

Transformation of the South African Construction industry

Case study: International Convention Centre. Durban

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Summary

South Africa, despite its wealth, advanced infrastructure and technology, has a historically unbalanced distribution of wealth in the country. The legacy of apartheid¹ and its accompanying repressive legislation over a period of 50 years has created major inequalities and imbalances in almost every sector of South African life. Major inequities in ownership, employment, education and skills make for a highly skewed economy in terms of individual income, productivity and employment, a problem that the new democratic government in South Africa is struggling to overcome.

The construction industry, which is one of the most important sectors of the economy, having accounted for almost 50% of the total gross domestic fixed investment in the country for many years, has not changed much. The construction sector in South Africa is unique in that the industry is dominated by a small number of large companies that carry out the bulk of the construction work. The vast majority of firms in the industry comprise of small, medium and micro enterprises, a group of historically disadvantaged and marginalised construction firms that operate in the shadow of the organised construction industry. These small contractors operate under severe constraints including a lack of technical and managerial expertise, lack of adequate finance, inadequate supervisory capabilities and difficulty in obtaining essential resources. For the small contractors who are excluded from main stream construction activities it is a continuous struggle against poverty, bureaucracy, and a lack of resources. They have limited or no access to technology and information and they operate in an environment, which is not supportive, threatening the viability of these operatives.

The few large companies that dominate the industry have somehow managed to convince the authorities until recently that they represented the construction industry in the country and were able to secure for themselves not only the bulk of the public and private construction sector

work, but also positions of influence in the various statutory bodies and boards.

Development projects initiated by state authorities were essentially carried out with little meaningful participation by the affected sector. In large government projects of the past the likelihood of participation by historically disadvantaged companies was highly unlikely, the authorities being more concerned with efficiency and technocratic considerations than with involving them in the process.

The importance of capacity building is however now widely recognised in the public sector but unfortunately the private sector which is responsible for the bulk of the construction work in the country is reluctant to implement change. The Department of Public Works has created an inter-ministerial committee and task team on Construction Industry Development with a view to creating an enabling environment for reconstruction, growth and development.

The task team along with the Construction Industry Council (CIC) and other stakeholders in the industry now face the challenge of forging a unity of purpose in the development and transformation of the construction industry.

The public works department also has a system of awarding tenders on price and development objectives, based on a points system, instead of on price competitiveness alone. These are positive move towards creating an enabling environment in the construction sector. This is not a solution to the problems of the industry but will go some way towards addressing the much needed process of capacity building.

The efforts of the public works department are laudable but there is a need to go beyond this. The small operatives in the industry are a national resource. They create employment, in a country that has an unacceptably high unemployment rate, and in this way help combat poverty and hunger.

What government also needs to do is remove the gross inequalities that exist between the various players and to provide all persons with the opportunity to earn a sustainable livelihood. Government needs to:

¹ *apartheid* – policy of racial separation

- Help to create a more efficient building sector by dismantling large monopolies, especially those in the materials supply industry, and support the formation of new firms.
- Initiate regulatory reforms in the industry.
- Develop training and education programmes with the involvement of non-government sectors to a level far exceeding what which is available at the moment, and
- Create favourable conditions to encourage the disadvantaged sector to participate.

The International Convention Centre (ICC) construction project, a public works project, in Durban is an example of how attempts are being made in South Africa to address the historical imbalance in the industry.

Positive results flowed from the ICC project, which was a fine example of the kind of capacity building work that is needed to transform the industry. This paper evaluates the manner in which the ICC project attempted to achieve its objectives of sustainable human resource development and capacity building amongst the workmen and emerging contractors. The ICC project was an imaginative exercise in empowerment. A declared objective of the development of ICC Durban was that the Construction Contract should be so structured that wherever possible work should be made available to those smaller contractors who, for a number of reasons, be it financial, legislative, lack of experience or racial and gender prejudices, had been precluded from participating in projects of this nature and magnitude in the past.

ICC Durban was to be community project, which had to have the co-operation, support and enthusiastic participation of the community during the construction phase. The goal of the ICC Durban Construction protocol was to arrange for the letting and award of the construction contracts such that the resource base for the project was shared and broadened to create opportunities for the employment and development of contractors, who may not otherwise be involved in that capacity.

Emerging contractors gained valuable experience through working with the convention centre contracting team. Small businesses learnt various skills, including business management principles. The project has demonstrated that it is possible to involve communities, often with limited skills, at all levels in the process, and still create a building of international standards.

The construction industry in South Africa is entering an extremely exciting period in its development as it faces up to the tremendous challenges facing it in the new millennium. The empowerment of emerging contractors and sub-contractors is a challenge that the construction industry has to deal with in an imaginative way.

Given the critical role that the construction sector needs to play in the transformation of South African society, there is a dire need for new innovative approaches to participation being introduced in development projects especially in the private sector. The private sector is responsible for the bulk of the construction work in the country but very little change has occurred here.

Much has been, and is being, done by the authorities and dedicated people committed to the process of transformation of the South African society but there is still a long way to go

Introduction

Aim of the paper

The aim of this paper is to:

- Highlight the very serious problems being experienced by the emerging construction sector² in South Africa.
- Evaluate the manner in which the ICC project attempted to achieve its objectives of sustainable human resource development and capacity building amongst the workmen and emerging contractors.
- Evaluate the ways in which the authorities are attempting to transform the industry from one that is dominated by a few largely white owned companies to one that truly reflects the demographics of the country.

A case study will be presented to illustrate what can and needs to be done to normalise the situation in the industry. The International Convention Centre (ICC) construction project, a public works project, in Durban is an example of how attempts are being made in South Africa to address the historical imbalance in the industry. The International Convention Centre is in the heart of the city of Durban in the province of KwaZulu-Natal. Positive results flowed from the ICC project, which was a fine example of the kind of capacity building work that is needed to transform the industry. This paper looks at the project from the perspective of education, training and development in the construction Industry since my work as an academic involves the education and training of construction management and quantity surveying students as well as emerging contractors, many of whom were employed on the ICC project.

Facts about the actors and the project

The construction of the International Convention Centre (ICC) in Durban was one of the highlights for the South African construction industry in general – and for the KwaZulu-Natal building industry in particular. International visitors to the centre are lavish in their praise of the level of skills and service achieved on the project-ranking it amongst the best in the world. The ICC is a striking low-rise building, which reflects its environment and location. The soft lines, gentle curves and waveforms of the ICC identify with the character of Durban. The ICC Durban is centred on three inter-linking halls of immense area, which has a combined capacity of over 7000 square metres of floor area. The main foyer-a

2 Emerging construction sector - small, medium and micro sized firms owned by members of the previously disenfranchised communities.

spacious assembly, registration and relaxation area for visitors has a massive glass facade that brings the sun and clear blue sky closer. A variety of environments are made possible by operable walls that can be moved easily. The plenary hall has raked seating for 1644 people, subdivided into two separate 840-seat auditoria. Sophisticated technology enables the seats to be raised into the ceiling and, within hours a banquet can be set up in the floor space created. Smaller venues and meeting rooms, suitable for smaller groups are conveniently situated on the ground and first floors levels (Project Pro, 1998). The construction of the ICC and the adjoining Hilton hotel are now proving to be major catalysts in the development of prime land on the CBD fringe.

The major role players in the project were as follows:

1. Client – the client is the City Council of the City of Durban represented by :
 - The Durban Infrastructural Development Trust (DIDT) which comprised of 50 % trustees from the Durban City Council and 50% trustees nominated by the previously disenfranchised community.
 - ICC Construction (Pty) (Ltd) – which was formed specifically to procure the development of the ICC Durban and act as agent for the DIDT and the Client on construction related matters.
2. The project team comprised 35 consultants and included overseas specialists carefully sourced for this development. The project size and complexity required the services of a development manager whose role included:
 - Identifying, delineating, resourcing, co-ordinating, controlling and managing all functional areas.
 - Directing all project managers
 - Reporting to the client representative, ICC executive committee and ICC Construction (Pty) LTD's board of directors (ICC Durban, 1995).

Andrew and Boule were appointed project managers for the project and were responsible for the overall co-ordination and management of the project.

3. The management contractors were a joint venture company formed by two large national construction companies (Grinaker Construction and Murray and Roberts). The contractors were brought in at an early stage and contributed to the design of the project.

The ICC project was an innovative exercise in empowerment on a large scale. A declared objective of the development was that the Construction Contract should be so structured that wherever possible work should be made available to smaller contractors who, for a number of reasons, be it financial, legislative, lack of experience or racial and gender prejudices, had been precluded from participating in projects of this nature and magnitude in the past.

ICC Durban was to be community project, which had to have the co-operation, support and enthusiastic participation of the community during the construction phase. It was proposed that the construction process allow for larger contractors and sub-contractors to work in association with smaller less experienced contractors over the period of the contract so that the disadvantaged

contractors could enhance and expand their capacity and experience to carry out, or contract for, or perform on larger contracts on their own in the future (ICC Durban, 1995).

Specific geographical, economic, cultural and political conditions

South Africa is a large, scenically splendid country situated at the foot of the African continent. It is the home to a diverse population of approximately 42 million people. Its physical size (approximately 1,2 million square kilometres) makes it bigger than Germany, France, Italy, Belgium and Holland combined.

Kwazulu-Natal is the second most populous province in South Africa. Its geography varies from sandy beaches on the east through rolling mountains in the west. Durban, the second largest city in the country and the busiest port, is a rapidly growing urban area.

South Africa is the largest, most sophisticated economy in Africa with a GDP three times that of Nigeria or Egypt. The GNP is by far the biggest in Africa – more than Egypt, Nigeria and Kenya combined (Editors Inc, 1998).

However despite its beauty and wealth there is a historically unbalanced distribution of wealth in the country. The racial policies and accompanying legislation of the previous government over a period of 50 years has created major inequalities and imbalances in almost every sector of South African life.



The new democratic South Africa is now struggling to overcome the problems inherited from these 50 years of repressive laws. Major inequities in ownership, employment, education and skills make for a highly skewed economy in terms of individual income, productivity and employment. The country also suffers from a huge income gap between the urban dwellers and rural population. The process of empowerment of the previously disadvantaged groups in South Africa commenced five years ago after South Africa's first democratic elections but the process is extremely slow

and nowhere is this more evident than in the construction industry. The construction industry, which is one of the most important sectors of the economy, having accounted for almost 50% of the total gross domestic fixed investment in the country for many years, has not changed much. Much has been, and is being, done by the authorities and dedicated people committed to the process of transformation of

South African society but there is still a long way to go.

The construction sector in South Africa is unique in that the industry is dominated by a small number of large companies approximately 2% of the total that carry out approximately 98% of the total work available. The remaining 98% of the industry comprise of small, medium and micro sized enterprises, a group of historically disadvantaged and marginalised construction firms that operate in the shadow of the organised construction industry. These small contractors operate under severe constraints including:

- a lack of technical and managerial expertise
- lack of adequate finance
- inadequate supervisory capabilities and
- difficulty in obtaining essential resources.

For these small contractors who are excluded from main stream construction activities it is a continuous struggle against poverty, bureaucracy, and a lack of resources. They have limited or no access to technology and information and they operate in an environment, which threatens their economic viability.

The few large companies that dominate the industry have somehow managed to convince the authorities until recently that they represent the construction industry in the country and have been able to secure for themselves not only the bulk of the public and private construction sector work, but also positions of influence in the various statutory bodies and boards. Development projects initiated by state authorities were essentially carried out with little meaningful participation by the affected sector. In large government projects of the past the likelihood of participation by historically disadvantaged companies was highly unlikely. The importance of capacity building is however now widely recognised in the public sector but unfortunately the private sector which is responsible for the bulk of the construction work in the country is reluctant to implement change. The construction industry in South Africa remained largely fragmented with an organisation known as BIFSA representing essentially the white owned companies and organisations such as BCI (Black Construction Industry) that represented black owned firms

However after more than three years of negotiations the Construction Industries Confederation (CIC) was officially launched on 12th May 1998 in Cape Town. The CIC brings together the employer associations of the established, predominantly white, contracting sector and the new emerging black sector. This new umbrella body is supposed to represent the whole contracting industry: the Building Industry Federation of South Africa (BIFSA), the Association of General Contractors (AGC), the South African Federation of Civil Engineering Contractors (SAFCEC) and the Black Construction Industry (BCI).

In launching the organisation the minister of public works expressed the hope that this was the first step towards a fully integrated organisation and not just an umbrella body and that the CIC would use its newfound unity to play a dynamic role in the country.

The department of public works has created an inter-ministerial committee and task team on Construction Industry Development with a view to creating an enabling environment for reconstruction, growth and development. The task team along with the CIC and other stakeholders in the industry now face the challenge of forging a unity of purpose in the development and transformation of the construction industry.

This is not a solution to the problems of the industry but will, however, go some way towards addressing the much needed process of capacity building.

Design Stage

Project organisation

The management contracting approach used on the ICC contract allowed for the period of design and construction to overlap. It also offered the flexibility to absorb design changes during construction thereby minimising the amount of cost and time overruns arising from such changes. The contractor had to contribute his skill and expertise in contracting to the development process. The contractor had to be available to the development team to discuss and evaluate matters relating to the construction aspects of the project.

The goal of the ICC Durban Construction protocol was to arrange for the letting and award of the construction contracts such that the resource base for the project was shared and broadened to create opportunities for the employment and development of contractors, who may not otherwise be involved in that capacity. This had to be achieved without incurring negative impacts on the quality, time and cost parameters of the project. The traditional procurement method in common use did not meet the requirements of the project objectives and a more innovative procurement method had to be found.

The stated objectives of the project were as follows:

- to provide and promote capacity-building (capability and experience) during the construction phase
- to arrange the construction contracts in a manner which shares the workload as far as is practical
- to formulate procedures whereby disadvantaged contractors will have an opportunity to participate actively in the construction phase
- to utilise existing standard construction contract documents and procedures incorporating such additional documentation as necessary
- to define the areas of responsibility and accountability which should be clearly understood by the contracting parties
- To ensure that the end product is of an acceptable quality within the prescribed time period and the agreed cost parameters (ICC Durban, 1995).

Purchasing – procurement – contracting

Contracts in South Africa almost exclusively use the traditional procurement method (TPS). The essence of the traditional procurement system is that construction work involving significant architectural input is undertaken with the client contracting and the architect as the principal design consultant. A separate contract is entered into between the client and the consulting engineers. Later, the client and contractor enter into a separate contract. In order to achieve this the architect must coordinate all of the design input from the various design specialists, so that a single comprehensive set of documents can be put out to tender.

According to Rwelamila (Rwelamila, 1997) technology in the construction sector is becoming more complex and composite, and new practices are becoming increasingly transient and expedient. In this environment building projects procurement systems have been criticised for being unable to cope with the complexity and dynamic nature of the current sector in balancing project parameters.

This system has been severely criticised by many for being out of date, inefficient, expensive and not reflecting the appropriate relationship between the client and the contractor. The TPS also does not facilitate the process of empowerment of emerging contractors.

The TPS did not fit the requirements for the achievement of the project goals of the ICC project. The approach that was used is defined as 'Management Contracting', with the party taking full responsibility for the project being defined as the 'Management Contractor' (the contractor). The construction work was to be let as a series of subordinate contracts who were to be appointed as 'selected (or Nominated) Sub-contractors contracting to the contractor (fig 2).

Although it would seem that the management contracting approach has been used for a number of years in some countries it is a relatively new approach in South Africa.

Background to management contracting

The characteristics of a management contract are that the client engages the management contractor to participate in the project at an early stage. The contractor contributes his construction expertise to the design and manages the construction. Because of these requirements, it is normal for the management contractor to be an experienced builder or construction company. The management contractor is not employed for the purposes of undertaking any of the works, but solely for managing the construction process. Management contracting consists of 100% sub-contracting. Every item of building work is sub-contracted to 'Works Contractors'. Management contracting is different from the 'Construction Management' approach in which the separate works contracts are made directly between the client and the works contractors. The approach adopted on the ICC project was a slight variation of the Management Contracting approach to the extent that the main contractor did in fact carry out a small part of the work.

The following diagram is a simple illustration of the relationship of the parties on the ICC project.

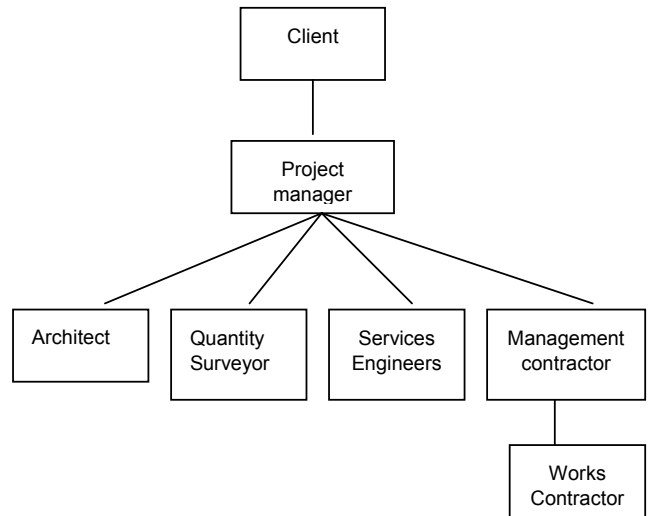


Fig 2 contractual relationships in management contracting

Project planning

The technique used to finalise the project scope and brief was a series of planning workshops where planning options were presented for review. International consultants covering the fields of Architecture, Urban Planning, Marketing, Operations and Management, who refined the brief to provide the terms of reference to finalise and agree the project scope, attended these workshops.

The total project scope was defined through the Work Breakdown Structure (shown in fig 3) which was used as a primary tool for resourcing, structuring, programming, and controlling the development.

In establishing the project structure the project managers on the ICC project applied the following principles (ICC Durban 1995):

- Seek to identify skills in the individual supported by the firm, as it is the individual who will contribute to the team input.
- Provide a high level of co-ordination within a framework of co-operation based on well-defined and understood consultant's briefs.
- Adopt a pro-active approach in controlling and managing all aspects of the project.
- Focus on the project goals and objectives to ensure that parties do not lose sight of or wander from the pre-determined and agreed principles and constraints
- Strong leadership and direction

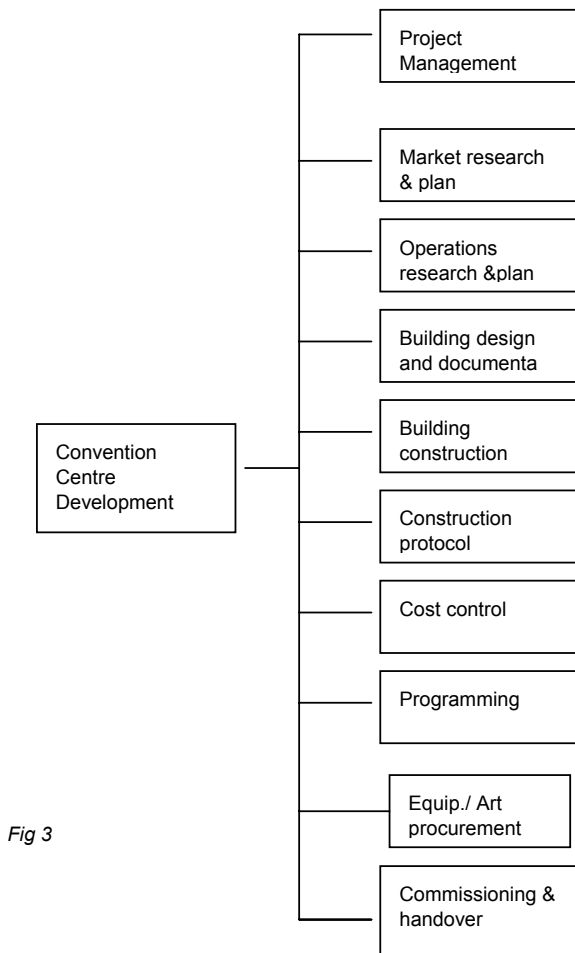


Fig 3

The project managers produced pro-active computerised project and documentation programmes from time to time in consultation with the project team including the Principal Building Contractor. Programmes were presented, for ease of reference, in the format of activity-linked Gantt Bar Charts. Programmes were distributed to the project teams and monitored to ensure that assignments were timeously completed.

Time constraints coupled by the small site plus the exacting standards of quality required were amongst the challenges, which faced the construction team.

The ICC project was divided into three stages as follows:

- Stage one – contractor pre-qualification
- Stage two – contractor tender
- Stage three – sub-contract tenders

Stage one–contractor pre-qualification

Public advertisements were placed calling for applicants to submit formal applications to tender. Applicants had to comply in every respect with the requests for information as contained in the enquiry document. Applicants had to be prepared to be interviewed in order to discuss or amplify information submitted in their applications.

Stage two-contractor tender

The applicants who were able to satisfy the Employer and the Professional Consultants that they could comply with the conditions of the pre-qualification document were invited to tender for the main contract and had to submit their bids based on the Main Contract Tender Document.

Tenderers had to be prepared to be interviewed to discuss items contained in the tender documents or their tender bids. It was an express condition that the lowest tender would not necessarily be accepted. The assessment of the most suitable company to be appointed was largely dependent on:

- the manner and form they intended handling the project in compliance with the construction protocol
- the cost of delivering in terms of the above
- the track record and experience of the company

Stage three- sub-contract tenders

The contractor and professional consultants were to jointly call for tenders on sub-contract work for the project.

Project financing

The ICC was a public works project funded by the Durban City Council through its Special Project Development Account which raised money through the sale of City assets and not from the rates account. Payment to the contractors was based on progress payment certificates. The works contractors had to have sufficient working capital to finance their section of the works and were subject to the normal retention (usually 10%) provisions. The availability and access to finance is a major problem for emerging contractors and it is for this reason that the vast majority of these contractors do not participate in anything other than minor building projects.

Budget and budget control

The budget was set as a not-to-exceed figure from the outset. A team of quantity surveyors, which included previously disadvantaged quantity surveying practices, was appointed for the purpose of controlling the financial aspects of the project. The cost management was effected through monthly detailed cost reports.

This required extensive and complete monthly cost controls to be exercised. Any cost overruns had to be financed by either cost savings or from the general contingency fund. This process entailed a continuous cost/benefit evaluation in order to ensure delivery of an appropriate end product within the defined cost parameters. Other methods to ensure that the cost plan was kept intact included careful monitoring of the contractors cash flow against the project programme, and monitoring human resources on site against the value of the contractors monthly payment certificates. Corrective action was taken timeously when danger signals emerged from these analyses. The ICC is possibly the only convention centre in the world that has been delivered within budget.

Costs: planned Vs actual

Cost	Approved Budget (million Rand)	Actual Cost	Variance
Building	229,917	229,136	(0,781)
Equipment	42,475	41,947	(0,528)
Total	272,392	271,083	(1,308)

Information technology

Whilst the consultants to the project had access to and used the most up to date technology to plan the works the small contractors employed on the project had no access to this technology. There is a need to transfer scientific and technological information down to the level of the sub-contractor and indeed to the workers themselves in order to promote and develop the skills in the construction sector.

Experiences to use in future projects

Large-scale construction companies need to be encouraged to introduce policies and make commitments to provide assistance to emerging contractors. Increased human resource development and capacity building is essential.

In the case of the ICC project special skills training facilities were set up on site to train local labour that was to be used in the project. The training operation was well co-ordinated and run by non-governmental organisations involved in training in the building industry.

Budget over-runs is a common problem on many projects. Careful monitoring of costs coupled with corrective action ensured that the ICC project was completed within budget.

Conclusions

Emerging contractors carried out development projects that were initiated by state authorities in the past with little meaningful participation. The authorities were more concerned with efficiency and technocratic considerations than with involving disadvantaged contractors in the process. Given the critical role that the construction sector needs to play in the transformation of South African society, there is a dire need for new innovative approaches to participation being introduced into private and public sector development projects.

The director general of the department of public works has said recently at the annual convention of the South African Association of Consulting Engineers that:

- it was pitiful that almost no black owned construction companies participated in projects exceeding R25m.
- Black contractors had a lot of potential to participate successfully in mainstream projects, but structural obstacles the department was determined to remove blocked them.
- In future 90% of all national and provincial public works and 25% of local government public works projects procured by parastatals would be awarded to black prime contractors.

- targets had been set according to the department's affirmative procurement policy
- His department would mobilise financial resources for emerging contractors and provide easy access to plant and materials.

It is hoped that this will accelerate the process of transformation of the construction industry.

The department now has a system of awarding tenders on price and development objectives, based on a points system, instead of on price competitiveness alone. This is a very positive move towards creating an enabling environment in the construction sector. The efforts of the public works department are laudable but there is a need to go beyond this. The small operatives in the industry are a national resource. They create employment, in a country that has an unacceptably high unemployment rate, and in this way help combat poverty and hunger. Government needs to:

- Develop training and education programmes with the involvement of non-government sectors to a level far exceeding what which is available at the moment
- Create favourable conditions to encourage the disadvantaged sector to participate

What government also needs to do is remove the gross inequalities that exist between the various players and to provide all persons with the opportunity to earn a sustainable livelihood.

The minister of finance has undertaken to allocate considerably increased funds for skills training over the next three years which should have long term beneficial effects on quality and productivity in the industry. As positive as the initiatives of the department of public works is, the fact remains that the public sector accounts for only 18% of the total building turnover in the country whilst the private sector accounts for the remaining 82%.

What is needed also is the development of policies and practices to increase participation by these marginalised builders through:

- greater financial assistance
- The creation of credit schemes and bulk procurement of building materials for sale to small-scale builders.
- The transfer of technological information from the main contractors down to the sub-contractors and to tradesmen to the extent that it is required to promote the development of skills.

Production stage

Tendering and contract

A legacy of underskilled people, high unemployment, limited scope for entrepreneurial activities and a construction industry with a depleted capacity to meet the demands of a growing economy were the result of fifty years of discriminatory laws in the country. With this in mind the ICC construction protocol was conceptualised.

The protocol recognised the value of partnership and mentorship as rapid means of transferring management skills, technology know-how, as well as contractual and business experience from the advantaged to the disadvantaged (Construction Protocol 1993). The approach adopted on this contract was that the contractor would be appointed on the basis of a tender, which detailed the contractor's approach, resources and costs. The contractor had to provide everything necessary for the contract as provided for in the Principal Building Agreement signed by both parties.

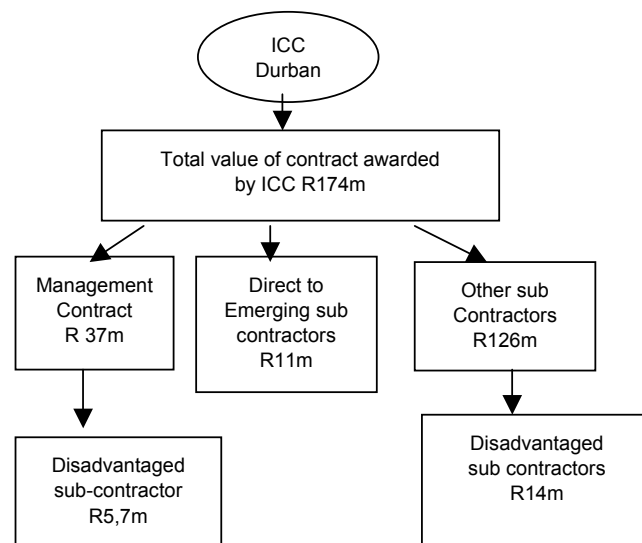
The construction work was to be let as a series of tenders During the development programme, resulting in Competitive tendering for each work package and Allowing for greater opportunity to expand the base for Sub-contract involvement.

The tendering process was organised in the following way:

1. The professional team in consultation with the Employer prepared a tender document, which invited submissions from suitable contracting parties to fulfil the requirements of the contract.
2. The tender was advertised in the press and included all tender particulars.
3. The Adjudication panel comprising of representatives of the City of Durban, the Development and Project Manager, the Architect and the Quantity Surveyor was then constituted to receive and review all tenders. The adjudication of this tender was based on evaluation criteria which included some of the following:
 - date of establishment of company
 - Description of company profile and details of staff complement. Details of any proposed joint venture.
 - Annual turnover over last 5 years.
 - Experience and capability of handling a project comparable to the ICC project
 - Details of company policy regarding Affirmative Action and how it has been implemented.
 - Details of in-house training programmes, participative management policies and practices, skills training etc.
 - The company's approach to construction of the ICC project given the nature of the project and its programme for development.
 - Key personnel to be allocated to the project together with experience and expertise. Management structure and reporting procedure for the project.
 - Suggested benefits that would arise and details of any potential pitfalls that need to be avoided in the proposed approach.
 - The tender price together with the specified detailed cost breakdowns submitted by the tenderer.
4. The panel, with a view to short-listing appropriate parties for consideration, then prepared an adjudication report. The report together with

recommendations was submitted to the client for approval.

5. The approved short-listed parties were then interviewed by the panel with a view to making a recommendation to the client on the appointment of the contractor.
6. The contractor once appointed was to carry out its duties in terms of the contract.
7. Tenders for subcontract packages of work was to be called for in accordance with the construction programme. Tenders were to be submitted to and adjudicated by the architect, quantity surveyor, appropriate specialist consultant, and the contractor, in consultation with the Development and Project Manager. The adjudication criteria for the appointment of sub-contractors was similar to that used for the main contract evaluation. These sub-contractors were to be appointed as selected (or nominated) sub-subcontractors responsible to the Contractor for due performance in terms of their contract (ICC Durban, 1995). The diagram below shows how the ICC project was sub-contracted.



Total value of work awarded to the 211 disadvantaged group of contractors and suppliers amounted to R30, 2 m.

Production planning

The management contractor on the ICC project was to be responsible to the Client for the total management of the contracts and contractors under its control and be responsible for the successful execution of the contract in regard to time, quality and cost. All construction work was to be let, as sub-contracts as and when required in terms of the programme. The contractor had to have the resources to execute the work in terms of the contract, to have the proven experience appropriate to this contract and the necessary expertise to plan, co-ordinate and manage all other contractors and construction activity on site, in conjunction with the project managers. The contractor had to:

1. Take responsibility for the entire construction contract in terms of the contract.
2. Programme, direct and co-ordinate all construction contracts.
3. Participate and interact with the Project Manager and all professional consultants in the detail design and documentation phase as well as in the construction phases.
4. Review and contribute to the sub-contract tender documentation and participate in the tender adjudication process.
5. Provide everything necessary for the contract in terms of the principal building agreement.
6. Resolve disputes that may arise in terms of the sub-contract agreement and consult with the project manager on any intended action prior to implementation.

A co-ordination manual detailing the following information was prepared by the project managers and distributed to the client and all consultants:

- consultants details
- project background and introduction
- project goals and objectives
- development and project management approach and policy
- construction protocol concerning affirmative procurement
- organisational structures and lines of communication
- project programmes
- communication systems and procedures
- professional fees and disbursement billing procedures

The purpose of the manual was to provide the necessary frame of reference for all consultants to appreciate, from the outset, the management discipline and methods applicable to the project.

Project programme

Using the comprehensive Work Breakdown Structure a detailed project programme with 432 tasks was prepared using CA Super Projects software. This was used as the control programme for the entire development. Sub-programmes were prepared for discreet project elements within the framework of the control programme.

Representative construction programme

The project managers prepared a representative construction programme with 148 primary tasks in order to establish, test and confirm the construction sequencing and period. The programme was used for guidance purposes only and was subsequently superseded by the contractor programme. It was used however to establish the basis for the technical documentation programme to ensure that information, drawings and tender documentation would be timeously prepared and available.

Technical Documentation Programme

This programme, with approximately 2500 tasks, was prepared by the project managers to direct and control the documentation process including the numerous adjudication and award time frames. When the principal

contractor was appointed and the preliminary programme prepared, the technical documentation programme was reviewed against this programme and amended accordingly in consultation with both the contractor and the Architect (ICC Durban 1995).

Quality assurance

The main contractor was fully responsible for delivering an end product of approved quality within the prescribed time period and agreed cost parameters. In so doing it had to co-ordinate all contracts and contractors under its control and to ensure that the sub-contract work was of an acceptable quality. All technical quality control remained the domain and responsibility of the Architect, who received advice from the relevant engineering and other consultants. A Clerk of Works and Resident Structural and Resident Electrical/Mechanical Engineers were employed full-time on the project and reported directly to the Architect. Quality assurance methods and procedures were established by the consultants and monitored and controlled by the Architect on the advice of the resident staff. The Architect also carried out regular inspections, established acceptable standards of product finishes and recorded these in Architects Instructions issued to the contractor. Regular inspections identified work that did not comply with the defined standards and specifications whereupon remedial requirements were issued to the contractor in Architects Instructions.

All furniture, fittings and equipment, which had considerable overseas content due to the international nature of the centre, were procured through a rigorous procurement programme. This project, which was handed over two months ahead of schedule, was successful in achieving practical completion to international standards and within budget.

Economic control-budget review and reconciliation

The ICC was to be built to international standards within the constraints of a prescribed budget, which could not be exceeded. The contract allowed for close monitoring of the costs by the quantity surveyors and the contractor as the work packages were let. It provided for the opportunity to adjust the work packages and their respective budgets and give feedback to the Project Manager and the Architect on the need for amendments to suit the cost plan. The approach afforded the opportunity for a pro-active approach to the management of the project costs whereby the whole development team, inclusive of the contractor, was at all times conscious of the need to remain on budget.

Experiences to use in future projects

The Convention Centre is being promoted to the international community as a symbol of community pride and achievement. The project has demonstrated that communities can and must be involved in all aspects of public works projects. Affirmative procurement is now an irreversible process in South Africa, and the ICC project

is an example of how successful integration of state-of-the-art technology can be coupled with affirmative procurement methods. The introduction of on-site training in building and management skills, the implementation of skills transfer, capacity building and mentorship programmes were successfully implemented on the project. The experiences from this project have been used by the department of public works in the formulation of strategy for public works projects and must be extended also to the private sector.

In identifying and resourcing the wide ranging consultants/specialist team, the principle of focusing on the skill and commitment of the individual rather than the firm was adopted. This led to the building of a strong cohesive team. In addition, the principals/senior partners were required to be assigned directly to the project. A high level of co-ordination and co-operation was developed as a result of this.

Conclusion

Emerging contractors gained valuable experience through working with the Convention Centre contracting team. Small businesses learnt various skills, including business management principles. However, although the ICC project provided for increased participation and training through its procurement and contract policies, participation by disadvantaged contractors was limited by the scope and complexity of the project.

Small contractors require technology and strengthened support to help further their technological capabilities. In order to promote a sustainable construction industry there needs to be greater government support for the development of skills in the construction industry.

The authorities are now attempting to address, especially in public works projects, the inequalities that exist in the industry by trying to upgrade the technical and managerial capacities of the small and emerging construction companies as well as the skills of operatives and supervisors in the industry. Nevertheless the problem of undoing the harm in the construction industry caused by fifty years of repressive laws remains a daunting task.

Property management

The ICC building is described as 'international, state-of-the-art, multi-disciplinary, multi-functional and innovative' (Projectpro 1998). Management of the ICC building is therefore a complex and integrated process in view of the advanced technologies used.

The ICC building is operated through a building management system which interfaces with all audio-visual, communications, fire and security, air conditioning, lighting and other building systems (Projectpro -1998).

Life cycle economy

In assessing the viability of developments clients generally focus on the economic consequences of their decisions. In the case of the International Convention

Centre the client and its agents are neither developers in the commercial sense, nor end users in the convention industry sense. The client therefore relied heavily on the advice and input it received from those parties reporting to it. In May 1991 the City of Durban, after having debated the merits of a Convention Centre for the city for many years, commissioned Project Managers, Andrew and Boule, to investigate the merits of a Convention Centre. The feasibility report focussed broadly on the size, siting, nature and demand for convention facilities and the benefits that such facilities could bring to the Durban region. The findings highlighted:

- employment opportunities
- potential for new business enterprises to be created through this new industry
- Foreign exchange benefits that would stimulate rapid growth in the regional economy.

Further studies indicated that:

- world wide convention centres had grown from strength to strength
- they were reasonably crisis-resistant and had grown in the face of economic decline
- the convention centre could be operationally viable in its third year of operation
- the ICC would provide a focal point for all sectors of the community
- it could act as a catalyst for economic development
- it would be a symbol of community pride and achievement
- it would expose Durban to international markets

In voting unanimously to proceed with the project the Durban City Council took into account the fact that The ICC represented more than an economic investment to the city of Durban and that the community could derive other long term benefits from its development. Since opening in 1998 the Convention Centre has been a popular venue for international conventions and all indications are that the objectives of the project are being met.

Maintenance planning

The International Convention Centre building was designed as a high technology low maintenance building. In keeping with the norm in the industry, the contractor had to take full responsibility for the care of the works during the construction period. After the date of the issue of the certificate of practical completion responsibility for the care of the works passed to the client. Any defects in material and workmanship, and any damage caused to the works as a result of this, which has become apparent within the patent defects liability period (90 days after practical completion) had to be made good by the contractor without adjustment of the contract sum.

The latent defects liability period began on the date of commencement of the construction period and terminates 5 years from the date of the certificate of final completion.

Commissioning of the centre was a complex exercise in view of the advanced technologies used and required much training.

Connection to the design stage - feedback

The specialised nature of convention centres dictated that the design of the ICC be driven by the operational and functional requirements of its end users. It was therefore fundamental for all parties involved to recognise from the beginning that the ICC was not just a building but a business, which required an in-depth understanding of all its facets before the design could commence. Projectpro describes the complex process as ‘... in developing the ICC Durban it was necessary to integrate the functional relationships between the building elements, operational determinants, financial resultants and market acceptance and in so doing satisfy the end user requirements’ Projectpro (May 1998).

In order to create a user friendly and functional building a Logistics Consultant was engaged on the ICC project. The Logistics Consultant was required to use his skill and knowledge to:

- review designs and operational proposals and to
- Advise on the logistical considerations to optimise the efficiency of the building and its operations.

The product of this input was to be:

- A developed logistical flow of all the elements that move into, through and out of the facility.
- Design specification and approval of storage and materials handling facilities equipment.
- A simulation model capable of testing the building against various proposed booking schedules to establish the optimum operating level.

That the ICC was a success was demonstrated by the fact that it was the winner of the 1998 Project Management Excellence Award, organised by the Project Management Institute of South Africa.

Experiences to use in future projects

The ICC development has demonstrated that it is possible to involve communities, often with limited skills, at all levels in the process, and still create a building of international standards. Whilst the generation of an operating surplus is often the main criteria in assessing project viability, the impact of the project on the greater community, through job creation, wealth generation, etc should not be overlooked.

Conclusions

In assessing the viability of projects there is a need to consider more than the economic value that buildings represent. In many instances buildings have value that cannot be measured in monetary terms. In public works projects for example it is essential to consider the social impacts of the development on the community as well. Community involvement in the development process is often ignored; however, community participation is no longer just desirable but an essential component of the development process. In many cases the lack of it could very well jeopardise the success of the project.

Epilogue

The construction industry in South Africa is entering an extremely exciting period in its development as it faces up to the tremendous challenges facing it in the new millennium. The empowerment of emerging contractors and sub-contractors is a challenge that the construction industry has to deal with in an imaginative way. The transformation of the industry has commenced but the road ahead is a long and difficult one and one hopes that the industry is up to the challenge.

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