steel CONSTRUCTION

Volume 38 No. 3 2014

IN THIS ISSUE:

Tubular Structures

SOUTHERN AFRICAN INSTITUTE OF STEEL CONSTRUCTION

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
+27 11 463 3641

TEKLA
A TRIMBLE COMPANY

EDITOR'S NOTE

Welcome to our all-out tubular steel feature. We have 'tubified' this issue from the company profile of Macsteel Tube and Pipe Value Adding Facility through to a technical article on drawn tube *(yep, I learned something new – it's got nothing to do with drawings).* Steel Awards received more than ten entries that could fit into the tubular category and we feature some of them in our one pager articles.

Everyone in the steel industry is aware that economic times are tough. It seems the brief boom (albeit superficial) ending in 2007 was ages ago and there is not much light on the horizon. So, it was very positive to receive 61 entries for Steel Awards and some of them still big industrial ones (see the next issue for the mining and industrial feature). The Institute is working hard to make it another memorable yet cost effective event.

The Institute's subsidiaries and School of Draughting are just as busy at making the Southern African steel construction industry a viable industry to work for and do business with. This issue tells more about what they are up to.

We are busy giving Steel Construction a bit of a revamp and we would really like to know what you like and do not like about the magazine in its current guise. The last thing we want is for our readers to come back to us after the fact and ask: "Now why have you gone and changed that?" Please let us know – just write us an email (renee@saisc.co.za for complaints and paolo@ saisc.co.za for compliments – only joking).

steel CONSTRUCTION

Volume 38 No. 3 2014

Contents

SAISC COMMENT

2 The SAISC in the fast lane

PROFILE

4 Macsteel Tube and Pipe Value Adding Facility

INDUSTRY NEWS

6 Industry news in brief

13 Multi-storey buildings: Designing parking garages in steel

18 SAMCRA achieves first milestones

20 POLASA gearing up

SASFA

22 SASFA's 18th industry feedback meeting

26 Gallery on Leviseur

27 TUBULAR PROJECTS

28 American International School of Johannesburg: Aquatic Centre

29 Malapa Fossil Excavation Site

30 Hyundai Parking Garage

32 Rydall Views Solar Screen

34 Zinc and lead storage and loading facility at Lüderitz Harbour, Namibia

36 Jindal Africa Head Office

TECHNICAL

40 Structural hollow sections - from an engineer's perspective

SAISC NEWS

37 Steel Awards 2014: Sponsors and entries

42 Calendar of events

43 The SAISC interns programme

46 Social snippets

47 The SAISC School of Draughting moves

Join us on and YouTube

OFFICIAL JOURNAL OF THE SOUTHERN AFRICAN INSTITUTE OF STEEL CONSTRUCTION

American International School of Johannesburg – Aquatic Center

Photo: Courtesy of TerraEther Architects

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

I do think that we need to increase and maintain the local content requirements and raise the bar significantly. It is time to ensure that large projects are designed in South Africa and managed by South Africans. The most effective way to create jobs in our industry is to stop losing them to imports.

THE SAISC IN THE FAST LANE

This year is really moving fast, as predicted by many it is certainly not one without adventure and challenge.

A special thank you and welcome to our new members who have come on board this year. So far we have an additional 88 new members. We are hoping to further increase our membership and would appreciate input from our existing members on how we are progressing.

Thank you to those of you who have entered Steel Awards. We have 61 entries which despite the tough financial conditions is a considerable increase in numbers compared to last year. Good luck!

On the lobbying front the SAISC has been hard at work. I would like to thank the DTI, Treasury, SARS and Eskom for their ongoing assistance. It is important that the industry is aware that we are invited to and attend and make meaningful contributions at many of their meetings. I particularly would like to thank Minister Rob Davies of the DTI for coming back to us so quickly having thoroughly investigated our view on using World Bank funding and the designation of power lines. The SAISC is passionate about creating and protecting South African steel fabrication jobs and will continue to put pressure on various stakeholders and work with government and the industry.

I do think that we need to increase and maintain the local content requirements and raise the bar significantly. It is time to ensure that large projects are designed in South Africa and managed by South Africans. The most effective way to create jobs in our industry is to stop losing them to imports.

On this front many arguments are made for sending designs and complex projects overseas due to apparent 'lack of skills'. We have many young engineers graduating who need to gain experience on large projects and this can only happen if we create the work in SA.

The SAISC is currently in the process of launching the SAISC Steel Academy which will cover a range of courses and training opportunities from typical engineering design courses, to competitiveness and contractual issues through to business development. We are working with some of the best and most experienced people in the industry to transfer their knowledge to our up-and-coming recruits. Please keep an eye out for developments, support the Academy and give us feedback on your training requirements.

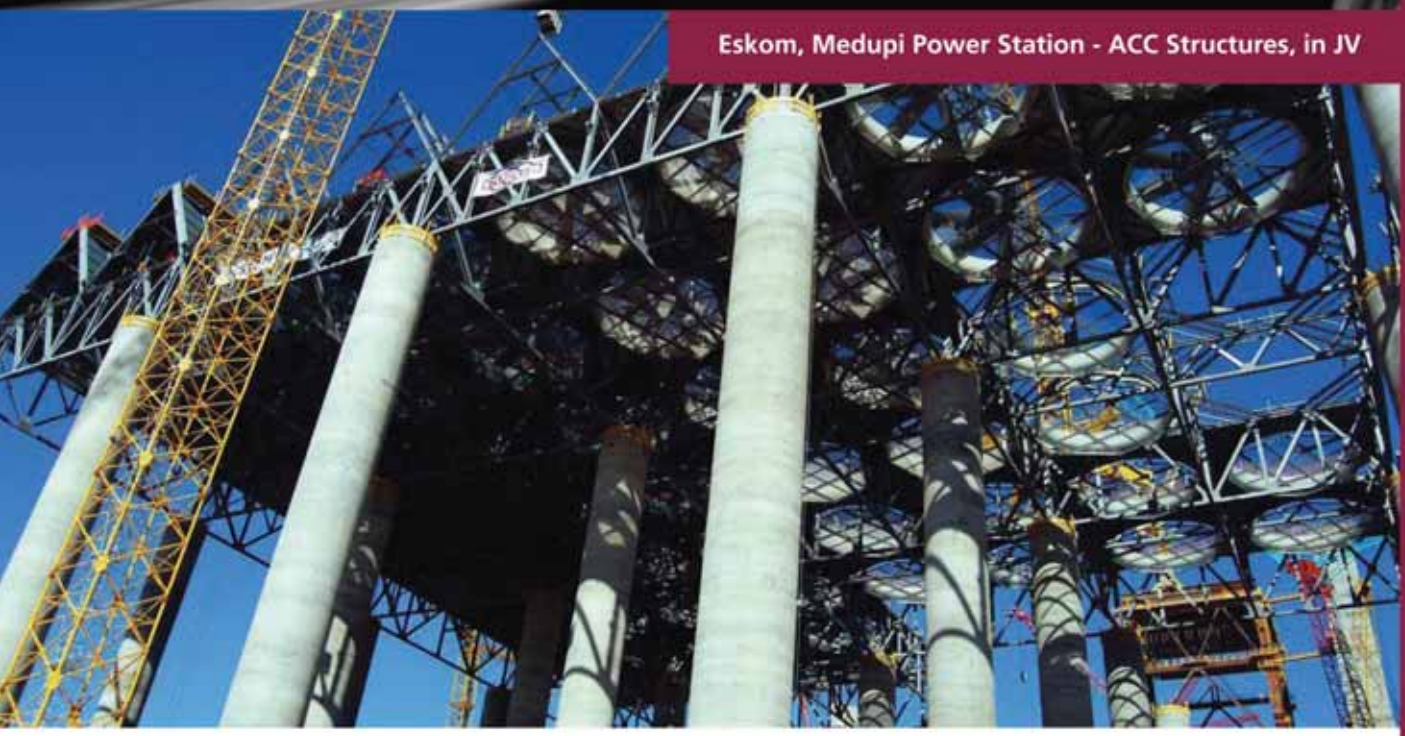
In line with the SAISC commitment to training we have taken on three young engineers from the Vaal University of Technology who will complete their training through an initiative funded by the Department of Science and Technology. See details in the article on page 43. If we are successful we hope to increase the number of training opportunities next year.

Our programme on promoting multi-storey steel framed buildings is beginning to gain traction. You may have noticed that every edition of Steel Construction this year has included a multi-storey steel framed project. A website is currently being developed which will pull projects and technical information together. Please remember to keep us informed of projects you are currently working on, we are constantly on the lookout for articles to include in our journal or website.

The SAISC School of Draughting has moved to Genrec Engineering. They now have a world-class facility based at a world-class steel fabricator's workshop. I would like to thank Mike Borello and the Murray and Roberts and Genrec team for assisting us in this regard and would encourage members to go and visit the school and sponsor a student or two. See the article on the move, page 47. The school is currently working on additional training modules for the industry.

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

MACSTEEL TUBE AND PIPE

VALUE ADDING FACILITY

By Spencer Erling,
Education Director, SAISC

As part of the Macsteel Group's ongoing expansion and the modernisation of its facilities, Macsteel Tube and Pipe recently developed and commissioned an additional new 30 000m² plant in Boksburg to house their extensive value adding capabilities.

Macsteel Tube and Pipe's diverse product offering combined with its world-class value added processing competencies, forms an integral business unit within the Macsteel Service Centres SA Group, which is the leading steel service centre company on the African continent.

Typically, when a structural steel fabricator thinks of a steel service centre, they think of plates cut to size and to shape, long product profiles cut to size and possibly the addition of a few value added services such as drilled holes or bevelling etc. Occasionally, maybe bending may come into the picture.

However, as part of the Macsteel Group's ongoing expansion and the modernisation of its facilities, Macsteel Tube and Pipe recently developed and commissioned an additional new 30 000m² plant in Boksburg to house their extensive value adding capabilities. This is not your ordinary steel service centre as described above, this is something totally different!

The construction of the new plant consumed 1 500 tons of structural steel and consists of seven 130m long by 29m wide bays, each equipped with two 10 ton overhead cranes. Localised state-of-the-art handling equipment is installed to facilitate optimum productivity. Fabrication gasses are piped throughout the work station areas.

Once again, this facility provides an excellent example of where long-span cellular beams have been successfully utilised in the construction of a factory/warehouse utilising overhead handling applications. Macsteel has provided a significant tonnage of innovative customised cellular beams for projects where spans have specified requirements ranging from 20 to 40 metres. An additional feature of this structure is the innovative use of tubular cross members for the columns supporting the crane girders.

Macsteel Tube and Pipe is ISO 9001:2008 accredited and supplies products to internationally approved quality standards for applications such as:

The plant is highly mechanised.

Weld preps are superb.

- Water and other conveyance pipe
- Tube for structural engineering and automotive applications
- Hi-tensile scaffolding tube
- Conveyor idler tube
- Mine support systems
- Furniture and general purpose precision tubing

The product offerings are fully supported by the new value adding facility which includes plant and machinery such as customised cutting machines, precision laser cutting, a high definition plasma cutting, tube chamfering machines, welding machines and processes including comprehensive jigged set-ups for welding pipes into a myriad of applications.

Additional features to the laser cutting facilities at Macsteel Tube and Pipe boast a unique offering whereby product inputs and outputs of 12m lengths are handled efficiently with ease. Laser cutting machines are also dispelling the perception that tubular fabrication is complex. Products supplied from these machines provide the fabricator with a precision cut tube ready for assembling and welding. Complicated architectural end designs for jointing connections and other applications for hollow sections are well within the capabilities provided.

Great welding.

The advanced production capabilities accommodate the attachment of a full range of fittings, flanges and other connecting mechanisms, including facilities whereby these components are converted into complete pipe systems to meet specialised requirements.

Macsteel Tube and Pipe has developed two innovative additional product ranges, namely;

- Lula Pipe which is a steel pipe made to assimilate plastic pipe dimensions and aimed at competing with plastic pipes. Lula Pipe is tested to 50 bar in many instances surpassing the smaller diameter systems (than plastic), minimising costs and providing a superior life cycle. The system is interchangeable with plastic elements and does not require special tools or skills to install.
- Cable Lock reticulation systems which are experiencing huge demand given their ease of installation, superior performance and cost advantages.

The connections for both these systems are all manufactured in Macsteel Tube and Pipe's new facility in Boksburg.

The full range of additional value added products on offer is impressive and includes Mac Shoulder end jointing systems, pipe tee's (suitable for bolting with flanges or suitably prepared for full penetration welding), branches, elbows, lobster back bends, all of which may be customised to a variety of specifications.

Macsteel Tube and Pipe looks forward with much confidence to the future and to being particularly well prepared to process a significant amount of tubular and piping products through its world-class new plant.

INDUSTRY NEWS IN BRIEF

ROBOR LAUNCHES STEEL INDUSTRY RELATED APP

SAISC company member

Robor is proud and excited to be the first South African steel tube and pipe manufacturer to announce the launch of an industry related 'app' compatible with Android and iOS smartphones. The app (short for application) can be downloaded for free and offers users readily available information regarding the full Robor offering, as well as other useful information and tools applicable to steel products and services.

This app enables people out in the field, to have easy access, through a mobile device, to Robor's steel products and services, as well as other useful industry related offerings, such as Steel Calculations, Steel Specifications and Smart Tools.

The app will undergo continuous improvements and updates to remain the leading app in the industry.

SILVERLINE GROUP SCOOPS ANOTHER COVETED NATIONAL AWARD

SASFA company member

Silverline Group was awarded "The FASA Franchisor of the Year 2014" sponsored by ABSA, at a gala event in Sandton. This is a great achievement only a few months after winning the SANLAM & Business Partners Emerging Entrepreneur of the Year Award.

Silverline Group is unique in the franchise marketplace in that it is the only franchise construction company in South Africa and one of a few in the world.

This prestigious award celebrates the success of the franchisor that has

Robor's app is compatible with Android and iOS smartphones.

made a significant impact in the marketplace and has, through effective business management and marketing, achieved outstanding financial results and a significant growth in its sector. It is awarded to the franchisor that originates the franchise concept and develops the business system so that it can be successfully duplicated through a network of franchises to successfully build a strong brand that becomes a household name.

Jonathan Pepler, Director at the Silverline Group receives the FASA Award on behalf of Silverline.

Franchising is undoubtedly the business phenomenon of our time – the one business system that can take a brand from obscurity and establish the brand in the mind of the consumer. South Africa's franchise sector has seen many iconic brands, both international and home-grown, receive recognition from many quarters. Yet, there is no doubt that recognition amongst one's own peers remains a sought after accolade.

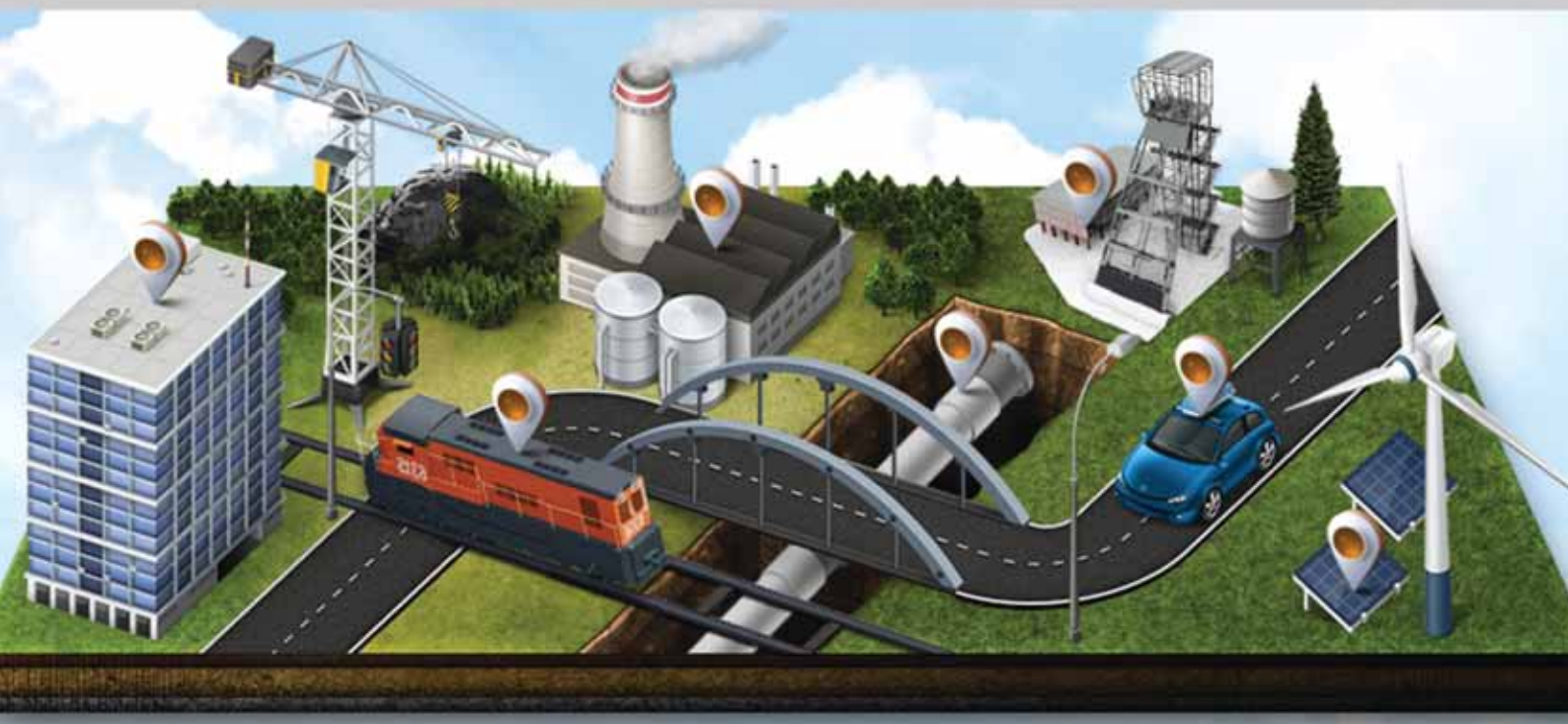
By Silverline Group winning this award, the benefits are far-reaching – from uniting all those who represent the brand to getting peer, public and media recognition.

WHAT MAKES A SUCCESSFUL CITY OF THE FUTURE?

Worldwide cities face the challenge of growing economically while balancing the social and environmental side of the city to remain sustainable in the future. To succeed, they need urban projects that have a clear vision and goals, are well managed and involve a broad range of parties working together effectively.

These are some of the findings of a new report produced by PwC, the European Institute for Comparative Urban Research (Euricur) and the Institute for Housing and Urban Development Studies. The report analyses how different type of innovative urban development projects and strategies are contributing to strengthen a city's capitals and to strike balances between the economic, social and environmental spheres.

Fundamental changes such as climate change, technological advances,



www.robor.co.za

Imagine a world without steel. *We Can't...*

Established in 1922, Robor is a world-class South African manufacturer and supplier of welded steel tube and pipe. Robor also supplies and adds value to carbon steel coil, plate, sheet and structural profiles. Robor is active in most industries, including Mining, Transport - rail and road, Construction, Engineering, Agriculture, Energy, Water and Automotive through the supply of steel, cold formed steel profiles and associated value added products including galvanizing.

SASTELA · STEASA · SAPVIA · steel · ISF · HOT DIP GALVANIZERS ASSOCIATION SOUTHERN AFRICA · CIDECT · NAACAM · EXECUTIVES' GLOBAL NETWORK South Africa

Download Robor's FREE Steel Related APP!

ANDROID APP ON Google play

Available on the App Store

robor

For more information:

Tel: +27 (0)11 971 1600 E-mail: info@robor.co.za www.robor.co.za

INDUSTRY NEWS

increasing societal demands, shifting power from national to local levels and the consequences of the 2008 financial crisis are changing the playing field of cities worldwide. However, on closer inspection, the types of imbalances faced by cities are different.

All in all, the context and dynamics of each individual city heavily influence the type of vision and strategies put in place to achieve sustainable competitiveness.

The report argues that while there is not one single path to sustainable competitiveness that every city can follow, there are certain key ingredients to success. These include:

- Collaborative power: this is the glue that brings sustainable competitive projects together. In the most successful projects, leadership is distributed across multiple organisations working closely together to make the project happen.
- Capabilities: successful urban projects require good design and vision but also sound implementation capabilities.
- Choice: depending on the aim of the urban development project, the report identifies key choices and dilemmas that urban managers should consider when planning for sustainable competitiveness in cities.
- A new type of urban manager: successful urban projects require a new kind of urban manager with multiple skills.

PwC Partner in Charge of the Western Cape, Danie Fischer, says: "Cape Town is one of the few urban projects highlighted in the report that ticks the above boxes." One advantage for Cape Town is that the effort and initiative to improve the city's competitiveness is supported by a number of public and private sector initiatives.

Now regarded as one of South Africa's safest cities, only a decade ago the central city district (CBD) was struggling with high levels of crime and gang violence with many 'high risk, no-go' areas negatively impacting the city's economic growth. The Central City Improvement District, launched in 2000, has played a major role in significantly reducing crime in the Cape Town central city over the past decade.

Fischer concludes: "A key urban challenge for the next decade is how to improve sustainable competitiveness, i.e. a city's ability to keep growing and developing over time while fostering social cohesion an environmental quality."

The Faculty of Engineering and Technology produced 687 graduates during the 2014 autumn graduations

VAAL UNIVERSITY OF TECHNOLOGY'S ENGINEERING PROGRAMMES GETS INTERNATIONAL RECOGNITION

The Vaal University of Technology (VUT) has received accreditation from the Engineering Council of South Africa (ECSA) for the engineering programmes in the Faculty of Engineering and Technology. The accreditation is internationally recognised as one of the best management practices in engineering education as it aligns to internationally recognised engineering accords.

"This means our students get the very latest technology, access to modern state-of-the-art methodology, receive professional development in the areas of engineering competencies, mentoring, training and practical work and graduate as adequate and competent persons meeting the minimum requirements to be registered as candidate engineering technicians and technologists", says Professor Maurice Ndege, Executive Dean of the Faculty of Engineering and Technology.

The Faculty of Engineering and Technology produced 687 graduates during the 2014 autumn graduations. The 415 diplomas, 254 Btechs and eight Mtechs graduates will contribute to the scarce and critical skills industry needed in South Africa. The graduate throughput

strengthens the quality of research and innovation in building capacity for South Africa's engineering needs.

"This standing offers our graduates the platform to use their qualification and be employable worldwide, so we are proud that our new innovative engineering courses will give our learners a head start not only in South Africa but also internationally", he said.

NASPERS CENTRE REDESIGN AWARDS

Media24 has revealed the judges' most favoured designs submitted for Design24, a design competition seeking concept ideas to 're-imagine' and rejuvenate the Naspers Centre on Cape Town's Foreshore.

Although there was no clear winner, Media24 decided to reward the three favoured designs. "Some of the entries truly re-imagined the iconic Naspers Centre, so even though there wasn't a clear winner we decided to split the prize money equally between the top three entries as recognition of their artistic contribution," said Media24 CEO Esmaré Weideman.

They are, in no particular order:

- Cape Town-based Tsai Design Studio, whose design titled Urban Sculpture imagined a folded sheath wrapped around the building, with a prominent media wall facing Walter Sisulu Avenue.
- MLB Architects, based in Cape Town and Johannesburg, whose design titled Reimagining an Icon used glass, mesh and green planting to create an entirely new silhouette for the building.
- Pretoria-based DBM Architects, whose design titled Roots imagined tangled roots reaching up the full height of the building, in reference to Media24's 100-year history in Cape Town.

The competition drew 94 entries from architects and designers across South Africa, in response to a brief that called for ideas to rejuvenate the building's exterior facade. Entries were judged by two panels and were assessed against six criteria: aesthetic value, sustainability, cost, technical feasibility, buildability and, lastly, a reflection of all four World Design Capital themes. Design24 is an official World Design Capital project.

The three favoured designs for the Naspers Centre redesign awards: Urban Sculpture, Reimagining an Icon and Roots.

ENGINEERING 25 YEARS OF INNOVATION

– the Prokon story

Celebrating a quarter of a century as a leader in providing structural engineering software solutions, **Prokon is set for even greater heights in the future.**

25 YEARS

PROKON
Software Consultants

Karl Eschberger | CEO | info@prokon.com

A solid foundation from the start

Prokon Software Consultants was founded in 1989 by structural engineers Karl Eschberger and Jacques Pienaar. Leading up to this time, they realised that structural analysis and design software had the potential to change the structural engineering sector.

At the time desktop computers were still a novelty and the duo focused their energy on writing programmes for DOS based personal computers. Their work was extremely well-received and before long most of their colleagues started to incorporate their software into their daily work routines.

Advent of the personal computer – the catalyst for growth

In the 1980s, desktop computers were becoming widely used and soon most engineers were migrating from mainframe computers to PCs. It was a natural progression for Karl and Jacques as well. Their first DOS-based programmes were well-received and a few months later they decided to establish their own venture. Thus, Prokon was born.

The company grew in popularity in its native South Africa, but they knew that their software had the potential to be a global success. In 1992, they brought Brian Zeederberg on board to establish a United Kingdom office. This was a defining moment for Prokon and their global reputation started spreading like wildfire shortly thereafter. The popularity of Windows 95, placed a PC on the desk of virtually every engineer. This provided Prokon with a new market opportunity which they pursued. They soon expanded their solutions to fit. In 2003 a Canadian office was opened and the company now had a platform from which they could further expand their activities around the globe.

Today, Prokon software is used and trusted by structural engineers in roughly 80 countries. Prokon software is not only developed for engineers, but is developed by engineers. Prokon employs a dedicated staff compliment of structural engineers and other competent staff, and is supported by a well-trained sales force and a skilled technical team.

Simplicity, form, function – a winning recipe

Prokon software can be used in the design of simple, single beam structures and yet it is powerful enough to complete full structural analyses and designs of substantial high rise projects with ease. Advanced analyses such as second order, non-linear and dynamic analyses can be performed.

Flexible licensing fees

In monetary terms, Prokon provides the most reliable and cost-effective software applications for structural engineering consultants, contractors, students, academics and even large engineering firms with thousands of staff.

The Prokon suite's scalable pricing model makes it a viable solution for any size project. Whether the budget and requirements call for one or fifty programmes, Prokon can deliver a reliable cost-effective solution. In addition, Prokon also offers an annual rental license option that allows one to access the software without the need for an upfront capital investment of purchasing software licences outright.

Autodesk® accreditation

The South African branch of Prokon Software Consultants became an Autodesk® Gold Partner for the Southern Africa region in 2001. This status has since expanded to Autodesk® Authorised Training Centre (Southern Africa), and Autodesk® Authorised Developer (worldwide). Today, Prokon Software Consultants is one of the largest Autodesk® resellers in South Africa.

Industry recognition

There is no doubt that since its inception in the 1989, Prokon has had a major influence in the South African structural engineering sector. This contribution was recognised in 2009 when Karl Eschberger was selected as a finalist for the National Science and Technology Forum Awards, which honours outstanding contributions to science, engineering, technology and innovation (SETI) with annual awards in a number of categories.

Into the future

As a market leader, Prokon recognises the importance of innovation in an ever changing environment. The newly released Sumo Structural Modeller, a 3D finite element analysis application, builds on previous analysis modules. It integrates with and extends Autodesk's world-leading AutoCAD® Revit® Structure and AutoCAD®. It simultaneously addresses the growing need for Building Information Modelling (BIM). The exceptional level of integration between Prokon modules continues to improve and extends automatically to Autodesk® products.

AUTODESK.
Gold Partner
Architecture, Engineering & Construction,
Engineering, Natural Resources & Infrastructure
Consulting Specialized
Support Specialized
Authorized Training Center
Authorized Certification Center
Authorized Developer

PROKON
Software Consultants

+27 12 346 2231 info@prokonbuild.co.za www.prokonbuild.co.za

PROKON ANALYSIS DESIGN & DETAILING SOFTWARE

PRODESK :

- Import and Export to and from Prokon Frame Analysis & SUMO
- Access to Prokon Section Data Base in Revit®
- Custom Parametric Sections & family creator using Prokon's Prosec
- Advanced family loader

SUMO :

- BIM (Building Information Modeling) platform
- Bi-directional link with Revit® Structure
- User friendly modeling environment and documentation
- Trusted analysis platform
- Code based design links & design groups

AUTOPADDS :

- Dynamic Detailing
- Dynamic Scheduling
- Dynamic Wizards
- Add-in for AutoCAD®

PRONET :

- Pressure Pipe Analysis in Civil 3D®
- AutoCAD® Civil 3D® add-on / plugin
- Analysis report directly in Microsoft® Word
- Comprehensive error checking

AUTODESK.
Gold Partner
Architecture, Engineering & Construction,
Engineering, Natural Resources & Infrastructure
Consulting Specialized
Support Specialized
Authorized Training Center
Authorized Certification Center
Authorized Developer

PROKON
Software Consultants

+27 12 346 2231 info@prokonbuild.co.za www.prokonbuild.co.za

Google™

SAISC

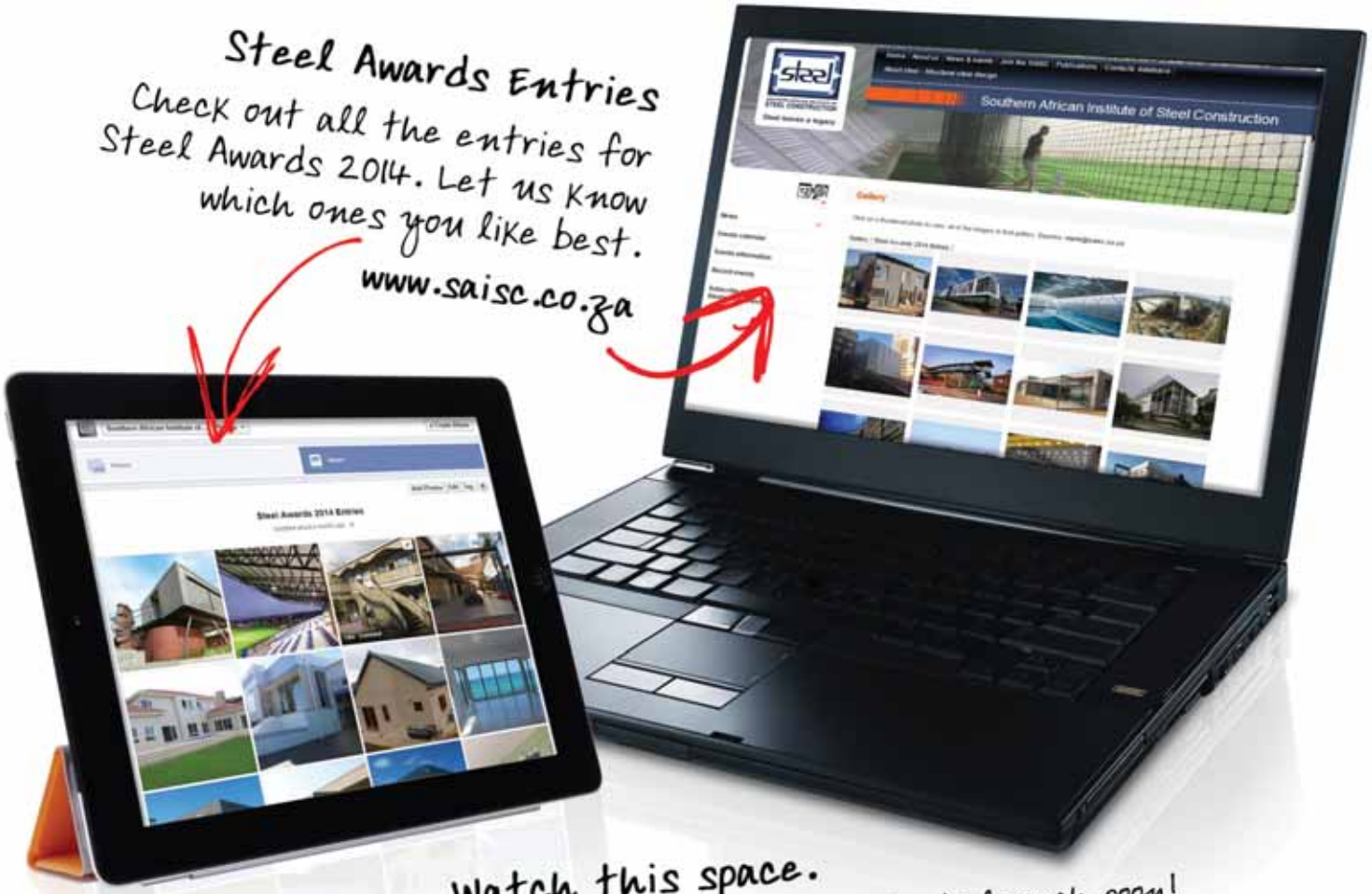
Advanced search
Language tools

Google Search | I'm Feeling Lucky

Steel Awards Entries

Check out all the entries for Steel Awards 2014. Let us know which ones you like best.

www.saisc.co.za



Watch this space.

POLASA's website will be ready to launch soon!

Have you heard about the Connections eTOOLKIT?
Read more about it and buy a licence @ www.saisc.co.za.

Click on the green banner on the home page

INDUSTRY NEWS

DESIGNING PARKING GARAGES IN STEEL – FAST, CLEAN, LIGHT WEIGHT, ROBUST, GREEN

Part 1

Compiled by Paolo Trinchero,
Chief Executive Officer, SAISC

All car parks should be fitted with adequate vehicle safety barriers to prevent accidental damage to the structure and restrain out-of-control vehicles.

Multi-storey parking garages or car parks are commonly found at shopping centres, railway stations, airports, hospitals and in city centres. They form part of mixed-use developments, retail and entertainment centres. These structures are usually above ground, normally as permanent structures, although there is a growing demand for temporary or demountable car parking. Underground and basement car parking is also used, mainly in city centres where high land values make this financially viable.

Multi-storey garages are unique buildings in which all elements of the structure are normally exposed to the public. Little weather protection is required and the top floor is generally uncovered.

ATTRIBUTES OF GOOD CAR PARK DESIGN

The car park is the first building many visitors to a venue or a town/city centre come into contact with and first impressions count! Although the functional requirements of multi-storey car parks have a strong influence on the building form, they should be expressed in good quality, creative design which reflects

The car park is the first building many visitors to a venue or a town/city centre come into contact with and first impressions count! Although the functional requirements of multi-storey car parks have a strong influence on the building form, they should be expressed in good quality, creative design which reflects their importance in creating a good first impression.

Cellular beams are ideal for construction of multi-storey car parks.

their importance in creating a good first impression. Where required, a range of cladding options is available to meet any specific planning requirements.

Good car park design should include the following attributes:

- Easy entry and exit to the car park and the parking bays
- Uncomplicated and logical traffic flow around the car park
- Unimpeded movement
- Light and airy
- Low maintenance
- Safe and secure

ADVANTAGES OF STEEL CONSTRUCTION

Steel construction is well placed to satisfy all the requirements of good car park design. Steel is:

- Ideal for long spans – providing column-free parking spaces
- Lightweight – reducing foundation requirements
- Robust and fire resistant
- Fast in construction – particularly relevant where the venue that is to be served is to remain operational during construction, e.g. shopping centres, stations and hospitals
- Easily maintained
- Modular steel systems are available for demountable structures
- Economic

DESIGN

The precise use of the parking garage and the client's objectives should be stated clearly in the brief. A car park can be used for a number or a combination of uses, like the provision of a parking facility for a specific development, a public car park built for profit, with a constant pattern of use or experiencing peak demands at certain times.

The type and mix of vehicles likely to use the car park needs to be defined as well as the likelihood of any special requirements for vehicle with non-standard dimensions. Consideration should also be given to the potential for the future development of the car park.

A range of cladding options is available to meet any specific aesthetic requirements.

CAR PARK LAYOUT

Whichever type of layout is chosen, a number of key principles should be followed:

- Keep it simple. What looks like a clever solution could be difficult for the user.
- Minimise the workload on the driver and avoid confusion as to where to go and what to do. (This is solved partly by signs but mainly by good design).
- Cover as many stalls as possible on the entry route.
- Pass as few stalls as possible on the way out.
- Separate inward traffic from outward traffic if possible, without causing additional complications.
- Circulate to the right if possible so that the driver is on the inside of the turn.

STRUCTURAL FORM

The structural design of a parking garage will usually determine its quality as a user-friendly structure. The structural form should provide:

Steel is lightweight, reducing foundation requirements for parking garages.

- Ease of entry and exit to and from bays so that users can gain rapid entry and exit without the risk of damage to vehicle or injury to person.
- Few obstructions to movement: The driver should be guided through the park without encountering severe obstructions such as columns in the drive path and badly parked cars caused by inefficient design or layout.
- A light and airy environment: The environment the car park provides will often determine how profitable it is. A light and airy environment should be one of the major goals of the car park designer. Steel is ideally placed to provide this type of environment because of its lightweight nature and long span capabilities. This can be further enhanced if open web sections such as cellular beams are chosen.
- A safe and secure environment: A building with minimal internal structure will help to enhance the feeling of security by making the area as open as possible with few barriers to sight lines. The light and airy environment made possible with steel will help to enhance the feeling of security required of these buildings.

LOADING

SANS 10160 should be used for determining vehicle and impact loads. The structure of the car park may be subject to vehicle impact either directly or through transmission from the edge protection barriers. All car parks should be fitted with adequate vehicle safety barriers to prevent accidental damage to the structure and restrain out-of-control vehicles. Edge barriers in particular should be adequate to restrain vehicles and be of a height and design, which will safeguard small children.

FOUNDATIONS

The loading on foundations is greatly influenced by the material chosen for the superstructure. Steel is the lightest practical construction material for car parks and will often allow the use of simple foundations where other, heavier materials will not. The type of foundation required is often the deciding factor on whether a project is economically viable and therefore steel construction is often the only viable solution for many multi-storey car parks.

COLUMN POSITIONS

The optimum bay configuration and flow characteristics of multi-storey car parks can only be realised if there are no internal columns. If steel is chosen as the frame

Top and below: A parking garage can be aesthetically pleasing!

material a clear span solution can be used for the majority of car parks.

However there may be occasions, for example, where the car park is beneath another form of structure with a different span arrangement, where internal columns must be used. The arrangement of columns has an impact on the building size and its parking capacity. A number of possible geometries for clear spans and propped alternatives are given in the references at the end of this article.

FLOOR AND FRAME SOLUTIONS

Hollow core pre-cast units used compositely with the steel beams: To achieve composite action, alternate cores of the precast units must be broken out and filled with in-situ concrete for the effective width of the slab. Additional transverse reinforcement is also required. A concrete topping would normally be used to give adequate resistance to moisture penetration and to tie the pre-cast units together to form a monolithic floor slab.

The system has the advantage that wider spacing of main beams can be achieved because of the pre-cast unit's spanning capabilities, and low self weight. Speed of construction will be improved over a solid slab, leading to greater cost savings on the scheme. In the non-composite version of this system the cores of the pre-cast units do not require to be broken out, this leads to faster construction times at the expense of greater steel weight.

Steel deck with composite beams: The shallow profile steel decking solution has been used for a small number of car parks in the UK and US. As well as performing a role as part of a composite slab, the steel deck also acts as permanent formwork to improve speed of erection and reduce cranage requirements compared with the other systems described. Deep deck solutions are now available in South Africa.

In the next issue we will continue with the article and cover topics such as deflection, dynamic performance, stability and robustness, fire resistance, waterproofing and aesthetic design. See page 30 for an example of a composite solution for a parking garage using tubular steel columns.

Links

www.steel-sci.com (Steel Construction Institute UK)

www.aisc.org (American Institute of Steel Construction)

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

SAMCRA ACHIEVES FIRST MILESTONES

By Dennis White, Director SAMCRA

SAMCRA was invited to participate in the task group responsible for drafting the update of the NHBRC manuals which will be published later this year. We are actively participating on a number of technical committees relating to the built environment.

SAMCRA in association with a SABS workgroup has completed the working draft of the new code for self-supporting, single skin, metal roof and side cladding. The draft has been submitted for approval and acceptance as a standard. The proposed code addresses all aspects pertaining to metal cladding, from design and testing of profiles; details of the application of the different types of base metal including aluminium and various grades of stainless steel; the suitability of the various fasteners available in Southern Africa and the installation of cladding.

Also included are sections on the design and installation of flashings, compatibility of materials, the installation and location of skylights, solar heaters, photovoltaic cells and ventilators together with addenda on special applications and the relationship with insulation materials.

SAMCRA was invited to participate in the task group responsible for drafting the update of the NHBRC manuals which will be published later this year. We are actively participating on a number of technical committees relating to the built environment.

Details have been finalised for a series of specialist workshops that will be presented during the second half of 2014.

For more information on SAMCRA contact Dennis White at dennis@saisc.co.za.

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.

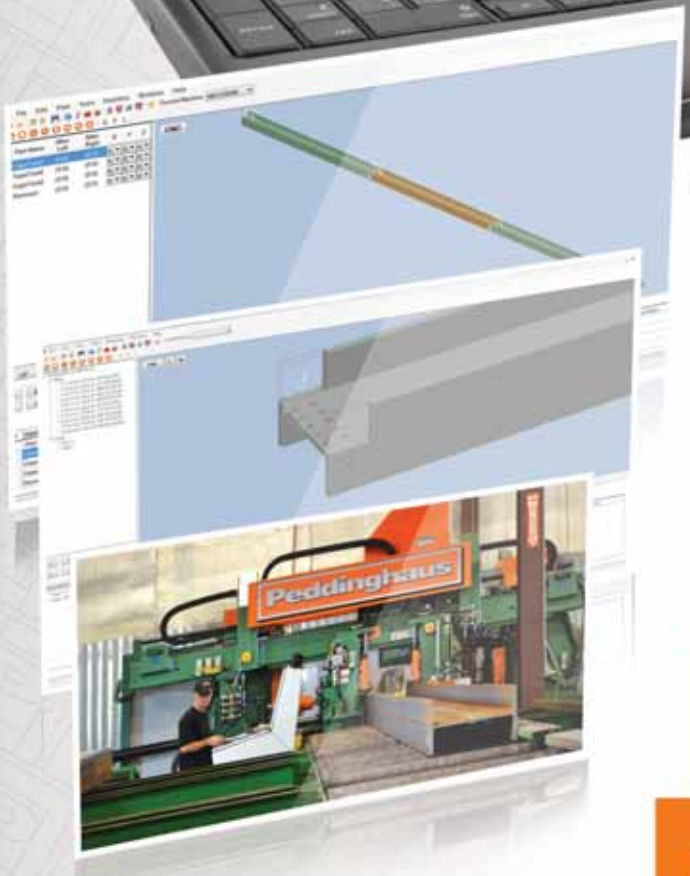
SAMCRA
SOUTHERN AFRICAN METAL CLADDING AND ROOFING ASSOCIATION

The new Cell C warehouse is a great example of the effective use of steel cladding.

Peddinghaus

3D CAD/CAM SOFTWARE

RAPTOR



- Faster importation, development, and exportation of part files than ever before
- Direct Tekla integration for streamlined programming of layout information, and cope data
- Import and export pre-nested DSTV+ files
- Apply automatic enhancements to large volumes of DSTV files with the click of a button
- Automatic batch nesting of existing part files
- Capable of importing and exporting Peddimat files for total compatibility with existing Peddinghaus machinery

- Ideal for programming:
  CNC Drill Lines | CNC Band Saws | CNC Angle Lines
  CNC Coping Machines | CNC Layout Marking Machines

www.peddinghaus.com/raptor

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

POLASA GEARING UP

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

One of the issues discussed was the use by Eskom of World Bank funding for the new Medupi power lines. The concern was that in terms of World Bank rules it is not allowed to specify local content and that the 'designation' ruling by Minister Rob Davies on power pylons would therefore not apply.

The launch of the Powerline Association of South Africa (POLASA) in August 2013 attracted significant attention and since then more than 30 members of the industry have joined.

Some prospective members asked us to again briefly outline why POLASA was established. The first reason is that it was a response to the ongoing crisis that this industry had been in for a number of years due to not enough work in spite of substantial new transmission requirements for the new power stations.

POLASA supports the development and maintenance of the full spectrum of the powerline industry to ensure a viable and sustainable network of companies that can support the growth and maintenance of the grid for the transmission and distribution of electricity in Sub-Saharan Africa.

The core purpose of the association is to provide all the stakeholders in the power line industry with a common platform to address matters of common interest and concern. Core activities include continuous improvement of the industry in terms of quality, productivity, investment, job creation, skills development and retention, technological development, safety and social responsibility which include assisting members to achieve their transformation aspirations.

Eskom has welcomed and endorsed this development. They often expressed the need to be able to talk to industry without becoming exposed to selective sharing of information or allowing individual interests to dominate discussions.

The POLASA Board meets monthly and every second month an open 'Industry Meeting' is held to give feedback on activities and to engage with members of the industry to identify and discuss issues in the industry. This is further facilitated through the POLASA Board members each focusing on serving the following categories:

- All activities - Gary Whalley (Chairman) +27 82 414 7996
- Professional service providers – Leon Heymans +27 82 458 0159
- Manufacturers – Sagren Moodley +27 83 635 4971
- Suppliers – John Buyers +27 83 468 5829
- Contractors – Vincent Kanyongola +27 82 390 4106
- Safety – Marcello Lamperini +27 83 443 9460
- Refurbishment and maintenance – Nick van der Mescht +27 83 452 5093

POLASA has met with Eskom senior management at a number of occasions. One of the issues discussed was the use by Eskom of World Bank funding for the new Medupi power lines. The concern was that in terms of World Bank rules it is not allowed to specify local content and that the 'designation' ruling by Minister Rob Davies on power pylons would therefore not apply.

After an appeal to the Minister the matter was investigated and the use of the loan was confirmed. The South Africans will therefore have to compete with imports from other countries. It was however officially confirmed that the 15% import duties on these products from overseas will apply. POLASA intends to make every effort to encourage and assist our members to compete head on for the World Bank funded power line jobs now starting to be issued.

POLASA
POWER LINE ASSOCIATION OF SOUTH AFRICA

INDUSTRY NEWS

A number of other relevant issues are also being explored or on the table such as possibly offering private finance for powerline projects; participation in the 18 SIPP preparation teams to provide input on South African capabilities; to give technical and other comments given for Eskom Standards and to become more actively involved with distribution in South Africa. Efforts continue to request the DTI to formally designate all power line hardware. Mr. Dames, the previous Eskom CEO indicated that local content requirements are already being implemented by Eskom.

In addition more work needs to be done by POLASA to inform the DTI and others on the industry and its characteristics. A detailed Industry Paper was developed setting out the recent history and analysing the current status of the power line industry and this needs to be submitted to various parties and properly work shopped.

The SAISC in support of ISF, the Structural Steel Industry Export Cluster, is also seeking ways to encourage and facilitate exports into Africa.

The powerline industry is still in 'survival mode' with far less work currently available than is required by the 14 line construction participants. The past two years saw almost 800km of new lines built per year – the highest in a decade, but in the current year this drops to only 217km! A major problem is the slow rate at which new servitudes and access to line construction corridors are being obtained.

So POLASA works steadily to establish its credentials and to find ways to improve the industry and to build a strong relationship with its main customer.

SASFA'S 18th INDUSTRY FEEDBACK MEETING

By John Barnard, SASFA director

SASFA membership has grown by 12% over the past year, and an industry survey has indicated that LSF building activity has grown by 21% during 2013 compared with the previous year. Highlights over the past year have been the significant growth in LSF building activity, the PICC announcement of support for new building technologies and the growing number of enquiries directed at SASFA from Sub-Saharan countries – which indicates LSFB is growing also beyond our borders.

In order to keep the broader industry informed about developments around light steel frame building, SASFA has been arranging industry feedback meetings since 2007. The aim is to have a meeting in each of the major centres every year. The 18th meeting was held on 8 May at the Country Club Johannesburg, in Auckland Park. It was well attended, with about half the audience consisting of representatives of SASFA member companies.

The current SASFA chairman, Hannes Basson from ArcelorMittal South Africa, gave a brief overview of the development of this industry since 2007. He highlighted the original obstacles that existed to implementation of light steel frame building in Southern Africa, and mentioned how each was overcome by SASFA. SASFA has developed as a professional industry representative association.

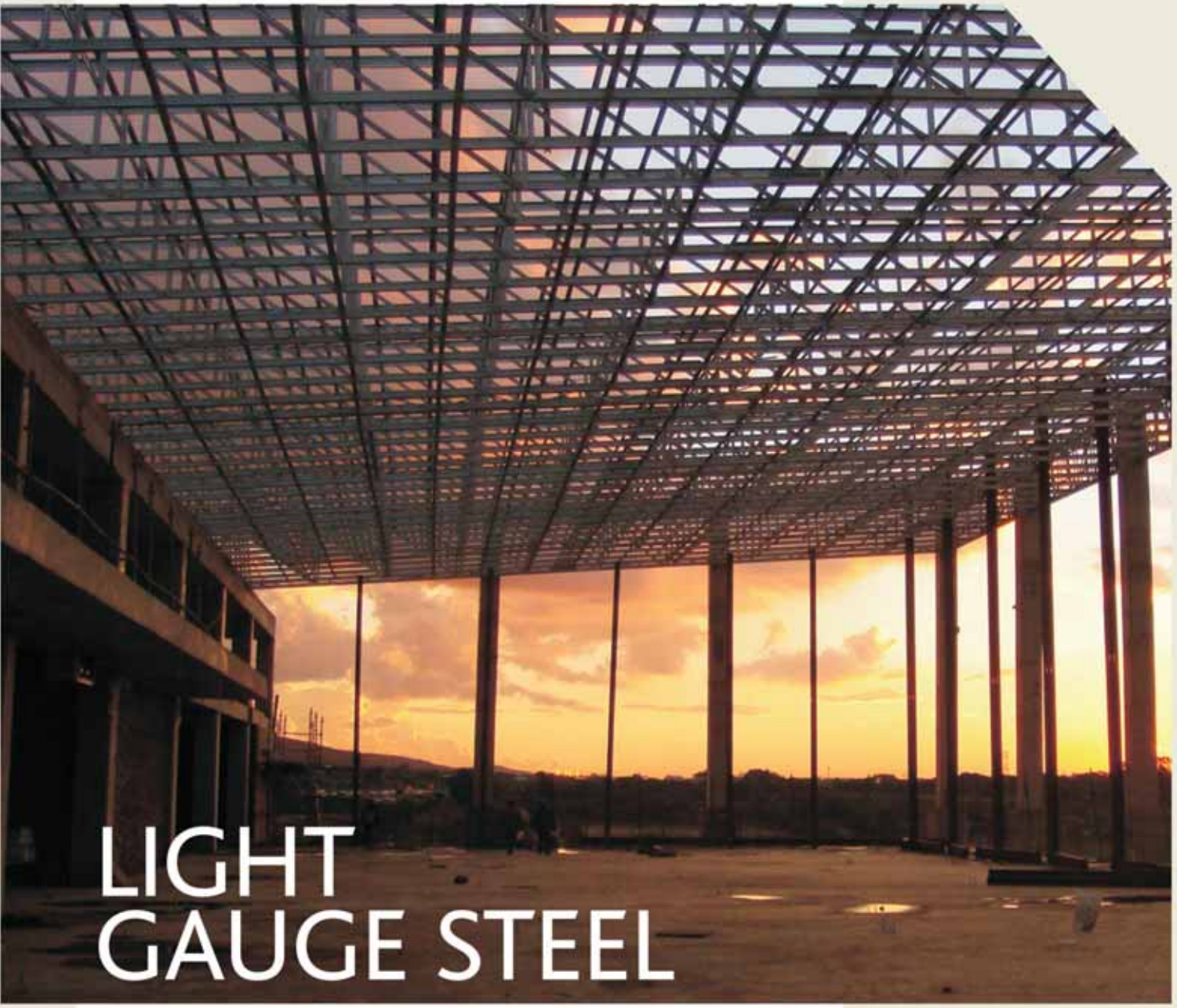
Henk Langenhoven, Chief Economist of SEIFSA, sketched the economic climate by reference to the recent past and trend lines of the different variables. He indicated that the increase in wages exceeded the growth in the economy, and that South Africa was in general a net importer of metal products. A large share (55%) of metal product exports is destined for Africa, which is good news as healthy growth rates is forecast for Sub-Saharan Africa economies. The local building industry is showing signs of recovering from low activity levels, in the residential, commercial and office building sectors.

Llewellyn van Wyk, Principal Researcher, Building Science and Technology Department, CSIR, discussed the developing potential for Innovative Building Technologies (IBTs) in South Africa. The use of IBTs is growing worldwide, in response to increasing environmental pressures. Using Agrement SA's standards, there are some 40 IBTs active in South Africa at present – in terms of efficiency, using the CSIR rating system, the 'standard' brick house rated 32nd out of 40! According to their research, IBTs offer faster construction, lower costs, improved energy efficiencies, better quality control, provide decent jobs, and have a smaller impact on resources and the environment. Accordingly it was no wonder that the PICC (Presidential Infrastructure

ETICS clad walls of Cell C's new head office near the Buccleuch Interchange.

ULTRA-SPAN®

LIGHT GAUGE STEEL TRUSS SYSTEM



LIGHT GAUGE STEEL

The low mass per m2 (between 2-10kg) of this roofing system ensures both savings on the supporting structure as well as on transportation and erection costs whilst also being vermin proof and non-combustible.
Large sections of the roof can simply be pre-assembled on the ground and hoisted into position on the walls – making this one of the most viable systems with a large range of applications up to a clear span of 40m.

Supported through a substantial network of licensed truss suppliers, Ultra-Span is equally ideal for all local and export applications where it can be pre-assembled or site assembled.

MiTek®

creating the advantage

The non-combustible solution.

MiTek Park,754 16th Road, Randjespark, Ext. 34, Halfway House,1685. Midrand (Head Office) Tel: + 27(0) 11 237 8700
Cape Town Tel: 021 905 0244 • Durban Tel: 031 700 6332 • Port Elizabeth Tel: 041 581 7525
email: marketing@mitek.co.za • www.mii.com/southafrica

Coordinating Commission) had decided to promote the use of IBTs, specifically for schools, clinics and student accommodation. Within three years, some 60% of new buildings in these categories will be supplied using IBTs. This is excellent news for the light steel framing industry.

John Barnard gave an overview of the development activities of the Association. A high level of publicity is obtained from media articles about LSF projects and events, building exhibitions, lectures at conferences, the annual Steel Awards function and the SASFA website (www.sasfa.co.za). During 2013, LSFB formed part of a series of television programs covering the renovation of a house in Johannesburg. SASFA is involved in training of all LSF role players on an ongoing basis, from builders, building inspectors and designers. The LSFB building standard, SANS 517, is being updated, and the SASFA certification scheme for building contractors is being rolled out.

SASFA membership has grown by 12% over the past year, and an industry survey has indicated that LSF building activity has grown by 21% during 2013 compared with the previous year. Highlights over the past year have been the significant growth in LSF building activity, the PICC announcement of support for new building technologies and the growing number of enquiries directed at SASFA from Sub-Saharan countries – which indicates LSFB is growing also beyond our borders.

Pieter Reyneke from Dalmar Construction, receiving their SASFA membership certificate from John Barnard and Paolo Trichero, SAISC CEO.

A few SASFA members presented an overview of their recent LSFB projects:

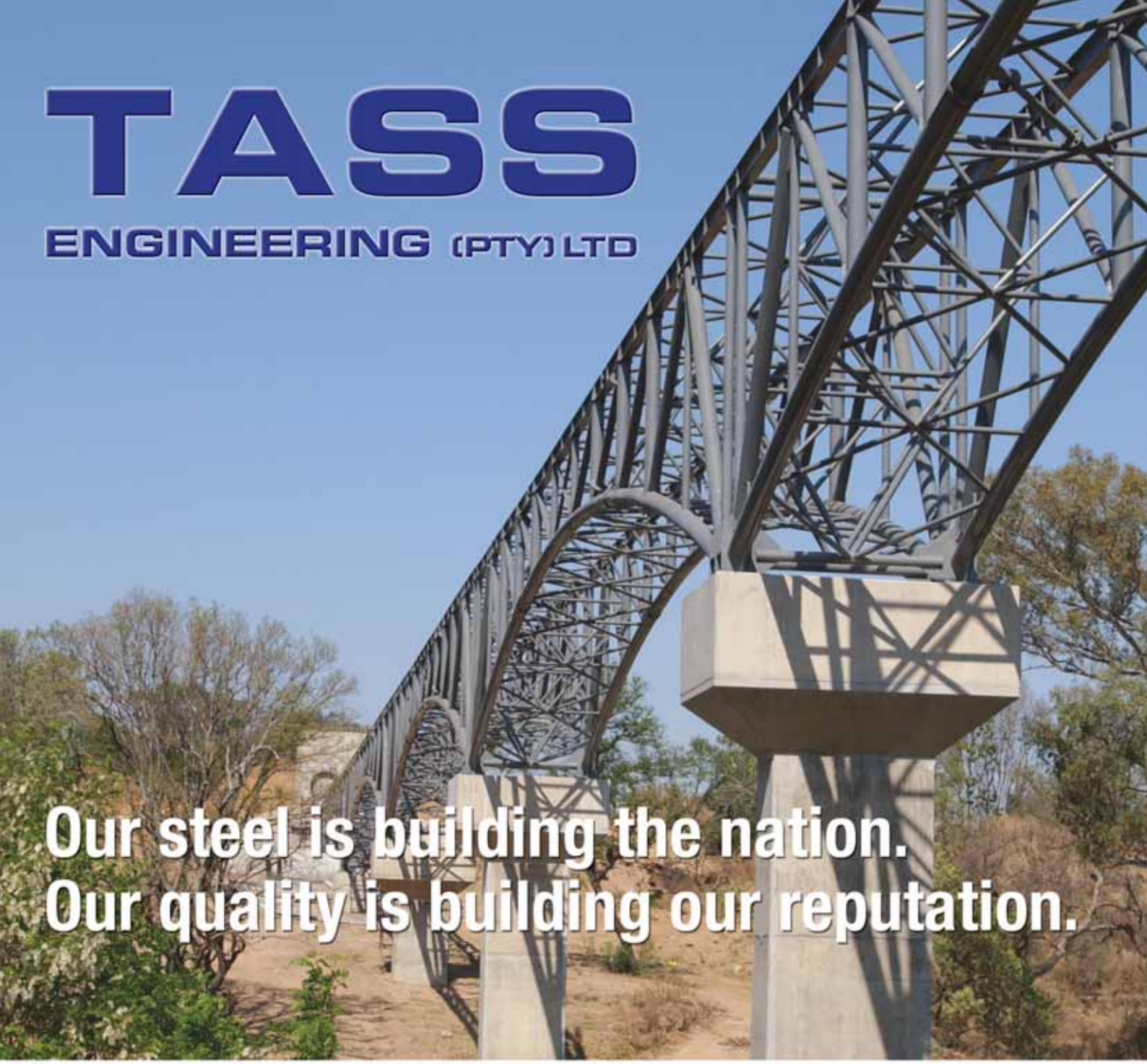
Craige Botha (CB Designs) shared his experiences when building his first LSF house, as well as the lessons he learnt – proper detailed planning is essential!

Quinton Peters (Saint-Gobain), showcased a number of ETICS clad office and commercial buildings, illustrating the striking effects the architect can achieve with LSF curtain walls on multi-storey buildings. Robbie Meyer from the Silverline Group illustrated a few of their most recent projects – for example a number of MacDonald's outlets which they built in only three months!

A membership certificate was handed over to Pieter Reyneke from Dalmar Construction.

The meeting was concluded by a networking session over cocktails. All agreed it was informative, exciting and hugely successful!

LSF house under construction above Hout Bay Harbour.



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
- Sandton Repositioning Phase 3 Office Tower Cladding - Liberty Properties
- Sandton Atrium on 5th Cladding - Liberty Properties
- Razomart Warehouse (350t) - Razomart
- Warehouse Columbia Pharmaceuticals (250t)
- DSTV Head Office, Randburg (100t) - Multichoice
- Sedibeng Brewery Extension (650t) - Heineken
- Aurecon Lynwood Offices, Bridge and Stairs - Aurecon
- Frankenwald Warehouse (480t) - Capital Property Fund
- Incubation Hub (240t) - Century Property Developments (Pty) Ltd
- Sandton Office Tower, New Spire - Liberty Properties

ISO 3834 Part 3
Certificate No. ZA-014

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

GALLERY ON LEVISEUR

project team

Developer/Owner:
Francisca de Gouveia

Architect:
Sergio Nunes Architects

Structural Engineer:
Cas Kempff Structural Engineers

Quantity Surveyor:
Pierre Oosthuizen

Main Contractor:
Qualicon Construction

Steelwork Contractor:
East End Construction

LSFB Contractor:
Site Form

Cladding Supplier:
Beaconplate

The project consists of major additions and alterations to an existing residential property in order to convert it to a small commercial art gallery, with a restaurant component and outdoor exhibition space.

Lightweight steel frames were selected as the main structural material as the architect felt that many of its advantages are not utilised fully when applied to mimic 'conventional' construction. The complex geometries, slanted wall planes and spans of this design lent themselves perfectly to the use of this system in a way that would show light steel frame structures don't have to look like regular masonry structures.

Hot rolled steel was used for most other structural elements for their structural attributes, as the architect wanted the structural members to be as elegant as possible to give the illusion that parts of the building were floating.

Intersections between various elements are expressively detailed; many structural elements are neither horizontal nor vertical – lending the illusion that the structures are incredibly light, or floating. Standard steel sections were also used to create custom elements (most notably the 'star' columns manufactured from flat bar). The use of light steel frame construction allowed the designers to create dynamic and interesting forms that would have been much more difficult with traditional construction forms.

Natural lighting was used as far as possible to light the interior spaces, and attention was paid to glazing percentages and location in order to minimise unnecessary solar gains. Many of the structural steel elements are mechanically fixed in order to allow possible reuse or easy dismantling if needed.

Getting the main contractor and client to buy into the idea of using the light steel framing was a challenge, especially in the light that it is a relatively new system, especially in Bloemfontein. The irregular forms and non vertical planes also proved challenging to the LSFB contractor, as they had never before attempted this with their system. In the end, cooperation with all concerned resulted in the final product being something special.

The client is very pleased with the outcome of the building, as it has generated a lot of interest from the general public.

Tubular projects

AMERICAN INTERNATIONAL SCHOOL OF JOHANNESBURG: AQUATIC CENTER

project team

Developer/Owner:
American School of Johannesburg

Lead and Conceptual Architect:
Flansburgh Architects

Project Architect:
Grosskopff Lombart Huyberechts and Associates, South Africa

Structural Engineer:
WSP Group Africa

Quantity Surveyor:
Taljaard Meyer & Srorm INC

Project Manager:
Jim Henrey & Associates

Main Contractor:
Baccai

Steelwork Contractor:
Omni Struct Nkosi (Pty) Ltd

Detailers/Detailing Company:
Omni Struct Nkosi (Pty) Ltd

The new 1 400 square meter Aquatic Center features a six lane, twenty five metre pool with an additional shallow teaching pool as well as enclosed changing areas, office areas, storage space, and mechanical room.

The Aquatic Center is a purposely designed all weather facility built for the American International School of Johannesburg. The school is located on a 58-hectare tract just on the northern edge of Johannesburg. Completion of the project marked the 30th anniversary of the school. Special design features that take environmental, operational and economical concerns into account include the tensile structures, mechanical louvers on the facade, solar panels on the roofing structure and a hybrid solar and gas heating system for the change rooms.

The tensile structures facilitate natural light and airflow through the building and are complimented with the horizontal mechanical louver system to the southern side to provide additional airflow and light into the interior. The pools have a heating facility with 38 solar panels on the northern face. These pools are based on FINA standards, constructed from shutter concrete and finished with imported European tiles. The sheeting used is Chromadek IBR 0.58mm with translucent polycarbonate pockets to allow the inflow of natural light.

The steel super structure is based on the curved tubular portal space-frame. The tubular steel frame comprises of 273mm diameter circular hollow sections in a 'scissor' geometry. This is further emphasised by the purlin cleats which elevate the purlins from the structure in order to lift the sheeting.

Tubular sections were further required to have no exposed conventional splice connections and the design team came up with innovative methods of connecting these members with internal sleeved cleats and internally bolted with 'out-of-sight' accessible bolted connections. The connections were then later site welded and ground down to achieve a smooth continuous finish. The base plates are also placed below floor finished levels. The specific innovative design and fabrication approach were used to achieve a continuous smooth flowing structure, similarly to that of the smooth surface of the water in the swimming pool which the roof structure is protecting from the elements.

MALAPA FOSSIL EXCAVATION SITE

The Malapa site is one of the richest early human ancestor sites on the planet. Sitting approximately in the middle of the Cradle of Humankind UNESCO World Heritage site, it was discovered in 2008 and revealed the first known remains of the new species of human ancestor Australopithecus Sediba. Excavation could not proceed without protecting the site from the elements.

The site however, not only sits within a World Heritage site, but within a many thousands of hectare pristine game reserve, teaming with endemic and often endangered flora and fauna. Thus the briefing for the design and construction was extremely strict.

In terms of environmental sensitivity, client and architect agreed that achieving an 'invisible' building from the outside with maximum impact on the interior would be desirable. Many 'camouflage techniques' were then employed by the architect such as: non-linear design; creating moving light and shade patterns, using 'site colours' (such as the colour of tree bark); asymmetrical design, use of leaf-like, insect or spider-like design, etc.

As the proposed structure was to have no concrete footings (due to possible fossils in the ground), and could be removed should it ever be required, leaving minimal traces, it was clear that a steel structure would be the answer. Tubular steel and bone motifs seemed an obvious match and circular sections could be curved to deal with site restrictions.

The main structural element is the oval curved space-frame or Toblerone truss onto which the roof is constructed and from which two other elements are hung namely the visitors' viewing platform and a manual crane hoist with a capacity of one metric ton.

The on-site construction period was reduced by designing and manufacturing the structure in separate parts that could be erected for a trial period and testing off-site, dismantled into the eight legs with a section of the main truss attached, and then bolted together again on site in the eight pieces with another two 'head and tail' pieces.

The structure blends remarkably within the environment, being practically invisible from just a few tens of meters away, yet is grand and significant when one enters, fulfilling one of the primary goals of the brief.

project team

Developer/Owner:
The University of the Witwatersrand School of Geosciences

Architect:
Krynauw Nel Associates (Pty) Ltd

Structural Engineer:
Peter Fellows Consulting (Pty) Ltd

Quantity Surveyor:
Crane QS (Pty) Ltd

Project Manager:
Craig Harrison PM cc

Main Contractor:
Omni Struct Nkosi (Pty) Ltd

Steelwork Contractor:
Spiral Engineering cc

Detailers/Detailing Company:
KRU Detailing

Cladding Supplier:
Cupric Tectonics cc

Painter:
Mzekizeki Painters

HYUNDAI PARKING GARAGE

project team

Owner/Developer:
M & F Giuricich

Architect:
Talmac Engineering in collaboration with GL Architects

Structural Engineer:
Talmac Engineering

Quantity Surveyor:
M & F Giuricich

Project Manager:
M & F Giuricich

Main Contractor:
Ferro Bros

Steelwork Contractor:
MPW Steel Construction

Detailer:
ISDC

Cladding Supplier:
WRT Roofing

The SAISC is actively driving the use of structural steel in multi-storey buildings, so this project makes us very excited to see that a client decided on a steel solution.

As part of the client's increasing need to store new vehicles, the decision was made to build a new parking garage. The client's brief was to design and fabricate a new parking structure that could accommodate 256 new vehicles, with an unobstructed ground floor area to be used as a workshop. The parking garage required innovative design specifically in the ability to be extended in size in the foreseeable future.

The design developed into a four level structural steel structure with composite concrete slabs. The space frame triangular girder and columns spaced at 8 metre spans and spanning 20 metres are constructed of tubular sections providing rigidity and strength. The roof sheeting was designed to span the entire length of the structure without any purlins. The parkade requirements extended to providing the client with a structure that will captivate the imagination of their clients when they collect their new vehicles.

150 tons of structural steel was used for the construction of the parking garage. The site is geographically located in-between two adjacent dealerships and space during construction was limited, making the design a challenging balance considering the constructability of the structure. The aesthetics of the structure provided numerous engineering challenges, such as the inter floor girders.

The short time frame allowed for the completion of the project required innovation in the detailing, fabrication and erection of the structure. The columns and truss sections were delivered to site completely assembled and erected on site as soon as they arrived.

The parkade is a modular design that allowed for quick erection. The structure can be extended at any given time allowing further flexibility in the choice of layout. Furthermore a rain water harvesting system collects rainwater which is then filtered and used to wash vehicles. All light fittings are connected to motion sensors and timers limiting the use of electricity.

Despite the challenges, the project was completed on time, within budget and is a new flagship for the client.

110A NORTH REEF ROAD

MEADOWBROOK

EDENVALE

1609

TEL: (011) 450 -3380

WEBSITE:
WWW.MPWTALMAC.CO.ZA

TWO COMPANIES WHO COMPLIMENT EACH OTHER:

Complementing each other, Talmac Engineering and MPW Steel Construction provide civil, structural and mechanical engineering consulting, design, fabrication, construction and excellent project management services. Boasting successful track records and renowned expertise, modern facilities, state-of-the-art equipment and essential capabilities, Talmac Engineering and MPW Steel Construction offers professional services, competitive pricing and quick turnaround times. Dedicated engineers and qualified staff are committed to detail, precision, quality assurance and control, delivery product consistency and high quality service every time, even in highly complicated situations.

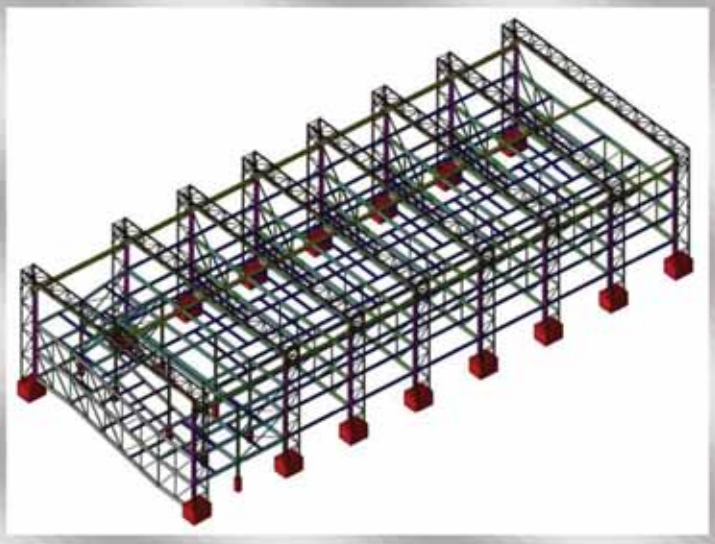
With each project, we align ourselves with our customers' objectives and determine potential requirements beyond project scope, allowing for scalability and ensuring customer satisfaction. Our successful project execution is based on outstanding project management and coordination between contractors, ensuring on-time delivery within budget. We value our relationships with our customers, suppliers, sub-contractors and vendors and together we make the difference and exceed your expectations.

With the capability, resources and expertise to manage small, medium and large scale commercial projects we extend our national footprint beyond the borders of South Africa to include Zimbabwe, Zambia and Kenya.

DESIGNED FABRICATED ERECTED

2 COMPANIES 1 GOAL

EXCEEDING YOUR EXPECTATION IN STEEL



RYDALL VIEWS SOLAR SCREEN

project team

Owner/Developer:
J.T. Ross

Architect:
Dean Jay Architects

Structural Engineer:
Linda Ness Associates

Quantity Surveyor:
J.T. Ross

Main Contractor:
J.T. Ross

Steelwork Contractor:
Rebcon Engineering (Pty) Ltd

Detailer:
Rebcon Engineering (Pty) Ltd

Cladding Supplier:
Rebcon Engineering (Pty) Ltd

Landscaping to the Cladding:
Horticultural Services

The new Rydall Views office building is the latest edition in the Rydall Vale Office Park, La Lucia Ridge. This is a four star green rated flagship offering a refreshing architectural sleekness to the park.

The elongated west elevation entrance facade required a solar shading screen to attend to the realities of a Durban winter. The architect responded with a wave of vegetation – a planted screen flowing off the roof gardens.

The brief's challenge was that it had to have the stature of a main entrance feature when faced to view on arrival, but also be pleasing to the eye when faced to view from the interior through a full height glazed screen from the open-plan office space within.

The structure is defined by a simple double-radii cross-section extruded as a surface along the length of the building, with a sweeping compound curved spline as the leading edge.

Small diameter rolled tube ribs wrap around this extruded surface and terminate in site-welded spiggot connections to the larger edge tube, which drapes down from both ends and lightly touches the ground somewhere near the middle through three vertical steel rod pins. The ribs receive a pallet of expanded aluminium mesh screens, spanning rib-to-rib.

Shop fabrication at the contractor consisted of rolling all tubes to length, with the larger edge tube delivered in sectors and site but-welded. The spline geometry of the large tube was developed as radii on the projected rotation of each sector. The ribs were clipped to the concrete roof edge with simple bolted cleats, and laid over scaffold towers in order to protect the geometry. The large edge tube was splice welded on its own prop supports, with ends welded onto end plates cast flush into the receiving concrete faces.

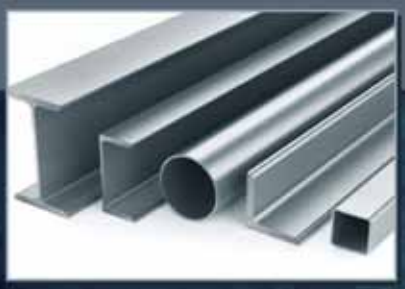
All the planting is indigenous, in some cases endemic, and will be self sustaining after a 12 month establishment period after which the irrigation system is switched off and becomes defunct in accordance with the environmental rating requirements.

There is a glimpse along the underside of the screen as you enter the building that might make you imagine yourself surfing inside the tube of a giant wave, just for a moment. Only it's green – or will be soon!

ocean machinery inc.

AVENGER
CNC BEAM DRILL LINE

½ THE PRICE! ½ THE FLOOR SPACE! 2X THE VERSATILITY!



The Ocean Avenger CNC single spindle beam drill line can process beams (up to 1,016mm), angles, channel, t-sections, flat bars, plates and more!

- Eliminates manual layout and drilling
- Provides exceptional accuracy of hole placement, eliminating costly field modifications
- Simple and easy to operate – built to withstand the rigors of welding structural steel fabrication shops
- No computer experience required
- Fully automatic drilling cycle
- Immediate payback on a low investment through attractive finance options

The Ocean Avenger CNC beam drill line is the most popular beam drill line produced on the market today!

FIND OUT MORE INFORMATION:

oceanavenger.com

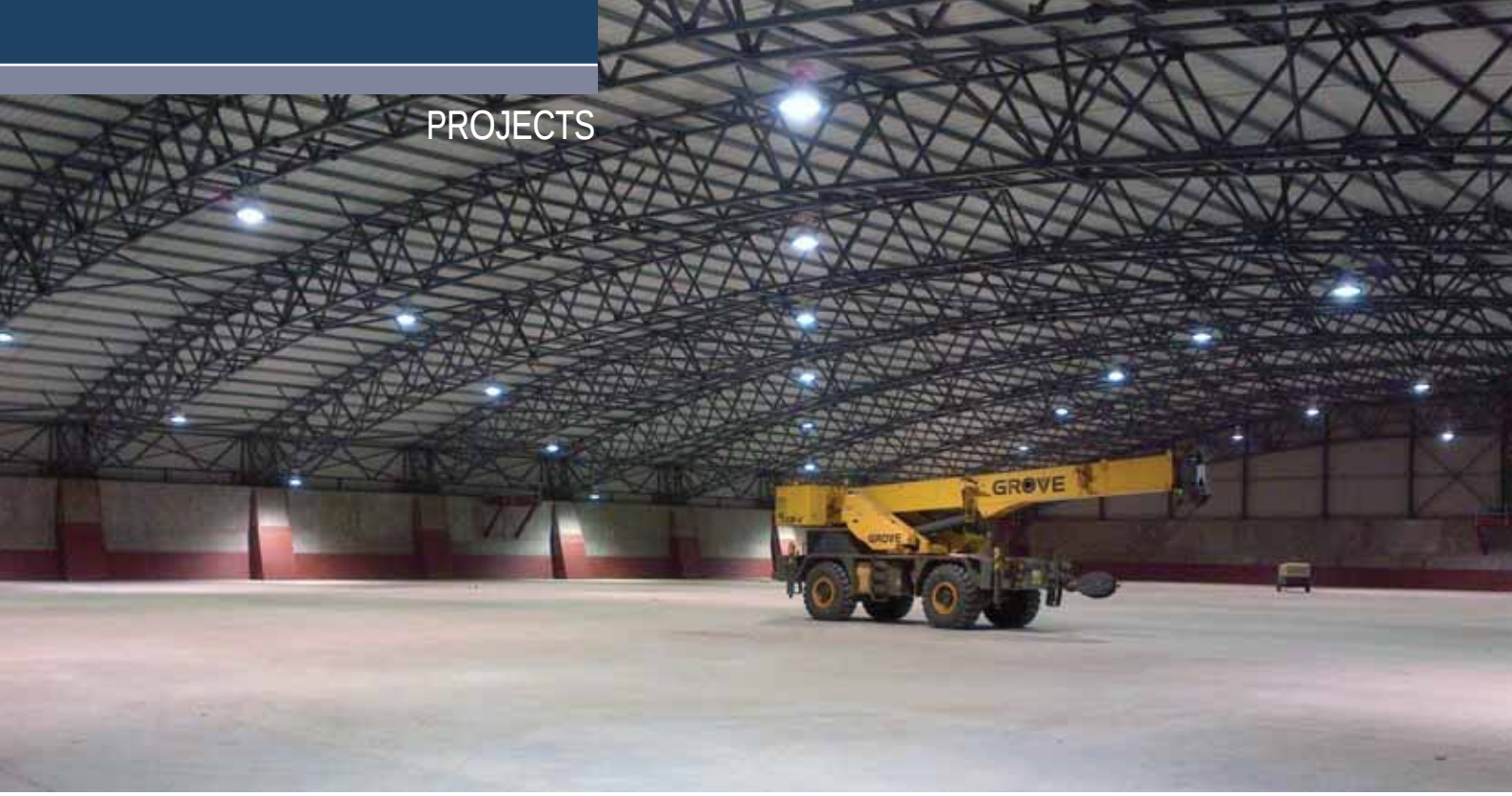
Call Ray Chellew on 082 891 8370 for a FREE Video and Brochure

skok machine tools

Gauteng Office: 29 Loper Avenue, Aeroport, Spartan ext.2, 1619, Kempton Park
T: +27 11 392 3710 | F: +27 11 392 3712

Eastern Cape Office: 26a Mangold Street, Newton Park, 6045
T: +27 41 363 8535 | F: +27 41 363 8536

info@skok.co.za | www.skok.co.za



ZINC AND LEAD STORAGE AND LOADING FACILITY AT LÜDERITZ HARBOUR, NAMIBIA

project team

Owner/Developer:
RPZC (Pty) Ltd – Part of Glencore Group

Architect:
Krenz Consulting Engineers (Pty) Ltd

Structural Engineer:
Krenz Consulting Engineers (Pty) Ltd

Quantity Surveyor:
Krenz Consulting Engineers (Pty) Ltd

Project Manager:
RPZC (Pty) Ltd – Part of Glencore Group

Main Contractor:
Salz-Gossow (Pty) Ltd

Steelwork Contractor:
Pro-Edge (Pty) Ltd

The project entails the bulk storage of zinc and lead ore for exporting purposes. Ship loading of 12 to15 thousand tons of ore must be completed within a period of 30 to 40 hours; therefore the client needed an efficient storage facility that would be able to handle these stringent requirements.

The two main design requirements of the project were firstly a maximum span clearance for mobility of vehicles (side tippers) and container loading (front-end loader-FEL-bucket capacity of 10 tons average) and secondly to have an ore storage capacity of 25 000 to 30 000 tons

Square hollow sections (SHS) were chosen for the primary and secondary structural members of a rectangular box section girder to obtain a clear span of 65m.

The benefits of using square hollow sections were:

- Low mass to strength ratio: 28kg per square metre of SHS (purlins and connections)
- SHS can deliver a longer welding length for critical joint connections
- Ease of fabrication (used repetition-jigs) and welding with minimisation of waste as secondary members were welded together from cut-offs
- Ease of erection due to structural rigidity and torsional strength
- Transportation cost was optimised
- Tubular sections are ideal for dominant wind loading conditions

The structural frame configuration consisted of retrofitted reinforced concrete columns integrated with retaining walls that support an arched rectangular box girder.

The arch-profile obtained the quickest height at the supporting point whilst having a minimum height at mid span. The arch-profile accommodates the lifting of the front end loader bucket during loading and scooping operations. Due to the loading combination of stockpiled ore (against 4m wall height) and the wind forces, this shape optimised member forces, during stress reversals. The low arch-shape blends well with the harbour area and the natural environment in the background, highlighting the historical buildings.

The Namibian coast is rated as severely corrosive. Therefore rolled Klip-Lok profiled sheeting consisted of 0.8mm aluminium substrate and all purlins, holding down bolts and bolts were hot-dipped galvanized.

MACHINERY FOR THE HIGH QUALITY PROCESSING OF METAL PROFILES

FICEP
STEEL THINKING

GEMINI

CNC gantry style plate fabrication centre for drilling, tapping, milling, marking and thermal cutting.

HP16 T6

Automatic CNC punching, drilling, shearing and marking angle line for processing angles, channels and flats.

ENDEAVOUR

Automatic CNC drilling system combined with band sawing unit.

Productivity, reliability and quality

Contact Maurice or Marc at:

Tel: 011 976-8600 • Fax: 011 394-2471

machines@retecon.co.za • www.retecon.co.za

Retecon (Pty) Ltd

MTMA

Cape Town: 021 555-2270/1 • Port Elizabeth 041 453-2720 • Durban: 031 701-8149

JINDAL AFRICA HEAD OFFICE

project team

Developer/Owner:
Jindal Africa

Architect:
KMH Architects cc

Structural Engineer:
L&S Consulting Pty (Ltd)

Quantity Surveyor:
BWR Quantity Surveyors

Project Manager:
NB Property Solutions

Main Contractor:
Probest Projects (Pty) Ltd

Steelwork Contractors:
Nancy Engineering, Ironman Structural Engineering, Steel Studio

Detailers/Detailing Company:
Mondo Cane

Cladding Supplier:
Robertson Ventilation Industries (Pty) Ltd

Paintwork:
Royal Coatings cc

Jindal Africa Head Office is a 5 000m^2 development in Bryanston and is positioned on a prominent site on William Nicol Drive.

Vastu Shastra philosophy (Science of Construction) is an ancient Hindu doctrine, governing aspects of conceptual architectural planning. At Jindal's request, these principles were applied to the new building by the architect.

Steelwork forms a large component of Jindal Africa's business and they requested that the material be used extensively in the construction of the building. Thus many conspicuous elements were built using steelwork. These included:

- Inclined 'V-columns' supporting portions of the ground, first and second floor slabs
- The main lift shaft and stair within the triple volume reception area
- The Jindal Africa 'tree' is an elaborate sculpture of tubular steel sections, that also acts as a support for the first and second floor link bridges
- Canopies, shop-front and sunscreen frames to the east and west elevations of the building
- Various non-structural copings and trimming elements
- The roof of the building

For fire-resistance purposes, structural hollow-section elements were provided with a reinforced concrete core – the steel section formed a sacrificial lining in the event of a major fire.

Steel was incorporated into many additional design elements to the building. The sunscreen louvers around the facade of the building were designed to specifically take into account sun angles to provide the best possible sun-shading without compromising the view.

Most of the feature elements required concealed, seamless connections. The steelwork contractor provided input regarding key-hole connection details, which were subsequently fitted with plates on site and ground smooth. To minimise the amount of joints, components were fabricated to the largest size possible, taking transport limitations into account.

The development was completed on time, within budget and is becoming a well-known landmark in the Bryanston area.

SAISC Steel Awards 2014

the 33rd event and 4th steel awards photo competition

Steel EMPOWERS

Sponsors and Entries

Main Sponsor

AVENG STEEL

Table Décor Sponsor

MACSTEEL

Photo Competition Sponsor

Cadex SA

TEKLA

Tubular Award Sponsor

ASTPM

Warehouse and Factory Category Sponsor

B&T

REDEFINING STEEL CONSTRUCTION

Partner Sponsors

Genrec

Fabricating Innovative Steel Solutions

njr steel

first for steel

Peddinghaus

RETECON (PTY) LTD

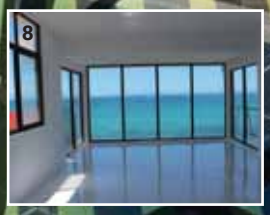
Your Partner in Metal Working

FICEP S.p.A.

Tubular

The steel construction award for excellence in the use of structural steel

01 Gallery on Leviseur
02 Bridgton Sports Pavilion
03 Bluebird Pre-Primary School
04 Additions to Eduplex High School
05 House Coetzee
06 C.A.T. Motors, Cradock
07 House van der Wath, Clanwilliam
08 Kalkbay Extension
09 McDonalds
10 Monaghan Farm, Lanseria
11 House Reith, Paarl
12 House Mahieu, Port Elizabeth
13 Tugela River Pedestrian Bridge
14 Stellenbosch Extension
15 Kwale Mineral Sands Export Facility
16 Pipe Racks at Island View
17 Maboneng Penthouse
18 DCD Wind Towers Factory
19 Hyundai Parkade
20 TSR Warehouse
21 30 Jellicoe
22 Gorongosa Biodiversity Research Centre
23 Lutheran Community Outreach Foundation Recreation Centre
24 Malapa Fossil Excavation Site
25 Zibo Phase 2 Warehouse
26 UP/CSA Indoor Centre of Excellence
27 Zinc and Lead Storage and Loading Facility at Luderitz Harbour, Namibia
28 Kone Cranes – Alstom
29 Rydall Views Planted Solar Screens
30 Medupi Unit 6 Flue Gas Duct
31 American International School of Johannesburg – Aquatic Center
32 American International School – Commons
33 Goldfields Vent Shaft Conveyors
34 Bakubung Platinum Mine Main Shaft Headgear
35 DRA Footbridge
36 Isando Pedestrian Bridge
37 House Cumming
38 Giant Stadium
39 Stand 47
40 The Last Glass House
41 Water Recovery Growth Plant Project
42 Key West Shopping Centre – Northern Parkade and Virgin Active
43 No.1 Silo
44 Cradlestone Mall
45 Nampak Furnace Three and Support Infrastructure
46 New Military Health Base Depot
47 New Fabrication Facility for African Cryogenics
48 Jindal Africa Head Office
49 Tweefontein Optimisation Project
50 Cell C Head Office
51 2929 on Nicol
52 The S.E.E.D.
53 Kusile Power Station Material Handling Silos
54 Lucky Bread Company
55 Perskor SkyBridge, University of Johannesburg, Doornfontein Campus
56 Multichoice Samrand Data Complex Expansion Roof Jacking
57 Group Five New Head Office Building
58 Mediclinic Hospital Gariep, Kimberley
59 Jubilee Mall, Hammanskraal
60 6 Campbell Street
61 Medupi Boiler Island



Steel EMPOWERS


19


28


37


20


29


38


46


54


21


30


39


47


55


22


31


40


48


56


23


32


41


49


57


24


33


42


50


58


25


34


43


51


59

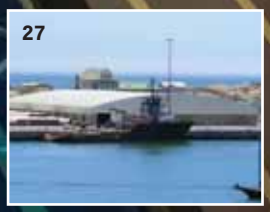

26


35


44


52


60


27


36


45


53


61

STRUCTURAL HOLLOW SECTIONS – FROM AN ENGINEERS PERSPECTIVE:

WHAT SIZE SHOULD I USE?

By Franco Mordini,
Business Development Specialist,
Macsteel Tube and Pipe

When specifying drawn sizes, where possible, ensure that you specify a size that does not require drawing down before conversion and is compatible with the mother tube standard sizes which will result in a finished product that will conform to the dimensions and standards called up in SANS 657 Part 1.

Good example where drawn tube was successfully specified - Standard Bank Facade in Rosebank.

Structural Hollow Sections are being used more and more in structural applications as they have proven to be aesthetically pleasing and very efficient profiles. This has resulted in an increase in demand for structural tube. This includes both direct off mill and 'drawn' sizes.

Typically tube is used in applications where the member is subject to compression or part of a frame that may be subjected to both compression and tension depending on load direction. In some cases it may be used in application where the member is subjected to biaxial bending. This typically results in lighter more efficient structures.

Other benefits include ease of erection as they are typically lighter and the increased stiffness makes it possible to fabricate longer sections. Tubular structures also create aesthetically pleasing buildings.

One common denominator regardless of production processes used is the structural behavior of the tube. As with other steel structural members the performance of the tube is dependent on the class of member, typically regarded as stocky or slender. Class 1 and 2 are regarded as stocky. Class 4 members are slender and should be avoided especially where the member is to be used as a structural element. One must bear in mind that Class 4 members are not structurally efficient as they will fail before the stress in the steel reaches its yield strength. In this case it is recommended that one rather chooses a 'stockier' size which may be smaller but more efficient. This would include Class 3 members.

Another interesting aspect of Class 4 members is that the higher the D/t or B/t ratios (depth or width divided by the thickness ratios) are the more difficult they are to manufacture. The difficulty will also increase, for the same ratios, the higher yield stress steel is as this ratio is inversely proportional to the square root of the yield stress in the case of Square or

Rectangular Hollow Sections; and inversely proportional to the yield stress in the case of Circular Hollow Sections. This correlates to the theory that thin plate or tube will elastically deform before reaching the yield stress, which may in the end result in severe deformation and in many cases results in failure of the member before it has reached its yield stress.

When Class 4 members are used, the complex theoretical resistance of the member will need to be calculated from first principles in order to avoid unwanted failures.

Drawn tube is often needed especially for sizes that are unique, too large for, or where volumes do not permit efficient direct of mill rolling. By definition, Drawn (tube) Hollow Sections are Circular (CHS), Square (SHS) or Rectangular (RHS) profiles that are converted 'off line' from a circular 'mother tube'. In this instance 'line' refers to tube manufacturing mill in which the final (by size) product is made on a continuous tube production line. Simply described, the process would entail taking a previously formed (circular) hollow section and alter its shape, preferably without reducing its diameter, into a square or rectangle which has the same perimeter as the mother tube.

The drawing process can also be used for circular sections to be drawn down into non-standard diameters through dies. The cost of rolls used to convert the tube is often low as typically they can be used to manufacture a range of different sizes, so the costs associated with changing an on line mill set up to a new profile can thus be avoided, which is especially desirable when only small quantities are required.

One of the biggest advantages of drawn tube is more than one size can be made from the Circular Hollow Sections input. In other words, the width and height of the profile can be varied for the same input mother tube, for example A 219.1 diameter circular hollow section can be converted to a RHS 250 x 100, RHS 200 x 150 or to a SHS 175. When producing tubes on an online mill, minimum order quantity is often based on the length of a strip of coil. To produce a drawn tube only the availability of the number of lengths of mother tube required is considered, hence small quantities can be made on a given 'Turks head' (the Turks head is the device used to draw down or reshape circular profiles) setting. The only limiting criterion is that the size of

Figure 1: Example of tubes with too tight corner radii.

the mother tube must be dimensionally suited to the finished drawn size. In order to draw down tubes, it is necessary for jaws to grip one end of the tube to pull it through the machines, resulting in a small length of waste on each tube (there are 'no free lunches' so someone is paying for the waste).

If a mother tube circumference is greater than the perimeter of the drawn size, it is necessary to draw down the circumference to suit the end product before conversion. If not done correctly it can result in a profile that will have very tight corner radii *(see Figure 1)*. If the radius is excessively tight this may result in cracking in the internal corners. The additional energy required also results in work hardening, especially in the corners, that reduces the ductility of the profile (but increased yield strength in the bend affected corners).

Figure 2: Tubes with too large corner radii resulting in large and inconsistent corner radii. The simple and desirable solution is to specify the sizes that are a direct conversion, i.e. a size that does not need to be drawn before conversion.

Size dxh (mm)	Thickness (mm)					
	3.5	4.0	4.5	6.0	8.0	10.0
200 x 100						
200 x 150						
250 x 100						
250 x 150						
300 x 140						
320 x 200						
340 x 180						

Size dxh (mm)	Thickness (mm)					
	3.5	4.0	4.5	6.0	8.0	10.0
150 x 150						
175 x 175						
200 x 200						
220 x 220						
250 x 250						
260 x 260						
285 x 285						

Items in blue typically drawn and others typically direct off mail.

Table 1: Typically larger sizes.

CALENDAR OF EVENTS

BASICS OF STEEL COURSE

Johannesburg: 9 & 10 July

Durban: 14 & 15 July

Cape Town: 21 & 22 July

SASFA INDUSTRY MEETINGS

Durban: 31 July

Cape Town: 30 October

VISITING ENGINEER: PROFESSOR ROBERT DRIVER

University of Stellenbosch: 11 - 15 August

University of Pretoria: 18 - 22 August

Afternoon lectures to practicing engineers

TBA

SASFA WORKSHOP WITH ARCHITECTS

20 August

NASREC

STEEL AWARDS 2014

18 September

Johannesburg – Emperors Palace

Cape Town and Durban – Venues TBA

SAISC AND SUBSIDIARY AGMS

13 November

Country Club Johannesburg, Auckland Park

FOR MORE INFORMATION ON EVENTS VISIT OUR WEBSITE – www.saisc.co.za

Annealing (heating and slow cooling treatment) may be required when excessive work hardening has occurred in the drawing down process. This can however be expensive and should therefore be avoided where possible.

If a mother tube circumference is too small for perimeter of the drawn tube is used, it will result in a profile which has very rounded corner radii considerably in excess of the requirements of SANS 657 Part 1 *(see Figure 2)*. In many of these cases a compounding problem may occur in that the four rounded corners are often unequal and may present aesthetic problems. A good example is a SHS 175 that is drawn from a CHS 219.1, if a 180 square is specified and product is drawn then the corners will be very rounded and in most cases will result in unequal corner radii.

Drawn tube manufacturing does not have a place where volumes required reach a critical mass which justifies these sizes to be made directly, and more efficiently, using on line mills. Some examples, to name a few, are SHS 120, SHS 150, RHS 160 x 80 and RHS 200 x 100.

The recommended (preferred) large square and rectangles sizes in graded steel (typically S355) are shown below. Smaller sizes, provided they are 'standard', will typically already be manufactured direct using on line mills. Consult the SAISC Steel Construction Handbook (The Red Book) or your friendly steel supplier or tube manufacturer if in doubt.

It is important for engineers to specify structurally efficient members avoiding Class 4 members. Drawn tube serves an important part of the market where non-standard sizes are required and/or when quantities are small. When specifying drawn sizes, where possible, ensure that you specify a size that does not require drawing down before conversion and is compatible with the mother tube standard sizes which will result in a finished product that will conform to the dimensions and standards called up in SANS 657 Part 1. The sizes listed in the latest Red Book will typically avoid many of the above pitfalls when specifying tube. For availability it is best discussed with your local merchant or tube mill.

For the record the mass per metre of drawn tubes will always be the mass per metre of the mother tube.

By sticking to these simple rules, the result will be a reduced cost and provide the end user with a better quality product.

THE SAISC INTERNS PROGRAMME

A PARTNERSHIP WITH THE DEPARTMENT OF SCIENCE AND TECHNOLOGY AND VAAL UNIVERSITY OF TECHNOLOGY

By Spencer Erling,
Education Director, SAISC

A part of the diploma requirements for civil engineering studies through a University of Technology is that students need to:

- firstly pass all the required subjects,
- and secondly have a year's work experience (Work Integrated Learning (WIL)) that puts into practise a large part of their academic studies. The WIL needs to be at a level for them to be challenged and to get maximum learning of their profession on the job before they are allowed to submit the necessary documentation and reports that will enable them to apply for and receive their diplomas.

To this end, the SAISC has embarked upon a programme to enable three Vaal University of Technology students (Mpho Mukhudwani, Nepfumembe Ndivhuwo and Senyane Masha) to do their one year's WIL program with the SAISC and its members.

We truly believe that this is a great opportunity to create well focussed human capital for the structural steel industry. Even more exciting is that their salaries are going to be paid for by the Department of Science and Technology, the SAISC will help with incidental costs.

To do this we will need the co-operation and assistance of the structural steel industry i.e. design, fabrication and erection to ensure a good all round grounding and training from which candidates will have the opportunity to get into industry in one of the directions he/she would find the most suitable.

The programme will be run by Spencer, Paolo and Amanuel. We envisage the following to be the important components of the intern programme. Even if you choose not to wade through the details below, the programme is comprehensive and we really do need the support of industry to help us help industry get suitable human capital in the future.

The SAISC will be directly responsible for :

The SAISC will ensure that all interns get the opportunity to attend any relevant courses that we offer (including giving them tutorial work to ensure they grasp the knowledge) such as:

1. Connection design (including use of SAISC eTOOLKIT);
2. Design of light steel structures (trusses, portals, beams and columns);
3. SAISC School of Draughting experience especially Tekla detailing software and

Even more exciting is that their salaries are going to be paid for by the Department of Science and Technology, the SAISC will help with incidental costs. But that is just the start of the programme, the bulk of the training and experience must come from industry and we are looking for partners in this regard.

its use for preparing general arrangements;

4. SAMCRA course related to cladding issues (SANS10237);
5. SASFA course on building of light steel framed structures;
6. Quality assurance for engineers;
7. Understanding standard contracts and costing for the steel fabrication industry (the SAISC estimating course);
8. Providing the mentor required (including life skills, motivation, learning to be pro-active and to take responsibility for one's life and job);
9. Ensure the candidate has a full set of PPE and is trained in their use;
10. Involvement in SAISC research programmes (HD bolts, dry flooring, decking, tee connections etc.);
11. Arrange site and field visits (e.g. Kusile, tube maker, steel making, hot dip galvanizing, service centres/merchants) and understand the visited companies' quality programmes.

But that is just the start of the programme, the bulk of the training and experience must come from industry and we are looking for partners in this regard.

The help we need from the design industry

We have to ensure that the candidate gets at least three months of practical design work. It would be great if the work was associated with design and construct contracts for the fabrication industry. It would be even better if the student was involved in a design and then follows the process through a workshop and construction.

They need to grasp the following:

1. Understanding the client's needs;
2. Analysis – both using computer software and hand methods of checking;
3. Design of steel structures;
4. Preparation of general arrangements drawing (layouts, hopefully using the Tekla software they will have been trained in);
5. Checking structural steel details;
6. Selection and design criteria for cladding;
7. Report and letter writing;
8. Site inspection (quality assurance and control) of projects.

The help we need from the fabricating industry

Ensure that the candidate gets experience in every sector of a steel fabrication company:

1. Estimating and tendering;
2. Buying, understanding and use of the correct names and specifications of products needed;
3. Basic contract planning and detailed workshop planning, reading various types of programmes and understanding the relevance of sticking to programme;
4. Drawing office;
5. Workshops:
   - Stockyard
   - Cutting and holing bays
   - Assembly
   - Welding – understanding the requirements of AWS D1.1. including knowledge of Weld Procedure Specifications, associated welder qualification and visual inspection to table 6.1
   - Inspection, understand the requirements of SANS 2001-CS1 including dimensional requirements and how to measure them. Data packs.
   - Corrosion protection requirements including if necessary, spending some time at corrosion (painting) experts.
   - Despatch and associated paperwork.

The help we need from construction industry

Ensure that the candidate gets experience in every aspect of what happens on a site related to both steel erection and cladding

1. Induction and safety issues;
2. Receiving and stocking of materials at site;
3. Co-ordination with and checking of concrete or foundation works done by others before taking them over;
4. Site establishment issues, (for longer duration sites this could include more unusual requirements such as separate stores for flammable goods [paints and oils] and gasses. Fuel depot including bund walls etc.), housing for workers;
5. Safe-working erection method statements (SEMS) and hazard and risk assessments;
6. Planning activities for the job in accordance with the SEMS, locating materials in advance of requirements, follow up on missing materials;
7. Co-ordination with the client and the fabrication works;
8. Dealing with daily reports and paperwork associated with sites (attendance records, plant histograms and safety);
9. Inspection and quality requirements, understand SANS 2001-CS1;
10. Handover and paperwork;
11. Site disestablishment.

You have surely noticed this is a comprehensive programme. If the interns get to grips with most of these items they will come out well rounded and knowledgeable National Diploma in Civil Engineering graduates who will surely be in great demand in our industry which is sadly lacking in technical skills.

If you are keen to be involved in the training of interns (and have first choice as their talent is un-locked) please contact Spencer on +27 11 726 6111.

DON'T STEAL – BUY S.A. STEEL

This family is one of the lucky ones! He, the breadwinner, has a 'decent' job in the steel construction industry. Many, many other South African families are not so lucky because of the high level of importation of structural steel from abroad that could easily have been bought from a competitive local company.

Remember, for every 1000 tons of structural steel you import you steal 100 jobs from ordinary South Africans. Don't steal. Buy South African steel.

Southern African Institute of Steel Construction
Tel: +27 11 726 6111 E-mail: info@saisc.co.za www.saisc.co.za

SOUTHERN AFRICAN INSTITUTE OF STEEL CONSTRUCTION

Steel leaves a legacy.

SOCIAL SNIPPETS

By Marlé Lötter, Events Manager, SAISC

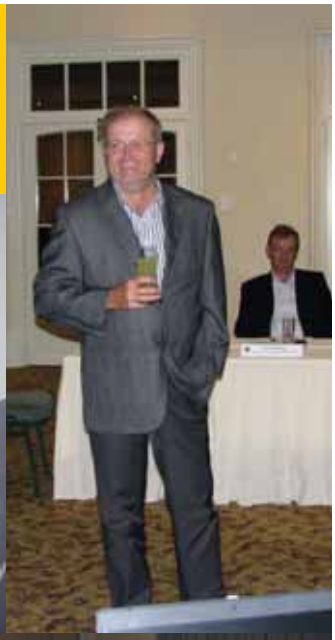
POLASA

POLASA, the Power Line Association of South Africa, which was founded in 2013, hosted two sessions on 22 April 2014 at the Country Club Johannesburg. A focus group workshop for manufacturers in the powerline industry was lead by Sagren Moodley of Metpress. This was followed by a general members' meeting with a special presentation by Danie Bosman of Stefanutti Stocks Structures on the practical implications of construction regulation for POLASA members.

RIGHT: Sagren Moodley, Metpress.

FAR RIGHT: Danie Bosman, Stefanutti Stocks Structures.

BELOW LEFT AND RIGHT: Guests at the general members' meeting



SAISC CONNECTIONS eToolkit LAUNCH

SAISC recently introduced the Connections eToolkit, a pioneering digital instrument created by the SAISC for designing structural steelwork connections. A team of engineering experts from WITS, lead by Prof Alex Elvin, assisted SAISC with the development of the eToolkit.

BELOW: Delegates at the launch workshop in Johannesburg on 2 April 2014. Workshops, sponsored by Cadex SA, were also hosted in Cape Town and Durban.

THE SAISC SCHOOL OF DRAUGHTING MOVES

By Roelf Lizemore, Principal SAISC School of Draughting

The big move was planned for the weekend of 29 March 2014. It was a great team effort, just as all engineering and project work should be.

Students proved to be great cartage.

After being accommodated at Aveng Manufacturing's offices in Germiston for six years, it was decided to move the SAISC School of Draughting to Genrec Engineering's premises in Wadeville, Germiston thanks to a very generous rental arrangement. Thank you to Aveng Manufacturing for the years of comfortable accommodation and co-operation during the school's sojourn at their offices.

THAT LAST WEEK AT AVENG

The last week of the school's stay at Aveng's offices turned out to be exciting in more than one way. With the 21 March, Human Rights Day, a public holiday, the school, like most of the country, enjoyed a long weekend.

The school opens at 07:00 daily so the staff and students were amongst the first to arrive at the Aveng office block on the Monday after the long weekend, only to be greeted by flood waters which started on the third floor of the building running all the way down to the ground floor where the school was located.

Roelf cleaning up (not begging) after the water leak at Aveng.

Solly Salojee the Drawing Office Manager and students visiting the workshops.

In the true spirit of the relationship that has grown between the school and Aveng the whole team jumped in and set about drying up the water before most others even arrived. When they did, the water was all cleaned up most of them not even being aware of the situation an hour before.

Well done to Roelf, the rest of the staff and the students! Please keep up that pro-active attitude to help where necessary. Thanks to Aveng for supplying lunch by way of thanks.

THE MOVE TO GENREC

Even though costs were kept to a minimum, the move went very well.

The big move was planned for the weekend of 29 March 2014. It was a great team effort, just as all engineering and project work should be. Everyone was excited and enthusiastic and jumped in and before we knew the move was done. What's that old adage about many hands make light work?

The staff and students moved most of the boxes and the smaller goods using their own vehicles. A truck was hired for the Saturday and three trips later, everything was transported from Aveng to Genrec. Thanks to the efficient, productive and cost effective truck hire company for their contribution to the move.

The school team arrived on Monday 31 March at the new premises at Genrec who had arranged for and ensured that all completed the induction before lunch. The final unpacking was completed in the afternoon and the school was fully operational by 1 April.

Our grateful thanks go to the Genrec team who have been so helpful and friendly in the way they assisted the school with the relocation. They have done a superb job refurbishing the building in terms of layout, telephones, network cables etc. from an office area into a school. We are looking forward to a long relationship with them. We truly believe that the school will benefit a great deal from this new venture and venue.

The students have already had the opportunity to learn from the tour of the world-class workshop and manufacturing facility at Genrec.

Students busy re-assembling the connections tree.

MACSTEEL

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

- 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

Best Quality, Service, Value!

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