -0.741 + 0.958.x1. So If the project organizers feel that these variables have been ful filled,then the performance of the resulting construction project will be better too.

***Keywords**: Concrete Quality Control, Quality Performance, Time Performance, Cost Performance, Construction Project Performance.*

Abstrak

Untuk proses pengolahan data peneliti menggunakan bantuan metode Uji Regresi Bertahap dan Uji Hipotesis. Hasil penelitian ini sangat berpengaruh positif terhadap faktor kontrol kualitas beton dan peran pihak terkait proyek terhadap pencapaian kinerja proyek konstruksi, yaitu dibuktikan dengan uji regresi bertahap dan uji hipotesis di mana Kinerja kualitas (Fi = 21.758> Ft = 2.060), Kinerja waktu (Fi = 14.950> Ft = 4.496), Kinerja biaya (Fi = 15.379> Ft = 4.496) .Untuk kinerja yang berkualitas ditampilkan : koefisien determinasi atau R square = 0,876, variabel yang berpengaruh adalah aspek implementasi (x1), dan aspek sumber daya manusia (x2), dengan Y1 = 0,285 + 0,148.x1 + 0,071.x2. Terkait dengan kinerja waktu: koefisien determinasi atau R square = 0,537, variabel yang mempengaruhi adalah waktu pemantauan chedule (x1), dengan Y2 = 2,166 + 0,415.x1. Terkait dengan kinerja Biaya: koefisien determinasi atau R square = 0,481, variabel yang mempengaruhi adalah percepatan implementasi (x1), dengan Y3 = -0,741 + 0,958.x1. Jadi, jika penyelenggara proyek merasa bahwa variabel-variabel ini telah dipenuhi, maka kinerja proyek konstruksi yang dihasilkan akan lebih baik juga.

***Kata Kunci**: Kontrol Kualitas Beton, Kinerja Kualitas, Kinerja Waktu, Kinerja Biaya, Kinerja Proyek Konstruksi.*

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1. INTRODUCTION

1.1 Background of Research

Road construction in the southern crossing line of East Java Province that passes through SogeTawang beach, construction of reinforced concrete walls to withstand waves is built along the sand beach (sea sand), road width is 20 m, retaining wall height is 7 m and distance of retaining wall construction with edge the sea is less than 5-30 m (tidal conditions). Construction of reinforced concrete retaining walls on the beach, of course, requires very large volumes of concrete. So that a system is needed to control the quality of the concrete structure during construction, and also the availability of good resources to support it (human resources, materials and equipment). In order for construction to be carried out satisfactorily or have good performance, it will look for factors that influence concrete quality control in the implementation of construction work and factors that influence the achievement of construction project performance (time performance, quality performance and cost performance). Therefore, researchers tried to make direct observations about concrete quality control in the implementation of the construction work, with a research study on "The Role of Project Related Parties on Quality Control (Concrete Structure) and Project Performance Achievement ".

1.2 Problem Formulation

How do the quality control factors of concrete have significant influence on the achievement of project performance?

How does the project-related party role for concrete quality control have a positive influence on the achievement of project performance?

1.3 Research Objectives

To know the factors of quality control of concrete that have a significant effect on the achievement of project performance.

To know the role of project stakeholders for the quality control of concrete that positively affect the achievement of project performance.

1.4 Research Purposes

Can prove the strong influence of concrete quality control factors and the role of project-related parties to the achievement of project performance.

1.5 Problem Limitation

This study is only conducted on the assessment of the achievement of project performance on the implementation of construction of reinforced concrete retaining walls, and not made comparisons with other project conditions.

1.6 Research Benefits

As an evaluation material for the parties involved in construction projects (stakeholders), policy makers, or drafting plans in the management of a project, especially on the achievement of project performance.

2. RESEARCH METHODS

2.1 Project Definition

The definition of the Project is the allocation of resources within a certain timeframe andcoordination of interconnected events to achieve the overall goal, while facing unique andpredictable challenges.The use of these resources to obtain benefits or to obtain future returns that can be planned, financed and implemented as a series of activities (Kadariah, 1999). The series of activities or activities are only once implemented and generally short term, and therein is a process that processes the project resources into a result of activities (Ervianto, I.Wulfram, 2002). To achieve the final outcome of the project activities is limited by the amount of budget allocated, the schedule / time to be met and the quality that must be met, and all three affect each other (SoehartoIman, 1999).

2.2 Construction Project Management

Construction project management is the activity of planning, organizing, directing and controlling the organization's resources to achieve certain goals, within a certain time, with certain resources. Project resources, especially construction projects, consist of materials, manpower, funding, implementation methods and equipment. Resources are planned to achieve project objectives with time, cost and quality restrictions. The challenge of project implementation is how to plan an effective time / schedule and efficient cost planning without reducing quality.

2.3 Construction Project Performance

The definition of performance is as a result of the work of a particular work activity during a certain period of time. Performance is the effectiveness of the achievement of the maximum work performance on quality, time, and cost and efficiency that compares inputs planned with actual inputs.The performance of the construction project is inseparable from the three constraints, which are important parameters in measuring the performance of construction projects in achieving the project objectives or targets. These parameters are quality performance, time performance and cost performance (Soeharto Iman,1999).

2.4 Construction Related Projects Parties

Construction projects can not be separated from the parties involved either directly or indirectly (stakeholders). From the stage of the construction process, it will certainly involve various

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elements that work together with the same goals so that the project can run in accordance with the planning.In general, the parties involved in the construction project include:Government,Owner of the project (Owner), Consultant, Contractor, Subcontractor, Labor (employee), Bank, and Security. control of concrete.Concrete quality planning and control can be done by controlling the quality of materials, the proportion of concrete mix, the execution of concrete work, and equipped with testing on freshly mixed concrete also on hardened mixed concrete, after placing concrete on formwork finished a good concrete treatment is done. Some of the things that need to be done for the quality control of concrete is the design of quality plan of the properties of concrete forming materials, concrete making process, and the execution of concrete work. As an instrument to record the data that occurs in the field and to control the process used control chart, namely control chart slump test and concrete compressive strength control chart, which consists of a straight line that describes the target level, upper limit level and lower limit level (YayatSupriatna , 2011).Concrete quality control is basically done continuously and systematically to avoid failure of construction. This regulation in SNI-2834-2002 concerning procedure of making a normal concrete mixed plan, SNI-2847-2002 on procedure of calculating concrete structures, and SNI-2847-2013 on requirements of structural concrete.

2.5 Research design

The flow of thought in the research becomes the guideline during the research process, starting from determining the population and the sample, collecting primary data (observation, questionnaire, documen-tation) and secondary data (such as research already done, papers, journals), formulating the problem, variables, composing instruments, testing the validity and reliability, then perform data processing / data analysis.

2.6 Testing Data Instruments

Before testing the validity and reliability, it is necessary to do the item selection procedure first by testing the characteristics of each item that becomes part of the test in question. Items that do not meet the quality requirements may not be included in the test section. Testing validity and reliability is only feasible to do with a collection of items that have been tested and selected.The less data that is in the test, the greater the overlap that occurs. Conversely, the more the number of items in the test, the consequence of the spurious overlap is getting smaller or not significant. If the number of items in the test is more than 30, then generally the spurious overlap effect is not so large and therefore can be ignored, whereas if the number of items in the test is less than 30, the effect becomes substantial so it needs to be taken into account.For this reason, in order to obtain more accurate information about the correlation between items with a test, correction of the spurious overlap effect is needed. At least the magnitude of the total item correlation coefficient after being corrected from the spurious overlap effect is 0.3 (Azwar, 2003).The formula for the total item correlation coefficient after being corrected (ri (x-1)) is due to the spurious overlap effect like the following:

$$r_{i(x-1)} = \frac{r_{ix} S_x - S_i}{\sqrt{\left(S_x^{\ 2} + S_i^{\ 2} - 2 r_{ix} S_i S_x\right)}} \quad (3.3)$$

Source:Riduwan (2008)

rix : total item correlation coefficient before correction(Pearson Product Moment)

Six : standard deviation of item score

Si : standard deviation total score (all items)

ri (x-1) : total item score correlation

coefficient after being corrected from the spurious overlap effect.

2.7 ValidityTest

Validity test is carried out with regard to the degree of accuracy of the measuring instrument against the measured concept so that it actually measures what should be measured. Another opinion, validity test is a measure that shows the level of reliability or validity of a measuring instrument (Riduwan, 2004).Related to testing the validity of the instrument, that a measuring instrument that is less valid means having low validity. To test the validity of the measuring instrument, first find the price of the correlation between the parts of the measuring instrument as a whole by correlating each measuring instrument (question item) with the total score which is the number of each item score, using the Pearson Product Moment (PPM) formula (Arikunto, 1995).Pearson Product Moment Correlation Analysis (PPM) is conducted to find out the relationship between variable (X) and (Y), and also the relationship between variables (X).To calculate the validity of the measuring instrument used the validity test (r. Count) with formula the analysis correlation PPM (Pearson Product Moment):

$$rhitung = \frac{n\left(\sum X_i Y_i\right) - \left(\sum X_i\right)\left(\sum Y_i\right)}{\sqrt{\left(n.\sum X_i^2 - \left(\sum X_i\right)^2\right)\left\{n.\sum Y_i^2 - \left(\sum Y_i\right)^2\right\}}}.$$

Source:Riduwan (2008)

r count : correlation coefficient (Pearson

Product Moment)

∑Xi : Number of item scores

∑Yi : Total total score (all items)

n : Number of respondents

To find out the correlation coefficient is significant or no distribution is used (table r) for the significance level α = 0.05 or α = 0.01 with degrees of freedom (dk = n-2). Then make a decision comparing r.count with r.table.The rule of decision: if r.count> r.table means valid and

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r11 <r.table means invalid (fall). If the instrument is valid, then the interpretation criteria are seen regarding the correlation index (r) by giving an interpretation of the correlation coefficient value:

No.	Interval (r.count) :	Validity Criteria :
1.	<0,200	Very low (invalid)
2.	0,200 – 0,399	Low
3.	0,400 – 0,599	Enough
4.	0,600 – 0,799	Height
5.	0,800 – 1,000	Very High

Next to state the size of the contribution variable X to Y can be determined by the determinant coefficient formula. The determinant coefficient is the square of the PPM correlation coefficient multiplied by 100%.The degree of coefficient of determination (KP) searching forwith the formula:

$$KP = r^2 x 100\ \%$$

Source:Riduwan (2008)

KP : Value of Determinant Coefficient

r : Correlation Coefficient Value

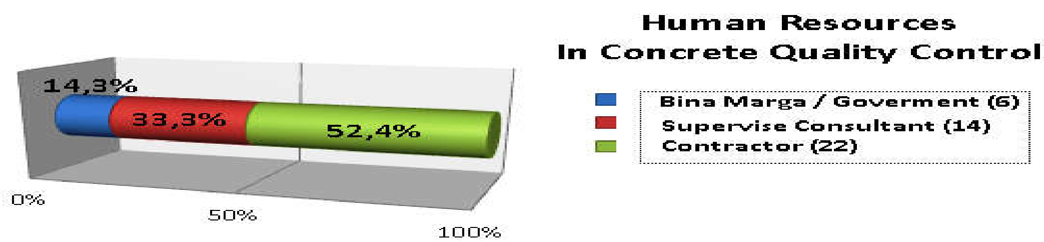
3. ANALYSIS AND DISCUSSION OF RESEARCH RESULTS

3.1 Population and sample techniques

Table 1: Results of Population and Sample Techniques (Respondents)

No.	Project Element :	Population :	Sample :
1	Bina Marga / Goverment	6	4
2	Supervise Consultant	14	10
3	Contractor	22	16
	Total :	42	30

Source: Researcher's analysis



Source: Researcher's analysis

Figure 1: Description of Population (HR) in Concrete Quality Control

3.2 Testing Data Instruments

Table 2: Results of Item Selection Tests on Project Performance

No. Item	Variabel	S_{ix}	S_{ix}^2	S_i	S_i^2	r_{ix}	$r_{i(x-1)}$	Decision $r_{i(x-1)} > 0{,}30$
1	Quality Performance (Y1)	2,5108	6,3041	0,9094	0,8270	0,8110	0,6087	Free from the Spurious Overlap effect
2	Performance Time (Y2)	2,5108	6,3041	0,9509	0,9042	0,8960	0,7588	Free from the Spurious Overlap effect
3	Cost Performance (Y3)	2,5108	6,3041	0,9997	0,9994	0,9210	0,8019	Free from the Spurious Overlap effect

Source: Researcher's analysis

Table 3: Results of Item Selection Tests on Quality Performance

Variabel	S_{ix}	S_{ix}^2	S_i	S_i^2	r_{ix}	$r_{i(x-1)}$	Decision $r_{i(x-1)} > 0{,}30$
Pre-Implementation Concrete Work (Xa)	19,5777	383,286 3	3,2699	10,6922	0,9340	0,9065	Free from the Spurious Overlap effect
Implementation Concrete Work (Xb)	19,5777	383,286 3	4,0859	16,6946	0,8620	0,7886	Free from the Spurious Overlap effect
Post-Implementation Concrete Work (Xc)	19,5777	383,286 3	3,6086	13,0220	0,9400	0,9114	Free from the Spurious Overlap effect
Human Resource Quality (Xd)	19,5777	383,286 3	4,5489	20,6925	0,9090	0,8499	Free from the Spurious Overlap effect
The Role of Project Related Parties (Xe)	19,5777	383,286 3	5,6749	32,2045	0,9650	0,9303	Free from the Spurious Overlap effect

Source: Researcher's analysis

Table 4: Item Selection Test Results Against Time Performance

Variabel	S_{ix}	S_{ix}^2	S_i	S_i^2	r_{ix}	$r_{i(x-1)}$	Decision $r_{i(x-1)} > 0{,}30$
Monitoring Time Schedule S-curve (Xa)	5,1145	26,1581	1,1942	1,4261	0,9000	0,8369	Free from the Spurious Overlap effect
Routine Coordination Meeting (Xb)	5,1145	26,1581	1,1074	1,2263	0,8850	0,8206	Free from the Spurious Overlap effect
Arrange evaluation report progress (Xc)	5,1145	26,1581	1,4134	1,9977	0,8790	0,7826	Free from the Spurious Overlap effect
Check preparation of heavy equipment and labor (Xd)	5,1145	26,1581	1,2262	1,5036	0,8480	0,7539	Free from the Spurious Overlap effect
Check volume of concrete (Xe)	5,1145	26,1581	0,9122	0,8321	0,8520	0,7882	Free from the Spurious Overlap effect

Source: Researcher's analysis

Table 5: Results of Item Selection Tests on Cost Performance

Variabel	S_{ix}	S_{ix}^2	S_i	S_i^2	r_{ix}	$r_{i(x-1)}$	Decision $r_{i(x-1)} > 0{,}30$
Batch-plant concrete capacity & material suppliers (Xa)	4,6606	21,7212	0,5174	0,2677	0,8370	0,7974	Free from the Spurious Overlap effect
Accelerated implementation of work (Xb)	4,6606	21,7212	0,5500	0,3025	0,7650	0,7087	Free from the Spurious Overlap effect
Repair of defective concrete (defect) (Xc)	4,6606	21,7212	1,4348	2,0587	0,9430	0,8839	Free from the Spurious Overlap effect
Checking data backup, MC payment (Xd)	4,6606	21,7212	1,2506	1,5640	0,9160	0,8484	Free from the Spurious Overlap effect
Checking Addendum (Contract Change Order) (Xe)	4,6606	21,7212	1,3818	1,9094	0,9470	0,8966	Free from the Spurious Overlap effect

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Source: Researcher's analysis

4. CONCLUSIONS AND SUGGESTIONS

4.1 Conclusions

The result of this research is very positive influence of concrete quality control factors and the role of project related party influence to the achievement of construction project performance, that is proved by stepwise regression test and hypothesis where Quality performance (Fi = 21,758> Ft = 2,060), Time performance (Fi = 14,950> Ft = 4,496), Cost performance (Fi = 15,379> Ft = 4,496).

a. Related to the Qualityperformance: coefficient of determination or R square = 0.876, indicating that the independent variable (x) modeling can affect the achievement of project quality performance 87.60%, the rest influenced by other factors 12.40% (of time and cost performance variables). The most influential variables related to quality performance are the implementation aspect (x1), and aspects of human resources (x2), with regression equation Y1 = 0,285 + 0,148.x1 + 0,071.x2.

b. Related Timeperformance: coefficient of determination or R square = 0.537, and the most influential variable is monitoringtimeschedule (x1), with regression equation Y2 = 2,166 + 0,415.x1.

c. Related Costperformance: coefficient of determination or R square = 0.481, and the most influential variable is the acceleration of implementation (x1), with regression equation Y3 = -0.741 + 0.958.x1.

5.2 Suggestions

a. If the project organizers feel that these variables have been fulfilled,then the performance of the resulting construction project will be better too.

b. In order to guarantee the quality of the constructed construction (the project performance measure), every project implementation must first create a Quality Plan (appropriate quality, timely, appropriate cost). There are two types of quality plans: the Project Quality Plan (PQP) prepared by the Committing Officer (Owner), and the Contract Quality Plan (CQP) prepared by the Contractor, including the Work Method. While the Consultant in addition to preparing Contract Quality Plan (CQP) related contract documents, also prepare the Standard Operation Procedure (SOP), Work Instructions and Checklist Work Preparation used.

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