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Management  
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OSA1/1  
(CN67)  
PART 1  
1/8

## CONTRACT FINANCE

### I. INTRODUCTION

The purpose of this note is to clarify some financial aspects of contract management and thus help to improve understanding between contract staff and financial staff.

The note covers contract budgeting, cash flow forecasting and the use of company funds. Each aspect is discussed briefly. Fuller treatment will be found in financial text books.

### II. THE MEANING OF "FINANCE"

Most businesses have to pay for the things they need for producing goods or services before their customers pay them. The money needed to bridge this gap is known as "finance".

Financial control aims to ensure, firstly, that adequate supplies of cash will be available at all times so that the company will remain solvent and, secondly, that financial resources are used economically and in the most profitable way.

The key to this lies in knowing:

1. the time lag between earning an entitlement to be paid for work done, and actually receiving the money due, and
2. the time lag between being committed to make a payment and actually paying.

Financial control is achieved with the aid of budgets and cash flow forecasts, and since in contracting a large part of a company's expenditure and virtually all its income passes through its contracts, control at contract level is very important.

### III. BUDGETING FROM THE PROJECT PLAN

A Budget is a conversion of the project plan into money. If the size of the project justifies it, a budget may be prepared at the tender stage and later modified to suit changes as they occur at award and during execution.



Only planned expenditure commitments and income entitlements are shown, period by period, in the budget, and not cash payments or receipts.

A. COMMITMENTS AND ENTITLEMENTS

The work planned to be done in each period calls for resources of labour, staff, subcontractors, materials, plant and equipment to be available at specified times. These lead, in turn, to a commitment to pay for them, the amount and timing of the commitment depending on the conditions of employment or purchase. Commitment often coincides with arrival on site but under certain conditions may be some other date, such as that of placing the order.

Similarly, work that is planned to be completed each period, materials on site or goods in manufacturers' stores, give rise to entitlements to receive payment under the terms of the contract.

Appendix I shows part of a typical project budget.

B. CONTRIBUTION

An important purpose of the budget is to enable management to foresee the commitments and entitlements which will arise if the work goes according to plan.

As a result the net income, that is the difference between entitlement and commitment, can be forecast period by period. This net income is the "contribution", which the project is expected to make towards central expenditure and profit and is a measure of project profitability.

C. CHANGES AND VARIATIONS

Budgets should help management to see the financial effects of change and give an up-to-date picture of the final outcome of the project. This is particularly necessary in construction, where changes in timing, method, quantity or price are the rule rather than the exception.

It is important therefore to structure budgets so that selective modification can be readily made. This should be done, for example, by separating items of expenditure (or income) according to the pattern they follow, such as:

- "once only" items (eg. setting up site offices)
- time-related items (eg. site supervision)
- quantity-related items (eg. materials)



To assist in cash flow forecasting, as described later, it is also helpful to keep separate such items as labour or materials where the time lag between commitment and payment differs.

The easier the process of updating and altering budgets, the more likely they are to be kept up-to-date.

#### D. CONTROL

The accuracy and sufficiency of budgets should be the responsibility of the line managers carrying out the work and should therefore be prepared so as to correspond with areas of management responsibility and authority. They thus become a basis for holding managers to account.

When a company has up-to-date budgets the overall financial position of the business is foreseeable and can be monitored and managed. At the same time the performance of each project and department can be measured separately against its own budget.

#### IV. FORECASTING CASH FLOW

A Cash Flow Forecast is an estimate of cash payments and receipts flowing out of and into the project. It is derived directly from the project budget.

##### A. TIMING OF PAYMENTS AND RECEIPTS

The time lag between a commitment to spend and the actual payment will vary according to the nature of the expense. For example, the time lag is one to two weeks on labour, up to a month on salaries and six weeks or more on materials.

To forecast the time when money is expected to flow out as cash payments, each type of expenditure must be considered separately. Calculating and totalling these amounts shows the cash going out period by period.

Similarly, it is possible to forecast the cash income which should be received in each period. In each case the effects of special advances, discounts or retentions must be allowed for.

A forecast of cash flow is thus the result of tabulating the answers to two questions, applied to each type of expenditure or income, namely:

"When will cash flow out?"  
and "When will cash flow in?"



## B. USES OF CASH FLOW FORECASTS

The main uses of a contract cash flow forecast are as follows:

1. At the pre-tender stage it enables management to estimate the finance required and decide whether this is acceptable.
2. It enables project and company management to foresee the effect on the cash position of changes during the execution of the contract, thus leading to better direct control on the contract and better company cash management.
3. It is a means of building experience of cash flow patterns for future use in pre-tender estimating.

## V. FINANCE EMPLOYED ON A PROJECT

The amount of finance "tied-up" in a project will vary from period to period.

At any point in time, a contractor is interested in two separate amounts:

### 1. The "Net" Financial Lock-up

The difference between the total cash inflow and outflow up to any point in the contract represents the amount of the contractor's own finance tied up and is known as the "net financial lock-up". This is indicated in Appendix II by the vertical line BC.

### 2. The "Gross" Financial Lock-up

At any such point, there may be commitments to pay for materials, labour and services which have not yet figured in the cash outflow.

These constitute additional finance provided by suppliers and other creditors which, together with the contractor's own finance make up the "gross financial lock-up".

This is indicated in Appendix II by the vertical line AC.



The steps in calculating net financial lock-up at any time are as follows:

1. Calculate the total cost of all labour, materials, plant and services chargeable to the project to date.
2. Deduct the total cash received to date. This gives the gross financial lock-up.
3. Deduct the total amount due but unpaid to employees, outside suppliers and subcontractors. This gives the net amount of the contractor's own finance tied up in the project.

#### VI. THE ROLE OF PROJECT STAFF

Project and contract staff have an important role in the overall management of the company's financial resources:

##### 1. Improving the use of finance on the project

The profitability of a project, just as of a company, depends on the relationship between profit and the finance used in producing it. Two key tasks in project management are maximising contribution and minimising the net finance tied up and, apart from any direct saving in interest charges, there may be as much scope for improving profitability by using less finance as by increasing the contribution.

Some ways of reducing the net finance tied up in a project are given in Appendix III.

##### 2. The Need for Teamwork

Financial control must be flexible and not rigid, so that when individual managers see opportunities or threats, the financial implications and their possible effect on other company activities can be quickly assessed.

Normally, the financial calculations and procedures are the responsibility of the accountants but the decisions which affect the flow of cash and the use of funds are made by technical, commercial and operating staff. It is essential that both sides work together on problems, each learning and understanding the others' objectives and needs.



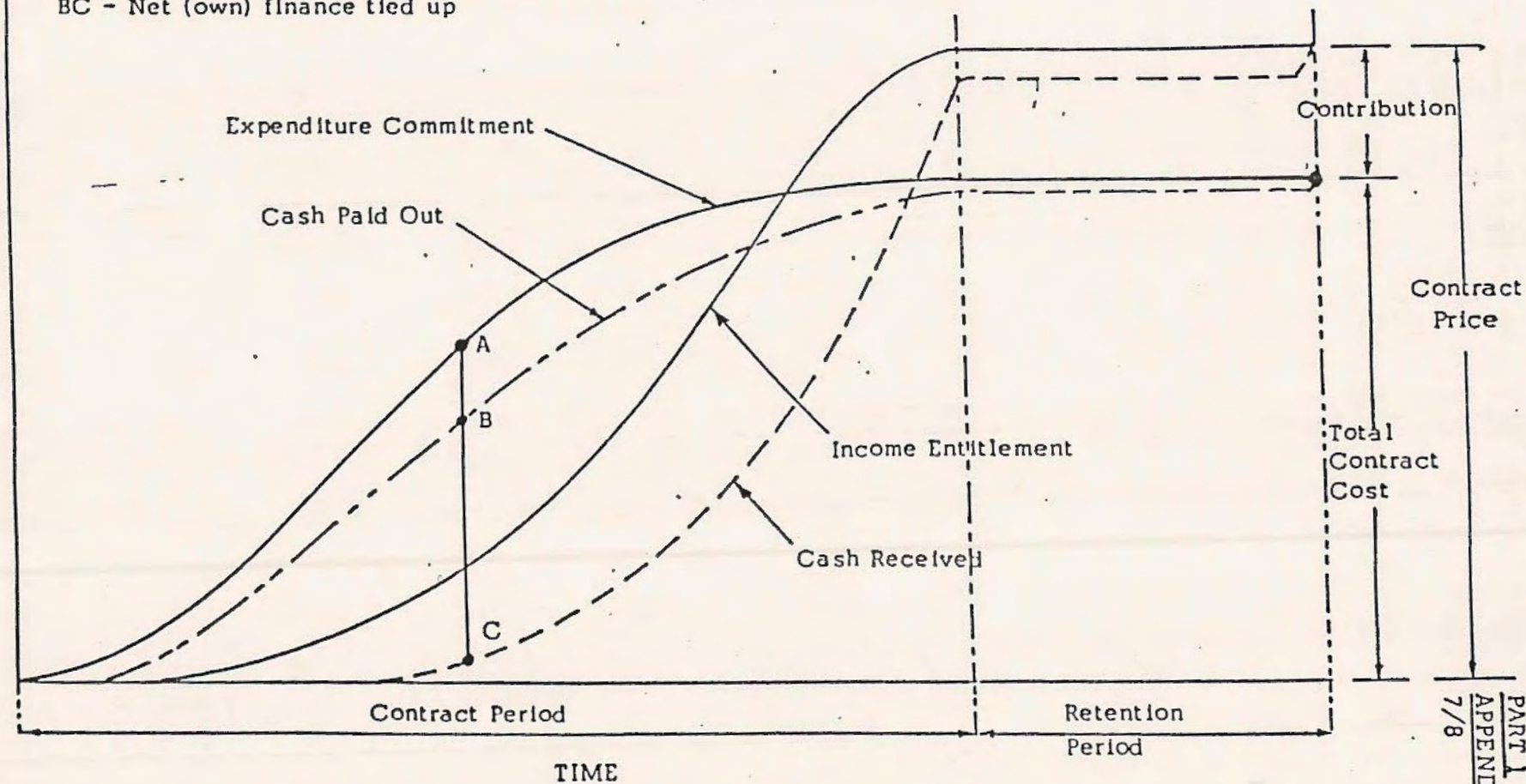
EXAMPLES FROM A PROJECT BUDGET

	Items	Totals £000	1977			
			Aug	Sept	Oct	Nov
Code	Number of weeks in period	104	4	4	5	4
	<u>EXPENDITURE</u>					
A.12	<u>Erect site offices</u>					
	Labour	20	10	10		
	Materials	25	12	10	3	
	Plant	5	3	2		
A.18	<u>Site establishment</u>					
	Engineering and Supervisory staff	85	2	3	4	4
	Admin staff	70	2	2	3	3
	General labour	45	1	1	1	1
	Heating and lighting	8	-	-	1	-
	Office expenses	25	10	1	1	1
S.5	<u>Construct Tank B</u>					
	Formwork materials	30	-	-	15	3
	Labour	105	-	-	10	12
	Ready mixed concrete	85	-	-	10	15
	Reinforcement	25	-	10	15	-
	Plant hire	12	-	2	2	2
	Steelwork subcontractor	80	-	-	-	40
	Painting subcontractor	7	-	-	-	-
	Total Committed Expenditure	£ 1940	45	83	158	232
	<u>INCOME</u>					
	<u>Preliminaries</u>					
	Clear and set up site	80	20	30	30	-
	Offices for Resident Engineer	30	5	25	-	-
	Recurring items	275	12	12	-	-
	<u>Tank B</u>					
	Foundations and walls	300	-	15	35	40
	Steelwork	100	-	-	-	50
	Painting	10	-	-	-	-
	Retentions - deductions	(218)	(4)	(7)	(15)	(21)
	- repayments	218	-	-	-	-
	Total Income Entitlement	£ 2183	33	68	140	200



CHART SHOWING PERIOD BY PERIOD THE EXPENDITURE AND INCOME  
BUDGETS, CASH FLOW AND FINANCE TIED UP ON A CONTRACT

AC - Gross finance tied up  
 AB - Finance provided by outside suppliers and subcontractors  
 BC - Net (own) finance tied up





SOME WAYS OF REDUCING FINANCE TIED UP IN A PROJECT

On the Income side

1. Securing advance payments from customer.
2. Shortening intervals between interim payments for work done.
3. Optimising project duration in relation to finance employed.
4. Loading more contribution on work to be done early in the contract.
5. Completing work items quickly so as to qualify for payment.
6. Measuring the work fully up to regular payment dates.
7. Prompt invoicing of valuations for payment.
8. Prompt invoicing of retention releases.
9. Expediting agreement on claims.
10. Collecting promptly all amounts outstanding from customers.

On the Expenditure side

1. Negotiating longer credit terms with suppliers (but considering possible loss of discounts).
2. Not calling forward materials, etc, too early.
3. Disposing promptly of surplus plant and materials.
4. Using subcontractors and hired plant.
5. Holding retentions on subcontractors.





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### COST OF ADDITIONAL FINANCE

#### ON A PROJECT AND ITS EFFECT ON PROFIT

#### I. FORECAST POSITION

This brief example of the cost of extra funds and its effect on profit is based on the following forecasts for a contract:

1. That the value of work will generally be around £50,000 per month.
2. That the gross funds tied up will equal  $2\frac{1}{2}$  months' work, i.e.,  $2\frac{1}{2} \times £50,000 = £125,000$ .
3. That subcontractors and suppliers will finance 50% and hence the net amount tied up - representing the main contractor's funds - will be 50% of £125,000, namely £62,500.

#### II. DEPARTURE FROM FORECAST

Suppose, however, that the project does not go according to plan, and that either or both of the following situations arise:

1. Gross funds tied up represent three months' work, or £150,000, and the contractor finances 50%, as before.
2. Gross funds tied up are £125,000, as forecast, but the contractor has to finance 60% of this, namely £75,000. The effects are shown below:

	Contractor's Funds Tied Up		
	Forecast	Actual	Excess
	£	£	£
If gross tie-up is £150,000 the effect is .....	62,500	75,000	12,500
If the contractor has to finance 60% of £125,000 the effect is ...	62,500	75,000	12,500
If both events happen the effect is .....	62,500	90,000	27,500



### III. INFERENCES

1. In the first two situations tabulated above, the excess funds tied up are £12,500 in each case; but when both occur together, the excess is £27,500 - not £25,000. This is because the contractor has to provide 60% of £150,000, which is £27,500.
2. The cost of providing the additional £27,500 at 8% p.a. for one month is £183, or £2,200 p.a.
3. The cost of £183 per month is very small in relation to monthly revenue - only 0.367%. Nevertheless, it absorbs a significant part of the profit margin - which is less than 4½% before tax on at least half of the work done by the construction industry in the U.K.

### IV. CONCLUSION

Additional funds are rarely easy to find and always cost money. It is therefore important, when managing a contract or a company, to avoid tying up more funds than are reasonably necessary, and to use those available both economically and intensively.





## CONTRACT CASH FLOW

### I. INTRODUCTION

When a contract is making the expected contribution to company overheads and profit it can still be costing more than necessary. Avoidable costs might be incurred on the work done, or in financing the contract. The latter can arise when the time lag in receiving entitlements from the client is greater than was planned.

When the expected contribution is not made the cash position will be even worse.

The exercise is designed to provide practice in calculating the planned and actual cash flow for a given programme of work. Even more important is the evaluation of the effects of departures from programme on the cash flow, and on the cost of financing the contract.

### II. RELEVANT FACTS

#### A. BUDGETED INCOME AND EXPENDITURE

The following table is derived from the planned programme of work. The values in the table are £000. Income represents the contractor's entitlement to receive money - at some future time - from the client. Expenditure represents commitments by the contractor to make payments at some future time.

The materials values have been adjusted to match the planned delivery pattern and assume cash discounts are taken.

Month	1	2	3	4	5	6
Gross certificate income	10	50	55	50	55	48
Expenditure:						
Labour payments	3	12	8	10	10	15
Materials - net	5	30	22	15	10	8
Plant charges - own	1	4	6	10	12	14
Nominated subcontractors	-	2	2	7	10	5
Own subcontractors	-	1	8	2	6	-
Site overheads	1	2	2	2	2	2



B TERMS AND CONDITIONS FOR PAYMENTS AND RECEIPTS

1. Certification of work budgeted for month 1 must be agreed in the first week of month 2 to ensure that payment is received in month 3.
2. Retentions at this stage are 10% of valuation and 10% on own subcontractors, but not on nominated subcontractors.
3. Labour is paid weekly.
4. Materials are normally delivered half in month of use and half in previous month. Payment is normally made by the end of the month following delivery to obtain 2½% cash discount: section A includes these assumptions:
5. Plant charges are deemed to be paid monthly to the plant department. Depreciation accounts for half the charges, but this is adjusted in the plant department cash forecasts.
6. Nominated subcontractors have to be paid within a few days of receiving payment for the client: it is assumed that they always do what is required of them.
7. Own subcontractors are long suffering and are normally paid nine weeks after the end of the month concerned.
8. Site overheads are mainly salaries and indirect wages paid during the month concerned. The remaining items may be regarded as paid likewise, being mainly prepayments or cash purchases with very little on credit.

C ACTUAL PROGRESS AND OTHER FACTORS AFFECTING PAYMENT

- |         |   |
|---------|---|
| Month 1 | Progress equals the plan. But the Q.S. fails to get the valuation certified in time for payment in month 3. Poor chap had two final accounts to complete.   |
| Month 2 | Valuation cannot be stretched beyond £47,000, but claims for an extra £5,000 are being prepared and ultimately are likely to be accepted.   |
| Month 3 | Due to bad soil conditions and unfavourable weather - for neither of which can any claim succeed - progress is only 60% of that planned. Commitments remain as forecast because no action was taken to defer material deliveries. |



- Month 4      By this stage money is short and early payments to material suppliers are not made, consequently the  $2\frac{1}{2}\%$  cash discount is lost on the material invoices originally planned to be paid at the end of month 4 and onwards.
- Month 5      The heavy use of own subcontractors, plus an additional £2,000 on own labour, enables a valuation of £60,00 to be certified. But the subcontractors have tax arrears and insist on being paid in month 5 for work done in months 3 and 4 - and likewise in month 6 for work in month 5, and so on.
- Month 6      Labour and materials used are each £2,000 in excess of budget. Due to favourable weather and revision of the incentive scheme, the certificate is submitted for £58,000. However, the client's representative queries the quality of some work included therein at £12,000, payment of which is withheld.

### III. YOUR WORK

You are required to calculate and record:

1. the cash outflow and cash inflow, month by month - planned and actual,
2. the net cash flow month by month, and also cumulatively - planned and actual,
3. the interest payable month by month, and in total for the six months - planned and actual - 12% a year (1% per month).

Ignore the timing of cash movements beyond the six months. A suitable form is available as Part 2 of this case study.

The columns headed 'plan' or 'P' should all be filled in before calculating and inserting 'actual' or 'A' figures. Work to one decimal place except for interest charges, where two decimal places should be used.



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## CONTRACT CASH FLOW - PLANNED AND ACTUAL - £000

Month		1		2		3		4		5		6		LATER	
		Plan	Actual	P	A	P	A	P	A	P	A	P	A	P	A
CASH OUTFLOW															
CASH INFLOW (Gross income - 10%)	P		-		-		-		-		-		-		-
	A	-		-		-		-		-		-		-	
Net Cash Flow - monthly	P		-		-		-		-		-		-		-
	A	-		-		-		-		-		-		-	
Net Cash Flow - cumulative	P		-		-		-		-		-		-		-
	A	-		-		-		-		-		-		-	
INTEREST @ 12% p.a.	P		-		-		-		-		-		-		-
	A	-		-		-		-		-		-		-	



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## CONTRACT CASH FLOW - PLANNED AND ACTUAL

	Month	1		2		3		4		5		6		LATER	
		Plan	Actual	P	A	P	A	P	A	P	A	P	A	P	A
CASH OUTFLOW															
Labour		3.0	3.0	12.0	12.0	8.0	8.0	10.0	10.0	10.0	12.0	15.0	17.0	*	*
Materials - net		-	-	5.0	5.0	30.0	30.0	22.0	-	15.0	22.6	10.0	15.4	8.0	20.5
Plant Operation		1.0	1.0	4.0	4.0	6.0	6.0	10.0	10.0	12.0	12.0	14.0	14.0	*	*
Subcontractors:															
- Nominated		-	-	-	-	-	-	2.0	2.0	2.0	2.0	7.0	7.0	15.0	15.0
- Own		-	-	-	-	-	-	-	-	0.9	9.8	7.2	5.4	8.9	1.7
Site Overheads		1.0	1.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	*	*
TOTAL CASH OUTFLOW	P	5.0	-	23.0	-	46.0	-	46.0	-	41.9	-	55.2	-	31.9	-
	A	-	5.0	-	23.0	-	46.0	-	24.0	-	60.5	-	60.8	-	37.2
TOTAL CASH INFLOW (Gross income - 10%)															
		0	-	0	-	9.0	-	45.0	-	49.5	-	45.0	-	119.5	-
		-	0	-	0	-	0	-	51.3	-	29.7	-	45.0	-	147.0
Net Cash Flow - Monthly	P	-5.0	-	-23.0	-	-37.0	-	-1.0	-	-7.6	-	-10.2	-	-87.6	-
	A	-	-5.0	-	-23.0	-	-46.0	-	+27.3	-	-30.8	-	-15.8	-	-109.8
Net Cash Flow - Cumulative	P	-5.0	-	-28.0	-	-65.0	-	-66.0	-	-58.4	-	-68.6	-	-19.0	-
	A	-	-5.0	-	-28.0	-	-74.0	-	-46.7	-	-77.5	-	-93.3	-	-16.5
INTEREST @ 12% p.a.	P	-0.05	-	-0.28	-	-0.65	-	-0.66	-	-0.58	-	-0.69	-	*	-
	A	-	-0.05	-	-0.28	-	-0.74	-	-0.47	-	-0.78	-	-0.93	-	*

\* = not known

P = Subject to rectification expenditure

\*\* = subject to acceptance of claim



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## CONTRACT CASH FLOW - PLANNED

*Handwritten signature*

	Month	1		2		3		4		5		5		LATER	
		Plan	Actual	P	A	P	A	P	A	P	A	P	A	P	A
CASH OUTFLOW															
Labour		3.0		12.0		8.0		10.0		10.0		15.0		*	
Materials - net		-		5.0		30.0		22.0	-	15.0		10.0		8.0	
Plant Operation		1.0		4.0		6.0		10.0		12.0		14.0		*	
Subcontractors:															
- Nominated		-		-		-		2.0		2.0		7.0		15.0	
- Own		-		-		-		-		0.9		7.2		8.9	
Site Overheads		1.0		2.0		2.0		2.0		2.0		2.0		*	
TOTAL CASH OUTFLOW	P	5.0		23.0		46.0		46.0		41.9		55.2		31.9	
	A	-		-		-		-		-		-		-	
TOTAL CASH INFLOW (Gross income - 10%)		0		0		9.0		45.0		49.5		45.0		119.5	
		-		-		-		-		-		-		-	
Net Cash Flow - Monthly	P	-5.0		-23.0		-37.0		-1.0		-7.6		-10.2		+87.6	
	A	-		-		-		-		-		-		-	
Net Cash Flow - Cumulative	P	-5.0		-28.0		-65.0		-66.0		-58.4		-68.6		+19.0	
	A	-		-		-		-		-		-		-	
INTEREST @ 12% p.a.	P	-0.05		-0.28		-0.65		-0.66		-0.58		-0.69		-	
	A	-		-		-		-		-		-		-	

\* = not known

P = Subject to rectification expenditure

- = subject to acceptance of claim

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