Productivity Analysis of Wall Plastering Work With Time Study Method In House Unit Type 55

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Abstract: This study aims to determine the level of productivity of plastering work on house units with type 55 and determine the factors that hinder the work. The method used is the time study method to measure the level of productivity of workers in the field. The weight of the wall plastering work contributes a large weight in the construction work of the housing unit. In this study, the level of productivity of wall plastering work with the time study method on the construction of a Type 55 m2 housing unit was 0.347 M2/OJ and the factors that hindered the productivity of wall plastering work on the construction of a type 55 house unit with the time study method of more workers. joking, chatting a lot, smoking a lot, playing cellphone a lot and drinking coffee during working hours.
Keywords: Productivity, Construction Labor, Time Study Method

INTRODUCTION

Labor productivity will determine the success of a project, with high productivity will support timely project completion so that the use of costs is more efficient and vice versa (Rizal, A. H., Nisnoni, D. B., &Udiana, I. M. 2020). The low productivity produced by workers makes the progress of a job late. With this phenomenon, worker productivity needs to be analyzed further, in order to get the expected results according to the specified duration. Duration is one of the parameters that can be used as a benchmark for project success. Therefore, in a project, optimal time control is needed so that the project can be completed on time (Suharto, I. P., &Sulistio, H. 2020).

Wall plastering is a work of covering a layer of red brick walls or light brick dining in a construction building and one of the jobs that can affect the beauty of a building. The weight of the wall plastering work contributes a large weight in the construction work of the housing unit. The general application of plastering is intended to improve the appearance of the surface and constructively also aims to protect the surface from weather such as rain, heat and others. The commonly used plastering material is using mortar which is also often referred to as plastering. (Saharuddin, 2018).

The productivity of the work to be studied is wall plastering work. Wall plastering work is a job that has a relatively large workload. In addition, plastering work is one of the jobs in the construction of buildings and houses. The housing uni Universitas Pamulang, Jl. Surya

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LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

The definition of productivity is generally defined as a comparison between the output and input (output and input). The various definitions of productivity are as follows:

1. Paul O. Olomolaiye (1998) states that productivity can be described as a comparison between the total output in the form of goods and services at a certain time divided by the total input in the form of manpower, material, money, method, machine during the period concerned in one unit Productivity = Output / Input
2. AfandiBahtiyar, 2018, output or output can be interpreted as the work obtained while input or input is defined as the standard time required to completea work activity. To get the value of work productivity can be used the formula: Productivity (P) = Output (O) / Input (I)

Time Study, always called stopwatch studies, is an accurate method/technique to determine the time required for a type of activity by continuously observing the time of an activity (Ervianto, n.d.). Time study is a measurement technique by collecting data based on the time it takes to complete a job (Pramudiyanto, Hasyim, &Suryo, 2017).

METHOD

Researchers use qualitative research because they know in depth the productivity of workers in wall plastering work, knowing for sure the factors that hinder worker productivity in the field.

Choosing research with qualitative methods, using several forms of data collection such as descriptions of observations, analysis of documents and other artifacts. The types of data used in this study include primary data and secondary data.

1. Primary data includes field conditions (projects), material requirements and tools used
2. Secondary data includes, including literature, drawing for construction and labor wages

The time study method is used to calculate the standard time value of a job. The use of this method is carried out by direct observation in the field, how a job is carried out from the initial stage to the final stage. Contingency allowance due to unexpected things in construction projects is usually sufficient with a value of 5% (Natalia, M., Adibroto, F., &Lubis, R. 2020). Standard Time = (1 + % Relaxation Allowance + % Contingency Allowances) x Basic Time (Pawiro, S., Tjakra, J., &Arsjad, T. T. 2015. The following tables are used in the time study method:

Table 1. Various Rates of working

Rate	Description	Compare walking rate	
		Mph	Kph
0	No Activity	0	0
50	Very slow, clumsy, fumbling movements. Worker appears half asleep with no interest in the Job	2	3.2
75	Steady, deliberate, unhurried performance, as of worker not on piecework, but under proper supervision; looks slow, but time is not beingintentionally wasted while under observation	3	4.8
100 (standard rating)	Brisk, business-like performance as of an average quali fied worker on piecework; necessary standard of quality and accuracy achieved with confidence	4	6.4
125	Very fast; operator exhibits a high degree of assurance dexterity and co-ordination of movement, well above that of an average trained worker	5	8.0

| 150 | *Exceptionally fast; requires intense effort and concen tration and is unlikely to be kept up for long periods; a virtuoso performance only achieved by a few outstanding workers* | 6 | 9.6 |

Source :Cahyadi, H., Purnamasari, E., & Nordiansyah, M. (2021)

Table 2. Relaxation Allowances

Nature	Description	Allowance expresses as percentage of basic time
Standar	Personal needs (toilet, drinking, washing) plus basic fatigue	8
Posture	Standing Awkward	2
	bending	2-7
	Very awkward (lying, stretching up)	2-7
Attention	Fairly fine to very excating visual work	0-5
	Fairly to very complex mental process or span of attention	0-8
Conditions	Lighting: fair to inadequate	0-5
	Ventilation: fair to dust or fumes to extreme conditions	0-5-10
	Noise: quiet to intermittent or hight pitched	0-5
	Heat: temperate to 35deg C at 95% humidity	0-70
Effort	Light: up to 5 kg lifts	1
	Médium: up to 20 kg lifts	1-10
	Heavy: up to 40 kg lifts	10-30
	Very heavy: up to 50 kg lifts	30-50
Monotony	Mental	0-4
	Physical: tedious to very tedious	0-5

Source :Cahyadi, H., Purnamasari, E., & Nordiansyah, M. (2021)

Table 3. Time Study Form

Project			Study No		
			Observation Date		

Element Description	R	WR	OT	BT	Description

R : Rating (Tabel 1)　　　WR : Watch Reading　　　OT : Observed Time

IT : Idle Time　　　BT : Basic Time

Source :Cahyadi, H., Purnamasari, E., &Nordiansyah, M. (2021)

Table 4. Time Study Abstract Sheet

Time Study Abstract Sheet		Date		
Element	Basic Time	Total	No	AV BT

Source :Cahyadi, H., Purnamasari, E., &Nordiansyah, M. (2021)

Table 5. Standard Time Summary Sheet

Standard Time Summary Sheet						Date		
Operation Description								
Element	% Relaxtion							
	Basic					% Cont	Total %	ST	Unit ST
	Time (BT)	S	P	A	C	E	M	

| Total Basic Time | | | | Total Standart Time |

S : Standard   P : Position   A : Attention   C : Condition   ST : Standard Time
E : Effort   M : Monotony C : Contigency   Q : Quantity

Source :Cahyadi, H., Purnamasari, E., & Nordiansyah, M. (2021)

RESULTS AND DISCUSSION

Observations in the field here regarding the productivity of workers on wall plastering work for a type 55 house unit with a salary of assistant builder (kenek) of Rp. 100,000, - and the Builder Rp. 150,000. Observations were carried out for 5 working days starting on October 24, 2022 until October 28, 2022 from 08:00 to 16:00.

Table 6. Time Study Form 24 October 2022

Project		Study No			
Wall Plaster		Observation Date 24 October 2022			
Element Description	R	WR	OT	BT	Description
Mortar Mixing	100	0;38;49	38,817	38,817	0 Builder 2 Assistant Builder

Wall Plaster	100	0;51;55	51,917	51,917	2 Builder 0 Assistant Builder

R : Rating (Table 1)   WR : Watch Reading   OT : Observed Time
IT : Idle Time   BT : Basic Time

Source :Calculation 2022

Next determine the Basic Time of wall plastering work which is described below:

1. Mortar Mixing

The number of workers	= 2 assistant builder	
Wages	= Rp. 100.000	
Conversion	= 2 x (Rp. 100.000 / Rp. 150.000)	
	= 1,333 builder (man)	
Watch Reading (WR)	= 38 minute 49 second	
Rating	= 100	
Basic Time (BT)	= WR x (R/100)	
	= (38 + 49/60) x (100/100)	
	= 38,817 minutes	
	= 0,647 hours	
BT conversionfor 0,2 m^3	= BT x conversion	
	= 0,647 hours x 1,333 man	
	= 0,862 man hours	

Brick spacing thickness = 2,5 cm
Area for 0.2 M3 with a thickness of 2.5 cm = 0,2 m^3/0,025 m
= 8 m^2
Conversion for 1 m^2 mortar = 0,862/8
= 0,108 man hours

2. Wall Plaster

The number of workers	= 2 builder
Wages	= Rp. 150.000
Conversion	= 2 x (Rp. 150.000 / Rp. 150.000)
	= 2 builder (man)
Watch Reading (WR)	= 51 minutes 55 second
Rating	= 100
Basic Time (BT)	= WR x (R/100)
	= (51 + 55/60) x (100/100)
	= 51,917 minutes
	= 0,865 hours

BT conversion for 1 m^2 Plaster = BT x conversion
= 0,865 hours x 2 man
= 1,731 man hours

   With the same calculation, the basic time for plastering brick walls is for other observation dates. The results of these calculations can be seen in the following Time Study Abstract Sheet table

Table 7. Time Study Abstract Sheet

Time Study Abstract Sheet					Date	24/10 - 28/10 2022	
Element	**Basic Time**					**Total**	**No**	**AV BT**
	24/10/22	25/10/22	26/10/22	27/10/22	28/10/22			
Mortar	0,108	0,109	0,107	0,105	0,102	0,531	5	0,106

Mixing							
Wall Plaster	1,731	1,744	1,684	1,725	1,714	8,598	5	1,720

Source :Calculation 2022

The basic time obtained is then entered into the Standard Time Summary Sheet table to get the value of worker productivity.

Table 8. Standard Time Summary Sheet

Standard Time Summary Sheet								Date	24/10 - 28/10 2022
Operation									Jam 08:00 - 16:00
Description									

Element		% Relaxtion						% Cont	Total %	ST	Unit ST
	Basic Time (BT)	S	P	A	C	E	M				
Mortar Mixing	0,106	8	2	2	30	5	4	5	56	0,166	0,166
Wall Plaster	1,72	8	3	3	30	5	4	5	58	2,717	2,717
Total Basic Time	1,826								Total Standart Time	2,883	

S : Standard   P : Position   A : Attention   C : Condition
ST : Standard Time

Source :Calculation 2022

Total standard time for wall plastering work in 1 M2 = 2.883 OJ
The productivity value of plastering work   = Output / Input
Output is the quantity of work and Input is labor   = 1 m^2 / 2,883 man hours
                                                   = 0,347 m^2/man hours

Factors that affect the work of installing red brick walls include: workers joke more, chat a lot, smoke a lot, play cellphones a lot and drink coffee during working hours.

CONCLUSIONS

Based on research on the productivity of wall plastering work using the Time Study method on the construction of a type 55 m^2 house unit as follows:
1. The productivity level of wall plastering work productivity using the Time study method on the construction of a type 55 m^2 house unit is 0.347 m^2/OJ.
2. Factors that hinder the productivity of wall plastering work in the construction of a type 55 housing unit with the time study method, workers joke more, chat a lot, smoke a lot, play cellphones and drink coffee during working hours.

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