ANALYSIS OF CONSTRUCTION MANAGEMENT CONSTRUCTION PROJECTS DEVELOPMENT OF FLATS OF TEGAL ALUR DKI JAKARTA

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ABSTRACT

Location of the development project of Tegal Alur DKI Jakarta KSO.WIKA & CAKRA in the Lingkungan III Tegal Alur West Jakarta coordinates Y: 2500.000 X: 2500.000 (West Jakarta PUPR Office)

Project management is an attempt to use limited resources efficiently, effectively and on time in completing a predetermined / planned project. There are 3 activities of the basic functions of project management namely planning, implementation and control. Of the three activities are controlled resources on a project that includes manpower, equipment, materials, money and methods.


This research methodology is composed of several main stages, namely Preparation of Survey and Identification of Field, Seeking primary data and secondary data in related institution and department needed to complete data needed in preparation of thesis, Conducting analysis of data obtained through identification problem and make formulation, Taking conclusions and suggestions from the results of research.

With Budget Plan Cost and calculation of workload of Jakarta Flat Development Project Tegal Alur DKI Jakarta resulted in Working Time Plan takes 231 days using CPM scheduling method with estimated cost of Rp. 36.690.228.549

Keywords : Project Management, Bar Chart, Curva S, CPM (Critical Path Method)
1. INTRODUCTION

1.1 Background

The purpose of project management is to manage or manage the implementation of the project in such a way as to obtain optimum results in accordance with the requirements and for the purposes of such achievement should pay attention to the quality of the building, the cost in use and time allocation. (Agnes Dwi Yanthi Winoto, 2014).

Several methods have been developed to overcome in the project such as Network Planning Method such as Critical Path Method (CPM), Barchart and Curve S. Network Planning method is one that can be used to help decide various problems especially planning, scheduling, and project control.

One of the outcomes of the planning is project scheduling, which can provide information on the project schedule and progress of the project in terms of resource performance in the form of cost, labor, equipment and materials and the progress and duration of project completion time. This is intended to help facilitate monitoring and evaluation of project implementation.

Analysis of Construction Management of Tegal Alur DKI Jakarta Flats Development Project is expected to provide an overview of the project conditions so as to facilitate the contractor in making decisions to optimize project performance.

1.2 Problem Formulation

The formulation of the problem in this writing is:

a. Analysis of Work Implementation Methods
b. Calculation of Volume and Budget Plan of Development Project of Tegal Alur DKI Jakarta Flats.
c. Preparation of Schedule on Tegal Alur DKI Jakarta Flats Development Project.
d. Analisa Arus Kas Pada Proyek Pembangunan Rumah Susun Tegal Alur DKI Jakarta

1.3 Purpose and Objectives

a. Purpose

The preparation of the thesis is intended to gain experience, knowledge and insight about the management of building projects, as well as an effort to realize all the science related to theory obtained during a lecture at the Faculty of Engineering, Prodi Civil Engineering University of Swadaya Gunung Jati.

b. Objective

This final project is carried out with the aim to analyze the construction management of the development project of Tegal Alur DKI Jakarta Flats such as:

a. Work Volume Calculation Analysis
b. Work Method Analysis
c. Work Time Schedule Analysis
d. Cost Analysis

1.4 Thinking Framework

![Figure 1. Thinking Framework](image)

2. REVIEW OF LITERATURE AND BASIC THEORY

2.1 GENERAL

The literature review is about similar planning that has been done before. And the theoretical basis that can be used as a reference in analyzing about Project Management.

2.2 REVIEW OF REFERENCE

1. Research conducted before

a. Management Analysis Project development PT. PRIMA MULTI BUSINESS INDONESIA XL (Yudi Sutomo (2015))
b. Analysis of Building Structure Building. The title of the research is Analysis of Construction Management Construction of Grand Orchard Cirebon store
house (Tanto sutanto Diharjo, (2015))

c. Analysis of Project Implementation Management of PT. Indo Food Cbp Cirebon (Rihad Arif Zein (2011))

2. The Differences of Prior Research with Current Research

Current research is Analysis of Construction Management of Tegal Alur DKI Jakarta's Construction Project. Basically has an element of similarity with previous research when viewed from the aspect of its objective is to overcome the problems in project management such as compiling the performance of time, Preparation Schedule execution, Time Schedule re-planning, cost and Implementation method. Projects in the field.

Based on the results of the study of the above three planning regarding the construction management planning of a building structure. assessed that the most approximate and equality in the planning of a construction management system with the planning that is doing now is the first planning.

2.3 BASIC THEORY

2.1.1. GENERAL PRINCIPLES OF PROJECT MANAGEMENT

According to George R. Terry: Terry defines management in his Principles of Management, "A process that distinguishes the planning, organizing, mobilization and supervision by utilizing both science and art in order to achieve predetermined goals.

2.1.2. DEFINITION OF ANALYSIS

Analysis is needed in planning especially for planning development either a region or a building construction. So that development planning can be done optimally.

2.1.3. DEFINITION OF PROJECT MANAGEMENT

According to IAI (Indonesian Institute of Accountants) project management is the management of the whole construction process starting from the process of preparing the project initiative, ie the stage of the formulation of project needs or ideas, budget preparation and overall development schedule until the completion of the construction process including the maintenance period as well procurement ‘procurement’ equipment and building supplies.

2.4 DATA ANALYSIS METHOD

Method of data analysis conducted in this research, the method of CPM (Critical Path Method) as a corrective action to analyze the network work for the implementation of the project to be ideal.

1. Bar chart

Bar Chart Is a set of activity lists arranged in vertical direction columns, and horizontal direction columns show the time scale. The start and end of an activity can be seen clearly while the duration of the activity is illustrated by the length of the bar chart.

The block chart consists of the x-axis and the y-axis, the y-axis representing the description of the activity or work package from the project scope while the x-axis represents the duration or time required for each activity with daily, weekly and monthly units.

2. S Curve

The S curve is a graph developed by Warren T. Hanumm on the basis of observing a large number of projects from the beginning to the end of the project.

The S curve can show the progress of a project based on activity, time and workloads represented as the cumulative percentage of all project activities. The visualization of the S curve can provide information on the progress of the project by comparing it to the planned schedule. From here it is known whether there is a delay or acceleration of the project schedule.

3. Budget Plan

The Budget Plan is a calculation of the amount of costs required for materials and wages, as well as other costs associated with building or project implementation. Budget cost is the price of building materials that are carefully calculated, meticulously and qualified. The cost budget in the same building will vary in each
region, due to the difference in material prices and labor costs.

4. Critical Path Method

T. Hani Handoko (1993) argues that CPM is a method designed to optimize project costs whereby it can be determined when exchanges of costs and time must be made to meet project completion schedules for the minimal cost possible.

CPM provides the following benefits:

a. Provide a graphical display and the flow of a project's activities.

b. Predict the time required to complete a project.

c. Indicate the flow of activities that are important to consider in maintaining the project completion schedule. Provide graphical display and the flow of activities of a project.

5. Cashflow

Cashflow is one of the other planning products in construction planning, such as scheduling, construction methods, and implementation budget. (Widiasanti & Lenggoni, 2013, p. 136)

3. METHOD AND RESEARCH OBJECT

3.1. RESEARCH METHOD

The research method used is quantitative and qualitative methods, the definition is like this:

a. Quantitative method is the method by collecting and studying the literature related to planning and Analysis of Calculation.

b. Qualitative method is a method done by collecting field data to be used as data in the object.

3.2. RESEARCH FRAMEWORK

Figure 2. Research Framework

3.3. RESEARCH LOCATION

Location of the development project of Tegal Alur DKI Jakarta KSO.WIKA & CAKRA in the Lingkungan III Tegal Alur West Jakarta coordinates Y: 2500.000 X: 2500.000 (West Jakarta PUPR Office)

4. RESEARCH RESULT AND DISCUSSION

4.1. GENERAL DESCRIPTION OF DEVELOPMENT PROJECTS

The construction of the Tegal Alur DKI Jakarta built in the neighborhood of III Tegal Alur subdistrict, Kalideres Sub-district, West Jakarta, is seven floors, intended as a habitable vertical dwelling for the people of DKI Jakarta.
affected by the relocation by the Provincial Government of DKI Jakarta.

Figure 4. Site Plan For The Development Of Apartment Projects In Jakarta

4.1.1. Project General Data

Project name:
Development Project of Tegal Alur DKI Jakarta's Leased Apartment

Project location:
Lingkungan street III Tegal Alur, Kalideres DKI Jakarta

Types of Foundation : Pile Foundation(Square Pile) & Pilecap

Structure Type: Reinforced Concrete

Concrete Quality: Fc’30

Quality Reinforcement: BJTS 40

4.1.2. Job Description

a. Preparatory work
1) Land Cleaning
2) Measurement and installation of bouwplank
3) Work of security fence
4) The making of the Board of Directors

b. Land and Foundation Work
1) Pile foundation work Uk. 35x35.
2) Excavation of soil pile cap and sloof.
3) The work of urugan sand under pile cap, sloof and floor work.
4) Working floor work under pile cap and sloof.

c. Concrete Reinforced Concrete Work
1) Pile cap foundation work
   Tipe pc 5= 2,185 x 2,185 x 1,200
   Tipe pc 6= 1,750 x 2,800 x 1,200
   Tipe pc 8= 1,750 x 3,850 x 1,200
   Tipe pc 9= 2,800 x 2,800 x 1,200
   Tipe pc 9A=3,615 x 2,800 x 1,200
   Tipe pc 10=1,750 x 5,075 x 1,200
   Tipe pc 11=2,519 x 3,850 x 1,200
   Tipe pc 12=1,750 x 6,250 x 1,200
   Tipe pc 12A=1,750x5,625 x 1,200
   Tipe pc 22=4,900 x 4,475 x 1,200
   Tipe pc 22A=3,850x7,350 x 1,200
   Tipe pc 24=5,125x 9,500 x 1,200

2) The work of the pedestal column
   Tipe K1= 0,700 x 1,000
   Tipe K2= 0,700 x 1,200
   Tipe K3= 0,700 x 1,300
   Tipe K4= 0,300 x 0,300

3) Tie Beam Works
   Tipe TB1 = 0,200 x 0,400
   Tipe TB2-7= 0,400 x 0,600
   Tipe TB8-12= 0,500 x 0,800
   Tipe TB13= 0,400 x 0,500
   Tipe TB14-16= 0,500 x 0,800
   Tipe LB1 = 0,300 x 0,500
   Tipe W10= 0,500 x 1,400

4) Work beam
   Tipe B1 = 0,200 x 0,400
Analysis Of Construction Management Construction Projects Development Of Flats Of Tegal Alur Dki Jakarta

- Tipe B2-B7 = 0.300 x 0.400
- Tipe B8-B12 = 0.400 x 0.500
- B13-B15 = 0.400 x 0.600
- Tipe LB1 = 0.300 x 0.500

d. Architectural Work
1) The work of plastering walls, and nat grout.
2) Ceramic work
3) Work frames, doors, and windows
4) Ceiling work
5) Work staircase railing
6) Front and page work
7) Roof covering work
e. Electrical Mechanical Works
1) Electrical installation work
2) Water installation work

4.2. METHOD OF IMPLEMENTATION OF WORK
a. Work Preparation
   Situations and Measures prior to the implementation of the construction of the initial stage of work is preparatory work.
   - Everything concerning the smoothness of the implementation work should be prepared on site before carrying out the work.
   - Detailed schedule, Time schedule, equipment and labor mobilization, and completeness of field administration must be prepared before starting work.
   - For the smoothness of previous activities the contractor should pay attention to the placement of materials and traffic.

b. Land and Foundation Work
   a. Excavation Work Pile soil cap and Sloof
   b. Urugan sand work under pile cap, sloof, and floor work. Urugan Sand compacted upholstery until it reaches thickness. Urugan Sand in accordance with the working drawings and technical specifications that are about 10 cm.

c. Work floor work under pile cap, sloof, and floor work After the soil is dug and granted sand, the work floor is then made with a mixture of 1Pc concrete: 3Ps: 5Kr. Before the concrete mix is laid, the ground floor is leveled first. The thickness of the work floor is about 5 cm, after the work floor hardened then placed on the foundation of Plat Places.

d. Compaction Work
e. Structural Work
1. Pile cap foundation work
2. Sloof's work
3. Works Formwork
4. Reinforcement Works
5. Work column
6. Work Beams, Plates Floors and Stairs
7. Roof Covering Works

d. Architectural Work
1. Wall Works, Plastering, and Acian
2. Granite and Ceramic Installation Works
3. Work Frame, Door, Window and Partition
4. Ceiling Work
5. Paintwork
6. Railling Stair Works
e. Electrical Mechanical Works.
1. Electrical Installation Works
2. Water Installation Works

4.3. ANALYSIS OF UNIT PRICE
4.3.1. Material and Wage Analysis
   Analysis of a work ingredient, which is the amount / volume of each material, as well as the amount of costs required. While the meaning of wage analysis of a worker is to calculate the number of personnel required, and the amount of cost required for the job. (H. Bachtiar, 1993)

Table 1. Tool Price Analysis
4.3.2. Work Unit Price Analysis

What is meant by the unit price of work is, the amount of material prices and wages of labor based on the calculation of the analysis. The price of materials obtained on the market, collected in a list called the price list of materials. (H. Bachtiar, 1993, p. 133)

Figure 5. Work unit price scheme

From the above scheme then got the formulation as follows:

\[
\text{Harga Satuan Kerja} = \text{Bahan} + \text{Upah}
\]

(Source Ibrahim, Rencana dan Estimate Real of Cost, Jakarta 1993)

4.4. CALCULATION OF BUDGET PLAN

The Begrooting Plan of a building or project is a calculation of the amount of costs required for materials and wages, as well as other costs associated with the execution of the building or project. (Ibrahim, 1993, p.3)

Before calculating the Budget Plan, first calculate the volume of each job obtained from the working draw (bestek).

After calculating the volume of each subsequent work is to calculate the Budget Plan by multiplying the volume with the unit price. (Winoto, 2014)

4.5. PREPARATION OF PROJECT SCHEDULING

4.5.1. Barchart analysis

Based on the planning and results of the calculation then if using the Analysis by Barchart method is as follows and attached:

Table 2. Analysis Barchart

4.5.2. Curve S Analysis

Based on the planning and the result of weight calculation then use Analysis of S curve is as follows.
4.5.3. CPM Analysis

1. Preparation of Working Network Schedule (AOA Method)

Activity On Arrow (AOA) or Arrow Diagram consists of arrows and circles / rectangles. The arrows describe the activity / activity, while the circle / quadrilateral describes the event (event). (Ervianto, 2005, p 233)

2. Determining the Relationship Between Activities

In the CPM, compile the components in the order of dependence logic through the basis of making the working period, so it is known for the activities from the beginning of the project until the completion of the project completion of the project as a whole.

The order of activities in accordance with the logic of its dependence on the Development Project of Tegal Alur DKI Jakarta Flats, the sequence of activities and vice versa can be in the table below.
4. Identify the Critical Path, Total Float and Project Completion Period

The Critical Path Method, where the approach used only uses one type of duration on its activities. The Critical Path is a path with a collection of activities having the longest duration that can be known when its activity has Total Float 0.

What is meant by the critical path in this step is the path consisting of a series of activities within the scope of the project, which, if delayed will result in the overall project delays, activities on this path are called critical activities, whereas float is the time voltage of a certain non-critical activity of the project.

5. Cash Flow Project Cash Flow Planning

Cashflow is the approximate flow of funds to be spent on the construction of the project in accordance with the Time Schedule that has been drawn up by the contractor. Making Cashflow is usually used at the beginning of the presentation with the owner because it aims to manage the finances of the owner about the amount of expenditure each week. This Cashflow creation is related to Curve S. The main formula of Cashflow building project creation is:

\[
\text{Cashflow} = \text{Plan Progress} \times \text{Total Float}
\]
5. CONCLUSIONS AND SUGGESTIONS

5.1. CONCLUSIONS

After data collection, discussion and analysis in the previous chapters based on the results of existing data, it can be drawn a conclusion as follows:

1. To reduce the problem of densely populated settlements in the capital is to build vertical housing one of the rental houses programed by the provincial government and central government.

2. Based on the Budget Plan of the Project Development of Tegal Alur DKI Jakarta Flats more or less cost Rp. 36,690,228,549 Unspecified: (Thirty Six Billion Six Hundred Ninety Million Two Hundred Twenty Eighty Five Five Hundred Forty Nine Rupiah)

3. With Budget Plan The cost and calculation of workload of Tegal Alur DKI Jakarta Flat Development Project in the result of Working Plan Time requires 231 days using CPM scheduling method

4. By Using Network Planning Diagram Sheduling can be seen clearly Time work that can be delayed or must be done

5. With Cash Flow Project Flow Preparation can be known the amount of Expenses incurred on a weekly or monthly basis.

6. With Project Management Analysis can be in the know Quality of materials, Cost and Time Planned On Development Project Flats Tegal Alur DKI Jakarta.

5.2. ADVICE

1. In the planning of Cost Calculation, it is necessary to evaluate the price which is done by Government or Private, whether it is Material Price and Worker's Wage in West Jakarta.

2. Material Requirement Monitoring Should pay attention to Work Requirement According to Contents of Budget Plan so it can minimize lost material or loss.

3. There needs to be a review of the identification of problems that will occur in the Project as it will affect the scheduling of project execution time and cost planning.

4. Provide the ability of Analysis Method to try to change part of the process, Then observe the effect on the project as a whole

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