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DOES THE PUBLIC WORKS CONTRACT FOR BUILDING WORKS DESIGNED BY THE EMPLOYER ACHIEVE VALUE FOR MONEY?

An Appraisal

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Introduction

Securing value for money is a key objective of public sector clients undertaking construction projects and has underpinned recent initiatives to improve performance within the sector. The Capital Works Management Framework launched by Department of Finance comprises a series of documents which sets out practice and procedure for the delivery of construction projects. It incorporates contractual provisions, guidance material and technical procedures covering the planning, implementation and review phases of projects. The Frameworks aims to establish an *‘integrated methodology and a consistent approach to the planning, management and delivery of public capital works projects with the objectives of greater cost certainty, better value for money and more efficient project delivery.’* (National Public Procurement Policy Unit, 2007) This study focuses on value for money and appraises the effectiveness of the Public Works Contract for Building Works Designed by the Employer (PWC) to achieve this objective.

Value for Money

The meaning of term value for money is readily understood but is difficult to define accurately. It may be seen as being a balance between satisfying client needs and expectations and the resources required to achieve them. The *Code of Practice for Project Management* summarises typical expectations thus: *“The client expects that effective project management will enable the projects completion, by the time when it is wanted, of a standard and quality that is required and a price that is competitive”* (Chartered Institute of Building 2002 p. xiii). Standards and quality expectations are, however, constrained by cost and time and therefore objectives must be prioritised. Clamp, Cox and Lupton. (2007) recognise these constraints and comment that:

“there may be clients who . . . think it is now possible to construct a quality building at break neck speed and for a knock down price. Any such unfounded euphoria needs to be dispelled at the outset. . .The reality is that although the three most important considerations for any client are usually cost, time and quality, the business of building procurement invariably calls for some compromise or a consensus balancing of these priorities. This requires adequate thinking time and careful thought.”

Priorities, and by extension, perceptions of value vary amongst clients and a critically important factor for one client may be insignificant to another. It is also clear that the broad priorities of time, cost and quality are complex and interrelated.

Priorities directly influence the choice of procurement strategy and associated contractual arrangements. The formulation of the terms of a contract is a key element in procuring building work as it regulates how the contract is to be operated and, in particular, how risks are to be allocated between the contracting parties in delivering project objectives. Table 3 of *Constructing the Team* (1994) (the Latham Report), summarises the strengths and weaknesses of the most common procurement strategies in achieving typical client objectives.

TABLE 3: SUMMARY OF ADVANTAGES AND DISADVANTAGES OF CONTRACT STRATEGIES

Project Objectives		Appropriateness of Contract Strategy in Meeting Project Objectives				
Parameter	Objectives	Traditional	Construction Management	Management Contracting	Design & Manage	Design & Build
Timing	Early Completion	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Cost	Price certainty before construction start	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Quality	Prestige level in design and construction	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Variations	Avoid prohibitive costs of change	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Complexity	Technically advanced or highly complex building	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Responsibility	Single contractual link for project execution	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Professional Responsibility	Need for design team to report to sponsor	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Risk Avoidance	Desire to transfer complete risk	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Damage Recovery	Ability to recover costs direct from the contractor	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Buildability	Contractor input to economic construction to benefit the department	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

- appropriate - not appropriate

Fig 1 Summary of Advantages and Disadvantages of Contract Strategies (Source Latham, 1994)

This Table suggests that adopting a traditional procurement approach, such as the PWC Form where the Employer provides the design, should facilitate strong price certainty before construction start, promote high quality design and construction, enable variations to be valued at reasonable rates should they arise, emphasise reliable reporting procedures

and enable the client to recover costs directly from the contractor. Potential drawbacks identified include the likelihood of a longer project duration. It is suggested that the potential benefits identified above are attractive to public sector clients and that the potential drawback of a longer project duration is less critical in the public sector than in the private sector where projects typically incur substantial up-front financial costs and are driven by a greater commercial imperative for early completion. It appears initially, therefore, that this traditional procurement strategy aligns with public sector objectives, and therefore, should provide these clients with value for money.

Value for money is also perceived within a time and location context. The collapse of the economy in the wake of the construction led property bubble has led to a return of pricing not seen the mid 1990s. In addition international benchmark studies rank Irish construction costs as being in the mid range of EU states. These factors suggest that value for money is being achieved at the present time, but the Contract itself cannot be seen as the sole factor in bringing about these conditions, many of which are beyond the scope of this study.

Achieving Quality

The Construction Industry has a poor record in delivering the expected levels of quality and the *Public Works Training Manual* cites the Egan Report's (1998) findings that 30% of projects fail to meet the expectations of users. The notion of 'quality' is multi-dimensional and includes aspects which may be appraised subjectively. *The Latham Report* identified a number of quality aspects which clients may seek in a satisfactory construction project: '*pleasing to look at; free from defects on completion; fit for the purpose; supported by worthwhile guarantees; satisfactory durability and customer delight* (1994). It is clear that several of these aspects are inherent in the design of the project, while others relate to how successfully the Contractor realises the design.

The quality of the design is not an issue directly addressed by the Contract. Procedures to achieve superior design quality are normally separately agreed between clients and their consultants. The Contract itself, however, *is* concerned with how the 'Works Requirements' are performed on site. This issue is primarily covered by Section 8 of the Contract which deals with 'Quality, Testing and Defects' and regulates standards of materials and workmanship; sets out quality assurance provisions to be implemented; it

describes testing and inspection arrangements and details procedures for dealing with defective construction. The objective of this section is to ensure that the Contractor complies with the Works Requirements. The ability of Employer's Representative to apply these quality control provisions requirements is therefore a key factor in delivering a successful project.

Most standard forms of contract, including both the RIAI and GDLA forms, require the Contractor to carry out and complete the Works in accordance with the Contract Documents and to the reasonable satisfaction of the Architect. This is the Contractor's prime responsibility as regards achieving quality standards. This basic quality control requirement is continued in the PWC Forms (Section 8.1) which add that the works must also comply with other legal requirements and be carried out in a workmanlike manner observing proper practice. Section 8, however, contains a number of additional measures to those set out in Clauses 8, 9 and 11 of the GDLA Form of Contract (Materials and Workmanship to Conform to Description, Work to be Opened Up and Access to the Works), which formalise and clarify, rather than extend, the authority of the Employer's Representative. Section 8.1 requires the materials to be new unless otherwise specified, and be fit for purpose. In addition, any works designed by or items selected by the contractor or specialists must be fit for purpose. Section 8.2 sets out the new provision requiring the Contractor to have quality assurance procedures in place. Appropriate quality assurance plans are to be submitted to the Employer's Representative who is entitled to receive QA reports and to carry out spot checks to ensure that the plans are being properly implemented. Sections 8.3 and 8.4 reinforce the Employer's Representative's inspection and testing powers and he or she remains entitled to '*inspect, test, observe and examine*' work in progress and in preparation both on and off site. The Contractor is now also required to give advance notice to the Employer's Representative where works or items to be inspected are to be covered up or packaged thereby becoming difficult or impossible to inspect. The Contractor is also required to facilitate the Employer's Representative's validation of any testing required by the Contract.

Regarding defective work Section 8.5 maintains the Employer's Representatives power to condemn work and have defective work made good at the Contractor's expense. Additional measures contained in the PWC contract include the provision for the Employer's Representative to reject whole sections, or indeed, the Works in its entirety.

There is also an option for the Employer to accept defective works in which case the Employer's Representative will determine the reduction in the value of the Work which shall be deducted from the Contract Sum.

The above measures may not necessarily eliminate all defects, but the additional emphasis on quality control and quality assurance sets out clearer expectations and provides the Employer's Representative with robust supervisory and inspection powers which should in turn assist in achieving better quality outcomes. The Contract provisions also clarify the Employer's ability to recover costs from the Contractor where work is deemed to be defective.

Specialist work

One of the most notable differences between the PWC and GDLA contracts are the means by which specialist work is arranged. The removal of the provisions for nominating subcontractors in the PWC forms of contract may have negative implications for achieving quality standards in specialist work. A particular advantage of the nomination process is that it provides the Architect with a means of appointing specialist subcontractors with proven track records for delivering quality. Typically tenders for nominated subcontractors would be submitted separately to the Employer's consultants who would subsequently recommend the appointment of the chosen subcontractor. Under the PWC, while there are provisions for the contract to name panels of specialists to be employed by the Contractor, this is by no means a mandatory procedure, and the contract may contain few or no limitations on the Contractor's freedom to procure specialist subcontractors. Under the PWC contract the main contractor may exert considerable pressure on specialists to lower their prices in order to submit a competitive tender. This may result in standards being compromised in certain instances. It is therefore essential that the Employer's Representative examines the contractors proposed specialists at both prequalification and tender stage to ensure that they are capable of delivering the expected quality standard.

Achieving Cost Targets

Section 2.5 of the Public Works Construction Contracts Training Manuals sets out a list of five of the Government's primary objectives of the Capital Works Management

Framework. The list commences with the objective to: ‘*Move towards greater cost certainty at contract award stage and ensure as far as practicable that the accepted tender prices and the final cost are the same;*’ (2007, p18) which may therefore be considered as the most important parameter in appraising the success of a project. This parameter is also related to the second and third objectives on the above list: to award contracts on the basis of a lump-sum, fixed-price and to seek optimal allocation of risk. These objectives are to be achieved through the Employer providing comprehensive information including site investigation and archaeological reports to allow a Contractor to price the detailed design and associated contractual risks.

The overall philosophy of the contracts emphasising cost certainty is clearly expressed from the outset. Article 4 of the Articles of Agreement states that:

"The Contractor has included in the initial Contract Sum allowances for all risks, customs, policies, practices, and other circumstances that may affect its performance of the Contract, whether they could or could not have been foreseen, except for events for which the Contract provides for adjustment of the initial Contract Sum."

The explanation notes to Schedule 1K of the contract defines *foreseeable* as a

“condition, circumstance or occurrence is unforeseeable if an experienced contractor tendering for the Works could not have reasonably foreseen on the Designated Date, having inspected the Site and its surroundings and having satisfied itself (in so far as practicable and taking into account any information in connection with the Site provided by the Employer) as to all matters concerning the Site, including its form and nature and its geotechnical, hydrological and climatic conditions.” (Page 63)

This is a clear expression that the Contract Sum will not change except for the occurrence of specific events set out in the Contract. This aim is reinforced by a number of measures designed to remove cost variables in final accounts.

Omission of Prime Cost work

The practice of including Prime Cost sums for works to be carried out by nominated subcontractors or items to be supplied by nominated suppliers has been excluded from the Contract. Works carried under prime cost arrangements are normally paid for on a cost reimbursement basis by the Employer, whereby the Contractor is paid the nominated subcontractor’s or supplier’s agreed final account plus attendances, profit and prompt

payment discounts. Under previous contract arrangements these accounts were often difficult to control and frequently led to cost overruns and the Contractor had little incentive to control costs; in effect, the more the subcontract cost the more profit the main contractor made.

Specialists are now employed by the main contractor on a 'domestic' basis. Under this arrangement the main contractor, not the client, assumes the specialists' pricing risk. In addition to the imperative to submit a competitive tender, discussed above, the exclusion of nomination provisions removes two significant risks previously borne by employers: liability for failure of the specialist to perform and liability for defective design provided by specialists. Both of these risks are now borne by the Contractor and are included in the Contract Sum. These measures could generate substantial savings for clients whose main priority is cost rather than quality.

Omission of provisional work

One of the central objectives underpinning the PWC contracts is to remove risk by providing complete designs in advance of seeking tenders and, consequently, to avoid the need to include provisional sums and provisionally measured work to cover "*work or costs which cannot be entirely foreseen, defined or detailed at the time the tendering documents are issued.*" These sums previously covered matters such as groundworks, builders work in connection with services, remedial works and contingencies, whose extent could not be accurately established in advance of opening up or site inspection.

Provisional sums are typically paid on a cost reimbursement basis while provisional quantities are subject to remeasurement on site. The actual costs are not known until the particular works have been completed and may exceed the budgeted sums set out in the contract. The cost or quantum risk of the work is borne by the Employer and, as is the case with prime cost sums, there is little incentive for contractors to complete such works efficiently.

The exclusion of Prime Cost and Provisional Sums places a greater onus on consultants to develop comprehensive designs so that the contract documents define the Works as fully as possible. Prudent contractors should also check the adequacy of the quantities

when submitting tenders as the risk associated with incorrect quantities stated in Bills of Quantities may be allocated to themselves.

These measures significantly increase the level of certainty that clients' budgets will be maintained.

Change Orders

The PWC Contracts cater for variations. The administrative procedures for processing variations, now called change orders, have been tightened up from those in the GDLA form, to ensure that the cost and time implications associated with the variation are established promptly. Change Orders are listed among various items classified as 'Compensation Events' which may entitle the Contractor to extra time to complete the Works and/or additional payment for the Works. In general, the provisions covering the valuation of variations are similar to those in the GDLA form, but there is a greater emphasis on agreeing the cost of varied works prior to their construction. Section 10.4 empowers the Employers Representative to require the Contractor to submit cost and time proposals and details regarding proposed variations within 20 days. The Employer's Representative has 20 days to agree or reject such proposals or seek additional information.

There is also a novel provision within the Contract dealing with work valued on a daywork basis. In these cases the works are to be valued at the rates submitted by the Contractor within the tender and form part of the tender assessment. It is likely that such rates will be more competitively priced and settled than under previously reimbursement arrangements. These provisions also apply to varied work.

Price variation provisions

The PWC Contracts are Fixed Price Lump Sum for a period of 36 months following the Contractor's tender submission. In effect this provision covers even the very largest building contracts. The Price Variation Clause will therefore apply only in exceptional circumstances. Although it was previously common practice to amend the GDLA Contract by deleting the price variation clause, this amendment was typically the subject of post tender negotiations, which would have been subject to less commercial pressure than where prices were submitted in competition.

Risk Redistribution

One of the principles claimed to underpin the PWC Contracts is that risk should be allocated to the party best able to manage it.

The PWC Contracts envisage that the design will be comprehensively developed at contract award stage. Compliance with approved design team procedures and/or best practice guidelines during the production information stage should ensure that accurate Bills of Quantities can be compiled for such projects. Public sector clients may, however, chose the contractual status of any Bills of Quantities. Where Contracting Authorities elect not to include the Bills as contract documents, the contract will become a ‘without quantities’ arrangement, and in these cases, the contractor assumes the risk for the accuracy of the quantities. Without quantities contracts were previously confined typically to small or low value contracts which contractors could readily measure and price.

The Contract Sum includes for all foreseeable risks except for events listed in Schedule Part 1K of the Contract, which allocates the risk associated with twenty one Compensation Events between the contracting parties. Of particular note is the risk associated with incorrect quantities, unforeseen ground conditions, archaeology, utilities and relocation of utilities, which may be transferred to the Contractor where it is considered that there is sufficient information to allow it to be accurately priced. The Contractor may be entitled to an extension of time and/or “expenses unavoidably incurred” during a period of delay should one or more of the Events arise for which the Employer has retained the risk. The Contract does not provide for the recovery of disruption or loss of productivity costs.

However value for money is not achieved by simply transferring risk indiscriminately to another party. Risk is expensive, and contractors must charge a premium to cover it and in the event that the risk does not arise the contractor will retain these premiums. Expecting contractors to bear the quantum and pricing risk of uncertain particulars will therefore lead to either increased tender levels, or exposure to potentially catastrophic losses which could, in turn, have serious rebound consequences for clients. In many cases the previous arrangement of the employer bearing the risk and the contractor coping with it may turn out to be the more prudent approach.

It may be argued that the PWC contract is much clearer in dealing with risk allocation than the GDLA Form and that this clarity regarding Compensation Events should result in fewer claims arising than was previously the case.

Achieving Schedule Targets

The effective delivery of projects is a primary objective of the Capital Works Management Framework. Revised design team procedures, Guidance Notes and new contract provisions have increased Public Sector Clients' expectations to achieve agreed contractual completion dates. The objective of providing a complete design at tender stage is a key factor in facilitating timely project completion and should reduce the incidence of requests for information on site and the potential for consequent delay claims.

The Contract itself contains a number of measures designed to improve the time management aspects of the project. The normal sanction of Liquidated Damages for late delivery is continued in the Contract, as is the Employer's option to suspend/determine the contract should the contractor fail to progress the works.

The PWC Contract now contains detailed particulars to be provided in the Contractor's construction Programme, whereas the previous GDLA Contract was silent on the matter. The Programme may form part of the Contract Documents. Previously, programme and planning information to be provided to the Architect would have been set out in the Specifications or Bills of Quantities, and would have differed between individual projects and practices. Simple bar charts were often the only form of programming information made available and these were rarely updated, occasionally making time and cost management difficult.

Section 9.4. of the PWC Contract regularises the above situation and requires the Contractor to produce a detailed programme and to keep this up-to-date throughout the project. Programmes are required to include details of when instructions or employer supplied items are required and to identify the critical path, float and any flexibility within the programme. In addition they are also required to identify the workforce and resource estimates required on site. These measures are designed to provide the management information to allow the Contractor and the Employer's Representative to

quickly identify variances from the programme and take appropriate action to remedy the situation. The Employer's Representative may direct that the programme be revised within a fifteen day period and this requirement is enforced through the power to deduct 15% from the Contractor's interim payments for failure to maintain a current programme.

Clause 4.10 requires the Contractor to give monthly progress reports to the Employer's Representative. These reports must contain specified information and are designed to facilitate the Employer's Representative in effectively monitoring progress on site against the programme and to highlight any information requirements at an early stage. The discipline of reporting progress is, in itself, a driver to conform to the agreed programme and strengthens the Employer's Representative's ability to control the process.

The incorporation of a Programme Contingency is perhaps the most radical innovation in these Contracts. The contract period now includes a 'Programme Contingency' which is a time allowance to cover delays and costs resulting from the occurrence of one or more of the Compensation Events. The allowance and thresholds are inserted in Schedule 1 Part K which is completed by the Employer prior to the tender. This measure provides a strong incentive to the Contractor to complete the project promptly as any balance remaining in the Programme Contingency will accrue to the Contractor. This fact has not been lost on critics of the Contract who argue that project costs are unnecessarily increased by the requirement to price numerous risks which may not arise and that this represents poor value for money.

These measures represent a shift to a more managerial approach by insisting on prompt and better information combined with stronger motivators to achieve contract completion targets.

Health and Safety

The previous PWC contract was silent on the matter of health and safety and any employer's requirements would have been set out in the preliminaries section of either the Specification or Bill of Quantities. In many instances these requirements were rudimentary and/or merely reflected the legal requirement to comply health and safety legislation. Sections 2.4 and 2.5 of the PWC contract specifically address health and safety issues regarding the appointment of the Project Supervisor for the Construction

Phase and compliance with the Health and Safety Acts and Construction Regulations. The Contractor is required to warrant the competence of appointees and the status of their insurances. The Contractor is also required to provide sufficient resources to construct the project in a safe manner.

While the above provisions echo current legislation, their introduction into the Contract expresses a clear obligation to comply with the requirements. These provisions, no doubt, create greater awareness of safety obligations throughout the Industry with the ultimate aim of reducing accidents.

Value Engineering

The objective of Value engineering is to assist clients to get the best possible value for money in terms of safety, performance and delivery targets. The previous GDLA Contract was based on the premise that value engineering activities would have been completed prior to seeking tenders. The PWC Contract, however, directly addresses the issue of value engineering.

Clause 4.8 of the Contract provides that the Contractor may make proposal to ER which will, if adopted, reduce the Contract Sum or accelerate the Works, Such Proposal must include the proposed changes to the Contract, the proposed changes to the Contractor's Documents, a detailed breakdown of original and projected cost any proposed changes to program. Critics argue that this approach equates cost or time reductions with value. This approach may deliver short term benefits by sacrificing particular design elements, but in the longer term the resulting loss of function may be seen to not represent true value at all.

The Contract is silent on the arrangements for carrying out the core activities of the value engineering process. This is normally viewed as being multi-disciplinary based, involving all the stakeholders, including the design team and independent experienced practitioners. It is difficult to imagine contractors incurring such expenses when there is such limited scope for them to gain in the process.

Conclusion

An appraisal of the effectiveness of the PWC involves judging whether it successfully achieves its aims. These have been clearly identified by the Department of Finance as achieving improved cost certainty, effective project delivery, both of which are key components of securing value for money.

Cost certainty is heavily emphasised in this Contract. The agreement that the Contract Sum covers all foreseeable risks apart from those set out in the Schedules, the removal of prime cost and provisional sums, provisionally measured work, material and labour price variations and the inclusion of a Programme Contingency are all designed to minimise or eliminate remeasurement and final accounting negotiations and it must be concluded that the contract is very strong on this aspect.

Regarding effective project delivery, this Contract is more clearly written and organised than the GDLA form, which should lead to fewer misunderstandings in its operation. It retains and reinforces the Employer's Representative's quality inspection and testing powers and requires the Contractor to operate a Quality Assurance system. These measures are designed to foster higher workmanship standards which should lead to fewer defects in the Works. Potential problems, however, may arise in the area of specialist work where competitive tendering pressures may lead inferior design and/or less sustainable options being chosen than would be the case under employer-led design approaches.

Regarding delivering the contract on time, the philosophy of providing a comprehensive design at tender stage, combined with the requirement to develop a detailed resourced programme should aid the contractor to identify potential blockages and lead to fewer delays being experienced on site. Minimising the expenditure of the Programme Contingency also provides an added incentive for the contractor to complete the project promptly.

In summary, the above argument indicates that the PWC contracts contain numerous measures which support the achievement of the Department of Finance's aims. The counterview that it lacks balance in its risk allocation approach, is overly bureaucratic and expensive to administer, and has done nothing to protect, reform or improve the

Industry at a time of unprecedented difficulties are certainly strong and valid criticisms of the Contract. On balance, however, this study concludes that Contract significantly improves the achievement of cost and time certainty and thereby promotes effective project delivery and, provided sufficient thought is given to risk allocation, goes some way to achieving better value for money.

References

Clamp, H, Cox, S and Lupton S (2007) *Which Contract? Choosing the Appropriate Building Contract* (4th Edition), London, RIBA Publishing

Chartered Institute of Building (2002) *Code of Practice for Project Management for Construction and Development* 3rd Edition, Blackwell

Department of Finance (2007) *Public Works Contract for Building Works Designed by the Employer*, Dublin

Latham, Sir Michael (1994) *Constructing the Team: Joint Review of Procurement and Contractual Arrangements in the United Kingdom Construction Industry: Final Report*. London: HMSO.

National Public Procurement Policy Unit (2007) *Public Works Contracts Training Manual*, Department of Finance, Dublin.