

Insights Consulting Engineers SA – Celebrating 60 Years

Training and retaining of new recruits is critical

THE consulting engineering industry is making slow, steady transformation progress as it seeks to become an industry that is truly representative of SA's people.

Peter Viljoen, chairman of Consulting Engineers SA's (Cesa's) marketing and communications committee, says the profession falls far short of where it should be from a demographics perspective.

However, from another perspective the industry is doing well and Cesa's member firms have put effort into transformation through mechanisms such as funding bursaries and extensive training and development.

"Of necessity it is a process that takes time and we cannot afford to rush it as people's lives depend on the decisions engineers make. It takes years of training for engineers to qualify and at least five years of good experience to prepare them for more senior roles," says Viljoen.

Another hurdle is engineers have to be good at mathematics and science, subjects that tend to be de-emphasised in many schools.

The relatively small pool of suitable students is in high demand as maths and science are requirements for many professions. Some of Cesa's members are

actively involved at a high school level in promoting science and mathematics, and Cesa has an annual drive to attract people into the industry by inviting students into its member firms to see the work carried out by engineers.

But while these are issues that need to be addressed, the main impediment to transformation is the low industry workload.

"A lot of work has been done at a tertiary education level and the people coming out of universities and technikon are largely reflective of the country's demographics. In addition, more women are training as engineers.

"However, there is a huge gap between an engineering graduate and an engineering professional with the years of project experience needed to add value to projects and mentor new entrants in the industry.

"Bridging this gap is a serious challenge as the industry's workload has fallen significantly and there are delays in bringing many of the major infrastructure programmes to the market.

"Without a strong flow of work, new graduates do not have the projects in which they can participate and start gaining much needed experience," says Viljoen.

He says that more work flow

also means greater demand for skills and more resources available within firms to develop people.

Viljoen says that engineers not only need experience to become better engineers but also to take on the challenge of starting their own firms. An engineer working on a range of major projects such as Gautrain is developing far ahead of one who works on a few routine projects and spends most of his time tendering.

"We need to develop engineers who are our future leaders and mentors so that future generations will have the foundation they need to develop and grow within the industry," says Viljoen.

He says there is a shortage of engineering talent around the world and that they are mobile, so SA is losing skilled people to other countries where there may be better opportunities. Further, engineers are popular with industries ranging from banking to management consulting and this is another drain on skilled resources.

"We have sufficient or even a surplus of engineers for our present workload. Once government's infrastructure projects gain momentum, we will need more people and we will be able to attract people back to this country," says Viljoen.

Consulting engineers must be involved from the start

Cost is usually the main factor in tender selection, which means the winning bid is not always the best

EFFECTIVE procurement of consulting engineer services needs to start right at the beginning so a project can benefit most from the skills being brought to bear.

Abe Thela, deputy president of Consulting Engineers SA (Cesa), says consulting engineers should be involved from the preconception stage of a project, where there is still greater flexibility to influence the project life cycle costs.

"Unfortunately, with current procurement practices the consulting engineering input is usually limited with regard to planning and fast-tracked through the detailed design and implementation stages of projects with diminished ability to innovate and influence project life cycle costs," says Thela.

Another limitation is that while functionality (quality) is

taken into account as a minimum threshold in the procurement process, it is usually not a factor in the final bid assessment.

Therefore, price is often the main determining factor in final selection. This means that not only is the winning bid not necessarily the best, but bidders are unable to build in a margin to allow for a review of the planning and apply creative innovation that might result in more effective solutions.

"The procurement process needs to happen sooner and the criteria need to be modified to create a single assessment that includes preference, price and quality.

"We need to move from a situation where professional services are viewed as a commodity with a lopsided focus on price to a situation where people with technical and engineering skills play a key role in the procurement of professional engineering services," says Thela.

He says quality plays a role in all projects, even in those that can be considered as routine; however, in large, complex mega projects, quality can be the key ingredient determining a successful



Naren Bhojaram ... it's time to introduce a new system.

outcome. Thela says aligned with the need to enhance the impact quality bidders have on outcomes is the need to build sufficient skills and resources into the evaluation process.

Over the years, the public sector has lost technical skills at an alarming rate and there is a dramatic need to reverse this process.

He says the government needs to make public sector positions more attractive for skilled professionals such as

engineers so that it can build its internal capacity.

While going through this rebuilding process, the government can also bring in retired engineers to help mentor younger professionals and make use of private sector skills to supplement its own resources so it can speed up the delivery of good services across the country.

"There are current interventions, such as the municipal infrastructure support agent programme in which private sector engineers and other professionals will be deployed on a temporary basis to struggling local authorities.

"The objective is to help them build their internal capacity," says Thela.

Peter Viljoen, chairman of Cesa's marketing and communications committee, says employing consultants is a short-term solution.

"In the longer term the public service needs to attract and develop its own skills and capacity. The public service needs its own engineers running programmes and taking engineering decisions."

Naren Bhojaram, president of Cesa, says that highly qualified personnel spend

about 30% of their time preparing tenders, a worthwhile investment provided that the processes are fair and honest.

Another issue is the pre-selection process as too many firms tends to qualify, which means there are too many submitting tenders and individual firms' success rates are often too low to justify the effort.

"Perhaps the time has come to introduce a new system. An approved supplier list can be created and for the more routine projects there can be a restricted number of pre-selection slots available each time and firms are allocated those slots on a rotation basis," says Bhojaram.

He suggests that in larger, more complex projects the weeding out process needs to take place sooner so that only a relatively small number of qualified firms are actively engaged in developed detailed tenders.

Viljoen says that the tender process can also reward firms for excellence on projects completed in the past and, thus, provide incentives to deliver incremental improvements.

Partnerships prove effective

THERE are many traditional delivery models such as tenders, but the time has come to examine alternatives that may better suit the South African environment.

Naren Bhojaram, president of Consulting Engineers SA (Cesa), says mechanisms such as framework agreements and public-private partnerships (PPPs) need to be considered where they offer a more effective solution.

Around the world PPPs are proving to be an effective mechanism for delivering infrastructure and making the best use of scarce resources. At the same time, projects have to be suited for a PPP arrangement and there must be an appropriate transfer of risks.

SA has many active PPPs including toll roads, hospitals, prisons, government buildings and the Gautrain.

"PPPs may be used where there are funding constraints or where the private sector has the better skills set to build and operate the project," says Bhojaram.

"However, while we have

sophisticated PPP legislation developed by the Treasury, there are still some bottlenecks that need to be addressed.

"For example, the unsolicited bid process is so full of obstacles that few entrepreneurs will consider taking the risk of bringing forward innovative solutions through this mechanism."

Abe Thela, deputy president of Cesa, says amended procurement regulations that came into force at the end of last year place a limit of 25% on subcontracting.

"This means that, for example, a large firm that wishes to subcontract some of the work to smaller enterprises is limited as to the extent it may do so.

"This is an impediment to the growth of smaller firms, many of which are black-owned and, therefore, the new regulations also act against transformation."

In addition, he says joint ventures are discouraged as they are required to have a consolidated empowerment scorecard that takes time and effort to generate, particularly given the time

constraints often associated with making such arrangements.

Turning to framework agreements and contracts, Bhojaram says these mechanisms are proving effective in some environments. Under such agreements, consulting engineers are pre-approved for work and their fee ranges for particular types of work is determined upfront. As projects become available so firms are taken from the list and allocated work.

"Framework agreements are not the answer to every scenario, but where appropriate they are proving effective in both the public and private sector," says Bhojaram.

"There has been some pushback from the smaller firms as they suggest that once an agreement is in place it eliminates firms for the period of the agreement. However, agreements can be designed to include and encourage participation by smaller firms.

"At Cesa, we support framework contracts that include provision for smaller firms."

The procurement process needs to happen sooner and the criteria need to be modified to create a single assessment that includes preference, price and quality

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