

AN ANALYSIS OF NETWORK ON THE DEVELOPMENT OF PT. JINGGA PROPERTI HOUSES IN SIGI BIROMARU

Endang Suerni
Saharuddin Kaseng
Syamsuddin

Master of Management Study Program, Economics and Business Faculty, Tadulako University
endangsuerni123@gmail.com saharuddin.kfamily@yahoo.com syam_singga@yahoo.co.id

ABSTRACT

Project management is used to plan, implement, and control project activities to minimize risks to project time and cost. Completion of an infrastructure project on time is a top priority. One of the problems that often occurs is the time delay of the project caused by the incompatibility of the schedule planning with the character of human resources, building materials, disasters, company regulations that can result in construction failure and have an impact on costs. Type of the research was descriptive quantitative, quantitative, and qualitative data sources. Planning for the construction of subsidized type 36 houses using Gant cart takes 75.5 days/604.5 hours in the construction of 1 unit of subsidized housing. This study aims to determine and analyze the network of construction of subsidized type 36 houses at PT. Jingga Properti Indonesia in Kalukubula Sigi Biromaru using the PERT (Project Evaluation Review Technique) method both in manual calculations and the assistance of POM-QM Software, the results of the research obtained that the construction of subsidized type 36 houses at PT. Jingga Property Indonesia can be completed in 400.47 hours. The results of the realization of house construction before the calculation using the PERT method were 538 hours. If targeted for 420 hours, the possibility of completion is 99%. The proposed schedule of 294.52 hours can be realized if the masons are added/more activities are done simultaneously.

Keywords: Project Management and Critical Path, PERT, Subsidized Housing

1. INTRODUCTION

Housing and settlement issues are regulated by Law Number 1 of 2011 concerning Housing and Settlement Areas (PKP). This law reminds us of the state's responsibility to protect all Indonesian people, one of which is by providing decent housing for the Indonesian people, especially low-income people. Therefore, private sector involvement in providing decent housing (type 36) as a form of private participation is solely to help & support the government's responsibility in fulfilling type 36 housing (Fauzi, 2020).

Project scheduling is the most important part of a project planning, which is to determine when a project is implemented based on a certain sequence from the beginning to the end of the project. CPM (Critical Path Method) is one of the methods used in analyzing the scheduling of a project's work time. The goal is to find out the critical path in which there are critical activities and compare the work time scheduling scheduled by the project owner and the work time scheduled using the CPM method. (Ilwaru, dkk, 2018).

At PT. Jingga Properti Indonesia (PT. JPI), the duration of completion of the construction of subsidized type 36 houses greatly affects the process, both the smoothness of the process and the rate of sales. Based on information from interviews with sales marketing, when the user/potential home buyer has finished preparing the files and the

filing process has been completed and is approaching the agreement at the Bank, the house building has not been completed so that sales marketing puts pressure on the production department in the field.

Project control, like other management system controls, involves close monitoring of resources, costs, quality, and budget. Control also means using a feedback loop to revise the project plan and having the ability to move resources where they are needed most. Computerized PERT/CPM reports and charts are widely available today from a multitude of competing software companies (Heizer & Render, 2015).

The work network is a method that is considered to provide a basic technique for determining the sequence and duration of project element activities so that it can be used to estimate the overall project completion time. (Ilwaru, 2018).

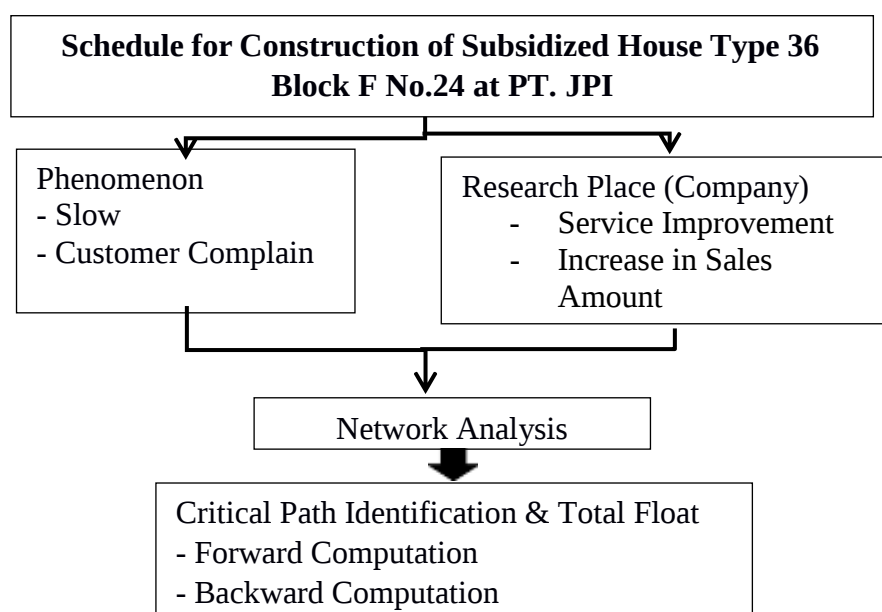


Figure 1 Theoretical Framework

2. RESEARCH METHOD

Research on network analysis of house construction at PT. Jingga Properti Indonesia used the PERT method with a type of quantitative research. This research applied descriptive quantitative research with the aim of applying the PERT method to predict and optimize the total duration of the project in the scheduling of house construction projects by PT. JPI.

Research on network analysis of house construction at PT. JPI used the subject of research, namely the calculation of the duration of the type of house construction activity in the construction of type 36 Block F No. 24. The location of this construction was carried out at BTN Housing PT. Jingga Properti Indonesia, Balintuma Street, Kalukubula Sigi Biromaru.

In the research on house construction analysis at PT. Jingga Properti Indonesia, the data analysis technique to determine the critical path used PERT and was tested using an application that searches for the critical path, namely the POM-QM application.

3. FINDINGS AND DISCUSSIONS

3.1. FINDINGS

In the research of the analysis of the network of subsidized housing construction, the observation results were obtained from the results of direct surveys to the location,

interviews with the Head of Craftsmen, Subordinates of Craftsmen, Foremen and Head of Production. Initial planning used Gant cart and by estimation, to build 1 unit of subsidized type 36 houses takes 75 days, as well as the realization of the construction of block F24 after it was realized, namely 65 days with a total work duration of 524.51 hours (65, 57 days).

3.2 DISCUSSIONS

The results of this research answered the discussion from the initial discussion which was the researcher's reference.

Type of Activity	Symbol	Between Events	Activity Duration	SPC _i	SPC _j	SPL _i	SPL _j	Slack	Critical
Reinforcing	A	0* - 1*	16,5	0	16,5	0	16,5	0	*
Land Clearing	B	1* - 2*	0,12	16,5	16,62	16,5	16,62	0	*
Foundation and SloofCasting Work, Drainage Pipe Work, Septic Tank	C	2* - 3*	25,57	16,62	42,19	16,62	42,19	0	*
Embankment Work	D	3* - 4*	5	42,19	47,19	42,19	47,19	0	*
Flat Brick Arrangement Work Frame	E	4* - 5*	49,67	47,19	96,86	47,19	96,86	0	*
Door & Window Frames Installation	F	4* - 6	16,5	47,19	63,69	353,8	370,3	306,61	
Bricklaying Work from the Frame Levelto the Ring Beam	G	5* - 7*	46,33	96,86	143,19	96,86	143,19	0	*
Terrace Brick Arrangement Work & Ring Beam Casting When Installing Terrace Bricks	H	7* - 8*	4,54	143,19	147,73	143,19	147,73	0	*
Brickwork for arranging the truss andcasting the ring beam after installing the truss bricks	I	8* - 9*	8,36	147,73	156,09	147,73	156,09	0	*
Install the Hood / Roof	J	9* - 10*	35,67	156,09	191,76	156,09	191,76	0	*
Internal Plaster, Pipe Installation & Electrical Box	K	10* - 11*	61,67	191,76	253,43	191,76	253,43	0	*
Exterior Plaster and Foundation Plaster	L	10* - 12*	43	191,76	234,76	308,43	351,43	116,67	
Wall Paint	M	11* - 12*	98	253,43	351,43	253,43	351,43	0	*

Install Interior Floor Tiles & Natural StoneWall Tiles	N	12* - 13*	44,17	351,43	395,6	351,43	395,6	0	*
Bathroom Work (FloorTiles, Wall Tiles, Toilets and Doors)	O	2* - 13*	15,83	16,62	32,46	379,75	395,6	363,13	
Door & Window Frame Paint	P	6 – 14	7	63,69	70,69	370,3	377,3	306,61	
Window Grilles Installation	Q	14 – 15	2	70,69	72,69	377,3	379,3	306,61	
Door & Window Installation	R	15 – 16	7,17	72,69	79,85	377,3	386,47	306,61	
Ceiling Installation	S	10 – 17	24	191,76	215,76	368,49	392,49	176,73	
Front Rebate, Bridge and Drainage	T	2* - 17	8,55	16,62	25,17	383,94	392,49	367,3	
Retention-Finishing (House & Yard Cleaning)	U	16 – 17	6	79,85	85,85	386,49	392,49	306,62	
Canopy Installation	V	11* - 17	3,65	253,43	257,08	388,84	392,49	135,41	
Electrical Installation	W	13* - 18	4,89	395,6	400,49	395,6	400,49	0	*
Water Installation	X	17 – 18	8	257,08	265,08	392,49	400,49	135,41	

Table 1. Table of Critical Network Calculation

Based on the table above, the t-value (desired/expected time duration) of each activity can be known. So thatthe network diagram can be described as follows:

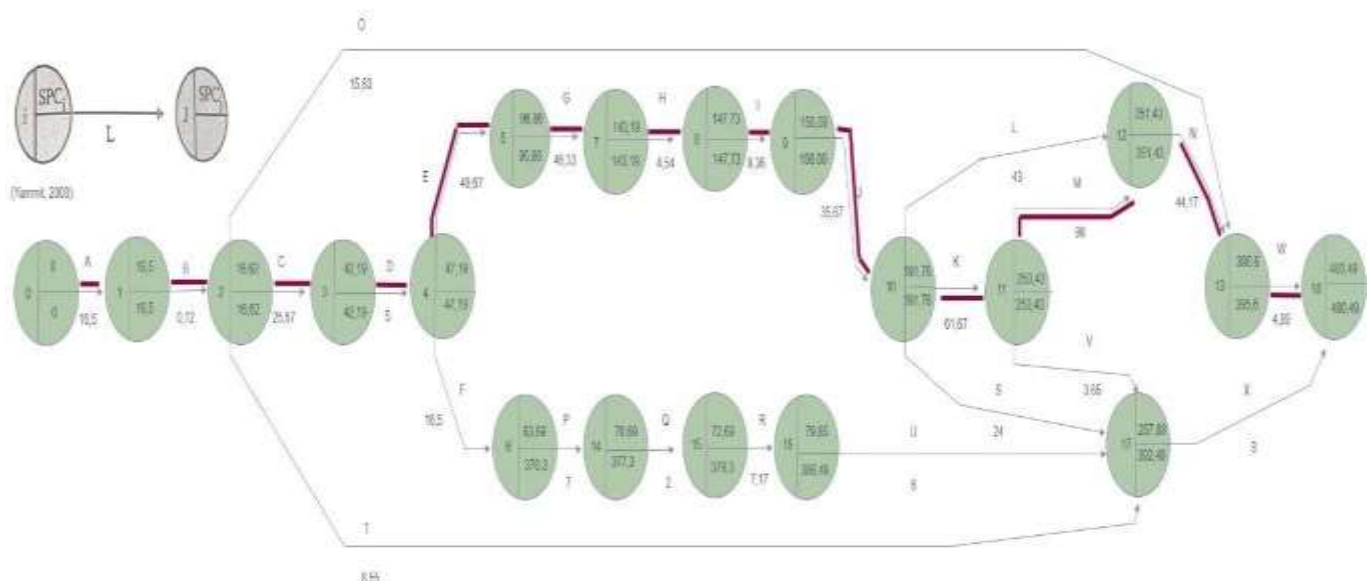


Figure 2
Diagram of Type 36 Subsidized House Network with ES, EF, LS, LF Notations

Based on the network diagram in Figure 2, it can be concluded that the longest and most critical path is as follows: A(16,5) + B (0,12) + C (25,57) + D (5) + E (49,67) + G (46,33) + H (4,54) + I (8,36) + J (35,67) + K (61,67) + M (98) + N (44,17) + W (4,89) = 400,49 Hours.

Based on research that has been conducted on the construction of subsidized type 36 houses, it can be concluded that:

1. The results of the analysis using the PsERT method, obtained the critical path of the work network in the activity of A (16,5) + B (0,12) + C (25,57) + D (5) + E (49,67) + G (46,33) + H (4,54) + I (8,36) + J (35,67) + K (61,67) + M (98) + N (44,17) + W (4,89) = 400,49 hours.
2. The analysis using the PERT method shows that the standard deviation of each activity from the critical path is 5.5 and the variance is 30.28. The possibility that the project is targeted to be completed in 420 hours is 99%.
3. By applying the PERT method, the critical path can be identified, the time required to complete a project so that efforts can be made to accelerate the project duration by speeding up the work on the critical path.

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