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Developing the local construction industry through the delivery and maintenance of construction works

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Ron has been a director of Soderlund and Schutte since 1990, was the 101st President of the South African Institution of Civil Engineering in 2004 and is a Trustee of Engineers Against Poverty. He has been at the forefront of many development initiatives in South Africa since the early 1990s, including procurement reform, the use of procurement as an instrument of policy, the changing of construction methods, technologies and practices to facilitate socio-economic development imperatives and the conceptualisation and implementation of a construction procurement system to reflect societal expectations. He has been involved in various aspects of construction industry development in South Africa since 1999 and led the development of a series of international standards (ISO 10845) for construction procurement. In 2009 he was awarded a senior doctorate (Doctor of Engineering) from the University of the Witwatersrand for contributions over over time to the delivery of infrastructure. In 2010, he was awarded the Institution of Civil Engineer's International Medal in recognition of his contribution to the delivery of enabling engineering mechanisms for the UN Millennium Development Goals.

Abstract

The construction industry is central to the process of economic and social development in any country and as such may be regarded as an engine of growth. Forecasts for the demand for new infrastructure suggest that approximately 80 per cent of the world's new infrastructure by about 2010 will be constructed in developing countries.

A critical question that needs to be asked is whether or not the delivery of much needed infrastructure will lead to the growth and development of the national, regional or local construction industry, and if not, why not, and if so, in what way?

The proposition put forward in this paper is that the outcome of construction industry development at a national level is:

1) an internal capability that meets the needs for constructing and maintaining construction works; and

2) a competitive construction industry that delivers to global standards of performance in terms of quality, productivity, safety, health and the environment.

Construction industry development needs to take place across the entire supply chain across all regions within a country and needs to be linked to the putting in place of an integrated strategy for construction industry growth and development.

Introduction

Construction works may be defined as everything that is constructed or results from construction operations. Construction works include buildings, engineering services including water supply, sanitation, electricity supply, electronic, telecommunication, transportation and stormwater systems as well as plant associated with such systems. Construction works also have to be maintained and are often during their lifecycle, rehabilitated, refurbished or expanded to meet emerging needs.

Construction procurement differs from other categories of procurement as there is usually no direct acquisition of construction works (unless it is a small prefabricated building such as a classroom). New buildings, for example, are seldom standard items and the refurbishment of existing buildings can never be standard. The act of creating a new, or extending, refurbishing or rehabilitating existing construction works cannot be compared to the procurement of goods which can frequently be requisitioned "off the shelf" where an immediate choice can generally be made in terms of cost and quality. The perceived user needs in relation to the construction, refurbishment, rehabilitation, extension or maintenance of construction works needs to be defined and then various options considered.

Unlike the processes adopted in manufacturing, construction activities are not ongoing but dynamic within a project. The team drawn together for a particular project, comprising managers, designers, specialist advisors and constructors, will disband at project completion and seldom will the same team form again unless they are engaged in long term partnering type contracts. Even if they do, the project will probably be substantially different. The end product is very dependent on the skills and capabilities of the team that is put together for a project.

Construction works are commonly created and maintained through a supply chain. A main contractor may:

a) subcontract portions of the works to subcontractors for a number of reasons; and

b) contract with:
   i) manufacturers and fabricators to provide components, plant or equipment,
   ii) service providers to provide a range of services including professional services,
   iii) equipment hire firms to hire equipment; and
   iv) suppliers to provide consumables incidental to the works and materials for incorporation into the works.

Construction works are owned by both the public and private sectors. However, the bulk of buildings within any country are owned by the private sector while the bulk of civil engineering works is owned by the public sector. Both buildings and civil engineering works require a team to plan, design, construct and maintain the works and the necessary resources including finance to do so.

The construction industry can be regarded as a broad conglomeration of industries and sectors which add value in the creation and maintenance of fixed assets within the built environment (Gounden, S 2000). This industry is central to the process of economic and social development in any country and as such may be regarded as an engine of growth.

Forecasts for the demand for new infrastructure expressed at the American Society of Civil Engineers' convention in Baltimore, 2004, suggest that approximately 80 per cent of the world's new infrastructure in 15 to 20 years time will be constructed in developing countries.

A critical question that needs to be asked is whether or not the delivery of much needed infrastructure will lead to the growth and development of the national, regional or local construction industry, and if not, why not, and if so, in what way? Assuming that clients, contractors and consultants agree that construction industry development is necessary, and there is the political will to develop the construction industry within a country, the starting point is to:

a) understand the nature of the construction and consulting firms;

b) define what precisely construction industry development is.

The nature of construction and consulting firms

Virtually all public sector infrastructure projects in sub-Saharan Africa are currently delivered using a traditional preplanned approach to construction which requires that the design and specifications be adequately developed and approved by clients before tenders for construction are invited and the works are priced. This “master / servant” approach to construction was established by John Smeaton in 1768 during the construction of the Clyde Canal in Scotland and captured in Sir Joseph Bazalgette’s standard forms of contract used during the 1860s to construct the London major sewer projects and the embankments on the Thames (Barnes, 1999). It enables the design to meet the client’s requirements closely and the contract, when awarded, to proceed without major change, delay or disruption.

This traditional approach to construction works evolved during a time when public authorities had adequate in house capabilities and capacity to undertake the design and contracts with contractors were priced based. Currently most public sector clients don’t have internal design staff and outsource the design to consulting firms. This non-integrated approach to delivery creates two distinctly different types of firms within the construction industry – consulting firms (masters who design and direct the works) and contracting firms (servants who execute the works in terms of the information provided by the consulting firms in terms of price based contracts).

Finance, equipment, people and management systems are required to provide construction works to a greater or lesser extent, depending upon the nature and scale of the works. Construction firms can be responsible for performing a contract for the whole of the work (main contractor) or a portion thereof (subcontractor). Accordingly contractors can be categorized at one end of the spectrum as being providers of labour only and at the other end mobilisers of all the resources necessary to construct works or to maintain works. In some countries, contractors, particularly civil engineering contractors where construction equipment is not freely available for hire, are categorised by the resources that they possess e.g. the equipment that they own and their permanent staff complement.

Ownership of construction firms range from having a single owner to multiple owners. In some instances, construction firms may be publically listed companies. Such firms range in size from a handful of people to large numbers of permanently employed people.

Consulting firms offer a variety of independent professional services covering the fields of architecture, landscape architecture, cost consulting, engineering and project management. They range in size from single professional practices to multidisciplinary practices with many professionals.

What is construction industry development?

The primary objectives associated with the delivery and maintenance of works typically include (CIDB, 2010):

a) tangible objectives including budget (cost of the works), schedule (time for completion), quality and performance characteristics required from the completed works and rate of delivery;

b) environmental objectives;

c) health and safety objectives; and

d) intangible objectives including those relating to buildability (i.e. the ease with which the designed building or infrastructure is constructed), relationships (e.g. long term relationship to be developed over repeat projects, early contractor involvement, integration of design and construction etc), client involvement in the project, end user satisfaction and maintenance and operational responsibilities

The secondary objectives associated with the delivery and maintenance of works relate to social and economic development and environmental issues e.g. the alleviation and reduction of poverty, minimising the harmful effects of development on the local environment, the establishment and strengthening of indigenous building materials, the promotion of construction technologies that

increase employment, and the promotion of the increased use of environmentally sound goods, building materials and construction technologies. (Watermeyer, 2004).

Construction industry development needs to embrace both the primary and secondary objectives associated with the deliver and maintenance of infrastructure. Construction industry development can accordingly be defined as *the deliberate and managed process to optimise the contribution of the construction industry in meeting national construction demand, in promoting national social and economic development objectives, industry performance and competitiveness, and improved value to clients and society* (CIDB, 2002).

Prerequisites for construction industry development

Introduction

Construction industry development needs to be driven by a set of objectives or end outcomes. The proposition put forward in this paper is that the outcome of construction industry development at a national level is:

1) an internal capability that meets the needs for constructing and maintaining construction works; and

2) a competitive construction industry that delivers to global standards of performance in terms of quality, productivity, safety, health and the environment.

This necessitates the development of the entire supply chain across all regions within a country and the putting in place of an integrated strategy for construction industry growth and development.

Procurement system requirements

The procurement system needs to provide an enabling environment within which industry development can take place. It accordingly needs to:

a) provide predictability in procurement outcomes i.e. ensure fair competition and curb abuses in the procurement system;

b) be standardised so that it can be readily implemented and understood by all who engage in procurement processes.

It also needs to provide a solid platform from which secondary procurement policies may be implemented i.e. procurement policy that promotes objectives additional to those associated with the immediate objective of the procurement itself.

Despite procurement being an activity which lends itself to standardisation and the demand being expressed for standards for procurement, the only set of integrated national standards for procurement which are currently in place are those which were developed in South Africa (Watermeyer, 2005a and 2005b). This will change during the early part of 2011 when the remaining seven parts in an eight part series of international standards (ISO 10845, Construction Procurement), based on the South African Standards, will be finalised (see Table 1).

ISO 10845-1:2010 requires an organisation to develop and document its procurement system

a) in a manner which is fair, equitable, competitive and cost-effective and which may, subject to the policies of an employer and any prevailing legislation, include the promotion of other objectives, in accordance with the requirements of Table 2, and

b) around a process which commences once the need for procurement is identified, ends when the transaction is completed and includes the attainment of procedural milestones which enable the system to be controlled and managed.

ISO/FDIS 10845-2 establishes, at both a main and subcontract level, a format for the compilation of calls for expressions of interest and tender and contract documents. It also establishes the general principles for compiling these procurement documents.

Table 1: An outline of the content of the different parts of ISO 10845

Part	Title	Scope
1	*Processes, methods and procedures*	This part describes processes, methods and procedures for the establishment within an organization of a procurement system that is fair, equitable, transparent, competitive and cost-effective. This part: a) describes generic procurement processes around which an employer can develop its procurement system, b) establishes basic requirements for the conduct of an employer's employees, agents, board members and office bearers when engaging in procurement, c) establishes the framework for the development of an employer's procurement policy, including any secondary procurement policy, and d) establishes generic methods and procedures for procurements, including those pertaining to disposals.
2	Formatting and compilation of procurement documentation	This part establishes, in respect of supply, services and engineering and construction works contracts, at both main and subcontract levels, a) a format for the compilation of 1) calls for expressions of interest, 2) tender and contract documents, and b) the general principles for compiling procurement documents.
3	Standard conditions of tender	This part sets out standard conditions of tender which a) bind the employer and tenderer to behave in a particular manner, b) establish what a tenderer is required to do in order to submit a compliant tender, c) make known the evaluation criteria to tenderers, and d) establish the manner in which the employer conducts the process of offer and acceptance and provide the necessary feedback to tenderers on the outcomes of the process. This part is intended for use in procurements relating to goods, services and construction works and disposals other than by auction.
4	Standard conditions for the calling for expressions of interest	This part sets out standard conditions for the calling for expressions of interest which: a) bind the employer and respondent to behave in a particular manner, b) establish what is required for a respondent to submit a compliant submission, c) make known to respondents the evaluation criteria, and d) establish the manner in which the employer conducts the process of calling for expressions of interest. This part is intended for use in procurements relating to goods, services and construction works and certain disposals other than by auction.
5	Participation of targeted enterprises in contracts	These parts establishes a key performance indicator, in the form of a contract participation goal (CPG), relating to the engagement of: a) targeted enterprises (Part 5) / targeted partners in a joint venture (Part 6) on a contract for the provision of goods, services or engineering and construction works; or b) the engagement of local enterprises and labour (Part 7) / targeted labour on a contract for the provision of services or engineering and construction works A CPG may be used to measure the outcomes of a contract in relation to the engagement of targeted enterprises or to establish a target level of performance for the contractor to achieve or exceed in the performance of a contract. This part sets out the methods by which the key performance indicator is measured, quantified and verified in the performance of the contract with respect to two different targeting strategies
6	Participation of targeted partners in joint ventures in contracts	
7	Participation of local resources in contracts	
8	Participation of targeted labour in contracts	

ISO/FDIS 10845-3 and ISO/DIS 10845-4 sets out standard conditions of tender and standard conditions for the calling for expressions of interest, respectively. ISO/FDIS 10845-3 establishes the rules governing the process of offer and acceptance when tenders are invited, while ISO/FDIS 10845-4 establishes the rules governing the processes associated with the registering of interest in undertaking a specific contract or to participate in a project or programme.

It is important in construction industry development to consider procurement-related deliverables other than those relating to the primary purpose of the procurement itself, particularly those relating to poverty reduction, job creation, local economic development and local industry development. Key performance indicators relating to the engagement of enterprises, joint venture partners, local resources and local labour in contracts are needed to set targets in contracts or to measure procurement outcomes. ISO/FDIS10845-5 to ISO/FDIS 10845-8 provide a range of key performance indicators relating to the participation of targeted enterprises and labour in a contract. They establish the processes, procedures and methods to quantify, measure and verify a contractor's performance in relation to such indicators in an auditable manner.

Table 2: Basic procurement system requirements (ISO 10845-1:2010)

Attribute	Basic system requirement
Fair	The process of offer and acceptance is conducted impartially without bias and provides participating parties simultaneous and timely access to the same information. Terms and conditions for performing the work do not unfairly prejudice the interests of the parties.
Equitable	The only grounds for not awarding a contract to a tenderer who complies with all requirements are restrictions from doing business with the employer, lack of capability or capacity, legal impediments and conflicts of interest.
Transparent	The procurement process and criteria upon which decisions are to be made shall be publicized. Decisions (award and intermediate) are made publicly available together with reasons for those decisions. It is possible to verify that criteria were applied. The requirements of procurement documents are presented in a clear, unambiguous, comprehensive and understandable manner.
Competitive	The system provides for appropriate levels of competition to ensure cost-effective and best value outcomes.
Cost-effective	The processes, procedures and methods are standardized with sufficient flexibility to attain best value outcomes in respect of quality, timing and price, and the least resources to effectively manage and control procurement processes.
Promotion of other objectives	The system may incorporate measures to promote objectives associated with a secondary procurement policy subject to qualified tenderers not being excluded and deliverables or evaluation criteria being measurable, quantifiable and monitored for compliance.

Procurement strategy

Strategy in the delivery and maintenance of infrastructure may be considered as the skilful planning and managing of the various processes associated therewith. It involves a carefully devised plan of action which needs to be implemented. It is all about taking appropriate decisions in relation to available options and prevailing circumstances in order to achieve optimal outcomes.

Procurement strategy is the selected packaging, contracting, pricing and targeting strategy and procurement procedure for a particular procurement (CIDB, 2010). Procurement strategy in the context of construction industry development needs to take place at a portfolio level i.e. where projects and programmes, which are not necessarily interdependent or directly related are grouped together to facilitate effective management of that work to meet strategic business objectives or developmental needs (see Figure 1) (Watermeyer, 2010).

Procurement strategy at a portfolio level can only be undertaken after an infrastructure plan which identifies long term needs and links prioritised needs to a forecasted budget for the next few years has been developed. Such a plan needs to provide a projected list of work items described by category, location, type and function. The work items also need to indicate the nature of the work i.e. design, construction, installation, refurbishment, supply, rehabilitation and maintenance or any combination thereof.

A packaging strategy is the organisation of work items into contracts or package orders issued in terms of a framework agreement. (ISO 10845-1:2010 defines a framework agreement as a*n agreement between an employer and one or more contractors, the purpose of which is to establish the terms governing contracts to be awarded during a given period, in particular with regard to price and, where appropriate, the quantity envisaged*.) Work items in the infrastructure plan need to be

grouped together or divided into packages for delivery under a single contract or a package order issued in terms of a framework agreement.

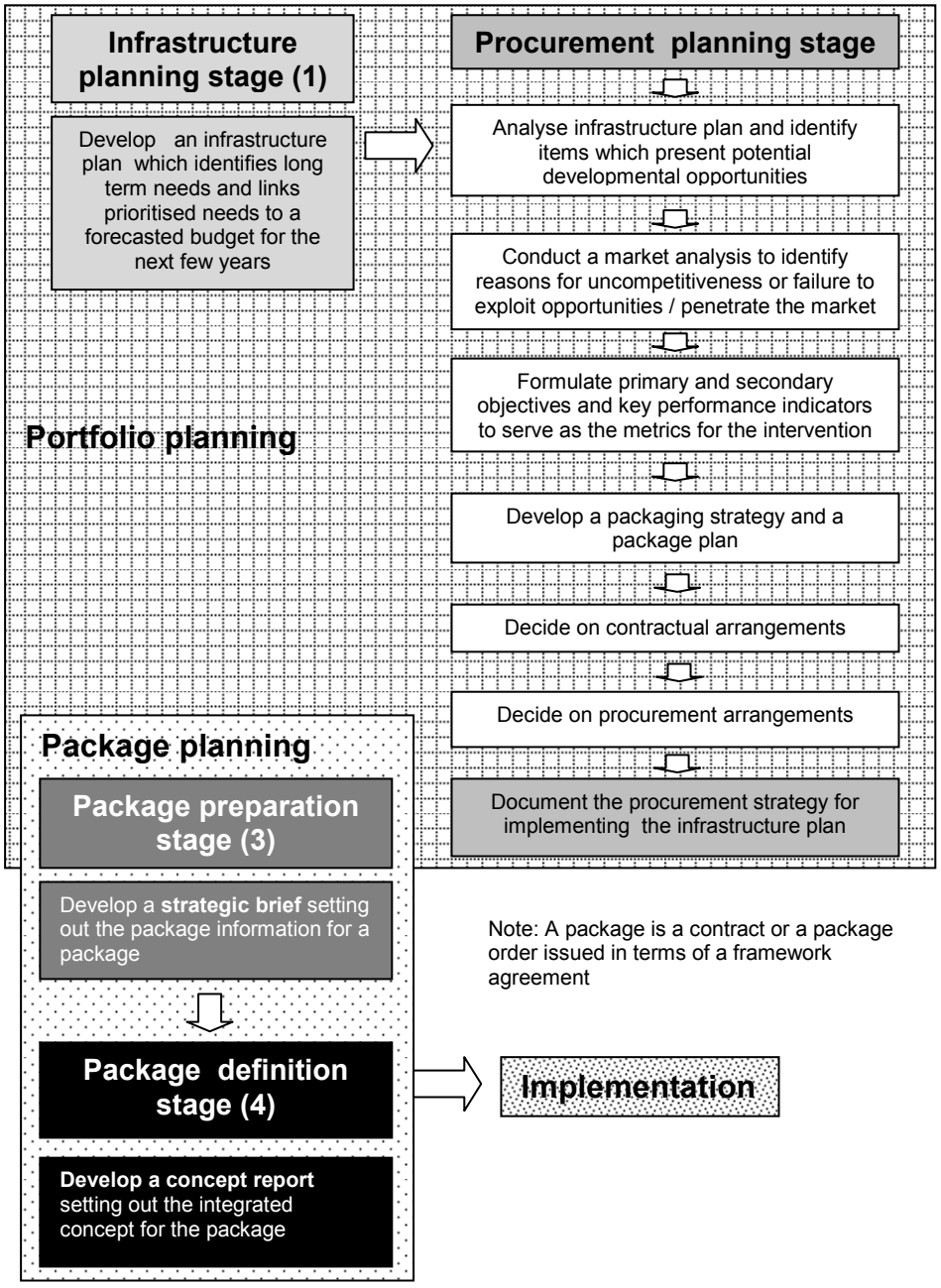

Figure 1: Planning for infrastructure investment at a portfolio and package level

Framework contracts are well suited to situations in which long term relationships are entered into. They also offer flexibility in attaining secondary procurement objectives as requirements can be adjusted from one package order to another, thus allowing new key performance indicators to be introduced or improved upon over time (Watermeyer and Thumbiran, 2009).

The work items in the infrastructure plan which are to be procured over the next few years need to grouped or divided into packages by balancing factors such as:

a) requirements for independent project / programme of projects;

b) use of framework / non-framework agreements;

c) the geographical spread of project / the technical mix of the work;

d) the desire to avoid any awkward technical, contractual or logistical interfaces between contracts;

e) requirements for management / programme;

f) economy of scale from grouping of projects in geographical areas / elimination of duplication of effort;

g) marketability i.e. attractiveness of the packages to the market; and

h) secondary procurement objectives fit i.e. objectives relating to construction industry development.

A package plan can then be prepared which identifies each package and the timing for the procurement of such packages.

The success or otherwise of development programmes are dependent upon the decisions that are made when formulating the contractual arrangements. A critical issue to consider is *what culture should be fostered in the contractual relationships*? Alternatively *what strategy should be adopted?* (Watermeyer, 2010). The Institution of Civil Engineers has indicated that a cultural change along the lines of that outlined in Table 3 is required to improve and optimise the delivery of infrastructure. This institution also make the observation that the choice of the contracting system can facilitate or frustrate performance (ICE, 2010).

The choice of the contracting system for a development programme can facilitate or frustrate performance in terms of the required project outcomes. Ideally, the selected form of contract should enable equitable long term collaborative relationships, be sufficiently flexible to enable risks to be effectively managed, reward performance and focus the parties on attaining the project outcomes throughout the supply chain. The system should also provide back-to-back subcontracts.

Table 4: The culture shift that is necessary to improve and optimise the delivery of infrastructure (after Institution of Civil Engineers, 2010)

From	To
Master-servant relationship of adversity	Collaboration between two experts
Fragmentation of design and construction	Integration of design and construction
Allowing risks to take their course or extreme and inappropriate risk avoidance or risk transfer	Active, collaborative risk management and mitigation
Meetings focused on the past - what has been done, who is responsible, claims. etc	Meetings focused on “How can we finish project within time and available budget?”
Develop project in response to a stakeholder wish list	Deliver the optimal project within the available budget
“Pay as you go” delivery culture	Discipline of continuous budget control
Constructability and cost model determined by design team and 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
Procurement strategy focused on selection of form of contract	Selected packaging, contracting, pricing and targeting strategy and procurement procedure aligned with project objectives
Project management focused on contract administration	Decisions converge on the achievement of the client’s objectives
Training is in classrooms unconnected with work experience	Capability building is integrated within infrastructure delivery
Lowest initial cost	Best value over life cycle

The NEC3 family of contracts published by the Institution of Civil Engineer, is a set of standard forms of contracts which not only defines the legal relationship between the parties to a contract but also facilitates the implementation of sound project management principles and practices. These contracts, which are suitable for use across the full spectrum of works, services and supply contracts ranging

from major framework contracts or major projects to minor works contracts or the purchasing of readily available goods, are designed to encourage collaboration and teamwork in contributing to and delivering best value outcomes. They are sufficiently flexible to be used across the entire supply chain in the delivery and maintenance of infrastructure.

The NEC3 Engineering and Construction Contract, NEC3 Engineering and Construction Subcontract, the NEC3 Term Service Contract and the NEC3 Professional Service Contract all have a target contract option. (ISO 6707-2:1993 defines a target cost contract as *a cost reimbursement contract in which a preliminary target cost is estimated and on completion of the work the difference between the target cost and the actual cost is apportioned between the client and the contractor on an agreed basis.*) This contracting arrangement not only enables framework contracts to be entered into but also enables the client to know where the money is being spent, rewards strong contractor performance, shares financial risk between the client and the contractor and promotes collaboration or a culture whereby both parties have a direct interest in decisions that are made regarding the cost and timing of the contract.

These NEC3 contracts as well as the NEC3 Supply Contract have standard options for partnering (option X12) which requires each partner to work with the other partners to achieve the client's objectives and links financial incentives to achieving or exceeding the target stated for a KPI. This option enables a project team to manage their performance with respect to KPIs and to introduce new KPIs as the need arises. As an alternative, each of these contracts has an option (option X20) which allows for incentive payments to be made if a target for a KPI is achieved or exceeded. The NEC3 family of contracts is accordingly well placed to support the required culture change and broader project objectives required to support construction industry development.

Decisions need to be made regarding procurement methodologies. This necessitates that decisions be made regarding how quality is to be achieved (see ISO 10845-1, 2010), the selection of a tender evaluation method and a procurement procedure, and the identification of targeted procurement strategies to promote secondary objectives.

There are a number of techniques and mechanisms associated with targeted procurement procedures (Watermeyer, 2000 and 2004 and ISO 10845-1, 2010), all of which are designed to promote or attain the participation of targeted enterprises and targeted labour in contracts. These procedures relate to the:

a) Measurement and quantification of the participation of targeted groups through monetary transactions with such groups.

b) Definition and identification of targeted groups in a contractually enforceable manner.

c) Unbundling of contracts either directly so that targeted enterprises can perform the contracts as main contractors or indirectly through resource specifications which require main contractors to engage target groups as subcontractors, service providers or suppliers within the supply chain or as joint venture partners.

d) Granting of evaluation points in the evaluation of expressions of interest or tenders (preferences) should respondents or tenderers satisfy specific criteria or undertake to achieve certain goals or key performance indicators in the performance of the contract.

e) Provision of financial incentives for the attainment of key performance indicators in the performance of the contract.

f) Creation of contractual obligations to engage target groups in the performance of the contract, e.g. subcontract a percentage of the work to or contract goods or services from targeted enterprises, enter into joint venture with targeted enterprises, subcontract specific portions of a contract to targeted enterprises in terms of a specified procedure or perform the works in a manner such that targeted labour is employed.

g) Evaluation of procurement outcomes i.e. the monitoring of the attainment of socio-economic deliverables at a contract level.

Standards and skills

ISO/IEC Guide 2 defines a standard as "*a document, established by consensus and approved by a recognized body, that provides, for common and repeated use, rules, guidelines or characteristics for activities or their results, aimed at the achievement of the optimum degree of order in a given context".* Standards (UNESCO, 2010):

- *facilitate the efficient and safe development, manufacturing and supply of products and services and the construction and maintenance of buildings and infrastructure;*
- *facilitate fair trade within and between regions or countries;*
- *enable suppliers, service providers and contractors to produce consistent products and outputs;*
- *provide a means for regulation of matters relating to health, safety and the protection of the environment;*
- *disseminate technical advances and innovation, new processes, procedures and methods, and good management practice;*
- *safeguard consumers, and users of products and services; and*
- *provide solutions to common problems.*

Standards are fundamental to economic growth and construction industry development.

New standards need to be developed or suitable existing standards need to be identified to not only support design processes and to specify the works, taking into account indigenous materials and practices, but also the constraints in designing and providing the works e.g. constraints relating to health and safety, environmental issues, quality management and participation of target groups in the performance of the contract.

Commercial, managerial, administrative and technical skills are required to satisfy requirements embedded in standards. Skills are also required to confirm compliance with standards or to accredit competencies required to implement certain standards. Accordingly, standards are also required to accredit competencies of contractors and consultants in the implementation of management systems.

The development of skills to implement standards is critical to construction industry development. This necessitates that educational programmes be put in place to address identified skills gaps. Traditional teaching methods that focus on the presentation of knowledge and skills will not suffice. Methods such as action learning (an educational process whereby the participant studies their own actions and experience in order to improve performance) and learning-by-doing and teaching through examples and repetitions will also be required. (Confucius is reputed to have said *I hear and I forget; I see and I remember, and I do and I understand*).

Participation in contracts through targeted procurement procedures as a joint venture partner or a subcontractor with local or international contractors or consultants who are capable of satisfying the required standards provides a platform for skills transfer. Development can be accelerated should such participation be linked to the provision of mentorship by a third party to simultaneously provide advice and counsel and to assist in setting up processes, procedures and systems within firms e.g. systems associated with the running of the business, financial management and the management of their risks, obligations and responsibilities in terms of their contracts (see CIDB, 2008).

Contractual requirements for the provision of experiential learning or work opportunities to individuals can also facilitate skills transfer where skills are lacking.

Long term "win-win" contractual relationships can provide an incentive to develop local contractors and, where such relationships are based on a target contract, reduce risk associated with doing so. Large contractors need to be incentivised to develop their subcontractors within their supply chain.

Access to resources and markets

Access to resources such as equipment, skills and finances also need to be considered. Reliance on targeted procurement procedures to secure participation (and make use of joint venture partner's or main contractor's resources) should only be seen as a short term measure in the development process. Various supply side interventions are required to ensure the supply of goods for incorporation in the works, access to credit, access to equipment either on a purchase or hire basis, etc.

Measuring and rewarding performance

The capability and capacity of contractors and contractors needs to be measured and evaluated for the purposes of construction industry development. Commercial associations as a general rule don't evaluate the capabilities and capacities of their member firms. Consulting associations, however, generally have information on the broad fields of expertise of their members and have a good understanding of the staff compliment in each member firm. This is seldom the case with contractor associations.

The Construction Industry Development Board Act of 2000 which establishes a statutory body to implement an integrated strategy for the reconstruction, growth and development of the South Africa construction industry, creates a register of contractors linked to a best practice recognition scheme and a register of projects linked to a best practice project assessment scheme. Both these registers are central to the implementation of the integrated strategy. Contractors are graded in terms of their capabilities to perform a contract below a specified value, based on proxy measures relating to turnover, available contract and highest value of contract previously completed at a point in time. The registers has 9 contractor grading designations linked to the maximum value of contract that a contractor is considered capable of performing. These designations focus on medium, small and micro enterprises.

Contractors are required by law to be registered with the Construction Industry Development Board (CIDB) in order to undertake construction works contracts in the public sector. There are currently just over 140 000 registered contractors, 70% of which are registered at the entry level designations and only about 0,5% in the highest three designations which account for more than 80% of the value of the works performed. Contractors in the highest three designations are firms with company structures and regularly operate across multiple sites at any point in time. Such firms should be the objective of development programmes in countries or regions where there are insufficient capabilities or skills for the local contractors to execute construction works.

The second phase of the CIDB register of contractors, which has not yet been implemented, links accreditation in terms of standards relating to management systems to a contractor's grading. Accreditation will be linked to prequalification criteria or evaluation criteria in the procurement process. This provides an incentive for contractors to obtain the necessary accreditation.

The capabilities and capacities of contractors and consultants need to be understood so that the procurement strategy that is adopted to implement the infrastructure plans supports industry development, both regionally and nationally. Incentives also need to be put in place to ensure that contractors embrace the required standards.

Proposed strategy for construction industry development

It is suggested that the growth and development strategy that is embarked upon to support construction industry development needs to:

1) provide market access to local contractors and consultants where gaps exist;

2) focus on the development and up skilling of contractors who have company structures and manage multiple sites;

3) focus on technology and skills transfer from foreign consultants to local consultants where there is likely to be a sustained demand for particular services that are lacking;

4) categorise contractors in terms of broad capabilities so that increases in capability can be measured over time and procurement strategies that are developed to implement infrastructure plans support industry development; and

5) recognise and reward contractors who embrace best practices relating to performance.

Conclusions

Construction industry development needs to be driven by a set of objectives or end outcomes and needs to take place across the entire supply chain across all regions within a country. Such development needs to be linked to the putting in place of an integrated strategy for construction industry growth and development.

Construction industry development is most likely to necessitate the overhaul of the procurement system, the adoption of a strategic approach to the delivery and maintenance of construction works, the establishment of a register of contractors and the engagement of industry based professional associations to implement the integrated strategy. It will also need supportive institutional arrangements.

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