Planning Cash Flow Payment Systems Progress per 25% EST and LST Conditions in the State Court Office Building Project, Balangan Regency

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ABSTRACT

In a construction project, cash flow is strongly influenced by the schedule, namely the activity to determine the time required and the sequence of activities and the completion time. Therefore, the role of cash flow planning is very important in project implementation. Because the flow of money coming in and going out must always be balanced. The purpose of this study is to determine the steps for cash flow of the *termijn* payment system including progress per 25%, determine how much cash flow the *termijn* payment system progress per 25% EST and LST conditions, and determine which cash flow the *termijn* payment system progress per 25% between EST and LST conditions that can provide the maximum benefit for the contractor. A short step to analyze the data in this study is project scheduling with a description and sequence of each activity taken from the schedule, then making a network diagram which in this study uses the CPM method, then the duration of the project work is obtained. Then make a cash flow with the *termijn* payment system with a progress per 25% on EST and LST scheduling conditions. The results of data analysis show that the *termijn* payment system in progress per 25% which provides the maximum profit for the contractor in this study is the LST condition with a net profit of IDR 325,817,567.97 or 7,13747% of the contract value.

Keywords: *Cash flow*, CPM, Earliest Start Time (EST), Latest Start Time (LST)

1. INTRODUCTION

The author takes the case on this project because in working on this project the contractor provides a large amount of capital, and of course, this greatly affects the contractor's profits. Therefore, it is necessary to plan cash flow to minimize the capital spent. In addition, in this project, the payment system uses the *termijn* progress method per 25%, therefore the contractor must manage his finances as much as possible so as not to experience negative payments due to withdrawals of money only four times. This becomes interesting to discuss because whether only having a down payment is enough to do project work or do you need additional money so that project work can still run.

Additional money is needed if the contractor has an urgent situation and usually the contractor makes a loan to the bank.

The cash flow method is also very necessary so that contractors can get maximum profit. Therefore, in this study, cash flow will be planned under conditions based on EST (Earliest Start Time) and LST (Latest Start Time). By comparing cash flow under these conditions, an effective cash flow concept will be obtained that can provide maximum profit.

2. THEORITICAL STUDY

According to Harahap (2011) cash flow is defined as cash inflows and outflows based on three activity reports, namely operating activities, investment activities, and financing activities. And according to Suharto (1997) cash flow is an estimate of the income (cash inflow) and expenditure (cash outflow) that occurs in investment within a certain period.

A. Cash in Flow

Cash inflow is a cash flow that contains all transactions that provide income to the contractor.

1. Down payment

Down payment (DP) in the procurement of goods/services is the amount of money with a certain nominal received by the contractor from the employer before the work is carried out or the handover of the goods.

2. *Termijn*

Termijn is a payment made by the agreement and contract. *Termijn* payment will be made when the service can be obtained.

3. Loans

A loan is a provision of money or what can be equated with a bill, based on a loan agreement or agreement between a bank and another party, in which the borrower is obliged to pay the debt in full during a specified period with interest.

B. Cash out Flow

Cash outflow is a cash flow that contains various kinds of transactions that can lead to a contractor's cash disbursement burden.

1. Direct Cost

Direct costs are all costs that are directly related to the implementation of construction project work in the field.

2. Indirect Cost

Indirect costs are all project costs that are not directly related to construction in the field.

3. Tax

Tax is a mandatory contribution to the state that is owned by an individual or entity that is coercive in nature based on the law, with no direct compensation, and is used for the needs of the state for the greatest prosperity of the people.

4. Loan interest

Interest is the amount of money paid as a result of using the money previously lent.

3. METHOD

A. Processing and data analysis

After analyzing the cash flow for the payment of the *termijn* progress method per 25% with a down payment of 20% of the contract value under EST and LST scheduling conditions, then from these two conditions, will be compared to which one provides the maximum profit for the contractor.

B. Flowchart
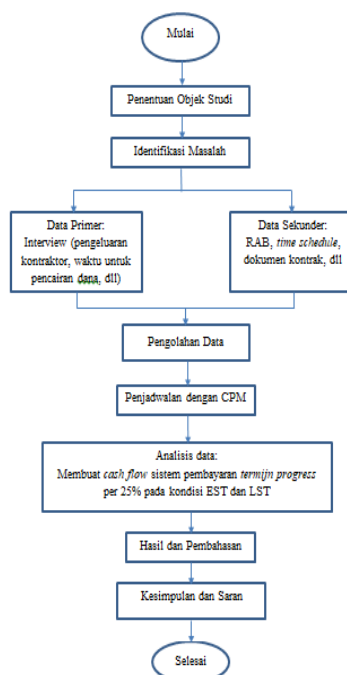
4. RESULT AND DISCUSSION

A. Result of calculation and discussion of cash flow *termijn* progress per 25% EST condition

Table 1 Cash Flow *Termijn* Progress Per 25% EST Condition During 30 Weeks of Project Work

Week to	Bobot (%)	Cash In Flow	Cash Out Flow	Cash Flow	Termijn
1	0,15	Rp912.978.000,00	Rp5.540.116,50	Rp907.437.883,50	
2	0,15		Rp5.540.116,50	Rp901.897.767,00	
3	0,70		Rp25.853.877,00	Rp876.043.890,00	
4	0,70		Rp25.853.877,00	Rp850.190.013,00	
5	0,71		Rp26.223.218,10	Rp823.966.794,90	
6	0,71		Rp26.223.218,10	Rp797.743.576,80	
7	1,49		Rp55.031.823,90	Rp742.711.752,90	
8	1,49		Rp55.031.823,90	Rp687.679.929,00	
9	4,40		Rp162.510.084,00	Rp525.169.845,00	
10	7,71		Rp284.761.988,10	Rp240.407.856,90	
11	7,58		Rp279.960.553,80	-Rp39.552.696,90	
12	7,30	Rp802.694.407,50	Rp269.619.003,00	Rp493.522.707,60	≥25%
13	7,30		Rp269.619.003,00	Rp223.903.704,60	
14	7,30		Rp269.619.003,00	-Rp45.715.298,40	
15	6,59		Rp243.395.784,90	-Rp289.111.083,30	
16	6,33	Rp886.729.882,50	Rp233.792.916,30	Rp363.825.882,90	≥50%
17	6,33		Rp233.792.916,30	Rp130.032.966,60	
18	6,33		Rp233.792.916,30	-Rp103.759.949,70	
19	6,33		Rp233.792.916,30	-Rp337.552.866,00	
20	2,56	Rp788.066.010,00	Rp94.551.321,60	Rp355.961.822,40	≥75%
21	0,98		Rp36.195.427,80	Rp319.766.394,60	
22	0,98		Rp36.195.427,80	Rp283.570.966,80	
23	0,98		Rp36.195.427,80	Rp247.375.539,00	
24	0,98		Rp36.195.427,80	Rp211.180.111,20	
25	3,90		Rp144.043.029,00	Rp67.137.082,20	
26	3,90		Rp144.043.029,00	-Rp76.905.946,80	
27	3,90		Rp144.043.029,00	-Rp220.948.975,80	
28	0,74		Rp27.331.241,40	-Rp248.280.217,20	
29	0,74		Rp27.331.241,40	-Rp275.611.458,60	
30	0,74		Rp27.331.241,40	-Rp302.942.700,00	
31		Rp634.934.700,00		Rp331.992.000,00	≥100%

Based on Table 1 above, the contractor must make a loan in the table with a negative sign so that the construction process continues. How much money the contractor borrows will affect the contractor's final profit because the more money he borrows, the greater the interest that must be paid. For more details can be seen in Table 2 below.

Table 2 Loans, Interest, and Loan Repayments During Project Work EST Conditions

Capital	Week To	Loans	Interest	Total Payment
1	11	Rp39.600.000,00	Rp93.060,00	Rp39.693.060,00
2	14 & 15	Rp289.200.000,00	Rp1.359.240,00	Rp290.559.240,00
3	18 & 19	Rp337.600.000,00	Rp1.586.720,00	Rp339.186.720,00
4	26, 27, 28, 29, 30	Rp303.000.000,00	Rp3.560.250,00	Rp306.560.250,00
Total		Rp969.400.000,00	Rp6.599.270,00	Rp975.999.270,00

Based on Table 2 above, it can be concluded that the remaining money from the 4th *termijn* of Table 1 has not been a net profit by the contractor. The net profit obtained by the contractor is after deducting the amount of interest to be paid. Below is Table 3 Cash Flow *termijn* progress per 25% EST conditions after deducting loan interest payments.

Table 3 Cash Flow *Termijn* Progress per 25% EST Condition After Deducting Loan Interest

Week to	Bobot (%)	*CashIin Flow*	*Cash Out Flow*	*Cash Flow*	Loans	Interest	*Termijn*
1	0,15	Rp912.978.000	Rp5.540.117	Rp907.437.884			
2	0,15		Rp5.540.117	Rp901.897.767			
3	0,70		Rp25.853.877	Rp876.043.890			
4	0,70		Rp25.853.877	Rp850.190.013			
5	0,71		Rp26.223.218	Rp823.966.795			
6	0,71		Rp26.223.218	Rp797.743.577			
7	1,49		Rp55.031.824	Rp742.711.753			
8	1,49		Rp55.031.824	Rp687.679.929			
9	4,40		Rp162.510.084	Rp525.169.845			
10	7,71		Rp284.761.988	Rp240.407.857			
11	7,58		Rp279.960.554	-Rp39.552.697	Rp39.600.000	Rp93.060	
12	7,30	Rp802.694.408	Rp269.619.003	Rp493.429.648			≥25%
13	7,30		Rp269.619.003	Rp223.810.645			
14	7,30		Rp269.619.003	-Rp45.808.358	Rp289.200.000	Rp1.359.240	
15	6,59		Rp243.395.785	-Rp289.204.143			
16	6,33	Rp886.729.883	Rp233.792.916	Rp362.373.583			≥50%
17	6,33		Rp233.792.916	Rp128.580.667			
18	6,33		Rp233.792.916	-Rp105.212.250	Rp337.600.000	Rp1.586.720	
19	6,33		Rp233.792.916	-Rp339.005.166			
20	2,56	Rp788.066.010	Rp94.551.322	Rp352.922.802			≥75%
21	0,98		Rp36.195.428	Rp316.727.375			
22	0,98		Rp36.195.428	Rp280.531.947			
23	0,98		Rp36.195.428	Rp244.336.519			
24	0,98		Rp36.195.428	Rp208.141.091			
25	3,90		Rp144.043.029	Rp64.098.062			
26	3,90		Rp144.043.029	-Rp79.944.967			
27	3,90		Rp144.043.029	-Rp223.987.996			
28	0,74		Rp27.331.241	-Rp251.319.237	Rp303.000.000	Rp3.560.250	
29	0,74		Rp27.331.241	-Rp278.650.479			
30	0,74		Rp27.331.241	-Rp305.981.720			
31		Rp634.934.700		Rp325.392.730			≥100%

Based on Table 3 above, as long as the project work lasts for 30 weeks it can be concluded that,

1. In *termijn* 4 in the 30th week, the contractor gets a net income of Rp. 634,934,700.00 and money go to the contractor's account in the 31st week, while expenses are Rp. 658,904,522.40. In the 26th to 30th week the cash flow is negative, the contractor must make a loan of Rp.303,000,000.00 in those 5 weeks. So that the contractor's remaining money after receiving the fourth *termijn* income is IDR 325,392,730.00.

2. So, the final profit or net profit obtained by the contractor is Rp. 325,392,730.00.

B. Result of calculation and discussion of cash flow *termijn* progress per 25% LST conditions

Table 4 Cash Flow *Termijn* Progress Per 25% LST Condition During 30 Weeks of Project Work

Week to	Bobot (%)	Cash In Flow	Cash Out Flow	Cash Flow	Termijn
1	0,15	Rp912.978.000,00	Rp5.540.116,50	Rp907.437.883,50	
2	0,15		Rp5.540.116,50	Rp901.897.767,00	
3	0,70		Rp25.853.877,00	Rp876.043.890,00	
4	0,70		Rp25.853.877,00	Rp850.190.013,00	
5	0,71		Rp26.223.218,10	Rp823.966.794,90	
6	0,71		Rp26.223.218,10	Rp797.743.576,80	
7	1,49		Rp55.031.823,90	Rp742.711.752,90	
8	1,49		Rp55.031.823,90	Rp687.679.929,00	
9	4,40		Rp162.510.084,00	Rp525.169.845,00	
10	3,40		Rp125.575.974,00	Rp399.593.871,00	
11	3,27		Rp120.774.539,70	Rp278.819.331,30	
12	3,27		Rp120.774.539,70	Rp158.044.791,60	≥25%
13	7,58		Rp279.960.553,80	-Rp121.915.762,20	
14	7,58	Rp872.101.485,00	Rp279.960.553,80	Rp470.225.169,00	
15	6,33		Rp233.792.916,30	Rp236.432.252,70	
16	6,33		Rp233.792.916,30	Rp2.639.336,40	≥50%
17	6,33		Rp233.792.916,30	-Rp231.153.579,90	
18	6,33	Rp826.971.322,50	Rp233.792.916,30	Rp362.024.826,30	
19	6,33		Rp233.792.916,30	Rp128.231.910,00	
20	6,33		Rp233.792.916,30	-Rp105.561.006,30	≥75%
21	4,75		Rp175.437.022,50	-Rp280.998.028,80	
22	4,75	Rp738.889.695,00	Rp175.437.022,50	Rp282.454.643,70	
23	0,98		Rp36.195.427,80	Rp246.259.215,90	
24	0,98		Rp36.195.427,80	Rp210.063.788,10	
25	3,90		Rp144.043.029,00	Rp66.020.759,10	
26	3,90		Rp144.043.029,00	-Rp78.022.269,90	
27	4,16		Rp153.645.897,60	-Rp231.668.167,50	
28	1,00		Rp36.934.110,00	-Rp268.602.277,50	
29	1,00		Rp36.934.110,00	-Rp305.536.387,50	
30	1,00		Rp36.934.110,00	-Rp342.470.497,50	
31		Rp674.462.497,50		Rp331.992.000,00	≥100%

Based on Table 4 above, the contractor must make a loan in the table with a negative sign so that the construction process continues. How much money the contractor borrows will affect the contractor's final profit because the more money he borrows, the greater the interest that must be paid. For more details can be seen in Table 5 below.

Table 5 Loans, Interest, and Loan Repayments During Project Work LST Conditions

Capital	Week to	Loans	Interest	Total Payment
1	13	Rp122.000.000,00	Rp286.700,00	Rp122.286.700,00
2	17	Rp231.200.000,00	Rp543.320,00	Rp231.743.320,00
3	20 & 21	Rp281.000.000,00	Rp1.320.700,00	Rp282.320.700,00
4	26, 27, 28, 29, 30	Rp342.500.000,00	Rp4.024.375,00	Rp346.524.375,00
Total		Rp976.700.000,00	Rp6.175.095,00	Rp982.875.095,00

Based on Table 5 above, it can be concluded that the remaining money from the 4th *termijn* of Table 4 has not been a net profit by the contractor. The net profit obtained by the contractor is after deducting the amount of interest to be paid. Below is Table 6 Cash Flow *termijn* progress per 25% LST conditions after deducting loan interest payments.

Table 6 Cash Flow *Termijn* Progress per 25% LST Condition After Deducting Loan Interest

Week to	Bobot (%)	*Cash i flow*	*Cash outflow*	*Cash Flow*	Loans	Interest	*Termijn*
1	0,15	Rp912.978.000	Rp5.540.117	Rp907.437.884			
2	0,15		Rp5.540.117	Rp901.897.767			
3	0,70		Rp25.853.877	Rp876.043.890			
4	0,70		Rp25.853.877	Rp850.190.013			
5	0,71		Rp26.223.218	Rp823.966.795			
6	0,71		Rp26.223.218	Rp797.743.577			
7	1,49		Rp55.031.824	Rp742.711.753			
8	1,49		Rp55.031.824	Rp687.679.929			
9	4,40		Rp162.510.084	Rp525.169.845			
10	3,40		Rp125.575.974	Rp399.593.871			
11	3,27		Rp120.774.540	Rp278.819.331			
12	3,27		Rp120.774.540	Rp158.044.792			≥25%
13	7,58		Rp279.960.554	-Rp121.915.762	Rp122.000.000	Rp286.700	
14	7,58	Rp872.101.485	Rp279.960.554	Rp469.938.469			
15	6,33		Rp233.792.916	Rp236.145.553			
16	6,33		Rp233.792.916	Rp2.352.636			≥50%
17	6,33		Rp233.792.916	-Rp231.440.280	Rp231.200.000	Rp543.320	
18	6,33	Rp826.971.323	Rp233.792.916	Rp361.194.806			
19	6,33		Rp233.792.916	Rp127.401.890			
20	6,33		Rp233.792.916	-Rp106.391.026	Rp281.000.000	Rp1.320.700	≥75%
21	4,75		Rp175.437.023	-Rp281.828.049			
22	4,75	Rp738.889.695	Rp175.437.023	Rp280.303.924			
23	0,98		Rp36.195.428	Rp244.108.496			
24	0,98		Rp36.195.428	Rp207.913.068			
25	3,90		Rp144.043.029	Rp63.870.039			
26	3,90		Rp144.043.029	-Rp80.172.990	Rp342.500.000	Rp4.024.375	
27	4,16		Rp153.645.898	-Rp233.818.888			
28	1,00		Rp36.934.110	-Rp270.752.998			
29	1,00		Rp36.934.110	-Rp307.687.108			
30	1,00		Rp36.934.110	-Rp344.621.218			
31		Rp674.462.498		Rp325.816.905			≥100%

Based on Table 6 above, as long as the project work lasts for 30 weeks it can be concluded that,

1. In *termijn* 4 in the 30th week, the contractor gets a net income of Rp. 674,462,497.50 and money go into the contractor's account in the 31st week, while expenses are Rp. 624,925,141.20. In the 26th to 30th week the cash flow is negative, the contractor must make a loan of Rp.342,500,000.00 in those 5 weeks. So that the contractor's remaining money after receiving the fourth *termijn* income is IDR 325,816,905.00.

2. So, the final profit or net profit obtained by the contractor is Rp. 325,816,905.00.

5.CONCLUSIONS

1. The payment system analyzed in this final project is the payment system according to the progress of the work *termijn* progress per 25%. The advantage of these two payment systems is seen in the amount of cash when the project has been completed or the final cash.

2. The final profit obtained by the contractor with the payment system in *termijn* progress per 25% EST and LST conditions is IDR 325,392,730.00 and IDR 325,816,905.00.

3. The payment system in *termijn* of progress per 25% which provides the maximum profit for the contractor in this study is the LST condition.

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