QUANTITY SURVEYING FOR BEGINNERS

BUILDING COSTINGS FOR STARTERS

JBG Quantity Surveying

QUANTITY SURVEYING FOR BEGINNERS

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Preamble

By the end of this book you will have a good idea what a quantity surveyor is and what they do in the building industry. The quantity surveyor's main task is to measure the quantity of materials required for a particular design and then to estimate the cost of construction.

As with most professions they did not appear in the last few years, rather their role has developed slowly.

Costing during design is an important first step, the design affects the cost of a building and so therefore the cost should also affect the design.

It is too late when tenders are called to find that the chosen design cannot be built for the budget and so costs should be considered as designs are developed and before final decisions are made.

Chapter 1

HISTORY OF THE QUANTITY SURVEYOR

The quantity surveying profession has largely developed over the last century. The earliest English quantity surveying firm of which reports are available is a firm in Reading, UK which was operating in 1785.

In the seventeenth century Architects were responsible for the erection of buildings, as well as their design and the appointment of the master craftsmen. Drawings were mostly in early sketch form and much of the work was figured out during construction of the job. On completion of their work each master craftsman submitted an account for their materials used and labour employed on the project.

It became practice for many of the master craftsman to engage a 'surveyor' or 'measurer' to prepare these accounts. One of the problems was to reconcile the amount of material listed on invoices with the quantity measured on the completed job. Some of the master craftsmen's surveyors made extravagant claims for waste of material in executing their work onsite and so the Architects also engaged Surveyors to contest these claims.

HISTORY OF THE QUANTITY SURVEYOR

General contractors became established during the period of the Industrial Revolution and they submitted inclusive estimates covering the work of all trades. Furthermore they engaged surveyors to prepare Bills of Quantities on which their estimates were based. As competitive tendering became more common the general contractors began to combine to appoint a single surveyor to prepare a Bill of Quantities, which all contractors priced. In addition the Architect on behalf of the building owner usually appointed a second surveyor, who collaborated with the Surveyor for the Contractors in preparing the Bill of Quantities, which was used for tendering purposes.

In later years it became the practice of one Surveyor only who prepared an accurate Bill of Quantities and measured any variations that arose during the progress on the job. That was the origin of the independent and impartial Quantity Surveyor as they operate today.

The University of Newcastle 2002

Chapter 2

ROLE OF THE QUANTITY SURVEYOR

The QS role in a property development can be split into the following broad stages:

1) Initial 'ballpark' estimate
2) Indicative Budget Estimate
3) Budget Estimate and Cost Plan
4) Structural estimate to check Item 3
5) Cost checks during the design period
6) Final pre-tender estimate or Bill of Quantities and Estimate
7) Contracts Administration during construction

Initial 'Ballpark' Estimate to Ensure Feasibility

The initial 'ballpark' estimate may be based on the minimum information available.

The figures indicate that the project cost is in within the 'ball park' of the client expectation or construction funds available.

It is based on m2 rates, but it is important to separate elements such as site preparation, siteworks and site services which are not proportionate to the size (m2) of the building.

Example:

Underground parking, one level - Reinforced concrete construction including deck over, mechanical ventilation, fire sprinklers, electrical services, fit-out, no lift.

'Ballpark Estimate'	$
Site Preparation	600,000
Carpark 3,500m2 x 1,360	4,760,000
Siteworks and Site Services	850,000
Total	6,210,000

Exclusions

1. Land costs
2. Legal fees
3. Finance
4. Professional fees
5. Unknown site conditions
6. Infrastructure
7. Escalation

The above example would normally be accompanied with a statement to the client that information is almost non-existent and that the bottom line figure while useful, should be treated as a 'ballpark only'

Indicative Budget Estimate

The indicative budget estimate will be prepared based on initial sketch design including, floor plans, sections and elevations. Services components can be based off m2 rates or service consultants maybe able to provide initial budgets estimates.

Various assumptions are required, but the measurement of the various elements improves on the 'ballpark' estimate. The exercise confirms a m2 rate for the project which can be compared with similar projects.

Example:

Budget Estimate for a single level basement car park with 120 car park spaces. Floor area of 3,500m2,

Site preparation - 3,500 x 5	17,500
Dewatering - 3,500 x 60	210,000
Earthworks - 3,500 x 100	350,000
Sheet piling - 3,500 x 120	420,000
Basement slab incl footings 3,500 x 425	1,487,500
Columns 3,500 x 45	157,500
Walls/stairs 3,500 x 100	350,000
Finishes 3,500 x 5	17,500
Suspended concrete roof - 3,500 x 281	983,500
Electrical Services - 3,500 x 72	252,000
Mechanical Services - 3,500 x 68	238,000
Fire Services - 3,500 x 47	164,500

Subtotal	4,648,000
Preliminaries - 13%	604,240
Margin - 7%	367,657
Contingency - 2.5%	131,306
DA - 3%	157,567
Consultants 5.5%	288,873
Total	6,197,643

Budget Estimate

The Budget Estimate is the development of the Indicative Budget Estimate based on further design information.

Estimates from the service consultants should be available and updated in the cost plan. New drawings from the Architect with additional details and finishes will also be available.

Cost checking against the original estimate is required to ensure the original budget is not exceeded and the budget is being spent as originally established.

Structural Estimate to Check Cost Plan

Once the initial structural drawings are available the structural elements of the building can be measured in more detail and priced.

Generally the structural drawings will be based off a geotechnical report. This report is also used to price the site preparation works more accurately.

The design process is constantly developing as more things are discovered about the project. For example at the early stages the architect may have documented an awning detailing the roof pitch and general shape. By this stage the structural engineer will have detailed structural steel member sizes and the architect will have detailed material type, gutter sizes and flashing's.

It is the task of the QS to identify these developments and check the costing remains inline with the first estimate.

Cost Checks during the Design Period

Cost checks are ongoing as the design progresses and more information becomes available.

Cost comparisons of the building elements may be required to ensure the original budget is maintained.

The QS is monitoring the design evolution to ensure there are no major cost increases without consideration of other savings. The QS should be familiar with all aspects of the project to the extent, that there are no surprises on receipt of tender documents.

Final Pre-tender Estimate / Bill of Quantities

A detailed cost plan / bill of quantities can be prepared by the QS as a pre-tender estimate. It is important to note that this would follow a trade format rather than the cost plan elemental format. Should no bill of quantities be prepared then a final check estimate is carried out. This may not be fully detailed due to the great detail of information, time and fee, available. The documentation is however checked in enough detail to ensure that the pre-tender estimate does not exceed the budget.

Contracts Administration

The main role of the QS during construction include:

1) Certifying the value of work complete and progress payment claims;
2) Determining claims for extensions of time;
3) Certifying the value of Variations;
4) Where a defect is accepted as completed works, determining the decrease in value to the works.

Assessment of Progress Payment Claims

The QS will carryout inspections onsite during the construction phase usually once per month following receipt of the Builders progress claim. It is important that the QS correctly determines the extent of works completed onsite and not be in a position where the value of work left to complete is more than the remaining contract value.

If for any reason the Builder was unable to complete the project it is important that the unclaimed amount is enough to complete the remainder of the works.

Determining claims for extensions of time

The QS maybe called upon to asses extension of time claim's from the Builder. The QS will act independently when reviewing the claim and use the relevant conditions of the Contract to assess the validity of the claim.

To avoid any potential disputes if the claim is rejected, it is important to provide evidence of why the EOT was rejected including referencing the relevant clauses in the contract if applicable.

Certifying the value of Variations and defective work

When the QS is assessing variation costs it is important that current industry standard rates are being applied across all trades. To avoid any potential disputes all variations should be agreed in writing prior to commencing the works. Variations should be provided with a detailed break up of material and labour costs, with invoices and/or quotes provided to support the claim. Variations are to be the actual cost to the Contractor plus the agreed margin % detailed in the Contract, which is an agreed percentage to cover the Builder's preliminaries, overheads and profit.

Chapter 3

WHAT IS COST PLANNING?

Cost planning is the process of relating the design of buildings to their cost, so that, while taking into account quality, services and appearance, the cost is planned to be within the economic limit of expenditure.

Cost planning during design is especially critical as these early decisions carry more economic consequence than the limited decisions which can be made later in the build.

If the cost plan is directly related to the capital costs of the build with little thought to the aesthetic qualities or life cycle costs, then the buildings which result will suffer and the client does not receive real value for their investment.

There are three purposes of cost planning:

1) Provide the client good value for money
2) Achieving the balance of expenditure between the different building elements
3) Keeping the expenditure within the budget allowed by the client.

WHAT IS COST PLANNING?

There are basically two possibilities on how the design team decides on the first estimate for the project.

The first possibility is that the client stipulates the maximum amount that can be spent. The other possibility is that the client can provide the design team a detailed description of the building he/she requires and asks the design team to provide an estimate.

It is important that the client understands what they are getting for there money. Clients range from organisations with continual development projects such as chain stores, to those that build once in their lives. The first client is experienced and understands the industry, the second is inexperienced and will not fully understand what will be provided.

Value for money does not represent the lowest initial capital cost. There has to be balance between quality, fit for purpose, initial capital cost and running costs for the life of the building.

Chapter 4

HOW TO IMPLEMENT A COST PLAN

There are three basic procedures for applying a system to control costs during the early stages of design through to development of working drawings. These are:

Step One – Setting cost targets and establishing a realistic first estimate.

The first estimate is often the figure that the client remembers the most. It sets the budget. It can sometimes be based on information that is a 'ballpark' figure.

When the client has accepted the realistic first estimate, this sum is considered as the cost limit for the building. By cost limit we mean the cost agreed between the client and design team as the amount beyond which the building may not go ahead.

Establishing how the estimate is to be spent among the parts of the building, entails splitting the cost limit into smaller sections of the building known as elements.

A building element is generally defined as a major component common to most buildings which usually fulfils the same function.

HOW TO IMPLEMENT A COST PLAN

Having established the realistic first estimate and our cost targets we move onto step two.

Step Two – Cost checking against original estimate

Is used to detect and measure departures from the original cost targets and check that the estimate is being spent as originally established.

The design process is constantly developing as more things are discovered about the project. For example at the early stages the architect may have documented an awning detailing the roof pitch and general shape. By the stages of working drawings the structural engineer will have detailed structural steel member sizes and the architect will have detailed material type, gutter sizes and flashing's. Hence assumptions need to be made during the early design stages.

It is the task of the cost controller to identify these developments and check the costing remains inline with the first estimate.

Step Three – Remedial Action

Consists of taking any remedial action to ensure the cost is contained within the cost limit. Remedial action may mean re-designing the element, changing the specification or seeking an alternate solution.

The remedial action should be taken immediately before the design process moves too far.

Occasionally suitable remedial action is impossible and additional finances must be obtained to complete the project. For example, the ground conditions may differ after a detailed site investigation is carried out and the foundations may need to be larger and deeper, thus incurring additional expense.