

## VALUE ENGINEERING IN NORTHERN IRELAND



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### ABSTRACT

One of the presenter's Firms, Trench Farrow & Partners, was appointed by the other presenter's organisation, Health Estates, to undertake Value Engineering services on two major hospitals in Northern Ireland. After considerable discussion traditional Value Engineering techniques were dropped and a bespoke, more informal, approach adopted. The interest is in the approach adopted on the first hospital adjusted on the second, rather than the results.

### INTRODUCTION

Health Estates are responsible for the UK Government's hospitals and other related real estate in Northern Ireland. The shortage of capital funding, and the ever increasing emphasis on providing improved quality at least cost, means that those responsible for projects must ensure value for money. This does not simply mean completing a project at least cost; it is vital to ensure that the key objectives of the project are also met.

The mandatory procedures for option appraisal practised by the NHS require a structured approach to establishing project objectives and to developing and weighting criteria to measure how well a range of options might satisfy those objectives. They also require a detailed analysis of all the revenue and capital costs and the savings which should arise from each option. These two elements are brought together in the form of a cost benefit analysis.

Having justified a major investment decision on the basis of the exercise outlined above, it seems consistent to adopt a methodology to ensure that the results of the design and procurement satisfy the Client's objectives and realise the predicted benefits of the preferred option. Many Clients, Project Managers and Design Team members will argue that their approach automatically ensures this, but quite often these objectives are neither adequately communicated in the briefing process nor fully understood by Client and Design Team representatives.

Today's trend, in the UK, is one of fee competition and of increasingly lower fee tenders. As a result of this there is an increased commercial pressure on the members of the Design Team to spend the least time possible on developing alternative solutions and to seek to persuade the Client to accept the first solution offered by them. This phenomena reinforces the need for the Client to ensure that the accepted solution represents the best value for money in terms of achieving the Client's objectives and that appropriate alternative design solutions have been explored.

All these considerations led the Head of Health Estates in Northern Ireland to utilise Value Management and Engineering techniques on the two hospitals in question.

#### CAUSEWAY HOSPITAL, COLERAINE

A new District General Hospital, budgeted at £32m, was proposed for Coleraine, a provincial town some 50 miles north of Belfast. After considerable discussion and an initial Value Management exercise undertaken by Bovis, Trench Farrow & Partners were appointed as Value Engineers, heading up a team which included a large firm of Architects and another separate large firm of Structural Engineers; this situation led to considerable confrontation with the Project Design Team in that they felt threatened with a review by peer firms. The other member of the review team was a small M/E Consultancy.

The resulting VE exercise was considered to be a success by both the Client and the Value Engineering team, from the point of view that they unearthed a considerable number of value opportunities but it proved difficult to persuade the Design Team to adopt them and to follow up to ensure that agreed items had indeed been adopted.

#### ROYAL VICTORIA HOSPITAL, BELFAST

The Royal Victoria is, as its name implies, predominantly a Victorian hospital built in the late 19th and early 20th centuries. It is located close to Belfast city centre on the Falls Road, infamous for scenes of sectarian violence.

*The hospital has a past tradition of excellence and innovation in design and*

construction and was the first major institutional building in the world to have air conditioning - a series of wards built in the early years of this century using naval air conditioning technology.

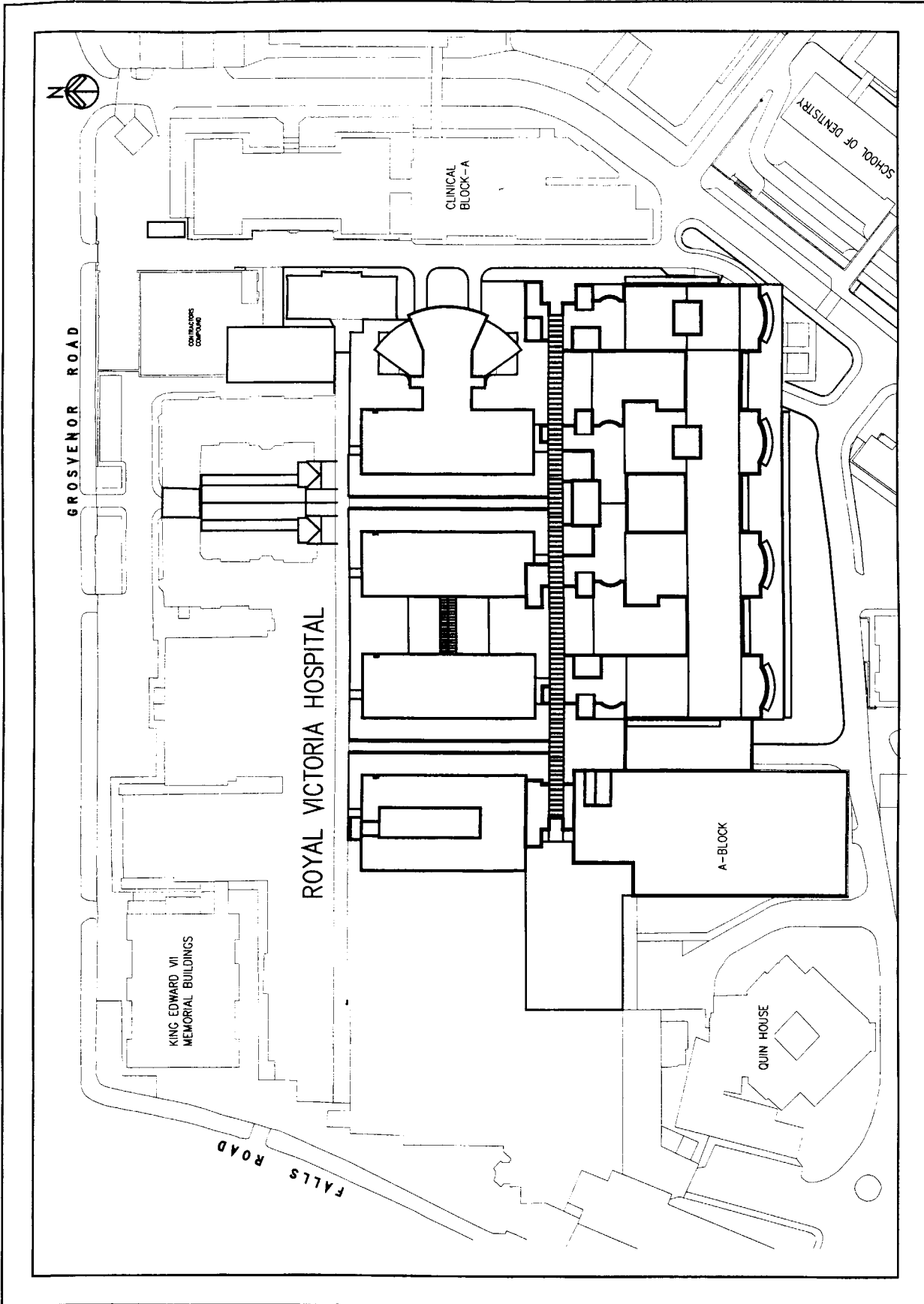
The project is being undertaken in two phases. Phase 1 consists of a six storey building including theatres, wards and ITU on a hospital "street" with a new main entrance. Once built and commissioned this makes way for the original Victorian "corridor" wards to be demolished and replaced by Phase 2. Phase 2 involves the imaging department plus a series of three storey buildings housing out-patient functions with a separate but linked building containing the Federation Centre. The overall development (Phases 1 and 2) consists of some 399,000 sq ft, but Phase 1, on which this VE study was undertaken, is approximately 275,500 sq ft.

Based on their experiences on the Coleraine Hospital Project, Trench Farrow & Partners proposed to act as a facilitator, bringing in specialist consultants and trade contractors to provide expert cost and technological advice. This approach was accepted and resulted in value engineering reviews taking place at the conclusion of design development and at the 80% construction document stage, the former being the comprehensive exercise with the latter being an update and check on progress.

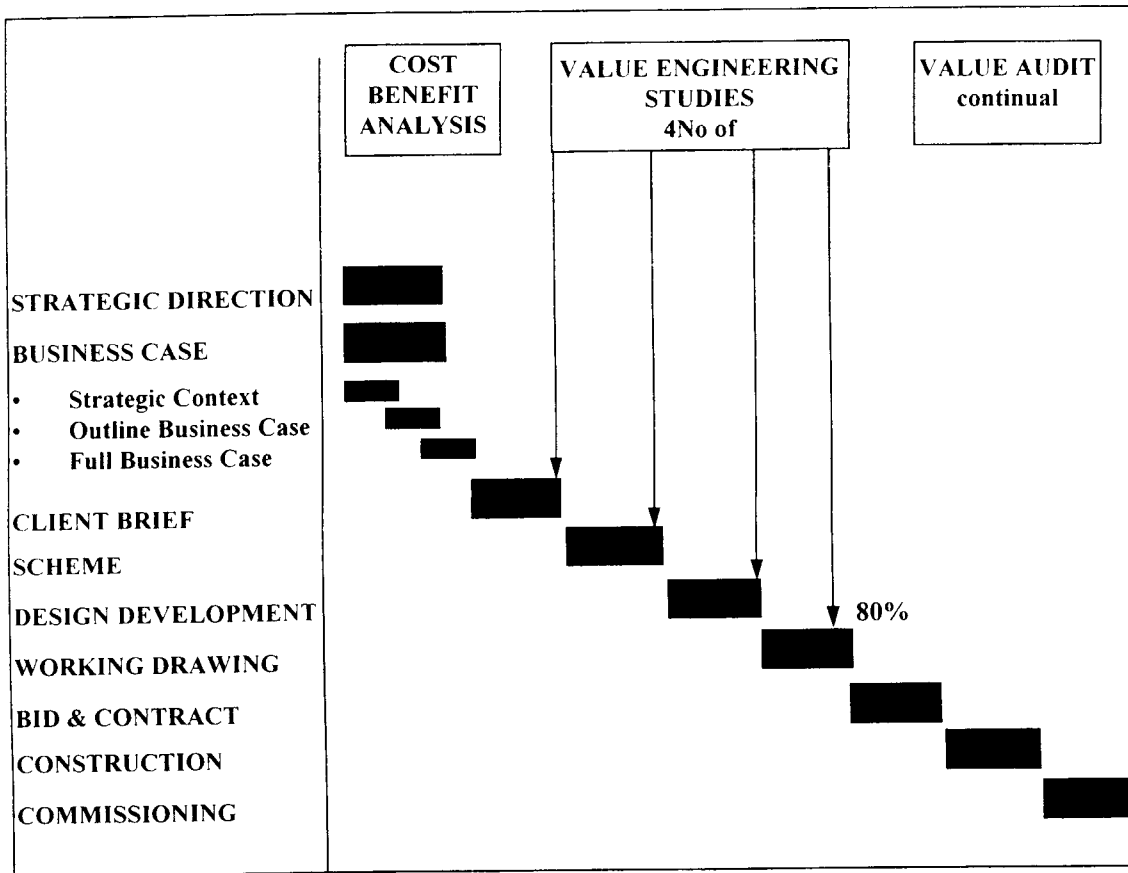
The core Value Engineering team consisted of an Architect and Structural Engineer (individuals rather than peer firms which had caused so much trouble at Coleraine), and a small M/E consultancy (the same one as at Coleraine). Other consultants and contractors were brought in to assist on various aspects of the study including a framework/concrete trade contractor, a landscape architect, a fire consultant and curtain wall consultant.

The VE team worked much better and more closely with the project Design Team than on Coleraine, but first involvement at the end of design development was too late. The Design Team's aspirations, and those of the Client, were just too set and the VE team's proposals tended to be put on the 'back burner' for consideration if the project came in over budget at bid.





**A PROPOSED VE MODEL FOR FUTURE PROJECTS**



We have concluded that the best format for a VE study is a small core team of architect, structural engineer and M/E engineer, drawing on further specialist expertise as required, much as the arrangements made for the Royal Victoria study. We would also propose that team members are either small companies or individuals, as this tends to reduce any perceived threat to the project Design Team who are likely to be much larger organisations on a project of any significance such as the two hospitals studied here.

We believe that it is imperative that the Value Engineering modus operandi is written down and included in the Contracts of Employment of the various members of the project Design Team. There should also be provision in the Design Team's appointments for them to undertake any design modifications resulting from Value Engineering exercises at no additional cost to the client; after all, they should have thought of any such ideas in the first place! We also propose that a programme detailing the VE team's input is included in the Design Team's appointments.

The stages for the VE study are proposed as follows:-

- On conclusion of initial Client's Brief (or Program)

This could be a 'think tank' with the project Design Team and one or two broad thinking members of the VE team present. Views should be sought and encouraged across professional disciplines. A large US A&E firm, for whom one of the authors used to work, referred to this session as a "Pre-design project analysis" - very appropriate.

- At conclusion of scheme design

This would consist of a full VE team review discrete from the project Design Team. It should cover a review of all design undertaken to date and provide advice and guidance for future development of the design.

The output of this exercise would be a *formal* report issued to the project Design Team and subsequently discussed with them at a conference

- At conclusion of the design development

A selected VE team review (selection dependent on results of scheme design study) and again discrete from project Design Team. The review should check as to whether agreed modifications from scheme review have been successfully incorporated. At this stage the VE team will be looking at the way component and inter-component design will be proceeding

- At 80% construction documents/working drawings

This would be a full VE team review, once again discrete from the project Design Team. This session is, in effect, a "buildability" and completeness check. As this is predominantly a document check it is possibly not necessary for this session to be followed up with a conference with the Design Team - just pass on the VE team's report for consideration/inclusion by the project Design Team

- Value Audit

Experience at both the Causeway and Royal Victoria Hospital leads us to the conclusion that a follow-up audit, to see what has been adopted and how much money it saved, is essential. Whilst Value Engineering exercises such as the one studied here are relatively inexpensive when compared to the overall value of the project, they still represent a considerable expenditure (up to £100,000 each) and such expenditure needs to be rationalised. As noted earlier in this paper it is proposed that a professional Quantity Surveyor joins the Design Team. Each of the VE studies, as noted above, will result in a formal report with the savings associated with each identified VE proposal being fully financially rationalised. The purpose, then, of the value audit will be to track all the VE proposals and establish, at the end of the project, exactly which ones were adopted

and what their financial implications were. Whilst this exercise will add considerably to the cost of the Value Engineering study, it is felt that it is imperative to carry it out as it is only in this way that the Client will be able to rationalise the use of such services in the future. It is not good enough to rely on the services of the Project Quantity Surveyor or cost consultant to value VE items as, being a member of the Design Team, he is liable to downplay financial savings.

### Conclusion

The authors' proposals for a VE model are included in the previous section, but it should be stressed that an open mind to the model should be maintained. Certain nuances will suit different situations; for instance, larger design firms with past experience of VE (possibly having carried it out themselves) may be more amenable to the imposition of VE than smaller, perhaps more insecure, firms. The make-up of the VE team should be adapted to suit the particular circumstances, as should the methodology. In the authors' view "pure" VE methodology is unlikely to be effective in the current UK construction market.

If the contents of this paper are adopted, the authors believe that clear benefits can be gained from VE in its widest sense.