

A common approach

In his final article, Nick Curran discusses a case study of how best practice contractors' project controls have been implemented in the Middle East

All projects are consistently tracked and measured from cost planning... through to final account

The lack of effective project controls in the construction industry is a major contributory factor as to why final outturn costs are often not accurately forecast and result in disputes, higher costs for clients and reduced margins for construction companies.

There are however, established methods and processes that can be followed to improve cost predictability and forecasting, and there are processes and systems available that, if implemented properly, will support this.

One example of where this has been achieved is the Al Raha Beach Development in Abu Dhabi, United Arab Emirates (see panel), which is being undertaken by ALDAR Laing O'Rourke, a joint venture between Laing O'Rourke and UAE developer, ALDAR Properties PJSC. Realising the common potential problems with cost and value management, the ALDAR Laing O'Rourke JV team recognised they needed strong project controls to bring together budget, time and cost to ensure the successful delivery of the project. The main business needs of the new system were:

- one system, removing the need for other spreadsheets, databases and associated rekeying of data which increases the risk of errors
- a construction-specific software solution
- ability to capture data in the same format/WBS across many projects allowing accurate performance reporting/benchmarking, KPIs, earned value analysis, etc
- use of cost data to identify trends and use of this data to forecast 'costs to completion'
- satisfy the client's forensic cost analysis requirements.

The contract is being managed under an NEC 3 form and is largely cost reimbursable; the openness of the

project controls solution lends itself perfectly to this type of procurement.

The development is split into three main divisions: logistics, infrastructure and building works. This top-level structure is mirrored in the way the structure of the project controls are set up in as much that all three areas have their own common WBSs (see Table 1):

- logistics works include the temporary site accommodation and the provision of labour camps for the initial 15,000 site operatives
- infrastructure works include dozens of individual projects to deal with, for example, the dredging in the Arabian Gulf for materials for land reclamation, the land reclamation itself, widening of the existing Abu Dhabi to Dubai highway, seven new intersections, 35 new bridges, a light railway system, water features, Boulevard Road, marinas and the provision of a complete network of new drainage and services for the development
- building works consists of seven different precincts in the East (masterplan yet to be decided for the West) each with a number of large multi-million dollar mixed use commercial, leisure and residential construction projects.

The full design of the project controls solution was undertaken in a matter of weeks before any software development or configuration was performed.

The 'common analysis' approach was taken on Al Raha Beach – the project plan level 2 WBS from the Primavera project plan has been adopted as the common analysis and not only are the individual tasks from the plan rolled up to it, but the BoQ estimates are linked to it and costs allocated to it.

The decision to have only three WBS templates (see Table 1) was made in the interests of simplicity.



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The Al Raha Beach Development

The 500+ hectare Al Raha site is located on the highway between Abu Dhabi and Dubai. Formed of 11 precincts across a total development area of 12 million m² along 8.5km, the mixed use Al Raha Beach development will have an estimated residential population of 120,000 with approximately 200,000 people on the development during the day. It is divided into a number of smaller communities, each offering a different mix of lifestyle, entertainment and business facilities. The project's total development value is US\$18bn and it is due for completion between 2014-2016.



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Table 1 – An extract from the WBSs

Logistics		Infrastructure		Building works	
WBS	Description	WBS	Description	WBS	Description
01PREL	Preliminaries	01PREL	Preliminaries	01PREL	Preliminaries
02DESN	Design	02DESN	Design	02DESN	Design
03PROC	Procurement	03PROC	Procurement	03PROC	Procurement
04BLDG	Offices	04GRND	Ground Works	04GRND	Ground Works
04GRND	Ground Works	05PILE	Piling	05PILE	Piling
05CAMP	Camp & Service Bldngs	06SUBS	Substructures	06SUBS	Substructures
06SERV	Services & Utilities	07SUPS	Superstructures	07SUPS	Superstructures
07RDTR	Roads & Traffic	08MEPS	MEP Works	08MEPS	MEP Works
08SECY	Security	09BRFN	Bridge Finishes	09FINS	Finishing Works
09TRAN	Transportation	11LIFT	Elevators & Escalators	10ENVE	Envelope
10CONS	Consumables	12SBAS	Carriageway	11LIFT	Elevators & Escalators
		13TEST	Test & Commission	12EXWK	External Works
		14DLPC	Hand Over & Completion	13TEST	Test & Commission
		15UTIL	Utilities	14DLPC	Hand Over & Completion
		16RDFN	Road Finishing	25DISA	Disallowed Activities
		17RETW	Retaining Walls	90UNAL	Unallocated
		18TWKS	Temporary Works		
		19LAND	Landscape Finishes		
		19STST	Structural Steel		
		20SFLD	Soft Landscaping		
		20TRCK	Track		
		21HDLD	Hard Landscaping		
		22FNTN	Fountains		
		23MOOR	Moorings		
		25DISA	Disallowed Costs		
		90UNAL	Unallocated		

It is against the common analysis that all projects are consistently tracked and measured from cost planning through estimating, project planning, procurement, change management and through to final account.

At the earliest stages of each project, elemental cost plans are produced against the common analysis. As the design is finalised and the projects pass through the defined approval gateways, the estimates are firmed up from outline BoQ to full BoQ estimates.

During the system design, a common library of resources was also agreed and adopted by all the commercial and financial disciplines from day one. For example, the same item selected by an estimator to build up a unit rate is then selected by the project administration team to raise a requisition. The item is

also used by the procurement team to raise a purchase order with supplier invoices and payments being posted into the system against this item for later approval.

Although the library is not fixed, its management is closely controlled and the JV team has procedures in place to protect its integrity. Experience has shown that a clean list of items on day one can become totally corrupt very quickly if not properly controlled.

As well as facilitating good business management, one of the key benefits of this approach is that core



» data is keyed directly into the solution and that data is then reused by all stakeholders further down the line. It does not consist of items collected in other systems and then re-keyed or even copied into the solution thereby increasing the validity of the data and eliminating inefficiencies and potential for errors.

As a by-product of this, it also provides improved management reporting through a complete top to bottom view of the project, allowing project directors, project leaders, commercial managers and even the clients' auditors (EC Harris) to take a holistic view or drill down into the detail where they feel necessary.

Lessons learned

The design of the solution benefited from the early involvement of experienced professionals who knew their roles and how they interfaced and impacted upon others in the process. To enhance the chances of success, detailed workshops were held to agree how the different business processes relating to estimating, procurement, cost collection and budget management disciplines would operate considering the bigger picture of project controls, and also how coding hierarchies would be put together – taking into account stakeholders from each discipline.

A pragmatic approach was taken to the level of detail that the common analysis would go down to using lessons learnt from previous experiences; the temptation is to set the level too low, making it almost impossible to collect the actual cost information and results in data that is inaccurate and almost meaningless.

Another key lesson was to link how the solution was used to the established Laing O'Rourke processes and gateways (particularly the production of detailed estimates and the collection of costs on site). On a number of occasions, the Laing O'Rourke controls were an invaluable tool for senior management to identify who had not followed the correct processes. For example, a forecast report by WBS showing a cost without a budget allowance can often be explained by something as simple as a requisition not being allocated to the correct WBS. The system can be interrogated to identify this and any related root cause, allowing the data to be collected and any underlying process issues to be resolved.

The main stakeholders are the members of the commercial team who are perceived to have failed if cost, budget and margin are not accurately forecast. As such, they have become the parties responsible for ensuring the processes are followed, that estimates are produced from the common library and allocated to the correct WBS, and that requisitions from the delivery team and purchase orders to suppliers are raised against the correct allowances and WBS.

A massive change for the commercial team is that much of their work is now performed up front rather than after the event, e.g. understanding the allowances, resources and WBS allocations while proactively tracking costs and re-budgeting as the month progresses, rather than retrospectively reviewing the previous month once costs have been closed off and published.



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The key factors in the success of the implementation were the buy-in from all levels, management of the change, and the management of the people who would ultimately be relied on to drive the system and produce the results. Even before they were trained on their own functionality, great effort was made to engage interested staff from all departments. They were presented with the big picture solution and given the opportunity to challenge what was happening and how the solution would work in practice.

Part of this process was to explain to staff that they would probably be using a computer system to do something they had only ever done in Excel before, and that they may need to input more data than previously so it could be used by everyone in the process. Providing an approachable, 'people friendly' person was also a key factor in the initial implementation.

Adaptations

The solution was implemented largely using off-the-shelf software linking the Causeway Estimating solution with their Project Accounting software and the Primavera project planning tool. Causeway made some enhancements to their solution (e.g. increased field sizes, improved usability generally, integrated the processes and compliance with the ALDAR Laing O'Rourke Gateway process), however these were relatively small. A solution roadmap is being maintained by the JV team and the solution will continue to evolve.

The implementation and use of such processes and systems is not simple however, which is the main reason why they are not yet common in contracting organisations. A clear vision, the definition of the requirement, coding hierarchies and touch points is the first step; selection of the correct systems, while crucial, is only about 20% of the answer. What is more important are solid business processes to underpin the solution and discipline within the company/project to follow them. In addition, there needs to be buy-in from all stakeholders and a clear message from the top that project controls are crucial to the success of the project.

Further information

The Al Raha Beach project can be viewed at www.alrahabeach.com

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