

5 PROCURING QUALITY CONSTRUCTION

Procurement processes, together with the actual process of construction, have the largest impact on construction quality. Specifically, the key factors within the procurement process that influence construction quality are:



- the ability to match a contractor's capabilities to the requirements of the project; and
- political interference, cronyism, and fraud and corruption.

These barriers to construction quality are discussed in the following sections.

5.1 Matching Capabilities with Requirements

Matching a contractor's capabilities to the requirements of the project depends largely on:

- the ability to recognise a contractor's capabilities; and
- a procurement system that provides for the recognition of a contractor's capabilities.

These factors are discussed in more detail in the following sections.

i) cidb Register of Contractors

The cidb Act requires that the Board must:

"... establish a national register of contractors, which categorises contractors in a manner that facilitates public sector procurement and promotes contractor development".

The aim of the cidb *Register of Contractors* is to facilitate public sector procurement, and it is mandatory that only cidb registered contractors be used for public sector procurement (other than for home building).

Registration of contractors is based on financial capability and on the size of projects completed, and until recently included a requirement for a registered professional person to be in the employ of the contractor for certain Grades. These requirements however do not necessarily give an indication of the capability of the contractor to meet the client's requirements of 'on brief, on budget and on time', and the client is still required to follow their own risk management processes. Guidance on evaluating the capability of a contractor to meet the requirements of a tender are given in cidb Practice Notes^{29, 30}.



The degree to which 'ineffective contractor registration' is seen to negatively affect quality, or to be a barrier to achieving quality, is given in the following table, in which stakeholders were asked to rate some 40 parameters in terms of being a barrier to achieving quality on a 5 point scale (where 1 = minor influence and 5 = major influence).

29 cidb (2007). *Practice Note 9: Evaluation of Quality in Tender Submission* (Version 1 - November 2007). Construction Industry Development Board, Pretoria. <http://www.cidb.org.za>

30 cidb (2008). *Practice Note 14: Selecting a Contractor on a Competitive Basis* (Version 2 - October 2008). Construction Industry Development Board, Pretoria. <http://www.cidb.org.za>

Perception of Ineffective Contractor Registration as a Barrier to Quality
Scale: 1 = minor; 3 = average; 5 = major influence

	Mean Score	Rank
Clients	4.2	4
Contractors; Grades 5 to 9	3.9	13
Designers	3.7	29
Project Managers	2.4	40

From the above table, it can be seen that very different views, and in fact almost opposing views, were obtained regarding the perception of ineffective contractor registration being a barrier to attaining construction quality. Specifically, it is seen that clients view ineffective contractor registration as the fourth most significant barrier to quality, whereas Project Managers ranked ineffective contractor registration as being a barrier being very low, namely 40th. It should be noted however that project managers are typically only involved on large projects, and their views are more likely to reflect their perceptions regarding the contractor registration of Grade 5 to 9 contractors (which they view as being effective).

In general, however, it can be concluded that clients, contractors and designers view the current mechanisms for registration of contractors as an ineffective indicator of a contractor's potential of delivering quality – and specifically for the lower Grade contractors. It should be noted however, that the survey reported on above did not differentiate between *cidb* registration of contractors and NHBRC registration of contractors (see Section iii below).

Clients, contractors and designers view registration of contractors as an ineffective indicator of a contractor's potential of delivering quality – and more so for the lower Grade contractors.

ii) cidb Best Practice Contractor Accreditation Scheme

The inability of the current *cidb Register of Contractors* to be a reliable indicator of a contractor's ability to deliver quality was well recognised at the time of writing the *cidb* Act. The *cidb* Act requires that the Board must, within a reasonable period after the establishment of the register of contractors, establish a *Best Practice Contractor Recognition Scheme* which:

- enables organs of state to manage risk on complex contracting strategies; and
- promotes contractor development in relation to best practice standards and guidelines developed by the Board.

The *cidb Best Practice Contractor Recognition Scheme* is currently under development, but the objective is that the *Best Practice Contractor Recognition Scheme* will recognise:

- the construction management qualifications and experience of contractors;
- the construction management systems adopted by contractors; and
- the performance of contractors.

Grade	Enablers: Business, H&S, Quality, Env, etc	Results
9	SANS / ISO / OSHAS Systems	Performance Reports
	<i>cidb</i> Accredited Management Systems	
2	<i>cidb</i> Competence Accreditation	

Once prescribed by the Minister of Public Works, the recognition of a contractor's abilities or performance within the *cidb Best Practice Contractor Recognition Scheme* will be used on public sector contracts for the purpose of:

- assessing the suitability of contractors for registration, pre-qualification, selective tender lists or expressions of interest; and/or
- adjudication for the award of a contract.

The cidb Best Practice Contractor Recognition Scheme will recognise a contractor's capability and performance track record.

The private sector would also have access to the recognition of a contractor's abilities or performance, and would be encouraged to use this information in their procurement methods.

iii) NHBRC Contractor Registration System

The National Home Builders Registration Council (NHBRC) was established in terms of the Housing Consumer Protection Measures Act, 1998 (Act No. 95 of 1998)³¹. The functions of the NHBRC are to keep a register of home builders, oversee the construction of residential homes to see to it that proper building standards are adhered to, and to provide a warranty service for major structural defects.

The NHBRC has a mandate over all new homes, including the bonded, cash markets and subsidy sector.

All builders of new homes must be registered with the NHBRC, and a contractor's registration is evaluated in terms of the following criteria³²:

- financial;
- technical;
- construction; and
- management.

However, as illustrated by the low quality observed in the low-income housing sector (see for example Sections 2.2 and 3.2), the credibility of the NHBRC contractor registration system is certainly in question. However, it must be recognised that not all low income housing has been built by NHBRC registered contractors. This is however in contravention of the Housing Consumer Protection Measures Act, and this raises the question as to how contracts could have been awarded to un-registered contractors!

The credibility of the NHBRC contractor registration system as an indicator of contractor's ability to deliver quality is in question.

NHBRC to crack down on unregistered home builders

The National Home Builders Registration Council (NHBRC) warned industry on Wednesday that it has been "given teeth" by South Africa's Department of Human Settlements to shut down unregistered home builders.

Newly appointed NHBRC CEO Sipho Mashinini was already reviewing about 40 projects in KwaZulu-Natal and planned to shut down builders as early as next week.

On concerns raised around possible lead times for nonregistered builders to comply, Mashinini said that there was "no room to break the law". He said that the council was in the business of ensuring that homebuilders consistently delivered sustainable quality houses.

The council pointed out that registration was not only applicable to developers and home builders, but also to contractors and subcontractors.

The NHBRC said that an inspection company would be set up in South Africa's nine provinces by May 28, to ensure that quality houses were delivered. Mashinini noted that the council was also considering the possibility of setting up its own inspection company.

*Engineering News
Loni Prinsloo
12 May 2010*

iv) Preferential Procurement Policy Framework Act

The *Preferential Procurement Policy Framework Act* (PPPFA) (Act 5 of 2000)³³ provides for the evaluation of tenders and the awarding of contracts in the public sector on the basis of price and preference, as well as 'other objective criteria' such as functionality (or quality). In terms of construction contracts, the *cibb Standard for Uniformity in Construction Procurement* elaborates on quality criteria, which amongst others could include:

31 Rep. of SA (2007). *Housing Consumer Protection Measures Act, 1998 (Act No. 95 of 1998 as amended)*. SA Government Gazette, Vol.401, No. 19418, Pretoria.

32 NHBRC (2010). <http://www.nhbrc.org>.

33 Rep. of SA (2001). *Preferential Procurement Policy Framework Act No. 5 2000*. Government Gazette No. 22549, 10 August 2001. Pretoria.

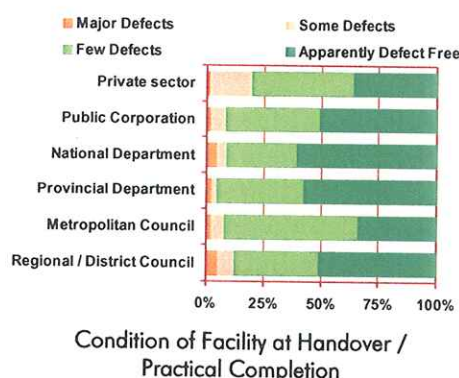
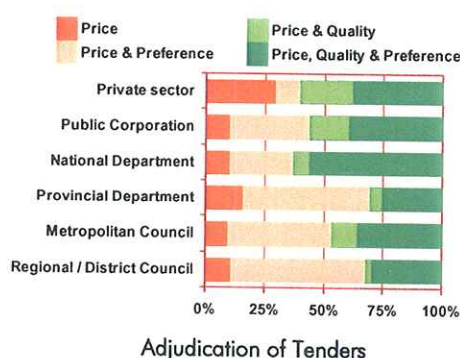
- response to (ability to relate to) the proposed scope of work/project design;
- quality control practices and procedures which ensure compliance with stated employer's requirements;
- qualifications and demonstrated experience of the key staff (assigned personnel) in relation to the scope of work; and
- demonstrated experience of tendering entity with respect to specific aspects of the project/comparable projects.

All of the above could impact directly on the quality of construction, and the PPPFA therefore provides for the selection of contractors on their ability to deliver quality construction.

The extent to which quality is taken into account in the adjudication of public and private sector contracts is given below. It is seen that in the 2009 *cidb Construction Industry Indicators*, around 60% of all contracts from national Departments were adjudicated on the basis of price, preference and quality. In contrast, only around 25% of provincial and local authority construction contracts were adjudicated on the basis of price, preference and quality!

Only 25% of provincial and local authority construction contracts were adjudicated on the basis of contractor's ability to deliver quality.

A breakdown of the condition of the facility at handover/practical completion for various client categories is included below – from which a weak correlation can be deduced between adjudication of contracts based on quality and the condition of the facility at handover.



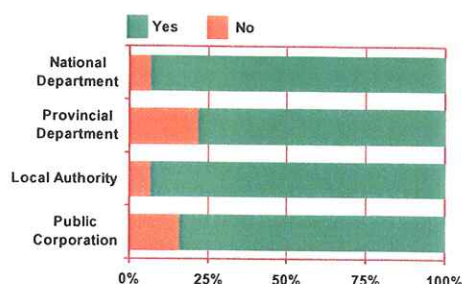
A related issue to that raised above, in which procuring construction contracts based on functionality or quality criteria is not the norm, is the awarding of contracts which are not in accordance with the client's procurement policy – such as overturning the recommendations of a tender evaluation committee. Such overturning of recommendations often (but not exclusively) arise due to political interference (see Section 5.2 to follow).

The extent of contracts being awarded that are not in accordance with the client's procurement policy is shown in the following figure, obtained from the 2009 *cidb Construction Industry Indicators*. The results show that, on average, around 13% of contracts were not being awarded in terms of the client's procurement policy. Of concern, around 22% of contracts were not being awarded within Provincial Department in terms of their procurement policy.

Around 22% of Provincial contracts were not being awarded within the Department's procurement policy.

Was the contract awarded in accordance with the employer's procurement policy?

	Yes	No
Public Corporation	84%	16%
National Department	93%	7%
Provincial Department	78%	22%
Local Authorities	93%	7%
Total	87%	13%



5.2 Bribery, Fraud and Corruption

An empirical study undertaken in 2005 indicated significant areas of concern developing with regard to ethical standards practiced within the South African construction industry³⁴. The range of ethical problems identified include collusion, bribery, negligence, fraud, dishonesty, and unfair practices of which significant parts of the issues resided with contractors among other identified participants in the construction process. It is notable that Architects (100%), Quantity Surveyors (94%), Consulting Engineers (67%), and Contractors (60%) all stated that they had observed/experienced professional negligence in South African construction with poor material quality and poor workmanship indicated as the most frequent professional negligence.

Corruption in the construction industry in South Africa was further identified as being a growing and major concern in the survey undertaken for this study, and was ranked as one of the most significant barriers to the attainment of quality in construction by contractors and project managers.

Perception of Corruption as a Barrier to Quality		
Scale: 1 = minor; 3 = average; 5 = major influence		
	Mean Score	Rank
Contractors; Grades 2 to 4	4.9	1 of 13
Project Managers	4.5	1 of 40
Contractors; Grades 5 to 9	4.2	1 of 40
Designers	4.1	21 of 40
Clients	3.7	34 of 40

In addition to the concerns raised about corruption in the survey undertaken for this study, evidence of the growing concerns about corruption were reflected on a regular basis in the media, press and other forums. Politicians and representatives of civil society were also increasingly raising concerns about corruption in South Africa and in the construction industry – including for example Minister of Finance, Pravin Gordhan, (see below) and Minister of Monitoring and Evaluation, Collins Chabane.

Measures to combat fraud and corruption

Mister Speaker, corruption is an ever-present threat to our ambitions. All South Africans must constantly and consciously work to root out this cancer. If we are to address this scourge, we need improved management capability, governance, enforcement, and oversight in government, and in the business sector. Poorly managed tender processes are all too often open to such abuse. Greater transparency and accountability in procurement systems will therefore be a key focus of reform in the period ahead.

Minister of Finance Pravin Gordhan: 2010 Budget Speech
www.info.gov.za/speeches/budget/budget_2010.pdf

Corruption, however, does not necessarily result in the paying of financial bribes, but also often takes the form of political interference in the tender process, or cronyism, nepotism, etc. Such political interference is also of growing concern in the construction industry, and frequently results in the appointment of contractors that do not have the necessary abilities to deliver the required quality.

Hard evidence of this is often difficult to obtain, but the most common form of political interference is where public sector officials override tender committee recommendations in the favour of, for example, local contractors to gain political influence, or in the favour of family and friends. Comments supporting such allegations are frequently reported on in the *cidb Construction Industry Indicators*.

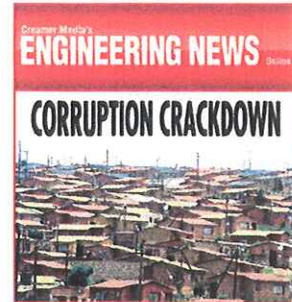
A more detailed overview of bribery, fraud and corruption in the South African construction industry is given in the following sections.

³⁴ Pearl, RG, Bowen, PA, Makanjee, N, Akintoye, A and Evans, KM (2005). *Professional ethics in the South Africa construction industry – A Pilot Study*. In: AC Sidwell (Ed.) *Annual International RICS Foundation COBRA Conference*, Brisbane: RICS, pp. 60-71

i) *Low income Housing Sector*

Corruption in the low income sector in particular has been reported on widely in the press and other media, and Minister Tokyo Sexwale recently provided an update on his department's anti-corruption investigations (see Section 2.2). Specifically, Minister Sexwale noted that the Department of Human Settlements has drawn up a shortlist of 20 problematic housing projects with a total value of R2 billion which are currently under investigation³⁵. The probes are being conducted by the National Audit Task Team appointed by Minister Sexwale in November 2009, headed by the Special Investigating Unit (SIU).

In a recent media briefing, Minister Sexwale noted that the focus of the investigation is on housing and on 'dodgy contractors'. To date, a conveyancing attorney in KwaZulu-Natal has been charged with 142 counts of fraud and theft and two criminal cases have been registered with SAPS for fraud in respect of a contractor and engineer who defrauded the department of more than R10 million. Minister Sexwale also stated that the process of restriction in respect of more than 40 contractors is in an advanced stage.



Furthermore, the national audit task team, appointed by the Department of Human Settlements, has recovered R44 million and arrested 1 910 government officials who were illegally benefiting from housing subsidies.

ii) *cidb Register of Contractors*

Fraud and corruption has occurred within the *cidb Register of Contractors*, including contractors submitting forged documentation in support of their registrations, and bribing of *cidb* employees to gain higher grades.

The *cidb* has resolved to deal with this very firmly, and has established an *Anonymous Fraud Reporting Hotline*. The *cidb* has also appointed external investigation companies to assist with forensic investigations into suspected fraudulent activities.



Contractors found guilty of fraud and corruption are suspended from the *cidb Register of Contractors*, effectively barring corrupt contractors from receiving government tenders for construction. Details of suspended contractors are published on the *cidb*'s website, and published in the government gazette.

Between August 2007 and March 2010, 34 contractors were found guilty of fraud related to their registration, and have either been suspended and/or fined. In addition, three *cidb* employees have to date been dismissed for accepting bribes.

35 Engineering News (2010). *Fight Against Housing Corruption Begins to Gain Traction with over 900 Arrests*. Dennis Ndaba. Engineering News. <http://www.engineeringnews.co.za>

Contractor Registration Fraud Alert

"The cidb has unfortunately discovered that some people have established businesses which are marketed as "cidb agents". These individuals/businesses contact unsuspecting contractors and entice them to pay large sums of money, promising them registration in grades higher than they qualify for. This is a scam and contractors must not register through these 'agents'. We have been informed of contractors paying up to R25 000 to be registered on a grade.

The cidb continuously conducts fraud and corruption investigations and contractors found to have been registered through fraudulent processes are downgraded immediately as per legislative requirements. The cidb also conducts forensic investigations and institutes disciplinary procedure as set out in the cidb Regulations, 2004. The names of contractors that are successfully prosecuted are published in the government gazette and on the cidb website.

Likewise, employees suspected of accepting or soliciting bribes, selling or facilitating the selling of registered companies, are also investigated. Apart from carrying out disciplinary procedures on employees, the cidb also lays criminal charges once the employees have been internally charged – we have already dismissed employees who were found to have accepted bribes from contractors" said Ronnie Khoza, CEO of the cidb.

cidb

11 July 2010

<http://www.cidb.org.za>

iii) cidb Standard for Uniformity

The cidb *Standard for Uniformity in Construction Procurement* (SFU) establishes requirements for public sector procurement within the construction industry which are aimed at bringing about standardisation and uniformity in construction procurement documentation, practices and procedures.

Amongst others, the SFU prescribes standards for:

- procurement documents;
- standard procurement procedures and tender evaluation methods;
- applying the cidb *Register of Contractors* to public contracts; and
- registration of projects on the cidb *iTender/Register of Projects*.

Specifically, the SFU and the cidb regulations require that all public sector projects above a value of R200 000 are to be registered on the cidb *iTender/Register of Projects*.

The SFU allows for auditing of a tender at any stage during tendering and project implementation – which therefore provides a platform for the identification of irregular and/or unauthorised expenditure. However, investigations by the cidb into reports of fraudulent awarding of tenders have not resulted in any prosecutions to date.

To date, investigations by the cidb into reports of fraudulent award of tenders have not resulted in any prosecutions.

Alarm over missing tender records

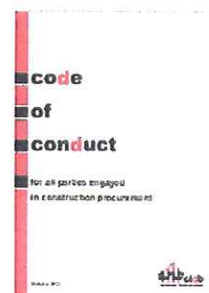
"How does a document about a tender get lost ... that cannot happen without a person explaining and this creates fertile ground for corruption," Minister of Monitoring and Evaluation Collins Chabane was quoted as saying in a statement.

Fin24.com, 19 October 2010

www.fin24.com/Business/Alarm-over-missing-tender-records-20101019

iv) cidb Code of Conduct

Section 5(4) of the cidb Act mandates the cidb to establish and promote uniform and ethical standards, and stipulates that the cidb "must publish a code of conduct for all construction-related procurement and all participants involved in the procurement process ..."



The *Code of Conduct* published by the cidb requires all parties engaged in construction procurement to³⁶:

- behave equitably, honestly and transparently;
- discharge duties and obligations timeously and with integrity;
- comply with all applicable legislation and associated regulations;
- satisfy all relevant requirements established in procurement documents;
- avoid conflicts of interest; and
- not maliciously or recklessly injure or attempt to injure the reputation of another party.

The Board may, as appropriate, sanction those who breach the *Code of Conduct* by:

- issuing a warning or a fine;
- referring the matter to the South African Police Services;
- referring the matter where a breach is in respect of an official to the accounting officer for action in terms of the Public Service Act;
- deregistering contractors for a period of time; or
- referring the matter to a statutory body that has jurisdiction over the matter.

The cidb notes, however, that sanctions by the Board are a reactive way to enforce the *Code of Conduct*, and a more proactive way is for all parties to *commit to adhere to the code and to do business only with those who do likewise*. Should this be done, adherence to the principles of the code will form an integral part of all business processes.

To date, no breaches of the cidb *Code of Conduct* have been reported to the cidb, and hence no sanctions have been issued under the *Code of Conduct*. (This, however, excludes sanctions against contractors and clients in respect of non-compliance with the cidb regulations and the *Standard for Uniformity*, as well as sanctions issued for fraud and corruption related to the cidb *Register of Contractors*.)

To date, no sanctions have been issued under the cidb Code of Conduct.

v) CESA/FIDIC Business Integrity Management System

Consulting Engineers South Africa (CESA) has also recently initiated a major focus on anti-corruption within the industry, and its president in 2009, Felix Fongoqa, advocated a 'zero tolerance approach to all forms of corruption'. CESA announced that member firms will be required to incorporate business integrity as part of quality management. CESA is also advocating the adaption of FIDIC's *Business Integrity Management System* (BIMS) and the FIDIC *Government Procurement Integrity Management System* (GPIMS) to the local context, and is exploring ways to fight corruption by forging partnerships with government.



Source: Duane Daws Engineering News

The FIDIC BIMS requires 100% integrity audits on critical projects and random audits on non-critical projects.

vi) World Economic Forum's 'Partnering Against Corruption' Initiative

In an effort to combat global corruption, the World Economic Forum's *Partnering Against Corruption Initiative* (PACI) was formally launched by CEOs from the Engineering and Construction, Energy and Metals and Mining industries in January 2004³⁷. PACI is a business driven global initiative with commitment from the top, and



36 cidb (2003). *Code of Conduct for all Parties Engaged in Construction Procurement*. Government Gazette 25656 of 31 October 2003. Construction Industry Development Board, Pretoria. <http://www.cidb.org.za>.

37 WEF (2004). *Partnering Against Corruption: Principles for Countering Bribery*. *Partnering Against Corruption Initiative (PACI)*. World Economic Forum, Geneva. <http://www.weforum.org/en/initiatives/paci/index.htm>

has developed multi-industry principles and practices that will result in a competitive level playing field, based on integrity, fairness and ethical conduct.

Signatories to the PACI undertake to implement a zero-tolerance policy towards bribery, and to develop a practical and effective implementation programme in support of this.

South African signatories to the World Economic Forum's *Partnering Against Corruption Initiative* is given below – which includes several of South Africa's major contractors and clients.

South African Signatories to World Economic Forum's Partnering Against Corruption Initiative (PACI)		
African Rainbow Minerals (ARM)	Patrice T. Motsepe	Executive Chairman
Aveng Limited	William Roger Jardine	CEO
Basil Read	Marius Heyns	CEO
Bowman Gilfillan Inc.	David Adrian Loxton	Director and Partner
Eskom	Jacob Maroga	CEO
Group Five Ltd	Michael R. Upton	CEO
Murray & Roberts Holdings	Brian C. Bruce	Group CEO
Sasol Limited	Pat Davies	CEO
Wesizwe Platinum Limited	Michael H. Solomon	CEO
Wilson Bayly Holmes - Ovcon Limited	M. S. Wylie	Chairman

5.3 International Trends

International trends in matching a contractor's abilities with the requirements of the contract, and international experience in addressing bribery, fraud and corruption are discussed below.

i) *Pre-qualification, Performance Assessment and Licensing Schemes*

Internationally, many risk management systems have been introduced that support the matching of a contractor's capabilities with the requirements of the work – including pre-qualification, performance assessment, licensing and incentive systems. Many of these systems share similar elements to the *cidb Best Practice Contractor Recognition Scheme* being developed (see Section 5.1).

Examples of such systems are highlighted briefly below:

- *Registration of Building Practitioners, Victoria, Australia:* Registration and licensing systems, such as the Victoria Building Practitioners licensing scheme are found in several countries – ostensibly to provide some form of quality assurance of builders and contractors.

Specifically, the Building Act of Victoria (1993) requires most people who carry out or undertake work in the business of building, to be registered as building practitioners with the Building Practitioner Board (BPB). The BPB registers individuals, and not companies or businesses, and the various categories and classes of building practitioners are outlined in the Building Regulations of Victoria (2006), and include:

- *Commercial Builder:* responsible for the construction of shops, offices, factories and other buildings; and
- *Domestic Builder:* responsible for the construction of residential buildings.



Registration of building practitioners is based on a peer review of experience and competence, as well as a requirement for indemnity insurance.

- *The NSW Australia Department of Commerce Contractor Prequalification and Best Practice Accreditation Scheme (2008 to 2010):* The system provides for the prequalification of contractors on the New South

Wales Government's capital works program for projects over A\$2,5 million (about R17 million). Prequalification requirements include^{38,39}:

- compliance with the NSW Government Code of Practice for Procurement;
- in-house corporate Project Management Systems;
- experience and performance requirements;
- submission of Contractor Performance Reports;
- compliance with NSW Government Quality Management Systems Guidelines; and
- compliance with requirements for NSW Government Occupational Health and Safety Management System Guidelines.



ii) *Bribery, Fraud and Corruption*

Throughout the developed and developing world, the construction sector is recognised as one of the most corrupt industries. For example, in the *2008 Bribe Payers Index* (BPI) by Transparency International, public works contracts and construction was ranked worldwide as the sector in which bribery of public officials was the most common, followed by real estate and property development⁴⁰.

Corruption in the construction industry is of growing concern, and is seen as the most significant barrier to construction quality by contractors and project managers.

Similarly, the Chartered Institute of Building (CIOB) report published in 2006 revealed that 51% of UK construction professionals felt that corruption was commonplace within the UK construction industry, 60% felt that fraud within the industry was rampant, and 41% had been offered a bribe⁴¹.

Monuments of corruption

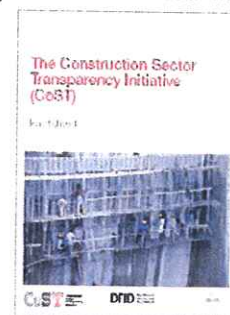
Corruption in the development planning process is not an isolated phenomenon, nor is it confined to Indonesia. The Bataan nuclear power plant is the Philippines' largest investment project and cost more than US\$2 billion. Westinghouse was controversially awarded the main contract after the late Filipino dictator, Ferdinand Marcos, personally overturned the initial contract decision. Westinghouse admitted paying US\$17 million in commissions to a friend of Marcos, though it maintained that the payments were not a bribe. The reactor sits on an active fault line that is part of the Pacific's 'rim of fire', creating a major risk of nuclear contamination if the power plant ever becomes operational. Completed in the 1980s, the plant has never produced a single unit of electricity.

*Corruption in Construction and Post-Conflict Reconstruction
Global Corruption Report 2005
Transparency International*

Initiatives aimed at combating corruption in the construction industry have already been introduced in Section 5.2, namely:

- FIDIC's *Business Integrity Management System* (BIMS) and the FIDIC *Government Procurement Integrity Management System* (GPIMS); and
- the World Economic Forum's *Partnering Against Corruption Initiative* (PACI).

A further initiative to note is the *Construction Sector Transparency Initiative* (CoST), which is an international multi-stakeholder initiative designed to increase transparency and accountability in the construction sector. It is supported by the Department for International Development (DFID) and the World Bank, and is being piloted in seven countries⁴².



38 NSW (2010). *2008 – 2010 Contractor Prequalification and Best Practice Accreditation Scheme*. NSW Government Department of Services, Technology & Administration. Sydney. <http://www.nswprocurement.com.au>

39 NSW (2008). *NSW Government Guidelines for Construction Projects: Procurement eBook*. NSW Government Procurement. Sydney. <http://www.nswprocurement.com.au>

40 Transparency International (2008). *Bribe Payers Index 2008*. Transparency International. Berlin. <http://www.transparency.org>

41 CIOB (2006). *Corruption in the UK Construction Industry: 2006 Survey*. Chartered Institute of Building, Berkshire, UK.

42 CoST (2010). *The Construction Sector Transparency Initiative*. <http://www.constructiontransparency.org>

The core concept of CoST is that it introduces the transparency and accountability concept to the construction sector and focuses specifically on public disclosure of information. The ultimate aim is to enhance the accountability of procuring bodies and construction companies for the cost and quality of public-sector construction projects.

Ensuring greater disclosure of information relating to public construction projects, in particular the basis on which the project was commissioned, project evaluation and any significant changes from the original tender document along with the reasons, in particular on cost, it can help to raise the level of scrutiny. It also aims to ensure greater awareness of the project evaluation. By allowing the public to make the comparisons between what was planned and what was delivered, as well as to raise questions, the aim is to reduce wasted opportunities and expenditure.

CoST is based on a set of key guiding principles and must be implemented following a set of agreed criteria⁴³.

Government to target tender fraud: Gordhan

Presenting his midterm budget statement today, Finance Minister Pravin Gordhan announced that the government was aiming to improve its supply chain management – especially the highly lucrative tender process – which has been open to abuse by unscrupulous officials and bidders.

Among the measures to be introduced is a transparent disclosure practice whereby departments and government entities will be required to furnish the names of companies and individuals bidding for tenders as well as the reasons for the awarding of a tender to a particular company or individual.

According to Gordhan, possible tender and procurement fraud to the value of R25-billion is currently under investigation by government.

*By Caiphus Kgosana, Timeslive
27 October 2010*

5.4 Summary

The previous sections have highlighted the following key factors within the procurement process that influence construction quality:

- the ability to match a contractor's capabilities to the requirements of the project; and
- political interference, cronyism, and fraud and corruption.

Specifically, it has been shown that the *cidb Register of Contractors* and the NHBRC *Register of Homebuilders* do not provide a reliable indicator of a contractor's ability to deliver quality – and specifically for the lower Grade contractors. International practice suggests that an assessment of competencies (including qualifications), construction management systems, and previous performance should be used to prequalify contractors and/or to assess their potential to deliver quality. Such systems are in fact currently under development within the *cidb* – namely the *cidb Best Practice Contractor Recognition Scheme*, which has been modelled on international best practice.

The *cidb Best Practice Contractor Recognition Scheme* is due to be phased-in from 2011/12, and its impact on quality of construction should be closely assessed.

The impact of the cidb Best Practice Contractor Recognition Scheme on construction quality should be closely monitored.

The previous sections have also shown that corruption in construction procurement is a global phenomenon, but indications are that corruption is rapidly increasing in South Africa. In fact, one such view is that South Africa is reaching a tipping point beyond which it may be very difficult to reverse corruption in the public sector⁴⁴.

43 CoST (2010). *UK Pilot Consultation: Increasing Transparency and Accountability in Procuring Infrastructure; Background Document*. CoST. The Construction Sector Transparency Initiative. <http://www.constructiontransparency.org>

44 News24 (2010). *Corruption: SA at Tipping Point*. SAPA, 26 October 2010. <http://www.news24.co.za>

The previous sections have also shown that while the cidb has aggressively dealt with corruption linked to the cidb Register of Contractors, and that while the cidb investigates cases of fraudulent awarding of tenders that are reported to it, the cidb has not adequately dealt with the broader issue of developing and implementing mechanisms to proactively prevent and/or identify corruption within construction procurement. Strong consideration should be given by the cidb to introducing requirements for integrity management and transparency in construction procurement.

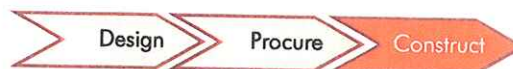
The cidb has to date not adequately dealt with the broader issues of corruption within construction procurement.

In line with international best practice, transparent public disclosure will be required at each stage of the supply process, in all spheres of government, including reasons for award decisions.

Speech by Pravin Gordhan, Minister of Finance
Medium Term Budget Policy Speech - October 27 2010
<http://www.politicsweb.co.za>

6 CONSTRUCTING QUALITY

The previous sections have investigated the influence of design and procurement related factors on construction quality. This Section investigates the key construction related barriers to construction quality, together with the actions which clients can adopt to encourage contractors to deliver to, or even exceed, quality requirements.



6.1 Process, Skills and Competence Factors

A survey of the barriers to construction quality undertaken for this study is given below, in which the top 15 factors under the influence of the contractor are shown, as viewed by contractors and by project managers. Key barriers are seen to include:

- poor site management;
- focus on time and cost;
- skills and competence issues;
- lack of quality improvement processes; and
- lack of worker participation (such as quality circles, quality improvement teams, etc).

Barriers to Attaining Quality; Internal Factors

Scale: 1 = minor; 3 = average; 5 = major influence

Interventions / Situations	Mean Score			Overall Mean	Rank
	Project Managers	Contractors: Grades 2 to 4	Contractors: Grades 5 to 9		
Poor site management	4.3	4.7	4.0	4.3	1
Lack of contractor quality expertise	4.2		4.2	4.2	2
Inadequate resourcing by contractors	4.3		4.1	4.2	3
Level of subcontracting	4.2	4.6	3.7	4.2	4
Lack of understanding of quality	3.8	4.6	3.7	4.0	5
Lack of worker participation	3.5	4.2	4.1	3.9	6
Focus on cost by contractors	3.8	3.8	4.1	3.9	7
Focus on time by contractors	3.7	4.0	4.0	3.9	8
Inadequate skills quality training	3.8		3.7	3.8	9
Lack of insight relative to the role of quality	3.8		3.7	3.8	10
Lack of quality improvement processes	3.2	4.3	3.7	3.7	11
Inadequate generic skills training	3.7		3.7	3.7	12
Lack of minimum requirement to contract	3.2		3.9	3.6	13
Reliance on inspections	3.5		3.6	3.5	14
Inadequate production skills	3.5		3.5	3.5	15

The key barriers identified above can largely be grouped together as:

- process issues (poor site management, focus on time and cost, lack of quality improvement processes and lack of worker participation); and
- skills and competence issues.

Similarly, internal areas that would improve construction quality that were identified by contractors and by project managers in the same study are given below, and include:

- management commitment;
- worker participation;

- education and training in quality; and
- quality management systems and standard operating procedures, etc.

Improving Construction Quality; Internal Factors

Scale: 1 = minor; 3 = average; 5 = major influence

Practices	Mean Score			Overall Mean	Rank
	Project Managers	Contractors: Grades 2 to 4	Contractors: Grades 5 to 9		
Management commitment	4.2	4.2	4.1	4.2	1
Organisation culture	4.4		3.8	4.1	2
Training in quality	4.2	4.2	3.9	4.1	3
Worker participation	3.5	4.3	4.2	4.0	4
Education in quality	3.8	4.2	3.9	4.0	5
Standard operating procedures (SOPs)	4.0		3.9	3.9	6
Goal setting	3.8		3.9	3.9	7
Quality improvement processes	3.3	4.2	4.0	3.8	8
Contractor project quality plans	3.5		4.2	3.8	9
Benchmarking	3.8		3.8	3.8	10
Measurement	3.7		3.9	3.8	11
Contractor Quality Management Systems	3.3		4.1	3.7	12
Safe work procedures (SWPs)	3.3	3.9	3.9	3.7	13
Re-engineering	3.4		4.0	3.7	14
Contractor ISO 9000 series certification	3.3		3.8	3.5	15

Together with management commitment, these key improvement areas are again largely process related and skills/competence related issues.

Management commitment, construction process related factors, and skills and competence factors are key focus areas for improving construction quality delivered by contractors.

i) Quality Management Systems and Plans

As shown in the following table, and as confirmed by previous studies⁴⁵, quality management systems (QMSs), quality management plans (QMPs) and quality improvement processes have the potential to contribute to improved construction quality.

Improving Construction Quality; Quality Management Systems and Plans

Scale: 1 = minor; 3 = average; 5 = major influence

	Contractors: Grades 5 to 9	Rank
Contractor project quality plans	4.2	2
Contractor Quality Management Systems	4.1	4
Quality improvement processes	4.0	7
Contractor ISO 9000 series certification	3.8	14

However, notwithstanding the perceived benefits of quality management systems and quality management plans, ISO 9000 certification is often only seen to be relevant to the large contractors. This is confirmed by the limited number of contractors that are ISO 9000 accredited – namely of the approximately 8 000 cidb registered General Building (GB) or Civil Engineering (CE) companies in Grades 5 to 9, less than 10 are ISO 9000 accredited. All of these are Grade 9 contractors, and include:

Of the more than 4 000 cidb registered GB and CE Grade 5 to 9 contractors, less than 10 are ISO 9000 accredited.

- Civcon;
- Concor Building;

⁴⁵ Rossouw, J-H and Smallwood, JJ (2008). *The Implementation of Quality Management Systems in South African Construction*. Proceedings of the COBRA 08 Conference of the Royal Institute of Chartered Surveyors, Dublin, Republic of Ireland, 4-5 September.

- Murray & Roberts Projects;
- Stefanutti Stocks – Building; and
- WBHO Construction.

This low number of ISO 9000 accredited contractors, and the strong view expressed that project quality plans and contractor QMSs will contribute significantly to improving construction quality, points to the need for much greater adoption of construction specific quality management plans and systems.

Recognising that the more well known management systems such as SANS ISO 9000 and 14000 and SANS OHSAS 18001 are often only appropriate for large organisations (such as Grade 8 and 9 contractors), the cidb has introduced complementary accreditation of construction management systems to promote and recognise performance improvement by contractors in, typically, Grades 5 to 7. This cidb standard is based on recognisable industry minimum standards covering:

- health and safety management;
- quality management; and
- environmental management (covering air, water, land and waste).

This cidb standard for management systems allows for easy expansion and conversion to meet the ISO or OHSAS requirements in the future.

ii) Skills and Competence

The survey undertaken for this study on construction quality clearly highlights the importance of skills, and education and training, in attaining quality. Furthermore, numerous studies have highlighted the acute shortages of trained artisans and first level supervisory staff, which clearly impacts on the demands for quality control, standard operating procedures, training, etc.

These skills shortages are further exacerbated by the aging profile of artisans in South Africa, for which the average age of the country's artisans is reportedly around 55 years old. This has led Dr Azar Jammie to note that, "(t)his shows the danger that most of the people available to transfer skills are getting older and older and there won't be sufficient mentoring"⁴⁶.

Shortages of skilled artisans and first level supervisory staff are impacting negatively on construction quality.

While many of the larger contractors are implementing programmes to address their skills requirements, smaller contractors, and in particular new entrants, generally do not have the resources necessary to address these quality factors – which points towards the need for public and private sector interventions to facilitate skills development at a broad level and within contractor development organisations. Examples of such interventions currently being implemented or under development include (see also Section 6.4):

- the skills development component of the Construction Charter;
- the cidb *Requirements and Guidelines for Contractor Competence Assessment*, which sets competence standards for contractors and site supervisors⁴⁷;
- the cidb *Requirements and Guidelines for Indirect Targeting* for Enterprise Development of Sub-Contractors, which promotes skills development⁴⁸;
- the cidb *Construction Skills Policy* under development, requiring skills development leading to nationally accredited outcomes on qualifying public sector contracts⁴⁹; and

46 Jammie, A (2010). *SA falling behind rest of Africa - Economist*. Business Report & Independent Online (Pty) Ltd, 29 July 2010. <http://www.busrep.co.za>

47 cidb (2010). *cidb Best Practice Contractor Recognition Scheme; Requirements and Guidelines for Contractor Competence Assessment*. Construction Industry Development Board. Pretoria. <http://www.cidb.org.za>

48 cidb (2010). *cidb Best Practice Project Assessment Scheme; Requirements and Guidelines for Enterprise Development of Sub-contractors*. Construction Industry Development Board. Pretoria. <http://www.cidb.org.za>

49 cidb (2010). *cidb Best Practice Project Assessment Scheme; Requirements and Guidelines for the Construction Skills Policy*. Construction Industry Development Board. Pretoria. <http://www.cidb.org.za>

- the cidb construction industry ESDA currently being piloted, which facilitates the placement of unemployed learners.

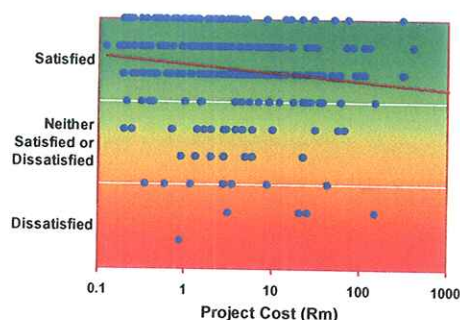
The above interventions are, however, by no means sufficient. In addition, the cidb continues to advocate for a building and construction component to be incorporated into the South African World Skills activities.



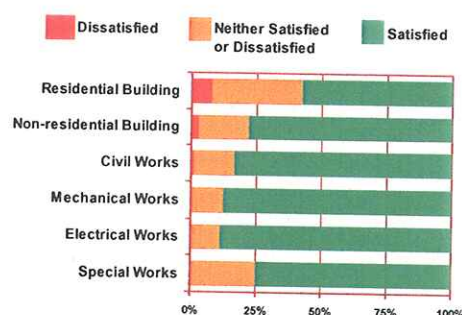
6.2 Quality and Small Contractors

Potential differences in the quality delivered by Grade 2 to 4 contractors and by Grade 5 to 9 contractors have been alluded to in previous sections. In particular, Section 2.3 suggests that the quality of completed work delivered decreases with increasing project size. However, it was noted in Section 2.3 that this trend needs further understanding, and could be due to (i) increasing complexity with increasing project size, or (ii) the inability of clients to discern quality on small projects.

However, in Section 2.2 it is shown that the quality of construction is perceived to be lowest in the residential building sector – which is largely dominated by small contractors.



Quality of Completed Work Delivered:
Influence of Project Size



Quality of Completed Work Delivered:
Satisfaction by Project Type

The perceptions of stakeholders of the quality delivered by Grade 5 to 9 contractors and by Grade 2 to 4 contractors are examined further in the following table. Overall, the view expressed by stakeholders is that the quality delivered by contractors is 'average', with the quality delivered by Grade 5 to 9 contractors being slightly better than Grade 2 to 4 contractors. However, it is noticeable that Grade 5 to 9 contractors and (to a lesser extent) clients rate the difference in quality between Grade 5 to 9 contractors and Grade 2 to 4 contractors as being somewhat more noticeable.

Perception of Stakeholders of Quality Delivered by Contractors

Scale: 1 = very poor; 3 = average; 5 = very good

Practitioner / Stakeholder	Mean Scores				Overall Mean
	Clients	Designers	Project Managers	Contractors: Grades 5 to 9	
Contractor: Grades 5 to 9	3.3	2.9	3.5	3.6	3.3
Contractor: Grades 2 to 4	2.9	2.8	3.3	2.9	3.0

Further somewhat conflicting perceptions regarding construction quality is given in the following table, in which common internal barriers to attaining quality are given as perceived by Grade 2 to 4 contractors and Grade 5 to 9 contractors. It is seen that Grade 2 to 4 contractors perceive the level of sub-contracting as the second highest internal barrier to attaining quality – presumably a reflection of the abilities (or inabilities) of Grade 2 to 4 contractors. However, Grade 5 to 9 contractors do not rate this significantly.

Barriers to Attaining Quality; Internal Factors

Scale: 1 = minor; 3 = average; 5 = major influence

Interventions / Situations	Contractors: Grades 2 to 4		Contractors: Grades 5 to 9	
	Mean Score	Rank	Mean Score	Rank
Poor site management	4.7	1	4.0	3
Level of subcontracting	4.6	2	3.7	6
Lack of understanding of quality	4.6	3	3.7	7
Lack of quality improvement processes	4.3	4	3.7	5
Lack of worker participation	4.2	5	4.1	1
Focus on time by contractors	4.0	6	4.0	4
Focus on cost by contractors	3.8	7	4.1	2

Of significance, however, is that small contractors rate poor site management, a lack of understanding of quality and a lack of quality improvement processes as significant barriers to attaining construction quality.

In summary, intuitively it is expected that smaller contractors have less resources to devote to construction quality than do larger contractors, and it would be expected that smaller contractors do not have as well developed quality management systems as do the larger contractors. However, while stakeholder perceptions confirm that the quality delivered by smaller contractors is somewhat less than that delivered by larger contractors, this difference in construction quality is not substantive.

Small contractors rate poor site management, a lack of understanding of quality and a lack of quality improvement processes as significant barriers to attaining construction quality.

6.3 Inspecting Quality

Within South Africa, including within the public sector, the client's agent is responsible and accountable for accepting that the contractor has delivered the construction works to specification. Where such work has not been delivered to the required specification, the client's agent has the right to ensure that the contractor undertakes the necessary remedial action. The client's agent is therefore the primary mechanism to ensure compliance with the client's specification.

However, as illustrated in the adjacent figure, it has been noted previously (Section 2.1) that in the 2009 CII, notwithstanding the role of the client's agent:

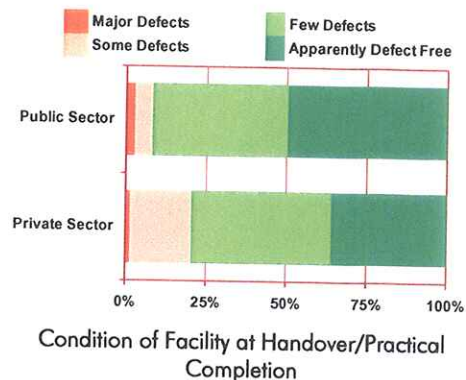
- clients, or the client's agents, were neutral or dissatisfied with the quality of completed work on around 20% of the projects surveyed; and
- around 12% of the projects surveyed had levels of defects which are regarded as inappropriate.

In relation to the role of the client's agent, this dissatisfaction with the quality of construction can be attributed to several factors, including:

- a lack of skills or experience of the client's agent; and/or
- the client overruling the client's agent.

Similarly, houses enrolled with the NHBRC are also required to be inspected to check for compliance with the NHBRC home building technical manual. Inspections of subsidy housing is undertaken by the NHBRC itself, while inspections of housing other than the subsidy sector have been outsourced to agencies – such as the KZN Master Builders Association which covers KwaZulu-Natal, Eastern Cape and the Free State.

However, research and anecdotal information suggests that the capacity of the NHBRC inspectorate is severely lacking. For example, a recent study into the role of the building inspector on construction in the homebuilding industry in the



The NHBRC inspectorate is viewed as being ineffective.

Gauteng and Western Cape provinces considered inspectors not only from the local authorities (inspecting compliance with the National Building Regulations), but also inspectors from the Department of Housing and the NHBRC⁵⁰. The study determined that inspectors from the Department of Housing conducted inspections '*sometimes to often*', while local authority inspectors visited sites '*seldom to sometimes*' and NHBRC inspectors were the only inspectors that were reportedly '*never*' visiting sites during construction. These findings lead to the conclusion that the lack of inspection by the building inspectorate could be a contributor to poor construction quality.

The study also rated the competence and/or knowledge of local authority and NHBRC inspectors as marginally '*above average*', and inspectors from the Department of Housing inspectors as '*below average*'. Specifically, contractors interviewed in the study reported a general lack of expert advice from the inspectors. These observations led the study to conclude that the building inspectors do not know the Regulations well enough to enforce them.

6.4 cidb Best Practice Project Recognition Scheme

The cidb Act requires the cidb to establish a *Best Practice Project Assessment Scheme* which can be used, amongst others, to promote best practices that enhance construction quality. The various components of the cidb *Best Practice Project Assessment Scheme* are still under development, but are likely to include:

- the cidb *Building Skills Policy*, requiring skills development leading to nationally accredited outcomes on qualifying public sector contracts⁵¹;
- the cidb *Requirements and Guidelines for Indirect Targeting for Enterprise Development of Sub-Contractors*, which promotes skills development⁵²;
- the cidb *Requirements and Guidelines for Management Plans*, requiring site specific QMPs⁵³; and
- the cidb *Requirements and Guidelines for Contractor Performance Reports*, providing, amongst others an assessment of the construction quality⁵⁴.

Value	Best Practice				
	People	Process		Product	
9	Building Skills Policy	Standard for Uniformity	Enterprise Development	SHEQ Management Plans	Energy Efficiency
2	Performance Reports

The cidb *Best Practice Project Assessment Scheme* provides a framework for enhancing construction skills, rewarding good construction quality, and enhancing construction quality through QMPs.

The cidb Best Practice Project Assessment Scheme provides a framework for enhancing construction quality.

6.5 International Trends

i) CONQUAS

The *Construction Quality Assessment System* (CONQUAS®) was developed by (what is currently) the Building Control Authority (BCA) in Singapore to improve the workmanship standard of contractors. CONQUAS contains objective quality standards for construction work and adopts a sampling system to assess conformance to these standards, and the resulting CONQUAS score out of 100 reflects the quality standard of the project⁵⁵.

50 Mpambane, S. (2008) *An Investigation into the Effectiveness of the Inspectorate in the South African Home Building Industry*. Unpublished MTech: Construction Management Dissertation. Cape Town: Cape Peninsula University of Technology.

51 *cidb Best Practice Project Assessment Scheme; Requirements and Guidelines for the Building Skills Policy*. Construction Industry Development Board. Pretoria. <http://www.cidb.org.za>

52 cidb (2010). *cidb Best Practice Project Assessment Scheme; Requirements and Guidelines for Enterprise Development of Sub-Contractors*. Construction Industry Development Board. Pretoria. <http://www.cidb.org.za>

53 cidb (2010). *cidb Best Practice Project Assessment Scheme; Requirements and Guidelines for Quality Management Plans (Draft)*. Construction Industry Development Board. Pretoria. <http://www.cidb.org.za>

54 cidb (2010). *cidb Best Practice Contractor Recognition Scheme; Requirements and Guidelines for Contractor Performance Reports*. Construction Industry Development Board. Pretoria. <http://www.cidb.org.za>

55 BCA (2010). *Construction Quality Assessment System CONQUAS*. Building and Construction Authority, Singapore. <http://www.bca.gov.sg>

CONQUAS was introduced in Singapore in 1989, and has been periodically fine-tuned to keep pace with changes in technology and increasing quality demands. In 1998, the BCA introduced a number of new features to CONQUAS resulting in the launch of CONQUAS 21.

CONQUAS is a key element of the *Bonus Scheme for Construction Quality* (BSCQ) in Singapore. In terms of this scheme, contractors accumulate merit or default points depending on their CONQUAS score achieved for a completed project relative to the mean score for similar building types.

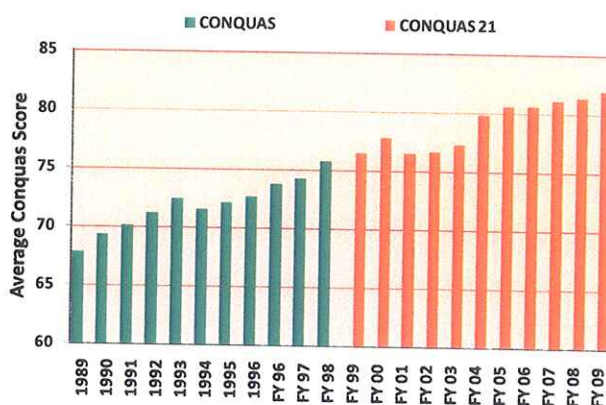
In terms of the merit system, a bonus or penalty of 0,2% of the effective contract sum is applied for each point scored above or below the applicable threshold score. The bonus/penalty is subjected to maximum of 3% of the effective contract sum or S\$2 million, whichever is lower.

Accumulation of CONQUAS default points are applied as follows:

- when a contractor has accumulated default points in the latest five contracts, a price-loading of 0,2% for each CONQUAS default point, subject to a maximum of S\$2 million, is applied against any tender proposal by the contractor in the evaluation of tender;
- if the contractor accumulates more than five CONQUAS default points in the latest five contracts, it will be downgraded by one grade for up to a period of 12 months; and
- debarment is recommended if the contractor accumulates 10 or more default points in the latest five contracts.

As illustrated in the adjacent figure, there has been a steady increase in the measured construction quality in Singapore since the introduction of CONQUAS in 1989.

CONQUAS is being marketed internationally, and is being used in Malaysia, China, Thailand, Hong Kong, India and Vietnam, and has also been adapted for conditions in the UK.



ii) Quality Management Plans

International initiatives in Australia, Singapore and other countries requiring accredited Quality Management Systems (QMSs) for prequalification of contractors for certain types of construction works was discussed in Section 5.3. In addition to requirements for accredited QMSs, the NSW *Government's Procurement System for Construction* requires site specific Quality Management Plans (QMPs) and Inspection and Test Plans (ITPs), depending on the type of work and risk⁵⁶ (see below). The requirements for QMPs and ITPs are specified in the tender and contract documents, as well as the requirements for monitoring, auditing and reporting of the QMS and ITPs.

56 NSW (2006). *Quality Management System Guidelines for Construction*. NSW Government Procurement. Sydney.
<http://www.nswprocurement.com.au>

		Type of Work and Risk under the Contract	
		Complex, with a definite possibility of nonconformity with the specification and significant impacts	Simple, or simple and repetitive with some or little possibility of nonconformity with the specification
Value and Type of Contract	Valued at \$1m or more	High – Service provider must have an agency accredited Quality Management System, and implement a Quality Management Plan and ITPs	Medium – Service provider must implement a Quality Management Plan and ITPs
	Valued at under \$1m	Medium – Service provider must implement a Quality Management Plan and ITPs	Low – Service provider must have and implement a ITPs

NSW Quality Management Requirements

While the intent of specifying requirements for site specific QMPs and ITPs together with requirements for auditing and reporting is clear, the impact of this requirement on construction quality has not yet been documented. Notwithstanding this, requirements for QMPs and ITPs will drive industry behaviour – ultimately leading to contractors gaining experience and competence with QMPs and ITPs.

Requirements for site specific QMPs will drive quality improvements.

iii) Performance Management

The NSW government approach to performance management and performance assessment of the design team and of the contractor has already been introduced in Sections 4.4 and 5.3. However, of significance, is that the NSW government has also introduced performance management and performance assessment of the 'project manager' (or client's agent) by the client body and by the contractor⁵⁷.

Performance areas of the project manager assessed by the client body include, amongst others, time, cost and quality management, while areas assessed by the contractor include:

- accuracy and completeness of contract documents;
- sufficient access provided to the site to carry out work;
- responsiveness and timeliness;
- claims resolved in accordance with the contract;
- adequacy of reasons given for rejecting claims; and
- responsiveness to Requests for Information.

While such systems would clearly support continuous improvement of the project manager, such systems can only be applied successfully within an environment of a 'knowledgeable client'. Notwithstanding this, there is clearly merit in some form of performance assessment of the client's agent.

6.6 Summary

This section has first identified the key construction site related barriers to quality, which can largely be grouped together as:

- process issues (poor site management, focus on time and cost, lack of quality improvement processes and lack of worker participation); and
- skills and competence issues.

In addition, lack of performance by the client's agent in ensuring compliance by the contractor with the client's specification is a further barrier to construction quality.

⁵⁷ NSW (2010). *Project Manager Performance Report*. NSW Government Procurement. Sydney. <http://www.nswprocurement.com.au>

It has also shown that while it can intuitively be expected that smaller contractors do not have as well developed quality management systems as do the larger contractors, stakeholder perceptions confirm that the difference in construction quality between large and small contractors is not substantive.

This section has then investigated actions which clients can adopt to encourage contractors to delivery to, or even exceed their quality requirements, including:

- enhancing and strengthening the role of the client's agent on construction projects;
- encouraging the use of, or mandatory requirements for, CMSs and site specific QPMs; and
- merit and demerit schemes based on construction quality achieved.

In addition, enhancing the skills and competencies of skilled and semi-skilled workers must remain a key priority in the industry – which requires a multi-stakeholder response. In this regard, this report recognises and acknowledges the initiatives being undertaken by the industry in addressing the skills shortages – particularly at the level of the skilled and semi-skilled workers.

In line with international experience and trends, various actions are being developed by the cidb which are aimed at enhancing construction skills and construction quality, including requirements for training opportunities on public sector projects, the establishment of the cidb/industry ESDA, contractor performance reports, and requirements for QMSs (Section 5.3) and QMPs.

However, notwithstanding this, local and international experience suggests that greater attention also needs to be focused on the role of the client's agent in construction quality – for example using performance management systems similar to those adopted by the NSW government. Such a performance management system may also be of relevance to the NHBRC inspectorate – which appears to be ineffective.

Greater attention needs to be focused on the role of the client's agent in construction quality.

In addition, this section has also presented a brief overview of the highly successful CONQUAS system developed by the BCA in Singapore, which is being used in Singapore as the basis for a construction quality bonus scheme, using merit and demerit points. Strong consideration should be given to introducing CONQUAS in South Africa – as a basis for 'absolute' measurements of construction quality.

Consideration should be given to introducing CONQUAS in South Africa.

7 SYNTHESIS AND RECOMMENDATIONS

The cidb has undertaken this study on the quality of construction in South Africa largely from a client perspective, and with the objective to identify those actions that can be implemented to derive higher quality on their construction projects.

This report has shown that, overall, clients are satisfied with the quality of construction in South Africa, but that the quality of construction does vary between contractors. However, clients in general, and in particular public sector clients, should not be complacent with this, and should strive for better value and higher quality construction.

While the issues of poor construction quality can be identified across all sectors, this report has shown that poor quality of construction is most prevalent in the residential building sector, in both the public and the private residential building sectors – which is not regulated by the cidb. In fact, due to a regulatory constraint in which homebuilders are exempt from registering with the cidb, clients do not have the flexibility to specify a requirement for using cidb registered contractors (in addition to the existing NHBRC requirements).

Recommendation: In addition to the existing mandatory NHBRC requirements, clients should be able to have the flexibility to specify additional requirements for procuring from cidb registered contractors in the residential building sector where appropriate. (This will however require a change to the cidb regulations which exempts contractors who are registered as a homebuilder in terms of section 10 of the Housing Consumer Protection Measures Act from registration with the cidb.)

This report has then highlighted that while South Africa has a well developed set of technical standards that can be used to describe the standards of materials and workmanship for construction works, these technical standards are in many cases outdated. Furthermore, it is noted that there are strong indications of a deteriorating capacity necessary to develop and maintain technical standards, codes and specifications – specifically at the SABS and the CSIR, but also at some client bodies and industry associations. It is therefore important that this formal capability for the development and maintenance of technical standards and specifications is retained and strengthened for the future.

Recommendation: The cidb should advocate for the maintenance of the necessary technical capacity for the development and maintenance of construction standards, codes and specifications – including that at the SABS and the CSIR.

This report has shown that the major contributors to poor quality of construction in South Africa are likely to be procurement related barriers. Such procurement related barriers include:

- fraud and corruption, or 'political interference' (including cronyism and nepotism);
- the procurement and delivery model (such as the 'design by employer' model);
- the use of procurement systems based on price and preference only, and not taking into account functionality (or quality); and/or
- insufficient information to be able to select professional services and/or contractors based on quality criteria.

This report has concluded that while the cidb has aggressively dealt with corruption linked to the cidb Register of Contractors, and that while the cidb investigates cases of fraudulent award of tenders that are reported to it, the cidb has to date not adequately dealt with the broader issue of developing and implementing mechanisms to proactively prevent and/or identify corruption within construction procurement.

Recommendation: Strong consideration should be given by the cidb to introducing requirements for integrity and transparency in construction procurement.

The report has also highlighted international trends aimed at enhancing construction quality and value for money by promoting procurement strategies and contract types that support the development of collaborative relationships between government clients and its suppliers, including the early appointment of

integrated supply teams. The report also notes that in the UK, for example, that traditional, non-integrated procurement approaches should not be used unless it can be clearly shown that they offer best value for money – which means, in practice they will seldom be used.

Recommendation: Strong consideration should be given by the cidb to advocate for procurement and delivery models promoting collaborative relationships and integrated supply teams (including design and build contracting strategies).

The cidb has consistently recommended the appointment of professional services and contractors in the public sector based on quality criteria (Method 4 in the cidb *Standard for Uniformity*), and has supported this with the development of cidb Practice Notes. The appointment of professional services and contractors based on quality criteria will be further supported through the development and implementation of performance assessment reports for professional service providers and contractors that are currently under consideration – and for which a degree of compliance with will be set out in legislation.

Recommendation: The cidb needs to continue to advocate for and to strengthen requirements for the appointment of professional services and contractors based on quality criteria – supported by performance assessment reports for professional service providers and contractors.

International experience also suggests that the concept of performance assessment reports can also be applied to a client's project manager that is accountable and responsible for ensuring that contractors deliver construction quality in accordance with the client's specifications.

Recommendation: The cidb should investigate the possible use of performance assessment reports for the client's agent in the public sector as a best practice.

This report has also highlighted the impact of skills and capacity constraints on construction quality, including:

- indications of a deteriorating capacity necessary to develop and maintain technical standards, codes and specifications;
- indications of a deteriorating capacity in the quality of client documentation; and
- ongoing shortages of appropriately trained skilled and semi-skilled workers.

Addressing these skills and capacity constraints requires a multi-stakeholder response, and various initiatives being undertaken by the cidb have been highlighted in the report. This report also recognises and acknowledges the initiatives being undertaken by the industry in addressing the skills shortages – particularly at the level of skilled and semi-skilled workers.

Recommendation: The cidb must continue to advocate for a building and construction component to be incorporated into the South African World Skills activities – and should actively seek to incorporate a construction skills component into the South African delegation.

This report has also highlighted examples of construction quality merit and demerit systems, including the Singapore Quality Bonus Scheme based on the highly successful CONQUAS system. This report has also highlighted that the cidb *Contractor Performance Reports* will be used on public sector projects to preference contractors that have a track record of delivering good quality.

Recommendation: Strong consideration should be given to the cidb piloting and testing the Singapore BCA CONQUAS system in South Africa.

In addition to the above, a consistent underlying theme to improving the quality of construction in South Africa is the 'management of quality' – which must permeate across all stakeholders in the construction delivery chain (as well as, in fact, the operation and maintenance of infrastructure). Key to this is the need for adequate exposure to quality management in the course content at all levels of schooling in the built environment.

Recommendation: The Council for the Built Environment (CBE) needs to assess and, where appropriate, strengthen the requirements for 'quality management' in the course content within built environment academic institutions.