Cashflow

- The significance to the contractor’s cashflow of different patterns of payment from the client and of delays is illustrated in the next figure showing a hypothetical contract of 2 years’ duration.

- The predicted revenue (2) assumes monthly payments for work completed and a 4-week delay between certification and payment by client. The shaded area between the curves represents the funding to be provided by the contractor. This would be considerably reduced if the client agreed to a 10% advance mobilization payment (3), or increased if payments were received late (4) as illustrated in the following figure.
The effect of delay in completion is serious as cost increases and payment for completed work is delayed.

If the delay is caused by factors outside the contractor’s control, an extension of time may be granted.

Programming techniques

- The best form of plan for site use is the bar chart.

- Each activity is shown in its schedule position which results in efficient use of resources.

- There is inter-relationship of activities and movement of resource teams

- Important constraints and key dates are marked to ensure that these are clearly communicated to all concerned with the project

Cost Estimating

- Estimates of cost and time are prepared and revised at many stages throughout the development of a project or contract.

- The accuracy of successive estimates should improve as the project or contract develops.
Cost Estimating

The requirements of an estimate are:

• To predict the most probable cost of the works and also to define the range within which the final cost is likely to lie.

• To produce a forecast of expenditure: the cashflow based on the project programme.

Cost Estimating

These predictions will be influenced by factors specific for the project:

- location
- weather
- availability and capacity of resources

Cost Estimating techniques

Additional work in a contract can be assessed and evaluated based on:

1. Manhours:
   This is suitable for labour intensive construction where reliable records of hourly productivity of different trades is available. The total manhours estimated for a given operation are then costed at the current labour rates and added to the costs of materials and equipment.

Cost Estimating techniques

Additional work in a contract can be assessed and evaluated based on:

2. Unit rates
   For additional work, the unit rates in the bills of quantities is used. If unit rates for a similar work does not exist in the bills of quantities, then Manhours are used.

1. Where a Contractor submits a programme which is approved or accepted by the architect/engineer, is he obliged to follow it or can he amend it at his own discretion (judgment)?

• The programme is usually intended to be a flexible document. If the contractor gets behind (maybe due to delays by a subcontractor), he would normally expect to revise the programme in an attempt to make up lost time. For this reason, programmes are rarely listed as contract documents.

• However, there are some contracts that do not permit the contractor to amend its programme once accepted without approval.

• If a contract does not require approval by the engineer for a programme to be revised, the contractor can revise his programme as he wishes.

• An architect/engineer who has not been asked to approve or accept an amended programme may feel under no obligation to issue drawings in good time to enable the contractor to comply with the revised programme.
2. Is a subcontractor obliged to follow a main contractor’s programme?

- Most standard forms of contract provide for the contractor to produce a programme. A failure to do so, is a breach of contract. **It is unusual however, for a programme to be classified as a contract document.** If it were so, then contractors would be required to carry out work strictly in accordance with the programme. This could in many cases prove impossible.

- The situation with subcontractors is similar to that of a main contractor.
- A court case between Pigott Foundations v. Shepherd Construction:
  
  Pigott was employed as a subcontractor to design and construct bored piling on a new fourteen storey office block. Shepherd Construction was the main contractor.

Pigott’s subcontract provided 8 weeks work. The work started on 26th June 1989. However, the majority of the works were completed by 20th October 1989. Pigott then left the site and returned in April 1990 to complete the remaining 9 piles. The work continued slowly and difficulties arose due to piling work which was alleged to be defective. It was not clear whether this was due to faulty design or bad workmanship and Pigott claimed that the difficulties arose as a result of ground conditions. A solution to the problem was reached which involved installing additional piles.

- The court decision in this case, was that the subcontractor was not required to comply with the main contractor’s programme.
- If there exists an obligation for a subcontractor to carry out work to suit a main contractor’s programme, it also requires an obligation upon the main contractor to provide access to enable the subcontractor to carry out the work in accordance to the main contractor’s programme.
- A subcontractor is not required to follow a main contractor’s programme unless provided in the terms of the subcontract. Equally, the main contractor is not obliged to grant access to enable the subcontractor to do so.

3. Who owns float time in the contractor’s programme, the architect/engineer or the contractor?

- Most sensible/careful contractors, will allow some form of contingency in their programme to accommodate for bad ground, strikes, weather conditions, shortages of labour and materials etc.

- If the contractor has clearly programmed an activity to take longer than is estimated to complete, can the employer take advantage of the float time? This might be useful if the engineer is late issuing drawings or delays have been caused by the employer.

- Float time was the issue in a court case in 1999 between Ascon Contracting Ltd v Alfred McAlpine Construction. McAlpine was the main contractor and Ascon was the subcontractor for constructing the reinforced concrete floor slabs, basement walls and upright columns between floors.

- The subcontract period was 29 weeks commencing on 28th August 1996 and completing works on 5th March 1997. Completion of the subcontract was not achieved until 9th May 1997, **nine weeks late.**
• No extension of time was granted.
• Ascon submitted a claim for extension of time and payment of 337,918.00 (UK pounds).
• McAlpine counterclaimed 175,000.00 (UK pounds) liquidated damages paid to the employer plus its own loss and expense.
• A dispute between Mc Alpine and the employer had been compromised by a final payment of 9,475.00 (UK pounds) and no deduction was made for liquidated damages.

• Part of Mc Alpine's case against Ascon was that if all subcontractors started and finished on time and Mc Alpine executed their work on time, completion of works would have been 5 weeks early.
• McAlpine's argument was that the 5 weeks float time was for their benefit to absorb their own delays. Because these 5 weeks were used by Ascon, McAlpine claimed they were entitled to recover their lost benefit.
• The judge rejected this argument. McAlpine could not claim against the subcontractors. If float time is available, it can be used on a first come first served basis.