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ANALYSIS OF CONSTRUCTION MANAGEMENT OF KINDERFIELD SCHOOL CIREBON DEVELOPMENT PROJECT

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ABSTRACT

Management of construction projects is becoming increasingly complex due to the many parties that interact in it and the increasingly high demands for quality of functions, comfort, security, aesthetics and sustainability. Therefore construction management is needed to ensure the efficiency and productivity of a construction project in meeting various expectations and requirements. Contruction management analysis on this building project of Kinderfield School include volume measurment, RAB, cost recapitulation and working/occupation unit cost analysis, with use CPM method (Critical Path Method) is a method in identificating a stripe or working item critically. CPM method solves the problem with retreat and forward measurement. From the weight measurment occupation based on Barchart analysis, Curva S and building PDM scedhule of Kinderfield School needs the times as long as 42 weeks with cost estimation Rp. 9,439,526,000,00..

Keyword: *Barchart, Construction Management, CPM (Critical Path Method), S-Curve.*

I. INTRODUCTION

1.1. Background

Construction management is the process of application of management science that covers all aspects of planning, organizing, acting, and systematic control to achieve certain goals by utilizing the available and effective time and resources to achieve optimal results. Resource control in the project include labor, equipment, materials, money, and methods.

1.2. Scope Of The Problem

Scope of the problem in this research are:
1. The data used in this research is image data planning of Kinderfield School.
2. Calculating Job Volume.
3. Calculating the Employment Budget Plan and Equipment
4. Employment Network Analysis Methods used in the study of this project is the PDM, Barchart and S curve.

1.3. Objective Of Story

The purpose of research in development project of Kinderfield School Cirebon are:
1. To analyze the volume of work on the Kinderfield School Construction project
2. To find out the duration of project implementation Kinderfield School.
3. To know the cost of implementing the work of the Kinderfield School.

II. LITERATURE REVIEW

2.1. Project

According to Syah (2004) simply and generally the definition of a project is a series of planned activities and executed sequentially with logic and using many types of resources, which are limited by the dimensions of cost, quality, and time.

2.2. Construction Management

According to Ervianto (2002) construction management is all the planning, implementation, control and coordination of a project from the beginning (the idea) until the completion of the project to ensure that the project carried out on time, cost-effective, and appropriate quality.

2.3. General Principle Of Construction Management

2.3.1. Planning

Planning is an action to take decisions on the data, information, assumptions or facts of the selected activities and will be carried out in the future. The planning are as follow:
1) Planning the scope of the project
2) Time planning and drafting
3) Quality planning
4) Cost planning
5) Labor planning

2.3.2. Organizing

Organizing is as a regulation of an activity conducted by a group of people, led by the group leader in an organization. This organization's container describes the structural and functional relationships necessary to channel responsibilities, resources and data. (Tanto, 2011).

2.3.3. Actuating

Actuating is defined as a management function to mobilize people who are incorporated in the organization to perform activities that have been defined in the planning. At this stage, the ability of group leaders to mobilize, direct, and motivate members of the group to jointly contribute to the success of the project management to achieve the goals and objectives set. (Tanto, 2011)

2.3.4. Controlling

Activities undertaken at this stage are intended to ensure that established programs and work rules can be achieved with minimum deviations and the most satisfactory outcomes. For that done the forms of activity are supervision, inspection and corrective Action.

2.4. Scheduling Techniques

Project scheduling is a tool to determine the time required to complete an activity. Scheduling is used to determine when to begin and when the activities end.

2.4.1. Barchart

A barchart is a set of events placed in a vertical column, while time is placed in a horizontal row. The start and finish times in each activity along with their duration are indicated by placing horizontal beams on the right side of each activity. Estimated start and finish times can be determined

from the horizontal time scale at the top of the chart. The length of the beam indicates the duration of the activity and usually the activities are arranged on the basis of the chronology of the work (Callahan, 1992).

2.4.2. S-Curve

The S-Curve is a graph developed by Warren T. Hanumm on the basis of observing most projects from the beginning to the end of the project. The S-Curve can show the progress of the project based on activity, time and workload presented as the cumulative percentage of all project activities by comparing it to the schedule of the plan.

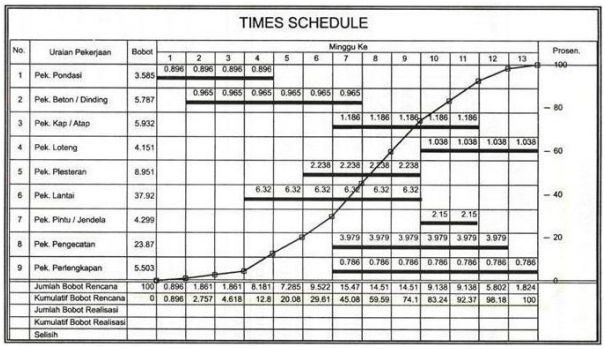

Figure 2.1 S-Curve (Source : Google)

2.5. Performance Control

2.5.1. Cost Control

According to Soeharto (2001) cost control is the final step of the project cost management process, which is to make use and expenditure in accordance with the plan, in the form of a predetermined budget.

2.5.2. Time Control

According to Soeharto (2001) overall project planning is outlined, carried out at the beginning of the project and always reviewed when the implementation is not in accordance with the plan. Scheduling is the detail setting required to implement the plan.

2.5.3. Quality Control

Quality assurance can be obtained by doing the process based on material and work criteria that have been established until the final product standard can be obtained, can also perform a working procedure in the form of a quality system to obtain standard quality system to the final product.

2.6. Budget Plan

According to Ervianto (2002) estimation activities are one of the main processes in a construction project to answer the question "How much money should be provided for a building?" The preparation of funds in the project is needed in large quantities. Activity estimation is the basis for making budget plan and schedule of construction implementation, to predict the happening in the implementation process and give value to each of these events.

2.7. Cashflow

Cashflow is one of the planning products among other planning products in construction planning, such as scheduling, construction methods and implementation budget (Asiyanto, 2005). Cashflow will explain the expenditure and income of the money during the construction project and also as a tool to estimate the financial condition in the future.

III. METHODOLOGY

3.1. Research Method

The research method used is qualitative method. Qualitative is descriptive research and tend to use analysis. Analysis means to process the existing data in such a way as to produce the final result that can be concluded.

3.2. Types and Sources of Data

3.2.1. Primary Data

This data is obtained either through observation, asking and interviews with related parties including project staff, field executives, and experienced experts in their scope.

3.2.2. Secondary Data

Secondary data is data taken indirectly. These secondary data are collected through project data, project reports, and literature books generally in the form of theory, information, basic concepts or methods that can support the writing of this research.

3.3. Collecting Data Method

Collecting data method is a step used to obtain data. In this research, the data needed are primary data and secondary data. The data obtained either through observation, asking and interviews with

related parties including project staff, field executives, and experienced experts in their scope.

3.4. Data Analysis Method

Data analysis method is a method used to process planning results in order to obtain a conclusion. The analysis used are as follow:

a. Analysis of Bar Chart
b. Analysis of S-curve
c. Precedence Diagramming Method (PDM)
d. Analysis of the needs of materials, labor, and tools.

3.5. Research Flowchart

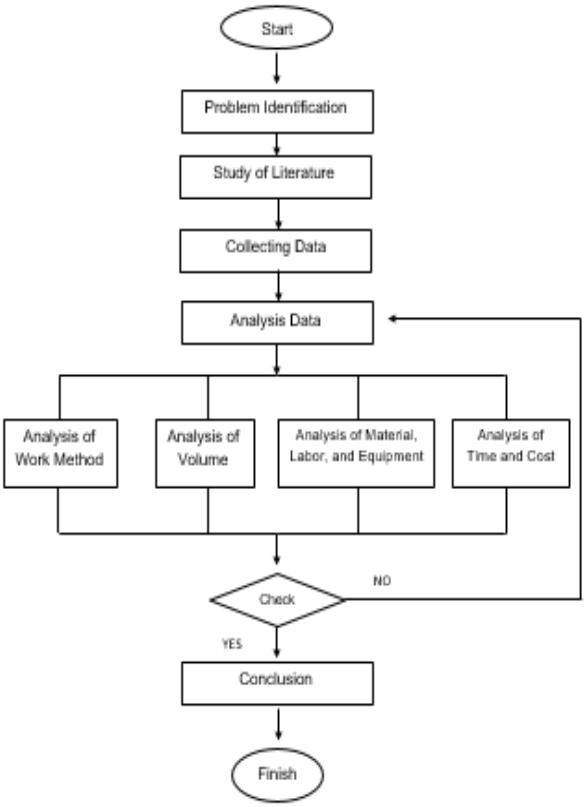

Figure 3.1 S-Research Flowchart

3.6. Research Location

The location to be used as research is on development project of Kinderfield School which is located at Jl. Kapten Samadikun No. 33 Cirebon City.

IV. RESULT AND DISCUSSION

4.1. Project General Description

To improve services in the field of education to be more effective and convenient, Kinderfield School that has been built additional building in order to create better service in education to the student.

Figure 4.1 Kinderfield School Cirebon

4.1.1. Project General Data

Name of Activity	:	Kinderfield School Cirebon
Project Location	:	Jl. Kapten Samadikun No. 33 Cirebon City
Owner	:	Kinderfield School
Contractor	:	CV. Tehnik Jaya

4.1.2. Project Technical Data

Surface Area	:	493.5 m2
Foundation	:	Pile Foundation
Structure Type	:	Reinforced Steel

4.2. Project Implementation Method

4.2.1. Preparatory Work

a. Land Clearing
b. Measuring and Bouwplank Installation
c. Making the Direksi Keet
d. Making the Warehouse
e. Making the Drainage
f. Safety Gate
g. Project Name Board

4.2.2. Soil Work

a. Foundation, pile cap and sloof excavation works
b. Backfilling of soil works
c. Compacting of soil works

4.2.3. Structure Work

a. Pile Foundation
b. Slood
c. Pile Cap
d. Column

e. Beam and Slab
f. Stairs

4.2.4. Architecture Work

a. Work of wall, plastering and panning
b. Work of ceramic
c. Work of frames, doors and windows
d. Work of plafond
e. Work of railing stairs
f. Work of face and page
g. Work of roof coverings

4.3. Project Schedule

4.3.1. Analysis of Bar Chart and S-Curve

Planning and calculation results using bar chart analysis method can be seen on table 4.1.

4.3.2. Analysis of Critical Path Method

Data of critical path method can be seen on table 4.2 and the result of CPM can be seen on figure 4.2.

Table 4.1 Bar Chart and S-Curve Analysis

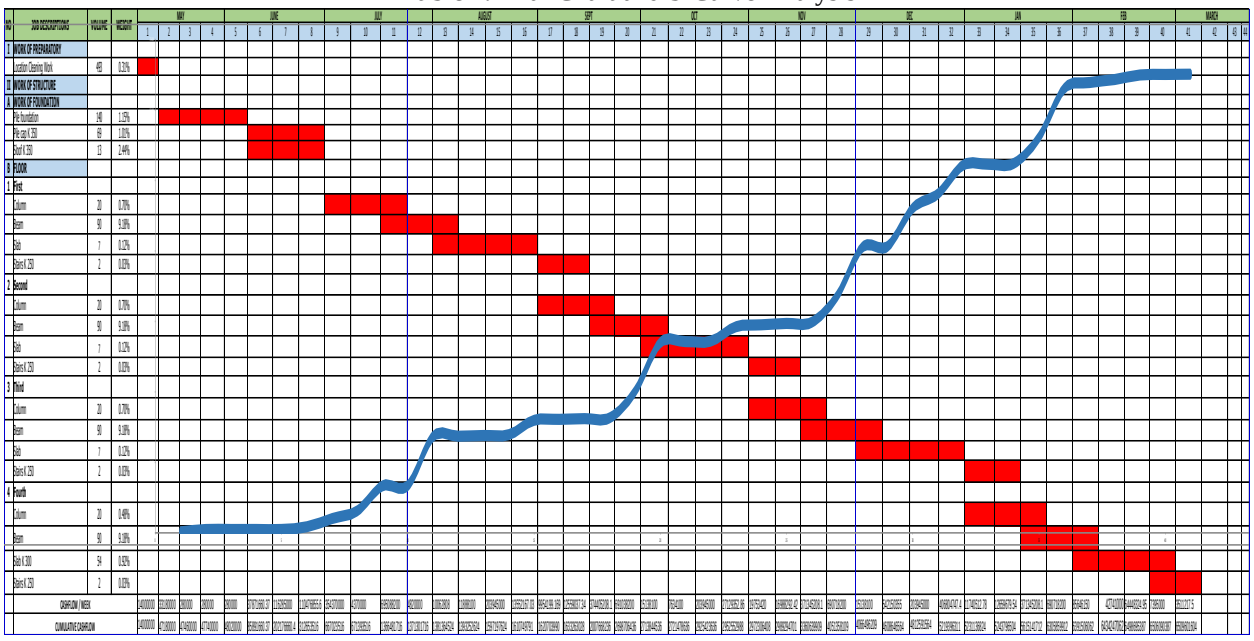

Table 4.2 Data of CPM

NO.	WORK DESCRIPTION	DURATION (MINGGU)	ACTIVITY CODE	PREVIOUS ACTIVITY
I	**WORK OF PREPARATORY**			
	Location Cleaning Work	1	A	-
II	**WORK OF STRUCTURE**			
A	**WORK OF FOUNDATION**			
	Pile foundation	4	B	A
	Pile cap K 350	3	C	B
	Sloof K 350	3	D	B
B	**FLOOR**			
1	**First**			
	Column 350 X 350	3	E	C, D
	Beam 400 X 200	3	F	E
	Slab	4	G	E
	Stairs K 250	2	H	F, G
2	**Second**			
	Column 350 X 350	3	I	F, G
	Beam 400 X 200	3	J	H, I
	Slab	4	K	J
	Stairs K 250	2	L	K
3	**Third**			
	Column 350 X 350	3	M	K
	Beam 400 X 200	3	N	L, M
	Slab	4	O	N
	Stairs K 250	2	P	O
4	**Fourth**			
	Column 350 X 350	3	Q	O
	Beam 400 X 200	3	R	P, Q
	Slab K 300	4	S	P, Q
	Stairs K 250	2	T	R, S

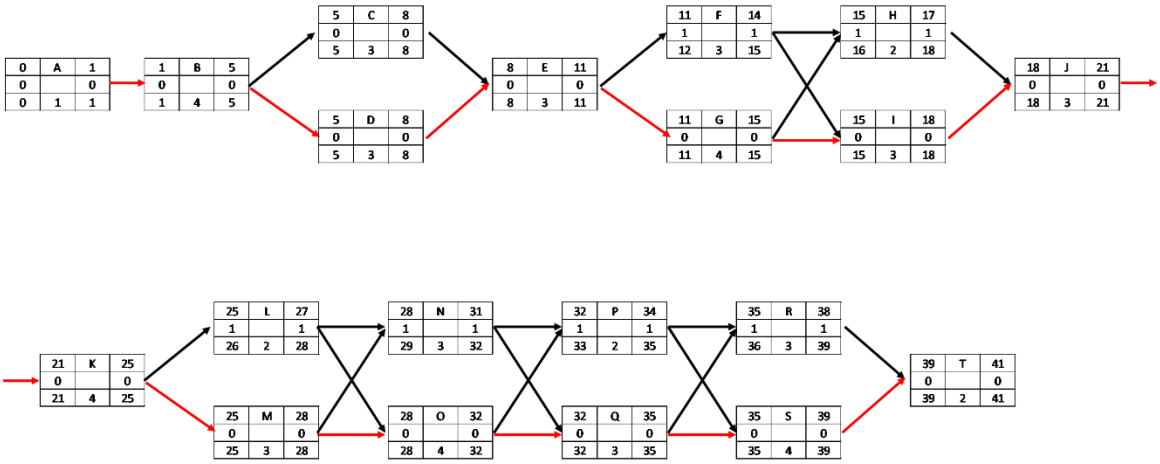

Figure 4.2 Critical Path

4.4. Project Cashflow

Based on the calculation of cash flow to complete the construction of Kinderfield School Cirebon project until final stage more or less cost as much Rp. 7,674,539,000,00. These costs are divided into two parts, structure and architecture work, for structures the cost as much Rp. 6,509,601,000,00 and for architecture the cost is Rp. 1,164,937,000,00. Detail calculation of project cashflow can be seen on table 4.3.

Table 4.2 Total casflow

PERIOD		PRICE OF LABOR	PRICE OF MATERIAL	PRICE OF EQUIPMENT	TOTAL COST PER WEEK	TOTAL COST PER MONTH	CUMULATIVE
MAY	1	5,000,000	-	9,000,000	14,000,000	47,740,000	14,000,000
	2	280,000	28,000,000	4,900,000	33,180,000		47,180,000
	3	280,000			280,000		47,460,000
	4	280,000			280,000		47,740,000
JUNE	5	280,000			280,000	264,913,516	48,020,000
	6	4,560,000	27,716,660	5,595,000	37,871,660		85,891,660
	7	2,400,000	108,290,000	5,595,000	116,285,000		202,176,660
	8	960,000	109,516,856		110,476,856		312,653,516
JULY	9	470,000	350,000,000	3,900,000	354,370,000	1,058,648,200	667,023,516
	10	470,000		3,900,000	4,370,000		671,393,516
	11	1,390,000	685,898,200	7,800,000	695,088,200		1,366,481,716
	12	920,000		3,900,000	4,820,000		1,371,301,716
AUGUST	13	1,240,000	4,922,808	3,900,000	10,062,808	239,448,075	1,381,364,524
	14	2,040,000	9,848,100		11,888,100		1,393,252,624
	15	280,000	203,665,000		203,945,000		1,597,197,624
	16	320,000	7,637,167	5,595,000	13,552,167		1,610,749,791
SEPTEMBER	17	1,270,000	4,784,199	3,900,000	9,954,199	1,087,956,645	1,620,703,990
	18	830,000	2,234,037	9,495,000	12,559,037		1,633,263,028
	19	550,000	366,055,208	7,800,000	374,405,208		2,007,668,236
	20	1,240,000	685,898,200	3,900,000	691,038,200		2,698,706,436
OCTOBER	21	1,390,000	9,848,100	3,900,000	15,138,100	253,846,553	2,713,844,536
	22	2,040,000	5,594,100		7,634,100		2,721,478,636
	23	280,000	203,665,000		203,945,000		2,925,423,636
	24	320,000	21,214,353	5,595,000	27,129,353		2,952,552,988
NOVEMBER	25	1,710,000	9,643,420	8,400,000	19,753,420	1,098,805,120	2,972,306,408
	26	750,000	6,743,292	9,495,000	16,988,292		2,989,294,701
	27	1,390,000	366,055,208	3,900,000	371,345,208		3,360,639,909
	28	920,000	685,898,200	3,900,000	690,718,200		4,051,358,109
DECEMBER	29	1,390,000	9,848,100	3,900,000	15,138,100	1,168,038,202	4,066,496,209
	30	2,040,000	540,110,355		542,150,355		4,608,646,564
	31	280,000	203,665,000		203,945,000		4,812,591,564
	32	320,000	400,889,747	5595000	406,804,747		5,219,396,311
JANUARY	33	1,430,000	6,410,513	3900000	11,740,513	1,086,463,600	5,231,136,824
	34	970,000	2,194,680	9495000	12,659,680		5,243,796,504
	35	1,390,000	366,055,208	3900000	371,345,208		5,615,141,712
	36	920,000	685,898,200	3900000	690,718,200		6,305,859,912
FEBRUARY	37	1,320,000	80,426,150	3900000	85,646,150	200,230,475	6,391,506,062
	38	720,000	42,021,000		42,741,000		6,434,247,062
	39	1,320,000	57,533,325	5595000	64,448,325		6,498,695,387
	40	1,800,000		5595000	7,395,000		6,506,090,387
MARCH	41	200,000	3,311,218		3,511,218	3,511,218	6,509,601,604
TOTAL		47,960,000	6,301,491,604	160,150,000	6,509,601,604	6,509,601,604	

STRUCTURE		**6,509,601,604**
RAB ARCHITECTURE		**1,164,937,881**
TOTAL		**7,674,539,485**

V. CONCLUSION AND RECOMENDATION

5.1. Conclusion

1. Based on the calculation of cash flow to complete the construction of Kinderfield School Cirebon project until final stage more or less cost as much Rp. 7,674,539,000,00. These costs are divided into two parts, structure and architecture work, for structures the cost as much Rp. 6,509,601,000,00 and for architecture the cost is Rp. 1,164,937,000,00.
2. From the calculation of CPM scheduling analysis, the development of Kinderfield School takes time for 41 weeks.
3. By using the CPM method can be known the critical paths that occur in the project is Preparatory - Pile foundation - Fisrt floor - Second floor - Third floor – Fourth Floor - Work of Floor.

5.2. Recommendation

1. In construction management analysis, the complete data is very needed such as drawing plan data, and supporting data such as unit price analysis, wage prices, material prices, and equipment rental prices to be able to quickly and easily in complete the thesis.
2. In analyzing the amount of resource needs, do not just use the existing analysis from the government, but also use analysis based on your own experiences and observations in the field.

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