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CASH FLOW PLANNING STUDY ON THE HEAVY REHAB PROJECT OF THE ASH SHIRATAL MUSTAQIM TANJUNG GREAT MOSQUE PHASE 1

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ABSTRAK

Pengendalian biaya dan waktu sangat penting pada pelaksanaan kegiatan proyek konstruksi, pengendalian terhadap biaya dan waktu sendiri dilakukan untuk menghindari resiko-resiko yang mungkin terjadi yang diakibatkan oleh adanya permasalahan biaya maupun waktu. Salah satu usaha yang dilakukan terhadap pengendalian biaya dan waktu ialah rencana aliran kas (cash flow), aliran kas (cash flow) pada dasarnya adalah penerimaan yang bisa berupa uang muka, pinjaman dari bank ataupun dana sendiri, lalu pengeluarannya yang disebut dengan pembayaran. Tujuan dari penelitian ini adalah merencanakan cash flow pada Proyek Rehab Berat Masjid Agung Ash Shiratal Mustaqim Tanjung Tahap 1. Metode yang digunakan untuk menganalisis data adalah penjadwalan proyek dengan membuat uraian dan urutan setiap kegiatan dalam aktivitas proyek. Dilanjutkan dengan menentukan durasi waktu untuk setiap aktivitas kemudian membuat diagram jaringan proyek dengan metode PDM sehingga didapatkan dua kondisi penjadwalan yaitu EST (Earliest Start Time) dan LST (Latest Start Time). Setelah diagram jaringan proyek didapatkan akan dilakukan analisis cash flow dengan sistem pembayaran bulanan menggunakan uang muka sebesar 2,9% pada kondisi penjadwalan EST (Earliest Start Time) dan LST (Latest Start Time). Hasil analisis perencanaan cash flow dengan pembayaran bulanan menggunakan uang muka 2,9% menunjukan bahwa kondisi penjadwalan yang memberikan keuntungan maksimum adalah kondisi penjadwalan EST (Earliest Start Time) dengan total pinjaman sebesar Rp. 2.900.850.000,00- dengan persentase keuntungan adalah sebesar 7,16% sedangkan untuk kondisi penjadwalan LST (Latest Start Time), total pinjaman adalah sebesar Rp. 3.028.350.00,00-, dengan persentase keuntungan adalah sebesar 7,07%.

Kata kunci : Cash flow, PDM, Earliest Start Time, Latest Start Time

ABSTRACT

Cost and time control is very important in the implementation of construction project activities, control of costs and time itself is carried out to avoid risks that may occur due to cost or time problems. One of the efforts made to control costs and time is a cash flow plan, cash flow is basically receipts that can be in the form of advances, loans from banks or own funds, then the expenses are called payments. The purpose of this study is to plan cash flow on the Heavy Rehab Project of the Ash Shiratal Mustaqim Tanjung Great Mosque Phase 1. The method used to analyze the data is project scheduling by making a description and sequence of each activity in the project activity. Followed by determining the time duration for each activity and then making a project network diagram using the PDM method so that two scheduling conditions are obtained, namely EST (Earliest Start Time) and LST (Latest Start Time). After the project network diagram is obtained, a cash flow analysis will be carried out with a monthly payment system using an advance of 2.9% under EST (Earliest Start Time) and LST (Latest Start Time) scheduling conditions. The results of the analysis of cash flow planning with monthly payments using a 2.9% down payment show that the scheduling condition that provides the maximum profit is the EST (Earliest Start Time) scheduling condition with a total loan of Rp. 2,900,850,000.00- with a profit percentage of 7.16% while for LST (Latest Start Time) scheduling conditions, the total loan is Rp. 3,028,350.00,00-, with a profit percentage of 7.07%.

Keyword : Cash flow, PDM, Earliest Start Time, Latest Start Time

I. INTRODUCTION

Construction project is an activity that has a certain period of time with limited resources to carry out a predetermined task. In the implementation of construction projects, there are many risks that are interrelated with each other, as well as time risks related to cost risks. Time risk in construction projects can be in the form of delays in the project schedule from a predetermined time, while cost risk can be in the form of congestion in the flow of money due to the implementer not being good at managing his finances, causing schedule delays due to unavailability of funds to carry out the work.

To control the risks that may occur during the project implementation period, a cash flow plan is needed. This cash flow plan is basically an income that can be in the form of a down payment, a loan from a bank or one's own funds, then the expenditure can be called a payment.

the Ash Shiratal Mustaqim Tanjung Great Mosque is one of the mosques in Tabalong district which is the city of Tanjung, this mosque requires expansion and construction of a new mosque because the number of pilgrims who come can no longer be accommodated by this mosque. In the Heavy Rehab Project of the Great Mosque of ASH Shiratal Mustaqim Tanjung, the total funds planned to implement the project are Rp. 31,135,899,000.00. with funding sources coming from government grants and community donations and its implementation is carried out by self-management contracts.

In Phase I of the Heavy Rehab Project of the Ash Shiratal Mustaqim Tanjung Great Mosque, the funds to be used are Rp. 14,999,170,000.00, In this project the down payment paid by the mosque committee to the implementer is only about 2.9% of the available funds for phase 1. Due to the down payment given is only 2,9% of the contract value along with its implementation using a self-managed contract system, the authors feels the need to plan for cash flow in the Heavy Rehab Project of the Ash Shiratal Mustaqim Tanjung Great Mosque Phase 1.

II. THEORITICAL STUDY

Construction Projects

According to (Dipohusodo, 1996) a construction project is a project related to efforts to build an infrastructure building, which generally includes main work which includes civil engineering and architecture.

Self-management

According to the Goods/Services Procurement Agency of the Government of the Republic of Indonesia No. 3 of 2021 concerning Self-Management Guidelines. Procurement of goods/services through Swakelola is a way of obtaining goods/services which is carried outby the Ministry/Institution/ Regional Apparatus, Ministries/ Institutions/Regional Apparatuses, Ormas, or Community Groups.

Project Scheduling

The schedule is the elaboration of project planning into a sequence of steps for implementing work to achieve goals. The time factor has been included in the schedule. A well-known method of constructing a schedule is network analysis, which depicts on a graph the relationships of the project work sequences. Jobs whose flow precedes or are preceded by other jobs are identified in terms of time. This network is very useful for project planning and control (Soeharto, 1997). Meanwhile (Erivianto, 2002), said scheduling is an activity to determine the time required and the sequence of activities and determine when the project can be completed

The steps in determining project scheduling, namely (Soeharto, 1999):

1. Identification of activities (Work Breakdown Structure),
2. Preparation of the sequence of activities,

3. Estimated timeframe, and
4. Scheduling.

Project Scheduling Method

Managing a project will always look for the right method with the aim of improving the quality of time and schedule planning to deal with the number of activities and project complexity that tends to increase. So that there are methods such as the bar chart method and network analysis.

According to (Pardede, 2014), the methods used in project scheduling are as follows:

1. Bar chart,
2. S curve (hanumm curve),
3. Linear scheduling method (vector diagram),
4. CPM method (critical path method),
5. PDM method (precedence diagram method), and
6. PERT method (program evaluation and review technique).

PDM Method *(Precedence Diagram Method)*

The precedence diagram is also known as the node diagram or construction block diagram. According to (Erivianto, 2002) the advantages of PDM (Precedence Diagram Method) compared to Arrow Diagrams (CPM) are:

1. No fictitious or dummy activities are needed so network creation becomes simpler.
2. Different overlapping relationships can be created without increasing the number of activities

In PDM (Precedence Diagram Network) its use is not limited to the rules of the CPM network (Critical Path Method) where the activity starts when the activity that precedes it has been completed, then the relationship between activities develops into several possibilities in the form of constraints.

The constraint itself shows the relationship between activities with one node line to the next node. One constraint can only connect two nodes, because each node has two ends, namely the starting end = (S) and the end = (F). So according to (Soeharto, 1999), there are four kinds of constraints, namely:

1. Finish to Start Constraint
2. Start to Start Constraint
3. Finish to Finish Constraint
4. Finish to Finish Constraints

Cash Flow Analysis

Cash flow in a real sense, it is a realization or estimate of money inflows and outflows that occur in an investment within a certain period of time. Cash flow is formed from first cost estimates, working capital, operating costs, production costs and revenue (Soeharto, 1997). Cash flow can be divided into three groups, namely:

1. Initial cash flow
2. Operating cash flow
3. Final cash flow

Cash flow has a very important role in the implementation of a project, cash flow planning usually aims to find out the amount of loan money needed, the required loan schedule, loan repayment schedule, and the amount of loan interest that must be borne by the project. Cash flow has two main elements, namely, a schedule of receipts and a schedule of expenses. Meanwhile, the other elements are initial cash, financial, and ending cash.

Admission Schedule

In a construction project, the realization of revenue is very dependent on the payment system used, for the payment system itself has been stated in the agreement letter or construction contract. The planned number of admissions is usually related to how much job performance is.

Expenditure Schedule

The basic guide to spending is a plan of action. Expenditures for project financing, the pattern or system depends on the applied project operational policies, namely cash payments and payments for a certain period of time (credit)

Cash inflow and Cash outflow

Cash inflow in a construction project is the cash flow that enters the construction project. The source of cash inflow in the construction work itself comes from the installment payments of the project owner, the amount of which has been determined in the previous agreement with the contractor or project implementer.

Cash outflow in a construction project is the cash flow that comes out of the project. Cash outflow in construction work includes payments to suppliers for the purchase of materials and equipment, wages for labor, subcontractors, and so on.

Initial Cash

Initial cash is a fund that must be prepared at the beginning of project activities whose purpose is to make a project activity a physical reality. The initial cash flow will be returned from the receipt of money at the end of the project. Initial cash is usually required at the beginning of the project (first month).

Final Cash

Ending cash is the cash condition at the end of the month which is the sum of the cash after the initial cash and the financial total. Therefore, these cash flows come from returns on working capital and sales and fixed assets. Meanwhile, terminal cash flow is the salvage value of assets and returns on working capital.

Financial

Financial is a financial decision to overcome and adjust cash conditions after the initial cash. If the condition of cash after completion of the initial cash deficit, it is necessary to find a way out such as entering loan funds and when the surplus is large enough it can be used to repay the loan (if there is a loan). The benchmark when making a decision to borrow funds is the level/amount of loan interest rates that are being paid (Asiyanto, 2005).

Retention (Retention)

Retention is a guarantee that aims to guarantee the project owner that the contractor will make repairs if there is damage during the maintenance period. Retention of 5% of the contract value will be returned after the project is completed (after maintenance).

Islamic Bank

Islamic Bank is a bank that carries out its business activities based on Sharia principles consisting of Sharia Commercial Banks and Sharia People's Financing Banks (Muthaher, 2012). The Sharia principle (akad) that will be used in this research is the musharaka principle. The principle of equity participation (musyarakah) in its meaning is a cooperation agreement between two or more parties for a certain type of business in which each party contributes funds (charity/expertise) with an agreement that the profits and risks will be shared in accordance with the agreement.

After the contract to be used is determined, the next step is to determine the ratio related to profit sharing from the management of funds that have been given to customers. Profit sharing system is a system where there is a mutual agreement or bond between two or more parties in conducting joint business activities. The determination of the size of the profit sharing portion between two or more parties is determined according to a mutual agreement, and must

be carried out based on the willingness (An-Tarodhin) of each party without coercion, the amount of profit sharing is in the form of a percentage.

Tax

Taxes are contributions paid by the people to the state which will later be included in the state treasury based on the law by not getting compensation services that can be used directly to pay for public needs.

Value Added Tax

Value Added Tax is an indirect tax imposed on every value added or transaction of delivery of taxable goods and or services in its distribution from producers and consumers. . VAT itself uses a single rate, where the VAT rate is only one, namely 10% so that it can facilitate the implementation by taxpayers as well as their supervision. This is based on Law No. 11 of 1994 Article 7 paragraph (1).

Income Tax

The determination of the amount of Income Tax (PPh) is based on Government Regulation of the Republic of Indonesia Number 51 of 2008 concerning Income Tax from Construction Services Business PPh Article 3 paragraphs 1 and 2 ,

Income Tax rates for the Construction Services business are as follows:

1. 2% (two percent) for Construction Implementation carried out by Service Providers who have small business qualifications;
2. 4% (four percent) for Construction Implementation carried out by Service Providers who do not have business qualifications;
3. 3% (three percent) for Construction Implementation carried out by Service Providers other than Service Providers as referred to in letters a and b;
4. 4% (four percent) for Construction Planning or Construction Supervision carried out by Service Providers who have business qualifications; and
5. 6% (six percent) for Construction Planning or Construction Supervision carried out by Service Providers who do not have business qualifications.

Overdraft

To find out the amount of bank credit that must be made, the contractor needs to know the maximum Overdraft that will occur during the life of the project. Overdraft is the difference between expenditures on a project and payments from the owner to the contractor, so it is a necessity for the contractor to provide funds first before receiving payments from the owner (Halpin, 1998).

III. METHOD

Data Collection

Based on the type of data, the data needed is divided into two, namely qualitative data and quantitative data, where qualitative data is data obtained from agencies in the form of information both orally and in writing while quantitative data is data obtained from field implementers in the form of numbers or numbers, both obtained from measurement results and by converting qualitative data into quantitative ones. Meanwhile, based on the data source is divided into two, namely:

1. Primary Data

Primary data is data obtained directly from the field, namely from the Heavy Rehab Project of the Ash Shiratal Mustaqim Tanjung Great Mosque Phase 1 The primary data obtained will be used to support the background of the problem in this study.

2. Secondary Data

Secondary data is data obtained from literature studies, written works and literatures related to the thesis being worked on. Secondary data collected in the form of:

a. Contract Documents, to obtain the payment system carried out in the project and the amount of the advance paid
b. Budget Plan (RAB), to get a description of the work items and the total cost used.
c. Time schedule, to get the duration and weight of each work item

Data Processing and Data Analysis

After the required data is collected (RAB, time schedule, and contract documents) then the data will be processed and analyzed in order to obtain an overview and conclusions. The following are the steps taken for processing and analyzing data for cash flow research on the Heavy Rehab Project of the Ash Shiratal Mustaqim Tanjung Great Mosque Phase 1.

Project Scheduling.

1. Make a description and sequence of each activity in the project activity with,
2. Determine the time duration for each activity,
3. Make a project network diagram using the PDM method, and
4. Make a work schedule (time schedule) and work weights (S curve), from the results of the S curve, you will get a work schedule (time schedule) EST (Earliest Start Time) and LST (Lates Start Time).

Cash Flow Analysis (Cashflow)

At this stage the expenditure and income will be examined against the estimated cash flow so that the cash flow will be known and be controlled, the stages of cash flow analysis include:

1. Cash Inflow
    a. Advance payment
    b. Bill payment,
    c. Payments from work and other activities outside the contract, and
    d. Other income.
2. Outflow of funds (cash outflow)
    a. Direct costs which can be in the form of wages, material costs, equipment costs, and other direct costs.
    b. Indirect costs such as office overhead costs and head office overhead costs.
    c. VAT tax is 10% and PPh tax is 3%

Analysis of Payment System Variations

The cash flow that is displayed is adjusted to the receipts from the payment system analyzed, namely from the monthly payment system by borrowing capital funds submitted to a 3rd party, where in this study the 3rd party is a Islamic Bank.

Cash flow calculation steps

The steps for calculating cash flow in this study are as follows:

1. Outflow (Cash Out)
    a. The Implementation Budget Plan (RAP) is as follows:
    RAB = RAP + Taxes
    RAP = RAB – (VAT+PPh)
    RAP = RAB – (10% + 3%)
    RAP = RAB – 13% RAB
    RAP = 0.87 RAB
    b. Indirect costs / project overhead Indirect
    costs = 0.05 RAB
    c. Direct Cost

= RAP – Indirect Cost
= 0.87 RAB – 0.05 RAB
= 0.82 RAB

2. Inflow (Cash In)
   a. Bills
      = Achievements
      = RAP + VAT + PPh Tax
      = 0.87 RAB + 0.13 RAB
      = RAB
   b. Assuming 5% of retention
      Retention = 0.05 x Bill
      = 0.05 RAB
   c. Payment
      = Invoice – retention – (advance/payment amount)
3. Calculation of cash flow can be written as follows:
   Overdraft = RAP – Payment
4. Profit Sharing Calculation
   a. The financing ceiling is the amount of funds issued by Islamic banks, i.e. the total nominal Overdraft is negative, provided that the maximum ceiling for the capital participation provided must not exceed 70% of the net project value (Project value before PPn-PPh-Project Profits) based on (Abma, 2020)
      Ceiling = Largest Overdraft
   b. It is assumed that the profit-sharing rate of Islamic banks (expected rate) is 10%, so the projected income of Islamic banks is:
      Projected profit
      = ceiling x$\frac{project\ duration}{12}$x 10%
   c. Profit sharing ratio of the Bank
      = $\frac{\text{Projected profit}}{Project\ prrofit}$
   d. Contractor's profit sharing ratio
      = 100% - Bank's ratio
   e. Bank’s Profit Sharing
      = Profit x Ratio forresults the Bank
   f. Contractor Profit Sharing
      = Profit x Profit sharing ratio Contractor

Flowchart

In this study, the analysis is carried out by making alternative cash flow plans with sources of funds from Islamic banks based on the PDM network diagram scheduling. It can seen in Figure 3.1 flow chart of the stages carried out in this research.

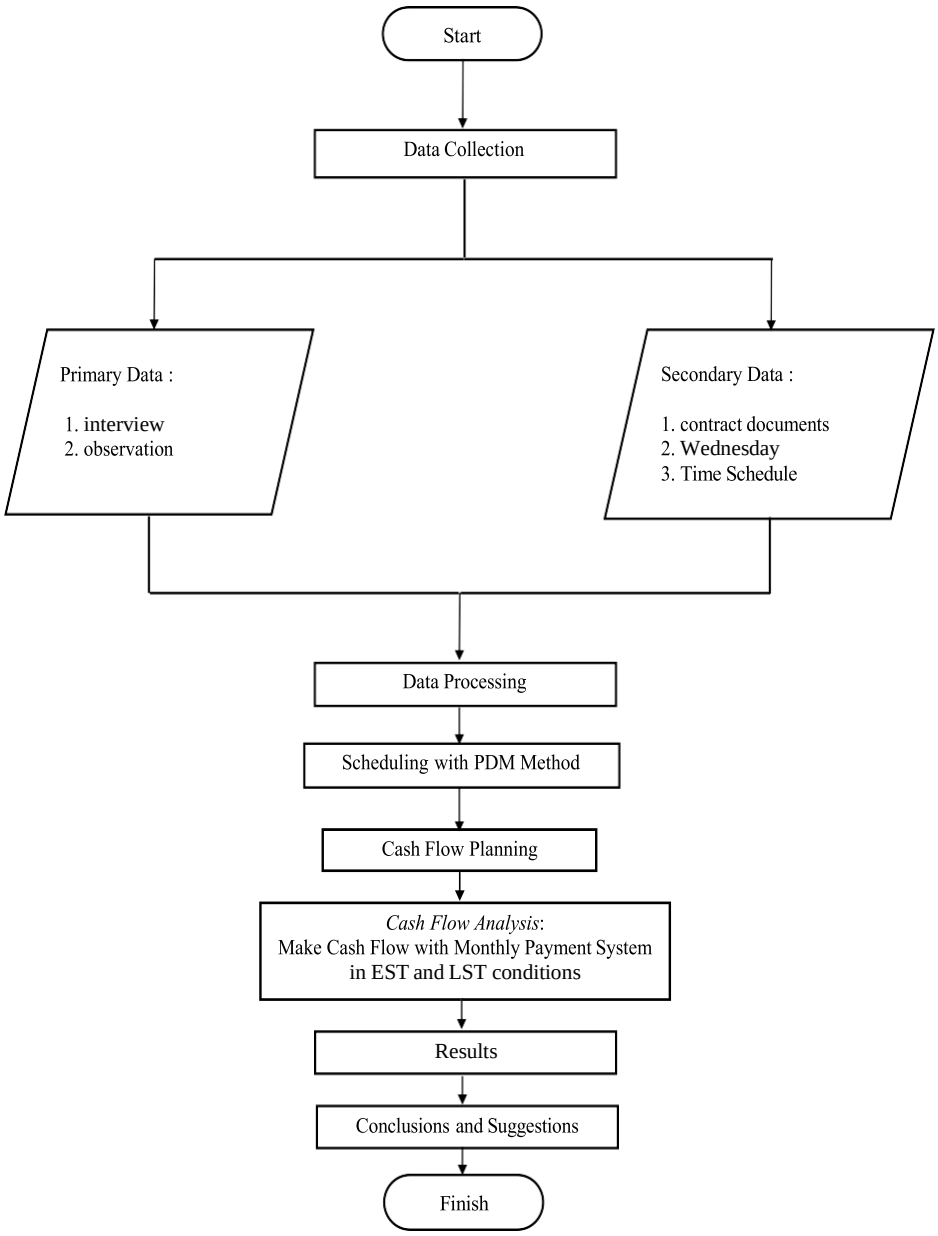

Figure 3.1 Flowchart

RESULT AND DISCUSSION

The Heavy Rehab Project of the Ash Shiratal Mustaqim Tanjung Great Mosque Phase 1 has a Project Value of Rp. 14,999,170,000, and the duration of the work is 184 calendar days (24 weeks) with starting time on 01 July 2021 until 31 December 2021.

Project Data

The data used in writing this Final Project is only secondary data obtained from the Heavy Rehab Project of the Ash Shiratal Mustaqim Tanjung Great Mosque Phase 1, secondary data used are general project data, time schedule, budget plan (RAB), and contract documents. In writing this final project will be analyzed with a monthly payment system. The project time schedule is made in two conditions, namely the EST (Earliest Start Time) scheduling condition and the LST (Latest Start Time) scheduling condition obtained from data processing by outlining and making each activity sequence in the activity using the PDM method. Next, a cash flow analysis will be made for a monthly payment system with an down payment of 2.9%

of the contract value under EST (Earliest Start Time) and LST (Latest Start Time) scheduling conditions.

Identification of Activities (Work Breakdown Structure)

The Work breakdown structure (WBS) will write in detail the work items to be carried out in the implementation of a construction project, as will be shown in Table 4.1

Table 4.1 WBS the Heavy Rehab Project of the Ash Shiratal Mustaqim Tanjung Great Mosque Phase 1

URAIAN PEKERJAAN	GROUP WORK WORK	
INTRODUCTION/ PREPARATION	1	Work demolition and cleaning of the old mosque and tower
	2	Construction of a safety fence around the work site (light steel frame zinc material)
	3	Making temporary roofs for places of worship with light steel frames
	4	Making temporary walls for places of worship
	5	Keet and warehouse directors manufacture
	6	Excavator Equipment Rental for Excavation & Backfill + BBM
	7	Scaffolding Rental
	8	Rent a Concrete Pump
SOIL/SAND/CHANNEL/SIRING WORKS	1	Sand fill under the foundation
	2	Siir reinforced concrete top width 20cm bottom width 40cm height 100cm :
		c. Formwork for foundation siding
	3	100x100x100 reinforced concrete channel + 15 cm thick concrete cover :
SOIL/SAND/FOUNDATION WORKS	1	Urugan pasir di bawah pondasi
	2	Pengadaan dan Jasa Pemancangan mini pile (20 cm x 20cm x 6 M) sistem injection
REINFORCED CONCRETE WORK	1	Floor cast concrete work (K-100) (poer)
	2	Porer plates
	3	Reinforced concrete sloof
	4	Column reinforced concrete
	5	Column Reinforced Concrete Tower
	6	Mihrab . reinforced concrete columns
	7	Reinforced concrete beams over trasraam
	8	Floor II reinforced concrete beams (± 4.9 m)
	9	Reinforced concrete slabs Lt.II
	10	slab reinforced concrete list plank Lt.II
	11	Reinforced concrete Daag Beams (± 8.00 m)
	12	reinforced concrete slabs (± 8.00 m)
	13	Reinforced concrete list plank (± 8.00 m)
	14	Reinforced concrete Daag Beams (± 9.60 m)
	15	Reinforced concrete slab (± 9.60 m)
	16	List plank slab reinforced concrete (± 9.60 m)
	17	Reinforced Concrete Daag Beams (± 10.50 m ;± 11.60 m;± 12.00 m)
	18	reinforced concrete slabs (± 10.50 m ; ± 11.60 m ; 12.00 m)
	19	Reinforced concrete list plank plate (± 10.50 m ; ± 11.60 m ,± 12.00 m
	20	Reinforced concrete inclined slab on tower
	21	Plate sunscreen A
	22	plate sunscreen B
	23	Plat sunscreen C
	24	plate sunscreen D
	25	Tower concrete beams ± 25 m
	26	Tower plate ± 25 m
	27	Plate list tower ± 25 m
	28	Tower concrete beams ± 27.7 m
	29	Tower plate ± 27.7 m
	30	Plate list tower ± 27.7 m
	31	Stair plate (upright t.20 cm)
	32	Ladder plate (slanted h.12 cm)
	33	Ladder plate (bordes t.15 cm)
	34	Stair plate (steps)
WALL WORKS	1	Pair of masonry trasram t.1/2 bt (above the sloof, terrace stairs)
	2	Plastering 1 SP : 2 PP 15 mm thick
	3	Pair of brick walls camp.1:2 (Ablutions) t.1/2 bt
	4	Plaster 1 SP : 2 PP 15 mm thick
	5	Pair of walls bt. thick brick camp stone. 1 SP : 4 PP
	6	Plastering 1 SP : 4 PP 15 mm thick
FLOOR WORKS	1	Bottom floor cast concrete t.7 cm (K-100)
		Wiremesh M8 150x150
		Backfill sand under floor t.20 cm
		Pile under floor t.108 cm

URAIAN PEKERJAAN	GROUP WORK WORK	
DOME WORK	1	Dome of the mosque made of copper + top decoration
CEILING WORK		
DOOR/GLASS/WINDOW WORK		**First Floor**
	1	Floor beam 10/15
		- Second Floor
	1	Floor beam 10/15
		- Upstairs / Tower
	1	Floor beam 10/15
SANITATION & WATER INSTALLATION WORK	1	Squat toilet
	2	tubs of fitting water. ceramic-coated bricks
	3	Floor drain
	4	water faucets (ablution)
	5	places for ablution:
		pas.bata camp.1 : 2 (1/2 bt)
		stucco camp.1:2
		fit. Granite 60 x 60 equivalent to Granito Salsa Waterstone color
	5	Clean water installation
	6	Dirty water installation
	7	Clean water connection
	8	Bio septic tank 2500 liters
OTHER OCCUPATIONS	1	K3 (Occupational Health & Safety) Cost
	2	Technical Supervision Consultant Fee

Dependency Logic List

The list of dependence on the Heavy Rehab Project of the Ash Shiratal Mustaqim Tanjung Great Mosque Phase 1 is obtained based on the list of durations of each project activity which can also be seen in Table 4.2.

Table 4.2 Dependency Logic List

No.	Type of Work	Symbols	Logical Dependence	Duration of Activity
1	Construction of a protective fence around the work site (zinc material for light steel frames)	A	-	3
2	Construction of directors of keet and warehouse	B	-	2
3	Construction of temporary roofs for places of worship with light steel frames	C	A-C (SS=1)	1
4	Construction of temporary walls for places of worship	D	A-D (SS=1)	3
5	Cast concrete work floor (K-100) (poer)	E	B-E (SS=1)	3
6	Porer plate	F	B-F (SS=1)	8
7	Demolition work and cleaning of old mosque buildings and towers	G	C-G (FS=0)	8
8	Scaffolding	H	G-H (SS=0)	6
9	Procurement and services for piling mini piles (20cm x 20cm x 6 M) injection system	I	H-I (SS=1)	5
10	Reinforced concrete sloof	J	D-J (FS=0) E-J (FS=0)	7
11	Reinforced concrete column	K	J-K (SS=0)	12
12	Sand fill under foundation	L	I-L (FF=1)	2
13	Reinforced concrete column tower	M	L-M (FS=0) F-M (FS=0)	11
14	Reinforced concrete beam over trasram	N	M-N (SS=0)	3
15	Backfill under floor t.108 cm	O	N-O (SS=2)	3
16	Reinforced concrete beam Lt. II (+4.9 m)	P	G-P (FS=0)	5
17	Reinforced concrete slab Lt.II	Q	P-Q (SS=0)	5
18	List plank reinforced concrete Lt. II	R	Q-R (SS=1)	5
19	Reinforced concrete beams (+8.00 m)	S	R-S (SS=0)	5
20	Backfill sand under floor t.20 cm	T	O-T (SS=2)	3
21	Reinforced concrete slab (+8.00 m)	U	S-U (SS=1)	5
22	Reinforced concrete column mihrab	BW	U-BW (SS=0)	4
23	Reinforced concrete list plank slab (+8.00 m)	V	U-V (SS=0)	5
24	Reinforced concrete beams (+9.60 m)	W	V-W (SS=0)	5
25	Reinforced concrete slabs (+9.60 m)	X	W-X (SS=0)	5
26	Trasram brick masonry t 1/2 bt (above sloof, terrace stairs)	Y	T-Y (FF=2)	4

No.	Type of Work	Symbols	Logical Dependence	Duration of Activity
27	Underfloor cast concrete t.7cm (K-100)	Z	Y-Z (SS=0)	3
28	Steel Wiremesh M8 150x150	AA	Z-AA (SS=0)	3
29	Reinforced concrete list plank plate (+9.60 m)	AB	U-AB (SS=1) BW-AB (SS=1)	5
30	Reinforced concrete beams (+10.50 m; + 11.60 m; 12.00 m)	AC	AB-AC (SS=0)	5
31	Reinforced concrete slab (+10.50 m; + 11.60 m; 12.00 m)	AD	AC-AD (SS=0)	5
32	Reinforced concrete list plank slab (+10.50 m; + 11.60 m; 12.00 m)	AE	AD-AE (SS=0)	5
33	Plastering 1 SP : 2 PP 15 mm thick	AF	Y-AF (SS=1)	4
34	Pair of brick walls camp 1:2 (ablution place) t 1/2 bt	AG	AF-AG (SS=0)	4
35	Pair of walls bt thick brick 1/2 camp stone 1 SP : 4 SP	AH	AG-AH (SS=0)	8
36	Excavator rental for excavation & backfill + BBM	BX	T-BX (FS=0)	3
37	Sloping reinforced concrete slab on tower	AI	BX-AI (SS=0) AE-AI (FF=1)	5
38	Sunscreen plate A	AJ	AI-AJ (SS=0)	5
39	Plate sunscreen B	AK	AJ-AK (SS=0)	5
40	Sunscreen plate C	AL	AA-AL (FS=0)	5
41	Sunscreen plate D	AM	AL-AM (SS=0)	5
42	Tower concrete beam +25 m	AN	AM-AN (SS=0)	5
43	Rent a concrete pump	AO	K-AO (FS=0)	7
44	Tower plate + 25 m	AP	AO-AP (SS=0)	5
45	tower plate list	AQ	AP-AQ (SS=0)	5
46	Concrete tower beam +27.7 m	AR	AQ-AR (SS=0)	5
47	Plastering 1 SP : 2 SP 15 mm thick	AS	AF-AS (SS=3)	4
48	Plastering 1 SP : 4 PP 15 mm thick	AT	AN-AT (SS=1) AH-AT (FF=1)	6
49	Tower plate + 27.7 m	AU	X-AU (FS=0)	5
50	Floor I (Beam 10/15)	AV	AR-AV (FF=0)	4
51	Clean water installation	AW	AV-AW (SS=0)	2
52	Installation of dirty water	AX	AW-AX (SS=0)	2
53	Bio septic tank	AY	AX-AY (SS=0)	1
54	Sand fill under slate foundation	AZ	AO-AZ (SS=2)	2
55	Reinforced concrete girder top width 20 cm bottom width 40cm height	BA	AZ-BA (SS=0)	5
56	Reinforced concrete channel 100x100x100 + concrete cover 15 cm thick	BB	BA-BB (SS=0)	4
57	Plate list tower ± 27.7 m	BC	AU-BC(SS=1)	5
58	Ladder plate (upright t.20 cm)	BD	AZ-BD (SS=0)	5
59	Ladder plate (slanted t.12 cm)	BE	BA-BE (SS=0)	5
60	Stair plate (bordes t.15 cm)	BF	BB-BF (SS=0) BE-BF (FF=0)	5
61	Stair plate (steps)	BG	BF-BG (SS=0) BD-BG (SS=0)	5
62	Second Floor (Beam 10/15)	BH	AV-BH (SS=1)	4
63	Squat toilet	BI	BH-BI (SS=0)	1
64	Tiled brick fitting water tub	BJ	BI-BJ (SS=0)	1
65	Floor drain	BK	BI-BK (SS=0)	1
66	Place for ablution (Pas.bata camp 1: 2 (1/2bt))	BM	AY-BM (FS=0) BK-BM (SS=0)	2
67	Dome of the mosque copper + top trim	BN	AK-BN (FS=0) BC-BN (FF=0)	4
68	Second Floor (krawang GRC)	BO	BG-BO (FF=0)	4
69	Upper Floor/tower (Beams 10th floor/ 15)	BP	BO-BP (SS=0)	4
70	Plastering camp 1:2	BQ	BP-BQ (SS=0)	1
71	Pas.Granite 60 x 60 equivalent to granito salsa waterstone color	BR	BQ-BR (SS=0)	2
72	Water faucet (ablution)	BS	BM-BS (FS=0)	1
73	Connecting clean water	BT	BS-BT (FS=0)	1
74	Cost of K3 (health & safety)	BU	BT-BU (FS=0)	1
75	Cost of technical supervision consultant	BV	BU-BV (SS=0) BR-BV (FS=1)	1

Network Diagram

After getting the dependency logic list, the network scheduling will be arranged, the network in this study uses the PDM (Precedence Diagram Method) method. The PDMnetwork (Precedence Diagram Method) can be seen in Figure 4.1

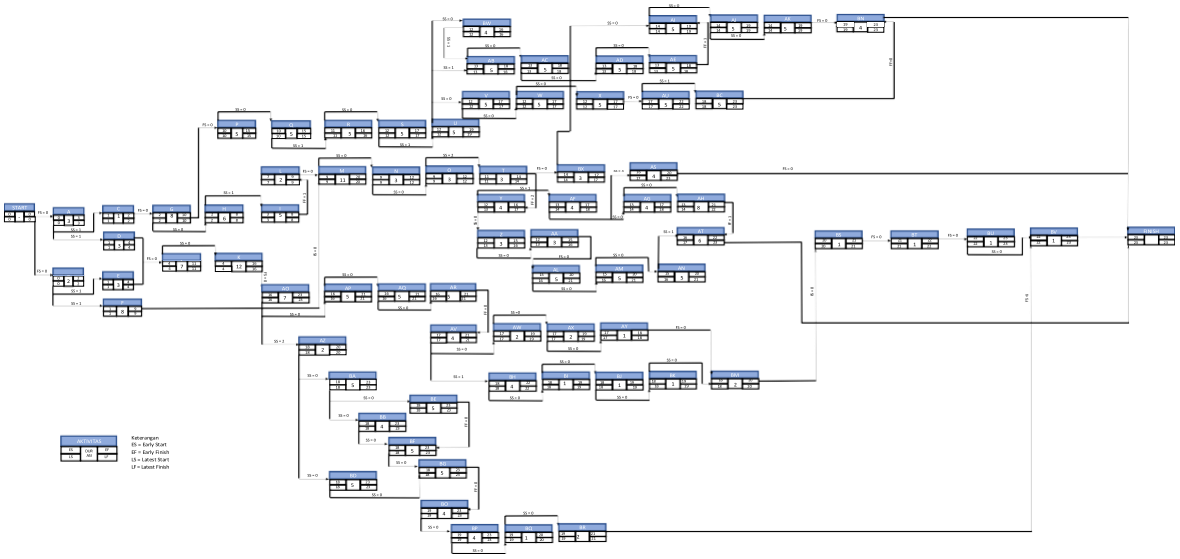

Figure 4.1 Network Planning

Based on the network that has been obtained, a Barchart and PDM S Curve will be compiled with EST and LST conditions, which can be seen in Figure 4.2 and Figure 4.3

Figure 4.2 S.curve for EST scheduling conditions (Earliest Strat Time)

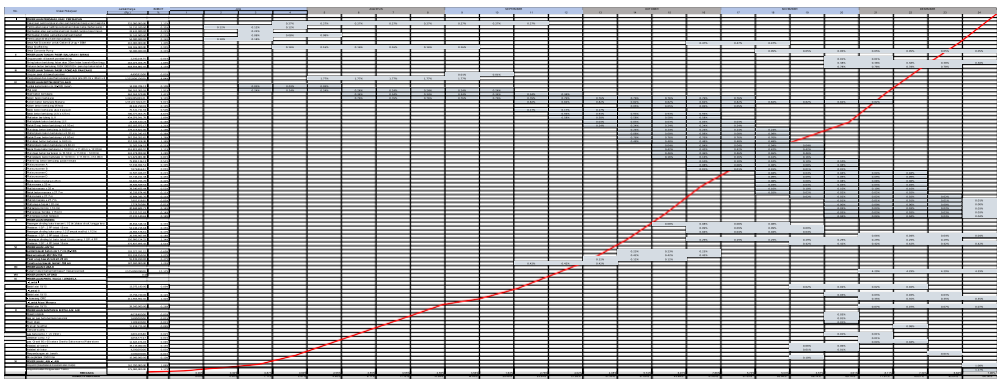

Figure 4.3 S.curve for LST scheduling conditions (Latest Strat Time)

Calculation of *Cash Flow*

The cash flow plan for project financing in this study uses an down payment from the owner of 2.9% with the payment system carried out is a monthly payment system (Monthly Payment) and the capital funds are borrowed from a 3rd party, namely Islamic Banks.

Project cash in is based on monthly net income, advances and additions from bank loans, while cash out is based on the weight of work each month according to the scheduling plan that has been made. The profit sharing is carried out twice, namely the payment of profit sharing when the project is completed and after the maintenance period ends.

Calculation of Alternative I

This calculation is based on EST (Earliest Start Time) Scheduling with a monthly payment system with an advance of 2.9% of the contract value (2.9% x Rp. 14,999,170,000.00-) which is Rp. 434,975,930.00- in the Heavy Rehab Project of the Ash Shiratal Mustaqim Tanjung Great Mosque Phase 1 is as follows, Table 4.3. shows the total work performance per month based on Earliest start time (EST) conditions.

Table 4.3 Monthly Employment Achievement

PERIOD	JOB ACHIEVEMENT(WEEKLY)				TOTAL
	1st Week	2nd Week	3rd Week	4th Week	
MONTH 1	0.00%	0.30%	0.87%	0.90%	2.07%
MONTH 2	2.55%	3.55%	3.55%	3.55%	13.19%
MONTH 3	3.56%	1.63%	2.78%	4.02%	11.99%
MONTH 4	4.08%	5.83%	7.33%	7.86%	25.10%
MONTH 5	5.91%	5.41%	3.48%	3.66%	18.46%
MONTH 6	8.11%	7.08%	6.50%	7.49%	29.19%
TOTAL					100.00%

In Table 4.4 can be seen the result of the calculation of cash flow with an advance in the amount of 2.9% and the credit-card system used is a system of monthly payments (monthly payment) under conditions of scheduling the earliest start time(EST)

Table 4.4 Cash flow Monthly Payment System Scheduling Condition Earliest Start Time (EST)

DESCRIPTION	PERIODE								TOTA
	MONTH 0th	MONTH 1st	MONTH 2nd	MONTH 3rd	MONTH 4th	MONTH 5th	MONTH 6th	MONTH 7th	MONTH 13th MONTH
JOB ACHIEVEMENT (%)		2.07%	13.19%	11.99%	25.10%	18.46%	29.19%		
CASH OUT									
RAB	Rp -	Rp 282,341,191	Rp 1,799,071,957	Rp 1,635,400,547	Rp 3,422,560,437	Rp 2,516,618,947	Rp 3,979,616,027	Rp -	
RAP	Rp -	Rp 245,636,836	Rp 1,565,192,603	Rp 1,422,798,476	Rp 2,977,627,580	Rp 2,189,458,484	Rp 3,462,265,943	Rp	
COSTS INDIRECT	Rp -	Rp 14,117,060	Rp 89,953,598	Rp 81,770,027	Rp 171,128,022	Rp 125,830,947	Rp 198,980,801		
DIRECT COSTS	Rp -	Rp 231,519,776	Rp 1,475,239,005	Rp 1,341,028,449	Rp 2,806,499,558	Rp 2,063,627,537	Rp 3,26		
CASH IN									
REVENUE / CHARGES	Rp -	Rp 310,575,310	Rp 1,978,979,153	Rp 1,798,940,602	Rp 3,764,816,480	Rp 2,768,			
ADVANCES	Rp 434,975,930	Rp -	Rp -	Rp -	Rp -	Rp			
VAT 10%	Rp -	Rp 28,234,119	Rp 179,907,196	Rp 163,540,055	Rp 342,256				
ACCEPTANCE AFTER VAT	Rp -	Rp 282,341,191	Rp 1,799,071,957	Rp 1,635,400,547	Rp				
PPH 3%	Rp -	Rp 8,470,236	Rp 53,972,159	Rp 49,062,0					
INSTALLMENT ADVANCES	Rp -	Rp 9,006,684	Rp 57,390,395	Rp					
RETENTION	Rp -	Rp 15,528,765	Rp 98,948,9						
NET REVENUE	Rp -	Rp 249,335,505	Rp						
CASH FLOW	PERIODE KE-0	PERIODE KE-1							
BALANCES	Rp 434,975,930	Rp							
LOAN	Rp								
LOAN INTEREST									
PAY LOANS									
FINAL CASH									
LOAN									

Based on the calculations that have been made, it can be seen in Table 4.4 that the profit obtained is Rp. 1,363,560,909, with the loan amount used is Rp. 2,900,850,000. After getting the amount of profit along with the amount of the loan, it will be continued with the calculation of profit sharing.

Profit Sharing Calculation

Profit sharing is a contract or agreement on profits that is agreed between those who are given the capital and those that include the capital. The following is the calculation for the results of the Cash flow plan.

After the Project is Completed

a. RAB before VAT

= Rp. 14,999,170,000

b. Project PPh value

= 3% x RAB before VAT
= 3% x Rp 14,999,170,000
= Rp 449,975,100

c. Contractor Profit

= Rp. 613,602,409

d. Net project value
= RAB before VAT – Project PPh value – Contractor profit
= Rp. 14,999,170,000 – Rp. 449,975,100 – Rp. 613,602,409
= Rp. 13,935,592,491

e. Value of equity participation
= 70% x net project value
= 70% x Rp 13,935,592,491
= Rp 9,754,914,743

f. Plafon
= The largest overhead
= Rp. 2.900.85 million

g. Loan age = 6 months

h. Projected profit
= ceiling x $\frac{Project\ duration}{12}$ x 10%

=Rp. 2,900,850,000 x $\frac{6}{12}$ x 10%

= Rp 145,042,500

i. Bank Ratio
= $\frac{Projected\ Profit}{Profit\ Kontraktor}$ x 100%

= $\frac{Rp.\ 145.042.500}{Rp.\ 613.602.409}$ x 100%
= 23.64%

j. Contractor Ratio
= 100% - Bank Ratio
= 100% - 23.64%
= 76.36%

k. Bank Profit Sharing
=Ratio x Contractor Profit
= 23.64 % x Rp. 613,602,409
= Rp. 145,042,500

l. Contractor's Profit Sharing
=Ratio x Contractor's Profit
= 76.36 % x Rp. 613,602,409
= Rp. 468,559,909

The calculation of Profit Sharing between Sharia Banks and contractors is more complete, can be seen in Table 4.5

Table 4.5 Profit Sharing Calculations for Cash Flow of the Ash Shiratal Mustaqim Tanjung Grand Mosque Phase 1

In Table 4.5 it can be seen that the profit sharing obtained by Islamic Banks and Contractors with the EST (Earliest Start Time) scheduling condition is for profit sharing carried out at the time of the project is completed. Islamic Banks with a ratio of 23.64% get a profit-sharing profit of Rp. 145,042,500 and for contractors with a ratio of 76.36% get a profit sharing of Rp. 468,559,909.

Meanwhile, for profit sharing payments made after the maintenance period is complete, Sharia Banks with a ratio of 19.34% get a profit sharing of Rp. 145,042,500 and for contractors with a ratio of 80.66% get a profit sharing of Rp. 604,916,000. so that the total profit-sharing for each Islamic Bank and Contractor is Rp. 290,085,000 and Rp. 1,073,475,909.

Alternative II

Calculation This calculation is based on LST Scheduling (Latest Start Time) with a monthly payment system with an advance of 2.9% of the contract value (2.9% x Rp. 14,999,170,000.00-) which is Rp. 434,975,930.00- in the Heavy Rehab Project of the Ash

Shiratal Mustaqim Tanjung Great Mosque Phase 1 is as follows, Table 4.6. shows the total monthly work performance based on Earliest start time (EST) conditions.

Table 4.6 Monthly Job Performance.

PERIOD	JOB ACHIEVEMENT(WEEKLY)				TOTAL
	1st Week	2nd Week	3rd Week	4th Week	
MONTH 1	0.00%	0.30%	0.87%	0.90%	2.07%
MONTH 2	2.55%	3.55%	3.55%	3.55%	13.19%
MONTH 3	3.56%	1.63%	2.78%	4.02%	11.99%
MONTH 4	4.08%	5.74%	6.91%	7.86%	24.59%
MONTH 5	5.70%	5.03%	3.57%	3.61%	17.90%
MONTH 6	8.11%	7.34%	6.84%	7.96%	30.24%
TOTAL					100.00%

In Table 4.7, it can be seen the results of thecalculation cash flow with the monthly payment system (mothly payment) under EST conditions.

Table 4.7 Cash flow Monthly Payment System Scheduling Condition Earliest Start Time (EST)

DESCRIPTION	PERIODE								TOT
	BULAN KE-0	BULAN KE-1	BULAN KE-2	BULAN KE-3	BULAN KE-4	BULAN KE-5	BULAN KE-6	BULAN KE-7	BULAN KE-13
JOB ACHIEVEMENT (%)		2.07%	13.19%	11.99%	24.59%	17.90%	30.24%		
CASH OUT									
RAB	Rp -	Rp 282,341,191	Rp 1,799,071,957	Rp 1,635,400,547	Rp 3,353,588,751	Rp 2,441,243,930	Rp 4,123,962,730	Rp	
RAP	Rp -	Rp 245,636,836	Rp 1,565,192,603	Rp 1,422,798,476	Rp 2,917,622,214	Rp 2,123,882,219	Rp 3,587,847,575	Rp	
COSTS INDIRECT	Rp -	Rp 14,117,060	Rp 89,953,598	Rp 81,770,027	Rp 167,679,438	Rp 122,062,196	Rp 206,198		
DIRECT COSTS	Rp -	Rp 231,519,776	Rp 1,475,239,005	Rp 1,341,028,449	Rp 2,749,942,776	Rp 2,001,820,022	Rp		
CASH IN									
REVENUE / CHARGES	Rp -	Rp 310,575,310	Rp 1,978,979,153	Rp 1,798,940,602	Rp 3,688,947,626	Rp			
ADVANCES	Rp 434,975,930	Rp -	Rp -	Rp -	Rp				
VAT 10%	Rp -	Rp 28,234,119	Rp 179,907,196	Rp 163,540,055	Rp				
ACCEPTANCE AFTER VAT	Rp -	Rp 282,341,191	Rp 1,799,071,957	Rp 1,635,400					
PPH 3%	Rp -	Rp 8,470,236	Rp 53,972,159	Rp					
INSTALLMENT ADVANCES	Rp -	Rp 9,006,684	Rp 57,390						
RETENTION	Rp -	Rp 15,528,765	Rp						
NET REVENUE	Rp -	Rp 249,335							
CASH FLOW	PERIODE KE-0	PER							
BALANCES	Rp 434,975								
LOAN	Rp								
PAY LOANS									
FINAL CASH									
LOAN									

Based on the calculations that have been made, it can be seen in Table 4.7 that the profit obtained is Rp. 1,363,508,909, with the loan amount used is Rp. 3,028,350,000. After getting the amount of profit along with the amount of the loan made by the contractor to the bank, it will then proceed with the calculation of profit sharing for Islamic banks which in full can be seen in Table 4.8.

Table 4.8 Profit Sharing Calculation for Cash Flow on the Heavy Rehab Project of the Ash Shiratal Mustaqim Tanjung Great Mosque Phase 1

Profit Sharing	RAB (before VAT)	Value of PPh Project	Profit Project	Value Net	maximum value of equity participation	Nominal loan (biggest negative overdraft)	Age of loan (months)	Projected profit	Ratio Bank	Ratio Contractor	Profit Sharing Bank	Profit Sharing Contractor
	(a)	(b) = (a) x 3%	(c)	(d) = (a)-(b)-(c)	(e) = (d) x 70%	(f)	(g)	(h) = 10% x (f) x ((g)/12	(i) = (h)/(c)	(j) = 100-(i)	(k) = (i) x (c)	(l) = (j) x (c)
After the maintenance period done	Rp 14,999,170,000	Rp 449,975,100	Rp 749,958,500	Rp 13,799,236,400	Rp 9,659,465,480	Rp 3,028,350,000	6	Rp 151,417,500	20.19%	79.81%	Rp 151,417,500	Rp 598,541,000
TOTAL											Rp 302,835,000.00	Rp 1,060,673,909.00

In Table 4.8, it can be seen that the profit sharing obtained by Islamic Banks and Contractors with LST (Latest Start Time) scheduling conditions, namely for profit sharing carried out when the project is completed, Islamic Banks with a ratio of 24.68% get profit sharing of Rp. 151,417,500 and for contractors with a ratio of 75.32% get a profit sharing of Rp. 462.132,909. Meanwhile, for profit sharing payments made after the maintenance period is complete, Islamic Banks with a ratio of 20.19% get a profit sharing of Rp. 151,417,500 and for contractors with a ratio of 75.32% get a profit sharing of Rp. 462.132,909. Meanwhile, for profit sharing payments made after the maintenance period is over, Islamic Banks with a ratio of 20.19% get a profit sharing of Rp. 151,417,500 and for contractors with a ratio of 79.81% get a profit sharing of Rp. 598,541,000. so that the total profit-sharing for each Islamic Bank and Contractor is Rp. 302.835.000 and Rp. 1,060,673,909..

Results of Planning Analysis Cash Flow

The results of the cash flow planning analysis with variations in the monthly payment system using an advance of 2.9% and in EST (Earliest Start Time) and LST (Late Start Time) conditions in the Heavy Rehab Project of the Ash Shiratal Mustaqim Tanjung Great Mosque Phase 1 can be seen in Table 4.9.

Table 4.9 Cash Flow Planning Results

VARIATIONS	PAYMENT SYSTEMS				
	MONTHLY PAYMENT				
	TOTAL LOANS		FINAL PROFIT		PERCENTAGE PROFIT
ADVANCED 2.9%					
EST (*EARLIEST START TIME*)	Rp	2,900,850,000	Rp	1,073,475,909	7.16%
LST (*LATEST START TIME)*	Rp	3,028,350,000	Rp	1,060,673,909	7.07%

Based on the results of calculations that have been carried out and shown in Table 4.9 cash flow planning with a monthly payment system using an advance of 2.9% with scheduling conditions EST (Earliest Start Time) has a total loan to Islamic Banks of Rp. 2,900,850,000 with a final profit of Rp. 1,073,475,909 and the percentage of profits obtained is 7.16%. Meanwhile, with the LST (Latest Start Time) scheduling condition, the total loan made is Rp. 3,028,350,000 with the final profit of Rp. 1,060,673,909 and the percentage of profit obtained is 7.07%. So that based on the calculations carried out the maximum profit will be obtained by the contractor using cash flow planning variations in monthly payments with an advance of 2.9% and the scheduling condition is EST (Earliest Start Time). The difference in the value for the percentage of profits and the number of loans made is due to the cash outflow being the same value, but different cash inflows, this is what causes the large percentage of profits and the amount of the loan to differ.

V. CONCLUSIONS AND RECOMMENDATIONS

Conclusion

Based on the results of the analysis and discussion that has been carried out for cash flow planning in the Heavy Rehab Project of the Ash Shiratal Mustaqim Tanjung Great Mosque Phase 1 that has been carried out, the conclusions from this study are as follows:

1. The payment system analyzed in this final project is by using a monthly payment system, borrowing funds used for capital, from a 3rd party where in this study the 3rd party used is a Sharia Bank. The down payment given to the contractor is 2.9% of the contract value, which is Rp. 434,975,930.00-.
2. The loan proposed by the contractor to the Islamic Bank for cash flow planning using a monthly payment system is Rp. 2,900,850,000.00 - for EST (Earliest Strat Time) scheduling conditions, and Rp. 3.028.350.000,00- for LST (Latest Start Time) scheduling conditions.
3. The profit obtained by the contractor by using a monthly payment system and an advance of 2.9%, for the EST (Earliest Start Time) scheduling condition the contractor gets a profit of Rp. 1,073,475,909,00-. Meanwhile, for the LST (Latest Start Time) scheduling condition, the profit obtained by the contractor is Rp. 1,060,673,909.00-.
4. Based on the calculation results, the monthly payment system, with an advance of 2.9% in the EST (Earliest Start Time) scheduling condition, provides greater benefits than when the LST (Latest Start Time) scheduling condition. The profit percentage for the EST (Earliest Start Time) scheduling condition is 7.16%, while for the LST (Latest Start Time) scheduling condition the contractor's profit percentage is 7.07%.

Suggestions

The suggestions that the author can give after conducting cash flow research on the Heavy Rehab Project of the Ash Shiratal Mustaqim Tanjung Great Mosque Phase 1 are:

1. In carrying out a construction work, the implementing party (contractor) needs to make or plan the scheduling and cash flow properly in order to achieve the target, and the construction project to run effectively and efficiently in terms of cost and time.
2. For further research, it is hoped that there will be an analysis between the progress payment system and turnkey payment so that it can be used as a comparison.
3. In future research, it is necessary to take into account the costs that will be incurred during the maintenance period.

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