QSD PQSL Series 2015

Cost Planning and Control

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Cost Planning and Control

Q1. If you were a Client, what would you expect your project Q.S. to provide in respect of cost planning and control?

Q2. How do you define a successful cost control?
Objectives / Agenda

• To recap Core Competency requirements.

• To introduce the concept of cost control

• To explain the cost control process and its implementation

• To identify the cost control tasks in the pre-contract and post-contract stages
HKIS QSD APC Rules and Guide - Core Competencies

• 4. Pre-contract cost planning, estimating and control

• 4.1 Able to understand the build-up of properties development budget, and methods of valuation of construction costs

• 4.2 Able to use cost data including adjustments to various factors such as locations, specification, time and market forces

• 4.3 Able to demonstrate knowledge of various factors affecting economics of design and construction

• 4.4 Able to undertake financial feasibility and comparative design studies

• 4.5 Able to prepare cost plans, update cost plans and carry out cost checks and control

• 4.6 Able to prepare cost estimates by various estimating techniques
HKIS QSD APC Rules and Guide - Core Competencies (Cont’d)

• 4. Pre-contract cost planning, estimating and control*

• 4.7 Able to evaluate alternative design solutions and life cycle costs

• 4.8 Able to prepare and interpret cash flow projections and profit/loss forecasts

• 4.9 Able to prepare cost reconciliation statements with previous cost estimates and with costs of similar projects

• 4.10 Able to prepare cost analyses

• 4.11 Able to prepare and submit cost data to in-house and/or external data collection agencies

• 4.12 Able to use cost estimating, CAD and BIM softwares to assist
Concept of Cost Control

What are the costs to be controlled?

Costs

Materials

Labour

Sub-contractors

Plant

Other expenses

Direct cost

Indirect cost

Nature and Classification of costs
Main elements of a “Control Process”:

1. The preparation of a plan that will achieve the objectives of the work
2. The recording of the plan in terms of the inputs to or the outputs from the system
3. The definition of the quantities and organization of the resources that will be necessary for the conversion of inputs to outputs
Concept of Cost Control

Main elements of a “Control Process” : (Cont’d)

4. The use of feedback in order to compare what is happening in practice with that which was planned

5. The evaluation of variances arising from the comparison, leading to decisions as to whether corrective action is required and whether a change in resources allocation is necessary
Concept of Cost Control

Aims of Cost Control / Cost Planning

• **Best use of resources** to gain the good value for money during the design and construction processes

• Controlling measures exercising in the design and construction processes to ensure the **total construction cost / final sum does not exceed the client’s approved budget**
Aims of Cost Control / Cost Planning (Cont’d)

- Cost as an element of design during the design and construction processes to achieve a suitably balanced costs throughout all parts of the building.
Concept of Cost Control

Implementation of Cost Control

• In order to achieve the cost control function, there are three elements need to be executed:

i) **Cost Planning** – to formulate the realistic cost plan for the project
Concept of Cost Control

Implementation of Cost Control (Cont’d)

ii) *Cost Monitoring* – continuous process to compare the actual cost with the planned cost

iii) *Action* – the effective cost rectification or cost reconciliation action to review the overall construction cost against the client’s approved budget
Concept of Cost Control

Cost adjustment opportunities

- Feasibility
- Detailed design
- Construction

Cost adjustment opportunities
Cost Control During Pre-contract Stage

A narrower definition of pre-contract cost control is:

“the total process which ensures that the contract sum is within the client’s approved budget or cost limit”

(produced by RICS committee (1982))
Cost Control During **Pre-contract Stage**

Pre-contract cost control tasks are exercising at different stages as follows:

i)  *Feasibility stage* – confirmation of cost limit

ii) *Outline proposals stage* – prepare possible solutions for cost plan and agree a outline cost plan

iii) *Scheme design stage* – to exercise the cost checks based on the scheme design drawings
Cost Control During Pre-contract Stage

Pre-contract cost control tasks are exercising at different stages as follows: (Cont’d)

iv) *Detail design stage* – to exercise the final cost check based on the detailed design drawings

v) *Tender Stage* – to exercise the cost analysis against the approved budget
## Cost Control During Pre-contract Stage

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<th>Stage</th>
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## Cost Control During Pre-contract Stage

<table>
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<tr>
<th>Stage</th>
<th>Purpose</th>
<th>Basis of Cost Estimate</th>
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</table>
| **Inception Stage**        | Work out the approximate overall building cost for development decision consideration | Construction Floor Area (CFA)* x $/m² (historical data)  
* denote the land use (i.e. Residential, office / commercial, industrial, retail, car park, etc. |
| **Feasibility Stage**      | Workout the effectiveness of building cost for feasibility               | CFA x $/m² (historical data)  
(normally only conceptual drawings are available)                                                                                                          |
| **Scheme Design Stage**    | Provide cost estimate to identify the cost significant items (facilitate the cost control function) | Element cost estimate  
(i.e. element quantity x element unit rate)                                                                                                           |
| **Detail Design / Tender Stage** | Provide the detail of cost estimate based on the detail design drawings and pre-tender estimate for cost justification | Detailed cost estimate in accordance with B.Q.  
(based on traditional method of rate build-up)                                                                                                           |
Cost Control During Pre-contract Stage

- Three categories of Client:
  i) Clients who have a clear intention of their building requirements, but are generally unaware of the cost implications
  ii) Clients who have a maximum amount of money to spend and a project in mind but are unsure of exactly what that amount of money will purchase.
  iii) Clients who have their building requirements and who also have a fixed sum of money to spend on the project.
Cost Control During Pre-contract Stage

Advantages of Cost Planning

1. Tender sum is more likely to equate with approximate estimate
2. Less possibility of addendum B.Q.
3. Cost-effectiveness and a value-for-money design are more likely to be achieved
4. Early involvement of Q.S.
Cost Control During Pre-contract Stage

Advantages of Cost Planning (Cont’d)
5. The result of pre-tender analysis enables more decisions to be taken earlier
6. Cost Planning provides a basis for comparing different projects
Cost Control During Pre-contract Stage

• Cost planning shall include forecast the cost implications of a whole range of design variables, such as size, shape, height, circulation ratio, wall-to-floor ratio and various other building characteristics, i.e. complicated shapes result in greatly increased building cost etc.
Cost Control During Pre-contract Stage

**Elemental Cost Planning**

- Sketch plans are prepared and the total cost of work is obtained by approximate method, such as cost per place or per square metre of gross floor area.
- The building is then broken down into various elements, e.g. internal walls, floors, internal finishes, roof, etc.
Cost Control During Pre-contract Stage

*Elemental Cost Planning (Cont’d)*

- Each element is allowed a cost based on cost analysis of similar projects.
- The sum of the cost targets set against each element must not exceed the total estimated cost.
- That is: *designing to a cost* (agreed cost limit).
Cost Control During Pre-contract Stage

Cost Control at Design Stage

1. Substitution between capital and running costs to secure the minimum total cost
2. Investigating different ways of producing the same building at lower cost
Cost Control During **Pre-contract Stage**

Cost Control at Design Stage (Cont’d)

3. Finding ways of slightly altering a building so that for the marginally greater use of resources, the returns are more than proportionately increased

4. Investigating methods of using the same resources to produce a different building which could give greater returns
Cost Control During Pre-contract Stage

Cost Control and Design Economics:

- **Building size**
  Larger buildings have lower unit costs than smaller-sized buildings

- **Plan shape**
  The more complex the shape, the higher will be the overall cost of the structure based on the same floor area (i.e., number of corners involved)
Cost Control During *Pre-contract* Stage

Cost Control and Design Economics: (Cont’d)

**Project A**
- Plan area = 900m²
- Perimeter length = 120m
- Wall area = 480m²
- **Wall-to-floor ratio = 0.53**
  \[
  \frac{480}{900}
  \]

**Project B**
- Plan area = 8100m²
- Perimeter length = 360m
- Wall area = 1440m²
- **Wall-to-floor ratio = 0.18**
  \[
  \frac{1440}{8100}
  \]
Cost Control and Design Economics: (Cont’d)

Plan area = 100m²  
Perimeter length = 40m  
Wall area = 120m²  

Wall-to-floor ratio = 1.2  
(120 / 100)  

Plan area = 100m²  
Perimeter length = 54m  
Wall area = 162m²  

Wall-to-floor ratio = 1.62  
(162 / 100)  

Cost Control During Pre-contract Stage

Cost Control and Design Economics: (Cont’d)

- **Storey height**
  Buildings with high storey height will cost more

- **Grouping of buildings**
  Inter-linked buildings or structures will save cost
Cost Control During Pre-contract Stage

Cost Control and Design Economics: (Cont’d)

Alternative plan groupings of buildings
Cost Control During Pre-contract Stage

Question to think about:

“What are the corrective actions if the Tender Sum exceeds the approved budget or cost limit?”
Cost Control During Post-contract Stage

• What is the post-contract stage?

• That is: The time from signing of the contract until the final certificate.
Cost Control During Post-contract Stage

- What is the main cost control function of an employer’s quantity surveyor during post-contract stage?

- To ensure that:

  Tender Sum (Contract Sum) = Final Account (Final Contract Sum)
Cost Control During Post-contract Stage

• What is the main cost control function of a contractor’s quantity surveyor during post-contract stage?

• To ensure that:
  Actual Expenditure $\leq$ Budget
  (maintain the same or better profitability)
Cost Control During Post-contract Stage

Cost Control activities in Post-contract stage includes the following:-

• Interim valuation and certificates for payments
• Cash flow control and forecasts through budgetary control
• Financial statements showing the current and expected final costs for the project
• Final account, the agreement of the final certificate and the settlement of claims
Cost Control During Post-contract Stage

Cost Control activities in Post-contract stage includes the following :- (Cont’d)

• Attendance at site meetings
• Preparation of documentation for subcontractors and suppliers, examination of quotations and invoices and making recommendations
• Advising on contractual implications
• Negotiation
Cost Control During Post-contract Stage

Cost Control activities in Post-contract stage includes the following :- (Cont’d)

- Confirmation of payments to domestic / nominated subcontractors (NSC)
- Advising on the implications of extensions of the contract period
- Preparation of special reports on cost implications
Cost Control During Post-contract Stage

Cost Control activities in Post-contract stage includes the following :- (Cont’d)

• Completion of documentation which may be required for some clients, particularly government departments

• Working with accounting department
Cost Control During *Post-contract* Stage

**Contractor’s Cost Control**:  
- Comment on profitability of different site operations  
- Advise on how to reverse a loss-making situations  
- Record cost details of site operations  
- Advise on the cost implication of alternative construction methods
Cost Control During **Post-contract** Stage

**Cashflow control** :-

- **Cashflow**: the actual movement of money in and out of a business
- **Cash deficit**: money out > money in
  Contractor requires **FUNDING**
- **Cash surplus**: money in > money out
  The contract is **SELF-FINANCING**
Cost Control During Post-contract Stage

Cashflow control :- (Cont’d)
Cashflow problems can be reduced by :-

• Realistic monthly assessment of preliminaries from fully documented and priced preliminaries schedules

• Increased costs under contracts with fluctuation kept up to date in monthly valuations
Cost Control During Post-contract Stage

Cashflow control :- (Cont’d)
Cashflow problems can be reduced by :- (Cont’d)

• Variations to the contract accurately assessed and included in valuations

• Daywork sheets completed and cleared for monthly payment

• Discounts and retention monies properly claimed against the contractor’s subcontractors and suppliers
Cost Control During Post-contract Stage

Cashflow control :- (Cont’d)
Cashflow problems can be reduced by :- (Cont’d)

• Collection of all monies properly due to the contractor

• Ensuring that all claims for loss and expense are fully documented, properly presented and submitted as quickly as possible
Cost Control During Post-contract Stage

S-Curve

- Cum. Expenditure
- Cum. Income

Month

$
Cost Control During Post-contract Stage
Cost Control During Post-contract Stage

- S-Curve
- Cumulative Expenditure
- Cumulative Income
- Profit Margin

Duration (Months)

Cumulative Cash Flow ($)
Cost Control During Post-contract Stage

Question to think about:

“How can an employer’s quantity surveyor control the cost during the post-contract stage, with the understanding that he has no authority under the Contract to issue instructions?”
Cost Control During Post-contract Stage

- At an early stage, agree with the Contractor for a suitable arrangement for dealing with daywork vouchers and claims for increased costs
- Maintain effective cost control arrangements by keeping a constant check on costs and by supplying cost advice to the Architect for any proposed variations
Cost Control During Post-contract Stage

- Control the use of contingency sum, make sure that the majority of it is to cover the cost of extra work that could not be reasonably foreseen at the design stage, rather than to cater for design alterations.
- Ensure that the probable cost of all variations should be computed before the Architect formally issues variation orders.
Cost Control During Post-contract Stage

- Early consideration should be given to expenditure against provisional and prime cost sums and the contingency fund, and the examination of subcontractors’ and suppliers’ quotations.

- Produce monthly forecasts of final expenditure, and predict and monitor cashflow
Successful Cost Control

1. The contract sum is within the client’s approved budget or cost limit
2. Tender Sum (Contract Sum) = Final Account (Final Contract Sum)
3. Value for money

Q & A