

Keynote Address: Joint CIB W070, W092 and TG72 International Conference on Facilities Management, Procurement Systems and Public Private Partnerships, Cape Town, 23rd to 25th January 2012

## **CHANGING THE CONSTRUCTION PROCUREMENT CULTURE TO IMPROVE PROJECT OUTCOMES**

**Ron Watermeyer<sup>1</sup>**

*Soderlund and Schutte (Pty) Ltd, PO Box 119 Parklands, Johannesburg, 2121, South Africa*

Abstract: Projects involving construction works need to be delivered on time, within budget, and to the required quality. They also need to meet client expectations and contribute to aspects of sustainable development. Such projects all too often fail to meet expectations. Changes in approach and practice are needed to improve project outcomes. This requires an understanding of contracting arrangements which enable projects to be delivered on a basis other than the traditional preplanned approach, including different allocations of responsibilities, cost based pricing strategies, early contractor involvement and framework agreements. It may also require the modernisation of the procurement and delivery management system and the adoption of a systematic, purposeful and strategic approach to the delivery of a construction works based on the ISO 10845 standards for construction procurement and the FIDIC and NEC3 families of contracts.

The systems, tools and techniques are available for an industry willing to embrace change in order to improve industry performance and project outcomes. A culture change is, however, necessary to embrace these changes

Keywords: contracting , procurement, tendering.

### **INTRODUCTION**

Procurement, according to ISO 10845-1 (2010), is the process which creates, manages and fulfils contracts relating to the provision of goods, services and construction works or disposals, or any combination thereof. Procurement is a key process in the delivery and maintenance of construction works as organisations invariably require goods and services from other organisations to satisfy their needs.

There is seldom the direct acquisition of construction works as client needs vary considerably. Professional services are required, as necessary, to plan, budget, conduct condition assessments of existing works, scope requirements in response to the owner or operator's brief, propose solutions, evaluate alternative solutions, develop the design for the selected solution, produce production information enabling construction and confirm that design intent is met during construction. Constructors, on the other hand, are required to construct or refurbish works in accordance with requirements or to perform maintenance services, frequently on works that is in use, and hand such

---

<sup>1</sup> watermeyer@ssinc.co.za

works over to or back to the user upon completion of the works or services. Construction works are accordingly delivered through a supply chain or what BS 8903 (2010) refers to as "a network of suppliers, including subcontractor".

Construction works projects need to be delivered on time, within a budget, to the required quality and to meet client expectations. There is much evidence, particularly in developing countries that that this is not always the case. Foster, for example, found that Sub-Saharan African countries typically only manage to spend about two thirds of the budget allocated to investment in infrastructure and where infrastructure is provided, it is not focussed where it is most needed. The Construction Sector Transparency Initiative's recent pilot project in Ethiopia, Guatemala, Malawi, the Philippines, Tanzania, United Kingdom, Vietnam and Zambia found that on the projects reported on only 28% were delivered within the contracted time with 23% being delivered in more than double the time, while 40% were completed within or below budget with 9% being more than 100% over budget. The Construction Industry Development Board (CIDB) in South Africa found that clients were neutral or dissatisfied with the quality of completed work on around 20% of the projects while around 12% of the projects surveyed had levels of defects which were regarded as inappropriate.

Construction works can also contribute to sustainable habitats in which present and future generations can live healthy within the limits imposed on the environment's ability to meet present and future needs. They are significant creators of employment over the life cycle of such works. For example, the construction sector is in South Africa the third highest generator of direct employment per US\$ 1 million spent and is only surpassed by the agriculture and mining sectors.

This paper reviews recent developments in procurement and the delivery of infrastructure which have the potential to improve delivery outcomes and outlines the culture change that is necessary to deliver better value.

## **CONTRACTING ARRANGEMENTS**

### **The traditional preplanned approach to delivery**

Virtually no civil engineering works were carried out in the UK after the Romans left until the seventeenth century. This all changed during the latter half of the 1700s. John Smeaton, who is often regarded as the founder of civil engineering and whose largest project was the Forth and Clyde Canal linking the East side of Scotland to the West, developed his approach to managing works. In 1768 he set down his management scheme for the construction phase with detailed tables of responsibility. His team comprised the engineer in chief, the resident engineer and the 'surveyors' for the various geographical sections working under him, and contractors (as opposed to direct labour) (Barnes 1999).

Sir Joseph Bazalgette, who was responsible for constructing the major sewer projects and the embankments on the Thames in London, developed a standard form of contract in the 1860s which was adopted by the Metropolitan Board of Works. This form of contract served as the model for many standard forms of contract, including the first edition of the Institution of Civil Engineer's standard form of contract published in 1945 (Barnes 1999).

This "master – servant" model, which was established by Smeaton and entrenched by Bazalgette has remained in use for the majority of civil engineering projects for more than two hundred years and is still used on projects managed in the traditional way,

particularly in developing Anglophone countries. This approach to delivery which was passed on from the UK to its colonies is no longer promoted by the UK Government which now requires that procurement strategies and contract types support the development of collaborative relationships between the government client and its suppliers and facilitate the early appointment of integrated supply teams. Traditional non-integrated procurement approaches are no longer used unless it can be clearly shown that they offer best value for money (OGC 2006).

### **Alternative allocation of responsibilities**

An alternative to the design by employer contracting strategy is the so-called design and construct contracting strategy. In this strategy, the contractor undertakes most of the design and all construction in accordance with the employer's brief and his detailed tender submission. This option provides single point accountability and allows the construction to commence before the detailed design has been completed.

A variation to the design and construct contracting strategy is the develop and construct contracting strategy. This strategy is similar to that of design and construct, except that the employer issues a concept design as a baseline document for the development of the design.

In the management contractor contracting strategy a management contractor provides consultation during the design stage and is responsible for planning and managing all post-contract activities, including any design of the works or portion thereof, and for the performance of the entire contract. The management contractor subcontracts construction works to others. This contracting strategy can be implemented on a design by employer in terms of which the contractor is not responsible for the design of the permanent works, a develop and construct or a design and construct basis.

### **Alternative pricing strategies**

Contractors have traditionally been required to price a scope of work in terms a price based pricing strategy i.e. a lump sum, bill of quantities or price lists. More recently, contractors have been required to do so on the basis of an activity schedule (lump sums for items linked to a programme and method statements). Contractors can also be required to perform a contract in terms a cost based pricing strategy.

In a cost reimbursable contract wages, salaries, materials, plant and equipment and subcontract amounts can be reimbursed at open market or competitively tendered prices. Some of the items of equipment can be reimbursed at prices that are agreed in terms of the contract. Site overhead charges can be included in a percentage overhead applied to wages and salaries of those working on site. Fees to cover items such as profit, company overheads, finance charges, insurances, and performance bonds, as relevant, can then be added. Such contracts can be competitively tendered as tenderers can compete on the basis of margins and rates.

A cost reimbursable pricing strategy can be used with any of the aforementioned allocation of responsibilities or where the contractor is not responsible for the design of the permanent works. Such a strategy is most often only used in emergency situations, unless the productivity / costs can be controlled. The management contractor contracting strategy enables costs to be controlled should such a contractor be required to subcontract on a competitive basis most of the works and services for which he is responsible.

A target cost contract enables productivity to be controlled by means of a target price which may be tendered or negotiated. In terms of this pricing strategy, the contractor is paid his costs as defined in terms of the contract and on completion of the works, is paid (gain share) or is liable (pain share) for an agreed proportion of the difference between the target cost and the actual cost.

### **Lean construction**

Research has indicated that in order to provide higher value and less waste the fragmentation in design needs to be addressed, preferably before 25% of the design is complete (Lichtig 2006). Target cost contracts can be used to facilitate early contractor involvement in terms of the design by employer, develop and construct and design and construct contracting strategies should contractors be contracted on the basis of their cost parameters and a target price is negotiated when there is sufficient production information available to agree a target price. Escape clauses can be inserted in such contracts to enable the employer to use the designs and approach the open market in the event that agreement cannot be reached regarding the target price.

### **Framework agreements**

Framework agreements enable infrastructure clients to procure goods, services and construction works on an instructed basis (call off) over a term without any commitment to the quantum of work instructed and in the absence of a detailed scope of work. Such agreements contain the term of the agreement during which an order may be issued, the broad scope of work which may be included in an order and the basis by which contractors will be remunerated for instructed work.

A key consideration in entering into a framework agreements is to decide on how contractors are to be remunerated for broadly defined work which is not sufficiently scoped to enable it to be priced at the time when the agreement is entered into. Cost based pricing strategies are well suited to framework agreements for works as:

- a cost reimbursable pricing strategy linked to the management contractor contracting strategy allows the cost of the project to unfold as the bulk of the works and services that are provided by the contractor are subcontracted on a competitive basis; and
- the target price in the target cost contract can be agreed before the issuing of a call off (order) to proceed with the works or services associated therewith

Cost based pricing strategies enable a framework agreement to be entered into with one or more contractors. Such pricing strategies enable a series of packages within a programme to be constructed by one or more contractor who can be provided with a continuous stream of work over the term. This enables lessons learned in one package to be taken to the next and enables a team to work together on an integrated approach over a period of time.

Framework agreements reduce the need to approach the market for goods, services or works falling within the scope of the agreement over the term of the agreement, reduce the number of relationships to be managed and provide clients with programming flexibility to manage expenditure relating to the delivery and maintenance of infrastructure over time. It is also possible for one public institution to make use of another public institution's framework agreement to meet their needs. This can be used to overcome capacity constraints at the different spheres of government or within a region.

# A SYSTEMS APPROACH TO PROCUREMENT

## Fundamentals of a procurement system

A system is an established way of doing things and provides order and a platform for the methodical planning of a way of proceeding. Systems are underpinned by processes, procedures and methods. Systems need to be documented, managed and controlled. Processes and procedures within a system also need to be audited to ensure that outputs and outcomes are achieved to the requisite quality and within an acceptable risk exposure.

Procurement is the process which creates, manages and fulfils contracts. Procurement commences once a need for goods, services, works or disposals has been identified and it ends when the goods are received, the services or works are completed or the asset is disposed of. There are six basic activities associated with procurement processes which establish actions and deliverables / milestones associated with the procurement process as indicated in Figure 1 (Watermeyer 2011b). Procedures and methods used in conjunction with policies guiding the selection of options and the application thereof are required to implement these procurement processes. Procurement documents are needed to communicate to tenderers a procuring entity's procedures and requirements up to the award of a contract and to establish the basis for the contract that is entered into with the successful tenderer. Governance and quality oversight structures need to be linked to milestones in the procurement process.

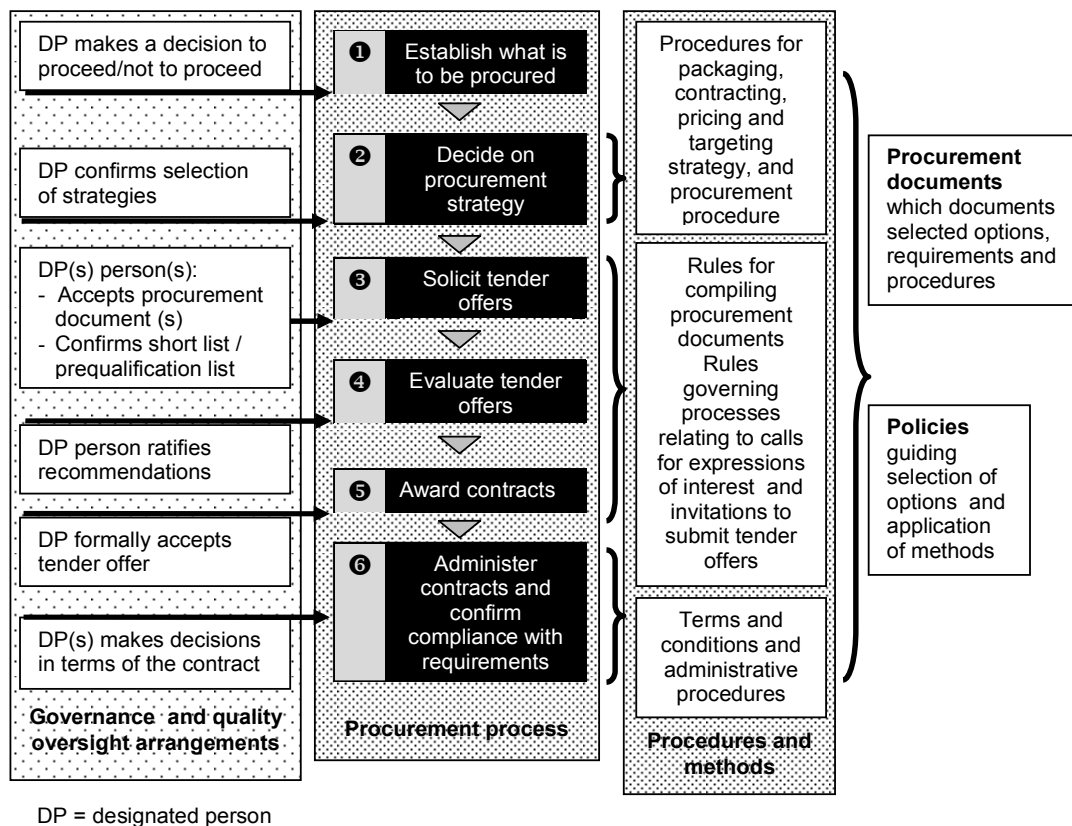


Figure 1: Components of a procurement system

A procurement system accordingly comprises (Watermeyer 2011a):

- rules and guidelines governing procedures and methods

- procurement documents which include terms and conditions, procedures and requirements
- governance and quality oversight arrangements to manage and control procurement
- organisational policies which deal with issues such as the usage and application of particular procurement procedures, requirements for recording, reporting and management of risk, procedures for dealing with specific procurement issues, the usage of procurement to promote social and developmental objectives and the assignment of responsibilities for the performance of activities associated with the various processes.

### **Standardising the construction procurement system**

Procurement is a process and can therefore be standardised. The starting point in the development of any procurement system is to determine the objectives for the system. Objectives associated with procurement systems typically relate to good governance (primary objectives) and, particularly in developing countries, to the use of procurement to promote social and national agendas (secondary or non-commercial objectives).

A set of procurement objectives which are acceptable to both the public and private sectors form the basis of the recently published ISO 10845 standards for construction procurement, namely:

- primary objectives: the procurement system shall be fair, equitable, transparent, competitive and cost-effective; and
- secondary objectives: the procurement system may, subject to applicable legislation, promote objectives additional to those associated with the immediate objective of the procurement itself

These objectives or end outcomes establish the overarching performance requirements for a standardised procurement system. Standards for methods and procedures associated with the soliciting of tender offers and the award of contracts can be developed around these system objectives at a national and international level. It is also possible to develop a generic set of procedures and methods covering the universe of options that are commonly encountered in the soliciting and evaluation of tender offers and the formatting and compilation of procurement documents. ISO 10845 parts 1 to 4 provides a set of generic methods and procedures to address these issues (Watermeyer 2011b).

There are many international, national and regional standard forms of contract (i.e. a contract between two parties with standard terms that do not allow for negotiation). These forms cover a wide range of contracting types, many of which satisfy the aforementioned primary objectives. These forms are, however, drafted around other objectives relating to the allocation of risk and the management and administration of the contract which vary depending upon the nature of the work. It is accordingly not possible to provide a single generic form of contract which enables contractual risk to be managed across the different categories and types of procurement that may be encountered. It is, however, possible to make use of standard forms of contract within families of standard contracts that have been developed by international organisations such as those published by the International Federation of Consulting Engineers and the Institution of Civil Engineers i.e. the FIDIC and NEC3 families of contracts. (The FIDIC and NEC3 forms of contract cover construction works and professional

services while NEC3 forms of contract also cover supply, term service and framework contracts.) (Watermeyer 2011b)

It not possible to standardise governance and quality oversight arrangements and policies at a national or international level as different arrangements need to be adopted to deal within different procurement contexts, e.g. between public and private sectors, between the different tiers of government and between government departments and state owned enterprises. Accordingly, some procedures and methods can be standardised at a regional, national or international level and others only at an organisational level.

ISO 10845-1 (2010) establishes the framework for the development of an organisation's procurement policy, including any secondary procurement policy. BS 8534 (2011) provides recommendations and guidance on the development within a public or private sector organization of policies, strategies and procedures for the procurement of construction in the built environment:

## **THE DELIVERY MANAGEMENT SYSTEM**

The delivery of construction works needs to be managed and controlled in a logical, methodical and auditable manner. The starting point in the development of any delivery management system is to identify the information which needs to be developed and accepted by the client at a particular point in the delivery process to enable a project to be advanced. The stages in the delivery of construction works can then be defined as the activities that need to take place between such points. These stages enable the work flow (sequence of connected activities) toward the attainment of an end of stage deliverable to be developed and culminate in gates (control points) which can be used to provide assurance that the proposed works:

- remains within agreed mandates,
- aligns with the purpose for which it was conceived, and
- can progress successfully from one stage to the next.

There are a number of different systems that have evolved (see Table 1). The Royal Institute of British Architect's Plan of Work (2000) commences with the appointment of the architect and is structured around the design by employer contracting strategy as it contains a procurement stage just after the production information stage.

ISO 29481-1 (2010) starts with the establishment of portfolio requirements at a project level (client planning) and is structured around a develop and construct contracting strategy as it contains a procurement stage just after the full conceptual design stage.

On the other hand, the CIDB Infrastructure Gateway System (2011) commences with planning at a portfolio level and does not embed any contracting strategies in the stages as the end of stage deliverable form the scope of work for a particular contracting strategy e.g. a management contractor can be appointed after stage 3, a design and construct contractor after stage 4, a develop and construct contractor after stage 5 and a design by employer contractor during stage 6. A key feature of the CIDB stages is the introduction of stage 2 (procurement planning) which allows a construction procurement strategy to be developed at a portfolio level during the planning stages and the advantages of framework contracts to be realised. Another key feature is the linking of the hand over and commissioning of the construction works to an asset register to improve the sustainability of the completed works.

# THE USE OF PROCUREMENT TO PROMOTE SUSTAINABLE DEVELOPMENT OBJECTIVES

## The sustainability agenda for procurement

Sustainable development may be defined as "an enduring, balanced approach to economic activity, environmental responsibility and social progress" (BS 8900:2006). The general principles for sustainability in construction works from inception to end of life are:

- sustainability needs to be consider in terms of economic, environmental, and social aspects;
- performance and functionality needs to be achieved with minimum adverse environmental impact whilst improving economic and social aspects at local, regional and global levels;
- the whole of the works as well as its parts (products and components), services and processes needs to be considered over life cycle; and
- different target audiences will have different perspectives on the challenges and the preferred solutions.

*Table 1: Stages in the delivery of construction works*

CIDB (2011)	ISO 29481-1 (2010)	RIBA Enterprises (2000)
1 Infrastructure planning	-	-
2 Procurement planning	-	-
	0 Portfolio requirements	
3 Package preparation	1 Conception of need	A Appraisal; B Strategic briefing
4 Package definition	2 Outline feasibility; 3 Substantive feasibility	C Outline proposals; D Detailed proposals
5 Design development	4 Outline conceptual design; 5 Full conceptual design; 6 Co-ordinated design and procurement	E Final proposals
6 Design documentation (6a (Production information) and 6b (Manufacture, fabrication and construction information))	7 Production information	F Production information; G Tender documentation; H Tender action; I Mobilisation
7 Works	8 Construction	J Construction to practical completion
8 Hand over; 9 Close out (9a Asset data and 9b Package completion)	-	K After practical completion



The sustainability agenda for procurement flows out of the 1992 Earth and 2002 World Summits i.e. to utilise procurement, without prejudicing international trade principles, to (Watermeyer 2004):

- alleviate and reduce poverty,
- minimise the harmful effects of development on the local environment,
- establish and strengthen indigenous building materials and methods,
- promote construction technologies that increase employment, and
- promote increased use of environmentally sound goods, building materials and construction technologies.

This agenda has more recently been expressed as only purchasing goods that are really needed, and buying items or services whose production, use and disposal both minimize negative impacts and encourage positive outcomes for the environment, economy and society (BS 8903: 2010).

### **Sustainable procurement**

The fundamental questions that needs to be asked before proceeding with a procurement are:

- Can unnecessary consumption be avoided through demand management?
- Can alternatives such as reuse, refurbishment or reconditioning or the acquiring of second-hand or used items be considered?

Once the decision has been taken to proceed with a procurement, choices need to be made regarding how best to proceed. Choices are informed by project objectives i.e. the reason for undertaking the project as well as broader societal objectives. Project objectives need to be translated into procurement objectives that may relate to either the delivery of the product itself (primary objectives) or what can be promoted through the delivery of the product (secondary objectives). Primary objectives typically relate to budget, schedule, quality / performance, rate of delivery, environmental / health and safety aspects, buildability, relationships (e.g. long term relationship, early contractor involvement, integration of design and construction etc), client involvement in the project, end user satisfaction and maintenance and operational responsibilities. Secondary objectives typically relate to the alleviation and reduction of poverty, job creation, the reduction of negative environmental impacts or the promotion of health and safety performance beyond statutory requirements.

Sustainability through procurement necessitates that attributes such as usage of e.g. energy and water, choice of construction materials, methods and resources, waste disposal, adaptability for changed usage, accessibility and maintainability are considered. These attributes may relate to different stages in the life cycle of construction works and may be described by a set of indicators (quantitative, qualitative or descriptive measures), that relate to its design, construction, occupation or eventual demolition. Such indicators should be based on the impacts of aspects of the works in relation to the environment, economic value, the well being of users and issues of concern to the community and provide a platform for objective decision making (Watermeyer and Pham 2011).

Choices are also informed by considerations relating to the service life of the works, whole-life costs and benefits of the procurement, and the capabilities of supply chains to address sustainability issues throughout the chain.

Primary objectives (“must haves”) are usually met through:

- the scope of work included in the contract i.e. the document that specifies and describes the goods, services, or construction works which are to be provided, and any other requirements and constraints relating to the manner in which the contract work is to be performed; and
- the selected procurement strategy i.e. the selected packaging, contracting, pricing and targeting strategy, and procurement procedure for a particular procurement.

Secondary procurement objectives (“nice to have”) can be achieved through the selected procurement strategy, particularly through targeting strategies which include incentives that are provided in the form of tender evaluation points, financial incentives for attaining key performance indicators, contractual obligations and mandatory subcontracting requirements. ISO 10845-1 (2010) provides a set of targeted procurement procedures which can be used to create the demand for services or goods or to secure the participation of targeted enterprises and targeted labour in contracts. Other parts of ISO 10845 provide key performance indicators to measure the participation of target groups in the performance of contracts throughout the entire supply chain.

## **CONSTRUCTION PROCUREMENT STRATEGY**

There are a number of different approaches to procuring construction works, each of which can result in different outcomes. Procurement strategy is all about the choices made in determining what is to be delivered through a particular contract or call off from a framework agreement, the procurement and contracting arrangements and how secondary procurement objectives are to be promoted.

The framework set out in Figure 2, which draws upon the menu of options embedded in the ISO 10845 construction procurement standards and the FIDIC and NEC3 families of contracts, enables choices to be made and aligned with project objectives in the development of a construction procurement strategy (Watermeyer 2011c). The application of this framework

- rationalises the delivery of projects within a programme or portfolio of projects and minimises the contractual relationships which are entered into; and
- enables resources and objectives to be matched to the choices made regarding the manner in which needs are to be met; and
- has the potential to deliver construction works more efficiently and in a manner which closely aligns with project objectives and is more likely to deliver value for money.

## **CHANGING THE CULTURE**

Embracing new or different practices such as those embodied in the ISO 10845 construction procurement standards, the FIDIC and NEC3 families of contracts and the CIDB Infrastructure Gateway System takes time and requires strategic leadership. Clients are the drivers of change. They need to change the culture in which construction works are delivered if they wish to see improvements in project outcomes.

Culture changes along the lines of those expressed in Table 2 have the potential to bring about improvements in project outcomes.

## CONCLUSIONS

There have been major advances in all aspects of the construction procurement system over the last few years, all of which have the potential to improve project outcomes. The systems, tools and techniques are available for an industry willing to embrace change in order to improve performance and project outcomes. A culture change is, however, necessary to embrace these changes.

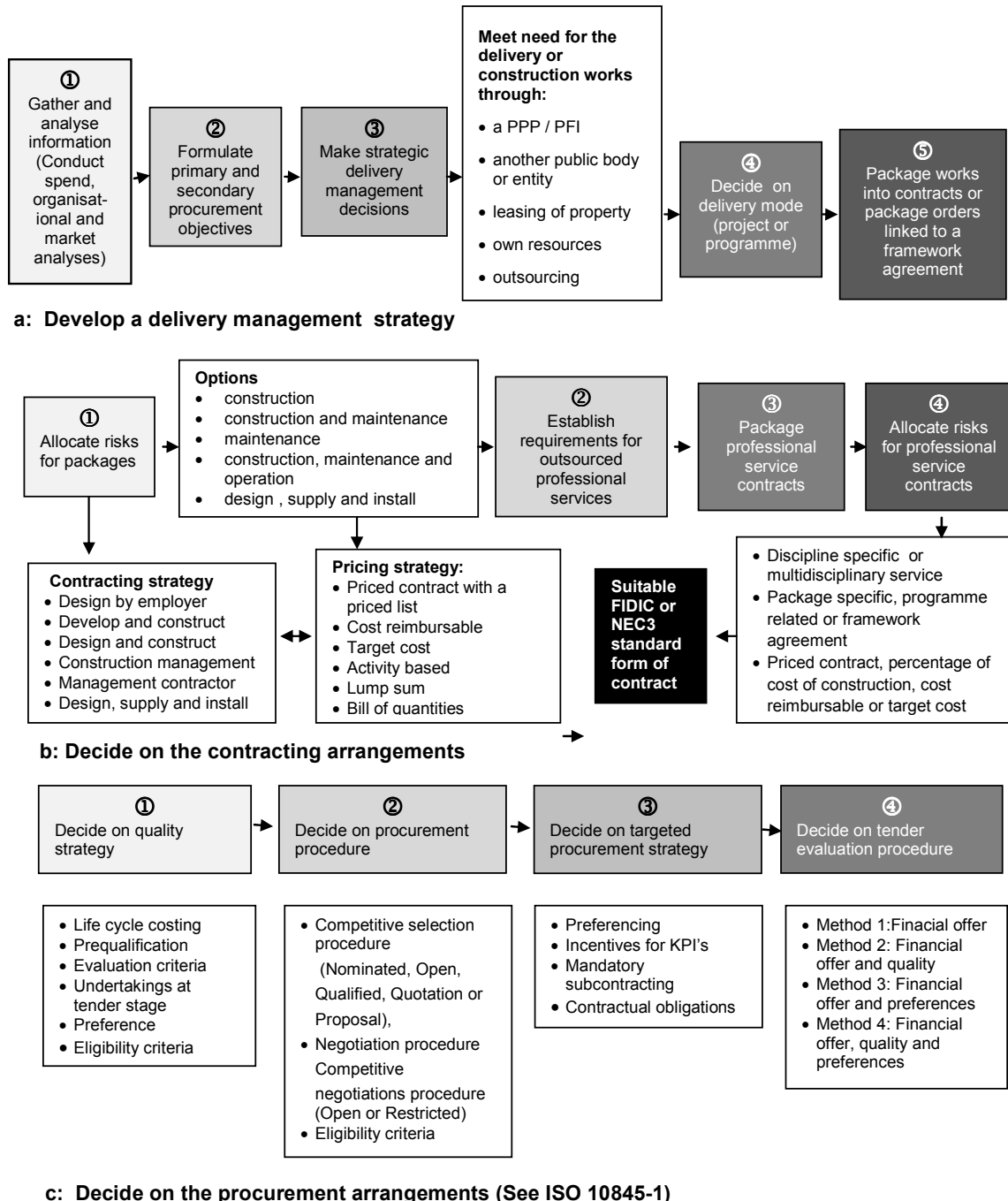


Figure 2: Framework for developing a construction procurement strategy (Watermeyer 2011c)

*Table 2: Culture change required to improve project outcomes*

From	To
Master-servant relationship of adversity ("them" and "us")	Collaboration towards shared goals (integrated project team approach)
Fragmentation of design and construction	Integration of design and construction
Constructability and cost model determined by design team and quantity surveyor / cost consultant 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
Risks are allowed to take their course	Active risk management and mitigation
Develop the project in response to a stakeholder wish list	Deliver the optimal project within the budget available
"Pay as you go" approach to delivery	Discipline of continuous budget control
Rigid, bespoke, ill defined and disjointed procurement system	Flexible, predictable, integrated, documented and auditable procurement system
Poorly structured procurement documents based on bespoke or local standards and forms of contract with reliance placed on local knowledge	Structured procurement documents based on international / national standards and forms of contract with minimal customisation / amendments and clear and unambiguous requirements
Project management focussed on contract administration	Decisions converge on the achievement of the client's objectives
Standard delivery stages prescribe the contracting arrangements and are unrelated to a portfolio of projects	Delivery is managed and controlled through stages which permit the full range of contracting arrangements and commence at a portfolio level
Ill defined end of stage deliverables and acceptance procedures	Well defined end of stage deliverables and acceptance procedures which enable informed decisions to be made
Design and construction developed in isolation from operation and asset management considerations	Design and construction aligned with operation and asset management requirements
Procurement strategy focussed on selection of form of contract as all other choices are predetermined	Selected packaging, contracting, pricing and targeting strategy and procurement procedure aligned with project objectives
One project one contract	Works packaged appropriately to achieve objectives and efficiencies
Project delivery take place within predetermined parameters without any conscious thought to objectives	Projects deliver on documented primary and secondary objectives in a measureable and quantifiable manner

## REFERENCES

- Barnes, M (1999) Smeaton to Eagon – the Extraordinary History of Civil Engineering Management. Smeaton Lecture, Institution of Civil Engineers.
- BS 8543 (2011) Construction procurement policies, strategies and procedures – Code of practice. British Standards Institute, London.
- BS 8900 (2006) Guidance for managing sustainable development. British Standards Institute, London.
- BS 8903 (2010) Principles and framework for procuring sustainably – Guide. British Standards Institute, London.
- Construction Industry Development Board (2011) Construction Quality in South Africa: a Client Perspective - A Discussion Document.
- Construction Industry Development Board (2011) Standard for the Delivery and Maintenance of Infrastructure using a Gateway System. Test edition November.
- Construction Sector Transparency Initiative (2011) Report on baseline studies: International comparison. January.
- Foster, V.(2008). African Infrastructure Country Diagnostic: Overhauling the Engine of Growth: Infrastructure in Africa. World Bank, September.
- Lichtig, WA (2006). The Integrated Agreement for Lean Project Delivery. "Construction Law", Summer.
- Office of Government Commerce (2006) Common Minimum Standards for the Procurement of Built Environments in the Public Sector. 18 January.
- ISO 10845-1 (2010) Construction procurement – Part 1: Processes, methods and procedures. International Organisation for Standardisation, Geneva.
- ISO 29481-1 (2010) Building information modelling – Information delivery manual – Part 1: Methodology and format. International Organisation for Standardisation, Geneva.
- RIBA Enterprises (2000) The architect's Plan of Work for the Procurement of feasibility studies, a fully design building project, employer's requirements or contractor's proposals. RIBA Enterprises, London ISBN 1 85946 088 2.
- Watermeyer, RB (2004) Tools and techniques to facilitate the alignment of public and donor procurement systems to promote sustainable development objectives. Public "Procurement Law Review", Pgs 30 to 55, Issue 1.
- Watermeyer, RB (2011a) Building trust - A platform for best practice construction procurement. "ISO Focus+", September.
- Watermeyer, RB (2011b) Regulating public procurement in Southern Africa through international and national standards. "Public Procurement Regulation in Africa Conference", 25 October 2011, Stellenbosch, South Africa.
- Watermeyer, RB (2011c) A framework for developing construction procurement strategy. Paper accepted for publication in "Management, Procurement and Law", July.
- Watermeyer, R, and Pham, L (2011) A framework for the assessment of the structural performance of 21st century buildings. "The Structural Engineer", 89 (1) 4 January.