

The Unintended Consequences of Tendering for Consulting Engineering Services

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Abstract

The Consulting Engineering industry in South Africa was up to 1994 largely a closed group of practitioners with companies ranging from sole practitioners to what one might have considered large back then. Prior to 1994, large developmental engineering capacity was created by the State for its internal own requirements as the custodians of the wellbeing of state owned infrastructure. In fact in 1953, there was a sum total of 30 Consulting Engineers practicing as individuals, 19 of which were Civil Engineers, 9 were Electrical and Mechanical Engineers and 2 Structural Engineers who based on their expertise were commissioned by Public Sector entities from time to time to complement their in-house expertise. During this period and probably up to the early nineties, even Private Sector companies such as mining houses and property developers had their own in-house engineering offices who did most of their own planning and design and only made use of the services of Consulting Engineers for specialist expertise or to supplement their own internal capacity. The Constitution of the Republic of South Africa in 1996, which included a Section 217 – Procurement, then necessitated that procurement by the State be conducted in a Fair, Transparent, Cost effective and Competitive manner. There is no argument against this ideal. However, the appointment of Consulting Engineers became caught up in the same quagmire as general procurement and price became the main driver for decisions made in appointing such professionals. Consulting Engineers found themselves having to bid for work with increasingly competitive bidding becoming fiercer and professional services becoming more under-valued. What impact has this had on the quality of service, the business of Consulting Engineering and the attractiveness of this profession? What might the future attraction be to the youth and why are other professions, such as the legal and medical professions not facing the same threat. Should Consulting Engineers not be afforded their rightful place in society as respected Professional Practitioners and how do we then explore alternative procurement strategies that serve to uphold the Constitution whilst ensuring that professional services procured from Consulting Engineers is based on quality and redress, with price being considered from a total cost of ownership perspective and not simply as least cost service provider. There are several best practice examples used elsewhere in the World which shall be explored with a view to recommending viable options. Furthermore some insight will be shared on a new Standard in South Africa which has been introduced into the public sector procurement and delivery management of infrastructure as a means of distinguishing such procurement from that of general goods and services in order to derive value for money in such investment.

1. Introduction

This paper will begin by providing a historical context to the Consulting Engineering Industry in South Africa and briefly explain the shift in technical engineering capacity that took place from 1994, the dawn of the democracy of the new South Africa, to present day and how the Consulting Engineering Industry developed over that period. We will examine the changes in the processes involved in procuring Consulting Engineering services and the impact of these changes. In considering these changes we shall evaluate the unintended consequences of the tendering system and the possible need for a differentiated approach. In any challenging situation, one can of course adopt a “do nothing approach” and we shall consequently review the impact of such an approach. Finally, we will review the alternatives that exist to the open tender process and examine the benefits that could be derived from adopting these alternatives.

2. Historical Context

The Consulting Engineering industry in South Africa was up to 1994 largely a closed group of practitioners with companies ranging from sole practitioners to what one might have considered large back then. Prior to 1994, large developmental engineering capacity was created by the State for its internal own requirements as the custodians of the wellbeing of state owned infrastructure. According to Consulting Engineers South Africa (previously South African Association of Consulting Engineers) in a 2002 publication in celebration of its 50th anniversary, in 1953 there was a sum total of 30 Consulting Engineers practicing as individuals, 19 of which were Civil Engineers, 9 were Electrical and Mechanical Engineers and 2 Structural Engineers who based on their expertise were commissioned by Public Sector entities from time to time to complement their in-house expertise. During this period and probably up to the early nineties, even Private Sector companies such as mining houses and property developers had their own in-house engineering offices who did most of their own planning and design and only made use of the services of Consulting Engineers for specialist expertise or to supplement their own internal capacity. Services of Consulting Engineering firms were procured on a relationship basis and using other possible decision factors in making appointments. Services were typically procured from a client's panel of consultants and payment was on the basis of a percentage of the construction costs. Membership of the panel depended on the quality of work delivered that was adjudicated through annual merit rankings of consulting engineers by client bodies. In most cases the number of firms on individual panels was limited to ensure that consulting engineers received continuous employment in order to develop and retain the costly skills and expertise that are required to produce quality designs and to advance technologies. This system had many advantages and was largely responsible for the development of the quality and expertise of the consulting engineering industry in the country. The system also had some disadvantages such as a lack of competitiveness in respect of price and furthermore, some criticism was leveled at the potential for this system to encourage “over-design” in order to increase the project cost and the related fees. In practice, though, tendencies of excess were controlled effectively by informed client bodies which existed at that time. In general, the system resulted in adequate levels of trust

between clients and consulting engineers as peer professional practitioners. Fees were generally adequate to ensure quality designs optimised by a comparison of alternatives and the facilitation of the general advancement of technology and practice within both client and consulting engineer organisations.

The number of companies increased beyond 100 and there were many new companies entering the market, owned and operated by Black Practitioners, who prior to 1994 enjoyed limited access to these opportunities. The numbers of companies increased but the access to projects grew only for a select few based on historical relationships. The current state of play in respect of engineering capacity post 1994 is that there is now significantly diminished capacity within the State as the Client body, with some Municipalities having little or no Engineers to manage their infrastructure.⁽¹⁾ The Consulting Engineering industry on the other hand has grown on the contrary, from its 30 individuals in 1953, to its present day number of 550 companies, employing at least 10 000 professional practitioners and a further 13 000 support staff. The new democracy then also introduced a new Constitution which was crafted to create a Country where equal opportunities were available to all. Consistent then with the new Constitution of the Republic of South Africa No. 108 of 1996⁽²⁾, Section 217, explicitly then required that all Procurement of goods and services from Organs of the State, be:

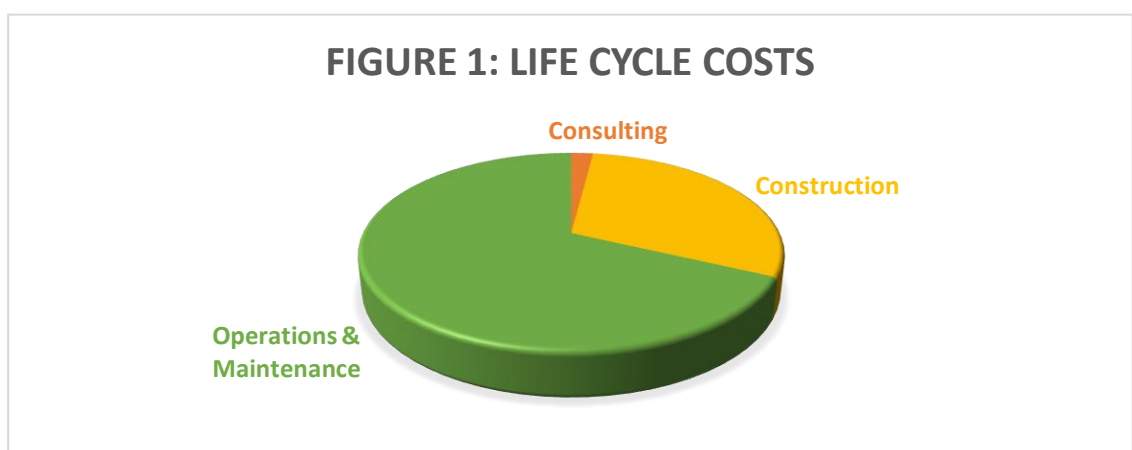
1. Fair;
2. Cost Effective;
3. Competitive; and
4. Transparent.

The landscape had thus changed significantly and it was then necessary for the State to explore better mechanisms for ensuring that the prescripts of the Constitution were met, whilst at the same time considering how Procurement preferences could best be utilised to drive greater inclusion of the companies that would otherwise not have been afforded such opportunity before the political changes in the Country in 1994.

3. Iterations of Changes in Procurement

Consulting Engineering services were initially procured on mostly relationship based decisions and with the capacity that existed in the State, it was not too difficult to keep the limited number of companies busy. Post 1994, in attempts to provide access to markets by companies which were black owned, but largely unknown to the Clients in the public sector, attempts were made develop roster systems where companies, based on their present experience and delivery record were afforded access to projects on a rotational basis. Fees for providing such services were determined according to the Fee Guidelines determined by the then South African Council of Professional Engineers, initially a non-statutory body and later then by the Engineering Council of South Africa, the statutory body that replaced the former following the promulgation of the Engineering Professions Act of 2000 ⁽³⁾. For the most part, scopes of work were reasonably well defined and fee determinations matched these such that there was opportunity to provide value for money professional services, ensuring a high quality of engineering innovation. Where scopes were not well defined, a level of maturity and understanding existed between Client and Service provider and sometimes fees would be agreed as the scope

became clearer. Professionalism prevailed between Client, whose representative was an Engineer and the Consulting Engineer as service provider. Further changes in the roles and responsibilities within State procurement introduced the overall shift to tender processes driven by Procurement Officers taking the lead roles for infrastructure procurement processes, often having little or no knowledge of infrastructure. The involvement of the Engineering Practitioner in the process was limited mostly to providing a scope, a specification and the verification of the credentials of the Consulting Engineering bidders, but very little in the overall price and value for money decision process. This being the case procurement tended towards favouring the least cost, ignoring any notion of quality of service that would accompany such least cost. Procurement Officers, aggressively assuming that their role was simply to ensure savings, further negotiated fees downwards where reportedly over the last few years there have been anecdotal reports of fees being discounted by as much as 60%. It is important to acknowledge that though Engineering Practitioners providing solutions to Clients pride themselves in the professionalism of their practice, not unlike medical and legal practitioners, Consulting Engineering companies where these practitioners are employed are businesses and as such they operate on business principles. Short term, all businesses gear themselves towards surviving and thriving, meeting payroll and other financial commitments. That short-term urgency drives some firms to 'buy' jobs and resort to cut-rate fees, narrowed scope and unbilled extra services. Here, selling time is often a stronger driver than value. Unfortunately, short-term compromises inhibit long-term prosperity and growth. 'Discounted engineering' is hardly a sustainable business practice ⁽⁴⁾. If a firm prospers, competes successfully and grows, it is thanks to their superior qualifications and through offering advantages not easily mirrored. In the long term, success in business derives from technical leadership, superior service delivery, or a combination of the two. Developing those superior qualifications requires investment in staff retention, education, technology, application (skills) transfer and team building. The value for money proposition of appointing a good Consulting Engineer at reasonable cost to provide quality design solutions, appropriate material specifications together with cost effective oversight of the construction process for the effective and efficient delivery of quality infrastructure at optimum cost that would last for its full design life, often 20 to 30 years coupled with the ability to build future capacity has subsequently been foregone in the drive towards least cost (**Figure 1**).



4. Maintain the Status Quo?

One often has to consider what would happen if all remained unconcerned and allowed the status quo to prevail. Already we are seeing the collapse of roof structures and ceilings in shopping malls, school children drowning in pit latrines, roads failing, and both wastewater and storm water systems not being able to cope with the present day demand due to capacity constraints. This is largely the consequence of poor present day infrastructure planning, maintenance and upgrade. The dearth of engineering skills within the public sector means that there are insufficient knowledgeable resources available to manage these needs internally or on an outsourced basis. Furthermore, where outsourced processes are in place, the open tender system then for procuring professional consulting engineering services to provide such support is then not managed on the basis of pre-qualification with the basic requirement of demonstrable skills and knowledge to provide such professional services. Tender briefing sessions are often filled to capacity with many attendees purporting to be able to provide the necessary professional services that are being procured. This situation, further exacerbated by corruption, means that not only are companies inadequately qualified to provide such services, but also that the money earmarked for these infrastructure projects are then siphoned off and no infrastructure is developed. The open tender system has also created a situation where companies are bidding fiercely competitively (**Figure 2**)

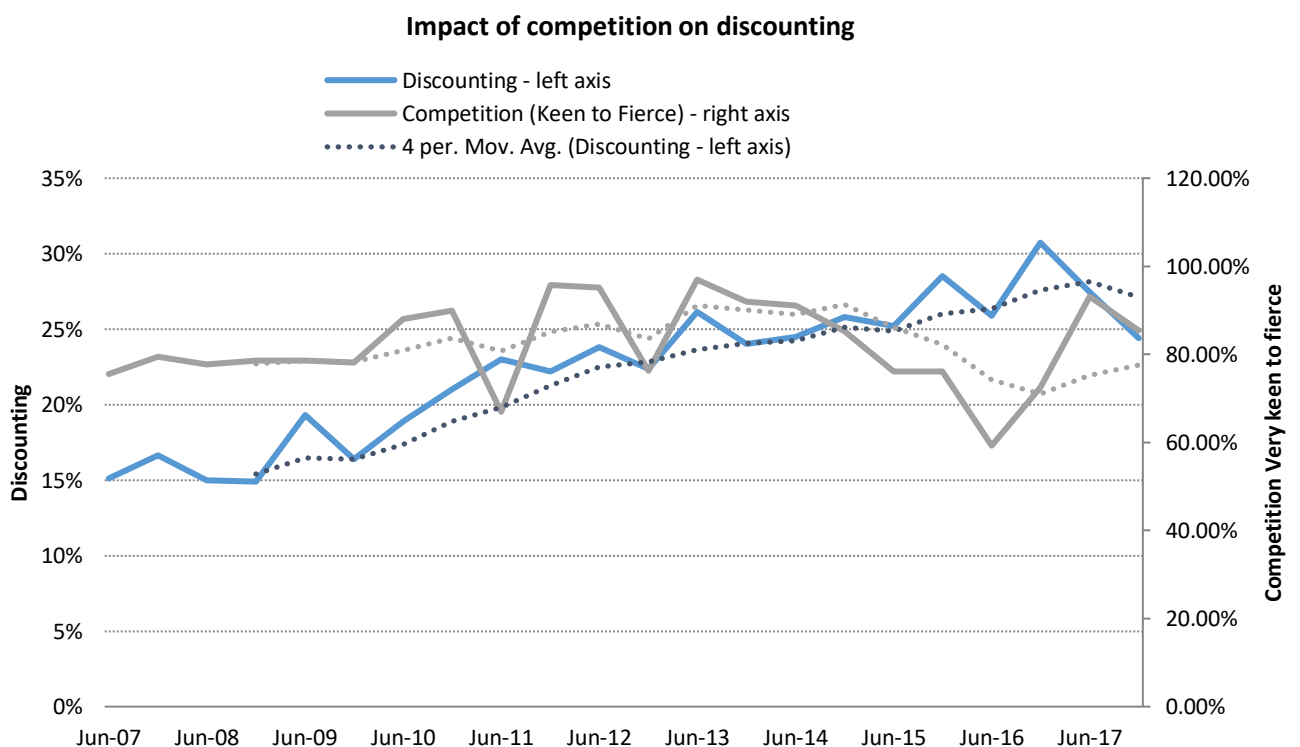


Figure 2: Competition and Discounting (CESA Bi-annual Economics and Capacity Survey (July to Dec 2017))

and in instances conceding to unsustainable discounts in their fees. Not only then is there little quality infrastructure delivered at high cost, creating a greater backlog, but the attractiveness of the Consulting Engineering industry is gradually eroding and young potential practitioners are opting to instead pursue careers in the financial services sector. Furthermore, Consultants then compromise their ability to deliver quality professional services of the high ethical standard and increase the risk exposure to both themselves and their Clients ⁽⁵⁾. With the shortage of capacity within the State and the risk of an industry in decline, one has to wonder, who will provide these services and what would be the cost then if we import these services from abroad. South Africa has always been respected globally for its excellence in Engineering such that the expertise of our local professionals is sought after. Would we really want to find ourselves buying back the services of our local experts through offshore based companies or have new colonisers, come and do it all for us and we remain indebted to them for infrastructure of questionable quality. The role that independent and competent consulting engineers play is invaluable to the infrastructure development process. It would be short-sighted to imagine cost effectively developing quality infrastructure through Design-Build processes as there is again little control over the quality of the end product as the oversight over material choices, economical design and construction quality would be lacking unless the Client has an adequate supply of such competent resources to perform such an oversight function. Clearly then we cannot ignore this problem and do nothing as it has consequences to both the industry and the Client with the public being the ultimate victim through perpetuated poor service delivery and risk to health and safety.

5. What are the Alternatives

There are various procurement methods that may be adopted, however much depends on the level of clarity that exists in the scope definition of the project and available information. Coupled then with the specific process we need to adopt the most appropriate evaluation criteria to ensure that the entire process provides the optimal result for both Client and Professional Service Provider. Some of the methods for procuring professional services include:

5.1 Open Tender Bidding

This is always an option, though in South Africa, is one used far too indiscriminately with the result that mandatory briefing sessions are often oversubscribed with far too many attendees only there to ply their trade, that of “tenderpreneurship” an anomaly that is prevalent in many African countries. Often Clients try to use the cost of tender documents as a deterrent but with the over-utilisation of this form of deterrent, the high costs for tender documents is also considered counter intuitive to developing companies who may well be serious about being in the business of Consulting Engineering. In order for this process to provide value for money, the scope must be very well defined such that respondents are able to provide reliable pricing and similarly the Client has to be knowledgeable and mature in the evaluation process. In instances such as these one has to accept that the bidding process will be

competitive enough so as to provide optimal bid offers, however, it remains imperative to ensure that a strong emphasis is placed on the quality of service that should accompany the bid offers. In such a case, the Quality, Cost Based Selection (QCBS) method would be appropriate. QCBS and Cost Based Selection (CBS) procurement starves firms of the investment income required to develop expertise for long-term survival and excellent performance over time. No provision is possible for costs related to investing in the training of future practitioners, a risk to the sustainability of the industry to be taken seriously, especially in an environment like South Africa with a shortage of such expertise in the public sector. It would not be uncommon on large scale projects to even have forms of post tender negotiation. The evaluation criteria should place a large enough emphasis on quality, for which sufficient guidance is provided for in the ISO 10845-1: 2010. Furthermore it is important that decisions then are premised on deriving value for money according to **Figure 3** below:

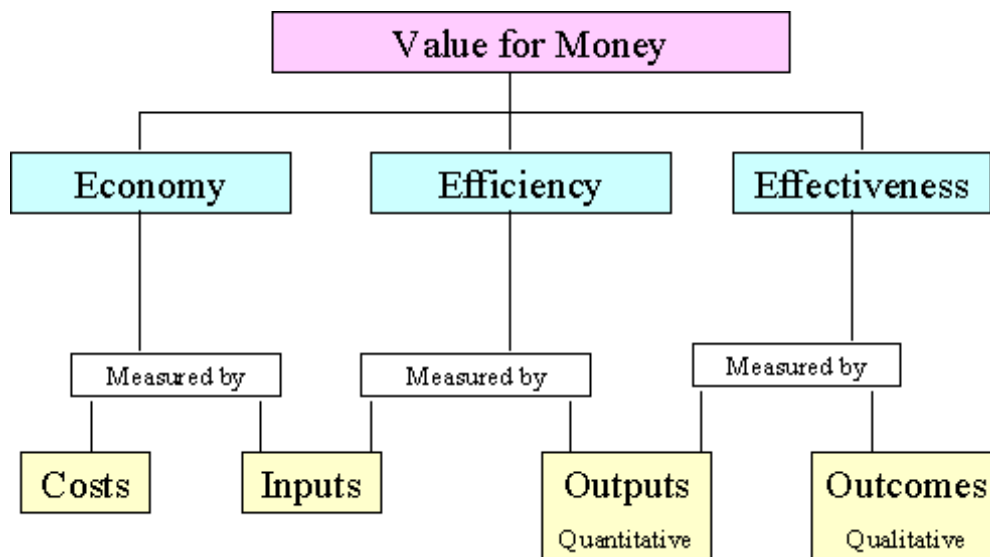


Figure 3: Value for Money

5.2 Method 4 – CIDB

The straightforward use of the Construction Industry Development Board a Statutory body in South Africa regulating amongst others, Procurement in the Construction Industry in South Africa, advocates several methods that may be used for procuring professional services⁽⁶⁾. Method 4 which incorporates, the Financial Offer, Quality and Preferencing is the most preferred, however with open tendering and without any indication of the estimated time required by the client in cases of vague scope, this method does have several shortcomings. Policies and practices need to be further developed by client organisations that can significantly improve the value of Method 4. Examples of practices that can be adopted to improve procurement processes are outlined below :

a. Registers of Consulting Engineers and Shortlisting

A component of procurement that has not seen much application in South Africa is shortlisting of firms to tender on projects. If a shortlisting system is developed that is fair and transparent, it can result in a reasonable distribution of work

without Consulting Engineers having to drastically cut prices in order to come into consideration for work. Poor performance by Consulting Engineers can reduce the frequency with which they are shortlisted thereby ensuring that Consulting Engineers take more pride in their performance and resulting in increasing competitiveness through quality rather than through price.

b. Key Man Months/ Work perception

Where projects are complex and not easily quantifiable in terms of the Consulting Engineer's input, clients should provide an indication of required key man-months required in order to ensure that both client and tenderers have a common understanding of the effort required on the project.

Where tenders only involve a few bidders more time can be spent by the bidder in preparing the bid and by the evaluator in evaluating the bids to assess value for money.

c. Procurement Support

Where client bodies have inadequate capacity to manage the complicated procurement process represented by Method 4 it is suggested that a consulting engineering firm be appointed directly on a time and cost basis to assist with procurement. This can involve developing a project scope and terms of reference as well as procedures to monitor performance and short listing of firms. Where the provision of such support on an individual project will exclude that firm from participating in the tender, the shortlisting process can allow for different firms to assist on different projects thus allowing it to tender on other projects. Where the type of services required are known but the exact scope of work is uncertain then a percentage fee system should be used to obtain prices for a notional estimated value of the work required. In this way changes in scope of work need not always be accompanied by variation orders and related protracted negotiations as the percentage fee will accommodate the variation.

5.3 Single Source Procurement

There have been several attempts by industry to increase the value of single source appointments which met with limited success. It would be argued to be unconstitutional and illegal, especially with the large number of companies in the market in South Africa despite its dire need for service provision to consider single source procurement in the consulting engineering industry. In Europe single source contracts from EBRD can be made up to an amount of some R2million, the World bank awards single source contracts regularly to a value of R300 000 and Hong Kong awards single source contracts to a value of R4million.

5.4 Framework Contracts

Framework contracts provide a means of awarding long term contracts to Consulting Engineers and ensuring that those who perform well are provided with continuous work while reducing the time and cost spent on procurement. This is still in its infancy in South Africa and needs to be supported with guidelines and practice notes. The Standard for Infrastructure Procurement and Deliver Management (SIPDM) ⁽⁷⁾ published by the Department - National Treasury of the Republic of South Africa, in 2015 advocates for this methodology as an option with the express requirement for transparency to protect the integrity of the process. These processes are not new but had unfortunately been abused in the recent past with the absence

of transparency. SIPDM also notably makes the distinction, the first of kind in the procurement realm, that infrastructure procurement processes should differ from general services and distinctly so from the procurement of commoditised goods. The latter being a groundbreaking approach with Quality of service being key to deriving value for money. This form of contract is normally done using Quality Based Selection (QBS). The purpose of such a process is to determine the most appropriately qualified Consultant, based on technical competitiveness, integrity, professionalism etc. leading to a negotiated award of consultancy services on a fair and reasonable basis. In QBS, 'Q' stands for the most appropriate quality for a certain consultancy job. Under QBS, the cost of the consultancy (price or fee) is an outcome of the selection process rather than a criterion. Fees for services are fixed during negotiation, following selection and before an agreement is reached, thus allowing for negotiation of project scope and service costing, with the most appropriate technically qualified Consultant. QBS will best identify the most appropriate consultancy firm on the basis of professional skill, experience and other essential attributes. QBS does not ignore the importance of cost, but endeavours to put this into appropriate perspective within a quality discussion.

6. Conclusion

It is clear then that despite the intentions of the Constitution of the Republic of South Africa, that the lack of appropriate skills and knowledge of the differences between various procurement approaches that need to be applied to the procurement of goods and services and specifically then professional services compromises the cost effectiveness prescript of the Constitution even if the remaining prescripts are met. We do need to place some serious emphasis on this key requirement. The one size fits all approach compromises the ability to do this and certainly with the critical and costly investment in infrastructure both social and economic, it becomes all the more important to ensure that the best and most knowledgeable resources are employed to drive the procurement for infrastructure development. The impact on the future economic growth of a country and the adequate provisioning of services to the citizenry are considerations far too important to be compromised by assigning the least attention to the value that can be derived by getting this process right, especially when, as a country we have to allocate a significant portion of our national budget to the necessary social needs of poverty and unemployment. It cannot be overemphasized that the investment in infrastructure has to be viewed holistically, from a total cost of ownership perspective. It is indeed true that with such critical investment, that the whole is worth more than the sum of the parts and unless the appropriate levers are utilised, savings will be derived on the 2% of infrastructure cost component, being the services of the Consulting Engineer, whilst little or no savings will be derived on the remaining 98% of the infrastructure cost as the professional service provider will simply not be able to afford to offer such quality of services at below these rates. Such instances occurring repeatedly has set a detrimental trend and we believe that, for the sustainability of the industry and the value for money sought by the Client in investing in infrastructure, this practice must be abandoned before we reach the tipping point.

References

1. A Lawless : Numbers & Needs in Local Government, 2007.
2. Constitution of the Republic of South Africa, No. 108 of 1996.
3. Engineering Professions Act (No. 46 of 2000) Engineering Council of south Africa.
4. FIDIC QBS Marketing Guideline : First Edition, 2015.
5. PNW Okonkwo & J Wium, Impact of Discounted Professional Fees on the Risk Exposure to Civil and Structural Engineering Consultants in South Africa, Journal of the South African Institution of Civil Engineering, Vol. 60, No.1 March 2018.
6. Construction Industry Development Board, Construction Procurement - Best Practice Guideline #A3, February 2008.
7. Department of National Treasury – Republic of South Africa, Standard for Infrastructure Procurement and Delivery Management, 1st edition, October 2015.