

CV4201 Civil Engineering Management
AY 2012/13 S1

1.a) (i) Function of Contract Administration:

-keep the site documents in order, such as minutes of meetings, daily returns of progress, weekly progress report.

-Prepare time schedule for the project (payment schedule, liquidated damages, project incentives)

-Maintain good rapport/relation management with owners, architects, subcontractors etc.

Importance of proper contract administration procedures

-To ensure every document is kept in good order and for the convenience of retrieval

Why contractor must train their management personnel in good administrative practices.

-To ensure they are familiarize with their job scopes. This is crucial since they facilitate the contract administration routines.

3 classifications of civil engineering contracts:

-Lump Sum Contracts

-Admeasurements (SOR Contracts)

-Cost/Reimbursement Contracts (C+FF, C+F%, C+V %...)

(ii) Unforeseen circumstances that delay the performance of the contract or make it more onerous to perform do not frustrate the contract because it does not fundamentally alter the object of the contract

The law should not allow one to back out of an agreement because circumstances changed in order to make it too difficult to perform a contract. Situations like this happen all the time in the commercial world and allowing the contractors to claim would undermine commercial uncertainty.

Quantum merit claim is only contingent on them being able to frustrate the contract
If contract not frustrated, cannot sue for quantum merit.

They couldn't claim for frustration though, because the purpose was not frustrated, not did it become impossibility. In fact, frustration is meant to apply when a supervening event occurs, which is not either party's fault that causes the contract to be very difficult or impossible to perform. In that case, it will be very unfair to hold them to the contract. So an extreme example would be if an earthquake destroys the construction site.

Some general conditions before a court will be willing to say a contract is frustrated:

- supervening event for which neither party at fault
- no express terms in contract providing for it
- results in radical change of obligations and duties that could not have been reasonably contemplated by parties at time of construction
- unjust to force them to continue contract

So importantly, is the third one. The event must have greatly changed the parties' obligations and duties, and in a way that they did not foresee when they sign the contract.

For the case of Davis itself, the final result was that the House of Lords ruled that there was no frustration, and the contract should be upheld.

The judges said that just because some unforeseen circumstances (labour shortage) had delayed the building work and increased the cost, this was not enough to "radically change the obligation of Davis".

Increased cost of production should not mean contracts are frustrated, because this is part and parcel of business. This also means that parties should have foreseen the possibility, even if just a small possibility, of costs increasing during the performance of the contract. One party has to bear the risk of such events that lead to increased cost of production.

**The only time when increased cost of production should lead to frustration is when the increased cost is so extremely high that it is obvious that both parties would not want to continue the contract at that cost (case of Staffordshire). For Davis, the increase in cost is not that much, although bad for Davis, the other party will still want contract to continue.

b) (i) Private Sectors

-SIA Articles and Conditions of Building Contracts

-REDAS Design and Build Conditions of Contracts

Public Sectors

-PSSCOC

-JCT Contracts

-ICE Conditions of Contracts

Advantages:

- Not convenient/ efficient for new set of conditions drafted for every new project.
- Clauses in standard form subjected to interpretation by courts, application is thus clearer.
- The contracts are drafted by experts. Agreed by recognized bodies representing all industries. Risks spread equitably.
- Standardization makes everything easier, less errors caused.

(ii) In this case the contractor, MKI is suing the government for providing wrong/inaccurate information.

Under COC it stated clearly that, 'contractor shall be deemed to have informed himself as to the site and local conditions affecting the carrying-out of the contract'. This means that MKI must make sure the soil conditions is OK before the work commences. MKI could not simply blame the government for providing inaccurate data. One reason why the MKI sue the government is perhaps the government failed to convey to them that "no responsibility was accepted for basic info contained in site condition".

In fact any info contained in the tender documents which are intended to be relied upon must be as accurate as possible. Probably MKI will lose if this case is brought to court.

2a) 3 aspects:

- When a PE publicizing his practice, he must ensure that the publicity does not make any comparison/criticism in relation to the quality of services provided by any other PE or allied professional.
- A PE must not maliciously or recklessly injure the professional reputation of another PE.
- A PE must refrain himself from expressing an opinion on engineering project to the general public, unless he is well-informed of all facts.

b) (i) For building which is in a dangerous state and immediate action should be taken to remove the danger, CBC may take necessary steps to solve the problem, such as

- ordering closure of building
- strengthening/retrofitting the building
- demolition of building

(ii) Any building works is considered unauthorized unless

- CBC has approved all the relevant plans
- there is in force a permit granted by the CBC to carrying out the building works.

Any person who contravenes the above rule will be guilty of an offence and shall be liable on conviction to a fine <\$50,000 or to imprisonment for a term <1 year or both.

(iii) Practicing certificate must be renewed every year. If a PE has not been renewing his practicing certificate for a continuous period of 10 years, he is liable to be expelled from the PE Board.

c) Assume that Mr. A and Mr. B are working in a consultant company CKW as a PE. Currently Mr. B is undertaking a \$100million condo project at Bedok area. According to Code of Professional Conduct and Ethics (CPCE) Part I, a PE shall not knowingly attempt to supplant another PE, which means, Mr A cannot anyhow take over or replace Mr. B's project, even though Mr. A has free time. Unless he is satisfied that Mr. B has been satisfactorily discharged from his current appointment, then only can he replace Mr. B's project. The rationale of the said provision is to ensure every PE carries out their responsibility as a PE to full commitment.

3a) Use Resource Levelling/Scheduling/Smoothing

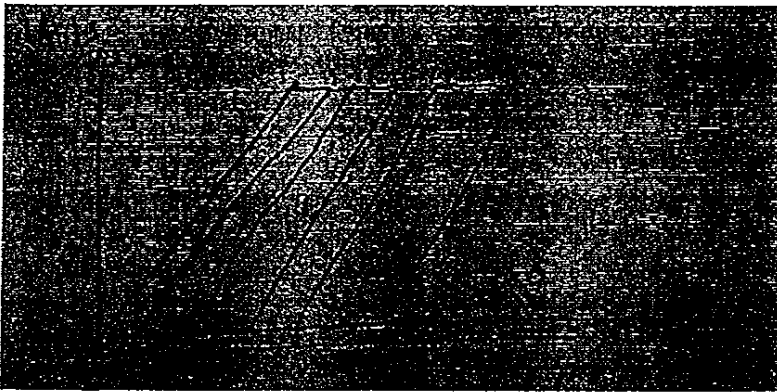
-It is a search for a schedule of activity so as to remove the peaks and troughs in resource requirement without extending the project time frame.

Procedures:

- Activity Shifting. Resource Aggregation is carried out by loading the activities according to their EST.
- Scrutinize the histogram and look for alternative solutions.
- Non-critical activities which have float times can shift to start at any time between their EST and LST.
- Choose the best configuration (least fluctuation).

b) (i) Given $R=7$ units/week, $d=6$ days/week, $h=8$ hours/day, $N=80$

Op.	M	Q	G	g	U	T	S
A	150	5	21.8	20	6.4	4	75
B	420	8	61.2	64	7.3	7	65
C	820	10	119.6	120	7.0	11	68



(ii) If only 10 teams are supplied on team C,

$$g=10 \times 10=100$$

$$U=5.9$$

$S=81 \Rightarrow$ The duration is extended by 13 weeks, hence the project will end on week 119.

4)a) (i), (ii), (iii)

	Items	\$1000
Direct Cost, DC	Payment to sub cons	230
	Cost of Labour	710
	Cost of hiring equipments	250
	Cost of materials	950
		2140
Indirect Cost, IC	Salaries to site staff	150
	Provision to site facilities	120
		270

Total Cost, $TC=DC+IC=\$2410,000$

Money received from owner= $\$2,500,000$

Value claimed= $\frac{2500000}{1-0.12}=\$2,840,909$

Value not yet claimed= $\$250,000$

Total Value, $TV=250000+2840909=\$3,090,909$

Mark-up, $MU=\frac{TV-TC}{TC}=28.3\%$

$TC+Contribution=TV$

Contribution=Overhead + Profit= $TV-TC=\$680,909$

\therefore Net Profit= $680909-120000=\$560,909$

b) The significance of Cost-Time Planning is to search for an optimum solution that maximize the profit while minimize the project duration. It is achieved through Network Compression.

An optimum cost-time solution can be achieved because we impose the constrain that the IC saved down is greater than the incurred crashing cost.

Procedures:

- Project duration may be shortened by crashing activities only along critical path.
- If an activity is crashed by 1 unit of time, then increase in project DC =Cost slope, CS of that activity.
- When project duration is shortened, then there is a saving in IC .
- Net saving in $TC=\frac{IC}{Unit\ Time} - CS$
- To reduce TC , only those activities which have $CS < \frac{IC}{Unit\ Time}$ should be selected for crashing.
- Crashing of non-critical activities will not change project duration.
- Compression should be done in stages taking into consideration the float available in non-critical chains. If two or more parallel chains are critical, they should all be compressed together by the same amount.

c) Important aspects of financial planning and cost control:

- To control the cost of construction at various sites.
- To control the expenditure on overheads.
- For planning working capital requirements.
- Forecasting cash flows.

In order to help the cash flow in construction organization, we must know the fundamental of financial planning and cost control. For example, we must know the cash flow forecasting and maximum working capital required.

To reduce working capital requirements, we may reduce the 'cumulative net cash inflow', which also means to reduce the difference between 'Cumulative Cash Inflow-Cumulative Cash Outflow'.

2 sources of working capital:

- Internal funds of the company
- Short-term borrowing (bank overdrafts)