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ANALYSIS OF CONSTRUCTION MANAGEMENT ON THE ASHLEY HOTEL CENTRAL JAKARTA DEVELOPMENT PROJECT

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ABSTRACK

Construction Management is the process of implementing management functions (Planning, Organizing, Actuating and Controlling) systematically on a project by using existing resources effectively and efficiently in order to achieve project objectives optimally.

Analysis of Construction Management on the Ashley Hotel Central Jakarta Development Project is starting from the analysis of implementation method, the calculation of the work volume, the calculation of the needs of labor, material, and equipment, the calculation of the budget plan, and the time and cost control project with Barchart, S-Curve and Critical Path Method (CPM).

Based on the analysis that has been done with Barchart, S-Curve and CPM, the construction of Ashley Hotel takes 69 weeks with an estimated cost of Rp. 39.091.299.600,00.

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

I. INTRODUCTION

A. BACKGROUND

Development Project of Ashley Hotel Central Jakarta requires a proper management in managing its resources. Resources owned by the company is limited, so in its implementation required a planning with clear targets, so that existing resources can be provide right. The management covers time, costs and quality.

B. FOCUS PROBLEM

Planning construction management to get estimated costs and time needed to complete the Ashley Hotel Central Jakarta project.

C. SCOPE OF THE PROBLEM

Scope of the problem in this research are:

1. The data used is drawing plan data.
2. Calculate the work volume.
3. Analyze the needs of material, labor, tool.
4. Calculate the budget plan.
5. Control of time and cost used network analysis method Barchart, S-Curve, and Critical Path Method (CPM).

D. FORMULATION OF THE PROBLEM

Formulation of the problem on the development project of Ashley Hotel Central Jakarta are as follows:

1. How is the work implementation method?
2. How to calculate the volume of work?
3. How to analyze the needs of materials, tools, and labor?
4. How to analyze Budget Plan?
5. How to control the time and cost implementation used network analysis method Barchart, S-Curve, and CPM?

E. PURPOSE OF RESEARCH

The purpose of research in development project of Ashley Hotel Central Jakarta are:

1. To know the work implementation method.
2. To obtain volume of work and budget plan.
3. To know the method of controlling time and cost implementation used network analysis method Barchart, S-Curve, and CPM.
4. To determine the cost and time (duration) of the development project.

F. BENEFIT OF RESEARCH

1. Theoretical Benefit.
2. Practical Benefit.

II. LITERATURE REVIEW AND THEORETICAL BASIS

A. PREVIOUS RESEARCH

1. **Analisis Manajemen Konstruksi Proyek Pembangunan PT. Tempoland Cirebon,** this research was conducted by Syahriel Shidiq Ma'mury.
2. **Analisis Manajemen Konstruksi Proyek Pembangunan RSUD Brebes,** this research was conducted by Opi Lasari.
3. **Analisis Manajemen Pelaksanaan Proyek Hotel Grand Prima,** this research conducted by Saripudin.

B. THEORETICAL BASIS

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. 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.

3. GENERAL PRINCIPLE OF CONSTRUCTION MANAGEMENT

a. 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

b. 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).

c. 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)

d. 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

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.

a. 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).

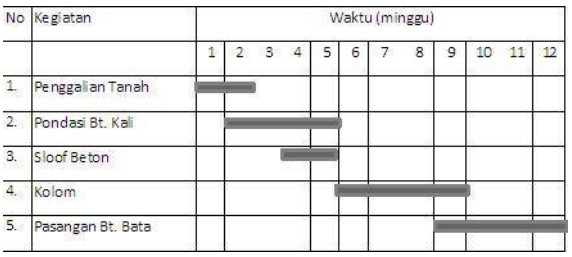


Figure 1. Bar Chart (Source : Google)

b. 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.

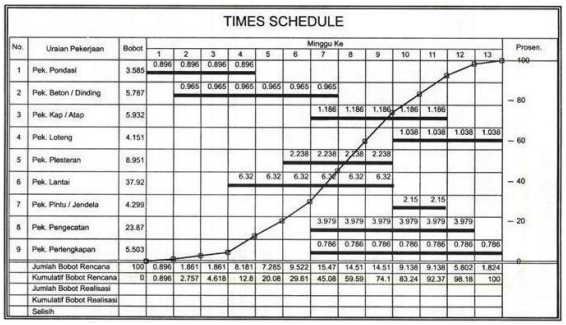


Figure 2. S-Curve (Source : Google)

c. Critical Path Method (CPM)

According to Soeharto (1999) the Critical Path Method (CPM) is a line that has a range of activity components with the longest total number of times and shows the fastest project completion period. Thus, the critical path consists of a series of critical activities, starting from the first activity to the final project activity.

5. PERFORMANCE CONTROL

a. 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.

b. 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.

c. 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.

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.

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. METHOD AND OBJECT OF RESEARCH

A. RESEARCH METHOD

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.

2. Writing Method

It starts with collecting and studying the literature related to project management. Collect the data to be used as data in the object.

3. Types and Sources of Data

a) 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.

b) 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 thesis.

4. 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.

5. 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. Analysis of Critical Path Method (CPM)
d. Analysis of the needs of materials, labor, and tools.

6. Research Flowch

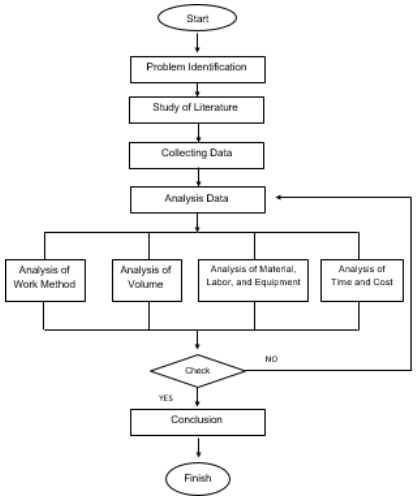


Figure 3. Flowchart

B. OBJECT RESEARCH

1. Research Location

The location to be used as research is on development project of Ashley Hotel which is located at Jl. KH. Agus Salim No. 25 RT. 02 RW. 01, Kebon Sirih, Menteng, Central Jakarta, DKI Jakarta 10340.

2. Research Time

The research is planned to be completed for 5 months, starting June 4th, 2018 to November 5th, 2018 in accordance with the Decree issued by the faculty. For 5 months the author must have completed the thesis and conducted seminar and final hearings.

IV. RESEARCH RESULT AND DISCUSSION

A. PROJECT GENERAL DESCRIPTION

Hotels are accommodation companies or business entities that provide lodging services, food and beverage provision, and other service facilities where all services are reserved for the general public, both those staying at the hotel or those who only use certain facilities in the hotel.

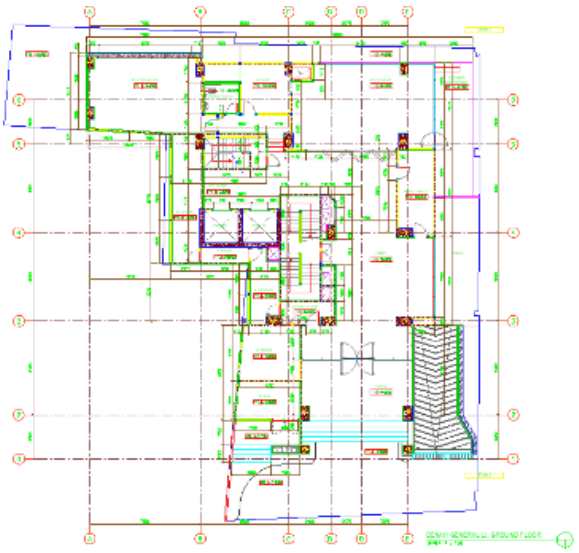


Figure 4. Shop Drawing

1. Project General Data

- Name of Activity : Ashley Hotel Central Jakarta
- Project Location : Jl. KH. Agus Salim No. 25 RT. 02 RW. 01, Kebon Sirih, Menteng, Jakarta Pusat, DKI Jakarta 10340
- Owner : PT. Prima Hospitaly
- Contractor : PT. Adhicon Prakasa
- Consultant : PT. Kurniadi Rekajasa
- Contract Starts : April 2017

2. Project Technical Data

Surface Area : 681,14 m^2
Foundation : Bored Pile Foundation
Structure Type : Reinforced Concrete

B. PROJECT IMPLEMENTATION METHOD

1. Preparatory Work

- Land Clearing
- Measuring and Bouwplank Installation
- Making the Direksi Keet
- Making the Warehouse
- Making the Drainage
- Safety Gate
- Project Name Boar

2. Soil Work

a. Basement excavation works
b. Foundation, pile cap and tie beam excavation works
c. Backfilling of soil works
d. Compacting of soil works

3. Structure Work

a. Bored Pile Foundation
b. Bored Pile Foundation
c. Soldier Pile
d. Capping Beam
e. Pile Cap
f. Tie Beam
g. Column
h. Beam and Slab
i. Stair

4. Architecture Work

a. Wall Installation Work
b. Wall Finishing Installation Work
c. Floor Finishing Installation Work
d. Frame, Door, Window, and Glass Installation Work
e. Ceiling Installation Work
f. Painting Work

5. Mechanical Electrical Work

a. Mechanical Work
b. Electrical Work
c. Electronic Work
d. Sanitary Work

C. CALCULATION OF WORK VOLUME

Table 1. Work Volume Calculation

NO	WORK ITEM	VOLUME	UNIT
I	PREPARATORY WORK		
1	Measuring and Bouwplank Installation	104,50	m'
2	Land Clearing	681,14	m^2
3	Tower Crane Rental	1,00	Ls
II	SOIL WORK		
1	Excavation of Soil	2079,78	m^3
2	Backfilling of Soil	86,16	m^3
III	LOWER STRUCTURE WORK		
A	FOUNDATION WORK		
1	Bored Pile Foundation Ø = 800 mm	2136,00	m'
B	SOLDIER PILE WORK		
1	Soldier Pile Ø = 600 mm	662,00	m'
2	Bentonite Ø = 600 mm	156,64	m'
C	CAPPING BEAM WORK		
1	Work Floor	3,82	m^3
2	Ready Mix Concrete K-300	38,22	m^3
3	Formwork	95,56	m^2
4	Steel Reinforcement	2769,58	kg
D	PILE CAP WORK		
1	Work Floor	15,92	m^3
2	Ready Mix Concrete K-300	477,53	m^3
3	Formwork	373,17	m^2
4	Steel Reinforcement	48638,84	kg
E	TIE BEAM WORK		
1	Work Floor	1,31	m^3
2	Ready Mix Concrete K-300	17,08	m^3
3	Formwork	96,91	m^2
4	Reinforcement Steel	4563,12	kg
F	RETAINING WALL WORK		
	a. Ready Mix Concrete K-400	96,35	m^3
	b. Formwork	385,31	m^2
	c. Reinforcement Steel	9287,85	kg
IV	UPPER STRUCTURE WORK		
A	SLAB WORK		
1	BASEMENT		
	a. Work Floor (width = 5 cm)	19,08	m^3
	b. Ready Mix Concrete K-300	80,65	m^3
	c. Reinforcement Steel	4297,97	kg
2	GROUND FLOOR		
	a. Ready Mix Concrete K-300	52,32	m^3
	b. Formwork	480,93	m^2
	c. Reinforcement Steel	5928,54	kg
3	MEZZANINE		
	a. Ready Mix Concrete K-300	33,36	m^3
	b. Formwork	307,02	m^2
	c. Reinforcement Steel	3602,23	kg
4	2nd FLOOR		
	a. Ready Mix Concrete K-300	54,91	m^3
	b. Formwork	505,10	m^2
	c. Reinforcement Steel	5925,05	kg
5	3th FLOOR		
	a. Ready Mix Concrete K-300	54,91	m^3
	b. Formwork	505,10	m^2
	c. Reinforcement Steel	5925,05	kg
6	4th FLOOR		
	a. Ready Mix Concrete K-300	54,91	m^3
	b. Formwork	505,10	m^2
	c. Reinforcement Steel	5925,05	kg
7	5th FLOOR		
	a. Ready Mix Concrete K-300	54,91	m^3
	b. Formwork	505,10	m^2
	c. Reinforcement Steel	5925,05	kg
8	6th FLOOR		
	a. Ready Mix Concrete K-300	54,91	m^3
	b. Formwork	505,10	m^2
	c. Reinforcement Steel	5925,05	kg
9	7th FLOOR		
	a. Ready Mix Concrete K-300	54,91	m^3
	b. Formwork	505,10	m^2
	c. Reinforcement Steel	5925,05	kg
10	8th FLOOR		
	a. Ready Mix Concrete K-300	54,91	m^3
	b. Formwork	505,10	m^2
	c. Reinforcement Steel	5925,05	kg
11	ROOF FLOOR		
	a. Ready Mix Concrete K-300	54,91	m^3
	b. Formwork	505,10	m^2
	c. Reinforcement Steel	5925,05	kg
B	COLUMN WORK		
1	BASEMENT		
	a. Ready Mix Concrete K-400	28,04	m^3
	b. Formwork	169,60	m^2
	c. Reinforcement Steel	11931,55	kg
2	GROUND FLOOR		
	a. Ready Mix Concrete K-400	37,93	m^3
	b. Formwork	211,30	m^2
	c. Reinforcement Steel	9205,01	kg
3	MEZZANINE		
	a. Ready Mix Concrete K-400	27,03	m^3
	b. Formwork	152,40	m^2
	c. Reinforcement Steel	7380,65	kg
4	2nd FLOOR		
	a. Ready Mix Concrete K-400	27,03	m^3
	b. Formwork	152,40	m^2
	c. Reinforcement Steel	7380,65	kg
5	3th FLOOR		
	a. Ready Mix Concrete K-400	18,96	m^3
	b. Formwork	126,60	m^2
	c. Reinforcement Steel	6233,43	kg
6	4th FLOOR		
	a. Ready Mix Concrete K-400	18,96	m^3
	b. Formwork	126,60	m^2
	c. Reinforcement Steel	6233,43	kg
7	5th FLOOR		
	a. Ready Mix Concrete K-400	18,96	m^3
	b. Formwork	126,60	m^2
	c. Reinforcement Steel	6233,43	kg
8	6th FLOOR		
	a. Ready Mix Concrete K-400	13,56	m^3
	b. Formwork	105,00	m^2
	c. Reinforcement Steel	5210,99	kg

9	7th FLOOR		
	a. Ready Mix Concrete K-400	13,56	m^3
	b. Formwork	105,00	m^2
	c. Reinforcement Steel	5210,99	kg
10	8th FLOOR		
	a. Ready Mix Concrete K-400	13,56	m^3
	b. Formwork	105,00	m^2
	c. Reinforcement Steel	4470,40	kg
C	CORE WALL WORK		
1	BASEMENT		
	a. Ready Mix Concrete K-400	13,00	m^3
	b. Formwork	88,80	m^2
	c. Reinforcement Steel	7138,22	kg
2	GROUND FLOOR		
	a. Ready Mix Concrete K-400	16,72	m^3
	b. Formwork	114,17	m^2
	c. Reinforcement Steel	7120,47	kg
3	MEZZANINE		
	a. Ready Mix Concrete K-400	13,00	m^3
	b. Formwork	88,80	m^2
	c. Reinforcement Steel	5715,91	kg
4	2th FLOOR		
	a. Ready Mix Concrete K-400	13,00	m^3
	b. Formwork	88,80	m^2
	c. Reinforcement Steel	5715,91	kg
5	3th FLOOR		
	a. Ready Mix Concrete K-400	13,00	m^3
	b. Formwork	88,80	m^2
	c. Reinforcement Steel	5715,91	kg
6	4th FLOOR		
	a. Ready Mix Concrete K-400	13,00	m^3
	b. Formwork	88,80	m^2
	c. Reinforcement Steel	5715,91	kg
7	5th FLOOR		
	a. Ready Mix Concrete K-400	13,00	m^3
	b. Formwork	88,80	m^2
	c. Reinforcement Steel	5715,91	kg
8	6th FLOOR		
	a. Ready Mix Concrete K-400	13,00	m^3
	b. Formwork	88,80	m^2
	c. Reinforcement Steel	5715,91	kg
9	7th FLOOR		
	a. Ready Mix Concrete K-400	13,00	m^3
	b. Formwork	88,80	m^2
	c. Reinforcement Steel	5715,91	kg
10	8th FLOOR		
	a. Ready Mix Concrete K-400	13,00	m^3
	b. Formwork	88,80	m^2
	c. Reinforcement Steel	5715,91	kg
11	ROOF FLOOR		
	a. Ready Mix Concrete K-400	13,00	m^3
	b. Formwork	88,80	m^2
	c. Reinforcement Steel	5715,91	kg
D	BEAM WORK		
1	GROUND FLOOR		
	a. Ready Mix Concrete K-300	35,42	m^3
	b. Formwork	346,13	m^2
	c. Reinforcement Steel	10918,74	kg
2	MEZZANINE		
	a. Ready Mix Concrete K-300	20,78	m^3
	b. Formwork	212,74	m^2
	c. Reinforcement Steel	6902,27	kg
3	2th FLOOR		
	a. Ready Mix Concrete K-300	35,64	m^3
	b. Formwork	354,37	m^2
	c. Reinforcement Steel	11555,46	kg
4	3th FLOOR		
	a. Ready Mix Concrete K-300	35,64	m^3
	b. Formwork	354,37	m^2
	c. Reinforcement Steel	11555,46	kg
5	4th FLOOR		
	a. Ready Mix Concrete K-300	35,64	m^3
	b. Formwork	354,37	m^2
	c. Reinforcement Steel	11555,46	kg
6	5th FLOOR		
	a. Ready Mix Concrete K-300	35,64	m^3
	b. Formwork	354,37	m^2
	c. Reinforcement Steel	11555,46	kg
7	6th FLOOR		
	a. Ready Mix Concrete K-300	35,64	m^3
	b. Formwork	354,37	m^2
	c. Reinforcement Steel	11555,46	kg
8	7th FLOOR		
	a. Ready Mix Concrete K-300	35,64	m^3
	b. Formwork	354,37	m^2
	c. Reinforcement Steel	11555,46	kg
9	8th FLOOR		
	a. Ready Mix Concrete K-300	35,64	m^3
	b. Formwork	354,37	m^2
	c. Reinforcement Steel	11555,46	kg
10	ROOF FLOOR		
	a. Ready Mix Concrete K-300	35,64	m^3
	b. Formwork	354,37	m^2
	c. Reinforcement Steel	11555,46	kg
E	STAIRS WORK		
1	BASEMENT		
	a. Ready Mix Concrete K-300	1,92	m^3
	b. Formwork	13,75	m^2
	c. Reinforcement Steel	399,86	kg
2	GROUND FLOOR		
	a. Ready Mix Concrete K-300	5,94	m^3
	b. Formwork	44,61	m^2
	c. Reinforcement Steel	1033,95	kg
3	MEZZANINE		
	a. Ready Mix Concrete K-300	4,85	m^3
	b. Formwork	36,36	m^2
	c. Reinforcement Steel	714,22	kg
4	2nd FLOOR		
	a. Ready Mix Concrete K-300	4,85	m^3
	b. Formwork	36,36	m^2
	c. Reinforcement Steel	714,22	kg
5	3th FLOOR		
	a. Ready Mix Concrete K-300	4,85	m^3
	b. Formwork	36,36	m^2
	c. Reinforcement Steel	714,22	kg
6	4th FLOOR		
	a. Ready Mix Concrete K-300	4,85	m^3
	b. Formwork	36,36	m^2
	c. Reinforcement Steel	714,22	kg
7	5th FLOOR		
	a. Ready Mix Concrete K-300	4,85	m^3
	b. Formwork	36,36	m^2
	c. Reinforcement Steel	714,22	kg
8	6th FLOOR		
	a. Ready Mix Concrete K-300	4,85	m^3
	b. Formwork	36,36	m^2
	c. Reinforcement Steel	714,22	kg
9	7th FLOOR		
	a. Ready Mix Concrete K-300	4,85	m^3
	b. Formwork	36,36	m^2
	c. Reinforcement Steel	714,22	kg
10	8th FLOOR		
	a. Ready Mix Concrete K-300	4,85	m^3
	b. Formwork	36,36	m^2
	c. Reinforcement Steel	714,22	kg
F	RAMP		
1	BASEMENT		
	a. Backfilling Soil of Ramp	58,98	m^3
	b. Ready Mix Concrete K-300	10,49	m^3
	c. Formwork	12,31	m^2
	c. Reinforcement Steel	1431,97	kg

D. ANALYSIS OF LABOR,MATERIAL AND EQUIPMENT NEEDS

Total Needs = volume x coefficient

Table 2. Labor Needs Calculation

NO	WORK ITEM	VOLUME		LABOR NEEDS				
		TOTAL	UNIT	LABOR	COEFF	LABOR NEEDS	DURATION	LABOR PER DAY
I	PREPARATORY WORK							
1	Measuring and Installation of Bouwplank	104,50	m'	Laborer	0,1000	10,45	2	6,00
				Skill Laborer	0,1000	10,45		6,00
				Chief Laborer	0,0100	1,05		1,00
				Foreman	0,0050	0,52		1,00
2	Land Clearing	681,14	m²	Laborer	0,1000	68,11	7	10,00
				Foreman	0,0500	34,06		5,00
II	SOIL WORK							
1	Excavation of Soil Work	2.079,78	m³	Laborer	0,0263	54,70	7	8,00
				Foreman	0,0066	13,75		2,00
2	Backfilling of Soil Work	86,16	m³	Laborer	0,3000	25,85	2	13,00
				Foreman	0,0100	0,86		1,00
III	LOWER STRUCTURE WORK							
A	FOUNDATION WORK							
1	Bored Pile Foundation Ø = 800 mm	2.136,00	m'	Laborer	0,1250	267,00	23	12,00
				Skill Laborer	0,0625	133,50		6,00
				Chief Laborer	0,0313	66,75		3,00
				Foreman	0,0104	22,23		1,00
B	SOLDIER PILE WORK							
1	Soldier Pile Ø = 600 mm	662,00	m'	Laborer	0,2143	141,87	12	12,00
				Skill Laborer	0,1071	70,93		6,00
				Chief Laborer	0,0536	35,48		3,00
				Foreman	0,0179	11,85		1,00
2	Bentonite Ø = 600 mm	156,64	m³	Laborer	0,5000	78,32	4	20,00
				Skill Laborer	0,5000	78,32		20,00
				Chief Laborer	0,0500	7,83		2,00
				Foreman	0,0250	3,92		1,00
C	CAPPING BEAM WORK							
1	Work Floor	3,82	m³	Laborer	0,2000	0,76	1	1,00
				Skill Laborer	0,2000	0,76		1,00
				Chief Laborer	0,0200	0,08		1,00
				Foreman	0,0600	0,23		1,00
2	Reinforcement Steel	2.769,58	kg	Laborer	0,0070	19,39	2	10,00
				Skill Laborer	0,0035	9,69		5,00
				Chief Laborer	0,0007	1,94		1,00
				Foreman	0,0004	1,11		1,00
3	Formwork	95,56	m²	Laborer	0,6600	63,07	4	16,00
				Skill Laborer	0,3300	31,53		8,00
				Chief Laborer	0,0330	3,15		1,00
				Foreman	0,0330	3,15		1,00
4	Ready Mix Concrete K-300	38,22	m³	Laborer	1,1000	42,05	2	22,00
				Skill Laborer	0,5000	19,11		10,00
				Chief Laborer	0,0500	1,91		1,00
				Foreman	0,0500	1,91		1,00
D	PILE CAP WORK							
1	Work Floor	15,92	m³	Laborer	0,2000	3,18	1	4,00
				Skill Laborer	0,2000	3,18		4,00
				Chief Laborer	0,0200	0,32		1,00
				Foreman	0,0600	0,96		1,00
2	Reinforcement Steel	48.638,84	kg	Laborer	0,0070	340,47	18	19,00
				Skill Laborer	0,0035	170,24		10,00
				Chief Laborer	0,0007	34,05		2,00
				Foreman	0,0004	19,46		2,00
3	Formwork	373,17	m²	Laborer	0,3000	111,95	5	23,00
				Skill Laborer	0,2600	97,02		20,00
				Chief Laborer	0,0260	9,70		2,00
				Foreman	0,0050	1,87		1,00
4	Ready Mix Concrete K-300	477,53	m³	Laborer	1,1000	525,28	12	44,00
				Skill Laborer	0,5000	238,76		20,00
				Chief Laborer	0,0500	23,88		2,00
				Foreman	0,0500	23,88		2,00
E	TIE BEAM WORK							
1	Work Floor	1,31	m³	Laborer	0,2000	0,26	1	1,00
				Skill Laborer	0,2000	0,26		1,00
				Chief Laborer	0,0200	0,03		1,00
				Foreman	0,0600	0,08		1,00
2	Reinforcement Steel	4563,12	kg	Laborer	0,0070	31,94	4	8,00
				Skill Laborer	0,0035	15,97		4,00
				Chief Laborer	0,0007	3,19		1,00
				Foreman	0,0004	1,83		1,00
3	Formwork	96,91	m²	Laborer	0,3000	29,07	3	10,00
				Skill Laborer	0,2600	25,20		9,00
				Chief Laborer	0,0260	2,52		1,00
				Foreman	0,0050	0,48		1,00
4	Ready Mix Concrete K-300	17,08	m³	Laborer	1,1000	18,79	1	19,00
				Skill Laborer	0,5000	8,54		9,00
				Chief Laborer	0,0500	0,85		1,00
				Foreman	0,0500	0,85		1,00
F	RETAINING WALL WORK							
1	Reinforcement Steel	9.287,85	kg	Laborer	0,0070	65,01	7	10,00
				Skill Laborer	0,0035	32,51		5,00
				Chief Laborer	0,0007	6,50		1,00
				Foreman	0,0004	3,72		1,00
2	Formwork	385,31	m²	Laborer	0,6600	254,30	14	19,00
				Skill Laborer	0,3300	127,15		10,00
				Chief Laborer	0,0330	12,72		1,00
				Foreman	0,0330	12,72		1,00
3	Ready Mix Concrete K-300	96,35	m³	Laborer	1,1000	105,98	5	22,00
				Skill Laborer	0,5000	48,17		10,00
				Chief Laborer	0,0500	4,82		1,00
				Foreman	0,0500	4,82		1,00
IV	UPPER STRUCTURE WORK							
1	BASEMENT							
A	SLAB WORK							
a	Work Floor (width = 5 cm)	19,08	m³	Laborer	0,2000	3,82	1	4,00
				Skill Laborer	0,2000	3,82		4,00
				Chief Laborer	0,0200	0,38		1,00
				Foreman	0,0600	1,14		2,00
b	Reinforcement Steel	4.297,97	kg	Laborer	0,0070	30,09	2	16,00
				Skill Laborer	0,0035	15,04		8,00
				Chief Laborer	0,0007	3,01		2,00
				Foreman	0,0004	1,72		1,00
c	Ready Mix Concrete K-300	80,65	m³	Laborer	1,1000	88,72	5	18,00
				Skill Laborer	0,5000	40,33		9,00
				Chief Laborer	0,0500	4,03		1,00
				Foreman	0,0500	4,03		1,00
B	COLUMN WORK							
a	Reinforcement Steel	11.931,55	Kg	Laborer	0,0070	83,52		17,00
				Skill Laborer	0,0035	41,76	5	9,00
				Chief Laborer	0,0007	8,35		2,00
				Foreman	0,0004	4,77		1,00
b	Formwork	169,60	m²	Laborer	0,6600	111,94	6	19,00
				Skill Laborer	0,3300	55,97		10,00
				Chief Laborer	0,0330	5,60		1,00
				Foreman	0,0330	5,60		1,00
c	Ready Mix Concrete K-400	28,04	m³	Laborer	1,1000	30,85	2	16,00
				Skill Laborer	0,5000	14,02		8,00
				Chief Laborer	0,0500	1,40		1,00
				Foreman	0,0500	1,40		1,00
C	STAIRS WORK							
a	Reinforcement Steel	399,86	kg	Laborer	0,0070	2,80	1	3,00
				Skill Laborer	0,0035	1,40		2,00
				Chief Laborer	0,0007	0,28		1,00
				Foreman	0,0004	0,16		1,00
b	Formwork	13,75	m²	Laborer	0,6600	9,08	1	10,00
				Skill Laborer	0,3300	4,54		5,00
				Chief Laborer	0,0330	0,45		1,00
				Foreman	0,0330	0,45		1,00
c	Ready Mix Concrete K-300	1,92	m³	Laborer	1,1000	2,11	1	3,00
				Skill Laborer	0,5000	0,96		1,00
				Chief Laborer	0,0500	0,10		1,00
				Foreman	0,0500	0,10		1,00
D	RAMP							
a	Backfilling Soil of Ramp	58,98	m³	Laborer	0,3000	17,69	3	6,00
				Foreman	0,0100	0,59		1,00
b	Reinforcement Steel	1.431,97	kg	Laborer	0,0070	10,02	2	6,00
				Skill Laborer	0,0035	5,01		3,00
				Chief Laborer	0,0007	1,00		1,00
				Foreman	0,0004	0,57		1,00
c	Formwork	12,51	m²	Laborer	0,6600	8,26	2	5,00
				Skill Laborer	0,3300	4,13		3,00
				Chief Laborer	0,0330	0,41		1,00
				Foreman	0,0330	0,41		1,00
d	Ready Mix Concrete K-400	10,49	m³	Laborer	1,1000	11,54	2	6,00
				Skill Laborer	0,5000	5,25		3,00
				Chief Laborer	0,0500	0,52		1,00
				Foreman	0,0500	0,52		1,00
2	GROUND FLOOR							
A	SLAB WORK							
a	Reinforcement Steel	5.928,54	kg	Laborer	0,0070	41,50	5	9,00
				Skill Laborer	0,0035	20,75		5,00
				Chief Laborer	0,0007	4,15		1,00
				Foreman	0,0004	2,37		1,00
b	Formwork	480,93	m²	Laborer	0,6600	317,41	16	20,00
				Skill Laborer	0,3300	158,71		10,00
				Chief Laborer	0,0330	15,87		1,00
				Foreman	0,0330	15,87		1,00
c	Ready Mix Concrete K-300	52,32	m³	Laborer	1,1000	57,55	3	20,00
				Skill Laborer	0,5000	26,16		9,00
				Chief Laborer	0,0500	2,62		1,00
				Foreman	0,0500	2,62		1,00
B	COLUMN WORK							
a	Reinforcement Steel	9.205,01	kg	Laborer	0,0070	64,44	7	10,00
				Skill Laborer	0,0035	32,22		5,00
				Chief Laborer	0,0007	6,44		1,00
				Foreman	0,0004	3,68		1,00
b	Formwork	211,30	m²	Laborer	0,6600	139,46	7	20,00
				Skill Laborer	0,3300	69,73		10,00
				Chief Laborer	0,0330	6,97		1,00
				Foreman	0,0330	6,97		1,00
c	Ready Mix Concrete K-400	37,93	m³	Laborer	1,1000	41,72	2	21,00
				Skill Laborer	0,5000	18,97		10,00
				Chief Laborer	0,0500	1,90		1,00
				Foreman	0,0500	1,90		1,00
C	BEAM WORK							
a	Reinforcement Steel	10.918,74	kg	Laborer	0,0070	76,43	8	10,00
				Skill Laborer	0,0035	38,22		5,00
				Chief Laborer	0,0007	7,64		1,00
				Foreman	0,0004	4,37		1,00
b	Formwork	346,13	m2	Laborer	0,6600	228,44	12	20,00
				Skill Laborer	0,3300	114,22		10,00
				Chief Laborer	0,0330	11,42		1,00
				Foreman	0,0330	11,42		1,00
c	Ready Mix Concrete K-300	35,42	m³	Laborer	1,1000	38,96	2	20,00
				Skill Laborer	0,5000	17,71		9,00
				Chief Laborer	0,0500	1,77		1,00
				Foreman	0,0500	1,77		1,00
D	STAIRS WORK							
a	Reinforcement Steel	1.033,95	kg	Laborer	0,0070	7,24	1	8,00
				Skill Laborer	0,0035	3,62		4,00
				Chief Laborer	0,0007	0,72		1,00
				Foreman	0,0004	0,41		1,00
b	Formwork	44,61	m³	Laborer	0,6600	29,44	2	15,00
				Skill Laborer	0,3300	14,72		8,00
				Chief Laborer	0,0330	1,47		1,00
				Foreman	0,0330	1,47		1,00
c	Ready Mix Concrete K-300	5,94	m³	Laborer	1,1000	6,53	1	7,00
				Skill Laborer	0,5000	2,97		3,00
				Chief Laborer	0,0500	0,30		1,00
				Foreman	0,0500	0,30		1,00
3	MEZZANINE							
A	SLAB WORK							
a	Reinforcement Steel	3.602,23	kg	Laborer	0,0070	25,22	3	9,00
				Skill Laborer	0,0035	12,61		5,00
				Chief Laborer	0,0007	2,52		1,00
				Foreman	0,0004	1,44		1,00
b	Formwork	307,02	m²	Laborer	0,6600	202,63	11	19,00
				Skill Laborer	0,3300	101,32		10,00
				Chief Laborer	0,0330	10,13		1,00
				Foreman	0,0330	10,13		1,00
c	Ready Mix Concrete K-300	33,36	m³	Laborer	1,1000	36,70	2	19,00
				Skill Laborer	0,5000	16,68		9,00
				Chief Laborer	0,0500	1,67		1,00
				Foreman	0,0500	1,67		1,00
B	COLUMN WORK							
a	Reinforcement Steel	7.380,65	kg	Laborer	0,0070	51,66	6	9,00
				Skill Laborer	0,0035	25,83		5,00
				Chief Laborer	0,0007	5,17		1,00
				Foreman	0,0004	2,95		1,00
b	Formwork	152,40	m²	Laborer	0,6600	100,58	6	17,00
				Skill Laborer	0,3300	50,29		9,00
				Chief Laborer	0,0330	5,03		1,00
				Foreman	0,0330	5,03		1,00

c	Ready Mix Concrete K-400	27,03	m³	Laborer	1,1000	29,73	2	15,00
				Skill Laborer	0,5000	13,52		7,00
				Chief Laborer	0,0500	1,35		1,00
				Foreman	0,0500	1,35		1,00
C	BEAM WORK							
a	Reinforcement Steel	6.902,27	kg	Laborer	0,0070	48,32	5	10,00
				Skill Laborer	0,0035	24,16		5,00
				Chief Laborer	0,0007	4,83		1,00
				Foreman	0,0004	2,76		1,00
b	Formwork	212,74	m²	Laborer	0,6600	140,41	8	18,00
				Skill Laborer	0,3300	70,20		9,00
				Chief Laborer	0,0330	7,02		1,00
				Foreman	0,0330	7,02		1,00
c	Ready Mix Concrete K-300	20,78	m³	Laborer	1,1000	22,86	2	12,00
				Skill Laborer	0,5000	10,39		6,00
				Chief Laborer	0,0500	1,04		1,00
				Foreman	0,0500	1,04		1,00
D	STAIRS WORK							
a	Reinforcement Steel	714,22	kg	Laborer	0,0070	5,00	1	5,00
				Skill Laborer	0,0035	2,50		3,00
				Chief Laborer	0,0007	0,50		1,00
				Foreman	0,0004	0,29		1,00
b	Formwork	36,36	m²	Laborer	0,6600	24,00	2	13,00
				Skill Laborer	0,3300	12,00		7,00
				Chief Laborer	0,0330	1,20		1,00
				Foreman	0,0330	1,20		1,00
c	Ready Mix Concrete K-300	4,85	m³	Laborer	1,1000	5,33	1	6,00
				Skill Laborer	0,5000	2,42		3,00
				Chief Laborer	0,0500	0,24		1,00
				Foreman	0,0500	0,24		1,00
4	2nd FLOOR							
A	SLAB WORK							
a	Reinforcement Steel	5.925,05	kg	Laborer	0,0070	41,48	5	9,00
				Skill Laborer	0,0035	20,74		5,00
				Chief Laborer	0,0007	4,15		1,00
				Foreman	0,0004	2,37		1,00
b	Formwork	505,10	m²	Laborer	0,6600	333,37	17	20,00
				Skill Laborer	0,3300	166,68		10,00
				Chief Laborer	0,0330	16,67		1,00
				Foreman	0,0330	16,67		1,00
c	Ready Mix Concrete K-300	54,91	m³	Laborer	1,1000	60,40	3	21,00
				Skill Laborer	0,5000	27,45		10,00
				Chief Laborer	0,0500	2,75		1,00
				Foreman	0,0500	2,75		1,00
B	COLUMN WORK							
a	Reinforcement Steel	7.380,65	kg	Laborer	0,0070	51,66	6	9,00
				Skill Laborer	0,0035	25,83		5,00
				Chief Laborer	0,0007	5,17		1,00
				Foreman	0,0004	2,95		1,00
b	Formwork	152,40	m²	Laborer	0,6600	100,58	6	17,00
				Skill Laborer	0,3300	50,29		9,00
				Chief Laborer	0,0330	5,03		1,00
				Foreman	0,0330	5,03		1,00
c	Ready Mix Concrete K-400	27,03	m³	Laborer	1,1000	29,73	2	15,00
				Skill Laborer	0,5000	13,52		7,00
				Chief Laborer	0,0500	1,35		1,00
				Foreman	0,0500	1,35		1,00
C	BEAM WORK							
a	Reinforcement Steel	11.555,46	kg	Laborer	0,0070	80,89	9	9,00
				Skill Laborer	0,0035	40,44		5,00
				Chief Laborer	0,0007	8,09		1,00
				Foreman	0,0004	4,62		1,00
b	Formwork	354,37	m²	Laborer	0,6600	233,89	12	20,00
				Skill Laborer	0,3300	116,94		10,00
				Chief Laborer	0,0330	11,69		1,00
				Foreman	0,0330	11,69		1,00
c	Ready Mix Concrete K-300	35,64	m³	Laborer	1,1000	39,20	2	20,00
				Skill Laborer	0,5000	17,82		9,00
				Chief Laborer	0,0500	1,78		1,00
				Foreman	0,0500	1,78		1,00
D	STAIRS WORK							
a	Reinforcement Steel	714,22	kg	Laborer	0,0070	5,00	1	5,00
				Skill Laborer	0,0035	2,50		3,00
				Chief Laborer	0,0007	0,50		1,00
				Foreman	0,0004	0,29		1,00
b	Formwork	36,36	m²	Laborer	0,6600	24,00	2	13,00
				Skill Laborer	0,3300	12,00		7,00
				Chief Laborer	0,0330	1,20		1,00
				Foreman	0,0330	1,20		1,00
c	Ready Mix Concrete K-300	4,85	m³	Laborer	1,1000	5,33	1	6,00
				Skill Laborer	0,5000	2,42		3,00
				Chief Laborer	0,0500	0,24		1,00
				Foreman	0,0500	0,24		1,00

5	3th FLOOR							
A	SLAB WORK							
a	Reinforcement Steel	5.925,05	kg	Laborer	0,0070	41,48	5	9,00
				Skill Laborer	0,0035	20,74		5,00
				Chief Laborer	0,0007	4,15		1,00
				Foreman	0,0004	2,37		1,00
b	Formwork	505,10	m²	Laborer	0,6600	333,37	17	20,00
				Skill Laborer	0,3300	166,68		10,00
				Chief Laborer	0,0330	16,67		1,00
				Foreman	0,0330	16,67		1,00
c	Ready Mix Concrete K-300	54,91	m³	Laborer	1,1000	60,40	3	21,00
				Skill Laborer	0,5000	27,45		10,00
				Chief Laborer	0,0500	2,75		1,00
				Foreman	0,0500	2,75		1,00
B	COLUMN WORK							
a	Reinforcement Steel	6.233,43	kg	Laborer	0,0070	43,63	5	9,00
				Skill Laborer	0,0035	21,82		5,00
				Chief Laborer	0,0007	4,36		1,00
				Foreman	0,0004	2,49		1,00
b	Formwork	126,60	m²	Laborer	0,6600	83,56	5	17,00
				Skill Laborer	0,3300	41,78		9,00
				Chief Laborer	0,0330	4,18		1,00
				Foreman	0,0330	4,18		1,00
c	Ready Mix Concrete K-400	18,96	m³	Laborer	1,1000	20,86	1	21,00
				Skill Laborer	0,5000	9,48		10,00
				Chief Laborer	0,0500	0,95		1,00
				Foreman	0,0500	0,95		1,00
C	BEAM WORK							
a	Reinforcement Steel	11.555,46	kg	Laborer	0,0070	80,89	9	9,00
				Skill Laborer	0,0035	40,44		5,00
				Chief Laborer	0,0007	8,09		1,00
				Foreman	0,0004	4,62		1,00
b	Formwork	354,37	m²	Laborer	0,6600	233,89	12	20,00
				Skill Laborer	0,3300	116,94		10,00
				Chief Laborer	0,0330	11,69		1,00
				Foreman	0,0330	11,69		1,00
c	Ready Mix Concrete K-300	35,64	m³	Laborer	1,1000	39,20	2	20,00
				Skill Laborer	0,5000	17,82		9,00
				Chief Laborer	0,0500	1,78		1,00
				Foreman	0,0500	1,78		1,00
D	STAIRS WORK							
a	Reinforcement Steel	714,22	kg	Laborer	0,0070	5,00	1	5,00
				Skill Laborer	0,0035	2,50		3,00
				Chief Laborer	0,0007	0,50		1,00
				Foreman	0,0004	0,29		1,00
b	Formwork	36,36	m²	Laborer	0,6600	24,00	2	13,00
				Skill Laborer	0,3300	12,00		7,00
				Chief Laborer	0,0330	1,20		1,00
				Foreman	0,0330	1,20		1,00
c	Ready Mix Concrete K-300	4,85	m³	Laborer	1,1000	5,33	1	6,00
				Skill Laborer	0,5000	2,42		3,00
				Chief Laborer	0,0500	0,24		1,00
				Foreman	0,0500	0,24		1,00
6	4th FLOOR							
A	SLAB WORK							
a	Reinforcement Steel	5.925,05	kg	Laborer	0,0070	41,48	5	9,00
				Skill Laborer	0,0035	20,74		5,00
				Chief Laborer	0,0007	4,15		1,00
				Foreman	0,0004	2,37		1,00
b	Formwork	505,10	m²	Laborer	0,6600	333,37	17	20,00
				Skill Laborer	0,3300	166,68		10,00
				Chief Laborer	0,0330	16,67		1,00
				Foreman	0,0330	16,67		1,00
c	Ready Mix Concrete K-300	54,91	m³	Laborer	1,1000	60,40	3	21,00
				Skill Laborer	0,5000	27,45		10,00
				Chief Laborer	0,0500	2,75		1,00
				Foreman	0,0500	2,75		1,00
B	COLUMN WORK							
a	Reinforcement Steel	6.233,43	kg	Laborer	0,0070	43,63	5	9,00
				Skill Laborer	0,0035	21,82		5,00
				Chief Laborer	0,0007	4,36		1,00
				Foreman	0,0004	2,49		1,00
b	Formwork	126,60	m²	Laborer	0,6600	83,56	5	17,00
				Skill Laborer	0,3300	41,78		9,00
				Chief Laborer	0,0330	4,18		1,00
				Foreman	0,0330	4,18		1,00
c	Ready Mix Concrete K-400	18,96	m³	Laborer	1,1000	20,86	1	21,00
				Skill Laborer	0,5000	9,48		10,00
				Chief Laborer	0,0500	0,95		1,00
				Foreman	0,0500	0,95		1,00
C	BEAM WORK							
a	Reinforcement Steel	11.555,46	kg	Laborer	0,0070	80,89	9	9,00
				Skill Laborer	0,0035	40,44		5,00
				Chief Laborer	0,0007	8,09		1,00
				Foreman	0,0004	4,62		1,00
b	Formwork	354,37	m²	Laborer	0,6600	233,89	12	20,00
				Skill Laborer	0,3300	116,94		10,00
				Chief Laborer	0,0330	11,69		1,00
				Foreman	0,0330	11,69		1,00
c	Ready Mix Concrete K-300	35,64	m³	Laborer	1,1000	39,20	2	20,00
				Skill Laborer	0,5000	17,82		9,00
				Chief Laborer	0,0500	1,78		1,00
				Foreman	0,0500	1,78		1,00
D	STAIRS WORK							
a	Reinforcement Steel	714,22	kg	Laborer	0,0070	5,00	1	5,00
				Skill Laborer	0,0035	2,50		3,00
				Chief Laborer	0,0007	0,50		1,00
				Foreman	0,0004	0,29		1,00
b	Formwork	36,36	m²	Laborer	0,6600	24,00	2	13,00
				Skill Laborer	0,3300	12,00		7,00
				Chief Laborer	0,0330	1,20		1,00
				Foreman	0,0330	1,20		1,00
c	Ready Mix Concrete K-300	4,85	m³	Laborer	1,1000	5,33	1	6,00
				Skill Laborer	0,5000	2,42		3,00
				Chief Laborer	0,0500	0,24		1,00
				Foreman	0,0500	0,24		1,00
7	5th FLOOR							
A	SLAB WORK							
a	Reinforcement Steel	5.925,05	kg	Laborer	0,0070	41,48	5	9,00
				Skill Laborer	0,0035	20,74		5,00
				Chief Laborer	0,0007	4,15		1,00
				Foreman	0,0004	2,37		1,00
b	Formwork	505,10	m²	Laborer	0,6600	333,37	17	20,00
				Skill Laborer	0,3300	166,68		10,00
				Chief Laborer	0,0330	16,67		1,00
				Foreman	0,0330	16,67		1,00

c	Ready Mix Concrete K-300	54,91	m^3	Laborer	1,1000	60,40	3	21,00
				Skill Laborer	0,5000	27,45		10,00
				Chief Laborer	0,0500	2,75		1,00
				Foreman	0,0500	2,75		1,00
B	COLUMN WORK							
a	Reinforcement Steel	6.233,43	kg	Laborer	0,0070	43,63	5	9,00
				Skill Laborer	0,0035	21,82		5,00
				Chief Laborer	0,0007	4,36		1,00
				Foreman	0,0004	2,49		1,00
b	Formwork	126,60	m^2	Laborer	0,6600	83,56	5	17,00
				Skill Laborer	0,3300	41,78		9,00
				Chief Laborer	0,0330	4,18		1,00
				Foreman	0,0330	4,18		1,00
c	Ready Mix Concrete K-400	18,96	m^3	Laborer	1,1000	20,86	1	21,00
				Skill Laborer	0,5000	9,48		10,00
				Chief Laborer	0,0500	0,95		1,00
				Foreman	0,0500	0,95		1,00
C	BEAM WORK							
a	Reinforcement Steel	11.555,46	kg	Laborer	0,0070	80,89	9	9,00
				Skill Laborer	0,0035	40,44		5,00
				Chief Laborer	0,0007	8,09		1,00
				Foreman	0,0004	4,62		1,00
b	Formwork	354,37	m^2	Laborer	0,6600	233,89	12	20,00
				Skill Laborer	0,3300	116,94		10,00
				Chief Laborer	0,0330	11,69		1,00
				Foreman	0,0330	11,69		1,00
c	Ready Mix Concrete K-300	35,64	m^3	Laborer	1,1000	39,20	2	20,00
				Skill Laborer	0,5000	17,82		9,00
				Chief Laborer	0,0500	1,78		1,00
				Foreman	0,0500	1,78		1,00
D	STAIRS WORK							
a	Reinforcement Steel	714,22	kg	Laborer	0,0070	5,00	1	5,00
				Skill Laborer	0,0035	2,50		3,00
				Chief Laborer	0,0007	0,50		1,00
				Foreman	0,0004	0,29		1,00
b	Formwork	36,36	m^2	Laborer	0,6600	24,00	2	13,00
				Skill Laborer	0,3300	12,00		7,00
				Chief Laborer	0,0330	1,20		1,00
				Foreman	0,0330	1,20		1,00
c	Ready Mix Concrete K-300	4,85	m^3	Laborer	1,1000	5,33	1	6,00
				Skill Laborer	0,5000	2,42		3,00
				Chief Laborer	0,0500	0,24		1,00
				Foreman	0,0500	0,24		1,00
8	6th FLOOR							
A	SLAB WORK							
a	Reinforcement Steel	5.925,05	kg	Laborer	0,0070	41,48	5	9,00
				Skill Laborer	0,0035	20,74		5,00
				Chief Laborer	0,0007	4,15		1,00
				Foreman	0,0004	2,37		1,00
b	Formwork	505,10	m^2	Laborer	0,6600	333,37	17	20,00
				Skill Laborer	0,3300	166,68		10,00
				Chief Laborer	0,0330	16,67		1,00
				Foreman	0,0330	16,67		1,00
c	Ready Mix Concrete K-300	54,91	m^3	Laborer	1,1000	60,40	3	21,00
				Skill Laborer	0,5000	27,45		10,00
				Chief Laborer	0,0500	2,75		1,00
				Foreman	0,0500	2,75		1,00
B	COLUMN WORK							
a	Reinforcement Steel	5.210,99	kg	Laborer	0,0070	36,48	4	10,00
				Skill Laborer	0,0035	18,24		5,00
				Chief Laborer	0,0007	3,65		1,00
				Foreman	0,0004	2,08		1,00
b	Formwork	105,00	m^2	Laborer	0,6600	69,30	4	18,00
				Skill Laborer	0,3300	34,65		9,00
				Chief Laborer	0,0330	3,47		1,00
				Foreman	0,0330	3,47		1,00
c	Ready Mix Concrete K-400	13,56	m^3	Laborer	1,1000	14,92	1	15,00
				Skill Laborer	0,5000	6,78		7,00
				Chief Laborer	0,0500	0,68		1,00
				Foreman	0,0500	0,68		1,00
C	BEAM WORK							
a	Reinforcement Steel	11.555,46	kg	Laborer	0,0070	80,89	9	9,00
				Skill Laborer	0,0035	40,44		5,00
				Chief Laborer	0,0007	8,09		1,00
				Foreman	0,0004	4,62		1,00
b	Formwork	354,37	m^2	Laborer	0,6600	233,89	12	20,00
				Skill Laborer	0,3300	116,94		10,00
				Chief Laborer	0,0330	11,69		1,00
				Foreman	0,0330	11,69		1,00
c	Ready Mix Concrete K-300	35,64	m^3	Laborer	1,1000	39,20	2	20,00
				Skill Laborer	0,5000	17,82		9,00
				Chief Laborer	0,0500	1,78		1,00
				Foreman	0,0500	1,78		1,00
D	STAIRS WORK							
a	Reinforcement Steel	714,22	kg	Laborer	0,0070	5,00	1	5,00
				Skill Laborer	0,0035	2,50		3,00
				Chief Laborer	0,0007	0,50		1,00
				Foreman	0,0004	0,29		1,00
b	Formwork	36,36	m^2	Laborer	0,6600	24,00	2	13,00
				Skill Laborer	0,3300	12,00		7,00
				Chief Laborer	0,0330	1,20		1,00
				Foreman	0,0330	1,20		1,00
c	Ready Mix Concrete K-300	4,85	m^3	Laborer	1,1000	5,33	1	6,00
				Skill Laborer	0,5000	2,42		3,00
				Chief Laborer	0,0500	0,24		1,00
				Foreman	0,0500	0,24		1,00
9	7th FLOOR							
A	SLAB WORK							
a	Reinforcement Steel	5.925,05	kg	Laborer	0,0070	41,48	5	9,00
				Skill Laborer	0,0035	20,74		5,00
				Chief Laborer	0,0007	4,15		1,00
				Foreman	0,0004	2,37		1,00
b	Formwork	505,10	m^2	Laborer	0,6600	333,37	17	20,00
				Skill Laborer	0,3300	166,68		10,00
				Chief Laborer	0,0330	16,67		1,00
				Foreman	0,0330	16,67		1,00
c	Ready Mix Concrete K-300	54,91	m^3	Laborer	1,1000	60,40	3	21,00
				Skill Laborer	0,5000	27,45		10,00
				Chief Laborer	0,0500	2,75		1,00
				Foreman	0,0500	2,75		1,00
B	COLUMN WORK							
a	Reinforcement Steel	5.210,99	kg	Laborer	0,0070	36,48	4	10,00
				Skill Laborer	0,0035	18,24		5,00
				Chief Laborer	0,0007	3,65		1,00
				Foreman	0,0004	2,08		1,00
b	Formwork	105,00	m^2	Laborer	0,6600	69,30	4	18,00
				Skill Laborer	0,3300	34,65		9,00
				Chief Laborer	0,0330	3,47		1,00
				Foreman	0,0330	3,47		1,00
c	Ready Mix Concrete K-400	13,56	m^3	Laborer	1,1000	14,92	1	15,00
				Skill Laborer	0,5000	6,78		7,00
				Chief Laborer	0,0500	0,68		1,00
				Foreman	0,0500	0,68		1,00

C	BEAM WORK							
a	Reinforcement Steel	11.555,46	kg	Laborer	0,0070	80,89	9	9,00
				Skill Laborer	0,0035	40,44		5,00
				Chief Laborer	0,0007	8,09		1,00
				Foreman	0,0004	4,62		1,00
b	Formwork	354,37	m^2	Laborer	0,6600	233,89	12	20,00
				Skill Laborer	0,3300	116,94		10,00
				Chief Laborer	0,0330	11,69		1,00
				Foreman	0,0330	11,69		1,00
c	Ready Mix Concrete K-300	35,64	m^3	Laborer	1,1000	39,20	2	20,00
				Skill Laborer	0,5000	17,82		9,00
				Chief Laborer	0,0500	1,78		1,00
				Foreman	0,0500	1,78		1,00
D	STAIRS WORK							
a	Reinforcement Steel	714,22	kg	Laborer	0,0070	5,00	1	5,00
				Skill Laborer	0,0035	2,50		3,00
				Chief Laborer	0,0007	0,50		1,00
				Foreman	0,0004	0,29		1,00
b	Formwork	36,36	m^2	Laborer	0,6600	24,00	2	13,00
				Skill Laborer	0,3300	12,00		7,00
				Chief Laborer	0,0330	1,20		1,00
				Foreman	0,0330	1,20		1,00
c	Ready Mix Concrete K-300	4,85	m^3	Laborer	1,1000	5,33	1	6,00
				Skill Laborer	0,5000	2,42		3,00
				Chief Laborer	0,0500	0,24		1,00
				Foreman	0,0500	0,24		1,00
10	8th FLOOR							
A	SLAB WORK							
a	Reinforcement Steel	5.925,05	kg	Laborer	0,0070	41,48	5	9,00
				Skill Laborer	0,0035	20,74		5,00
				Chief Laborer	0,0007	4,15		1,00
				Foreman	0,0004	2,37		1,00
b	Formwork	505,10	m^2	Laborer	0,6600	333,37	17	20,00
				Skill Laborer	0,3300	166,68		10,00
				Chief Laborer	0,0330	16,67		1,00
				Foreman	0,0330	16,67		1,00
c	Ready Mix Concrete K-300	54,91	m^3	Laborer	1,1000	60,40	3	21,00
				Skill Laborer	0,5000	27,45		10,00
				Chief Laborer	0,0500	2,75		1,00
				Foreman	0,0500	2,75		1,00
B	COLUMN WORK							
a	Reinforcement Steel	4.470,40	kg	Laborer	0,0070	31,29	4	8,00
				Skill Laborer	0,0035	15,65		4,00
				Chief Laborer	0,0007	3,13		1,00
				Foreman	0,0004	1,79		1,00
b	Formwork	105,00	m^2	Laborer	0,6600	69,30	4	18,00
				Skill Laborer	0,3300	34,65		9,00
				Chief Laborer	0,0330	3,47		1,00
				Foreman	0,0330	3,47		1,00
c	Ready Mix Concrete K-400	13,56	m^3	Laborer	1,1000	14,92	1	15,00
				Skill Laborer	0,5000	6,78		7,00
				Chief Laborer	0,0500	0,68		1,00
				Foreman	0,0500	0,68		1,00
C	BEAM WORK							
a	Reinforcement Steel	11.555,46	kg	Laborer	0,0070	80,89	9	9,00
				Skill Laborer	0,0035	40,44		5,00
				Chief Laborer	0,0007	8,09		1,00
				Foreman	0,0004	4,62		1,00
b	Formwork	354,37	m^2	Laborer	0,6600	233,89	12	20,00
				Skill Laborer	0,3300	116,94		10,00
				Chief Laborer	0,0330	11,69		1,00
				Foreman	0,0330	11,69		1,00
c	Ready Mix Concrete K-300	35,64	m^3	Laborer	1,1000	39,20	2	20,00
				Skill Laborer	0,5000	17,82		9,00
				Chief Laborer	0,0500	1,78		1,00
				Foreman	0,0500	1,78		1,00
D	STAIRS WORK							
a	Reinforcement Steel	714,22	kg	Laborer	0,0070	5,00	1	5,00
				Skill Laborer	0,0035	2,50		3,00
				Chief Laborer	0,0007	0,50		1,00
				Foreman	0,0004	0,29		1,00
b	Formwork	36,36	m^2	Laborer	0,6600	24,00	2	13,00
				Skill Laborer	0,3300	12,00		7,00
				Chief Laborer	0,0330	1,20		1,00
				Foreman	0,0330	1,20		1,00
c	Ready Mix Concrete K-300	4,85	m^3	Laborer	1,1000	5,33	1	6,00
				Skill Laborer	0,5000	2,42		3,00
				Chief Laborer	0,0500	0,24		1,00
				Foreman	0,0500	0,24		1,00
11	ROOF FLOOR							
A	SLAB WORK							
a	Reinforcement Steel	5.925,05	kg	Laborer	0,0070	41,48	5	9,00
				Skill Laborer	0,0035	20,74		5,00
				Chief Laborer	0,0007	4,15		1,00
				Foreman	0,0004	2,37		1,00
b	Formwork	505,10	m^2	Laborer	0,6600	333,37	17	20,00
				Skill Laborer	0,3300	166,68		10,00
				Chief Laborer	0,0330	16,67		1,00
				Foreman	0,0330	16,67		1,00
c	Ready Mix Concrete K-300	54,91	m^3	Laborer	1,1000	60,40	3	21,00
				Skill Laborer	0,5000	27,45		10,00
				Chief Laborer	0,0500	2,75		1,00
				Foreman	0,0500	2,75		1,00
B	BEAM WORK							
a	Reinforcement Steel	11.555,46	kg	Laborer	0,0070	80,89	9	9,00
				Skill Laborer	0,0035	40,44		5,00
				Chief Laborer	0,0007	8,09		1,00
				Foreman	0,0004	4,62		1,00
b	Formwork	354,37	m^2	Laborer	0,6600	233,89	12	20,00
				Skill Laborer	0,3300	116,94		10,00
				Chief Laborer	0,0330	11,69		1,00
				Foreman	0,0330	11,69		1,00
c	Ready Mix Concrete K-300	35,64	m^3	Laborer	1,1000	39,20	2	20,00
				Skill Laborer	0,5000	17,82		9,00
				Chief Laborer	0,0500	1,78		1,00
				Foreman	0,0500	1,78		1,00
V	CORE WALL WORK							
a	Reinforcement Steel	65.701,88	kg	Laborer	0,0070	459,91	33	14,00
				Skill Laborer	0,0035	229,96		7,00
				Chief Laborer	0,0007	45,99		2,00
				Foreman	0,0004	26,28		1,00
b	Formwork	1.002,12	m^2	Laborer	0,6600	661,40	34	20,00
				Skill Laborer	0,3300	330,70		10,00
				Chief Laborer	0,0330	33,07		1,00
				Foreman	0,0330	33,07		1,00
c	Ready Mix Concrete K-400	146,76	m^3	Laborer	1,1000	161,44		15,00
				Skill Laborer	0,5000	73,38		7,00

NO	WORK ITEM	VOLUME		MATERIAL NEEDS			
		TOTAL	UNIT	MATERIAL	UNIT	COEFF	TOTAL
I	**PREPARATORY WORK**						
1	Measuring and Installation of	104,50	m'	Wood Beam 5/7	m³	0,0120	1,2540
	Bouwplank			Wood Board 3/20	m³	0,0070	0,7315
				Nail 2 - 5"	kg	0,0200	2,0900
II	**SOIL WORK**						
1	Backfilling of Soil Work	86,16	m³	Backfilling Sand	m³	1,2000	103,3927
III	**LOWER STRUCTURE WORK**						
A	**FOUNDATION WORK**						
1	Bored Pile Foundation Ø = 800 mm	2.136,00	m'	Reinforcement Steel	kg	43,3858	92672,0688
				Ready Mix Concrete K-300	m³	0,5027	1073,6698
				Casing	m²	2,5133	5368,3490
B	**SOLDIER PILE WORK**						
1	Soldier Pile Ø = 600 mm	662,00	m'	Reinforcement Steel	kg	31,4475	20818,2450
				Ready Mix Concrete K-300	m³	0,2827	187,1759
				Casing	m²	1,8850	1247,8395
2	Bentonite Ø = 600 mm	156,64	m³	Portland Cement	kg	250,0000	39159,9194
				Bentonite Clay	kg	50,0000	7831,9839
				Water	Liter	1000,0000	156639,6774
C	**CAPPING BEAM WORK**						
1	Work Floor	3,82	m³	Portland Cement	kg	230,0000	879,1520
				Concrete Sand	m³	0,6379	2,4381
				Concrete Coral	m³	0,6041	2,3092
				Water	Liter	0,0720	0,2752
2	Reinforcement Steel	2.769,58	kg	Reinforcement Steel	kg	1,0500	2908,0598
				Annealed Wire	kg	0,0150	41,5437
3	Formwork	95,56	m²	Meranti Wood (Class III)	m³	0,0400	3,8224
				Nail	kg	0,4000	38,2240
				Formwork Oil	Liter	0,2000	19,1120
				Meranti Wood Beam (Class II)	m³	0,0180	1,7201
				Plywood 15 mm	Lbr	0,3500	33,4460
				Dolken Wood 8/10 cm L = 4 m	Batang	2,0000	191,1200
4	Ready Mix Concrete K-300	38,22	m³	Ready Mix Concrete K300	m³	1,0500	40,1352
D	**PILE CAP WORK**						
1	Work Floor	15,92	m³	Portland Cement	kg	230,0000	3661,0552
				Concrete Sand	m³	0,6379	10,1532
				Concrete Coral	m³	0,6041	9,6161
				Water	Liter	0,0720	1,1461
2	Reinforcement Steel	48.638,84	kg	Reinforcement Steel	kg	1,0500	51070,7820
				Annealed Wire	kg	0,0150	729,5826
3	Formwork	373,17	m²	Concrete Brick	Bh	13,0000	4851,2100
				Portland Cement	kg	10,0000	3731,7000
				Sand Tide	kg	0,2000	74,6340
4	Ready Mix Concrete K-300	477,53	m³	Ready Mix Concrete K300	m³	1,0500	501,4054
E	**TIE BEAM WORK**						
1	Work Floor	1,31	m³	Portland Cement	kg	230,0000	300,2478
				Concrete Sand	m³	0,6379	0,8327
				Concrete Coral	m³	0,6041	0,7886
				Water	Liter	0,0720	0,0940
2	Reinforcement Steel	4563,12	kg	Reinforcement Steel	kg	1,0500	4791,2771
				Annealed Wire	kg	0,0150	68,4468
3	Formwork	96,91	m²	Concrete Brick	Bh	13,0000	1259,8430
				Portland Cement	kg	10,0000	969,1100
				Sand Tide	kg	0,2000	19,3822
4	Ready Mix Concrete K-300	17,08	m³	Ready Mix Concrete K300	m³	1,0500	17,9384
F	**RETAINING WALL WORK**						
1	Reinforcement Steel	9.287,85	kg	Reinforcement Steel	kg	1,0500	9752,2453
				Annealed Wire	kg	0,0150	139,3178
2	Formwork	385,31	m²	Meranti Wood (Class III)	m³	0,0300	11,5592
				Nail	kg	0,4000	154,1220
				Formwork Oil	Liter	0,2000	77,0610
				Meranti Wood Beam (Class II)	m³	0,0200	7,7061
				Plywood 15 mm	Lbr	0,3500	134,8568
				Dolken Wood 8/10 cm L = 4 m	Batang	3,0000	1155,9150
				Spacer of Formwork	Bh	4,0000	1541,2200
3	Ready Mix Concrete K-400	96,35	m³	Ready Mix Concrete K300	m³	1,0500	101,1638
IV	**UPPER STRUCTURE WORK**						
1	**BASEMENT**						
A	**SLAB WORK**						
a	Work Floor (width = 5 cm)	19,08	m³	Portland Cement	kg	230,0000	4388,4000
				Concrete Sand	m³	0,6379	12,1703
				Concrete Coral	m³	0,6041	11,5266
				Water	Liter	0,0720	1,3738
b	Reinforcement Steel	4.297,97	kg	Reinforcement Steel	kg	1,0500	4512,8685
				Annealed Wire	kg	0,0150	64,4696
c	Ready Mix Concrete K-300	80,65	m³	Ready Mix Concrete K300	m³	1,0500	84,6825
B	**COLUMN WORK**						
a	Reinforcement Steel	11.931,55	kg	Reinforcement Steel	kg	1,0500	12528,1275
				Annealed Wire	kg	0,0150	178,9733
b	Formwork	169,60	m²	Meranti Wood (Class III)	m³	0,0400	6,7840
				Nail	kg	0,4000	67,8400
				Formwork Oil	Liter	0,2000	33,9200
				Meranti Wood Beam (Class II)	m³	0,0150	2,5440
				Plywood 15 mm	Lbr	0,3500	59,3600
				Dolken Wood 8/10 cm L = 4 m	Batang	2,0000	339,2000
c	Ready Mix Concrete K-400	28,04	m³	Ready Mix Concrete K400	m³	1,0500	29,4441
C	**STAIRS WORK**						
a	Reinforcement Steel	399,86	kg	Reinforcement Steel	kg	1,0500	419,8541
				Annealed Wire	kg	0,0150	5,9979
b	Formwork	13,75	m²	Meranti Wood (Class III)	m³	0,0300	0,4125
				Nail	kg	0,4000	5,5000
				Formwork Oil	Liter	0,1500	2,0625
				Meranti Wood Beam (Class II)	m³	0,0150	0,2063
				Plywood 15 mm	Lbr	0,3500	4,8125
				Dolken Wood 8/10 cm L = 4 m	Batang	2,0000	27,5000
c	Ready Mix Concrete K-300	1,92	m³	Ready Mix Concrete K300	m³	1,0500	2,0160
D	**RAMP**						
a	Backfilling Soil of Ramp	58,98	m³	Backfilling Sand	m³	1,2000	70,7717
b	Reinforcement Steel	1.431,97	kg	Reinforcement Steel	kg	1,0500	1503,5650
				Annealed Wire	kg	0,0150	21,4795
c	Formwork	12,51	m²	Meranti Wood (Class III)	m³	0,0400	0,5005
				Nail	kg	0,4000	5,0053
				Formwork Oil	Liter	0,2000	2,5027
				Meranti Wood Beam (Class II)	m³	0,0150	0,1877
				Plywood 15 mm	Lbr	0,3500	4,3797
				Dolken Wood 8/10 cm L = 4 m	Batang	2,0000	25,0266
d	Ready Mix Concrete K-300	10,49	m³	Ready Mix Concrete K400	m³	1,0500	11,0161
2	**GROUND FLOOR**						
A	**SLAB WORK**						
a	Reinforcement Steel	5.928,54	kg	Reinforcement Steel	kg	1,0500	6224,9670
				Annealed Wire	kg	0,0150	88,9281
b	Formwork	480,93	m²	Meranti Wood (Class III)	m³	0,0400	19,2371
				Nail	kg	0,4000	192,3708
				Formwork Oil	Liter	0,2000	96,1854
				Meranti Wood Beam (Class II)	m³	0,0150	7,2139
				Plywood 15 mm	Lbr	0,3500	168,3245
				Dolken Wood 8/10 cm L = 4 m	Batang	6,0000	2885,5620
c	Ready Mix Concrete K-300	52,32	m³	Ready Mix Concrete K300	m³	1,0500	54,9360
B	**COLUMN WORK**						
a	Reinforcement Steel	9.205,01	kg	Reinforcement Steel	kg	1,0500	9665,2605
				Annealed Wire	kg	0,0150	138,0752
b	Formwork	211,30	m²	Meranti Wood (Class III)	m³	0,0400	8,4520
				Nail	kg	0,4000	84,5200
				Formwork Oil	Liter	0,2000	42,2600
				Meranti Wood Beam (Class II)	m³	0,0150	3,1695
				Plywood 15 mm	Lbr	0,3500	73,9550
				Dolken Wood 8/10 cm L = 4 m	Batang	2,0000	422,6000
c	Ready Mix Concrete K-400	37,93	m³	Ready Mix Concrete K400	m³	1,0500	39,8265
C	**BEAM WORK**						
a	Reinforcement Steel	10.918,74	kg	Reinforcement Steel	kg	1,0500	11464,6741
				Annealed Wire	kg	0,0150	163,7811
b	Formwork	346,13	m²	Meranti Wood (Class III)	m³	0,0400	13,8451
				Nail	kg	0,4000	138,4506
				Formwork Oil	Liter	0,2000	69,2253
				Chief Laborer	0,0500	7,33 11	1,00
				Foreman	0,0500	7,34	1,00

Table 3. Material Needs Calculation

				Meranti Wood Beam (Class II)	m³	0,0180	6,2303
				Plywood 15 mm	Lbr	0,3500	121,1443
				Dolken Wood 8/10 cm L = 4 m	Batang	2,0000	692,2531
c	Ready Mix Concrete K-300	35,42	m³	Ready Mix Concrete K300	m³	1,0500	37,1874
D	**STAIRS WORK**						
a	Reinforcement Steel	1.033,95	kg	Reinforcement Steel	kg	1,0500	1085,6494
				Annealed Wire	kg	0,0150	15,5093
b	Formwork	44,61	m²	Meranti Wood (Class III)	m³	0,0300	1,3383
				Nail	kg	0,4000	17,8442
				Formwork Oil	Liter	0,1500	6,6916
				Meranti Wood Beam (Class II)	m³	0,0150	0,6692
				Plywood 15 mm	Lbr	0,3500	15,6137
				Dolken Wood 8/10 cm L = 4 m	Batang	2,0000	89,2210
c	Ready Mix Concrete K-300	5,94	m³	Ready Mix Concrete K300	m³	1,0500	6,2359
3	**MEZZANINE**						
A	**SLAB WORK**						
a	Reinforcement Steel	3.602,23	kg	Reinforcement Steel	kg	1,0500	3782,3427
				Annealed Wire	kg	0,0150	54,0335
b	Formwork	307,02	m²	Meranti Wood (Class III)	m³	0,0400	12,2809
				Nail	kg	0,4000	122,8088
				Formwork Oil	Liter	0,2000	61,4044
				Meranti Wood Beam (Class II)	m³	0,0150	4,6053
				Plywood 15 mm	Lbr	0,3500	107,4577
				Dolken Wood 8/10 cm L = 4 m	Batang	6,0000	1842,1320
c	Ready Mix Concrete K-300	33,36	m³	Ready Mix Concrete K300	m³	1,0500	35,0318
B	**COLUMN WORK**						
a	Reinforcement Steel	7.380,65	kg	Reinforcement Steel	kg	1,0500	7749,6825
				Annealed Wire	kg	0,0150	110,7098
b	Formwork	152,40	m²	Meranti Wood (Class III)	m³	0,0400	6,0960
				Nail	kg	0,4000	60,9600
				Formwork Oil	Liter	0,2000	30,4800
				Meranti Wood Beam (Class II)	m³	0,0150	2,2860
				Plywood 15 mm	Lbr	0,3500	53,3400
				Dolken Wood 8/10 cm L = 4 m	Batang	2,0000	304,8000
c	Ready Mix Concrete K-400	27,03	m³	Ready Mix Concrete K400	m³	1,0500	28,3815
C	**BEAM WORK**						
a	Reinforcement Steel	6.902,27	kg	Reinforcement Steel	kg	1,0500	7247,3849
				Annealed Wire	kg	0,0150	103,5341
b	Formwork	212,74	m²	Meranti Wood (Class III)	m³	0,0400	8,5095
				Nail	kg	0,4000	85,0945
				Formwork Oil	Liter	0,2000	42,5473
				Meranti Wood Beam (Class II)	m³	0,0180	3,8293
				Plywood 15 mm	Lbr	0,3500	74,4577
				Dolken Wood 8/10 cm L = 4 m	Batang	2,0000	425,4726
c	Ready Mix Concrete K-300	20,78	m³	Ready Mix Concrete K300	m³	1,0500	21,8218
D	**STAIRS WORK**						
a	Reinforcement Steel	714,22	kg	Reinforcement Steel	kg	1,0500	749,9354
				Annealed Wire	kg	0,0150	10,7134
b	Formwork	36,36	m²	Meranti Wood (Class III)	m³	0,0300	1,0909
				Nail	kg	0,4000	14,5456
				Formwork Oil	Liter	0,1500	5,4546
				Meranti Wood Beam (Class II)	m³	0,0150	0,5455
				Plywood 15 mm	Lbr	0,3500	12,7274
				Dolken Wood 8/10 cm L = 4 m	Batang	2,0000	72,7280
c	Ready Mix Concrete K-300	4,85	m³	Ready Mix Concrete K300	m³	1,0500	5,0918
4	**2nd FLOOR**						
A	**SLAB WORK**						
a	Reinforcement Steel	5.925,05	kg	Reinforcement Steel	kg	1,0500	6221,3036
				Annealed Wire	kg	0,0150	88,8758
b	Formwork	505,10	m²	Meranti Wood (Class III)	m³	0,0400	20,2040
				Nail	kg	0,4000	202,0400
				Formwork Oil	Liter	0,2000	101,0200
				Meranti Wood Beam (Class II)	m³	0,0150	7,5765
				Plywood 15 mm	Lbr	0,3500	176,7850
				Dolken Wood 8/10 cm L = 4 m	Batang	6,0000	3030,6000
c	Ready Mix Concrete K-300	54,91	m³	Ready Mix Concrete K300	m³	1,0500	57,6551
B	**COLUMN WORK**						
a	Reinforcement Steel	7.380,65	kg	Reinforcement Steel	kg	1,0500	7749,6825
				Annealed Wire	kg	0,0150	110,7098
b	Formwork	152,40	m²	Meranti Wood (Class III)	m³	0,0400	6,0960
				Nail	kg	0,4000	60,9600
				Formwork Oil	Liter	0,2000	30,4800
				Meranti Wood Beam (Class II)	m³	0,0150	2,2860
				Plywood 15 mm	Lbr	0,3500	53,3400
				Dolken Wood 8/10 cm L = 4 m	Batang	2,0000	304,8000
c	Ready Mix Concrete K-400	27,03	m³	Ready Mix Concrete K400	m³	1,0500	28,3815
C	**BEAM WORK**						
a	Reinforcement Steel	11.555,46	kg	Reinforcement Steel	kg	1,0500	12133,2303
				Annealed Wire	kg	0,0150	173,3319
b	Formwork	354,37	m²	Meranti Wood (Class III)	m³	0,0400	14,1750
				Nail	kg	0,4000	141,7498
				Formwork Oil	Liter	0,2000	70,8749
				Meranti Wood Beam (Class II)	m³	0,0180	6,3787
				Plywood 15 mm	Lbr	0,3500	124,0311
				Dolken Wood 8/10 cm L = 4 m	Batang	2,0000	708,7491
c	Ready Mix Concrete K-300	35,64	m³	Ready Mix Concrete K300	m³	1,0500	37,4204
D	**STAIRS WORK**						
a	Reinforcement Steel	714,22	kg	Reinforcement Steel	kg	1,0500	749,9354
				Annealed Wire	kg	0,0150	10,7134
b	Formwork	36,36	m²	Meranti Wood (Class III)	m³	0,0300	1,0909
				Nail	kg	0,4000	14,5456
				Formwork Oil	Liter	0,1500	5,4546
				Meranti Wood Beam (Class II)	m³	0,0150	0,5455
				Plywood 15 mm	Lbr	0,3500	12,7274
				Dolken Wood 8/10 cm L = 4 m	Batang	2,0000	72,7280
c	Ready Mix Concrete K-300	4,85	m³	Ready Mix Concrete K300	m³	1,0500	5,0918
5	**3th FLOOR**						
A	**SLAB WORK**						
a	Reinforcement Steel	5.925,05	kg	Reinforcement Steel	kg	1,0500	6221,3036
				Annealed Wire	kg	0,0150	88,8758
b	Formwork	505,10	m²	Meranti Wood (Class III)	m³	0,0400	20,2040
				Nail	kg	0,4000	202,0400
				Formwork Oil	Liter	0,2000	101,0200
				Meranti Wood Beam (Class II)	m³	0,0150	7,5765
				Plywood 15 mm	Lbr	0,3500	176,7850
				Dolken Wood 8/10 cm L = 4 m	Batang	6,0000	3030,6000
c	Ready Mix Concrete K-300	54,91	m³	Ready Mix Concrete K300	m³	1,0500	57,6551
B	**COLUMN WORK**						
a	Reinforcement Steel	6.233,43	kg	Reinforcement Steel	kg	1,0500	6545,1015
				Annealed Wire	kg	0,0150	93,5015
b	Formwork	126,60	m²	Meranti Wood (Class III)	m³	0,0400	5,0640
				Nail	kg	0,4000	50,6400
				Formwork Oil	Liter	0,2000	25,3200
				Meranti Wood Beam (Class II)	m³	0,0150	1,8990
				Plywood 15 mm	Lbr	0,3500	44,3100
				Dolken Wood 8/10 cm L = 4 m	Batang	2,0000	253,2000
c	Ready Mix Concrete K-400	18,96	m3	Ready Mix Concrete K400	m³	1,0500	19,9080
C	**BEAM WORK**						
a	Reinforcement Steel	11.555,46	kg	Reinforcement Steel	kg	1,0500	12133,2303
				Annealed Wire	kg	0,0150	173,3319
b	Formwork	354,37	m²	Meranti Wood (Class III)	m³	0,0400	14,1750
				Nail	kg	0,4000	141,7498
				Formwork Oil	Liter	0,2000	70,8749
				Meranti Wood Beam (Class II)	m³	0,0180	6,3787
				Plywood 15 mm	Lbr	0,3500	124,0311
				Dolken Wood 8/10 cm L = 4 m	Batang	2,0000	708,7491
c	Ready Mix Concrete K-300	35,64	m³	Ready Mix Concrete K300	m³	1,0500	37,4204
D	**STAIRS WORK**						
a	Reinforcement Steel	714,22	kg	Reinforcement Steel	kg	1,0500	749,9354
				Annealed Wire	kg	0,0150	10,7134
b	Formwork	36,36	m²	Meranti Wood (Class III)	m³	0,0300	1,0909
				Nail	kg	0,4000	14,5456
				Formwork Oil	Liter	0,1500	5,4546
				Meranti Wood Beam (Class II)	m³	0,0150	0,5455
				Plywood 15 mm	Lbr	0,3500	12,7274
				Dolken Wood 8/10 cm L = 4 m	Batang	2,0000	72,7280
c	Ready Mix Concrete K-300	4,85	m³	Ready Mix Concrete K300	m³	1,0500	5,0918
6	**4th FLOOR**						
A	**SLAB WORK**						
a	Reinforcement Steel	5.925,05	kg	Reinforcement Steel	kg	1,0500	6221,3036
				Annealed Wire	kg	0,0150	88,8758
b	Formwork	505,10	m²	Meranti Wood (Class III)	m³	0,0400	20,2040
				Nail	kg	0,4000	202,0400
				Formwork Oil	Liter	0,2000	101,0200
				Meranti Wood Beam (Class II)	m³	0,0150	7,5765
				Plywood 15 mm	Lbr	0,3500	176,7850
				Dolken Wood 8/10 cm L = 4 m	Batang	6,0000	3030,6000
c	Ready Mix Concrete K-300	54,91	m³	Ready Mix Concrete K300	m³	1,0500	57,6551
B	**COLUMN WORK**						
a	Reinforcement Steel	6.233,43	kg	Reinforcement Steel	kg	1,0500	6545,1015

				Annealed Wire	kg	0,0150	93,5015
b	Formwork	126,60	m2	Meranti Wood (Class III)	m3	0,0400	5,0640
				Nail	kg	0,4000	50,6400
				Formwork Oil	Liter	0,2000	25,3200
				Meranti Wood Beam (Class II)	m3	0,0150	1,8990
				Plywood 15 mm	Lbr	0,3500	44,3100
				Dolken Wood 8/10 cm L = 4 m	Batang	2,0000	253,2000
c	Ready Mix Concrete K-400	18,96	m3	Ready Mix Concrete K400	m3	1,0500	19,9080
C	BEAM WORK						
a	Reinforcement Steel	11.555,46	kg	Reinforcement Steel	kg	1,0500	12133,2303
				Annealed Wire	kg	0,0150	173,3319
b	Formwork	354,37	m2	Meranti Wood (Class III)	m3	0,0400	14,1750
				Nail	kg	0,4000	141,7498
				Formwork Oil	Liter	0,2000	70,8749
				Meranti Wood Beam (Class II)	m3	0,0180	6,3787
				Plywood 15 mm	Lbr	0,3500	124,0311
				Dolken Wood 8/10 cm L = 4 m	Batang	2,0000	708,7491
c	Ready Mix Concrete K-300	35,64	m3	Ready Mix Concrete K300	m3	1,0500	37,4204
D	STAIRS WORK						
a	Reinforcement Steel	714,22	kg	Reinforcement Steel	kg	1,0500	749,9354
				Annealed Wire	kg	0,0150	10,7134
b	Formwork	36,36	m2	Meranti Wood (Class III)	m3	0,0300	1,0909
				Nail	kg	0,4000	14,5456
				Formwork Oil	Liter	0,1500	5,4546
				Meranti Wood Beam (Class II)	m3	0,0150	0,5455
				Plywood 15 mm	Lbr	0,3500	12,7274
				Dolken Wood 8/10 cm L = 4 m	Batang	2,0000	72,7280
c	Ready Mix Concrete K-300	4,85	m3	Ready Mix Concrete K300	m3	1,0500	5,0918
7	5th FLOOR						
A	SLAB WORK						
a	Reinforcement Steel	5.925,05	kg	Reinforcement Steel	kg	1,0500	6221,3036
				Annealed Wire	kg	0,0150	88,8758
b	Formwork	505,10	m2	Meranti Wood (Class III)	m3	0,0400	20,2040
				Nail	kg	0,4000	202,0400
				Formwork Oil	Liter	0,2000	101,0200
				Meranti Wood Beam (Class II)	m3	0,0150	7,5765
				Plywood 15 mm	Lbr	0,3500	176,7850
				Dolken Wood 8/10 cm L = 4 m	Batang	6,0000	3030,6000
c	Ready Mix Concrete K-300	54,91	m3	Ready Mix Concrete K300	m3	1,0500	57,6551
B	COLUMN WORK						
a	Reinforcement Steel	6.233,43	kg	Reinforcement Steel	kg	1,0500	6545,1015
				Annealed Wire	kg	0,0150	93,5015
b	Formwork	126,60	m2	Meranti Wood (Class III)	m3	0,0400	5,0640
				Nail	kg	0,4000	50,6400
				Formwork Oil	Liter	0,2000	25,3200
				Meranti Wood Beam (Class II)	m3	0,0150	1,8990
				Plywood 15 mm	Lbr	0,3500	44,3100
				Dolken Wood 8/10 cm L = 4 m	Batang	2,0000	253,2000
c	Ready Mix Concrete K-400	18,96	m3	Ready Mix Concrete K400	m3	1,0500	19,9080
C	BEAM WORK						
a	Reinforcement Steel	11.555,46	kg	Reinforcement Steel	kg	1,0500	12133,2303
				Annealed Wire	kg	0,0150	173,3319
b	Formwork	354,37	m2	Meranti Wood (Class III)	m3	0,0400	14,1750
				Nail	kg	0,4000	141,7498
				Formwork Oil	Liter	0,2000	70,8749
				Meranti Wood Beam (Class II)	m3	0,0180	6,3787
				Plywood 15 mm	Lbr	0,3500	124,0311
				Dolken Wood 8/10 cm L = 4 m	Batang	2,0000	708,7491
c	Ready Mix Concrete K-300	35,64	m3	Ready Mix Concrete K300	m3	1,0500	37,4204
D	STAIRS WORK						
a	Reinforcement Steel	714,22	kg	Reinforcement Steel	kg	1,0500	749,9354
				Annealed Wire	kg	0,0150	10,7134
b	Formwork	36,36	m2	Meranti Wood (Class III)	m3	0,0300	1,0909
				Nail	kg	0,4000	14,5456
				Formwork Oil	Liter	0,1500	5,4546
				Meranti Wood Beam (Class II)	m3	0,0150	0,5455
				Plywood 15 mm	Lbr	0,3500	12,7274
				Dolken Wood 8/10 cm L = 4 m	Batang	2,0000	72,7280
c	Ready Mix Concrete K-300	4,85	m3	Ready Mix Concrete K300	m3	1,0500	5,0918
8	6th FLOOR						
A	SLAB WORK						
a	Reinforcement Steel	5.925,05	kg	Reinforcement Steel	kg	1,0500	6221,3036
				Annealed Wire	kg	0,0150	88,8758
b	Formwork	505,10	m2	Meranti Wood (Class III)	m3	0,0400	20,2040
				Nail	kg	0,4000	202,0400
				Formwork Oil	Liter	0,2000	101,0200
				Meranti Wood Beam (Class II)	m3	0,0150	7,5765
				Plywood 15 mm	Lbr	0,3500	176,7850
				Dolken Wood 8/10 cm L = 4 m	Batang	6,0000	3030,6000
c	Ready Mix Concrete K-300	54,91	m3	Ready Mix Concrete K300	m3	1,0500	57,6551
B	COLUMN WORK						
a	Reinforcement Steel	5.210,99	kg	Reinforcement Steel	kg	1,0500	5471,5395
				Annealed Wire	kg	0,0150	78,1649
b	Formwork	105,00	m2	Meranti Wood (Class III)	m3	0,0400	4,2000
				Nail	kg	0,4000	42,0000
				Formwork Oil	Liter	0,2000	21,0000
				Meranti Wood Beam (Class II)	m3	0,0150	1,5750
				Plywood 15 mm	Lbr	0,3500	36,7500
				Dolken Wood 8/10 cm L = 4 m	Batang	2,0000	210,0000
c	Ready Mix Concrete K-400	13,56	m3	Ready Mix Concrete K400	m3	1,0500	14,2380
C	BEAM WORK						
a	Reinforcement Steel	11.555,46	kg	Reinforcement Steel	kg	1,0500	12133,2303
				Annealed Wire	kg	0,0150	173,3319
b	Formwork	354,37	m2	Meranti Wood (Class III)	m3	0,0400	14,1750
				Nail	kg	0,4000	141,7498
				Formwork Oil	Liter	0,2000	70,8749
				Meranti Wood Beam (Class II)	m3	0,0180	6,3787
				Plywood 15 mm	Lbr	0,3500	124,0311
				Dolken Wood 8/10 cm L = 4 m	Batang	2,0000	708,7491
c	Ready Mix Concrete K-300	35,64	m3	Ready Mix Concrete K300	m3	1,0500	37,4204
D	STAIRS WORK						
a	Reinforcement Steel	714,22	kg	Reinforcement Steel	kg	1,0500	749,9354
				Annealed Wire	kg	0,0150	10,7134
b	Formwork	36,36	m2	Meranti Wood (Class III)	m3	0,0300	1,0909
				Nail	kg	0,4000	14,5456
				Formwork Oil	Liter	0,1500	5,4546
				Meranti Wood Beam (Class II)	m3	0,0150	0,5455
				Plywood 15 mm	Lbr	0,3500	12,7274
				Dolken Wood 8/10 cm L = 4 m	Batang	2,0000	72,7280
c	Ready Mix Concrete K-300	4,85	m3	Ready Mix Concrete K300	m3	1,0500	5,0918
9	7th FLOOR						
A	SLAB WORK						
a	Reinforcement Steel	5.925,05	kg	Reinforcement Steel	kg	1,0500	6221,3036
				Annealed Wire	kg	0,0150	88,8758
b	Formwork	505,10	m2	Meranti Wood (Class III)	m3	0,0400	20,2040
				Nail	kg	0,4000	202,0400
				Formwork Oil	Liter	0,2000	101,0200
				Meranti Wood Beam (Class II)	m3	0,0150	7,5765
				Plywood 15 mm	Lbr	0,3500	176,7850
				Dolken Wood 8/10 cm L = 4 m	Batang	6,0000	3030,6000
c	Ready Mix Concrete K-300	54,91	m3	Ready Mix Concrete K300	m3	1,0500	57,6551
B	COLUMN WORK						
a	Reinforcement Steel	5.210,99	kg	Reinforcement Steel	kg	1,0500	5471,5395
				Annealed Wire	kg	0,0150	78,1649
b	Formwork	105,00	m2	Meranti Wood (Class III)	m3	0,0400	4,2000
				Nail	kg	0,4000	42,0000
				Formwork Oil	Liter	0,2000	21,0000
				Meranti Wood Beam (Class II)	m3	0,0150	1,5750
				Plywood 15 mm	Lbr	0,3500	36,7500
				Dolken Wood 8/10 cm L = 4 m	Batang	2,0000	210,0000
c	Ready Mix Concrete K-400	13,56	m3	Ready Mix Concrete K400	m3	1,0500	14,2380
C	BEAM WORK						
a	Reinforcement Steel	11.555,46	kg	Reinforcement Steel	kg	1,0500	12133,2303
				Annealed Wire	kg	0,0150	173,3319
b	Formwork	354,37	m2	Meranti Wood (Class III)	m3	0,0400	14,1750
				Nail	kg	0,4000	141,7498
				Formwork Oil	Liter	0,2000	70,8749
				Meranti Wood Beam (Class II)	m3	0,0180	6,3787
				Plywood 15 mm	Lbr	0,3500	124,0311
				Dolken Wood 8/10 cm L = 4 m	Batang	2,0000	708,7491
c	Ready Mix Concrete K-300	35,64	m3	Ready Mix Concrete K300	m3	1,0500	37,4204
D	STAIRS WORK						
a	Reinforcement Steel	714,22	kg	Reinforcement Steel	kg	1,0500	749,9354
				Annealed Wire	kg	0,0150	10,7134
b	Formwork	36,36	m2	Meranti Wood (Class III)	m3	0,0300	1,0909
				Nail	kg	0,4000	14,5456
				Formwork Oil	Liter	0,1500	5,4546
				Meranti Wood Beam (Class II)	m3	0,0150	0,5455
				Plywood 15 mm	Lbr	0,3500	12,7274
				Dolken Wood 8/10 cm L = 4 m	Batang	2,0000	72,7280
c	Ready Mix Concrete K-300	4,85	m3	Ready Mix Concrete K300	m3	1,0500	5,0918
10	8th FLOOR						
A	SLAB WORK						
a	Reinforcement Steel	5.925,05	kg	Reinforcement Steel	kg	1,0500	6221,3036
				Annealed Wire	kg	0,0150	88,8758
b	Formwork	505,10	m2	Meranti Wood (Class III)	m3	0,0400	20,2040
				Nail	kg	0,4000	202,0400
				Formwork Oil	Liter	0,2000	101,0200
				Meranti Wood Beam (Class II)	m3	0,0150	7,5765
				Plywood 15 mm	Lbr	0,3500	176,7850
				Dolken Wood 8/10 cm L = 4 m	Batang	6,0000	3030,6000
c	Ready Mix Concrete K-300	54,91	m3	Ready Mix Concrete K300	m3	1,0500	57,6551
B	COLUMN WORK						
a	Reinforcement Steel	4.470,40	kg	Reinforcement Steel	kg	1,0500	4693,9200
				Annealed Wire	kg	0,0150	67,0560
b	Formwork	105,00	m2	Meranti Wood (Class III)	m3	0,0400	4,2000
				Nail	kg	0,4000	42,0000
				Formwork Oil	Liter	0,2000	21,0000
				Meranti Wood Beam (Class II)	m3	0,0150	1,5750
				Plywood 15 mm	Lbr	0,3500	36,7500
				Dolken Wood 8/10 cm L = 4 m	Batang	2,0000	210,0000
c	Ready Mix Concrete K-400	13,56	m3	Ready Mix Concrete K400	m3	1,0500	14,2380
C	BEAM WORK						
a	Reinforcement Steel	11.555,46	kg	Reinforcement Steel	kg	1,0500	12133,2303
				Annealed Wire	kg	0,0150	173,3319
b	Formwork	354,37	m2	Meranti Wood (Class III)	m3	0,0400	14,1750
				Nail	kg	0,4000	141,7498
				Formwork Oil	Liter	0,2000	70,8749
				Meranti Wood Beam (Class II)	m3	0,0180	6,3787
				Plywood 15 mm	Lbr	0,3500	124,0311
				Dolken Wood 8/10 cm L = 4 m	Batang	2,0000	708,7491
c	Ready Mix Concrete K-300	35,64	m3	Ready Mix Concrete K300	m3	1,0500	37,4204
D	STAIRS WORK						
a	Reinforcement Steel	714,22	kg	Reinforcement Steel	kg	1,0500	749,9354
				Annealed Wire	kg	0,0150	10,7134
b	Formwork	36,36	m2	Meranti Wood (Class III)	m3	0,0300	1,0909
				Nail	kg	0,4000	14,5456
				Formwork Oil	Liter	0,1500	5,4546
				Meranti Wood Beam (Class II)	m3	0,0150	0,5455
				Plywood 15 mm	Lbr	0,3500	12,7274
				Dolken Wood 8/10 cm L = 4 m	Batang	2,0000	72,7280
c	Ready Mix Concrete K-300	4,85	m3	Ready Mix Concrete K300	m3	1,0500	5,0918
11	ROOF FLOOR						
A	SLAB WORK						
a	Reinforcement Steel	5.925,05	kg	Reinforcement Steel	kg	1,0500	6221,3036
				Annealed Wire	kg	0,0150	88,8758
b	Formwork	505,10	m2	Meranti Wood (Class III)	m3	0,0400	20,2040
				Nail	kg	0,4000	202,0400
				Formwork Oil	Liter	0,2000	101,0200
				Meranti Wood Beam (Class II)	m3	0,0150	7,5765
				Plywood 15 mm	Lbr	0,3500	176,7850
				Dolken Wood 8/10 cm L = 4 m	Batang	6,0000	3030,6000
c	Ready Mix Concrete K-300	54,91	m3	Ready Mix Concrete K300	m3	1,0500	57,6551
B	BEAM WORK						
a	Reinforcement Steel	11.555,46	kg	Reinforcement Steel	kg	1,0500	12133,2303
				Annealed Wire	kg	0,0150	173,3319
b	Formwork	354,37	m2	Meranti Wood (Class III)	m3	0,0400	14,1750
				Nail	kg	0,4000	141,7498
				Formwork Oil	Liter	0,2000	70,8749
				Meranti Wood Beam (Class II)	m3	0,0180	6,3787
				Plywood 15 mm	Lbr	0,3500	124,0311
				Dolken Wood 8/10 cm L = 4 m	Batang	2,0000	708,7491
c	Ready Mix Concrete K-300	35,64	m3	Ready Mix Concrete K300	m3	1,0500	37,4204
12	CORE WALL WORK						
a	Reinforcement Steel	65.701,88	kg	Reinforcement Steel	kg	1,0500	68986,9740
				Annealed Wire	kg	0,0150	985,5282
b	Formwork	1.002,12	m2	Meranti Wood (Class III)	m3	0,0300	30,0635
				Nail	kg	0,4000	400,8460
				Formwork Oil	Liter	0,2000	200,4230
				Meranti Wood Beam (Class II)	m3	0,0200	20,0423
				Plywood 15 mm	Lbr	0,3500	350,7403
				Dolken Wood 8/10 cm L = 4 m	Batang	3,0000	3006,3450
				Spacer of Formwork	Bh	4,0000	4008,4600
c	Ready Mix Concrete K-400	146,76	m3	Ready Mix Concrete K400	m3	1,0500	154,1004

Table 4. Equipment Needs Calculation

NO	WORK ITEM	VOLUME		EQUIPMENT NEEDS				
		TOTAL	UNIT	EQUIPMENT	COEFF	EQUIPMENT NEEDS	DURATION	EQUIPMENT PER DAY
I	**PREPARATORY WORK**							
1	Tower Crane Rental	1,00	Ls	Tower Crane	1,0000	1,00	392	1,00
II	**SOIL WORK**							
1	Excavation of Soil Work	2.079,78	m³	Excavator	0,0066	13,67	7	2,00
				Dump Truck Capacity 8 m3	0,0226	47,05		7,00
2	Backfilling of Soil Work	86,16	m³	Stamper	0,0071	0,62	2	1,00
III	**LOWER STRUCTURE WORK**							
A	**FOUNDATION WORK**							
1	Bored Pile Foundation Ø = 800 mm	2.136,00	m'	Bore Pile Machine	0,0104	22,24	23	1,00
				Concrete Pump	0,0093	19,80		1,00
				Dump Truck Capacity 4 m3	0,0211	45,04		2,00
B	**SOLDIER PILE WORK**							
1	Soldier Pile Ø = 600 mm	662,00	m'	Bore Pile Machine	0,0179	11,82	12	1,00
				Concrete Pump	0,0052	3,45		1,00
				Dump Truck Capacity 4 m3	0,0144	9,53		1,00
2	Bentonite Ø = 600 mm	156,64	m³	Bucket and Tremi Pipe	0,0496	7,77	4	2,00
				Concrete Vibrator	0,0357	5,59		2,00
C	**CAPPING BEAM WORK**							
1	Reinforcement Steel	2.769,58	kg	Bar Cutter	0,0004	0,99	2	1,00
				Bar Bender	0,0004	0,99		1,00
2	Ready Mix Concrete K-300	38,22	m³	Concrete Pump	0,0496	1,90	2	1,00
				Concrete Vibrator	0,0357	1,37		1,00
D	**PILE CAP WORK**							
1	Reinforcement Steel	48.638,84	kg	Bar Cutter	0,0004	17,37	18	1,00
				Bar Bender	0,0004	17,37		1,00
2	Ready Mix Concrete K-300	477,53	m³	Concrete Pump	0,0496	23,69	12	2,00
				Concrete Vibrator	0,0357	17,05		2,00
E	**TIE BEAM WORK**							
1	Reinforcement Steel	4563,12	kg	Bar Cutter	0,0004	1,63	4	1,00
				Bar Bender	0,0004	1,63		1,00
2	Ready Mix Concrete K-300	17,08	m³	Concrete Pump	0,0496	0,85	1	1,00
				Concrete Vibrator	0,0357	0,61		1,00
F	**RETAINING WALL WORK**							
1	Reinforcement Steel	9.287,85	kg	Bar Cutter	0,0004	3,32	7	1,00
				Bar Bender	0,0004	3,32		1,00
2	Ready Mix Concrete K-400	96,35	m³	Bucket and Tremi Pipe	0,0496	4,78	5	1,00
				Concrete Vibrator	0,0357	3,44		1,00
IV	**UPPER STRUCTURE WORK**							
1	**BASEMENT**							
A	**SLAB WORK**							
1	Reinforcement Steel	4.297,97	kg	Bar Cutter	0,0004	1,53	2	1,00
				Bar Bender	0,0004	1,53		1,00
2	Ready Mix Concrete K-300	80,65	m³	Bucket and Tremi Pipe	0,0496	4,00	5	1,00
				Concrete Vibrator	0,0357	2,88		1,00
B	**COLUMN WORK**							
1	Reinforcement Steel	11.931,55	kg	Bar Cutter	0,0004	4,26	5	1,00
				Bar Bender	0,0004	4,26		1,00
2	Ready Mix Concrete K-400	28,04	m³	Bucket and Tremi Pipe	0,0496	1,39	2	1,00
				Concrete Vibrator	0,0357	1,00		1,00
C	**STAIRS WORK**							
1	Reinforcement Steel	399,86	kg	Bar Cutter	0,0004	0,14	1	1,00
				Bar Bender	0,0004	0,14		1,00
2	Ready Mix Concrete K-300	1,92	m³	Bucket and Tremi Pipe	0,0496	0,10	1	1,00
				Concrete Vibrator	0,0357	0,07		1,00
D	**RAMP**							
1	Backfilling Soil of Ramp	58,98	m³	Stamper	0,0071	0,42	3	1,00
2	Reinforcement Steel	1.431,97	kg	Bar Cutter	0,0004	0,51	2	1,00
				Bar Bender	0,0004	0,51		1,00
3	Ready Mix Concrete K-400	10,49	m³	Bucket and Tremi Pipe	0,0496	0,52	2	1,00
				Concrete Vibrator	0,0357	0,37		1,00
2	**GROUND FLOOR**							
A	**SLAB WORK**							
1	Reinforcement Steel	5.928,54	kg	Bar Cutter	0,0004	2,12	5	1,00
				Bar Bender	0,0004	2,12		1,00
2	Ready Mix Concrete K-300	52,32	m³	Bucket and Tremi Pipe	0,0496	2,60	3	1,00
				Concrete Vibrator	0,0357	1,87		1,00
B	**COLUMN WORK**							
1	Reinforcement Steel	9.205,01	kg	Bar Cutter	0,0004	3,29	7	1,00
				Bar Bender	0,0004	3,29		1,00
2	Ready Mix Concrete K-400	37,93	m³	Bucket and Tremi Pipe	0,0496	1,88	2	1,00
				Concrete Vibrator	0,0357	1,35		1,00
C	**BEAM WORK**							
1	Reinforcement Steel	10.918,74	kg	Bar Cutter	0,0004	3,90	8	1,00
				Bar Bender	0,0004	3,90		1,00
2	Ready Mix Concrete K-300	35,42	m³	Bucket and Tremi Pipe	0,0496	1,76	2	1,00
				Concrete Vibrator	0,0357	1,26		1,00
D	**STAIRS WORK**							
1	Reinforcement Steel	1.033,95	kg	Bar Cutter	0,0004	0,37	1	1,00
				Bar Bender	0,0004	0,37		1,00
2	Ready Mix Concrete K-300	5,94	m³	Bucket and Tremi Pipe	0,0496	0,29	1	1,00
				Concrete Vibrator	0,0357	0,21		1,00
3	**MEZZANINE**							
A	**SLAB WORK**							
1	Reinforcement Steel	3.602,23	kg	Bar Cutter	0,0004	1,29	3	1,00
				Bar Bender	0,0004	1,29		1,00
2	Ready Mix Concrete K-300	33,36	m³	Bucket and Tremi Pipe	0,0496	1,65	2	1,00
				Concrete Vibrator	0,0357	1,19		1,00
B	**COLUMN WORK**							
1	Reinforcement Steel	7.380,65	kg	Bar Cutter	0,0004	2,64	6	1,00
				Bar Bender	0,0004	2,64		1,00
2	Ready Mix Concrete K-400	27,03	m³	Bucket and Tremi Pipe	0,0496	1,34	2	1,00
				Concrete Vibrator	0,0357	0,97		1,00
C	**BEAM WORK**							
1	Reinforcement Steel	6.902,27	kg	Bar Cutter	0,0004	2,47	5	1,00
				Bar Bender	0,0004	2,47		1,00
2	Ready Mix Concrete K-300	20,78	m³	Bucket and Tremi Pipe	0,0496	1,03	2	1,00
				Concrete Vibrator	0,0357	0,74		1,00
D	**STAIRS WORK**							
1	Reinforcement Steel	714,22	kg	Bar Cutter	0,0004	0,26	1	1,00
				Bar Bender	0,0004	0,26		1,00
2	Ready Mix Concrete K-300	4,85	m³	Bucket and Tremi Pipe	0,0496	0,24	1	1,00
				Concrete Vibrator	0,0357	0,17		1,00
4	**2nd FLOOR**							
A	**SLAB WORK**							
1	Reinforcement Steel	5.925,05	kg	Bar Cutter	0,0004	2,12	5	1,00
				Bar Bender	0,0004	2,12		1,00
2	Ready Mix Concrete K-300	54,91	m³	Bucket and Tremi Pipe	0,0496	2,72	3	1,00
				Concrete Vibrator	0,0357	1,96		1,00
B	**COLUMN WORK**							
1	Reinforcement Steel	7.380,65	kg	Bar Cutter	0,0004	2,64	6	1,00
				Bar Bender	0,0004	2,64		1,00
2	Ready Mix Concrete K-400	27,03	m³	Bucket and Tremi Pipe	0,0496	1,34	2	1,00
				Concrete Vibrator	0,0357	0,97		1,00
C	**BEAM WORK**							
1	Reinforcement Steel	11.555,46	kg	Bar Cutter	0,0004	4,13	9	1,00
				Bar Bender	0,0004	4,13		1,00
2	Ready Mix Concrete K-300	35,64	m³	Bucket and Tremi Pipe	0,0496	1,77	2	1,00
				Concrete Vibrator	0,0357	1,27		1,00
D	**STAIRS WORK**							
1	Reinforcement Steel	714,22	kg	Bar Cutter	0,0004	0,26	1	1,00
				Bar Bender	0,0004	0,26		1,00
2	Ready Mix Concrete K-300	4,85	m³	Bucket and Tremi Pipe	0,0496	0,24	1	1,00
				Concrete Vibrator	0,0357	0,17		1,00
5	**3th FLOOR**							
A	**SLAB WORK**							
1	Reinforcement Steel	5.925,05	kg	Bar Cutter	0,0004	2,12	5	1,00
				Bar Bender	0,0004	2,12		1,00
2	Ready Mix Concrete K-300	54,91	m³	Bucket and Tremi Pipe	0,0496	2,72		1,00
				Concrete Vibrator	0,0357	1,96	3	1,00
B	**COLUMN WORK**							
1	Reinforcement Steel	6.233,43	kg	Bar Cutter	0,0004	2,23	5	1,00
				Bar Bender	0,0004	2,23		1,00
2	Ready Mix Concrete K-400	18,96	m³	Bucket and Tremi Pipe	0,0496	0,94	1	1,00
				Concrete Vibrator	0,0357	0,68		1,00
C	**BEAM WORK**							
1	Reinforcement Steel	11.555,46	kg	Bar Cutter	0,0004	4,13	9	1,00
				Bar Bender	0,0004	4,13		1,00
2	Ready Mix Concrete K-300	35,64	m³	Bucket and Tremi Pipe	0,0496	1,77	2	1,00
				Concrete Vibrator	0,0357	1,27		1,00
D	**STAIRS WORK**							
1	Reinforcement Steel	714,22	kg	Bar Cutter	0,0004	0,26	1	1,00
				Bar Bender	0,0004	0,26		1,00
2	Ready Mix Concrete K-300	4,85	m³	Bucket and Tremi Pipe	0,0496	0,24	1	1,00
				Concrete Vibrator	0,0357	0,17		1,00
6	**4th FLOOR**							
A	**SLAB WORK**							
1	Reinforcement Steel	5.925,05	kg	Bar Cutter	0,0004	2,12	5	1,00
				Bar Bender	0,0004	2,12		1,00
2	Ready Mix Concrete K-300	54,91	m³	Bucket and Tremi Pipe	0,0496	2,72	3	1,00
				Concrete Vibrator	0,0357	1,96		1,00
B	**COLUMN WORK**							
1	Reinforcement Steel	6.233,43	kg	Bar Cutter	0,0004	2,23	5	1,00
				Bar Bender	0,0004	2,23		1,00
2	Ready Mix Concrete K-400	18,96	m³	Bucket and Tremi Pipe	0,0496	0,94	1	1,00
				Concrete Vibrator	0,0357	0,68		1,00
C	**BEAM WORK**							
1	Reinforcement Steel	11.555,46	kg	Bar Cutter	0,0004	4,13	9	1,00
				Bar Bender	0,0004	4,13		1,00
2	Ready Mix Concrete K-300	35,64	m³	Bucket and Tremi Pipe	0,0496	1,77	2	1,00
				Concrete Vibrator	0,0357	1,27		1,00
D	**STAIRS WORK**							
1	Reinforcement Steel	714,22	kg	Bar Cutter	0,0004	0,26	1	1,00
				Bar Bender	0,0004	0,26		1,00
2	Ready Mix Concrete K-300	4,85	m³	Bucket and Tremi Pipe	0,0496	0,24	1	1,00
				Concrete Vibrator	0,0357	0,17		1,00
7	**5th FLOOR**							
A	**SLAB WORK**							
1	Reinforcement Steel	5.925,05	kg	Bar Cutter	0,0004	2,12	5	1,00
				Bar Bender	0,0004	2,12		1,00
2	Ready Mix Concrete K-300	54,91	m³	Bucket and Tremi Pipe	0,0496	2,72	3	1,00
				Concrete Vibrator	0,0357	1,96		1,00
B	**COLUMN WORK**							
1	Reinforcement Steel	6.233,43	kg	Bar Cutter	0,0004	2,23	5	1,00
				Bar Bender	0,0004	2,23		1,00
2	Ready Mix Concrete K-400	18,96	m³	Bucket and Tremi Pipe	0,0496	0,94	1	1,00
				Concrete Vibrator	0,0357	0,68		1,00
C	**BEAM WORK**							
1	Reinforcement Steel	11.555,46	kg	Bar Cutter	0,0004	4,13	9	1,00
				Bar Bender	0,0004	4,13		1,00
2	Ready Mix Concrete K-300	35,64	m³	Bucket and Tremi Pipe	0,0496	1,77	2	1,00
				Concrete Vibrator	0,0357	1,27		1,00
D	**STAIRS WORK**							
1	Reinforcement Steel	714,22	kg	Bar Cutter	0,0004	0,26	1	1,00
				Bar Bender	0,0004	0,26		1,00
2	Ready Mix Concrete K-300	4,85	m³	Bucket and Tremi Pipe	0,0496	0,24	1	1,00
				Concrete Vibrator	0,0357	0,17		1,00
8	**6th FLOOR**							
A	**SLAB WORK**							
1	Reinforcement Steel	5.925,05	kg	Bar Cutter	0,0004	2,12	5	1,00
				Bar Bender	0,0004	2,12		1,00
2	Ready Mix Concrete K-300	54,91	m³	Bucket and Tremi Pipe	0,0496	2,72	3	1,00
				Concrete Vibrator	0,0357	1,96		1,00
B	**COLUMN WORK**							
1	Reinforcement Steel	5.210,99	kg	Bar Cutter	0,0004	1,86	4	1,00
				Bar Bender	0,0004	1,86		1,00
2	Ready Mix Concrete K-400	13,56	m³	Bucket and Tremi Pipe	0,0496	0,67	1	1,00
				Concrete Vibrator	0,0357	0,48		1,00
C	**BEAM WORK**							
1	Reinforcement Steel	11.555,46	kg	Bar Cutter	0,0004	4,13	9	1,00
				Bar Bender	0,0004	4,13		1,00
2	Ready Mix Concrete K-300	35,64	m³	Bucket and Tremi Pipe	0,0496	1,77	2	1,00
				Concrete Vibrator	0,0357	1,27		1,00
D	**STAIRS WORK**							
1	Reinforcement Steel	714,22	kg	Bar Cutter	0,0004	0,26	1	1,00
				Bar Bender	0,0004	0,26		1,00
2	Ready Mix Concrete K-300	4,85	m³	Bucket and Tremi Pipe	0,0496	0,24	1	1,00
				Concrete Vibrator	0,0357	0,17		1,00
9	**7th FLOOR**							
A	**SLAB WORK**							
1	Reinforcement Steel	5.925,05	kg	Bar Cutter	0,0004	2,12	5	1,00
				Bar Bender	0,0004	2,12		1,00
2	Ready Mix Concrete K-300	54,91	m³	Bucket and Tremi Pipe	0,0496	2,72	3	1,00
				Concrete Vibrator	0,0357	1,96		1,00
B	**COLUMN WORK**							
1	Reinforcement Steel	5.210,99	kg	Bar Cutter	0,0004	1,86	4	1,00
				Bar Bender	0,0004	1,86		1,00
2	Ready Mix Concrete K-400	13,56	m³	Bucket and Tremi Pipe	0,0496	0,67	1	1,00
				Concrete Vibrator	0,0357	0,48		1,00
C	**BEAM WORK**							
1	Reinforcement Steel	11.555,46	kg	Bar Cutter	0,0004	4,13	9	1,00
				Bar Bender	0,0004	4,13		1,00
2	Ready Mix Concrete K-300	35,64	m³	Bucket and Tremi Pipe	0,0496	1,77	2	1,00
				Concrete Vibrator	0,0357	1,27		1,00
D	**STAIRS WORK**							
1	Reinforcement Steel	714,22	kg	Bar Cutter	0,0004	0,26	1	1,00
				Bar Bender	0,0004	0,26		1,00
2	Ready Mix Concrete K-300	4,85	m³	Bucket and Tremi Pipe	0,0496	0,24	1	1,00
				Concrete Vibrator	0,0357	0,17		1,00
10	**8th FLOOR**							
A	**SLAB WORK**							
1	Reinforcement Steel	5.925,05	kg	Bar Cutter	0,0004	2,12	5	1,00
				Bar Bender	0,0004	2,12		1,00
2	Ready Mix Concrete K-300	54,91	m³	Bucket and Tremi Pipe	0,0496	2,72	3	1,00
				Concrete Vibrator	0,0357	1,96		1,00
B	**COLUMN WORK**							
1	Reinforcement Steel	4.470,40	kg	Bar Cutter	0,0004	1,60	4	1,00
				Bar Bender	0,0004	1,60		1,00
2	Ready Mix Concrete K-400	13,56	m³	Bucket and Tremi Pipe	0,0496	0,67	1	1,00
				Concrete Vibrator	0,0357	0,48		1,00
C	**BEAM WORK**							
1	Reinforcement Steel	11.555,46	kg	Bar Cutter	0,0004	4,13	9	1,00
				Bar Bender	0,0004	4,13		1,00
2	Ready Mix Concrete K-300	35,64	m³	Bucket and Tremi Pipe	0,0496	1,77	2	1,00
				Concrete Vibrator	0,0357	1,27		1,00
D	**STAIRS WORK**							
1	Reinforcement Steel	714,22	kg	Bar Cutter	0,0004	0,26	1	1,00
				Bar Bender	0,0004	0,26		1,00
2	Ready Mix Concrete K-300	4,85	m³	Bucket and Tremi Pipe	0,0496	0,24	1	1,00
				Concrete Vibrator	0,0357	0,17		1,00
11	**ROOF FLOOR**							
A	**SLAB WORK**							
1	Reinforcement Steel	5.925,05	kg	Bar Cutter	0,0004	2,12	5	1,00
				Bar Bender	0,0004	2,12		1,00
2	Ready Mix Concrete K-300	54,91	m³	Bucket and Tremi Pipe	0,0496	2,72	3	1,00
				Concrete Vibrator	0,0357	1,96		1,00
B	**BEAM WORK**							
1	Reinforcement Steel	11.555,46	kg	Bar Cutter	0,0004	4,13	9	1,00
				Bar Bender	0,0004	4,13		1,00
2	Ready Mix Concrete K-300	35,64	m³	Bucket and Tremi Pipe	0,0496	1,77	2	1,00
				Concrete Vibrator	0,0357	1,27		1,00

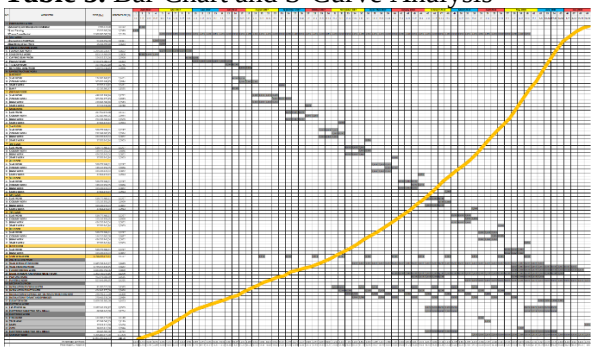
V	CORE WALL WORK							
1	Reinforcement Steel	65.701,88	kg	Bar Cutter	0,0004	23,46	33	1,00
				Bar Bender	0,0004	23,46		1,00
2	Ready Mix Concrete K-400	146,76	m^3	Bucket and Tremi Pipe	0,0496	7,28	11	1,00
				Concrete Vibrator	0,0357	5,24		1,00

E. PROJECT SCHEDULE

1. Analysis of Bar Chart and S-Curve

Based on the planning and calculation results using bar chart analysis method are as follows.

Table 5. Bar Chart and S-Curve Analysis



2. Analysis of Critical Path Method (CPM)

Table 6. Data of CPM

NO	JOB DESCRIPTION	DURATION (WEEK)	ACTIVITY CODE	PREVIOUS ACTIVITY
I	**PREPARATORY WORK**	2	A	-
II	**SOIL WORK**	2	B	D
III	**LOWER STRUCTURE WORK**			
-	Bored Pile Foundation	4	C	B
-	Soldier Pile	2	D	A
-	Capping Beam	1	E	C
-	Pile Cap	6	F	E
-	Tie Beam	1	G	F
-	Retaining Wall	2	H	I
IV	**UPPER STRUCTURE WORK**			
1	BASEMENT			
-	Slab	1	I	G
-	Column	2	J	I
-	Stairs	1	K	M
-	Ramp	1	L	G
2	GROUND FLOOR			
-	Slab	3	M	H, J
-	Column	2	N	M, O
-	Beam	3	O	H, J
-	Stairs	1	P	Q
3	MEZZANINE			
-	Slab	2	Q	N
-	Column	1	R	Q, S
-	Beam	2	S	N
-	Stairs	1	T	U
4	2nd FLOOR			
-	Slab	3	U	R
-	Column	1	V	U, W
-	Beam	3	W	R
-	Stairs	1	X	Y
5	3rd FLOOR			
-	Slab	3	Y	V
-	Column	1	Z	Y, AA
-	Beam	3	AA	V
-	Stairs	1	AB	AC
6	4th FLOOR			
-	Slab	3	AC	Z
-	Column	1	AD	AC, AE
-	Beam	3	AE	Z
-	Stairs	1	AF	AG
7	5th FLOOR			
-	Slab	3	AG	AD
-	Column	1	AH	AG, AI
-	Beam	3	AI	AD
-	Stairs	1	AJ	AK
8	6th FLOOR			
-	Slab	3	AK	AH
-	Column	1	AL	AK, AM
-	Beam	3	AM	AH
-	Stairs	1	AN	AO
9	7th FLOOR			
-	Slab	3	AO	AL
-	Column	1	AP	AO, AQ
-	Beam	3	AQ	AL
-	Stairs	1	AR	AS
10	8th FLOOR			
-	Slab	3	AS	AP
-	Column	1	AT	AS, AU
-	Beam	3	AU	AP
-	Stairs	1	AV	AT
11	ROOF FLOOR			
-	Slab	3	AW	AT
-	Beam	3	AX	AT
12	Core Wall	11	AY	L
V	**FINISHING WORK**	9	AZ	AX

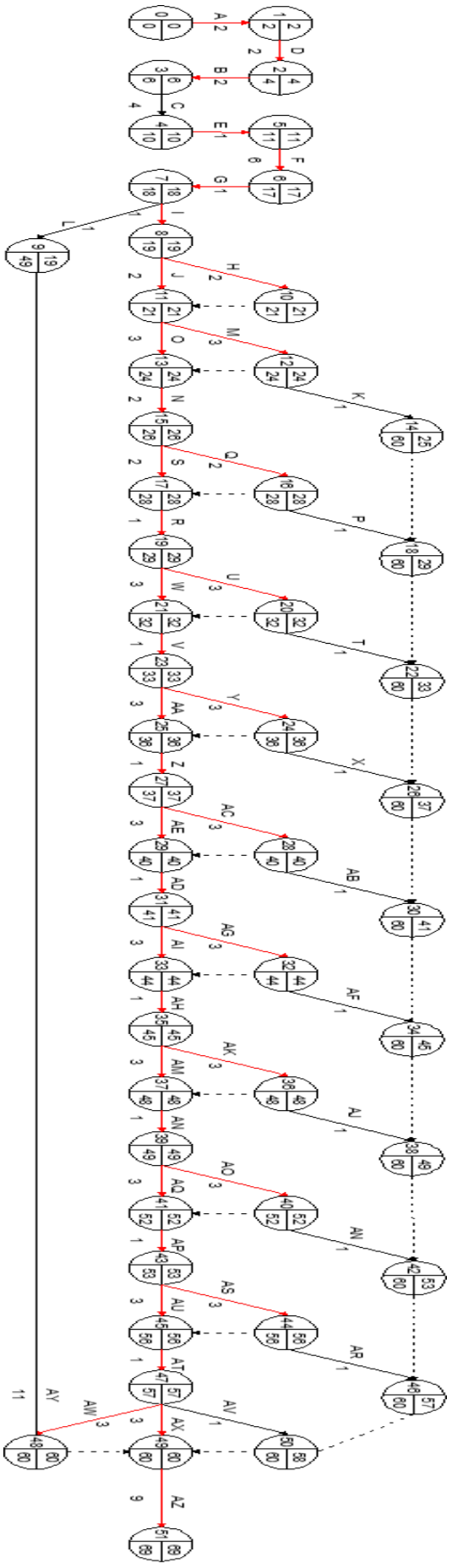


Figure 5. Critical Path

F. CASHFLOW

Tabel 7. Total Cashflow

PERIOD		COST OF STRUCTURE	COST OF ARCHITECTURE	COST OF MECHANICAL ELECTRICAL	TOTAL COST PER WEEK
APRIL 2017 - JULY 2018					
April 2017	1	15.220.380,00	0,00	0,00	15.220.380,00
	2	226.600.276,20	0,00	0,00	226.600.276,20
	3	306.748.347,08	0,00	0,00	306.748.347,08
	4	333.326.763,71	0,00	0,00	333.326.763,71
May 2017	5	166.252.531,45	0,00	0,00	166.252.531,45
	6	733.276.549,92	0,00	0,00	733.276.549,92
	7	733.276.549,92	0,00	0,00	733.276.549,92
	8	733.276.549,92	0,00	0,00	733.276.549,92
	9	220.825.730,61	0,00	0,00	220.825.730,61
June 2017	10	228.569.507,83	0,00	0,00	228.569.507,83
	11	312.014.897,83	0,00	0,00	312.014.897,83
	12	324.858.023,23	0,00	0,00	324.858.023,23
	13	320.672.666,90	0,00	0,00	320.672.666,90
July 2017	14	423.933.285,06	0,00	0,00	423.933.285,06
	15	162.239.987,21	0,00	0,00	162.239.987,21
	16	227.470.068,14	0,00	0,00	227.470.068,14
	17	473.308.043,75	0,00	0,00	473.308.043,75
August 2017	18	439.039.238,83	0,00	0,00	439.039.238,83
	19	320.683.780,56	0,00	0,00	320.683.780,56
	20	488.695.302,76	0,00	0,00	488.695.302,76
	21	309.393.372,27	0,00	0,00	309.393.372,27
	22	217.527.501,99	0,00	0,00	217.527.501,99
September 2017	23	180.262.559,21	0,00	0,00	180.262.559,21
	24	454.729.841,43	0,00	0,00	454.729.841,43
	25	298.415.422,92	0,00	0,00	298.415.422,92
	26	204.978.694,98	0,00	0,00	204.978.694,98
October 2017	27	198.236.484,36	0,00	0,00	198.236.484,36
	28	310.252.761,63	0,00	0,00	310.252.761,63
	29	346.971.117,16	0,00	0,00	346.971.117,16
	30	369.560.626,40	0,00	0,00	369.560.626,40
November 2017	31	448.396.733,58	0,00	32.684.990,00	481.081.723,58
	32	347.908.908,47	0,00	145.120.080,00	493.028.988,47
	33	346.971.117,16	0,00	37.691.610,00	384.662.727,16
	34	369.560.626,40	47.486.299,66	28.526.130,00	445.573.056,06
	35	416.118.042,11	97.959.092,13	36.370.176,00	550.447.310,24
December 2017	36	337.265.451,74	65.837.469,75	27.122.700,00	430.225.621,49
	37	346.971.117,16	79.155.204,94	37.748.790,00	463.875.112,10
	38	369.560.626,40	113.801.218,67	60.336.738,00	543.698.583,07
	39	416.118.042,11	50.711.253,84	27.360.540,00	494.189.835,96
January 2018	40	337.265.451,74	209.657.511,75	35.713.114,00	582.636.077,49
	41	346.971.117,16	300.579.872,97	37.780.650,00	685.331.640,13
	42	369.560.626,40	163.202.512,31	27.360.540,00	560.123.678,71
	43	416.118.042,11	209.157.513,68	35.713.114,00	660.988.669,80
	44	337.265.451,74	194.218.412,65	37.780.650,00	569.264.514,39
February 2018	45	346.971.117,16	246.801.741,16	46.193.842,00	639.966.700,32
	46	369.560.626,40	257.030.576,54	84.641.217,60	711.232.420,54
	47	401.148.540,91	211.020.845,74	117.352.420,00	729.521.806,65
	48	317.925.555,55	215.503.223,81	179.884.142,67	713.312.922,02
March 2018	49	346.971.117,16	206.305.094,12	188.236.716,67	741.512.927,94
	50	369.560.626,40	160.295.363,32	37.780.650,00	567.636.639,72
	51	401.148.540,91	244.457.067,53	27.360.540,00	672.966.148,44
	52	317.925.555,55	237.398.701,10	67.768.874,00	623.093.130,64
April 2018	53	346.971.117,16	180.811.854,00	191.421.186,00	719.204.157,16
	54	369.560.626,40	243.580.298,41	274.253.823,33	887.394.748,15
	55	395.834.751,08	220.314.541,24	163.903.064,00	780.052.356,32
	56	312.611.765,72	190.224.587,37	358.295.810,00	861.132.163,10
May 2018	57	346.971.117,16	246.801.198,70	278.584.520,00	872.356.835,86
	58	369.560.626,40	378.489.695,92	349.276.614,00	1.097.326.936,32
	59	332.479.689,08	566.855.047,39	290.144.790,00	1.189.479.526,48
	60	231.456.547,72	491.252.578,51	473.038.762,67	1.195.747.888,89
	61	0,00	582.429.975,85	403.747.582,67	986.177.558,52
June 2018	62	0,00	599.044.277,24	887.921.582,67	1.486.965.859,91
	63	0,00	576.026.289,05	818.630.402,67	1.394.656.691,72
	64	0,00	544.624.611,82	887.921.582,67	1.432.546.194,48
	65	0,00	462.457.958,65	666.106.800,00	1.128.564.758,65
July 2018	66	0,00	453.893.812,22	320.515.160,00	774.408.972,22
	67	0,00	455.262.563,05	251.223.980,00	706.486.543,05
	68	0,00	126.555.677,61	320.515.160,00	447.070.837,61
	69	0,00	37.703.815,89	269.036.690,00	306.740.505,89
Total		20.863.326.138,34	9.666.907.758,59	8.561.065.735,60	39.091.299.632,53

V. CONCLUSION AND SUGGESTION

A. CONCLUSION

1. The time required to complete the project is 69 weeks.
2. The cost required in complete the project is Rp. 39.091.299.632,53.
3. By using CPM, it is known that the critical path that occurs in the project is on A - D - B - C - E - F - G - I - J - O - N - S - R - W - V - AA - Z - AE - AD - AI - AH - AM - AN - AQ - AP - AU - AT - AX - AZ

B. SUGGESTION

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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