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Discussion: Innovative construction procurement at Wits University

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Contribution by Richard Patterson

The contributor congratulates the authors (Laryea and Watermeyer, 2014) on a fine piece of research and very clear explanation of what was clearly a successful programme of procurement, innovative against the background of what was 'normal' in the market in South Africa. The paper shows clearly how the use of NEC can support a range of procurement strategies – when properly managed.

The strategy of using (for some) a new form of contract (NEC) AND using the target cost option AND using 'early contractor involvement' represents three bold steps, similar to those of the UK's Highways Agency some time ago. Could the authors please explain a little of the following

- How was the 'early contractor involvement' stage managed? (e.g. Was the contractor paid for this and if so using what contract? Was it NEC Professional Services Contract or a two-stage Engineering and Construction Contract (ECC)?)
- How was the development of the target cost controlled in the 'early involvement' stage when the commercial incentive on the contractor is inevitably to push the target upwards?

If there were more space, it would have also been good to have seen some high-level indicators for the contracts – for example, outturn price compared with price at award.

On the off chance that someone is reading this having read the paper, the contributor warns about the unfortunate jump in Section 5.3. After a note in the first paragraph that 19 contracts used Option C, the immediately following quote is about activity schedules under the very different Option A (lump sum) form of the contract – in which, of course, the payment mechanism is very different. Of course, under Option C, there is a priced activity schedule to set, justify the target, but payment is based on the contractor's costs and not the prices in the activity schedule.

Authors' reply

To answer the contributor's questions, it is necessary to outline the procurement strategy that evolved as this project unfolded, to briefly present a case study to illustrate the approach and outcomes and to sketch out the culture change that took place.

The employer adopted a design by employer contracting strategy for a number of reasons. As a result, the contractor was required to undertake construction only on the basis of full designs issued by the employer.

A framework contractor is procured through a competitive negotiations procedure in accordance with the provisions of ISO 10845 (construction procurement) (ISO, 2010). A call for expressions of interest is advertised, and thereafter only those tenderers who express interest, satisfy objective criteria and who are selected to submit tender offers are invited to do so. Tenderers who were admitted to the first round of the competitive negotiations tender a target price, based on a bill of quantities and the cost parameters associated with defined cost and the fee. Tenderers are evaluated in terms of a points scoring system that combines their financial offer, preferences and quality in accordance with the provisions of ISO 10845. The number of tenderers is thereafter reduced to three in the second and final round where tenderers are required to tender their best and final offer based on an activity schedule following a round of competitive negotiations with the client and his design team.

The NEC3 ECC can be converted into a framework contract by simply introducing a Z clause modelled along the lines of secondary option X17 (task order) contained in the NEC3 Term Services Contract. The contract data that is entered into using an NEC3 ECC can then make references to package orders that are to be issued in terms of the aforementioned Z clause. Package orders can, in this manner, be issued through the standard NEC3 ECC during the term of the contract. Accordingly, the NEC3 ECC becomes a framework contract that sets out the generic terms, conditions and works information for the 'call offs' over the term while the package orders contain the package-specific data and information. The 'contract' for a work package is therefore the package order read together with the NEC3 ECC contract that is entered into. The contract that is entered into has no value in the absence of a package order and does not commit the university to the issuing of any package orders beyond the first package order.

The total of the prices for a package order is based on a target price. For the first package order, the tendered target price is used.

For the second and subsequent package orders, the target price is negotiated, based on the tendered pricing parameters and the extended pricing data gleaned from the tender process and the execution of the first package order.

Early contractor involvement is possible in the second and subsequent package orders and usually takes place once the concept or preliminary design has been completed. The contractor does not have to tender the target price as he will be awarded the package order if it provides value for money and he has performed satisfactorily on the previous order. The contractor is not paid for his participation in the design development process as he is using the interactions with the design team to develop his programme and activity schedule in the expectation of being issued a package order. He is not required to tender against his competitors in an open tender process where he has no assurance of being successful in the tender process. As a result, the costs of his early involvement with the design team are covered in his company overheads included in his tendered fee percentages.

The University of the Witwatersrand's Undergraduate Science Centre (UGSC) project involved the conversion of the western grandstand of the historic former agricultural showground of the Rand Easter Show on the West Campus into large teaching auditoria linked to a new three-storey laboratory building to accommodate approximately 3500 students at any one time. This project involved the construction of three laboratories (chemistry, physics and biology) with a total of 1100 bench spaces, all with supporting services, storage and preparation facilities; five large lecture venues accommodating 1570 students with capacity ranging from 250 to 450 seats and 20 tutorial rooms providing a total capacity for 830 students.

The cost estimates upon completion of the concept/preliminary design by the design team, inclusive of contingencies, cost escalation, professional fees and VAT was R204 million. The university, however, only had R178 million available for the project. A framework contractor was assigned to work with the university's design team during the design development stage with a view to delivering the project within a control budget of R178 million. A cost model was developed between the cost consultants and the contractor following extensive value engineering which indicated that this was possible.

The UGSC had to be completed ahead of the start of the academic year. In order to fast-track the project to meet the academic programme, the contractor was instructed to proceed with construction of the reinforced concrete frame with a target price of R41 million. The target was increased when the production information became available. The project was completed on time for an amount of R179 million. The contractor and the employer both enjoyed a small share gain as the project came in just under the target price.

Clients are the drivers of change. Those responsible for delivering the Capital Projects Programme took a conscious decision to move away from the pre-planned traditional contracting approach ('them-and-us') towards an integrated project team approach in order to improve project outcomes. The decision taken to change over to an NEC contracting system was done so in order to stimulate a culture shift towards collaboration, efficiency and greater certainty. Table 3 sets out the culture change that accompanied the aforementioned approach to improve performance and deliver optimal outcomes within budget.

In section 5.3, the authors were merely highlighting the use of activity schedules, which is very different from the current practices in South Africa, which merely provide for lump-sum contracts and bills of quantities. The largest project on the campus was the Wits Junction Student Residence (R440 million), which accounted for approximately 30 per cent of the expenditure. This project was executed under a negotiated option A on a develop-and-construct basis.

Activity schedules are not used simply to 'justify the target' under option C. They are extremely useful tools for setting a target,

From	To
Master–servant relationship of adversity	Collaboration towards shared goals
Fragmentation of design and construct	Integration of design and construct
Allow risks to take their course	Active risk management and mitigation
Meetings focused on past – what has been done, who is responsible, claims, and so on	Meetings focused on 'How can we finish project within time and budget available?'
Develop the project in response to a stakeholder wish list	Deliver the optimal project within the budget available
'Pay as you go' delivery culture	Discipline of continuous budget control
Constructability and cost model determined by design team and cost consultant (quantity surveyor) only	Constructability and cost model developed with contractor's insights
Short-term 'hit-and-run' relationships focused on one-sided gain	Long-term relationships focused on maximising efficiency and shared value

Table 3. Culture change introduced to improve project outcomes

reducing risk pricing when negotiating a target and managing changes to the target, particularly in fast-track construction. They also allow earned value (the value of the work performed expressed in terms of the budget assigned to that work) and planned value (the authorised budget assigned to the scheduled work to be accomplished) to be monitored against the prices for work done to date (defined cost uplifted by the fee) under option C. This enables projects to be more tightly managed.

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ISO (International Organization for Standardization) (2010) ISO 10845-1:2010: Construction procurement – Part 1: Processes, methods and procedures. ISO, Geneva, Switzerland.

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