Become (MRICS)

المعهد الملكي للمساحين القانونيين

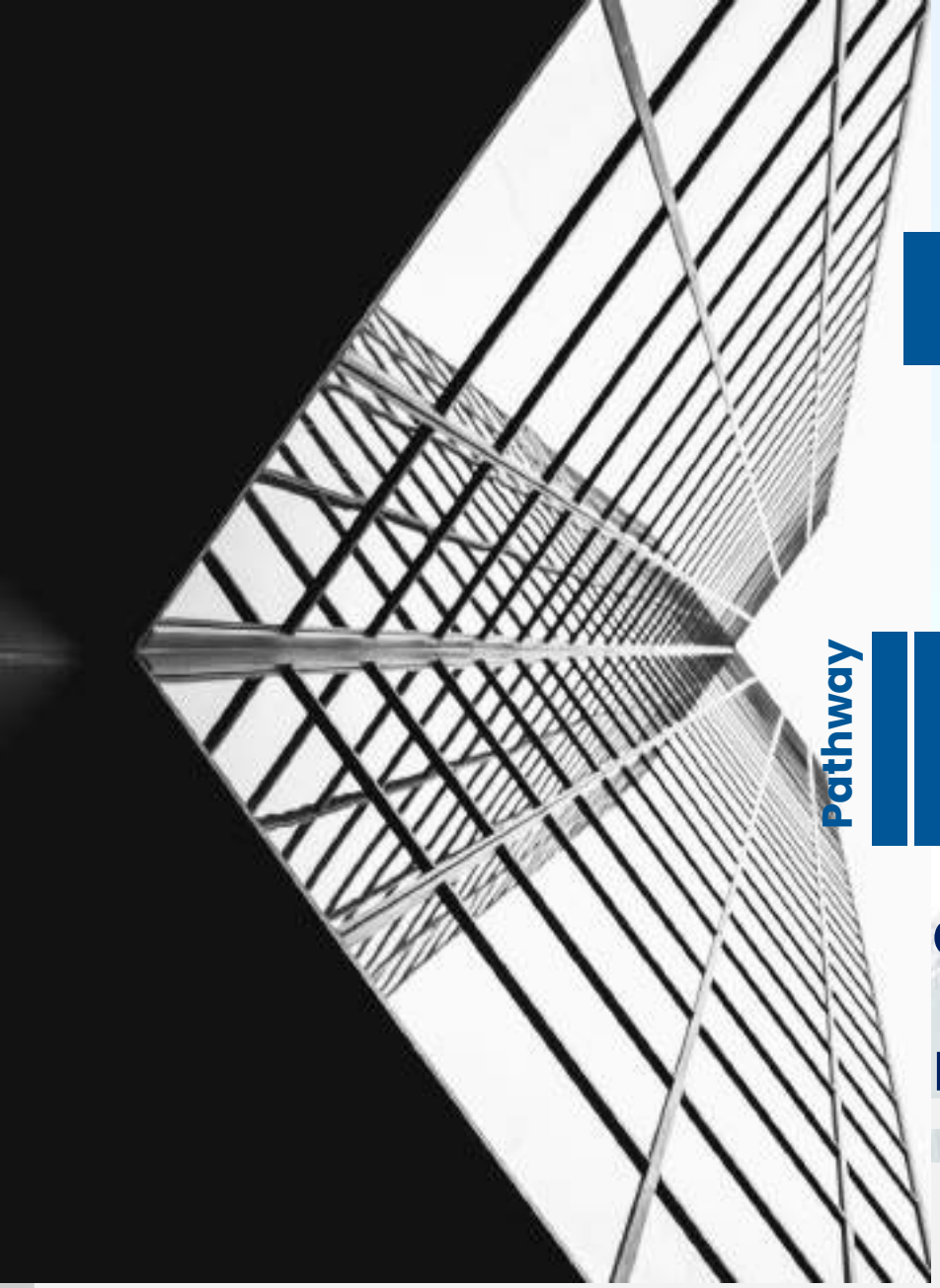
PATHWAY

QUANTITY SURVEYING AND CONSTRUCTION –PM-APC

Commercial Management of Construction Level 1& L2 & L3

Eng. Ehab Essmat, MRICS, PMP

محاضرة رقم 14



Become an (MRICS)

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Pathway

Membership of the Royal Institution of Chartered Surveyors.

Commercial Management of Construction

Level 1& L2 & L3

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The Worthy Journey

محاضرة رقم 14

Keep up

The Worthy Journey

Moving to the MIDWAY Just ***Continue!!***

Revision

FIVE (5) Rules of Conduct

1

Members and firms must be **honest**, **act with integrity** and comply with their professional obligations, including obligations to RICS

أمانة ونزاهة.

2

Members and firms must maintain their professional competence and ensure that services are provided by competent individuals who have the necessary expertise

مؤهلين أشخاص

3

Members and firms must provide good-quality and diligent service.

الخدمات بكد وجودة

عالية

4

Members and firms must treat others with respect and encourage diversity and inclusion.

الإحترام والتنوع والإستيعاب

5

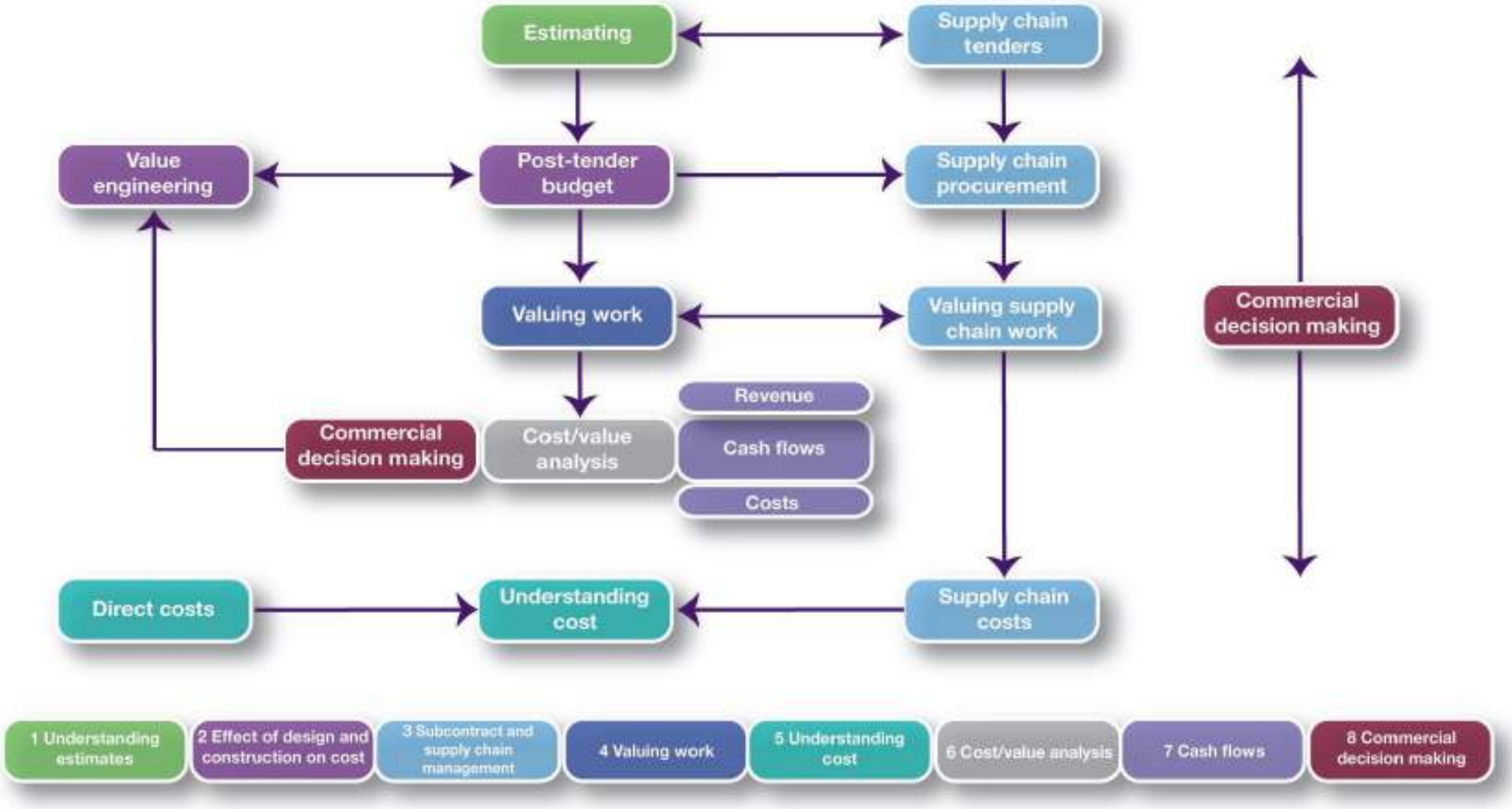
Members and firms must act in the public interest, take responsibility for their actions and act to prevent harm and maintain public confidence in the profession. العمل للصالح

العام وتحمل المسئولية

Objectives

By the end of the presentation, you will be aware of:

- Understand estimates
- Value engineering
- Supply chain management (Procurement of Subcontractors, Labor, Plant & Materials)
- Valuing work
- Understand cost
- Cost/value analysis/reconciliation
- Earned value technique
- Cash and cost flow analysis
- Commercial decision making.



Flow of processes and associated data from an estimate through to cost/value analysis and commercial decision-making

GN

Take Care

Many APC candidates confuse between the requirements to proof their competencies in “Commercial Management” “ Design Economics and Cost Planning &“Quantification and Costing”

Overview of Competency : Commercial Management

The role of a Commercial Manager is to maximize the potential of a business in terms of profitability.

The Commercial Manager monitors financial performance (both forecast and achieved) and manages any risks

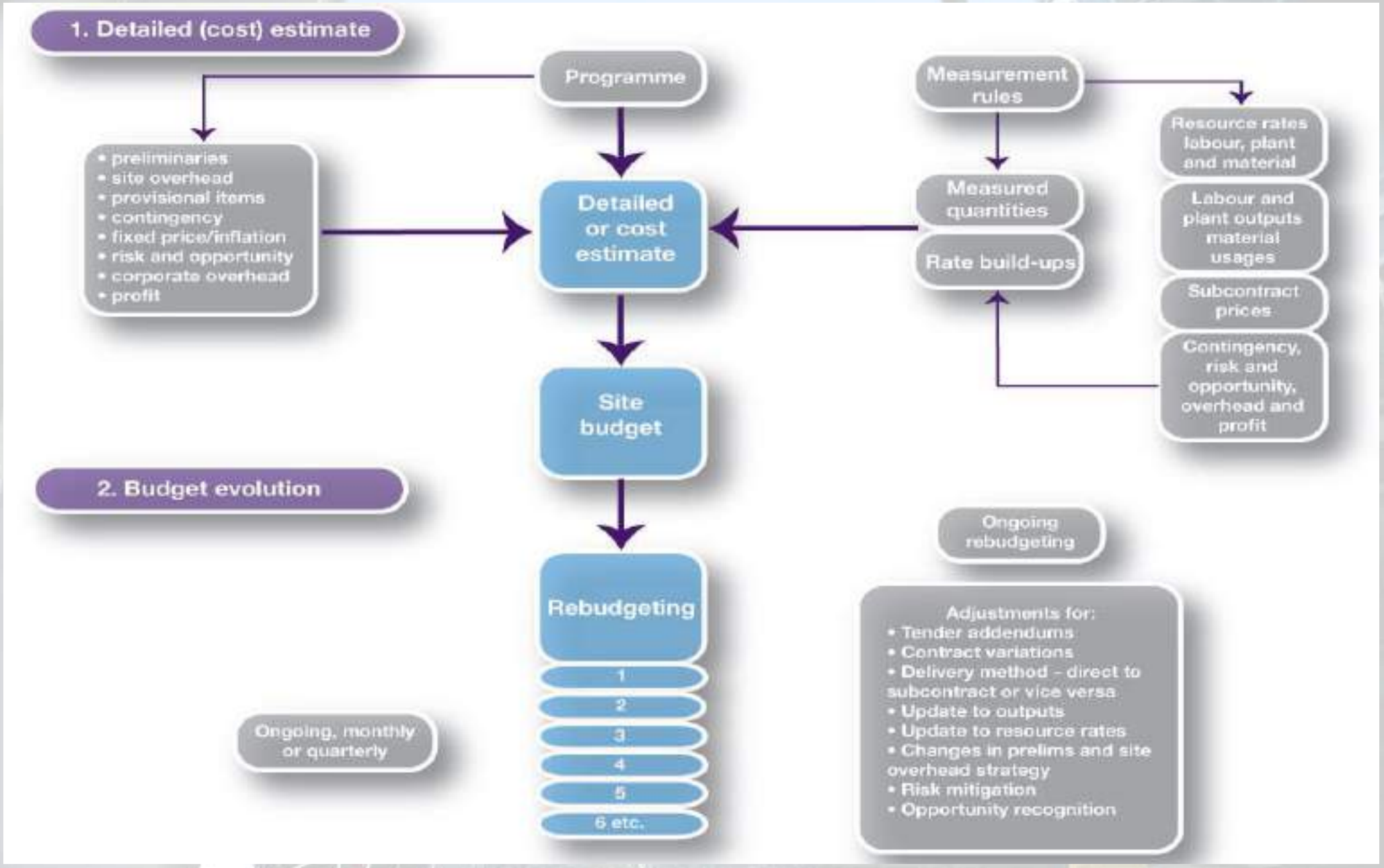
One of the key things that differentiates Commercial Management from general quantity surveying skills is the ability to take an overview of a project

Risk and opportunity management

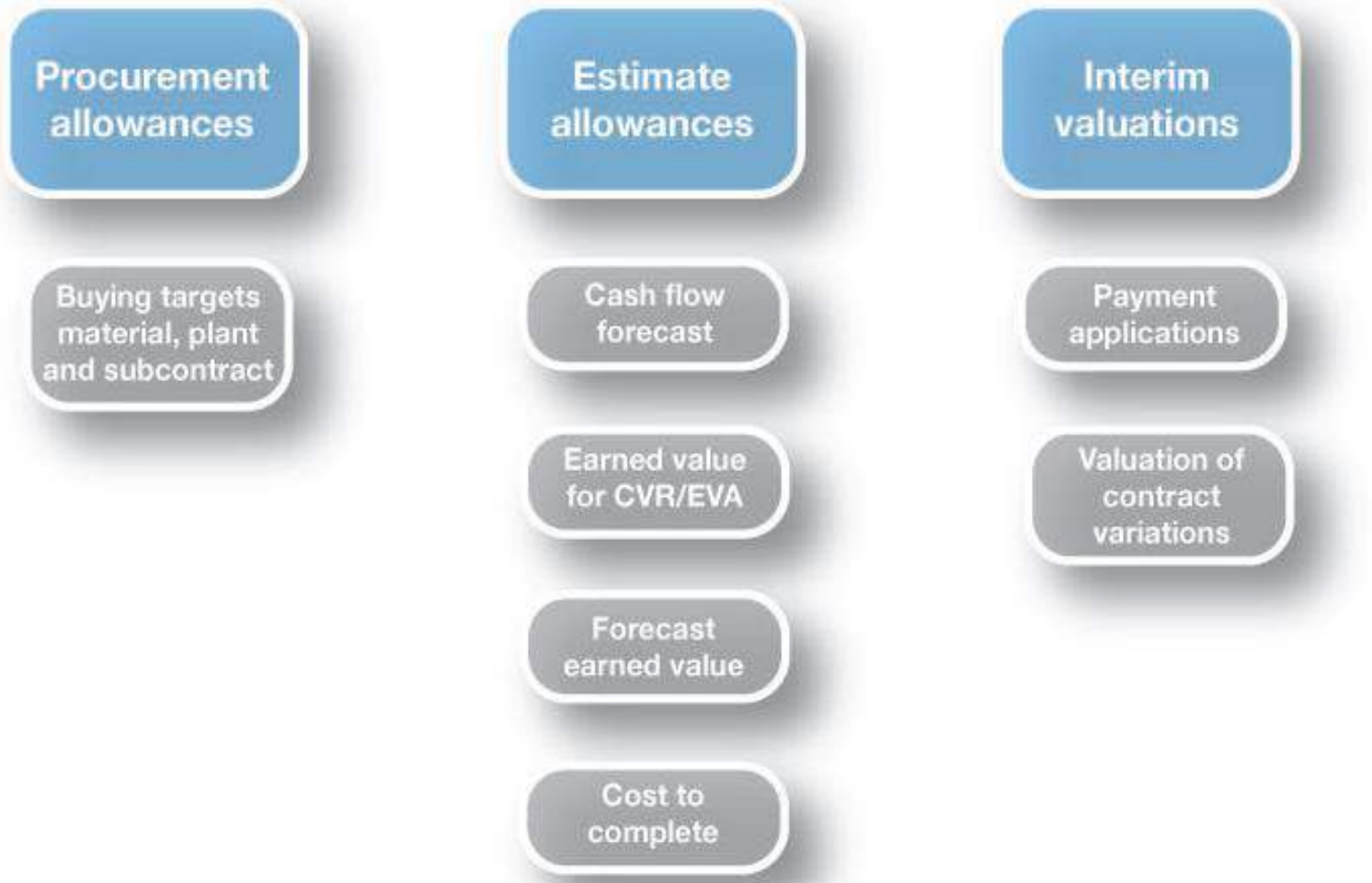
the commercial manager must be familiar with all the risks, opportunities and contingencies made in relation to a project or contract. In particular, the commercial manager must understand contingency amounts – where they are included and at what stages they can be released, should the risk or opportunity fail to materialize.

Estimating Quick Quiz

What tasks relating to estimating have you carried out ?


1. Detailed (cost) estimate
Programme
• preliminaries
• site overhead
• provisional items
• contingency
• fixed price/inflation
• risk and opportunity
• corporate overhead
• profit
Detailed or cost estimate
Site budget
Measurement rules
Measured quantities
Rate build-ups
Resource rates labour, plant and material
Labour and plant outputs material usages
Subcontract prices
Contingency, risk and opportunity, overhead and profit
2. Budget evolution
Rebudgeting
1
2
3
4
5
6 etc.
Ongoing, monthly or quarterly
Ongoing rebudgeting
Adjustments for:
• Tender addendums
• Contract variations
• Delivery method – direct to subcontract or vice versa
• Update to outputs
• Update to resource rates
• Changes in prelims and site overhead strategy
• Risk mitigation
• Opportunity recognition

3. Budget to build uses and outputs



Estimate and Budget

Commercial managers should be able to use the **details** of the estimate readily when developing and maintaining the construction budget. The budget should then be used to develop and subsequently maintain a forecast outturn cost and value.

- The **five-column** split of main cost elements are labor, plant, materials, subcontract and others
- There are usually two stages to a detailed estimate:

Stage 1: production of a BOQ (MOM)

Stage 2: pricing of the BOQ

- Labor, material, plant/equipment , subcontractors or hybrid / attendance
  - The quantities of materials needed to deliver a unit of the measured item should include an estimated allowance for waste.
  - There are many published sources of historic cost data available, including those from the RICS Building Cost Information Service (BCIS)

BOQ is used to

- Manage budget
- Track and manage procurement
- Inform cash flow projections
- Earned value
- Payment valuation

Variables necessitate adjustment for estimate (contingencies)

- Risk identified in the tender documents, for risks that are quantifiable, an appropriate contingency will be included, dependent on exposure to risk. Amounts to be included for unquantifiable risks will be based on the management perception of the situation (management reserve) . This may sometimes result in a qualification or exclusion or, in extreme circumstances, in the contracting organization withdrawing from the tender process.

- Estimated price escalation for anticipated price increases: allowances for projected increases due to inflation or other external factors.

- Estimated adjustments for foreign-exchange fluctuations, if the work is in a country with a different currency or if any packages are to be procured from a country with a different currency. In larger organizations, this is a variable that is sometimes managed outside of the project itself and is a risk that can be mitigated by hedging currency (for example, by forward-buying the foreign currency in question at the current or other agreed rates).

- Once the detailed estimate, including preliminaries and other variables, is established, the contracting organization will carry out a review meeting, often referred to as a **'tender adjudication'** or 'strategic review.

Budget will continually evolve, due to:

- ❑ Tender addendums: depending on the procurement route, it is possible that a client may issue changes to a contract after a site budget has been produced, but before the contract has been signed
- ❑ Contract variations
- ❑ Value engineering and changes in delivery method
- ❑ Updates to resource rates: there may be changes in the actual price of key resources, such as local labor, or in key materials, such as concrete, possibly due to market conditions or changes in legislation. These may be recoverable through the contract change mechanisms.
- ❑ Subcontract package-buying gains and losses
- ❑ Changes in site overhead and preliminaries strategy: changes in staff levels, or the number
- ❑ Changes in, or reviews of, the risk and opportunity register: these may result in changes to the assessed contingency amounts.

Time invested during the mobilization period, in developing project controls and processes, will reap an equivalent amount of savings in time every month

Budgets & Cash flow

How are budgets established ?

Why is cash flow important ?

What factors can affect a Cash flow ?

How is cash flow monitored ?

Value Engineering

- Value engineering is a process designed to maximize value through either **improved design, enhanced function, reduced cost, reduced risk or reduced whole life cost** of the asset being constructed.
- The term ‘value’ in this instance is what would be the most **economically advantageous** price for the **optimum product** and takes into consideration the overall cost of ownership of the end-product, including maintenance and replacement costs.
- To maximize the benefit derived from value engineering, it is best undertaken between the stage of project inception and that of detailed design.
- You need to be aware of the different construction technologies advantages and disadvantages to effectively manage the value engineering

The commercial manager, and his or her wider team, can contribute to the value engineering process (in addition to proposing options) by providing **structure and governance to the process**, for example, by **maintaining a register** of elements and activities that could attract additional value. These can be individually identified, managed and tracked until the detailed design is complete and the benefits have been realized, with the results then **fed into the estimate, budgets and forecasts.**

- Design growth is the reverse of value engineering, without a proactive discipline within the commercial team, additional costs resulting from design growth may not be picked up and affect the profitability of the project for the contracting organization. This, in turn, may result in disputes with the client.

Which party or parties will derive the benefit – financial or commercial – from the effects of design changes ?

- On cost plus or cost reimbursable contract types, any change is reimbursed, so although the change may affect time and cost, the client generally takes the risk and, by the same token, benefits from any savings.

- By contrast, on fixed price or lump sum contract types, any design changes initiated by the client are subject to valuation in accordance with the contract. Those initiated by the contractor are generally at the contractor's risk and work both positively and negatively in that regard.

- Alternatively, there may be clauses in the contract relating to cost savings and value improvements (FIDIC Red Book) , as well as others with regard to fitness for purpose, or performance specification. If this is the case, and the contractor carries out a value engineering process resulting in cost reductions, then so long as performance is maintained, the contractor is entitled to share any savings (while remaining responsible for satisfying the fitness for purpose obligation).

Supply Chain Management

Supply chain management consists of (4) stages as follows :

1. Vendor management

- Database management (list, certificates, registration,..)
- Performance management (input, annual performance review,..)
- This management should be based on the experiences of previous engagements, addressing questions such as:
  - Health and safety: did they work safely and comply with health and safety legislation
  - Quality: was the quality of work up to standard
  - Remedial work: Were there any defects or anything that required remedial work?
  - Program adherence
  - Administration: was their record-keeping adequate?
  - Commercial: were there any commercial issues with regard to interim applications or the final account?

It is important to understand the precise distinction between insurances and contractual indemnities, and their relevance to supply chain management.

- A contractual indemnity is an agreement by **one party to reimburse another party** for any loss suffered as a result **of specified items** that the indemnity covers, thereby transferring the risk to the party providing the indemnity.
- Insurance is a separate contract (usually called a policy), taken out with **a third-party** insurer, to provide a party with certain costs and expenses to cover a legal liability

2. Procurement and pre-contract (6) steps

- Establish and define a list of packages for the project
- Identify different vendors from the vendor database who can deliver that package
- Requests for Quotation (RFQ)
- After receiving feed back, analyze to identify which is the most commercially and technically favorable
- Negotiations can commence considering time, previous performance, qualifications,..
- Formal engagement with approved and signed subcontract documents in place

Delivery strategy

- Is the work of a specialist nature, meaning that specialists should be engaged?
- Is there a risk that should be incorporated into a subcontract, or transferred to the SC
- Are there potential productivity issues that should be transferred to or considered in a subcontract?
- What is the availability of resources (people, equipment and materials) to self-deliver?
- Are there subcontractors willing / available to carry out the work and will they accept the risks?

Once the above have been considered, the next steps should be the production of the:

- A procurement schedule in place, long lead consideration
- A requisition or similar, providing a clear definition of the scope and specification
- Robust documentation to send as an invitation to price
- Price return template. **Plugged Rates technique** : which allow to insert either the budget rate, an average rate, the highest rate returned, in place of anything not priced by tenderer,
- Standard and bespoke forms of agreement for entering into contract.

There are some additional areas that could be further considered at this stage:

- The program: it is worth stressing that program requirements and dates should be documented and accepted prior to finalizing any further agreement
- Attendances: it is worth reconfirming and checking attendances, as not only will there be a cost implication if there is any confusion, but also a potential impact on the program
- Risk register: Each subcontract package should have a risk register, recording all decisions made through all four of the stages of supply chain procurement

- **Performance bond protect performance**
- **Parent company guarantee protect insolvency**

3. Contract administration

- Understanding the contract in place and its terms and conditions
- Record-keeping from the site or any other source
- Reliable filing of correspondence, the measurement of works, …
- Monitoring that all previous are in line with other indicators of project progression.

As PER RICS, good practice include:

- Creating a standard structure for filing,
- Circulating contact names for the client, contracting organization, subcontractor,...
- Using standard templates wherever possible for notifications, payment certificates,
- Clearly issuing notices of delays, of additional works, of any defects
- Issuing timely sectional (where appropriate) and final completion certificates
- Compliance with contractual reply durations (Time bars). If no contractual durations are specified, then replies must be made in a timely manner.

4. Final account

- It is a good practice to have Contemporary agreements and early resolution of issues to expedite final account settlement
- On time submission of operation and maintenance manuals, as built drawings, tests at completion,.. will facilitate final account settlement and the release of performance guarantees and retention amounts.

Valuing Work

The term ‘valuing work’ relates to a monetary assessment of **how much** work has been carried out at a given point **in time**. Work is valued on construction projects or contracts **for two main purposes**:

- **Internal valuation** : To assess the value of work done against the project budget, for comparison with costs incurred to date used to forecast the final cost, final account and ongoing profitability of the contract

- **External valuation** :allow the contracting organization to be paid for the work done, as an interim or final payment.

All values should be calculated cumulatively for the project or contract in question, so that any period movements are calculated by taking the previous cumulative from the current cumulative. Any other approach is not considered **Best Practice**.

The external and internal values will differ on a month-by-month basis, as external value reflects the contracting organization's contractual entitlement to payment, whereas internal value is an assessment of the work that has actually been done against the estimate. These are unlikely to be the same.

Valuing variations

- **Rolling Contract Final Account** should be maintained, taking the original estimate, plus or minus agreed variations, and a percentage likelihood of variations that have not yet been agreed.

- The difference between the external and internal valuations effectively tells a contracting organization where the valuation of work is ahead or behind execution, so that due allowance can be made later within the cost/value analysis. The ability to analyze the external valuation versus the internal valuation will thus allow a contracting organization readily to monitor and understand ‘where it is’ with regard to its cash flow forecasting, and the reasons why.

Further technique

- Earned value analysis (EVA), in relation to cost/value reporting and forecasting. It is a technique used to forecast the final financial position of a project, using the current work in progress value as its basis. In its simplest terms, the technique compares the current progress achieved with the planned progress at a point in time, against a comparison of current costs with planned costs.

❑ Earned value analysis

- Method of assessing the work completed and a technique used to forecast final cost and value
- Method of **Performance Measurement** and project control. The reason for the popularity of this reporting system in project management is that it reports performance to cost and performance to schedule in one report
- Represent the budget cost for work performed (BCWP)
- Parameters
  - ✓ Planed value (PV)
  - ✓ Actual cost (AC)
  - ✓ Earned value (EV)
- If the project follows the project plan, each of these three parameters are exactly the same. Significant deviations between the values of the three parameters—PV, AC, and EV—are cause for concern

- Earned Value Report

- If The AC is higher than the EV ,this means that we are spending more money to accomplish the work, i.e. overbudget

- If EV is above the PV, this means that the project is ahead of schedule.

- CV = EV - AC (This is the difference between the work that is actually completed and the cost expended to accomplish the work. A positive variance is good, and a negative variance is bad)

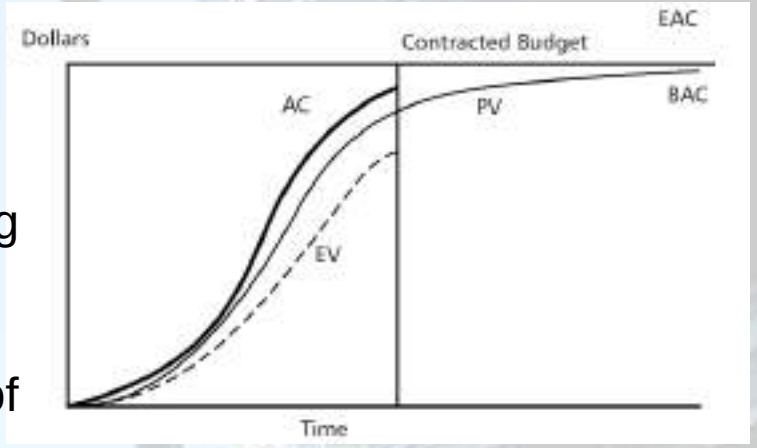
- SV = EV - PV (This is the difference between the work that was actually completed and the work that was expected to be completed at this time. A positive variance is good, and a negative variance is bad)

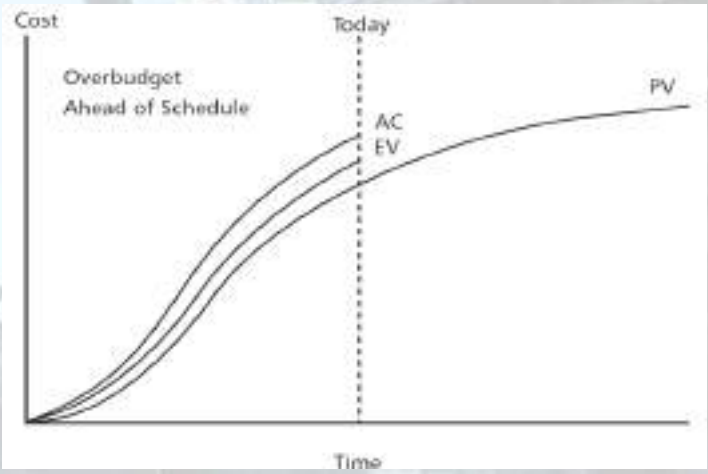
- Cost performance index (CPI) = EV / AC , >1 is good

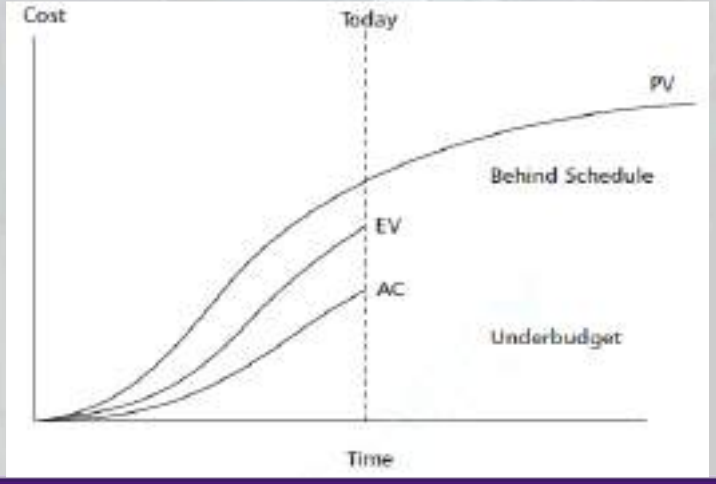
- Schedule performance index (SPI) = EV / PV, >1 is good

- Estimate at completion (EAC) = BAC / CPI
  (EAC) = AC + Remaining PC / CPI

- ETC = EAC – AC (The ETC is the remaining budget required to complete the project if work continues at the present performance rate)







- Earned Value Example

Week	PV	AC	EV	CV	SV	CPI	SPI	EAC	ETC
1	1,000	1,000	1,000	0	0	1.00	1.00	16,000.00	15,000.00
2	2,000	2,000	2,000	0	0	1.00	1.00	16,000.00	14,000.00
3	4,000	5,000	4,000	−1,000	0	0.80	1.00	20,000.00	15,000.00
4	7,000	8,000	6,000	−2,000	−1,000	0.75	0.86	21,333.33	13,333.33
5	10,000	12,000	9,000	−3,000	−1,000	0.75	0.90	21,333.33	9,333.33
6	12,000	13,000	11,000	−2,000	−1,000	0.85	0.92	18,909.09	5,909.09
7	13,000	14,000	11,500	−2,500	−1,500	0.82	0.88	19,478.26	5,478.26
8	14,000	14,500	13,000	−1,500	−1,000	0.90	0.93	17,846.15	3,346.15
9	15,000	15,000	14,500	−500	−500	0.97	0.97	16,551.72	1,551.72
10	16,000	16,000	15,500	−500	−500	0.97	0.97	16,516.13	516.13
11	16,000	17,000	16,000	−1,000	0	0.94	1.00	17,000.00	0.00
BAC	16,000								

- One item example
  - If you have item with total quantity of 10m, budget cost for each m 10SR, at the cut off date the planned quantity is 6m, actual executed quantity is 5m with actual cost 12 SR/m , using EV analysis clarify the performance.

Answer :

BAC = 10*10 = 100 SR

EV = 10*5 = 50 SR

AC = 5*12 = 60 SR

PV = 6*10 = 60 SR

CPI = 50/60 = 0.83 (over budget)

SPI = 50/60 = 0.83 (behind schedule)

EAC = 100/0.83 = 120.48 SR

ETC = 120.48 – 60 = 60.48 SR

Understand Cost

- A base cost report from a contracting organization's financial accounting system will, as a minimum, show the costs incurred to date, by **cost type**, analyzed by a **five-column** split (People (Staff, labor), plant, materials, subcontract and other)
- Cost reports and cost forecasts for a **contracting organization** will usually be a detailed breakdown of all the direct and indirect resources employed on the contract, captured using methods similar to those below. These resources and methods may include the following:

1. People: operatives and staff. Captured using timesheets against employee records, assessing hours worked, pay codes
2. Equipment: owned and hired plant, equipment and vehicles. Captured using plant hire orders, on/off hire recording, plant accruals, plant timesheets
3. Materials purchased for the contract works. Captured using purchase orders, goods received notes, accruals and invoices, as well as stock management.
4. Subcontract and subcontract services. Captured using subcontract purchase orders, accruals and applications for payment or invoices
5. Other: indirect costs that do not naturally come under any of the above headings, such as utility bills, stationery, photocopier costs, and other ancillary site overhead purchases that will not be used within the works. These are usually captured and processed as purchases in a similar way to Materials.

*For further information on cost reporting, see the RICS guidance note Cost reporting

- By contrast, a clients' cost report will often be simply a summarized analysis of the contract estimate, noting what has been paid to the contracting organization, with a forecast of the final account by contract element. It is important to note that cost reports produced by a contracting organization for their own internal management purposes will be much more detailed than cost reports produced for the client.

- For an up-to-date view of goods and services consumed, it is beneficial also to include:
  - accruals for goods and services received
  - a forward forecast of costs to come, from orders placed, but where the goods or services have not yet been received. These are known as **'commitments'** and are extremely useful when forecasting.

- Setting up the cost element and common analysis levels at the start of the project or contract is crucial to its smooth commercial management (consistent coding structure for cost/value and forecasting) , financial accounting systems are extremely helpful

- IT systems must support business processes for the capture of costs, helping to ensure that these are properly incurred, in accordance with documented business processes and corporate governance.

Cash flow monitoring – Quick Quiz

What is a CVR ?

Why is it carried out ?

Can you explain it?

Cost/value analysis/reconciliation (CVR) or (CVC)

- In Building and Civil Engineering Works, the preparation of Construction Contractor's Cost – Value Reconciliation (CVR)' is an important tool in tracking the **'financial health'** of construction **projects** and early identification of potential commercial problems, it is the **profit and loss statement** for the project

- The production of a comparison of cost to date versus value to date, and a comparison of the final cost and value, are some of the most important aspects of commercial management

- CVR is comparison of expenditure against income at regular interval generally on monthly basis (in the same point in time/date) to arrive at project profitability. The period movement should be easily calculated by taking the previous cumulative from the current cumulative amounts.

- Comparison by common analysis levels (work breakdown structure, element or activity), reflecting the levels at which the estimate and project forecast were produced

- A CVR Report basically comprises of the following details in different sections:
  - Work executed (either certified or not)
  - Adjustment for Materials on/off Site
  - Variations
  - Provisional sum/PC adjustment
  - Adjustment for under /over Valuation
  - Back-charges
  - Cost to Complete
  - Subcontractors work executed
  - Subcontractors accruals
  - Liabilities
- Based on the above project profitability is calculated

- Identification of variances in cost and value against each element or activity. It may be possible to narrow the variance down to a particular cost head, for example, labor, plant, materials or subcontract.

- Once the basic reconciliation result is arrived at, the consideration of risk, contingency and other director's adjustments can be made.

- CVR data allows the commercial manager to **make decisions** on people and equipment resource levels, construction methods, program and preliminaries, as well as to develop recovery strategies in terms of contractual claims or procurement.

- It is so important that the forecast and the CVR are collated at the most appropriate level of detail for each project or contract

- Decisions or issues may need review :
  - Change management schedules: what entitlement there is, what has been recovered, and what revenue has been taken for change that has been delivered, but not yet agreed
  - The plant on hire lists: ensuring that there is neither anything on hire that should not be, nor anything being charged for that is not actually on hire
  - Other time-based charges
  - The staff lists: are internal charges for staff as forecast and accurate?
  - Operative costs: are these being charged to the project or contract as expected?
  - Subcontract liabilities and commitments
  - Risk, opportunity and contingency amount review

- Cost forecasting (CTC & CAC) and, in particular, trend analysis, require a good understanding of a number of more complex issues. These include the following:
  - Risk and opportunity
  - Do adjustments need to be made to these trends to account (was there unexpected inclement weather, was there a shortage in any materials, was there any industrial action or other third party caused matter?

- Decision making with reference to the CTC is therefore based on a number of key issues:
  - accurate collection and reporting of historical data (cost to date)
  - a record of commitments made that have not yet been costed
  - accurate forecasting based on construction methodology
  - current program position and guidance provided by program reviews, alongside any EVA calculations
  - probability analysis of the worst, best and likely cases with regard to items on the risk and opportunity

- Cost reporting tools can produce reports in a variety of formats, some examples of good practice are summarized below:
  - In a traditional row and column format
  - As a graphic, showing the comparison of cost versus value, forecast versus actual, or the evolution of results. As with tabular data, graphs can also be interrogated if the underlying data is accessible. Types can include:
    - ✓ bar charts
    - ✓ pie charts
    - ✓ line graphs
    - ✓ dashboard reports.

- The development of IT to support an integrated CVR, bringing cost and value together, and the development of EVA as part of a project controls philosophy in construction, are still at a relatively early stage. There are many reasons for this, including the historic and inherent barriers to the full use of IT within the construction industry. However, if the correct approach is adopted and a consistent vision maintained, it is possible to implement and use systems effectively.

Project Name														
Scope of work														
COST VALUE RECONCILIATION														
CVR No.					**Period Ending**							**Contract No.**		
Payment Certificate No.					Contract Commencement Date:							Time Completed		
Gross Value					Contract Completion Date:							Weeks Used		
Valuation Date:					Revised Completion Date:							Weeks Available		
Contract Sum								**SECTION B: COST**				**Previous Cumulative**	**Current Cumulative**	**For the month (Curr. - Prev.)**
Variations								7	Cost to Date					
Prov. Sum Adjustment									(a)	Preliminaries				
Employer's Claim									(b)	Labour				
Others (Insurance Claim)									(c)	Plant				
EOT/Prolongation Cost									(d)	Materials				
Projected Final Account (AED)									(e)	Subcontract				
SECTION A: VALUE				**Previous Cumulative**	**Current Cumulative**	**For the month (Curr. - Prev.)**			(f)	Others				
1	Gross Certified							8	Contract Cost to Date					
2	Sundry Invoices/Receipt								(g)	Staff				
3	**Gross Income (Turnover)**								(h)	Depreciation				
4	Adjustment to Valuation							9	Total Cost to Date					
	(a)	Advance Payment												
	(b)	Materials on/off Site						10	Forecast Cost to Complete					
	(c)	Over Valuation												
	(d)	Under Valuation						**SECTION C: GENERAL**						
5	**Total Value Adjustments**							11	Current Trading Margin [6-9]					
								12	Current Margin v TO % [11/6]					
6	**Adjusted Contract Income**							12a	Current Margin v Cost % [11/8]					
Notes:								13	Estimated Final Contract value					
								14	Estimated Final Cost					
								15	Estimated Outturn Margin [13-14]					
								16	Estimated Margin v TO % [15/13]					
								16a	Estimated Margin v Cost % [15/14]					
								17	Tender Margin v TO%					
								18	Value Completed % [6/13]					

Cash and cost flow analysis

- Cash flow is used to manage income and expenditure to ensure that there are enough liquid funds in the business to keep it running
- Strong cash position is thus important to a contracting organization for the following reasons:
  - pay its expenses when they become due
  - provides the money to make investments that will save money later: (purchase items previously hired at high rates.)
  - illustrates security to lenders for credit
  - It provides contingency for unexpected issues
- The key elements to monitoring cash balances are an understanding of:
  - the valuation, submission, assessment and certification processes
  - any under- or over-valuation of works (intentional or unintentional) and the effect this may have on cash flow
  - the contractual payment process
  - month-end dates for payments of salaries, leases and other fixed costs
  - credit arrangements with subcontractors and suppliers
  - payment dates of direct and indirect costs, such as staff and labor salaries, plant and equipment hire or leases, supplier agreements and subcontract agreements

- Strong cash flow will strengthen the trading and negotiating position of a business, so how to improve cash flow:

- Cash out
  - ✓ contracting organizations often employ subcontracted labour, plant, equipment and services, as a way to avoid the investment of capital on these. By subcontracting, there is an opportunity for payment terms to be negotiated
  - ✓ Makes use of subcontractors, the money can usually be held for longer, awaiting a monthly invoice, and paid out one or two months
  - ✓ Advance payment to Subcontractors / payment terms
  - ✓ materials (do you need to purchase before you can bill?)

- Cash in
  - ✓ advance payments
  - ✓ payment terms
  - ✓ payment for materials off site, or not installed
  - ✓ From the program, how much work will be done each month? **Program drive works and works drive valuation**
  - ✓ continuous monitoring to validate whether the work you are doing should be a variation : If there are excess resources (people, material and equipment), then unless there is a variation, this will result in a negative effect on the margin, as well as the cash flow.

Commercial decision making

- When ?
  - Commercial decision making is not just in response to things that have already happened, but throughout a project's life cycle. Most frequently, they are made with due regard to things that are anticipated and have a commercial impact on the Project , it starts with business development stage through tendering stage up to the construction and close out stage.

- It is best practice to include the commercial decision in the risk and opportunity register, to quantify and value each decision, ensure that risks are mitigated and opportunities maximized

- **Commercial decisions at the tender stage**
  - What requirements are there in terms of bonds, collateral warranties and parent company guarantees
  - What are the funding arrangements for the project? Are there any third-party financing conditions, such as public-private partnerships (PPPs)?
  - Are there any process design/full function points (FFP) risks? (for instance,; Risk of missing some required user functions during estimation or analysis) Can the proposed levels be accepted, or can they be 'backed off' التراجع عنها to a third party, such as a design consultant? Will insurance cover the process risk?
  - Are there any consequential loss provisions (indirect loss)?
  - Are there any delay and liquidated damages provisions?
  - Are there any joint ventures or consortiums to be considered?
  - What, if any, insurance provisions are in the contact? Are there any minimum levels of cover?
  - Are there any provisions that will affect cash flow?

- Examples of where commercial decisions could be made :
  - ✓ movement of resources and associated sums, between items that are considered over- or undermeasured
  - ✓ adjustments to people or equipment rates
  - ✓ adjustments for omissions or ambiguities in the contract documents
  - ✓ adjustments for gaps between the method of measurement, the specification, the drawings and any BOQ or schedules of rates (SOR)
  - ✓ value engineering and alternative methods, such as off-site fabrication.

❑ Post-tender commercial decisions

- Once the initial baseline forecast and a related cash flow are produced, commercial attention focuses on further engagement with the supply chain, on valuing work (for internal and external purposes), on analyzing costs and on the CVR process tracking against the forecast and the cash flow. Further updates to the forecast, and the need for additional commercial decisions, will be driven by the progression of these factors, and by how the matters that emerge from them give rise to additional or evolving risks and opportunities.

- The foundation for robust and timely decision making is
  - data collection
  - data analysis
  - data reporting
- Cost mitigation strategies:
  - Delivery strategy: consider a change of construction methodology (such as subcontract or self-deliver)
  - Financial or funding:
  - consider hedging التحوط material prices (for example, locking out steel, copper, .. by forward-purchasing to mitigate escalation)
  - consider hedging of foreign exchange, if purchasing from overseas
  - consider paying up front for off-site goods and materials or unfixed plant and equipment to avoid price fluctuations.
  - Procurement
  - consider re-tendering subcontract and material packages, looking for economies of scale by using suppliers company-wide, rather than just per project.
  - Resources

- consider the question of leasing versus purchase of equipment: will the leasing cost exceed purchase costs over time?
- utilities: consider temporary power versus permanent power in a cost benefit analysis
- consider implementing just in time (JIT) delivery, to reduce storage charges
- carry out a review of programming, to deliver improved efficiency of resources
- conduct a review of staffing and supervision levels, to gain efficiency.

Procurement of Subcontractors, Labour, Plant, Materials

Subcontractor Selection

Tender Lists

Labour Hire Agencies

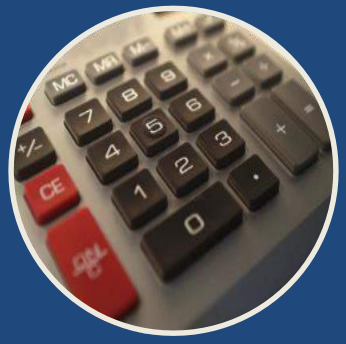
Plant & Materials Suppliers

Procurement of Subcontractors - Quick Quiz

When sending out tender documents to a subcontractor to price, what information do you typically send ?

Commercial Management of Projects – Matters to Consider

Cost to Complete Exercises



Value Engineering

Profitability

Advising on Financial Implications

Level - 1

- Identifying and understanding the components that make up the cost of the project to the contractor
- Understanding of the effect that the design and construction processes have on the cost
- Awareness of the techniques used to reconcile the cost against income
- Awareness of the techniques to financially manage sub- contractors and suppliers
- Understanding the use of cash flows.

Level - 2

- Apply your knowledge to the Financial management of construction projects, including regular monitoring and reporting on cashflow and profitability.
- Collecting of data for reports
- Carrying out cost to completion exercises
- Preparing cashflows
- Preparing reports such as liability statements, cost to complete and cost value reconciliations
- Applying value engineering processes
- Preparing and submitting cost data for in-house and/or external use in relation to areas such as:
  - cost of preliminaries,
  - comparative cost of different construction elements
  - taxation allowances.

Level - 3

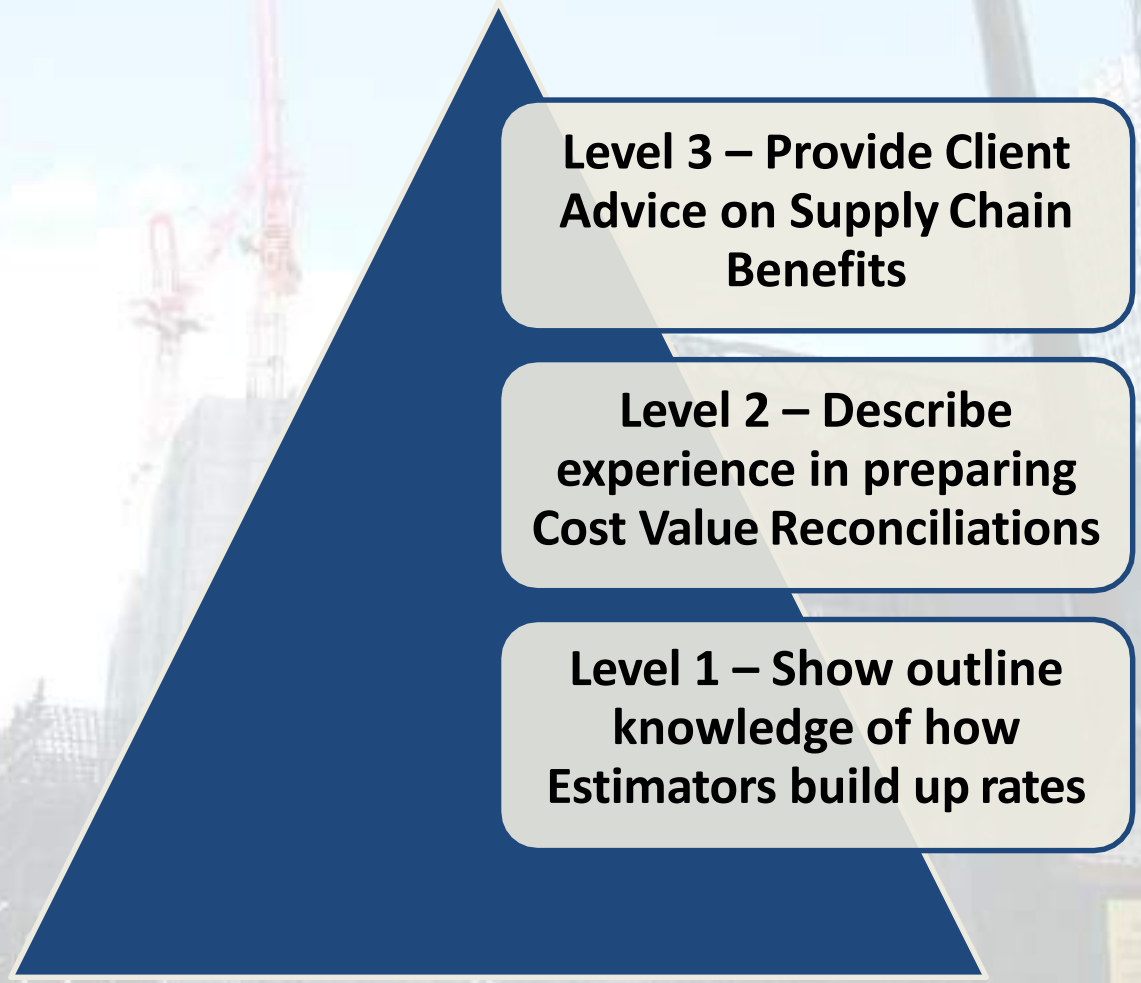
- Monitor, report and advise on project cashflows and profitability. Evaluate and advise on the Financial implications and appropriate management actions.

- Examples of activities and knowledge comprised:

  - Monitoring, analyzing, reporting and advising at a senior level on project cash flows and profitability for internal use

  - Evaluating and advising on Financial implications and appropriate management actions.

Template Tips Examples



Good and Bad Examples of Template Completion follow

- **Which is which ?**

- **Give me a smiley face for good, sad face for bad**

Good or Bad Example ?

Level 1

During my degree I studied modules of Commercial Management of Construction.

I learnt how, why and the reasons for monitoring cash flow on construction sites. I learnt about the S Curve method for monitoring cash flow, along with factors which can affect cash flow. Two examples of these factors include, delays to the works and late payment from clients.

Level 1 text ……is a Good Example

Good or Bad Example ?

Level 2

In xxxxxxxxxx project I was responsible to manage all the variations including adjustments of provisional sums and prime costs. In this project we were benefiting from the value engineering by sharing the saving with the Employer.

In xxxxxxxxxx, I was responsible to coordinate for the issuance of bank bonds, insurance policies, prepare the payment applications to the Engineer which incorporate the measured works and variations (which I was managing), issue subcontractors' payment certificates and managing all their variations and claims. Moreover, prepare the commercial part of RFQ's and monthly cost report.

What do you think could have made it better ?

Good or Bad Example ?

Level 3

At the Hotel Project, I worked for the Contractor as a Site QS. The project was valued at USD 45million and I was one of 5 on site QSs. We had a scenario where the client was constantly paying our company late, each valuation. We had to demonstrate to our directors, the impact, these late payments had upon our cash flow. We prepared a cash flow forecast and highlighted, periods of late payment and lost interest from the bank. We then presented this to our directors and advised on the next course of action.

What do you think could have made it better ?

This is a Good Example for Level 2

At the Office Building Project, I was the Contractor's Commercial Manager and was responsible for managing the tender enquiries for the subcontractors on this £2million project. Before preparing my tender list, I sent a prequalification questionaire to subcontractors from our Supply Chain. One example, was the dry-lining. I received the completed pre-qualification questionairre, and analysed it for safety records, workloads, experience in this type of work, amongst other criteria. I then sent out tender documents for pricing to those I considered appropriate. On receipt of the tender returns, I compared them to each other and prepared a tender report on this trade for my director. I then discussed this with him and subsequently invited "Subcontractor A" in for a meeting to discuss the project. The meeting was successful, and I then placed a subcontract order , using our standard form, ensuring, it was "back-to-back" with the main contract terms and conditions.

This is a Good Example for Level 3

At the xxxxxx Project, there was a delay of 15 weeks, which my company, the Building Contractor, were responsible for. I was tasked with preparing a cost to complete exercise based upon a 15-week late completion.

I advised the Site Manager, that I had been tasked with this and requested that we spend time together analysing future prelims, and resource requirements for this delayed period. Based upon information, collated from him and myself, I prepared a report, with spreadsheets, and cost data. I then linked this to a programme of works. This showed that my company were to potentially lose £200,000 on this £22 million project.

I advised that if a bonus incentive was offered to the workforce, my company could save £40,000 from the predicted loss, and finish 3 weeks earlier. My reasons for this advice were based upon accelerating the works, by extended site opening hours, weekend working, and off hiring of non essential agency site office personnel. The director took my advice, which resulted in a saving and earlier site completion.

Demonstrating your levels – Activity 1

You have prepared a Monthly Cost Value Reconcilliation

What Level is this ?

1 2 3

Demonstrating your levels – Activity 2

You have prepared a report and advised your Directors ways of improving the current poor cash flow position.

What Level is this ?

1 2 3

Example Question for Level 1

- Assessor may ask :-
- What is a Budget ?
- This is a Knowledge based question
- **Remember Level 1 is about :-**
- **KNOWING**

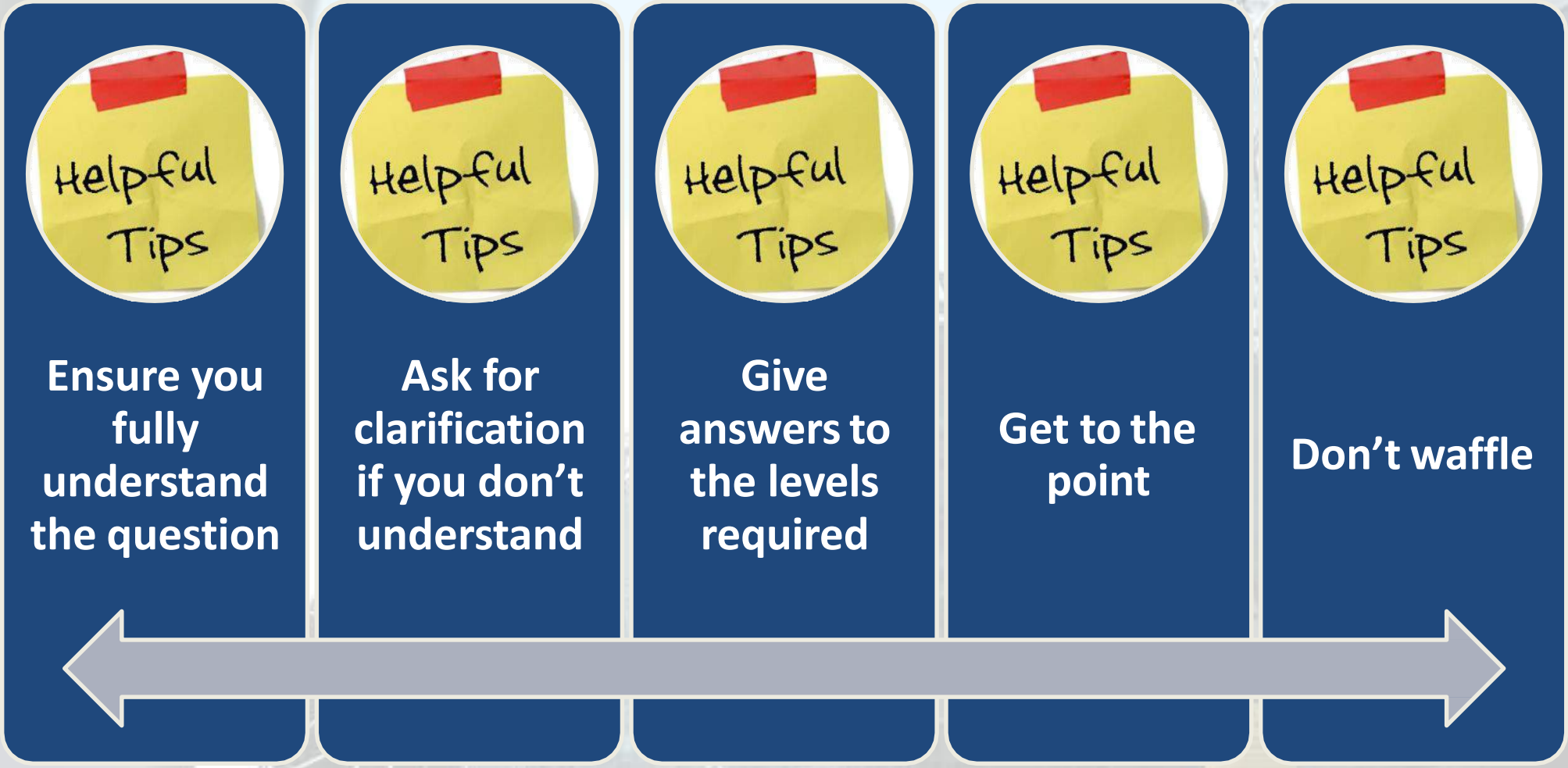
Example Question for Level 2

- Assessor may ask :-
- Give me an example of a recent Cost Value Reconciliation you have prepared
- This is an experience based question
- **Remember Level 2 is about :-**
- **DOING**

Example Question for Level 3

- Assessor may ask :-
- What advice would you give a Director concerning increasing profitability on your project
- This is an Advice based question
- **Remember Level 3 is about :-**
- **ADVISING**

Answering Questions – Tips



Avoiding Common Pitfalls

Common Template / SOE / Case Study Pitfalls

- Poor grammar and spelling
- Too brief, rushed or poorly presented
- Does not relate to the level claimed
- No relationship with this competency and the pathway guide


Q&A

How would you deal in pricing of incomplete design information?

- Provisional sums
- Contingency / risk allowance
- Qualifications/ Deviations

What would you consider in analyzing the materials cost?

- Quantity required for the works
- Wastage allowance
- Allowance for cutting out (if relevant)
- Delivery costs
- Minimum production or delivery batch
- Handling costs
- Storage costs

What would you consider in analyzing the labor costs?

- Direct staff (including holidays, sick leaves, training, pensions...)
- Indirect staff (including agency fees)
- Anticipated production rate (man hours/quantity of work item)
- Adjusted productivity rates for site conditions
- Adjusted productivity for skills/experience of staff
- Idle time (i.e. awaiting deliveries)

What would you consider in analyzing the plant costs?

- In-house cost allocation (including depreciation, storage, insurances...)
- Time related hire costs
- On/off hire costs
- Idle time
- Fuel, oil, tires
- Repairs and maintenance costs
- Transportation and setting out to site

What would you consider in analyzing sub-contractor costs?

- Quotations / purchase orders
- Attendance
- Provision of preliminaries items
- Qualifications and exclusions
- Minimum visit charge
- Payment terms (impact on cash flow)
- Inflation / expiry date of quotations
- Allocation of risks

What is the liability statement?

- Liability statement summarize the contractor's total liability for each sub -contractor package (accruals + commitments)
- The total liability is the total cumulative amount that would be due to a subcontractor for work done up to the period end-date, if no further work was to take place (=value of work done)
- It can include variation not yet agreed, but for which a prudent allowance should be made in the liability
- An accrual is an accounting function: it is the difference between the total liability and the amount already paid to the subcontractor = amount due / invoiced but not yet certified
- A commitment: is a forecast of costs / invoices to come from orders placed but where the goods or services have not yet been received

How would you manage the negative cash flow?

- Increase sources of funding: borrowing, check variations accounts and payments, materials on/offsite, advance payments
- Reduce outgoings:
  - ✓ Negotiate the payment terms with supply chain
  - ✓ Review procurement schedule
  - ✓ Reduce resources on site without affecting the program
  - ✓ Increase productivity / review work methodology


Thank You