Project Cost Management

By

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Cost Management

Cost management is a living process in the construction industry. It is born at the inception of a project as a concept cost plan, matures into an elemental cost plan, with the assistance of value engineering and risk apportioning, then converts into the engineer’s pre-tender estimate. Upon award of the construction contract, post-contract cost management begins. This process can never be treated as a post-mortem procedure.
Some useful Abbreviations/Terminologies

CVC – COST VALUE COMPARISON
ECR – EXECUTIVE COMMERCIAL REVIEW
CTC – COST TO COMPLETION
OSL – OUTSTANDING LIABILITIES
CL – COMMITTED LIABILITIES
MOS – MATERIALS ON SITE
WIP – WORK IN PROGRESS
NSV – NOTIONAL SALES VALUE
GE – GENERAL EXPENSES
GROSS – PRIOR TO ANY DEDUCTION
NET – REMAINDER AFTER ALL DEDUCTIONS
Value

Value is the degree of satisfaction in some transaction, considered in relation to its cost, and involves such criteria as performance, appearance, prestige and intrinsic worth, some of which have no direct financial element. In times of financial stability, experience of price and quality over periods of time gives a sharp sense of value. Conversely uncertainties of price and quality blunt such judgements. In recent years, for instance, construction cost prediction and thus the service available to the employer must have become less precise and reliable.
Cost

The cost of anything to a consumer is what he is willing to sacrifice in cash, credit, time, effort and inconvenience to get it. The cost to a seller is the amount that he is prepared to risk in similar terms in order to trade. The cost to a maker is the sum of the various demands on resources, skill and organization that must be met before he can offer his product to the public. Cost therefore has an objective element, which is interpreted in the context of a series of subjective judgments about risks, return and value.
Cost (cont’d…….)

It is not a single-valued function of materials, labour, plant and overheads. If it were, then the processes of costing, accounting, estimating and designing would be less of a problem.

Cost and Financial Control for Construction Firms
B. Cooke and W. B. Jepson 1979
Cost Management

For a company's management to be effective overall, cost management must be an integral feature of it. It is easiest to understand this concept if it is explained in the context of a single project. For instance, before a project is started, the anticipated costs should be identified and measured. These expenses should then be approved before any purchasing occurs. During the process of completing a project, all incurred costs should be noted and kept in a record of some kind, to help ensure that the costs are controlled and kept in line with initial expectations, to the extent that this is possible.
Cost Management (cont’d....)

Taking this approach to cost management will help a company determine whether they accurately estimated expenses at first, and will help them more closely predict expenses in the future. Any overspending can also be monitored in this way, and either eliminated in future projects or specifically approved if the expense was necessary. Cost management cannot be used in isolation; projects must be organized and tailored with this strategy in mind....
Contractors or Consultants Cost Management

Both parties are equally responsible for effective project cost management. However, the consultant’s cost management procedure is somewhat simpler compared to the contractors. In the post-contract stage, the contractor’s value of work is to be considered the employer’s major cost element of the project and most of the variation cost estimates are derived based upon the rates of the contract bill of quantities.
Components built within the contract for project cost management

- Project construction programme
- Project cash flow
- Contract notices
- Project progress reports
- Cost proposals and valuation of variations
- Payment application and certification procedure, including release of retention
- Bonds and guarantees, insurances
- Final account procedure
- Contract termination Procedure
Executive summary of a consultant’s monthly cost report - minimum requirements

1. Contract Sum dated xx yyy zzzz
2. Variations by Engineer's Instructions
3. Variations committed but not covered by Engineer's Instructions
4. Forecast of variations which have arisen from Employer's / Engineer's comments
5. Provisional Sum Adjustment
6. Contingency Sum Adjustment
7. Day Works Adjustment
8. Contractual Claims
   ○ ANTICIPATED AMOUNT OF STATEMENT AT COMPLETION As at
Budget / Forecast

Comparisons of actual results against budget and forecast revisions should be tabulated into three sections:
- The month currently being reviewed
- The year to date
- The total project performance to date

Each section is analysed in turn:
- Net cost of production
- Gross margin
- Overheads
- Profit
Cost to Completion (CTC)

The purpose of the CTC exercise is to make the site management aware of allowances and costs and to identify the strong and weak commercial aspects of the project so as to enable site management, in conjunction with department heads, to take appropriate management decisions in time to improve commercial performance.
Cost Headings / Codes

Work by B. Fine (unpublished) suggests that recording cost data becomes highly erroneous when large numbers of codes are used and for this reason alone a coarse-grain system is the only suitable one for construction-type work. The figures suggested by Fine are:

- 30 cost headings: ~2% of items are misallocated
- 200 cost headings: ~50% of items are misallocated
- 2000 cost headings: ~98% of items are misallocated
Cost Value Comparisons (CVC)

CVCs are usually completed by the contractor’s QS, but will require liaison with other departments in its completion. Also, considerable discussion is required with the rest of the project team, before the CVC is issued to the rest of the management team.
Cost Value Comparisons *contd.*

While there are no legal requirements that companies monitor their performance using a set methodology, the Institute of Chartered Accountants in England and Wales has issued the ‘Statement of Standard Accounting Practice No. 9’ (SSAP9), comprising a series of explanatory notes intended to remove inconsistencies from financial reporting procedures relating to published or financial accounts.
Cost Value Comparisons *contd.*

The management accounts are the contractor’s method of reviewing their performance throughout any financial year and should not be confused with their financial accounts, which are a statutory requirement for any limited company.
Among other things, the CVC can be used:

- To compare project profitability and turnover against budget and forecast figures
- To monitor project performance in terms of labour, plant and material costs against original tender figures
- As a monitor of general performance to be used when assessing tenders on other similar projects
Contractor’s Cash Flow

Cash flow may be defined as the actual movement of money in and out of a business.

Within a construction organisation positive cash flow is mainly derived from monies received as monthly payment certificates. Negative cash flow is related to monies expended on a contract in order to pay wages, material, plant, subcontractors’ accounts rendered and overheads expended during the progress of construction operations. On a construction project, the net cash flow will require funding by the contractor when there is a cash deficit. When cash is in surplus, the contract is self-financing.

The firm itself has other incomes and expenditures. It issues shares and pays dividends, raises loans and pays interests, invests in convertible stocks and sells again when the liquidity of the firm demands it. In effect the term ‘funds flow’ would be a better term in light of the overall picture.
Contractor’s Cash Flow contd.

Construction firms undertake their work largely under contractual terms that maintain them in a state of financial deficit for much of the contract period. The contractor undertakes a relatively small number of discrete but complex operations, being required to finance at any time the difference between the cumulative contractual value of work done, less retention monies and the cumulative cost of doing the work.

The aggregate of a contract’s cash flow will then depend on the scale of work and its phasing in with the rest of the firm’s work. It follows that there will be periods of deficit and periods of surplus. It is the job of financial managers to raise funds to meet the former and apply surpluses in the best interests of the firm.
Interim Payment Applications

The elements to be included within an interim application can be summarised in less contractual terms as:

- Preliminaries
- Measured works
- Valuation of Engineer’s instructions or variations
- Unfixed materials on site and, where allowable, materials off site
- Fluctuations, where they are allowable within the contract provisions
Gross Certified Value

Moving to the CVC itself, the starting point must always be the gross certified value. This figure must be supported by the appropriate engineer’s interim certificate. This is the external valuation and not the contractor’s QS’s assessment or internal valuation of works carried out on site.
Internal Valuation

This reconciliation can be varied and must include all adjustments, either under valuations or over valuations, necessary to bring the external valuation to an accurate gross adjusted valuation, which can be used for costing purposes. The development of this schedule needs to be thorough and well documented, not only in terms of producing the required level of accuracy but also to facilitate ease of checking by others should this be necessary.
Internal Valuation - Deductions

Once the internal valuation has been assessed, further deductions are made from the figure to arrive at a final residual value or margin.

- Subcontract liabilities

- Snagging and defects
  - Snagging required at the end of the project to achieve handover
  - A levy to cover for costs incurred in the defects liability period before the defects liability certificate is issued
Differentiation between ECR Pack & CVC

ECR Pack - Forecast at Contract Completion
- ECR 1 : NSV Reconciliation up to Contract Completion
- ECR 2 : COST Reconciliation up to Contract Completion
- ECR 3 : SUMMARY

CVC - Review at end of every Month
- NSV : NSV Reconciliation up to Current Month
- COST : COST Reconciliation up to Current Month

ACTUAL FORECAST

ACTUAL
Tender Allowance Mapping
Tender Allowance and Actual Progress Mapping

<table>
<thead>
<tr>
<th>Category</th>
<th>Millions</th>
</tr>
</thead>
<tbody>
<tr>
<td>LABOUR</td>
<td></td>
</tr>
<tr>
<td>PLANT</td>
<td></td>
</tr>
<tr>
<td>PERMANENT MATERIAL</td>
<td></td>
</tr>
<tr>
<td>TEMPORARY MATERIAL</td>
<td></td>
</tr>
<tr>
<td>SUBCONTRACT</td>
<td></td>
</tr>
<tr>
<td>SUPERVISION</td>
<td></td>
</tr>
<tr>
<td>GENERAL EXPENSES</td>
<td></td>
</tr>
<tr>
<td>MARGIN</td>
<td></td>
</tr>
</tbody>
</table>

- **Planned**
- **Progress & Actual**
Project Trend Analysis

Graph showing trends from March 2003 to September 2004.

- **Margin in Month**
- **Margin to Date**
- **Margin Forecasted**
Project Trend Analysis
Basic Calculation

Add
   Contract Award Value

Additional Works / Variations

Less
   Actual Cost

   Forecasted Cost

\[
\begin{align*}
\text{Add} & \quad \text{Contract Award Value} \\
\text{Additional Works / Variations} & \quad = \quad \text{NSV} \\
\text{Less} & \quad \text{Actual Cost} \\
\text{Forecasted Cost} & \quad = \quad (\text{COST}) \\
\text{MARGIN} & \quad = \quad \text{NSV} - \text{Actual Cost} - (\text{COST})
\end{align*}
\]
Margin Breakdown
Project Allowance & Cost Alignment

Project Allowance  ⇒  Project Cost

Project Allowance  ⇒  Project Cost
What Constitutes the Head Office Overheads?

- Executive and administrative salaries, allowances & recruitment
- Head office rent and maintenance
- Insurance (except contract insurances)
- Utilities, phone, fax, IT and bank charges
- Depreciation of company assets
- Furniture and equipment - Stationary and printing
- Travel
- Professional fees
- Auditing expenses
- Advertising and marketing (Tendering costs)
- Interest on company borrowings (except project financing)
- Bad debt
- Entertainment - Pantry expenses
- Contributions - Sponsorship fees
- Idle resources (except contract related)
- Training
When do You Need to Deal with Head Office Overheads?

- Pricing the Tenders
- Building-up rates and prices
- Analyzing the contract rates and prices
- Varying the contract rates and prices
- Making adjustments pursuant to Sub-Clause 52.3 of FIDIC Red Book 4th Edition
- Assessing prolongation costs
NSV to Date Calculation

Add
- Gross amount Claimed Contract Works = X
- Additional Works / Variations / Sundry Sales = X
- Materials On Site = X
- Under-measure = X

Less
- Over-measure = $(X)$
- Materials On Site = $(X)$

NSV
### NSV Allowance Generation

<table>
<thead>
<tr>
<th>Description</th>
<th>Labour</th>
<th>Plant</th>
<th>Materials</th>
<th>Sub-Con.</th>
<th>Supervision</th>
<th>GEs’</th>
<th>Margin</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rate Split</td>
<td>10%</td>
<td>4%</td>
<td>70%</td>
<td>0%</td>
<td>6%</td>
<td>2%</td>
<td>8%</td>
<td>100%</td>
</tr>
</tbody>
</table>

#### Work Done To Date is Qty To date X BOQ Rate (i.e. 100Nos @ 2,000Dhs/No=200,000.00)

<table>
<thead>
<tr>
<th>Allowance Generated for above Installation</th>
<th>200000 X 10%</th>
<th>200000 X 4%</th>
<th>200000 X 70%</th>
<th>200000 X 0%</th>
<th>200000 X 6%</th>
<th>200000 X 2%</th>
<th>200000 X 8%</th>
<th>-</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work Done To Date</td>
<td>20,000</td>
<td>8,000</td>
<td>140,000</td>
<td>0</td>
<td>12,000</td>
<td>4,000</td>
<td>16,000</td>
<td>200,000</td>
</tr>
</tbody>
</table>

| Under Measure                            | (1,000)      | (400)       | (7,000)      | (0)        | (600)      | (200)      | (800)      | (10,000)|
| NSV                                      | 19,000       | 7,600       | 133,000      | 0          | 11,400     | 3,800      | 15,200     | 190,000|
What is required to prepare a CVC/CTC

Interim Application, Payment Certificates, Allowances & Payments

WIP & VO Details & Allowances

Processed Cost, OSL, CL

MOS

Risks & Opportunities Assessment

CTC / Balance to Order Details

ECR Pack (CVC / CTC) ECR 1-3
Materials/Subcontract Costing Process Key Dates

Materials Order Placed

Materials Delivered to Site

GRN Posting for Items with LPO / Invoice Posting for Items without LPO

Invoice Submitted by Supplier for Items with LPO

PM Approval for Invoice Value > / Non LPO items

H/O Approval / Payment to Supplier / Subcontractor

Agreed Delivery Period

Services Delivered to Site

Posting of Payment Certificate for Subcontractors

Agreed Payment Terms as per the LPO / Sub Contract

Committed Liabilities

Outstanding Liabilities

Processed Cost

Payment Processing

Payments to Supplier
Processed Costs

Outstanding Liability

Committed Liabilities

Materials Delivered, Delivery Note Entered to Data System, Invoice Processed

Materials have been Delivered, Delivery Note /Invoice Not received.

Orders have been raised but Materials have not been Delivered

Project Cost @ ~ 15% Complete
**Processed Costs**
- Materials Delivered, Delivery Note Entered to Data System, Invoice Processed

**Outstanding Liability**
- Materials have been Delivered, Delivery Note / Invoice Not received.

**Committed Liabilities**
- Orders have been raised but Materials have not been Delivered

**Project Cost @ ~ 50% Complete**
Processed Costs

Materials Delivered, Delivery Note Entered to Data System, Invoice Processed

Materials have been Delivered, Delivery Note / Invoice Not received.

Orders have been raised but Materials have not been Delivered
What is Happening to your ECR Pack

Prepared by PM & QS

Reviewed by the Area QS & Managing QS

Prepared by Commercial Manager (CM)

Reviewed by the Senior Management (GM/DGM/CM/AM)

ECR 1-3

ECR 4 / Exec. Summary

Exec. Comm. Review Summary

The accuracy of these reports decides the future of the Business
Teamwork

Within any organization, teamwork is absolutely essential to success. The team must act in unison, drawing upon the total team resources, not just the key players. The core team should be responsible for main decision making, monitoring the team approach, problem solving and dispute resolution.

It should establish specific project objectives against which performance can be measured. One such objective should be to deliver the project within the agreed target cost and share the financial rewards.
References

Cost and Financial Control for Construction Firms. B. Cooke and W. B. Jepson
Commercial Management in Construction. I. Walker and R. Wilke
Modern Construction Management. Frank Harris and Ronald McCaffer
Skills and Knowledge of Cost Engineering. The Association for the Advancement of Cost Engineering
Thank you for the valuable contribution of your time and attention.

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