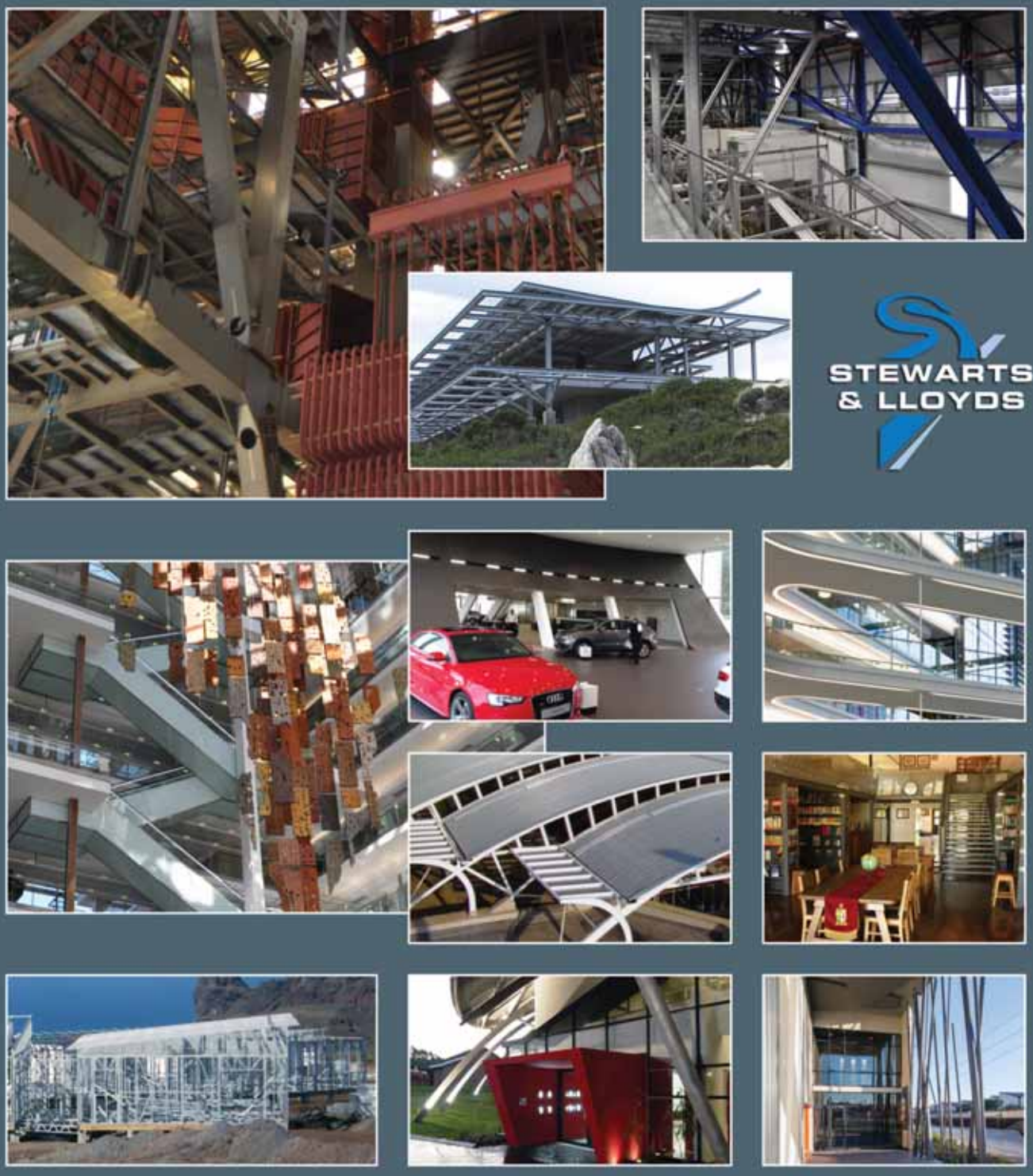
steel CONSTRUCTION

Volume 37 No. 6 2013

CONGRATULATIONS TO ALL THE STEEL AWARDS 2013 WINNERS



IN THIS ISSUE: International Projects

OFFICIAL JOURNAL OF THE SOUTHERN AFRICAN INSTITUTE OF STEEL CONSTRUCTION

Total process optimization

Bob (35) knows the most efficient way to design, detail, and fabricate a steel structure. His company uses Tekla to automate fabrication and project management through interfacing with MIS systems and CNC machinery. What's more important, sharing the Tekla model allows the project team members to stay in the building information loop real-time.

Tekla BIM (Building Information Modeling) software solutions provide a data-rich 3D environment that can be shared by contractors, structural engineers, steel detailers and fabricators, and concrete detailers and manufacturers. Choose Tekla for the highest level of detail, accuracy, constructability and integration in project management and delivery. Visit our website to learn more about Tekla solutions and references. Since 2011, Tekla has been a part of the Trimble Group.

> www.tekla.com

Contact **Cadex SA**,
Tekla's Partner for
Southern Africa
info@CadexSA.com
www.CadexSA.com

TEKLA
potential^3

EDITOR'S NOTE

2013 is rushing to its end *(and I still have so much to do!)* and most companies have already done their planning for 2014 - looking forward and speeding to the next goal and the next. Time has become the most precious commodity.

I think the Institute can be proud with how they filled their hours in 2013. We kicked off the year with SteelFuture and didn't really stop for a breath after that. Great strides have been made in the multi-storey building system (read a bit about it on p. 11); another successful Steel Awards was completed and we have had a very smooth transition from now retired CEO, Hennie to the new CEO, Paolo.

In this issue there is a lot said about new activities of the Institute including the establishment of two new associations SAMCRA and POLASA (see pages 16 and 20) as promised in the previous issue. Our 'buy local' campaign is also picking up speed and the Don't steal. Buy SA Steel. billboard received appreciation from members and even a complaint to the Advertising Standards Authority (ASA).

A number of Steel Awards entries were refurbishment or extension type projects, so many and of such quality that the judges decided on joint winners for the category. So, for the international projects I looked at refurbishment and extension projects and though there were many to choose from, highlighted only two projects for this issue.

Apology

Volume 37 No. 3 2013: Front cover and the images used on page 26 and 27 of the same issue:

Steel Construction apologises for not giving due credit to the photographer Mike Bagley of Megapix Digital.

steel CONSTRUCTION

Volume 37 No. 6 2013

Contents

SAISC COMMENT

2 The Institute's mission for the next 10 years

PROFILE

4 Quality Steel

INDUSTRY NEWS

7 Industry news in brief

10 The future of steel construction in South Africa – Innovation

16 SAMCRA (South African Metal Cladding and Roofing Association)

20 POLASA (Power Line Association of South Africa)

22 Don't Steal. Buy S.A. Steel

SASFA

24 SASFA feedback meetings – 2013

26 SASFA News

PROJECTS

28 Theater on the Roof

34 Industry solves technical challenge

TECHNICAL

38 Lapped joints in compression

40 Should we go Eurocode for Steel?

SAISC NEWS

42 Steel Awards 2013 – New Generation Programme

44 Social snippets

46 Steel Awards 2013 suppliers

47 Steel Awards 2013 sponsors

48 Support the SAISC School of Draughting

Join us on and YouTube

OFFICIAL JOURNAL OF THE SOUTHERN AFRICAN INSTITUTE OF STEEL CONSTRUCTION

Steel Awards 2013
Winners and Commendations

Cover Sponsored by Stewarts & Lloyds

PUBLISHED BY
Southern African Institute of Steel Construction
1st Floor, Block C
43 Empire Road, Parktown West
P O Box 291724, Melville 2109
Tel +27 11 726 6111
Fax +27 11 482 9644
E-mail: info@saisc.co.za
Web site: www.saisc.co.za

EDITOR
Reneé Pretorius
...with pepper communications
Tel +27 83 565 7173
E-mail: renee@saisc.co.za

ART DIRECTOR
Sandra Addinall
Tel +27 11 868 3408
E-mail: cbtdesign@adcot.co.za

REPRO & PRINT
Camera Press
Tel +27 11 334 3815

ADVERTISING
Viv van Zyl
Tel +27 16 349 6839
Cell +27 82 492 8603
Fax +27 86 647 2788
E-mail: viv@lantic.net

SOUTHERN AFRICAN INSTITUTE OF STEEL CONSTRUCTION (SAISC)
Chief Executive Officer
Paolo Trinchero
paolo@saisc.co.za

Education Director
Spencer Erling, PrEng.
spencer@saisc.co.za

ISF Director
Neels van Niekerk
neels@isf.co.za

SASFA Director
John Barnard
john.barnard@saol.com

SAMCRA Director
Dennis White
dennis@saisc.co.za

CHANGES TO THE MAILING LIST:
Please notify us of any changes to the mailing list.
info@saisc.co.za

SUBSCRIPTIONS:
To subscribe to Steel Construction contact us at
info@saisc.co.za

ANNUAL SUBSCRIPTION:
R100.00 South Africa
R200.00 Other countries
Prices include VAT, packaging and postage.

SAISC COMMENT

By Paolo Trinchero,
Chief Executive Officer, SAISC

We need to roll up our sleeves and put in the hard yards to do so. Yes, we will continue to work on education and training, but we need to work on developing business, people and opportunities.

THE INSTITUTE'S MISSION FOR THE NEXT 10 YEARS

The steel construction industry currently presents many challenges and opportunities. In the last decade we have experienced boom times with the highs of the 2010 FIFA World Cup and large power station projects to the lows of the last two years where large projects are few and far between and international competition is growing.

What has become clear is that the Institute needs to prioritise and focus on projects and initiatives which will have a direct, positive impact on our members.

We need to:

- Grow our market by increasing the share of steel in traditional concrete, timber and plastic industries. This includes multi-storey steel framed buildings, bridges (pedestrian and road), transmission pylons, guard rail posts, piling and piping. The light steel framing initiative has played a significant role in growing a new market. In addition to this we may need to look at other sectors closely aligned to construction to increase our reach and membership.
- Increase the size of our market through exports. The SAISC and ISF need to work together to lay a foundation for our members to access more work in Sub-Saharan Africa.
- Ensure that our industry gets as large a slice as possible of government projects (National Development Plan). We can do this by lobbying, working with and educating government.
- Develop young South Africans to play a role in member companies. This can include fields such as engineering, marketing and business development.
- Assess our competitiveness through benchmarking.
- Find ways to motivate and train our work force. This could have a substantial influence on making the industry more competitive.
- Identify opportunities to standardise on steel grades, codes and products across Sub-Saharan Africa, which should give us access to additional markets. This could be promoted by taking our training courses to other African countries.
- Be mindful that we are now in a global market place and we should work closely with our designers to maximise potential benefits.

An enormous amount of work has been done by the Institute over the last decade and I consider it to be critical to ensure that this work continues, that the staff, committees and initiatives remain in place and the Institute continues to thrive.

When one first comes into office, it is easy to make lofty statements, then back track and blame everything on outside factors such as the local economy, the slowdown in Europe, lack of training, not enough skills, government policy etc. We forget that despite all the challenges that we have faced in the past and those which we are facing right now, ingenuity and entrepreneurial flair continue to survive and thrive in South Africa.

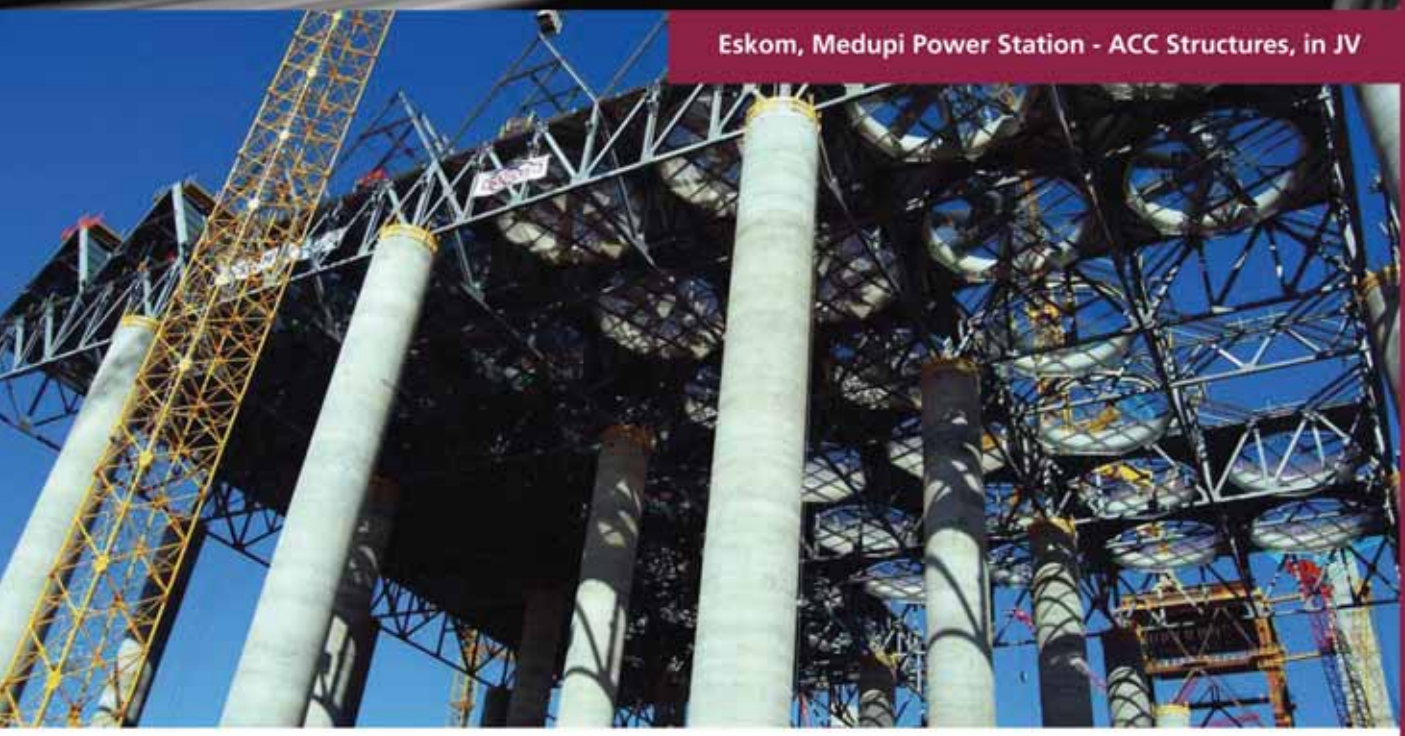
So here is my lofty statement. "We want to grow the market for steel construction in Southern Africa by 5% per year for the next 10 years"

I believe that together, with all the players in our industry, we have the passion, the people and world-class companies to realise this goal. We need to roll up our sleeves and put in the hard yards to do so. Yes, we will continue to work on education and training, but we need to work on developing business, people and opportunities.

So please work with us, challenge us and keep us on our toes. Remember in this industry it is not frowned upon to work hard, have fun and show a profit.

CADCON

STEEL CONSTRUCTION AND ENGINEERING



Eskom, Medupi Power Station - ACC Structures, in JV

Established in 1987, Cadcon, as a vibrant and reputable entity, has grown into a leading steel construction, designing and engineering organization involved in major projects in and around Southern Africa and internationally. Cadcon operates from their 15 400 m² workshop and office facilities in Centurion, Pretoria, housing state of the art machinery and latest technology CNC plate, beam, angle, cutting, drill and saw facilities serviced by 20 overhead cranes. Cadcon has also implemented the FabTrol System providing drawing management, material nesting, purchasing, inventory control, production and CNC management, shipping and more.

Eskom, Medupi Ducting Supports, Lephalale

Planning and completion of various significant and complex national and international projects on time, for commercial, industrial, mining and plant sectors, serves as testimony putting Cadcon as a leader at the cutting edge, in a rapidly growing and competitive environment. Cadcon has valuable experience in exports of steel products internationally and strong innovative contributions to the whole of Southern Africa.

Overall Winner SAISC Steel Awards 2011
Sandton City - Protea Court Rooflight, in JV

Furthermore, Cadcon's unique packages include the design and supply of buildings through Mictec, Cadcon's in-house engineering design department. Additional services include crane, truck and trailer hire.

Cadcon operates their full production process from the delivery of raw material, fabrication, abrasive blasting, corrosion protection, erection and finishing to the proud delivery of the final product through their team of graduates and dedicated artisans. Cadcon's methodologies and processes results in their ability to provide their clients with turnkey solutions at optimum efficiency; **STRIVING FOR EXCELLENCE AND PEACE OF MIND IN STEEL CONSTRUCTION**, this being the cornerstone of Cadcon's success and competency.

steel
SOUTHERN AFRICAN INSTITUTE OF STEEL CONSTRUCTION

SAIW CERTIFICATION iiw
ISO 3834 Part 3
Certificate No. ZA - 033

Quality Management DQS ISO 9001:2008

SEIFSA

Striving for Excellence and Peace of Mind in Steel Construction

1027 Ergon Street • Lyttelton • Ext. 6 • 0157 • Box 35042 • Menlo Park • 0102
Tel: 012 664 6134/40/43/77 • Fax: 012 664 6166 • E-mail: richbutler@cadcon.co.za • www.cadcon.co.za

Quality Steel's Managing Director, André Potgieter.

QUALITY STEEL

By Spencer Erling,
Education Director, SAISC

Key to André's approach is great service from all divisions of the company. His brochure describes Quality Steel as the 'bull terrier' of the industry – tenacious, trustworthy, tough, fast and effective, fierce in their approach, drive with passion to finish well and all in the interest of a loyal relationship with his clients.

I was fortunate enough to have the opportunity to visit Quality Steel's works in Nelspruit at the beginning of June 2013.

It was exciting to see the "big fish in the small pond" doing all that is necessary to be totally up to date on the technology side, from 3D detailing to a full set of NC controlled equipment on the shop floor, to modern erection cranes, and happily tackling the export market and succeeding. Many of his bigger peers in the cities close to all the big company agencies are surely jealous of this brave approach.

Chatting to Managing Director, André Potgieter is refreshing. No 'cry and moan' about the difficult market, there is just a determination to get on top of all the challenges. There is a strong pride in what he has achieved.

Key to his approach is great service from all divisions of the company. His brochure describes Quality Steel as the 'bull terrier' of the industry - tenacious, trustworthy, tough, fast and effective, fierce in their approach, drive with passion to finish well and all in the interest of a loyal relationship with his clients.

Established in 1993, a decade later found themselves land owners in Waterfall Avenue, the home of their modern workshop. In the next decade amongst their achievements were compliance with the OHS Act; their first R20 million project; registration with the CIDB; setting up of a quality management system in accordance with ISO9001:2008 and the opening of their 5 300m² works with a 400 ton per month capacity, investing some R15 million. That's going some for a privately owned company. They also have a Level 3 BEE contribution. Their workshop is now equipped with a Voortman drilling and saw combination and a Hypertherm plasma plate handling centre.

Quality Steel offers the full structural steel service from design, detailing, fabrication, painting to erection. Turn key projects complete with earthworks and civils together with mechanical work also on the menu.

Whilst their home base is in Nelspruit, they do work elsewhere in South Africa. The Lowveld sugar industry is one of their customers, together with shopping malls in

A view of Quality Steel's workshop equipped with Voortman equipment.

Contact: Andre D Potgieter
Tel: +27 13 752 2723/4
Fax: +27 13 752 2407
Email: andre@qualitysteel.co.za
Website: www.qualitysteel.co.za

NEVER COMPROMISE

Quality Steel

Give this puppy face A CHANCE TO QUOTE on your job

MECHANICAL WORK

Mechanical Structures • Conveyors

TURNKEY PROJECTS

Design, detailing & Shop Drawings • Earthworks • Civils

Structural Steel • Sheeting

we are powered by Voortman

www.qualitysteel.co.za

THE BULL TERRIER OF THE STEEL INDUSTRY

7 Waterfall Ave
Riverside Industrial Park
Nelspruit

Telephone : 013 752 2723/4
Email : office@qualitysteel.co.za
Andrè Cell : 083 2899 298

the area. Their repertoire includes very decorative architectural to the strongly engineering plant type work.

Their recent projects include:

- Buscor, Nelspruit – Bus Terminus
- Sonae Novobord, Rocky's drift – MDF Ducting & Cyclone
- TSB Sugar, Malelane – ELB/Bulk Stores
- WBHO Construction – Barlow World Tete, Mozambique

They have a strong customer base in neighbouring territories such as Mocambique, Zimbabwe and Botswana as well as further afield in Africa.

But their policies do not stop at contracting business they specialise in:

- They have a green initiative which re-uses, reduces and recycles.
- They are environmentally aware and are constantly passing these messages onto their staff. By keeping their vehicles in tip-top condition they are minimising harmful emissions and are working towards ISO14001 certification.
- On the health and safety side they are complying with the requirements of ISO18001.

But it is in the area of corporate social responsibility that André and his team are truly showing the way, especially considering they are really quite a small company, they are punching way beyond their weight. "Instead of moaning about what the government aren't doing, we are filling the gap, helping to better the future for the next generation", André confirms.

Sonae Novobord, Rocky's drift – MDF Ducting & Cyclone. Their repertoire includes very decorative architectural to the strongly engineering plant type work.

Our current 'We care to make a difference' project is helping to build a new social hall at Kamagugu of 600m², by providing the structural steel, sheeting and ventilators. The hall includes two classrooms and a therapy centre that will relieve the waiting list of 76 learners.

Kamagugu Inclusive School is one of only 30 Resource Schools in South Africa accommodating learners in high need of support. This entails teaching the learners basic skills like hygiene, sign language, life skills and regular subjects as in any other school. This prepares them for adulthood to be independent and productive members of society.

Great one guys, I hope all our members take a leaf out of André's book.

One of their recent projects: Buscor, Nelspruit – Bus Terminus.

INDUSTRY NEWS IN BRIEF

CADEX SA INVITES STUDENTS TO THE NEW TEKLA CAMPUS TO JOIN BIM WITH FREE SOFTWARE

Steel Awards 2013 Photo Competition Sponsor

Tekla and Cadex SA both consider Building Information Modeling (BIM) highly important for engineering and construction students. They now give them an opportunity to learn BIM with their software with the opening of Tekla Campus, an online academy for students.

Tekla offers students an opportunity to download Tekla Structures Learning edition, a free student license of the BIM software. The students can use the fully functional software for self-learning, school projects and course work. In addition to the software, Tekla Campus offers learning material, video tutorials, and a discussion forum for peer support and sharing thoughts.

When a student enters today's tough job market, the skills learned on Tekla Campus may prove very valuable.

"Students who know BIM can get better jobs, and are more proficient with the tools that industry uses now and in the future. I would learn BIM if I were a student today," says Michael Evans, Director of Engineering & Key Accounts at Tekla.

The students who start Building Information Modeling can participate to the student competition in Tekla Global BIM Awards later on this year. Why not start learning by doing?

Visit Tekla Campus at campus.tekla.com and visit Cadex SA at cadexsa.com

INCREASE IN ORDER BOOKS AND MARGINS UNDERSCORE RENEWED OPTIMISM ACROSS GLOBAL CONSTRUCTION INDUSTRY

After prolonged economic uncertainty, a majority of companies in the global engineering and construction sector have fresh confidence in the growth prospects for the industry, according to KPMG International's 2013 Global Construction Survey: Ready for the Next Big Wave?

Tekla BIM Software.

Just over 50 percent of 165 respondents from the Americas; Europe, Middle East and Africa (EMEA); and Asia-Pacific (AsPac) regions say their companies are expecting an increase in order books of at least five percent in the period from 2012 to 2013.

From a South African point of view, KPMG interviewed ten of the leading construction companies in the country. Of the ten companies, 70 percent indicated that they foresaw their order books increasing by more than 10 percent in 2013 over 2012, which is significantly ahead of the global trend.

The growth can be attributed to favourable trading conditions in the regions, as well as good prospects for mining, oil and natural gas in certain parts. In South Africa, 60 percent of the companies interviewed forecast growth of up to 25 percent in 2013.

Government infrastructure plans still remain the leading driver for growth in the sector overall according to 66 percent of respondents, followed by global economic growth (42 percent), and population growth (38 percent). In South Africa, all ten companies indicated that government infrastructure plans will have the most impact on the future of the industry, followed by urbanisation (60 percent), global economic growth (50 percent) and access to new energy resources (50 percent).

Only one company in South Africa believes that Public-Private Partnerships (PPP's) will be a key market driver. Last year's survey revealed that globally there was a lack of trust between the private sector and government in recent years.

Nearly two-thirds (63 percent) say that it will be between two to five years for

INDUSTRY NEWS

market drivers to have a positive impact on the industry.

Many companies maintain a balanced view on what the likely obstacles to growth might be, with budget deficits and public funding shortages being the overwhelming factor according to 72 percent. 80 percent of South African construction executives agree that budget deficits and the public funding crisis is the leading market impediment, followed by regulation and private sector financing availability.

In anticipation of continued growth, 47 percent of respondents say their companies are making plans for international expansion into new regions. Africa (35 percent) is the top priority.

Entering new industry sectors is also important for growth. From a local point of view, 70 percent of South African companies identified the power/energy sector as a top priority, followed by water-related activities (50 percent) and mining (40 percent).

VITAL ENGINEERING'S PRODUCTS A MATCH FOR TOUGH MINING CONDITIONS IN AFRICA

Steel Awards 2013 Partner Sponsor

Quality of product is the ultimate test when it comes to meeting the challenge of harsh mining conditions on the African continent. This is the view of Chris Spacey, Export Executive at Vital Engineering. Vital Engineering manufactures high quality non-slip floor gratings, stair treads, expanded metals and hand railings in galvanized steel, fibreglass, stainless steel and aluminium.

"We are constantly developing new products for challenging mining environments and have supplied in excess of 10 000 tons of product over the last five years alone to the African mining industry, including gold, coal, uranium, copper and cobalt," he says.

The 4014 and 4017's new designs have significantly improved visibility in line with the EN15830 European standards.

"Our products are supplied to gold mines in Burkino Faso, Ghana, Guinea, Namibia, Tanzania; copper and cobalt mines in the DRC, Zambia, Namibia and Uganda; nickel mines in Madagascar and Tanzania, and coal mines in Mozambique. We also supply uranium mines in Namibia and Malawi, as well as a kimberlite mine in Sierra Leone."

With massive growth prospects and investment opportunities in Africa, Vital Engineering sees a major mining investment shift happening on the continent, and has positioned itself to meet demand with both a wide and varied stockholding and reliable service deliveries.

"On-time delivery is a must where safety is priority in the mining industry," notes Spacey. "Our dedicated, in-house export division has the necessary experience when it comes to accommodating our clients' delivery requirements."

With ever-intensifying competition from other markets, notably China, Vital Engineering keeps a sharp focus on continually seeking the most cost-effective solutions for its clients in developing mining countries.

"We work closely with a wide spectrum of consultants and EPCM companies in finding the most economical, best-of-breed solution to meet their budgets and performance requirements without compromising on safety and quality," points out Dodds Pringle, Managing Director of Vital Engineering.

"Opportunities in Africa abound, but one can never rest on one's laurels," says Pringle. "An important part of our work, therefore, is to monitor current and new mining projects on a daily basis. Regular field trips by our export team also help to keep us abreast of developments in the mining industry."

IMPROVED PRODUCTIVITY WITH NEW OPERATOR ORIENTED TELEHANDLERS FROM JLG

Eazi Sales & Service – Steel Awards 2013 Partner Sponsor

Eazi Sales & Service, South Africa's sole supplier of world-leading JLG access solutions, has introduced the new JLG 4014 and 4017 Telehandlers, offering optimised productivity, improved user safety and greater operating efficiency whilst reducing total cost of ownership.

Built to take on the toughest applications, the 4014 and 4017 feature a maximum lift capacity of 4 tons and maximum lift heights of 14 and 17 metres respectively.

Designed with additional power for performance, the 75 kW Stage IIIb compliant Deutz engines and Powershift four-speed transmissions deliver the horsepower, speed and control that are needed for optimal productivity. The engines selected are compliant with the latest standards in environmental regulations that ensure reduced fuel consumption and lower emissions. In addition, each handler is equipped with an adaptive load control system (EN15000), for safe operation.

The 4014 and 4017 further benefit from a load-sensing variable displacement piston pump that produces 150 litres per minute output, increasing lifting performance. The piston pump also contributes to reduced cycle times and fuel consumption.

With high ground clearance, a low centre of gravity and a four-wheel drive, the Telehandlers are designed to take on the toughest terrains. Standard frame levelling adds efficiency by varying the level of the frame in relation to the ground when loading on uneven terrain. The front axle of the Telehandlers creates greater stability by keeping the machine straight on slopes of up to ten degrees.

The 4014 and 4017's new designs have significantly improved visibility in line with the EN15830 European standards. The engine, boom pivot and cab are positioned to ensure maximum visibility of the work site. Cab-mounted controls, a wraparound dashboard and easy-to-read gauges make the 4014 and 4017 easier to operate. The new joystick enables simultaneous boom movement, featuring lift up and down, tele-in and tele-out functions, drive direction, gear selection, auxiliary controls, and tilt

Henry Laas, Group Chief Executive, Murray & Roberts.

roller functions. The variety of steering modes available assists the operator in the handling and navigating of tough terrains.

The design has taken into account the need for easy maintenance by mounting the engine to the side, and the grouping of grease points in the boom – which provides easy access for service engineers.

MURRAY & ROBERTS SETS ITS SIGHTS ON AFRICAN EXPANSION

In November this year, Murray & Roberts will add Mozambique to the list of African countries where it has a permanent presence. This follows operations opened in Ghana and Zambia in the last two years. Murray & Roberts's expansion across Africa forms part of its long-term growth plan.

Murray & Roberts is putting this strategy to work by consolidating its operations to take advantage of core global and African growth areas, which include mining, energy, infrastructure and building.

"We see enormous opportunity for Murray & Roberts in the mining and energy sectors across the continent and we are already gaining substantial traction in these markets. We are using the innovation, skills and expertise gained in other countries to position us as market leaders on the African continent," says Henry Laas, Group Chief Executive, Murray & Roberts.

One example of this is Murray & Roberts' 61.6% shareholding in Clough, an Australian engineering and construction company that has worked on more than 20 major energy and resources projects across Australasia in the last year alone. The company recently announced its intention to acquire the remaining shares in Clough.

Although the company has worked on projects across the continent for many years, permanent operations in these three countries will allow it to serve countries in Central, East and West Africa in a more sustainable way.

"Our intention is not to dip in and out of projects but to establish sustainable, long-term operations, that will see Murray & Roberts become a valuable partner in the design, construction and maintenance of large scale projects in these countries," says Laas.

This strategy is paying off. Murray & Roberts has been granted a steady stream of high profile projects in the country and region since becoming a permanent corporate resident in Zambia. These projects include a number of shaft sinking and underground mine infrastructure contracts in Zambia and the DRC.

It is the same for Ghana. The company's permanent operation, based in Accra, allows it to serve companies and contracts in West Africa and it is ideally positioned to take advantage of opportunities in the mining, infrastructure, water treatment as well as the oil and gas industries. Murray & Roberts Water achieved early success in Ghana to provide two modular plants at Gold Fields' Tarkwa Operations.

THE FUTURE OF STEEL CONSTRUCTION IN SOUTH AFRICA - INNOVATION

By Dr. Hennie de Clercq,
retired CEO, SAISC

At a recent SAISC Breakfast talk, Hennie gave a presentation of the future of steel construction in South Africa. Here is an overview of the presentation.

The great movie maker Sam Goldwyn said "Never make forecasts, especially about the future." And that was in an era when the future was a lot more predictable than it is at the moment, especially for the global steel industry – including South Africa – which seems to be in a constant state of flux.

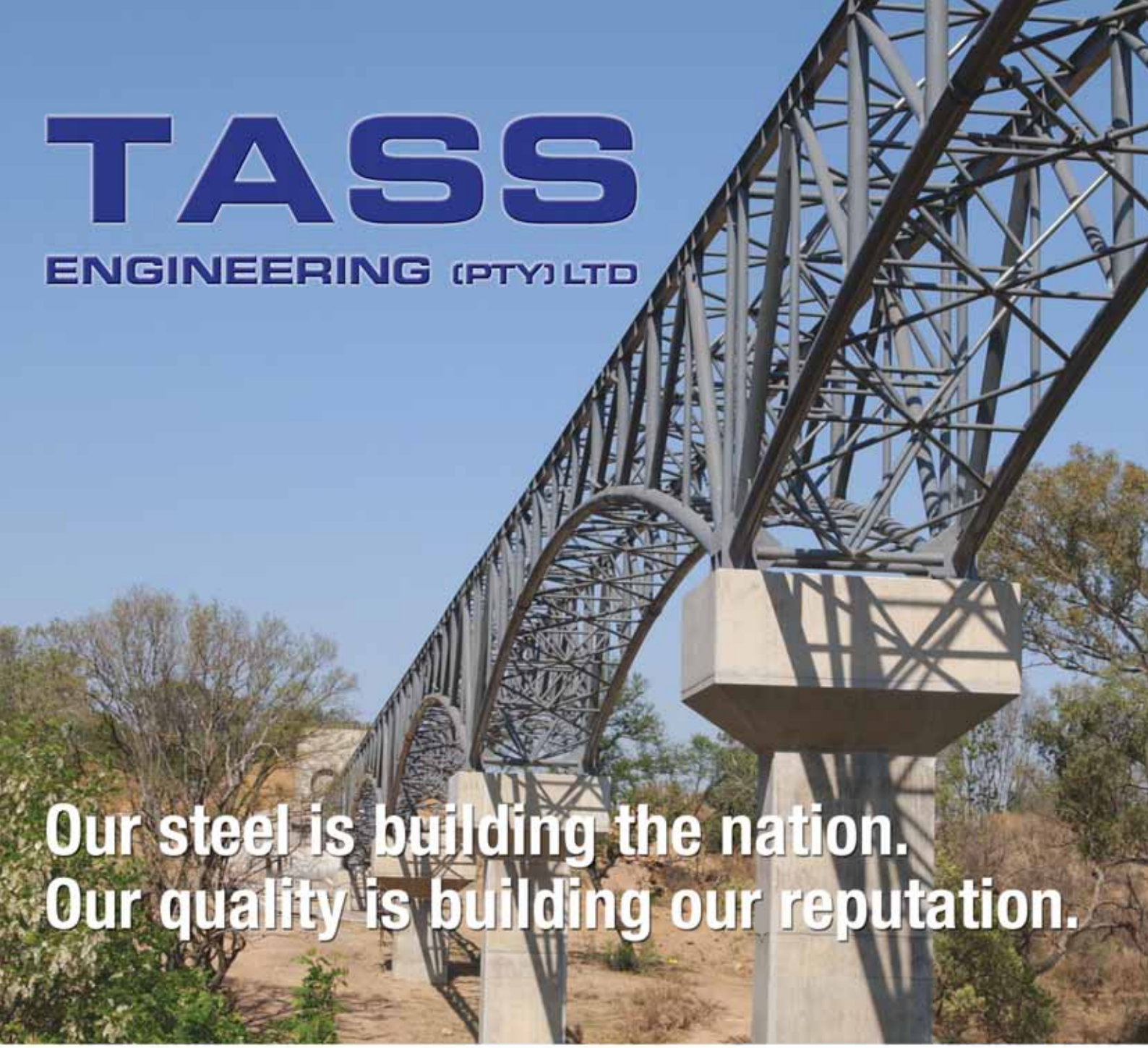
We can only do four things with respect to the future:

- We can identify trends and project them into the future, so we can say there will be growing labour unrest.
- We can identify things that are already determined. If you have 1 million 20-year olds now, you can predict with some confidence that in 20 years you will have some 900 000 40-year olds and more than 1 million kids.
- You can identify all the possible things you can think about, assess their likelihood and develop scenarios around these.
- And you can look at history and at the present to develop a better understanding of the world so that the future will at least not be too much of a surprise when it comes.

So let us look at history, and for that I am one of the better qualified people. In a few months' time it will be 45 years since I started working as a young engineer. Since 1969 there have been amazing changes, mostly enabled by computers. It is absolutely astonishing how we can now design structures and draw and detail them, how information can be fed into CNC machines that fabricate steelwork to exquisite accuracy without the involvement of the old template loft. The speed of communications is astonishing and sometimes a little frightening. We can know where precisely every piece of steelwork is at any time and when what work has to be done to it. Our understanding of the behaviour of steel structures has improved tremendously and we have codes of practise that are thick and complicated to reflect our increased knowledge.

And yet, when we look at a typical steel structure anywhere in the world it looks just about the same as it did 45 years ago. And it takes us about the same amount of steel and the same amount of time to fabricate and construct it. What progress have we actually made during my working life?

Looking more broadly at the steel industry in South Africa I can tell you that 45 years ago the country consumed about 4.5 million tons of steel per year, which



TASS Engineering has been actively involved in structural and architectural steel fabrication and erection for more than four decades.

Current projects:

- New Sentech Masts (650t) - Sentech
- Kansanshi Fuel Depot (130t) - Total Zambia
- Sandton Repositioning Phase 3 Office Tower Cladding - Liberty Properties
- FAW Showrooms - FAW
- Sandton Atrium on 5th Cladding - Liberty Properties
- Medupi Coal & Ash Terrace - ELB
- Cradlestone Mall - Sasol Pension Fund
- Silverstone Street Warehouse (40 000m^2, 850t) - Capital Property Fund (Pty) Ltd
- Forest Hill Shopping Centre (1 000t) - Billion Property Developments (Pty) Ltd
- Mayfield Shopping Centre (350t) - Investec / AM Developments

steel
STEEL CONSTRUCTION
SAIW
ISO 3834 Part 3
Certificate No. ZA-014
SEIFSA

Contact details: Tel +27 (11) 975 0647 • Fax +27 (11) 970 1694 • E-mail tasseng@mweb.co.za

The introduction of LSFB into SA demonstrates that there are certain things that can only be achieved through an association.

amounted to 220kg per person. These days we consume roughly 5 million tons per year, or 100kg per person. We have slipped to half of the world average of 200kg per person per year. Our GDP, incidentally, is about $7 500 per person, whereas the world average is approximately $10 000.

In the early 80s Dorbyl Structural Engineering was working on four power stations simultaneously, all self-designed and constructed within programme and budget, whereas now our whole industry battles with two, admittedly very large, stations, designed in Germany. My information is that fabrication now requires about twice the number of man-hours per ton in comparison with the earlier power stations. I am also very concerned that during the past decade productivity on construction sites has declined badly and costs have increased. I think the time has come to take a serious look at where we as a steel construction industry stand and where we are heading, because the trends are not good.

But let us turn our attention to the environment within which the steel construction industry operates, and firstly to the world as a whole. You may think that I have here at the end of my career become a pessimist, but I see a world under tremendous stress. There are simply too many people. In Henk Langenhoven's words, we have entered a period of chaos and transition. The population of the world is pouring into the big cities at an ever growing rate, and people are producing more and consuming more. That means that they will need housing, offices and factories, water supply and transportation systems, sport, recreation and education facilities, power stations and electricity distribution and many other things. For the steel construction industry that means opportunity on a scale one cannot imagine.

As for South Africa, it will depend on many things that are unpredictable, among others on whether the government and the people will see industry as the saviour of the country or as a bunch of fat cats intent on ripping off the country. I think it all depends on leadership: we clearly need a person and a cadre of leaders, in government and in industry, who will get us all united around a common vision.

It comes as a bit of a surprise to think that Africa's future now seems to be more predictable and upbeat than South Africa's. Expectations for Africa are high and I share that optimism. The continent has huge resources, and I think its people are one of these. While cycling around the continent I have noticed a work ethic among African people that amazed me. Most countries have a better education system than ours and the young people are eager to learn. They also have a positive, constructive attitude to life.

I believe that the South African steel construction industry is faced with great opportunity in the country, and in Africa, and in the world. But I also think opportunity is not going to come to those who sit there hoping that it will come knocking on the door. One has to go out and find it. Moreover, opportunity will come to those who come to the world and to the future with innovation.

Looking at innovation from the point of view of our industry, we can say that there are basically three kinds of innovation: business, process and technical innovation. Business innovation speaks for itself. Process innovation refers to the processes for making products and bringing them to market, in our case design, detailing, fabrication, transport and erection. Technical innovation bears on a product or machine – its design, materials, etc.

Now we need to say that innovation is not the same thing as creativity; it is not just having a brilliant idea. Even if you take your idea further and turn it into an invention by developing it into a workable concept it is still not innovation. You can only talk about innovation once a new concept has been implemented and it becomes established as a new way of doing things.

Light steel framing is an innovation. It is a new way of building that has been successfully implemented. It is interesting to note that BHP, then the large steel mill in Australia, saw the concept of LSFB in America and went ahead to develop it into a system with computer programmes, special rolling machines, etc. Then they gave their intellectual property away to the industry consisting of many small companies, who proceeded to form an association and to develop the concepts and processes further, and to market the product, very successfully.

John Barnard and I went to Australia to study LSFB and we came back and started promoting it. We were faced by all manner of obstacle: it was against the regulations and there were no codes, cities would not allow it and you could not get a bond for such a house from a bank. No artisans were trained in it and the public was suspicious. With the establishment of SASFA we overcame each obstacle. I want to hold it out as proof that the Institute can, in collaboration with the companies in the industry that actually deal with clients and build projects, take a concept through the vital period of market development and successful implementation. In fact, the introduction of LSFB into SA demonstrates that there are certain things that can only be achieved through an association.

More recently the SAISC is engaged in another case of innovation. We have for some time been thinking about the market for office buildings and how we can gain a share of it. It has been clear to us that the important part of that market lies in the three to six storey category, and that such buildings always have parking on the lower floors, which means that the columns have to be on a rectangular grid of about 8.5 x 7.6m. Delivering the entire building – not just the structure – very quickly was another thing we thought about, and that it had to be green, meaning that it had to use a minimum of materials and be demountable

and reusable. So one day I was on a flight to the USA and an idea struck me. When I came back I explained it to Spencer and Amanuel and they started running with it.

The testing and development of the concept have to be completed and then comes the next phase: marketing. I sincerely hope that this project will meet with great success in future.

What do we learn from the two examples I have just discussed – LSFB and the office building concept?

- Ideas come to you in the shower but only if you are actively searching for ideas, talking to people, looking at what others have done and trying out things. Ideas come from individuals, but the stimulus of a group and an environment tends to help.
- Invention comes when you work on an idea to define it, improve it and make it practical. Smaller inventions are fine for an individual or small company to handle, but larger ones require significant resources. The role of BHP in the development of LSFB illustrates this point.
- Innovation tends to require even bigger resources, especially when it also requires market development. A big company or an association may be needed to pull successful innovation off.

I trust you will agree with me that our industry needs innovation in order to meet the opportunities the future holds for it. The SAISC has demonstrated that it can operate successfully in the innovation arena, and I think it has three specific responsibilities in this regard:

- It must stimulate an atmosphere of innovation. It must get all of us in the industry to think of new ideas and create an environment in which innovation can thrive.

Full scale test assembly under construction.

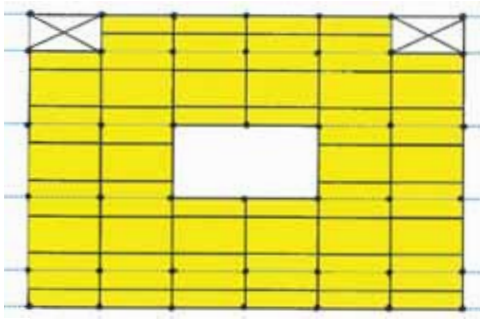
- The Institute must support innovators in the industry, be they companies or individuals. The DTI and DST have 'innovation funds' that can be tapped for development, which includes market development.
- And then the Institute can do technical development on behalf of individual companies or groups of companies, and it can do market development for technologies that several companies will benefit from.

I would love to come back one day and see the Institute as a house of innovation, an exciting place where people come to share ideas, get collaborators, receive technical support, and even find sources of funding for new concepts or investment opportunities.

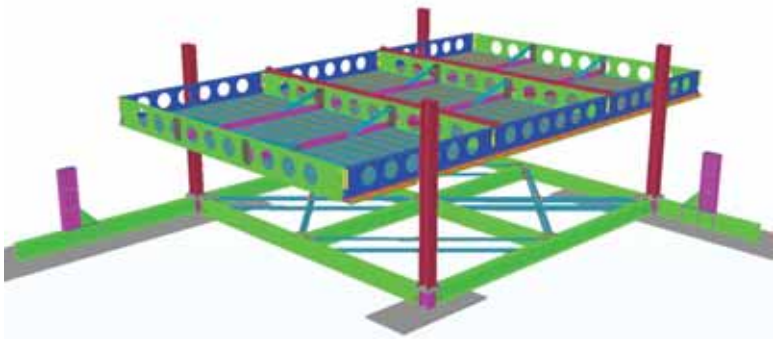
I want to encourage you sincerely to get yourself and your company on an innovation track. Being innovative is not something that some people are born with and others not. What distinguishes innovators is an enthusiasm for finding new ways of doing things, discovering new needs and opportunities, and working hard to turn ideas into reality.

There is a great future for the steel construction industry in South Africa. We need to work hard, as companies and as an industry, to realise the prosperous future that can come our way. Innovation has to stand at the centre of our approach. Then you can aspire to get R100 000 per ton in today's money, because you have added brains to the steel.

Lay-out concept for the multi-storey building system



Test assembly set-up



The SAISC is engaged in developing a new multi-storey composite building system currently undergoing testing at Tass Engineering.

There are times when piercing is a really smart choice....When it's pierced fix roofing from GRS

Ultra-durable Pierced Fix roofing from GRS

When you're looking for smart roof cover on any large project, take a good look at GRS pierced-fix solutions. All of the GRS pierced-fix roofing and cladding options, in various substrates, offer really smart designs that maximise their primary attributes. Choose according to looks, strength, durability, economy, drainage, weight, or ease and economy of installation. GRS has really smart machinery, to provide accurate bullnosing, cranking and curving of sheeting. The smart GRS team of experts is also available to assist with product choice, design details, estimating and technical advice. So get smart and speak to GRS when it come to GRS IBR, Supa-Clad, GRS Corrugated, Nu-Rib and BR7.

Talk to us, *The Smart Roof People* on 011 898 2900 or visit www.globalroofs.co.za or info@globalroofs.co.za

GRS
GLOBAL ROOFING SOLUTIONS
BrownBuilt | HH Robertson

SAMCRA
(Southern African Metal Cladding and Roofing Association)

Everyone acquainted with construction in Southern Africa will agree that the extensive metal roofing industry, which plays such an important role in the environmental performance of buildings, is in urgent need of an overhaul. The formation of SAMCRA is, in essence, aimed at restoring credibility to this dynamic and important industry.

Celebrating the launch of SAMCRA are (l-r) Paolo Trinchero (SAISC CEO), Johann van der Westhuizen (SAMCRA Chairman) and Dennis White (SAMCRA Director).

In launching the Southern African Metal Cladding and Roofing Association (SAMCRA) in Johannesburg on the 30th October 2013, SAMCRA Chairman, Johann van der Westhuizen, said that in an industry which uses, inter alia, 650 000 tons of metal and colour coated coil per annum, the need for an industry association had become essential.

SAMCRA will be a sub-association of the SAISC with its Executive Committee reporting to the SAISC Council.

"It should be borne in mind that much of our industry involves installing roofs on buildings across the economic spectrum including housing. It was therefore incumbent on the industry players to ensure that standards, both from a product and ethical perspective, were effectively policed".

"Unfortunately, this has been difficult as the relevant technical committees are reluctant to engage with individuals and we have realised that a formal structure was required to ensure that there are comprehensive, appropriate and widely accepted SANS standards for metal roof and side cladding as well as metal tiles," van der Westhuizen said.

He added that it is most advantageous that SAMCRA is a subsidiary of the SAISC. "The SAISC is a very professional organisation with an excellent reputation among all the relevant standards and specifying authorities. It is recognised both locally and abroad for its contributions to the construction industry. Being part of such an organisation enables us right from inception to focus on what has to be done to achieve our goals," he said.

Central to these goals will be the establishment of an accredited testing facility to verify the performance of product; the creation of a successful campaign to have all metal cladding products sold in South Africa branded with the relevant product information; providing information to specifiers, building inspectors and other decision makers and to facilitate training for all with particular focus on artisans; the implementation of a programme to certify roofing contractors and a programme to have 'roofer' recognised as a trade.

Dennis White, SAMCRA's inaugural director working full-time for the Association, says it is clear that the main beneficiaries of SAMCRA will be the

SAMCRA
SOUTHERN AFRICAN METAL CLADDING AND ROOFING ASSOCIATION

SAFINTRA

world class roofing systems

Safintra roll-forms steel sheeting in a variety of profiles which fulfill the most innovative design demands and challenging structural requirements.

SAFLOK
concealed fix roofing

Trimflute

WIDEDEK

VERSATILE

FLUTELINE
INDUSTRIAL SEVEN

TUFDEK iBR

classicorr
corrugated

METSEC

S-5!®
The Right Way
Clamps for all metal roof attachments

The Saflok® concealed fix system includes both 700mm and 410mm cover width sheets for specific wind load applications. All profiles, both concealed and pierce-fixed, are sold with a range of standard and bespoke flashings and accessories to provide a total roofing solution. Sheeting is complemented with the world's leading brand of aluminium clamps for above-roof installations of PV panels, walkways, fall safe systems, HVAC and more.

Safintra is also the sole SA licensee for Metsec, a light-gauge pre-engineered sleeved purlin system allowing for spans of 12m and more.

Free technical advice is provided to clients countrywide.

Polokwane, Nelspruit, Johannesburg, Cape Town, Durban, Port Elizabeth. *www.safintra.co.za*
Mozambique, Malawi, Zambia, Tanzania, Kenya, Angola, Uganda, Rwanda, Burundi, Ethiopia. *www.safintra.com*

Safintra is a member of the:

SAFAL™ GROUP

Safintra is a Founder Member of:

SAMCRA
SOUTHERN AFRICAN METAL CLADDING AND ROOFING ASSOCIATION

SAMCRA'S MISSION

To create an infrastructure on which an orderly industry can be built, including appropriate standards, testing facilities and a base of knowledgeable people.

To facilitate the fusion of the ambitions of the metal cladding and roofing industry with the requirements of the specifiers and clients to create a successful and respected industry.

To promote the image of the metal roofing and cladding industry and the use of its products.

end-user. "Our customers deserve this and it's time it happened," he said.

White added that everyone acquainted with construction in Southern Africa will agree that the extensive metal roofing industry, which plays such an important role in the environmental performance of buildings, is in urgent need of an overhaul. "The substitution of specified materials with inferior products, particularly in the emerging sector, is rife, with price considerations prevailing over structural performance and durability. The formation of SAMCRA is, in essence, aimed at restoring credibility to this dynamic and important industry," he said.

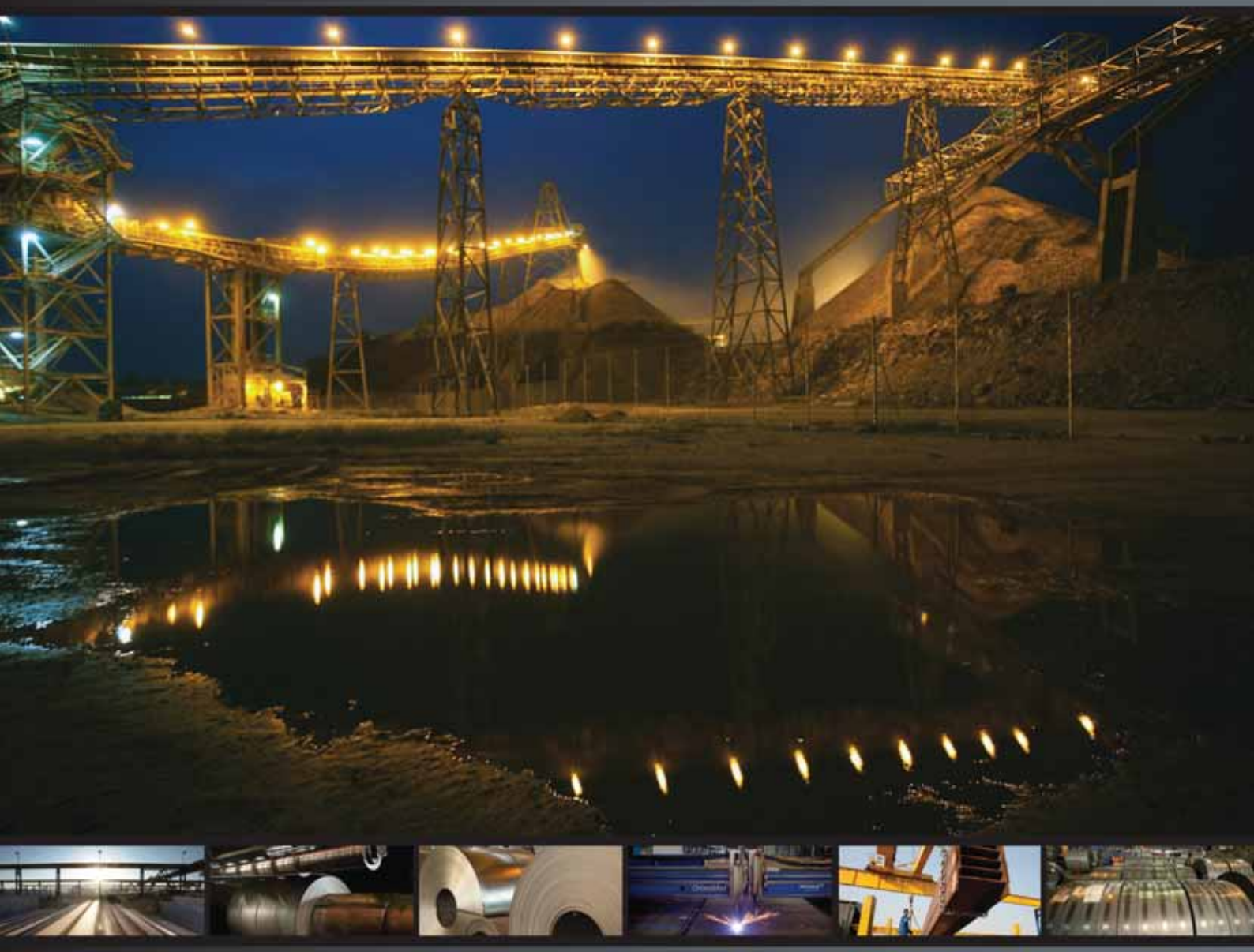
On the membership issue White says that the intention is to include anyone with a stake in the industry, from the manufacturers of coated coil, metal cladding and tiles and related products to the professions and anyone with an interest in the industry like the NHBRC, relevant government departments, developers, financial institutions and insurance companies.

The Founder members of SAMCRA are:

- ArcelorMittal SA – www.arcelormittalsa.com
- BlueScope Steel – www.bluescopesteel.co.za
- BSI Steel – www.bsisteel.com
- Clotan Steel – www.clotansteel.co.za
- Global Roofing Solutions – www.globalroofs.co.za
- Heunis Steel – www.heunis.co.za
- Macsteel Roofing – www.macsteel.co.za
- Pro Roof Steel Merchants – www.proroof.co.za
- Safintra – www.safintra.co.za

For more information please contact Dennis White on +27 11 726 6111 or dennis@saisc.co.za

THE STRENGTH OF STEEL IN AFRICA



The integration of the Aveng Group's three steel companies, Aveng Trident Steel, Aveng Steeledale and Aveng Fabrication into one cluster known as Aveng Steel, creates a new powerhouse in the steel industry.

Aveng Steel is the leader and supplier of structural work steel, sheet metal, carbon and alloy spring steel, welded tube and the largest supplier of reinforcing steel and mesh. This integration will continue to provide customers in South Africa and across the African continent with the best products which deliver the highest quality for infrastructure development.

Aveng Steel, the one-stop steel solution.

For more information contact: www.aveng.co.za

AVENG STEEL

POLASA
(Power Line Association of South Africa)

By Kobus de Beer,
POLASA Secretariat and Industry Development Executive, SAISC

The purpose of the Association is to actively promote the development, growth and flexibility of its members thus providing utilities like Eskom and municipalities with a healthy pool of local contractors and suppliers that can service the utilities' needs for new lines and line refurbishment.

On Thursday 15 August 2013 the newly constituted Power Line Association of South Africa (POLASA) was formally launched at a well attended breakfast function hosted by the SAISC. A toast on POLASA was proposed by Francois Bothma, Eskom Executive Manager responsible for power lines.

Gary Whalley, Managing Director of Babcock Ntuthuko Powerlines is the first Chairman of the Association and he made a short presentation on the state of the industry and the challenges that need to be faced.

Power line construction is integral in the National Infrastructure Plan (NIP) where out of the 18 PICC Strategic Integrated Projects (SIPs), six contain transmission and distribution infrastructure.

According to Eskom's Transmission Development Plan (TDP) the demand indications for extra high voltage (EHV) lines of 275 kV, 400 kV and 765 kV for the period 2013 to 2017, totals 7610 km. This equates to around 1 500km of new lines every year during this period. From 2018 to 2022 5 393km of new lines or 1 000km per year will need to be constructed.

At present there are 14 contractors servicing the EHV industry, directly employing more than 6 000 people. In the financial year ending March 2013, 737km of new high voltage lines were built and another 837km is expected to be built during the year ending March 2014.

In his presentation Whalley described the 'crisis period' the power line industry is currently experiencing and said that the irony is that in an environment where much work needs to be done, the industry is at a stand-still to the extent that in the recent past six contractors in the power line and associated industries were liquidated or applied for Business Rescue, no significant enquiries have been were issued for more than 22 months and the industry faces up to 12 months without power line work. One of the major problems is the slow rate at which Eskom is able to obtain servitudes and access the rights to build power lines. Significant job losses have already been incurred and at present some 6 000 direct jobs are at risk. POLASA was primarily established as a response to this crisis period.

The purpose of the Association is to actively promote the development, growth and flexibility of its members thus providing utilities like Eskom and

Polasa Launch: From left: Kobus de Beer (SAISC), Dennis White (SAISC), Francois Bothma (Eskom), Hennie de Clerq (SAISC), Gary Whalley (Babcock Ntuthuko Powerlines) and Paolo Trinchero (SAISC).

municipalities with a healthy pool of local contractors and suppliers that can service the utilities' needs for new lines and line refurbishment.

POLASA's vision encompasses all participants in the building and maintenance of transmission and distribution lines, not only EHV, as well as the full range of supporting products and services up to and including transformer stations.

The Association will facilitate participation in training and education and the development of export markets and to add value to Eskom's actions and requirements such as the Eskom Safety Improvement Project.

POLASA will support healthy competition between entities but will endeavour to resolve issues that restrict the industry from performing at optimum levels of productivity, quality and safety.

It aims to add value to engineering issues applicable to the industry in close co-operation with the SAISC.

The way forward is to establish and maintain a credible Association with representative and participating membership. An immediate challenge is to present a factual and well researched industry paper to create a platform for engagement with Eskom and Government with a view to avoid job losses and ensure a vibrant, sustainable industry to deliver on Eskom's demand and support aspirations in SADC and Africa.

Membership of the Power Line Association of South Africa will be open to contractors for Eskom's transmission and distribution line requirements. Existing members of the SAISC are also members of POLASA. In order to ensure inclusion on circulars and invitations, such members must advise the Institute of its interest.

For more information please contact Kobus de Beer at kobus@saisc.co.za or +27 11 726 6111.

DON'T STEAL. BUY S.A. STEEL

The push to "buy locally" is not meant in the spirit of giving the local industry a 'hand-out' irrespective of its productivity and efficiency. It's not an anti-competition initiative at all. Our industry must be and remain competitive against the hoard of foreign companies exporting structural steel to this country.

The SAISC has launched a 'buy local' campaign in an attempt to curb the unnecessary loss of jobs in the steel construction industry. The campaign, which kicked-off with a billboard on the R24 Edenvale off-ramp, is supported by Proudly South Africa.

The campaign, headlined "Don't Steal. Buy SA Steel", equates importing structural steelwork with 'robbing' or 'stealing' decent jobs from South Africans and according to Kobus de Beer, the SAISC champion for this campaign, this is correct. "This is based on formal research done by the Institute to determine the job creation multipliers for fabricated structural steel in South Africa," he says. "The bottom line of this research is that for every 1 000 tons of fabricated structural steel made and used in South Africa 100 real jobs are created, which are completely lost if the products are imported."

Taking into account the 'multiplier effect', which measures the knock-on loss to the country for every job lost in the steel construction industry alone, the negative impact is astronomical. In a country where job creation is of paramount importance, allowing existing jobs to be lost is unforgiveable. Moreover, these are 'decent jobs' i.e. jobs for a full year done by trained people in existing, fully equipped facilities and paid for in accordance with agreed norms in the industry.

There are many examples of fabricated structural steel being imported into South Africa from various overseas suppliers in spite of the fact that capacity exists to supply and manufacture these essential goods and services locally. This directly and indirectly causes job losses. The wisdom of importing 'cheaper' fabricated structural steel has often been shown to be questionable.

The push to "buy locally" is not meant in the spirit of giving the local industry a 'hand-out' irrespective of its productivity and efficiency. "It's not an anti-competition initiative at all. Our industry must be and remain competitive against the hoard of foreign companies exporting structural steel to this country. But the fact that South Africans have managed to export about 280 000 tons of structural steel in the last two years alone does indicate a reasonable enough degree of competitiveness, which the SAISC , in conjunction with its members is continuously working to improve," de Beer says.

Turning back to the promotional campaign, it was designed in support of extensive discussions with major clients and government organisations. "It's now time that the industry took a holistic view and understood that, given South Africa's relative overall competitiveness, buying fabricated steel locally is not only beneficial to them in terms of the overall efficiency of trade, it is also good for the country's economy as a whole," he concluded.

The "Don't Steal. Buy SA Steal" is due to roll-out across the full gamut of media in the first quarter of 2014.

The outdoor billboard is the first advertising medium used by the SAISC in its campaign to curb job losses in the steel construction industry in South Africa.

Midvaal Structures

BEE Level 5 BWO company





WE ARE THE PROUD OWNERS OF THE ONLY PYTHON X-(7AXIS ROBOTIC PLASMA CUTTING MACHINE) STRUCTURAL FABRICATION SYSTEM IN SA

We recently purchased an Ajan 3000 High Definition Plasma table, with HP260 Generator and Jet Filter. This machine enables us to do our own inhouse cutting of Base plates and Connecting plates.

Plasma Table

Medupi Power Station

Python X

Medupi Power Station

- Offers an in-house detailing and architectural studio to assist customers from the early design stages right up to the final construction of their steel construction project.
- Works with a variety of roofing solutions, from small portal frame-type structures, through to 60-metre-span lattice girder designs.
- Mainly serves the commercial and industrial markets, with smaller contracts in the domestic market.
- Exports its solutions to various African countries – including Angola, Mozambique, Malawi, the Democratic Republic of Congo, and Swaziland.

Midvaal Structures specialise in the cost effective building of steel structures for churches, factories, warehouses, hangars, shopping centres and offices.

WE ARE ISO 9001 APPROVED AND A PROUD MEMBER OF THE SAISC
WE PRIDE OURSELVES IN HONESTY AND INTEGRITY

Tel: +27 16 365 5961
Fax: +27 16 365 5951
www.steelstructures.co.za
Email: rina@steelstructures.co.za

SASFA FEEDBACK MEETINGS – 2013

By John Barnard, SASFA director

Included in the feedback meeting was an overview of the development of the LSFB industry and SASFA. The presentation highlighted that SASFA's membership has almost doubled during the past five years, and the manufacturing capacity for light steel framing has grown threefold.

In order to keep SASFA membership and all interested parties informed about developments in the light steel framing industry, SASFA again arranged a series of Industry Feedback meetings in 2013, held in Johannesburg (April), Durban (July) and in Cape Town (October).

At these meetings, the chief economist of ArcelorMittal SA, Chifipa Mhango, gave presentations giving an overview of global financial conditions, narrowing it down to focus on the local building and construction industry. Of particular interest is the medium to long term forecast GDP growth of Sub-Saharan countries averaging above 5% per year, due to infrastructure developments in energy, railway, telecommunication, ports, roads and mining activities stimulating economic growth. This indicates a huge potential export market for LSFB.

The Executive Director of AAAMSA, Hans Schefferlie, gave presentations on energy efficiency according to SANS 10400-XA. He clearly illustrated why the building regulations are becoming progressively more demanding in terms of energy efficiency of buildings. The demand for new electricity generation capacity is expected to grow significantly in the next decade. Through energy efficient buildings, the demand can be moderated. It is comforting to know that LSFB fully meets the new requirements for thermal efficiency according to SANS 517, while the same cannot be said for all masonry buildings.

Included in the feedback meeting was an overview of the development of the LSFB industry and SASFA. The presentation highlighted that SASFA's membership has almost doubled during the past five years, and the manufacturing capacity for light steel framing has grown threefold. The application of LSFB started off with modest residential buildings, but in the hands of the South African designers and developers, has evolved into upmarket residential, industrial and commercial buildings.

SASFA focuses on training and publicity and regularly presents a six-day course for building contractors where a number of local specialists are involved, a one-day course on SANS 517 for designers, and a half-day course for building inspectors. International specialists are regularly approached to

Guests at the Cape Town Industry Feedback meeting of SASFA in October 2013.

Winner of the Stewarts and Lloyds Light Steel Frame Category - The Audi Showroom in East London.

present courses on new fields for application of LSFB as well as to assist with the development of training material.

SASFA maintains a high level of media presence, publishing on average three to four media articles per month in a range of prominent publications. Exhibitions such as Interbuild, and the Green Building Exhibition is used to increase awareness amongst the target audiences of such as architects and builders. SASFA's website traffic is growing steadily. During 2013, the LSFB industry submitted 14 projects for the Steel Awards 2013 – the judges chose the Audi Showroom in East London, submitted by Shospec, as the LSFB category winner. The project to supply accommodation for the workers on a large project on St Helena in the Atlantic Ocean, submitted by SA Steelframe Systems, drew special commendations from the judges.

SASFA coordinated the building of an energy efficient LSF second floor on an existing brick house, as the topic for a 13 part TV programme aired on KykNET TV. This has hugely expanded the awareness of LSFB amongst the public, and the project will continue to bear fruit in the years to come.

Apart from serving on several SABS code revision committees, SASFA has also been invited to sit on the NHBRC Industry Advisory Committee, and is involved in the redrafting of the NHBRC's Home Building handbooks. Work is being done to roll out SASFA's certification system for builders, on the drafting of a LSF handbook and to revise SANS 517.

The industry survey to quantify LSF building activity during 2013 will be conducted towards the end of November. It is widely expected to show a significant growth since the previous year, notwithstanding the prevailing poor business conditions in the building industry.

In order to give members the opportunity to showcase some of their own LSF projects, they are invited to do short presentations at the industry feedback meetings – we have had project presentations by Innosteel, Shospec, Durobuild, Mitek, and Silverline during the past year.

The meetings are closed off with cocktails, offering an excellent opportunity for networking. After the Cape Town function, one of the attendees remarked "if every person in the audience does not leave these meetings excited and strongly motivated, they were not paying attention!"

www.sasfa.co.za
Tel: +27 11 726 6111
Fax: +27 11 482 9644
Email: info@sasfa.co.za

The Saint Helena Workers Village received a commendation at Steel Awards 2013.

SASFA NEWS

SASFA EXHIBITION AT THE GREEN BUILDING CONFERENCE, CAPE TOWN, OCTOBER 2013

By John Barnard, SASFA director

As part of the ongoing programme to promote awareness of light steel frame building, SASFA booked an exhibition stand at the Green Building Conference, held at the CTICC (Cape Town International Conference Centre). We decided to use the same design as was used for Interbuild.

Schalk van der Walt of Techomes offered to manufacture and erect the LSF structure, Kevin Gargin from Saint-Gobain undertook to install the internal lining and insulation, and Adri Bester of Everite agreed to do the external cladding. Marshall Hinds provided the vapour permeable membrane, to ensure that the cladding complied with SANS 517.

The structure was left partially unclad, so as to display the supporting framework. Similarly, the lining was progressively finished to illustrate the stages of the internal lining process. A flat screen TV monitor was used to show a continuous slide show of LSF buildings, locally and overseas. Pamphlet shelves were used to display literature supplied by SASFA members – visitors to the stand found this very useful, and generally collected a full set of pamphlets.

In all, we recorded some 80 visitors to the stand – a somewhat disappointingly low number. However, the interest of the visitors – mainly architects and developers – made up for the low volume. Contact was established with amongst other architects from Namibia and Mozambique, who are planning LSF developments; a developer from Gauteng, who is planning a 90-room hotel, and a number of home-owners who wished to build new, or add onto their existing houses.

SAINT-GOBAIN GYPROC CALLS FOR LOCAL ENTRIES TO COMPETE IN INTERNATIONAL TROPHY COMPETITION

The 9th Saint-Gobain Gypsum International Trophy was recently launched, coupled with the announcement that the awards ceremony will be hosted in Berlin in June 2014.

A call for entries from South Africa is being spear-headed by Saint-Gobain Gyproc, where a national winner will be identified to travel to Berlin to compete in one of six categories of the International Trophy competition, which is expected to attract entries from over 37 countries with the submission of over 100 construction projects. The projects will typically be a collection of the world's most interesting and newest buildings.

Saint-Gobain Gyproc is looking for building or renovation projects that will be completed by 31 January 2014 to represent South Africa in the International Trophy. The winner of the SA national trophy will enjoy an all-expenses paid trip with travel in business class to Berlin in June 2014 and will receive a professional photographic shoot of their project.

Saint-Gobain are proud sponsors of this International Trophy, which aims to promote world class skills in dry-wall technology and plastering in construction projects, encouraging and recognising contractors for their contribution to innovation in the industry.

The Saint-Gobain Gypsum International Trophy, established in 1998, is billed to be one of the largest international competitions of its kind, promoting excellence and innovation in the use of sustainable, lightweight plasterboard systems and plasters.

Projects are entered and judged in six categories including; plasterboard, plasterer solutions, innovation, segment solutions (education/ hospitals/ hotels), residential and mixed use (commercial including leisure and retail).

For more information and to register your project go to www.gyproc.co.za and complete the entry form, before 31 January 2014.

For full competition rules and regulations see:
http://www.saint-gobain-gypsum-international-trophy.com/

Google™

SAISC

Advanced search
Language tools

Google Search | I'm Feeling Lucky

If you missed the Steel Awards 2013 event, at least watch the video!

www.youtube.com search Steel Awards 2013 YouTube

Meet the new SAISC Council on our Facebook page. Remember to Like us on facebook and keep up to date with SAISC News.

Check out the photos of Steel Awards 2013

www.saisc.co.za - recent events

Photo copyright: Francis Dzikowski/Esto

THEATER ON THE ROOF

By Cawsie Jijina, P.E., and Alvaro Castaño, P.E.

This article was previously published in the January 2013 issue of the American Institute of Steel Construction's magazine, Modern Steel Construction.

There was nowhere to go but up for New York's Lincoln Center, which added a new performance space on top of its original theater building.

The Lincoln Center Theater (LCT) in New York has long been associated with big productions. But it serves as a showcase for lesser-known artists as well, as indicated by LCT3, a program of scaled-down productions and emerging talent.

In searching for a permanent home for LCT3's growing audience, the theater realized the need to expand its capacity within the Lincoln Center for the Performing Arts (LCPA) campus and add a small, intimate theater to serve LCT3's needs. However, historic preservation of the 16-acre LCPA complex, just northwest of New York City's Columbus Circle, had locked in the building layout and, except for temporary events, space was not available for new construction.

The LCT building, designed by architect Eero Saarinen, was originally built to house the 1 080-seat Broadway-style Vivian Beaumont Theater. The building features a column-free space spanning 175ft (53.34m), over which the New

Photo: Yorke Construction

The LCT3 addition under construction.

KANSAI PLASCON

AFRICA'S NO.1 COATINGS COMPANY

EXCEEDING EXPECTATIONS TOGETHER

Angola • Botswana • Ghana • Kenya • Lesotho • Malawi • Mauritius • Namibia • Nigeria • Seychelles • South Africa • Swaziland • Tanzania • Zambia • Zimbabwe

ADVANTAGES

- Water-based coating
- Anti-corrosive properties with built-in rust inhibitors
- Safe and easy to use
- Excellent metal protection
- No primer needed
- Direct application to mild and galvanised steel

DIRECT TO METAL

AquaDuo™ is a new Direct-To-Metal water-based coating that serves as a primer and topcoat in one and can be applied directly to prepared mild and galvanised steel. Rust inhibitors are built into the coating, which means that no primer is needed. It saves time for the applicator, which ultimately translates into a cost saving. AquaDuo™ is easy to apply and withstands exposure from environmental conditions, while maintaining a protective sheen finish.

Plascon AquaDuo™ Direct-To-Metal can be tinted using the Plascon Inspired Colour system with more than

1400 colours

For more information visit our website at:

www.plascon.co.za

or call our Plascon Advisory Service on

TEL 0860 20 40 60

PLASCON INDUSTRIAL COATINGS

Photo: Mercedes I Armillas, AIA/H3 Hardy Collaboration Architecture

The interior of the space with exposed truss elements.

York Public Library for the Performing Arts is located; columns can only be found at the perimeter, and any expansion needed to respect this layout. Expanding downward into the ground had already been done in the past, all the way down to bedrock, to house the 290-seat Mitzi E. Newhouse Theater, LCT's second theater. Therefore, the only option was to follow the trend in city development and expand upward, requiring the insertion of new elements through existing volumes and changing the nature of exterior elements.

Preservation of the logic inherent in Saarinen's design meant that any major visual alteration to the base building was unacceptable. LCT wanted this proposed addition, which opened last May, to feel as though it had always been there. The design team responded with a light, airy 23 000 square feet (about 7 000 square metres) two-story addition on top of the original building.

Successful completion required carefully navigating and satisfying the requirements set by city agencies, the Lincoln Center Development Partnership, the New York Public Library, preservationists, artists and community boards. In addition to design, the critical issue of constructability on a beloved and architecturally recognized structure, and its added associated costs, framed the design-construct dialogue.

DIRECT LANDING

To limit the structure's weight, a steel frame with lightweight concrete on a composite metal deck was chosen. Since a standard column layout was impossible due to the limited capacity of the existing concrete girders, Severud Associates, the project's structural engineer of record, elected to land directly on the exterior columns and bypass the entire existing internal structural framing system. That decision would require LCT3 to become a bridge unto itself – a conceptual nod to the minimalism of the original Saarinen design.

Photo copyright: Francis Dzikowski/Esto

Photo copyright: Francis Dzikowski/Esto

The wide-flange main longitudinal trusses, weighing about 65 tons each, are the main load-carrying elements of the addition.

Photo copyright: Francis Dzikowski/Esto

The new structure provides increased capacity for the growing LCT3 program.

Deep truss configurations were picked over arches and plate girders to minimize weight, optimize the architectural layout and allow clear runs for the mass of conduits, lighting, data, ductwork and the systems associated with theater design. Two 30-ft-deep (9m) wide-flange main longitudinal trusses, weighing about 65 tons each, would become the main load-carrying elements that would vault the 175-ft (53.34m) span of the original building. Two additional cross trusses would be 75 ft (23m) long and each end would cantilever an additional 15ft (4.6m). Together they would also become the lateral force resisting system. A third long truss would tie it all together.

The exact location of the trusses played an important role in balancing the reactions to the chosen columns below, since it was imperative that the load being delivered to the columns was exactly what the columns had in 'reserve'. The reserve itself was a number conjured up by the structural engineers, who combed through the existing structural system, paring down theoretical excess, reducing allowances and precisely accounting every weight that was in position rather than allocating weight by floor area. A series of non-destructive tests determined the actual material strength of the various existing structural elements, and the reserve increased.

Photo: Mercedes I Armillas, AIA/H3 Hardy Collaboration Architecture

One of the lifts performed by the Manitowoc 16000 crane.

Since the architectural motif was a light box hovering over the existing building, 36-inch-deep wide-flange (914mm) steel girders were used to transfer the load from the trusses into the columns below via isolating bearing pads. The idea was that if there had to be isolators, then they were going to do double duty and they were designed to allow the new structure to slide over the tops of the old columns, thereby subjecting the existing columns to vertical loads only. In addition, a careful and thorough distribution of the various force combinations eliminated the need for an overall seismic retrofit of the entire building.

Headroom clearance requirements and architectural walkways necessitated the incorporation of Vierendeel panels into the truss configuration. The three long trusses could not be hidden, so the architects chose to show them off as architecturally exposed structural steel (AESS). Since aesthetics precluded gusset plates, the engineers answered by designing and detailing fully welded truss connections in all the visible zones.

Access to the new space is provided by an elevator tower, which carefully pierces through the existing structure from the foundation up to the rooftop. Constructed of square hollow structural steel (HSS) and channel glass, the elevator tower was designed for strict tolerances of wind and seismic movement. Structurally, it is completely independent from the original building and the new rooftop theater, a slender steel and glass tower unto itself.

RELIEVING STRESS

Staging the installation of the curtain wall façade presented several challenges. The glass had to be attached to the trusses before the concrete floors could be formed and the interior finishes added. But forming the floors and adding the finishes would make the trusses deflect, which would likely cause the glass to stress and crack. To prevent the glass from cracking when the floors were formed, the team designed joints into the curtain wall to accommodate those deflections. To prevent cracking during installation of the finishes, the team applied temporary weight to the trusses prior to attaching the curtain walls; doing so ensured that the glass was in the appropriate position to handle those deflections. It was a balancing act between the jointing in the glass, the sequencing of the finishes

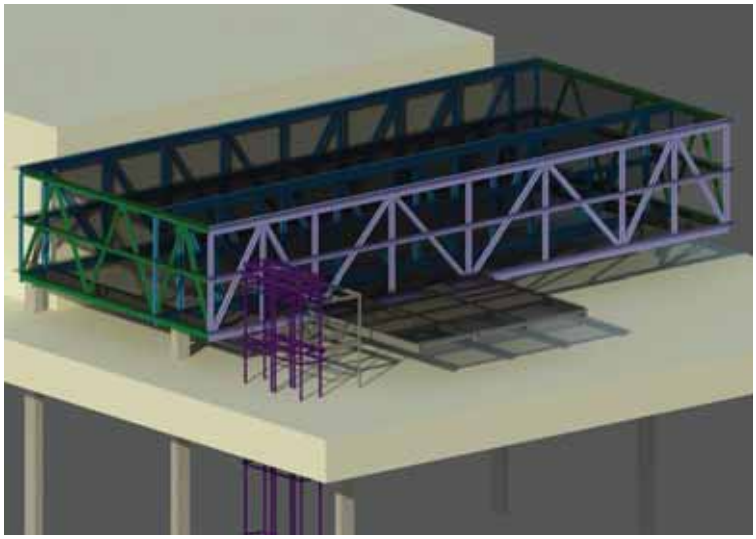
and the weight that could be added at any given moment in time. Cambers were calculated so that in their final loaded configuration, the trusses would stay flat over their entire span.

Another challenge: The theater could not be stick-built because the roof of the original building was incapable of handling the weight of the raw material. Instead, the structural framing, including the large trusses, was prefabricated, assembled in the shop to ensure the fit, deconstructed and shipped to New York. It was divided into sections so that a crane could lift each section and hold it in place over the roof during construction. Crane reach and lift capacity decided the size of the spliced segments (the furthest reach was 220ft [67m] with 13.5 tons, while the heaviest was 50 tons at 105ft [32]).

WEIGHT ISSUES

As construction began, additional challenges related to weight arose and the engineers became wary that the foundation of the original building had not been constructed in accordance with the building's design and became concerned over the associated differential settlement issues this would cause.

Test pits and core samples were required to expose the theater's foundations, which rest directly on bedrock, and the engineers' fears were confirmed; the foundation was smaller than depicted on Saarinen's drawings. Worse, there was no discernible pattern to the deviation in the four column foundations. While the columns worked, the foundations did not.



Model: Severud Associates

A 3D model showing the trusses of the new addition and the elevator, which is structurally separate from the new and old buildings.

The ostensibly obvious solution – enlarge the foundation – would have required evacuating the building and displacing a number of people from their offices within LCT. It would also delay the project. This led the structural engineers to conduct an even more sophisticated analysis of the new theater as well as the original building. The analysis confirmed that the foundations were not evenly loaded, and once the new theater was constructed some of the columns would settle more than others.

Concerned that the differential settlement would cause unpredictable micro-cracking in the original building, the engineers analyzed the structure yet one more time, this time with the focus on differential deflection and crack control. From there, they determined that they could accommodate a slight amount of differential settlement between the columns.

DISCIPLINED THEORY

Structural engineers are responsible for the general welfare and safety of the public in and around their structures. As such, we can be a conservative bunch. We tend to be even more conservative when modifying and adding to structures that are not ours but were designed by others. But how much of that conservatism is genuine and how much of it is a fear of the rigorous application of engineering theory?

Great structures are possible when that fear is leashed, when disciplined theory rules, when architect, engineer and builder are perfectly in synch and believe in the end product. LCT3 perfectly illustrates this.

The authors would like to note the contributions of Lou Occhicone, P.E., Daniel Surrett, P.E., and Gustavo Amaris to the successful completion of the project.

project team

Architect:
H3 Hardy Collaboration Architecture, New York

Structural Engineer:
Severud Associates Consulting Engineers, PC, New York

General Contractor:
Yorke Construction, New York

Steel Team

Fabricator and Erector:
Capco Steel, Inc., Providence, R.I.

Detailer:
Arcan Detailing, Inc., Windsor, Ontario, Canada

Peddinghaus

PLATE PROCESSING SUCCESS

HSFDB-2500

- Roller Feed© measurement system for continuous feed production
- Edge Start Cutting, Common Cutline/Chain Cutting Capable - Yield scrap as low as 5% in common structural applications
- Automated unloading systems available for streamlined removal of complete parts
- Powerful 48 HP Siemens spindle motor
- Minimum Quantity Lubrication (MQL) system
- Oxy-Fuel and Plasma cutting systems
- 8-station automatic tool changer

www.peddinghaus.com | info@peddinghaus.com | +1 (815) 937-3800
web email phone

INDUSTRY SOLVES TECHNICAL CHALLENGE

This article was previously published in the March 25 2013 issue of New Steel Construction published by the British Constructional Steelwork Association, the Steel Construction Institute (UK) and Tata Steel.

Structural steelwork has played a prominent role in creating a technical college with an industrial identity.

project team

Client:
Royal Borough of Greenwich

Architect:
Walters & Cohen

Main contractor:
BAM Construction

Structural engineer:
Clarke Nicholls Marcel

Steelwork contractor:
Bourne Special Projects (part of Bourne Group)

A brownfield site in Woolwich South London is being converted into a new University Technical College (UTC) backed by the University of Greenwich, Transport for London, Wates and the local authority, the Royal Borough of Greenwich.

UTCs are said to be a new concept in education, offering 14 - 19 year-olds a full time, technically orientated curriculum and clear route into higher education, apprenticeships and careers.

As well as technical subjects, specialising in engineering and construction, students will also study GCSE (General Certificate of Secondary Education) and A-level subjects, so a mixture of classrooms and workshops are required for a UTC.

To highlight this technically aligned educational format an industrial feel to the college design has been achieved, most notably through the use of exposed structural steelwork and the retention of a steel framed 1950s warehouse.

This existing structure has had its original steelwork strengthened and the building will house workshops and classrooms. An adjacent new steel building

Although two separate buildings, the workshop and teaching block form one connected facility.

A retained 1950s warehouse is incorporated into the scheme.

with three floors will accommodate more classrooms and will feature plenty of exposed steel, enhancing the premises' desired architectural feel.

As well as providing the project with the required aesthetic look, steelwork was chosen for its speed of construction. "The UTC will open in time for the autumn (2013) term," says Kevin Stoney, BAM Construction Project Manager. "We only have a 12 month on site programme, so a quick steel erection process is vital for keeping us on schedule."

Another important consideration was the poor ground conditions under the site. The new steel framed structure is supported on piled foundations and the lighter steel solution reduces the number and lengths of piles needed.

Bourne Special Projects completed the steel erection, which also included the installation of precast planks, in just six weeks.

"The site is quite constrained and having another contractor on site laying the precast planks would have meant us having to stop the steel erection programme intermittently," says Chris Page, Bourne Special Projects Senior Site Manager. "By doing both tasks we were able to erect one floor along with the planks, and then move on to the next level using the lower floor as a safe working platform."

Delivered in one piece, the main lift shaft was the first element to be erected, subsequently providing stability for the rest of the steelwork.

In order to provide stability to the new three-storey high frame, Bourne initially installed a fully fabricated and braced lift shaft. Weighing 9.5t, the steel framed unit was brought to site in one piece and saved the overall programme nearly three days of assembly work. Once in place, the shaft - which is centrally positioned along one of the main elevations – allowed the rest of the steel frame to be erected around it.

The teaching block has a footprint of 58m x 18m and features a first floor entrance foyer leading onto the adjacent Woolwich Road. Steps will lead up to the main doors and then into the college. The first and second floors will accommodate classrooms, while the ground floor will house dining areas and a large open plan fitness suite.

Each of the three floors has a different wall alignment as the rooms on each level vary in size. This has made it difficult to align column positions within walls as grids vary between 3m and 9m throughout the structure. However the flexibility of a steel framed solution has worked successfully within these constraints.

In order to create a 17.2m x 19m ground floor fitness suite with no internal columns, a transfer structure has been installed. This consists of two 16m long 1.11m-deep plate girders, and is positioned at roof level.

"Both the first and the second floors above the fitness suite are hung from these two girders, forming the open space at ground floor," says John Matthews, Associate at Clarke Nicholls Marcel. "Putting the transfer structure at roof level was the most efficient solution. The only alternative was to place deep transfer beams at the underside of the first floor. The first floor could not be raised due to the adjacent street level, so this would have meant lowering the ground floor level to maintain the required clear height. The additional excavation costs meant this wasn't an option."

Positioning of the vertical bracing was also a challenge says Mr Matthews: "On a long narrow building most of the walls and partitions have windows, doors or teaching boards, so areas for bracing are at a premium. The lift shaft is heavily braced making it a primary core, while cross bracing has also been installed beside the stairwells and moment resisting frames used to maintain structural stability."

Both the teaching block and the renovated workshop will form one large interlinked building, although each is structurally independent with a movement joint separating them.

The original steelwork frame for the workshop dates from the 1950s. Visual surveys confirmed it was in good condition with very little corrosion. The structure has been re-checked based on the original steel section values and design stresses including additional loading from the new roof covering loads. It has also been stiffened with new vertical and horizontal bracing and horizontal tie beams to allow existing internal masonry shear walls to be removed.

A steel framed canopy has been added to the rear (interior) elevation of the workshop. It is 50m long, 6m wide and supported on 10 x 4.2m high columns at varying centres. As well as providing external protection for students from inclement weather, it is another steel architectural feature adding to the overall industrial look.

A steel frame supporting precast planks was the quickest construction option for the teaching block.

Khanyisa

BLAST & PAINT (PTY) LTD

Abrasive Blasting

Application of heavy industrial paints

On site blast and painting

Our trained, skilled, experienced and dedicated team of industrial Spray Painters and Sand Blasters will ensure that we deliver the best possible service and on time.

Facilities on this site includes

- undercover blasting rooms of 900m²;
- 4 undercover painting factories of 5 440m²;
- An overhead crane with a lifting capacity of up to 10 tons; and
- Various forklifts with lifting capacities of up to 7 tons.

We are approved applicators for the following Industrial paint suppliers

- Sigma Coating
- StonCor Africa
- International / ICI Dulux

Khanyisa fully supports the South African Government's Economic Empowerment initiative and has obtained a level 4 rating.

Khanyisa is a member of the Corrosion Institute of South Africa.

KHANYISA BLAST AND PAINT (PTY) LTD

11 – 17 Arkin Street
Industries East
Germiston South

Tel: 011 873 8308
Fax: 011 873 1050
E-mail:
dirk@khanyisabandp.co.za
sebastian@khanyisabandp.co.za

International

SIGMA COATINGS
A PPG Brand

StonCor Africa

LAPPED JOINTS IN COMPRESSION

By Amanuel Gebremeskel,
Development Engineer, SAISC

There have been a number of structural failures in South Africa over the past few years in connections that use lapped gusseted joints in compression. These types of connections typically occur in lightly loaded braces and trusses because they help to facilitate easy fabrication, transportation and erection. Therefore they deserve an equally economical and easy method to check their capacity.

There have been a number of structural failures in South Africa over the past few years in connections that use lapped gusseted joints in compression. These types of connections typically occur in lightly loaded braces and trusses because they help to facilitate easy fabrication, transportation and erection. Therefore they deserve an equally economical and easy method to check their capacity.

The following simple equation is proposed to evaluate the capacity of such connections:

$$C_r = b\,(120t - 2.2L) \quad [N]$$

Where $5 < L/t \leq 30$

Equation 12.30 of the SAISC Green Book presents a more rigorous approach, repeated below right, that also accounts for the eccentricity between the gusset plate that is attached to the support and the spade plate that is attached to the brace member.

As discussed in the Green Book axially loaded members in braces and trusses are commonly attached to columns and beams, or truss chords, using gusset plates. When the attachment is concentric one needs to check the gusset plate for axial yielding or buckling. Moreover if the gusset plate is supported on at least two edges it can typically be assumed to be braced against lateral sway.

$$C_r = \frac{\phi C}{\frac{tC}{2M_p} + \phi}$$

where: $C = btf_y\,(1+\lambda^{2n})^{-1/n}$

$$n = 1.34$$

$$M_p = \frac{bt^2}{4} f_y$$

$$\lambda = \frac{\ell\sqrt{f_y}}{338t}$$

Figures 1 (a), (b) and (c) below illustrate that the challenge with lapped joints lies in the eccentric loading that occurs due to the attachment of the spade plate on the side of the gusset plate rather than on its edge. To add to the problem gusset plates in lapped joints are commonly supported only on one edge, causing them to sway sideways.

It is important to remember that the vast majority of real cases will be controlled by the capacity of the lapped joint rather than that of the brace member itself. Both approaches below (Figure 1) make that assumption. This matters because if the brace member is relatively slender and has a lower buckling strength than the lapped joint then the overall buckling is likely to resemble that shown in Figure 1 (d) rather than (c). It is best to avoid such slender brace members in the first place, but in the rare event that they occur the capacity of the lapped joint has to be

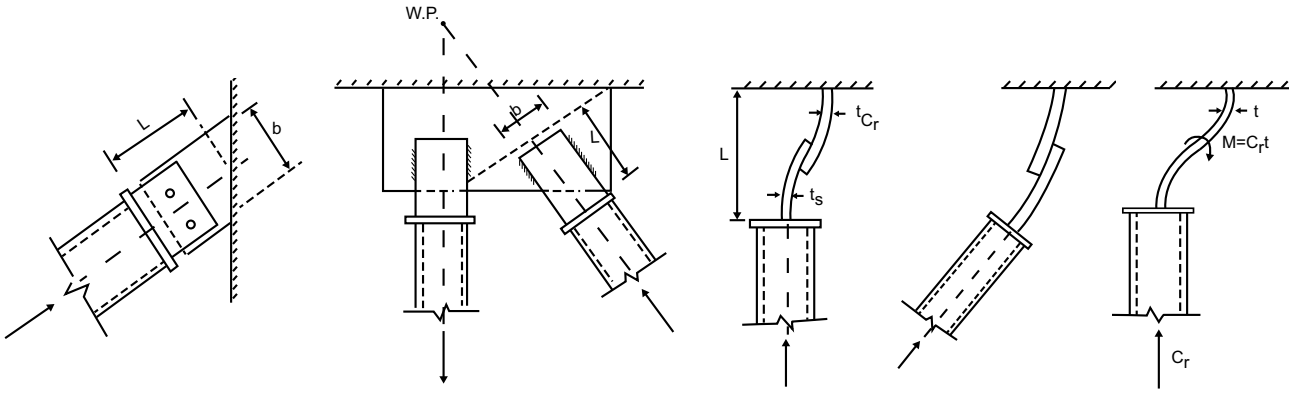


Figure 1

recalculated assuming free rotation at the brace end of the spade plate. In other words effective length ℓ = 2L in equation 12.30 of the Green Book.

The equations on page 38 also assume that local buckling of the gusset plate – typically checked using the Whitmore section between the dotted line and the support in Figure 1 (b) – does not control the design of the system. Lastly it is common to ignore the bending moment due to eccentricity from the spade plate into the brace member for relatively stout braces. However for slender braces, where this moment is greater than 5% of the flexural capacity of the brace, the effects of flexure must be taken into account when evaluating the capacity of the brace member.

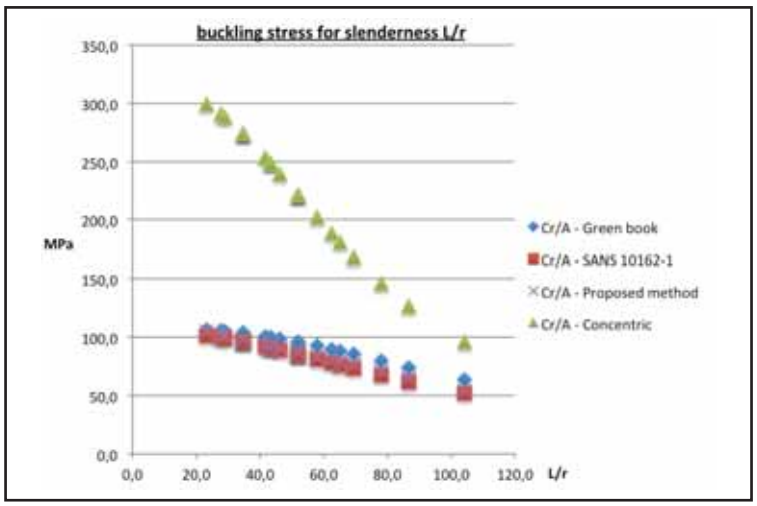
When designing lapped joints the arrangement shown in Figure 1 (c) is idealised to that shown in (e). This is reasonable as long as the conservative thinner and narrower values of t and b of the gusset and spade plates in the joint are used. The buckling length L is identified by locating the likely fold lines – at the ends of the gusset and spade plates in most cases – of the plates as illustrated with the dotted line in (b).

Finally a third approach can be used to evaluate a lower bound capacity of the joint using SANS 10162-1 if one assumes that the lapped plates represent beam-columns with axial load and flexure that are amplified for geometric second order effects (P-Δ). Such an approach is less attractive because it requires iteration to solve C_r and all of the assumptions above would have to hold anyway. In the graph (Graph 1) below all three approaches discussed herein are compared to the capacity that is obtained if lapped joints are designed by mistakenly assuming concentric loading.

As a conclusion to the discussion an example may help to illustrate the simplicity of the proposed methodology. Consider a truss where the connection illustrated in Figure 2 is used. Assume that 6mm plates are used for the gussets and spades while the brace member is an 88.9 x 3 circular hollow section. Also assume that the distance between the work points on either end of the brace is 3.0m and a factored load of 85 kN needs to be supported. All steel is S355JR.

L = 80 mm t = 6 mm b = 90 mm

At 3.0m length the circular hollow section has an ultimate axial capacity of 111 kN from Table 4.14 of the Red Book.



Graph 1.

There have been a number of structural failures in South Africa in connections that use lapped gusseted joints in compression.

111 kN > 85 kN Good!

$5 < {}^{L}/_{t} \leq 30 \Rightarrow {}^{L}/_{t} = {}^{80}/_{6} = 13.33$
so we can use the proposed equation

$C_r = b\,(120t - 2.2L) \Rightarrow C_r = 90(120*6 - 2.2*80)$
$= 48\ 960$ N

C_r = 48.9 kN < 85 kN No Good! Use 10mm plate

$C_r = 90(120*10 - 2.2*80) = 92160$ N

${}^{L}/_{t} = {}^{80}/_{10} = 8$
so we can use the proposed equation

C_r = 92.1 kN > 85 kN but also less than 111 kN. Thus it is not controlled by brace member buckling and thus safe.

When using equation 12.30 in the Green book C_r = 95.3 kN. It is also greater than 85 kN and less than 111 kN. This further validates the final design using 10mm thick plates.

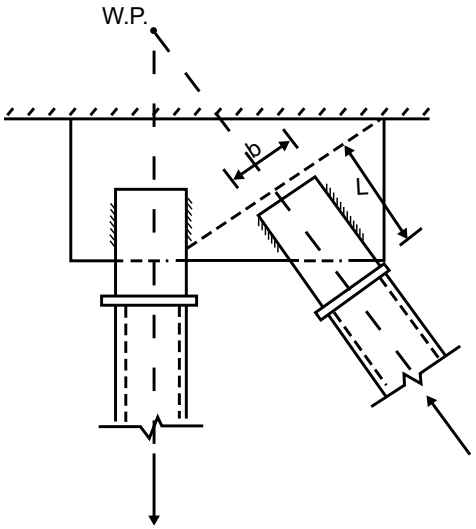


Figure 2

SHOULD WE GO EUROCODE FOR STEEL?

By Dr. Hennie de Clercq,
retired CEO, SAISC

I hope nobody will be affronted when I say that the last two statistics remind me of what an engineer recently said to somebody I know: "I think we should go for the Eurocode, but I still prefer BS449".

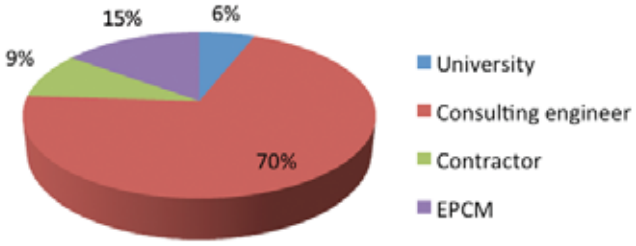
I would like to report back on the survey we did recently in an effort to guide us in deciding whether to go to the Eurocode for the design of structural steelwork.

We received 151 responses to our questionnaire, for which we truly and profusely want to thank everybody who responded.

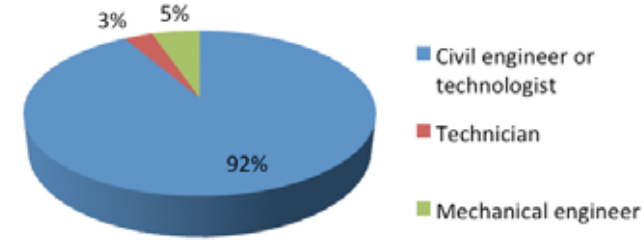
A SUMMARY OF THE DATA

(Not showing the very low numbers)

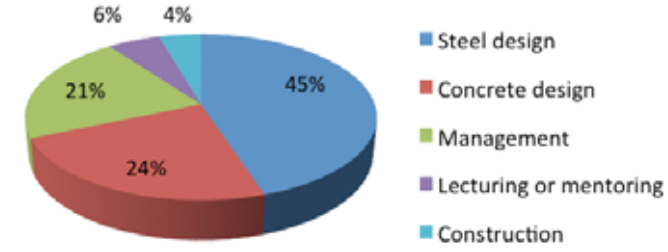
Where do you work?



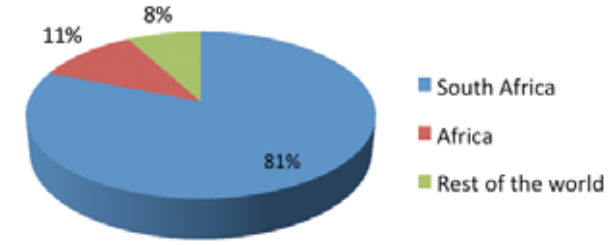
Profession?



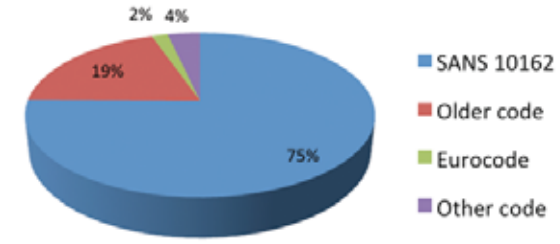
Percentage of your time spent on... *(Note: adds up to less than 100%)*



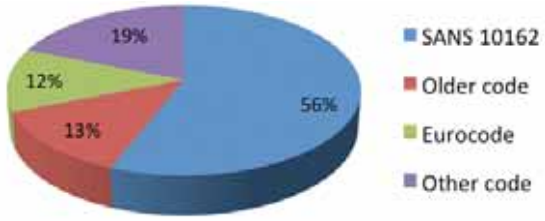
Percentage of your projects located in...



What code do you presently use for steel design for projects in SA?
(Note: adds up to more than 100%)

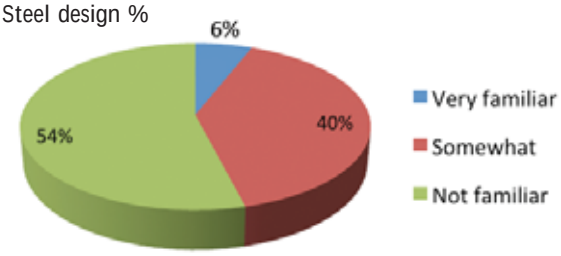


And for outside SA *(62% of the respondents reported under this heading)*

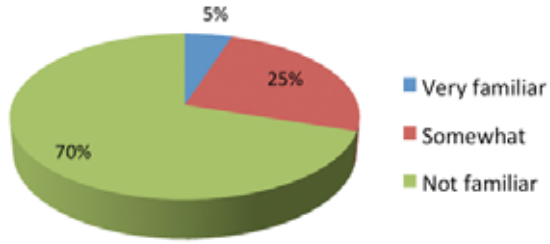


Familiarity with the Eurocodes:

Steel design %



Concrete design %



9.3% said there was some other aspect of the Eurocodes they were at least somewhat familiar with.

DO YOU THINK WE SHOULD GO FOR THE EUROCODE?

No, don't: 47% vs. Yes, do: 49%

Now let me admit: having worked through the results and read all the comments, I wasn't prepared for the tally on how many of the respondents (clearly a bunch of people who spend more time on steel design than on concrete or anything else, i.e. a sample with a steel bias – exactly what we were hoping for) thought that the Eurocode was the thing for us. Among those who voted for the Eurocode were 33% of the academics, 59% of the consultants and 38% of the EPCM people. 59% of those who support the Eurocode had at least some familiarity with it, but 41% had none. Among those who still use pre-SANS 10162-1 codes 55% are in favour of the Eurocode.

I hope nobody will be affronted when I say that the last two statistics remind me of what an engineer recently said to somebody I know: "I think we should go for the Eurocode, but I still prefer BS449". Taking some of the comments received from respondents into account, I read this as: "I think the Eurocode is the superior code on the globe and I guess it will help us latch onto the rest of the world, even though I have not had the time or reason to spend the effort required to get to grips with SANS 10162-1. In any case, deep down I feel that simpler codes probably serve engineers and humanity better than these ones that go to the nth degree and require a lot of design time, and I am suspicious as to whether they make structures either safer or more economical". About the comments received I can say that several were quite vehemently opposed to the introduction of the Euronorm; those in favour typically made their views dependant on such things as that the right software had to be made available.

My view of the situation at present is as follows:

- The skills situation in the country is such that we cannot afford to introduce a new, complex code; it will not be generally accepted and implemented before almost the entire corps of currently active engineers has been replaced – some 20 years.
- CEN will not allow us to do anything with the Eurocode other than to adopt it exactly as any member of the EU would do: adopt the whole caboodle, without changing one iota, by means of the specified national annexes. The complete set of standards is hugely comprehensive, complex and very expensive, with a high degree of inter-reference.
- Some Eurocodes are unacceptable to us. EN 1993-1-3, dealing with cold formed sections, is an example. We have recently adopted, as SANS 10162-2, the Australian standard AS/NZS 4600, which is based on the North American standard (and is thus in effect a sister code of SANS 10162-1), because our light steel framing industry has very close Australian ties. Moving to another code would be unconscionable.
- There is no international trend towards the Eurocode. As far as we know, outside Europe only Singapore and Malaysia are adopting it, while Australia and other countries are quite strongly opposed to it and the Chinese, Japanese, Indians and others don't even think about it. Many more structures are designed in the world (and maybe even in Europe?) to other standards than to the Eurocode.

Taking note of all of the above, I would like to recommend the following. Let us resolve to put the Eurocode firmly on the back burner, until a time arrives when it becomes clear that it (or another set of codes) is clearly the right thing for the country. In the meantime, anybody is free to study the Eurocode and to use it for designing structures, even in South Africa if needs be. It is surely a good set of reference documents. But let us, until a groundswell for change develops, not live in an atmosphere where we act as though our code is on the way out and do such things as to base the education of students on the Eurocode.

The SAISC is in the process of updating SANS 10162-1, one of the objectives being to bring it in line with the newest edition of the Canadian code.

If you have any strong views on this matter, feel free to let me have your comments as soon as you can. If the feedback is such that it becomes clear that the above recommendation is contra the feelings of a significant number of steel designers I will refer the issue to others.

STEEL AWARDS 2013

NEW GENERATION PROGRAMME

By Marlé Lötter,
Events Manager, SAISC

To some extent the merit of the programme has already been proven by the fact that included among 'regular' guests at the Steel Awards 2013 dinner were participants of the New Generation Programme of previous years, who were now attending as employees of organisations within our industry. Top students = top employees!

The New Generation at Emperors Palace at the Gauteng Steel Awards event.

The SAISC recognises the value of excellent education provided by our universities for the future of the structural steel industry in South Africa. The New Generation Programme was initiated in 2008 as an add-on to Steel Awards to serve as a special incentive and inspiration to both lecturers and top senior and postgraduate students. By allocating an equal contribution from every one of our event sponsors and R25 of every attendance fee the Institute was once again able to expose 17 top performing students and mentors, representing seven universities (and the SAISC School of Draughting) to a range of industry specific experiences and to create networking opportunities with key role players at site visits and at tables during the Steel Awards dinner at Emperors Palace.

To extend the benefit as far as possible, 11 more top candidates were invited as complimentary guests at a Steel Awards dinner at the venue closest to them. To some extent the merit of the programme has already been proven by the fact that included among 'regular' guests at the Steel Awards 2013 dinner were participants of the New Generation Programme of previous years, who were now attending as employees of organisations within our industry. Top students = top employees!

The full day programme included a visit to the workshop of Tass Engineering under technical guidance of Tim Tasioulas and Marten Spencer (in photo on the right).

Top students of the Universities of Stellenbosch and Cape Town with US mentor, Dr Celeste Barnardo-Viljoen at Steel Awards 2013 at the Cape Town International Convention Centre.

The full day programme included a visit to the workshop of Tass Engineering under technical guidance of Tim Tasioulas and Marten Spencer, followed by an encounter with the SAISC's new floor system testing site close-by. As in 2012, the group was once again allowed onto the Eskom Kusile Power Station construction site, which included getting around, into and even up to the 100m level of one of the boiler supports. Participants agreed that this gave them a whole new perspective of the scale of this mega structure and its structural complexity, compared to seeing a typical wide angle panoramic picture. SAISC thanks Hitachi Power Africa for arranging this visit and for technical guidance on site – we specifically recognise the extensive efforts by Mark Marais, Stefanie Kulhanek and Johan Slabbert. Participants were accompanied throughout the programme by Amanuel Gebremeskel and Viv van Zyl of the Institute.

These were some of the post event comments from participants about the New Generation Programme 2013:

"A valuable and indispensable introduction to structural steel engineering," Prof Ben van Rensburg, UP.

"The New Generation Programme bridges the gap between books and our future career potential... opens our eyes... to the influence we can have... not just on a community but a nation!" R Mans, UKZN

"...the programme made students really aware of the significance of steel... (and that) it does not have to be incorporated into concrete," T Mbanjwa, UCT.

SOCIAL SNIPPETS

By Marlé Lötter, Events Manager, SAISC

STEEL AWARDS 2013 – THE EVENT IN PICTURES

19 SEPTEMBER 2013

RIGHT: Hermien de la Mare of the Light Steel Frame Category Sponsor, Stewarts & Lloyds, on stage with Mike Lomas (far Left), SASFA Director John Barnard and Spencer Erling. The award went to the NTT Audi Showroom in East London.

BELOW: John Swallow of the Photo Competition Sponsor, CadexSA, presents a cash prize of R10 000 and a special framed edition of the winning picture to the photographer, Andrew Bell, of Paragon Architects.

ABOVE: The 2013 award in the ASTPM Tubular Category was presented by Paul Deppe (centre), Vice-president of the Association of Steel Tube and Pipe Manufacturers of SA, to Rob Mylroie of Tass Engineering, as project team member of the New Office Facility of Standard Bank of South Africa in Rosebank.

RECEIVING AWARDS...

ABOVE: Proud members of the Overall Winning team of the Eskom Medupi Power Station main frame and boiler grid supports. Fom left to right – Top Row: Spencer Erling (SAISC), Gert Lange (Genrec Engineering), Ernest von Claer (Hitachi Power Africa) and Mark Marais (Hitachi Power Africa). Bottom Row: Mike Lomas (SAISC Chairman), Mike Borello (Genrec Engineering), Howard Fox (Genrec Engineering), Michael Moller (Genrec Engineering)

LEFT: John Barnard (2nd from right) was recognised as Honorary Life Member of the SAISC. Here with SAISC CEO, Paolo Trinchero, SAISC Chairman, Mike Lomas and outgoing SAISC CEO, Dr Hennie de Clercq.

BELOW: Smiling members of the Rooi Els Beach House project team receiving the award for the Residential Category of Steel Awards 2013 in Durban.

LEFT: Margy Holmes of Conspec Consulting Engineers received the award as joint winner in the Refurbishment and Extension Category on behalf of the project team for the Paarman Food New Factory in Cape Town. Presented by Mike Papanicolaou, Chairman of the SAISC Western Cape Regional Committee, with Tiana Ferreira of SAISC Head Office in attendance. The other joint winner was the King Edward VII School in Houghton.

GETTING 'INTO AFRICA' AT ALL THREE VENUES

...with marimbas & kwêlas, pap-potjies & painters, beads & blankets...













SUPPORTING A GOOD CAUSE!


Table decor created and sponsored by Macsteel was awarded to one lucky guest at every table across all three venues.

At Emperors Palace and the CTICC guests could make voluntary cash or pledge contributions. In Durban a portion of every attendance fee was reserved for community support.

Some pledge amounts are still coming in, but these are the figures so far:

Gauteng: R30 360 raised for Ry-Ma-In Centre for Quadriplegics in Linden.

Western Cape: R6 780 raised for the Hout Bay Music Project

Kwazulu Natal: R6 600 raised for the Action 4 Blind and Disabled Children

The SAISC thanks all our guests for the support.

STEEL AWARDS 2013 SUPPLIERS

The SAISC proudly recognises the following service providers who helped to make Steel Awards 2013 exceptional

Udo Carelse.

Buskaid Soweto String Ensemble

Drum Tribe.

Hout Bay Music Project.

Jo-Ann Strauss.

Kevin Perkins.

The Girls.

Design elements.

ALL THREE VENUES:

Framing of awards certificates:
Omni Arts & Crafts – Viv van Zyl, +27 82 492 8603, viv@lantic.net

Media relations:
Brooke Browde Communications - Alan Browde, +27 11 483 1823, alanb@bbcomms.co.za

Visual production:
i-Line Films – Johnny Taute, +27 83 273 3088, johnny@iline.co.za

Design elements (banners, programmes, invitations etc.):
...with pepper communications. – Reneé Pretorius, +27 83 565 7173, renee@withpepper.co.za

GAUTENG

Master of ceremonies:
Udo Carelse - Prime Talent, Primedia, Lebo Masipa, +27 11 506 3163, LebogangM@primedia.co.za

Entertainment:
Buskaid Soweto String Ensemble – Rosemary Nalden, +27 11 442 9676, rosemary@buskaid.co.za or Anne Bull, bull@buskaid.co.za

Marimba players, face painters and interactive drumming:
Drum Tribe - Shaun Reyneke, +27 82 853 2451, shaun@drumtribe.co.za (Additional contribution by the Main Sponsor Aveng Steel)

Event photography:
i-Line Films – Johnny Taute, +27 83 273 3088, johnny@iline.co.za

Technical support & production management:
Multi-Media Events – Tim Fish, +27 11 315 3585, tim@multi-media.co.za

Event management support:
Ping Pong Communications – Nadine Piek, +27 83 264 4496, nadine@ping-pongevents.co.za

WESTERN CAPE

Master of ceremonies:
Jo-Ann Strauss - Five Seasons Entertainment, 0860 110 309, enquiries@5seasons.co.za

Entertainment:
Hout Bay Music Project – Leann Dollman, +27 21 790 0141, hbmusic@telkomsa.net.

Event photography:
ProTeknik Services – Daniel, +27 73 209 5849, daniel@proteknikservices.co.za

Event management support:
Attitude Events – Alfreda Coetzee, +27 84 549 8447, alfreda@attitude-events.co.za

KWAZULU-NATAL

Master of ceremonies/Comedian:
Kevin Perkins aka Michael Naicker – Entertainment Online, +27 76 798 6986, jp@entertainment-online.co.za

Entertainment:
The Girls: Cristina Rodrigues & Cathy Del Mei – Cristina, +27 82 921 2752, Cathy, +27 82 682 2866, info@cristinarodrigues.com

Event photography:
Xposure Photography – Gail van Vuuren, +27 83 609 4394, gail@xposurephotography.co.za

Technical support:
Superior Vision - Warren Loots, +27 82 835 6570, warren@superiorvision.co.za

INTO Africa

Sponsors

SAISC STEEL AWARDS 2013

MAIN SPONSOR

Aveng Steel
Tel: +27 (0)11 861 7105 / Fax: +27 (0)11 865 3031
Email: trident@trident.co.za / Website: www.avengtridentsteel.co.za
Postal: P.O. Box 124054, Alrode, 1451
Physical: Marthunisen Road, Roodekop, Germiston

TABLE DÉCOR SPONSOR

Macsteel
Contact: Dave Dawkshas,
Group Marketing Director, Macsteel Corporate Services
Tel: +27 (0)11 871 0000 / Fax: +27 (0)11 823 3860
Email: info@macsteel.co.za / Website: www.macsteel.co.za
Postal Address: PO Box 7729, Johannesburg, 2000
Physical Address: 7 Brook Road, Lilianton, Boksburg

PHOTO COMPETITION SPONSOR

Cadex SA
Contact: John Swallow or John Duncan
Tel: +27 (0)11 463 1857 / Fax: +27 (0)11 463 9445
Email: info@CadexSA.com / Website: www.cadexsa.com
Postal: PO Box 411340, Craighall 2024

TUBULAR AWARD SPONSOR

Association of Steel Tube and Pipe Manufacturers of South Africa
Contact: Colin Shaw or Margie Olivier
Tel: +27 (0)11 823 3546 / Fax: +27 (0)11 823 2377
Email: astpm@astpm.com / Website: www.astpm.com
Postal: PO Box 18587, Sunward Park 1470

LIGHT STEEL FRAME AWARD

Stewarts and Lloyds
Contact person: Hermien de la Mare
Tel: +27 (0)11 553 8500 / Fax: +27 (0)11 553 8510
Email: info@sltrading.co.za / Website: www.stewartsandlloyds.co.za
Postal Address: PO Box 79458, Senderwood, 2145
Physical Address: Pellmeadow Office Park, 60 Civin Drive, Bedfordview

PARTNER SPONSORS

ArcelorMittal SA
Contact: Lara Benson
Tel: +27 (0)16 889 4484 / Fax: +27 (0)16 889 3487
Email: lara.benson@arcelormittal.com
Website: www.arcelormittal.com/southafrica/
Postal: PO Box 2, Vanderbijlpark,1900
GPS: E 27.8033 S 26.6703 or E 27° 48' 19.6" S 26° 40' 22.3"

B&T Steel
Contact: Bryan Wilken
Tel: +27 (0)13 665 1914 / Fax: +27 (0)86 528 3349
Email: marketing@btsteel.co.za / Website: www.btsteel.co.za
Physical: 16 Flambojant Street, Delmas 2210

Eazi Sales & Service
Contact person: Elisma Malherbe
Tel: +27 (0)11 312 7308 / Fax: +27 (0)11 312 7381
Email: sales@eazi.co.za / Website: www.eazisales.co.za
Postal Address: Postnet suite #265, Private box: x121,
Halfway House, 1685
Physical Address: Unit 3, No 2 Swart Drive, President Park,
Midrand, 1685
GPS co-ordinates: S 26°00.048 E 028°.08.477

Genrec Engineering, a division of Murray & Roberts Ltd.
Contact: Monya de Kok
Tel: +27 (0)11 876 2308 / Fax: +27 (0)86 765 0363
Email: monya.dekok@murrob.com / Website: www.genreceng.co.za
Postal: Private Bag X035, Wadeville, 1422

NJR Steel Holdings
Contact: Colin Chapman
Tel: +27 (0)11 477 5515 / Fax: +27 (0)11 477 5550
Email: cchapman@njrsteel.co.za / Web: Website: www.njrsteel.co.za
Postal Address: PO Box 58337, Newville 2114

Peddinghaus
Contact: Patrick Pereira
Tel: +27 (0)82 821 6974 / Fax: +1 815 937 4003
Email: marketing@peddinghaus.com / Website:
www.peddinghaus.com
Postal Address: 300 N. Washington Ave. Bradley, IL 60915 - USA
Physical Address: 300 N. Washington Ave. Bradley, IL 60915 - USA
GPS co-ordinates: 41.145641, -87.862892 or
N41° 8.7385', W087° 51.7735'

Tubular Holdings (Pty) Ltd
Contact person: Tony Trindade
Tel: +27 (0)11 553 2000 / Fax: +27 (0)11 450 2165
Email: tony.t@tubular.co.za / Website: www.tubular.co.za
Postal Address: PO Box 1342, Bedfordview, 2008
Physical Address: 8 Hawley Road, Bedfordview, 2007

Vital Engineering
Contact: Dodds Pringle
Tel: +27 (0)11 8988500 / Fax: +27 (0)86 743 9880
Email: sales@gratings.co.za / Website: www.vitagrid.com
Postal Address: PO Box 6099, Dunswart 1508
Physical Address: Vital House , Lea Road, Dunswart, Boksburg North

MAIN SPONSOR

AVENG STEEL

TABLE DÉCOR SPONSOR

MACSTEEL

PHOTO COMPETITION SPONSOR

Cadex SA

TEKLA

TUBULAR AWARD SPONSOR

ASTPM

LIGHT STEEL FRAME AWARD SPONSOR

STEWARTS & LLOYDS

PARTNER SPONSORS

ArcelorMittal

B&T

EAZI SALES & SERVICE

Genrec
Fabricating Innovative Steel Solutions

njr steel
first for steel

Peddinghaus

Tubular

WWW.VITAGRID.COM

SUPPORT THE SAISC SCHOOL OF DRAUGHTING

The School has two serious issues and the SAISC is looking to the industry for support, but the kind of support you would call a 'win-win' situation.

SAISC School of Draughting students during a construction site visit.

The SAISC School of Draughting has been operating under the sole management of the SAISC for a few years now. Students of the School receive the National Diploma in Structural Steel Detailing after completing a two year programme. The programme is set to a very high standard and run by highly competent lecturers. Companies who have employed graduates of the SAISC School of Draughting can attest to that.

There are currently two groups enrolled at the School with a total of 24 learners. The senior group of 14 learners are in the final phase of their training. Their two-year programme will end in February 2014 with a final assessment.

The junior group started in March 2013. They received training on the following:

- The use of drawing equipment and to apply drawing techniques to produce detail drawings of basic structural steelwork assemblies and arrangement drawings
- The application of regulation codes
- The understanding of drawing office practices
- The mechanical properties of bolts set screws and welds
- AutoCad

They will start with their training in Tekla Structures soon. The school also ensures that they take part in industry events where possible such as the SteelFuture Conference and undertake field trips to give them a practical experience of the industry.

However, the School has two serious issues and the SAISC is looking to the industry for support, but the kind of support you would call a 'win-win' situation:

There have been insolvencies in the industry leaving two advanced students needing financial support. Thus in aiding these students companies could find themselves employing one or two very talented 'draughties' just by taking over a portion of their training costs.

The second issue is that too few of our students are from previously disadvantaged homes. This is because in the vast majority of cases, 'Dad' is paying for the student's education - sadly disadvantaged homes do not have that kind of money.

The SAISC has decided to approach industry for financial support to create scholarships to fund previously disadvantaged students school costs. If you can see your way to (partly) sponsoring a student's fees please call Spencer Erling at the SAISC offices or email him at spencer@saisc.co.za. Such sponsorships will surely be regarded as CSI for your BBBEE scorecards.

The SAISC School of Draughting has also started to offer a RPL programme to experienced detailers who are interested to obtain the qualification as well as other learnerships and skills programmes to detailers in training as a means to obtaining the qualification.

Applications for the new intake of students close on 10 February 2014 and classes begin 3 March 2014.

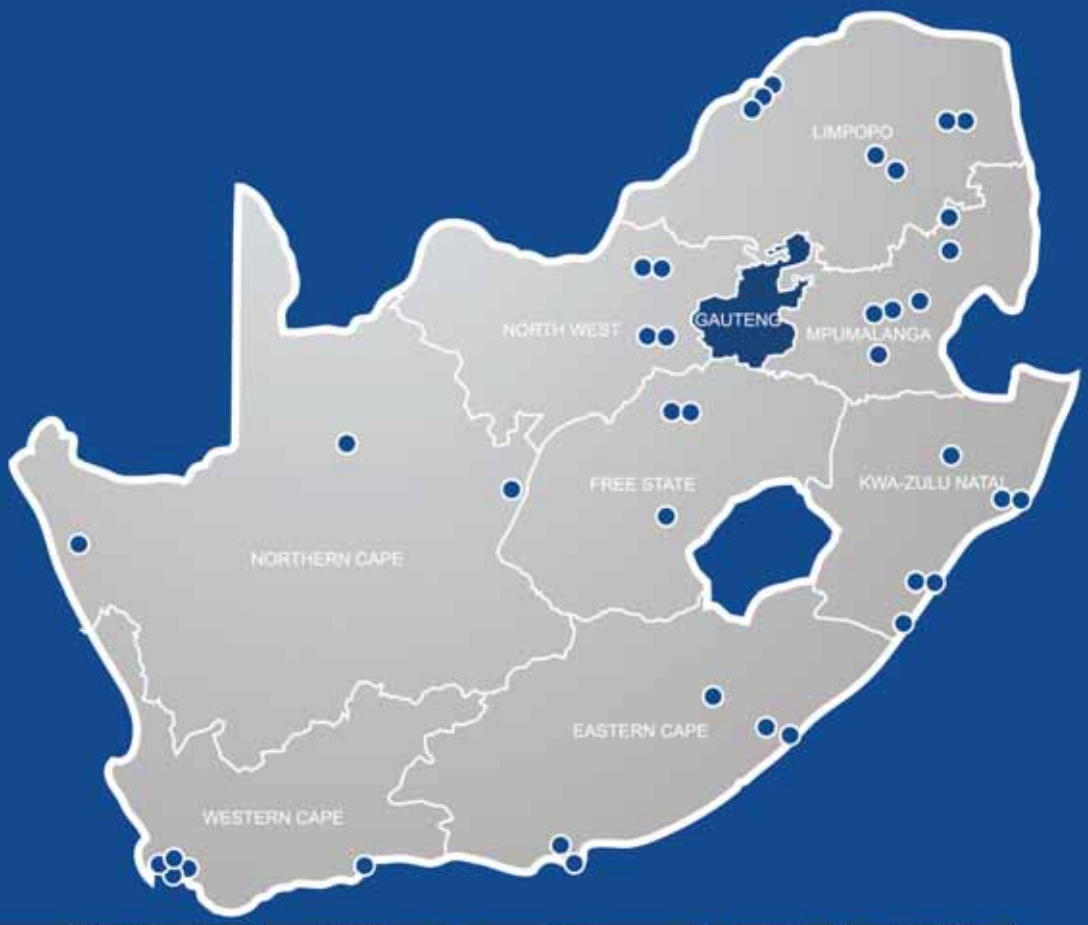
If you are interested in enrolling for the National Diploma or any of the other courses please contact Jenny Claassens at +27 11 876 5324 or jenny@saisc.co.za.

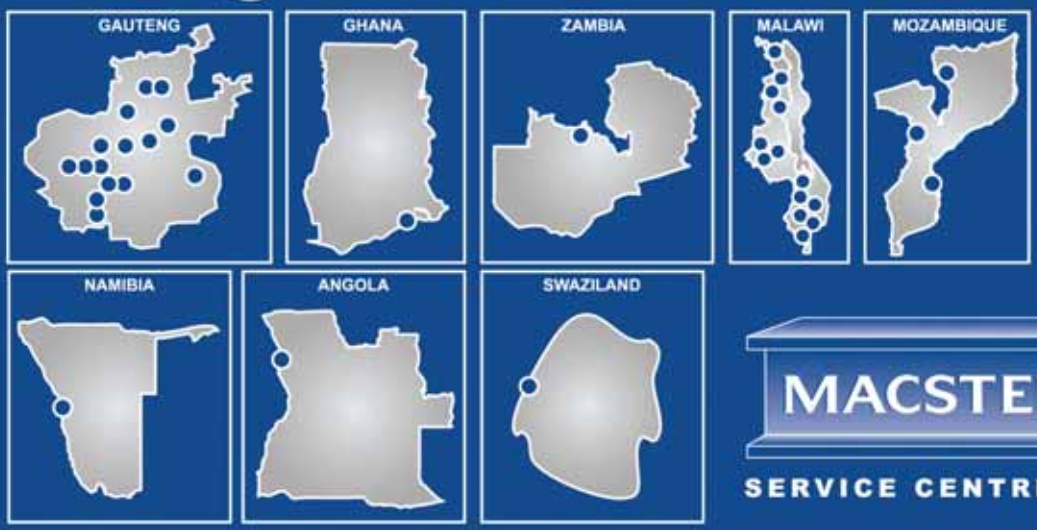
MACSTEEL

Africa's leading steel supplier

Offering you the most comprehensive range of steel products and value added processing services

- Aluminium
- Blanking
- Bright Bar
- Castellated Beams
- Cellular Beams
- Cold Form Sections
- Cold Saw Cutting
- Conveyance Pipe
- Corrugated Roofing
- Drilling
- Expanded Metal
- Fencing Products
- Flame Cutting
- Flanges
- Fluid Control Systems
- Freestock
- Galvanized Sheets
- Galvanized Tubing
- Grating
- Guillotining
- Harveytiles
- Heat Treatment Services
- High Strength Steels
- Hollow Bar
- IBR Roofing
- Laboratory Services
- Laser Cutting
- Laser Cut Tubing
- Lipped Channels
- Open Sections
- Palisade Fencing
- Pipe Fittings
- Plasma Cutting
- Plates
- Plate Bending & Rolling
- Pre-coated Sheets
- Pressure Vessel Steels
- Profile Sections
- Purlins
- Rails
- Reinforcing
- Roofing Solutions
- Sheets
- Slitting
- Special Steels
- Stainless Steels
- Stretcher Leveling
- Structural Steels
- Technical Consultancy
- Tool Steels
- Tubing
- Valves & Actuators
- Wear Resistant Steels
- Zincalume Roof Sheets





MACSTEEL

SERVICE CENTRES SA

The Macsteel Group - Africa's leading steel supplier - www.macsteel.co.za

John (51) has the key elements of project delivery - structural data from each phase -embedded into the Tekla model, to schedule and monitor project performance from design to supply and installation. Combining all available 3D and management data into the Tekla model allows his team members to stay in the building information loop.

Tekla BIM (Building Information Modeling) software solutions provide a data-rich 3D environment that can be shared by contractors, structural engineers, steel detailers and fabricators, and concrete detailers and manufacturers. Choose Tekla for the highest level of detail, accuracy, constructability and integration in project management and delivery. Visit our website to learn more about Tekla solutions and references. Since 2011, Tekla has been a part of the Trimble Group.

> www.tekla.com

Contact **Cadex SA**,
Tekla's Partner for
Southern Africa
info@CadexSA.com
www.CadexSA.com
+27 11 463 3641

TEKLA
A TRIMBLE COMPANY