

KV3 FOCUS

YOUR ENGINEERING UPDATE

Creative, sustainable solutions for people and planet

KV3

NEWSLETTER 08/09



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Just under 12 months before South Africa hosts the biggest sporting event in the world, the country enters its first recession in 17 years. To add fuel to the fire, Eskom's 34% tariff hike will have a dire effect on individuals and businesses alike, leading to higher inflation and impacting on economic growth. The good news is that, according to reports, everything is on track to wow the world of soccer with our construction skills and hopefully our soccer skills as well.

At KV3 we take the development of skills seriously. In this issue of KV3 Focus, read about our efforts to empower local communities through knowledge. Continuously improving our own skills, Chris Liebenberg tells us about the various international symposiums he has attended in the past 18 months.

We meet Hans Karemaker who was recently appointed Director and COO. Also read about the obstacles we had to overcome in giving rise to Hibernian Towers, Strand, as well as the construction of a new reservoir and elevated water tower in Kathu.

We wish to applaud our own team for their excellent performance in the recent Professional Management Review Survey. As the soccer fans will say, "laduuuma!"

Francois Jacobs, CEO
pjfjacobs@kv3.co.za

Hibernian Towers is a 22-storey, upmarket residential development, situated along the mesmerising Strand coastline, one of Cape Town's premier locations.

This project was initiated by Quaypower Properties to provide local and international clients with a luxury multi-storey apartment building that offers accommodation ranging from one to three-bedroom apartments. In addition, provision has been made for office and retail space. Parking requirements were also addressed.

The first four floors create the building's podium, which has a 3 840m² footprint. Above the podium are the remaining three portions, two individual towers and an atrium, which links the two towers.

The use of concrete as a construction material was governed by several factors. Concrete is more economical for this type of structure. The concrete lines and bulk are key features of the architecture. Because of the shape of the structure, reinforced concrete is the most appropriate type of construction.

The building's special features start at ground level with several unusually large pile caps, the largest of which required 115m³ of concrete and 15 500kg of steel.



"A total of 13 800m³ of concrete and 2 020 tons of reinforcement were used in the construction of this structure."



A TOWER ABOVE THE REST

The fact that Strand is categorised as a seismic zone, coupled with the vulnerability of high-rise buildings to lateral loads, made it necessary to specifically design the building to sustain seismic forces.

The lateral forces that are imposed on the structure, as a result of an acceleration of the ground during an earthquake, are carried to the ground by means of structural walls. The most critical portion of the tower walls is the plastic hinge region. As the term suggests, the walls are designed to ensure that they have sufficient plastic capacity to remain structurally sound, well into the plastic region during deformation. No splices in vertical rebar were allowed between levels 5 and 6 in all structural walls and corresponding boundary elements. As a result, vertical bars were

approximately 8m in length. Specific seismic detailing was applied to the structural walls and columns.

The other significant structural elements, in terms of seismic loads, are the concrete shear blocks, which were introduced with the intention of transferring all horizontal loads to the bed rock.

The design, and more significantly the construction of the slabs, were complicated by the irregular column grid and slab geometry.

The central atrium structure consists of reinforced concrete beams following the atrium circumference, repeating every second level. Circumferential columns provide support to these beams. These columns start at level 5 and were supported on transfer structures at level 5. In addition,

a reinforced concrete bridge links the two towers on each level.

The building has a swimming pool in the gym on level 4, which was designed as a water-retaining structure.

A total of 13 800m³ of concrete and 2 020 tons of reinforcement were used in the construction of this structure.

After a construction period of 33 months and at a cost of approximately R165 million, Hibernian Towers was completed in March 2009.

▶ CONTACT: Pravesh Naidoo
Tel: +27 (0)21 912 3000
Fax: +27 (0)21 912 3222
Email: pnaidoo@kv3.co.za

KV3 KEEPS ABREAST OF TECHNOLOGICAL ADVANCES

The Environmental and Waste Management Division of KV3 has been involved in consulting clients in the waste management field for over 23 years. In this time we have grown to be one of the leading consultants in the waste management field in South Africa and our expertise covers the total field of waste management. We have also successfully completed projects in different parts of Africa.

As our involvement in the waste management field expanded, we also became involved with investigations into alternative waste treatment technologies. We have always believed in keeping abreast of the most up-to-date technologies from around the world. Our staff regularly attends relevant congresses to learn from others and quite often to participate in delivering papers. In order to play a bigger role in the global waste management arena, Chris Liebenberg attended the International Waste Symposium in Sardinia in 2007, where he also delivered two papers. This was followed up by an attendance at the Waste and Biomass to Energy Symposium in Venice in 2008, which was attended by over 600 delegates from 67 countries.

At this symposium, he delivered a paper titled "Public acceptance of incinerators: are we addressing the right issues?". He brought his experience and insight of the public participation process to the fore. With the establishment of incinerators, many important components need to be addressed in the process of setting up a facility or waste-to-energy plant. The one main criterion is the Environmental Impact Assessment process which includes a social component of getting the approval or buy-in of the general public in the surrounding areas, as well as of any interested and affected parties.



Many of these types of projects have failed to be implemented due to objections and concerns from these parties.

Technologies improve each year and the improvements in incineration technologies, especially exhaust fume scrubbing technologies, are already at a high standard. Professionals can rightly stand up at any public forum and tell the public how well the process will work and how little negative impact it will have on the surrounding environment, but the public does not always believe what they are told by technocrats. Chris's paper took an in-depth look at why this happens and whether we as professionals, handling these processes, are actually addressing the real issues, and what should be done to improve the success rate. A number of suggested positive interventions were explained.

Chris was also invited to be part of the panel of ten experts for the discussions held at the close of the symposium, which was called a "Round Table Plenary Session". The subject was "Health-related issues and public acceptance of thermal treatments". The aim of this round table session was to stimulate discussion between a panel of experts from various disciplines and the delegates, on the scientific aspects of health-related

issues and other controversial subjects on mass-burn technologies. The discussions also focused on technological aspects of thermal treatments, underlining the role they play in energy production and to assess whether the opposition and concern displayed by public groups and individuals are based on scientifically-proven facts or rather facts of an emotional nature. This resulted in a very lively discussion and the issues were debated from all angles.

On the last day of this symposium, a large waste-to-energy plant of A2A in Brescia was visited, where approximately 100 tons per hour of pre-sorted waste are converted into electrical energy through steam turbines. The waste heat is recovered and then used to heat water which gets piped to 67 000 houses for central heating purposes.

In this way our knowledge has been updated and information from this specific experience has been put to good use. As lead consultants of a transaction adviser team for the City of Johannesburg on an Alternative Waste Treatment PPP project, we have been able to add extra value with our extensive and up-to-date information.

▶ **CONTACT:** Chris Liebenberg
Tel: +27 (0)12 425 6300
Fax: +27 (0)12 460 1336
Email: cliebenberg@kv3.co.za

EMPOWERING LOCAL COMMUNITIES THROUGH KNOWLEDGE

BUILDING SKILLS THROUGH SUSTAINABLE INITIATIVES

At KV3 we acknowledge that our future is inextricably tied to the sustainable development of communities in South Africa. Our success depends on a climate of economic and social prosperity.

We have taken responsibility for our role and are committed to the communities we serve. Our Corporate Social Investment programmes are based on the principles of partnership and community development.

The socio-economic impact of HIV/AIDS, high unemployment and the continuing educational gap are just some of the challenges we face. These issues are high on the government's agenda. However, success depends on the South African society's involvement beyond government. The private sector, alongside government and civil society, must play a significant role in the upliftment of South Africa. KV3 contributes to this mission with fervour, with our focus on education, job creation and HIV/AIDS.

Our active engagement in the promotion of entrepreneurship in small and medium enterprises (SME's), as well as the economic empowerment of historically disadvantaged communities, illustrate our commitment to long-term projects that promote self-sufficiency and sustainable development.

Our dedicated social investment programme promotes sustainable development by investing resources in the communities we serve. Investment includes both financial and non-financial resources and consists of donations to civil society organisations, socially responsible sponsorships and commercial ventures.



Winky Ximiya far right with staff of Homevale Secondary School

GROWING A NATION OF SCIENTISTS Mathematics and Science (Physics and Chemistry) are the gatekeepers to many essential professions and services and are required for all nations to compete effectively, yet not enough South African learners successfully complete their studies in these subjects. KV3 recognises the shortfall and, through the Chairperson Corporate Social Investment Programme (CCSIP), aims to promote and entrench appropriate passion and skills for these subjects in our learners.

The CCSIP helps to promote the teaching of Mathematics and Science at schools, with a view of reaching and/or maintaining a high standard of teaching in these subjects. We aim to provide the necessary resources required by learners with an aptitude for the subjects and to allow them to achieve the highest possible marks in their final matriculation examination. It is hoped that some of these learners will be encouraged to study Engineering at University upon leaving school.

We have selected four schools to promote the teaching of Mathematics and Science, namely:

- 1) Ntsokotha Senior Secondary School outside Queenstown

- 2) Homevale Secondary in Kimberley
- 3) Pesodia High School in Kimberley
- 4) Bridgton High School in George

The benefits of our investment in Bridgton High School were evident when the learners came fifth in the 2008 matric examinations, in the "Previously Disadvantaged School" category.

In addition to sponsoring the schools mentioned above, KV3 has adopted a talented 11-year old girl, Thuli Manunga, who has won numerous awards for her exceptional public speaking abilities. What makes her even more outstanding is the fact that she does this in Afrikaans, which is not her home language. KV3 contributes R25 000 each year for the development of this gifted and magnificent young girl.

We have played, and will continue to play, a responsible role in all South African communities. Our CSI programme reiterates our commitment to the key social issues facing the country today, coupled with our promise to show leadership by example.

▶ **CONTACT:** Winky Ximiya
Tel: +27 (0)12 425 6300
Fax: +27 (0)12 460 1336
Email: wximiya@kv3.co.za

KV3 EQUIPS KATHU FOR NEW RESIDENTIAL DEVELOPMENTS



PROJECT DETAILS:

Project description: The construction of a 14ML reservoir and a 2.5ML elevated tower for Kathu

Project costs: R33 536 175.06 (construction costs and professional costs including VAT)

Construction period: 60 weeks

Client: Gamagara Municipality (Northern Cape Province)

Contractor: Patula Balekane JV

Contracts manager from contractor: Mike Randall

KV3 design engineer: Alwyn le Roux (structural design)

KV3 design engineer: Telez Augustyn (mechanical design of pump station)

KV3 project director: Wian Steynberg (responsible for project execution, including tender phase, project management and site supervision)

KV3 office of appointment: Kimberley

electricity) had to be upgraded to accommodate these developments. More importantly, the bulk services had to be in place prior to the construction of the internal services of these ± 5 200 stands.

The construction of the reservoir and elevated tower was one of twelve bulk service projects that had to be executed as a result of the SEP. The existing bulk infrastructure of Kathu was more or less operating at maximum capacity and therefore new bulk infrastructure had to be built for the proposed new residential developments.

Kathu, a town in the Northern Cape, originated because of its mining activities. It boasts one of the largest open-cast iron ore mining operations in the world.

As a result of the Sishen Expansion Project (SEP) of the Kumba Iron Ore Mining Group (now owned by Anglo), approximately 5 200 residential stands (a combination

of low, medium and high density units) will be developed on the eastern side of Kathu. KV3 was appointed by Gamagara Municipality to conduct the design and project execution of the new reservoir and elevated tower for these proposed developments.

Inevitably, the bulk infrastructural services (water, sewer, roads and

▶ **CONTACT:** Wian Steynberg
Tel: +27 (0)53 831 4199
Fax: +27 (0)53 832 2497
Email: wsteynberg@kv3.co.za

TECHNICAL DETAILS:

RESERVOIR

Capacity: 14ML
Diameter: 47m
Height: 9m

As a result of the size, the post tensioning construction method was used for the reservoir.

ELEVATED TANK

Capacity: 2.5ML
Diameter of reservoir section: varies between 14m and 21m
Total height: 35m
Height of top water level: 32m above ground level

BOOSTER PUMP STATION

Pump size: 185kW
Pump delivery: 400l/s at a head of 32m
Generator size: 250kVA

The booster pump station withdraws water from the reservoir and pumps it up the tower. The pump station is situated between the reservoir and tower. Two pumps have been installed with a duty-standby configuration. A standby generator was also installed in case power failures occur.

KV3 INTERVIEW



HANS KAREMAKER, DIRECTOR AND CHIEF OPERATING OFFICER

widely representative of South Africa's rainbow nation. Today, KV3 is also a world-class engineering company that works closely with international companies and high quality people who are well-educated and trained.

WHAT HAS BEEN THE BIGGEST CHALLENGE IN YOUR CAREER SO FAR?

KV3 and the industry have gone through some challenging changes. I can highlight Kwezi's BEE transaction in 2000, the competition that entered the industry and lately the globalisation, world recession and skills shortage we now face as some of the biggest.

WHAT MOTIVATES YOU TO SUCCEED?

I love the challenges engineers are exposed to, as well as engaging with clients, working to provide solutions and seeing the difference it makes to our country and environment.

TELL US ABOUT ANY INTERESTING PROJECTS YOU ARE CURRENTLY WORKING ON.

I am very privileged to work on projects like Gautrain, Eskom Medupi and the Kusile Rail. Under the current economic conditions and target programmes these projects have proved to be very challenging.

WHAT ARE THE BIGGEST CHALLENGES FACING THE ENGINEERING INDUSTRY?

To provide, maintain and operate sustainable environmentally-friendly infrastructure, buildings and industries. To sustain this, the industry needs to create an environment which is acceptable to young people to choose engineering as a career.

ANY ADVICE FOR ASPIRING ENGINEERS?

Work hard, keep up with technology, listen to your clients, protect the environment, deliver on time, be responsible and remember to live.

WHAT ARE YOU CURRENTLY READING?

The Shack by William Young.

FAVOURITE HOLIDAY DESTINATION? WHY?

Zebula in the Bela-Bela area and George in Southern Cape. Zebula offers the relaxing bushveld, game viewing and campfire-talks and George the fantastic golfing in one of the most beautiful areas in the world.

FAVOURITE SPORT TO WATCH AND/OR PARTICIPATE?

I am a sport fanatic and play golf, tennis and squash. I also enjoy watching rugby, tennis, golf and even squash, sometimes to my wife Riana's frustration!

YOU HAVE BEEN WITH KV3 FOR 25 YEARS. WHAT A MILESTONE! WHAT WAS YOUR POSITION WHEN YOU STARTED?

I started in 1984 as a structural engineer in the Pretoria office which, at the time, totalled not more than 20 employees.

HOW HAS THE COMPANY CHANGED SINCE THEN?

Over the 25 years that I have been with KV3, it has gone through many changes. When I joined the company in 1984, then only seven years old, we were a predominantly Afrikaans-speaking company in a partnership environment. Since then, KV3 has developed into an incorporated company structure and currently it's a propriety limited company with close to 800 employees in the group,



HECTOR PETERSON SENIOR SECONDARY SCHOOL GOLF DAY

On 15 March, KV3 sponsored a Golf Day at the Hector Peterson Senior Secondary School. We are proud to be associated with such a historical school.

KV3 staff members, pictured from left to right: Stoney Steenkamp, Ashley September, Louw Venter and Herman Wolff.

KV3 IN ZAMBIA

KV3's involvement in Zambia over the last ten years, as KV3 Consulting Engineers, has been restructured with the formation of a newly established KV3 Engineers Zambia under new shareholding and management.

Zambia is a landlocked country and is geographically located at the centre of the SADC region. It predominantly depends upon the Indian Ocean ports of Dar es Salaam and Durban for its imports and exports, which largely include mining products. It is therefore in need of alternative and shorter access routes to the sea to facilitate the decongestion of these two traditional ports and to relieve the immense pressure of heavy and bulk cargo transportation on its roads.

Similar needs and concerns of sub-Saharan African countries were addressed at a high-level investment conference, the North-South Corridor conference. It convened as a tripartite meeting of COMESA, EAC and SADC in Lusaka from 6 to 7 April 2009 and was attended by five heads of state and over 1 000 officials, donors, business people, ministers and diplomats from Africa and elsewhere. Over US\$1.2 billion was pledged for rolling out this Aid for Trade programme to finance infrastructure development along and across the North-South Corridor (which traverses eight countries in eastern and southern Africa),

facilitating physical interconnectivity throughout the region.

Against this background, KV3 is actively involved in identifying alternative rail line routes in Zambia to interconnect into the North-South Corridor. Under the aegis of South Africa's Department of Trade and Industry, KV3 has prepared a feasibility study involving financial modelling, preliminary design and an environmental impact assessment for the North-West rail line connecting the mining towns of Chingola and Lumwana in Zambia's Copperbelt. Plans are now in hand to extend this North-West rail line to a rail

connection on the Angolan border and thus become a major rail corridor from the Copperbelt to the Atlantic Ocean port of Lobito.

From its newly located offices in Lusaka, KV3 Zambia is undertaking, on behalf of ARQ in South Africa, the construction supervision of the Lusaka Premier Health Clinic, a US\$20 million hospital, expected to become one of Zambia's foremost commercial multi-disciplinary medical facilities with a capacity of 120 beds.

▶ **CONTACT:** Tahir Taherzadeh
Email: ttaherzadeh@kv3.co.za

PMR WINNERS

KV3 Engineers Kimberley and Upington received the highest rated award from Professional Management Review (PMR), namely the 'Golden Arrow Award' in the Business Sector: Engineering Consulting Firms in the Northern Cape Province who did the most in their specific business sector to enhance economic growth and development in the Northern Cape Province.

PMR conducted a survey on November 2008 to January 2009, evaluating businesses, local/provincial government and professional firms through market research and interviews with clients to identify business excellence and achievements.



Schalk van der Merwe (Kimberley Office) and Abrikus Agenbag (Upington Office) displaying their PMR Golden Arrow Awards certificates received for First Overall, Northern Cape Province Leaders and Achievers, Engineering Consulting Firms.

▶ **CONTACT:** Schalk van der Merwe
Tel: +27 (0)53 831 4199
Email: svdmerwe@kv3.co.za

Abrikus Agenbag
Tel: +27 (0)54 332 4943
Email: agenbaga@kv3.co.za

KV3 Cape Town +27 (0)21 912 3000
KV3 Bloemfontein +27 (0)51 410 8700
KV3 Durban +27 (0)31 275 8500
KV3 Pretoria +27 (0)12 425 6300
KV3 Port Elizabeth +27 (0)41 391 8811

AFRICA & INTERNATIONAL
KV3 Kinshasa (DRC) +243 81 814 3951
KV3 Lusaka (Zambia) +260 211 261 810
KV3 Abu Dhabi (UAE) +971 2 550 0785
KV3 Windhoek (Namibia) +264 61 24 0909
KV3 Tripoli (Libya) +218 21 484 0792

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