steel CONSTRUCTION

Volume 37 No. 2 2013

IN THIS ISSUE:

STEEL FUTURE

A REVIEW

OFFICIAL JOURNAL OF THE SOUTHERN AFRICAN INSTITUTE OF STEEL CONSTRUCTION

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EDITOR'S NOTE

The SteelFuture Conference is something of the past, but its influence will carry on for some time – mostly in the form of work and planning for the SAISC. Here is the publication to celebrate, summarise and conclude all that involved SteelFuture. We hope that it achieved the objective of being a keepsake for those who attended and a meaningful review for those who missed out.

Some of the presentations are highlighted in the form of articles in this journal, but from the evaluation forms we can conclude that most of the presentations were of such quality that all of them could be featured in this magazine if it weren't for a lack of space.

Like most events, to 'outsiders' it seemed to just happen, but 'behind-the-scenes' attention was given to the finest detail. For one, we could not have a conference if we didn't have a good programme. Hennie was the main architect (engineer?) of this core ingredient and was rewarded with the enthusiasm and willingness of the speakers he invited. Then there are the 'nitty gritty' details of the event and Marlé Lötter had her role cut out for her from the start. But the proof is probably in the amount of times we heard "Very well organised!" during the conference. In between the rest of the staff worked long and late hours to produce a conference that seemed to just happen. But then again nothing would have happened if we did not have the support of our sponsors.

So what's next? Steel Awards of course. This year the theme is 'Into Africa' focussing on the many opportunities in Africa for our steel construction industry. Be sure to enter your export-into-Africa projects, but also any other project that you feel meets the criteria of the competition. Remember the deadline is 30 April 2013. Check out the details on the website *http://saisc.co.za/steel_awards_2013/.*

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Contents

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The Steel Construction journal supports the freedom of media and speech implicitly enshrined in our Constitution (Article 16).

OFFICIAL JOURNAL OF THE SOUTHERN AFRICAN INSTITUTE OF STEEL CONSTRUCTION

Supertree structures, Gardens by the Bay, Singapore.
Photo: Lee Yiu Tung

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SAISC COMMENT

By Dr Hennie de Clercq,
Chief Executive Officer, SAISC

SteelFuture and ISCG left us with a mountain of ideas, issues, and things to follow up; work, in short. In fact, it will take us some time to digest all the information we gleaned, to study the reports others are writing about what they got out of the events and to act on whatever is regarded as most useful.

STEELFUTURE, STEEL AND THE FUTURE

The past SteelFuture Conference was for us, as staff of the Institute, a rather existential affair. We threw everything into organising it and if it had failed we would have been very despondent. In reality, however, it worked out even better than we had hoped for.

The first thing to go right was that literally everybody we approached to speak at the conference said "yes", and that included quite a few names we thought to be rather distant prospects. The second success was that the people came. We ended up with just about twice the number of attendees we thought might turn up in view of the state of the world's and South Africa's economy, and especially the state of the construction industry. And then everything just seemed to go according to plan. All the planning we did to anticipate and mitigate every conceivable contingency proved not to have been necessary.

A feature of the conference was that it had, besides the South African speakers, a strong contingent of international speakers – no less than 23 of them. This was the only way we could give credibility to the SteelFuture theme, namely to get to the cutting edge and try to look forward. We got some leading people in the world together and got them to talk about what they considered to be happening at the cutting edge.

This strong international presence was taken further to the meeting of the International Steelwork Contractors Group (ISCG) in Cape Town immediately following SteelFuture. This informal grouping consists of the institutes of steel construction of the USA, UK, Canada, Australia, New Zealand and South Africa and has met every two years since 2003 to discuss issues of common concern, share information and insights, and identify projects to collaborate on.

SteelFuture and ISCG left us with a mountain of ideas, issues, and things to follow up; work, in short. In fact, it will take us some time to digest all the information we gleaned, to study the reports others are writing about what they got out of the events and to act on whatever is regarded as most useful.

What was my overriding observation during SteelFuture and ISCG?

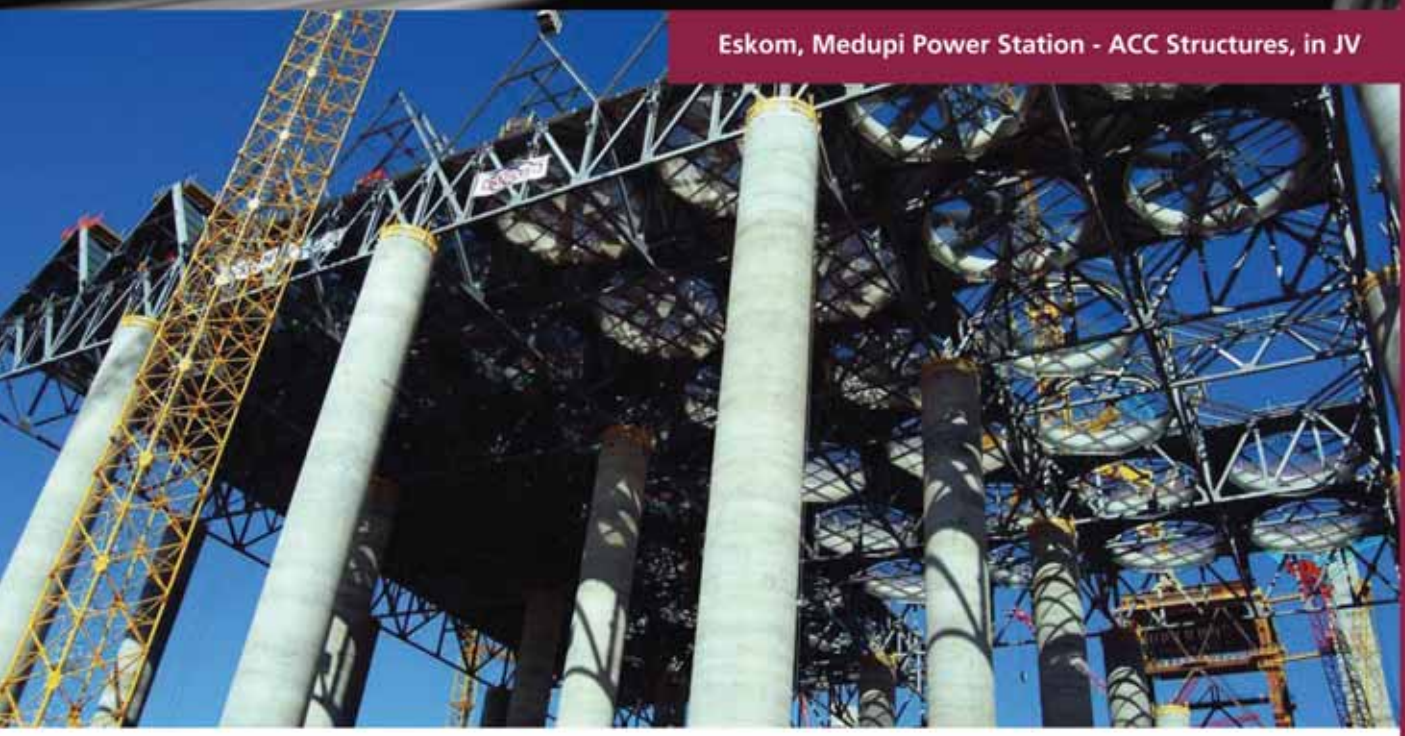
Well, I just realised again how amazing a product steel is. And to think that it is so abundant that 1.6 billion tons of it is produced worldwide per year! It's a phenomenal resource that has played a major role in enabling the development of the advanced, industrial civilisation that is now predominant all over the world. Without steel it would be impossible for 7 billion people to live on the globe.

But the very existence of this industry-based civilisation and this large number of people is a source of major problems and challenges that need to be addressed by present and future societies. Much of what the future will bring is not a matter of guessing; the die has already been cast. The children that will grow up and have children have already been born, the CO_2 is already in the air and there is almost no way of turning the ship that pumps out ever more of it, and the stream of people into ever larger cities is growing wider and faster.

The efforts of world leaders to stop global warming are a good start and should be supported. But it is clear that nobody and nothing short of a global disaster with the power to wipe out a sizeable portion of humanity will halt this runaway world. That's frightening, but it also comes with unbelievable opportunities. Fabulous wealth awaits those people who can meet the needs of the people of this world in future. And many of those needs involve building and construction:

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
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housing, workplaces, recreational, sports and cultural facilities, transportation, energy, etc.

However, wealth and fame will not come to those who do things the old way. The complexities of these new cities, politicised requirements for sustainability, the need to use a minimal amount of resources and surely many things we have yet to think about will require totally new ways of doing things. Ingenuity, creativity and innovation of a totally new order will be in serious demand. With respect to buildings the prize will go to those who can create facilities using minimal amounts of the greenest materials, within a very short time, while having almost no impact on any other person or system and creating opportunities for others to derive value from adding value.

I believe steel will be the most utilised material for the strength-giving parts of buildings and other constructions when this scenario becomes reality. I can conceive of steel meeting many of the requirements while I have difficulty seeing any other abundant and relatively cheap material that can do the job. However, the steel will not constitute the building, just as today it does not constitute a motor car. In fact, the automobile might be a good illustration of the future role steel can play: a framework of minimal weight that gives shape and strength while permitting all manner of item (many of which will be made of steel) and systems to be attached to it and integrated into the larger system. Cars also show the way to mass customisation, luxury within small spaces, branding to maximise desirability, and mass production. There's a lot we can learn from the auto industry.

If steel is to reach its full potential in the building and construction industry of the future, major breakthroughs will need to happen. Where will the innovations come from? Will they be the result of some large company investing heavily in research and development? Will it be on the level of an industry doing collective development and sharing the results? My guess is that we are going to see some disruptive technologies arising from un-expected places. Initially everybody will ignore the entrepreneurs who come from these unexpected places and serve unimportant segments of markets, until someday everybody wakes up to see that their markets are being seriously eroded by technologies they simply don't have an answer to. Those technologies will most probably be steel-based, but traditional steel companies may end up seeing them as the enemy when they destroy the markets that we have built up over many years.

For the company who can be truly creative in technology, processes and business models, the future holds great opportunity. I believe that he who can use steel creatively will walk away with the prize.

STEELFUTURE – A REVIEW

By Spencer Erling,
Education Director, SAISC

The SteelFuture Conference addressed a myriad of topics, but underlying all of them was their focus on what the future holds. Spencer took the task upon himself to write an overview of the most important issues that were discussed at the conference.

For those of you who were not there - what a great conference it was (he says with much modesty and humility)! But what we can do is give you a taste of what you missed.

The theme was very well covered by our speakers both international and local.

THE WORLD ECONOMY AND PROSPECTS FOR STEEL

The first two sessions looked at the economic situation and how it could impact on our material of choice. For a more detailed review of Edwin Basson, Director General of worldsteel's comments see Hennie de Clercq's article on page 10.

He also predicted a 2.5% growth of world steel production for 2013 to somewhere round about 1.6 billion tons of steel, another record, with close to 50% of it in China. He predicted that some 1.5 billion people world-wide will urbanise in the next 20 or so years. This really means we will in theory need another 60% increase in facilities compared to where we are currently - this is where to look for growth and opportunities.

Who would want to be an economist predicting the future? Henk Langenhoven looked at some of the drivers that could affect the future growth of steel sales such as:

- Spending of the middle classes
- GDP growth rates
- Financial instability e.g. Greece, Spain, Italy
- Urbanisation
- Fixed capital assets
- Investment in infrastructure which is expected in China in 2030 to be double anywhere else
- Globalisation versus Protectionism

A packed plenary room with Dr Edwin Basson's opening address.

Henk Langenhoven, Chief Economist, SEIFSA.

- Democracies and the degree thereof
- Levels of corruption
- African growth tracking Chinese?
- Sub-Sahara corridors

No wonder economists find it difficult to give a straight prediction...

Another speaker who believes growth will come from developing nations was Vusi Ndala. He painted a very positive picture for Africa feeling that it was progressing from exporting resources to manufacturing. This was not achievable without developing new infrastructure, together with a good degree of regional integration to create bigger markets.

SUSTAINABILITY ISSUES

Not surprisingly, sustainability issues enjoyed a lot of attention at the conference. The major overview was presented by Llewellyn van Wyk (read his article on page 58) who started by introducing the term 'resilience' which he defines as the capacity to continually change and adapt yet remain within critical thresholds, and is the new 'buzz word' for sustainability. So to improve sustainability, we need to reduce vulnerability by reducing exposure and/ or increasing resilience.

He believes the drivers of change are:

- Emissions
- Land use
- Climate changes with extreme events increasing

His parting message was a strong plea to move to a carbon neutral economy and in fact hoped for one better, to a carbon free economy in his words,
"Imagine...
A green economy with new materials...
Eco-neighbourhoods, green(ing) infrastructure together with eco-buildings."

Coming to the 'nitty gritty' of CO_2 footprints and the like, Bauke Bonnema of Tata Steel in the Netherlands introduced his view on improving the carbon footprints of buildings with some interesting and challenging statistics such as:

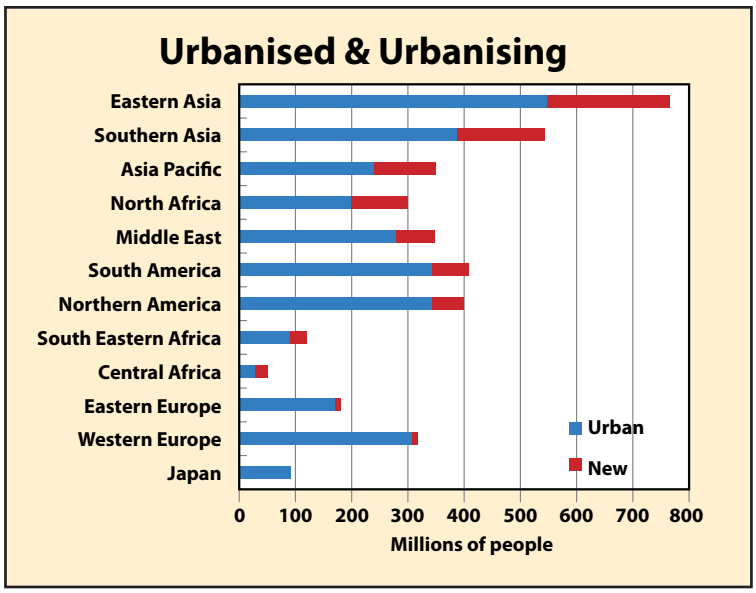
Construction in West Europe is responsible for:

- 40% CO_2 emission / energy use
- 25% transport
- 35% waste
- 20% water use

And this is typically for between 4 and 11% of GDP (Western European countries). As an industry we clearly have a responsibility to improve our performance when it comes to sustainability issues.

We were introduced to the two documents covering Sustainability of Construction Materials (EN15804) and Sustainability of Construction Works (En 15978) and the ULCOS project (Ultralow CO_2 steel making) with a stated aim of a 50% reduction in CO_2 per ton of steel produced by 2050.

But the most important need is for us to become involved in the energy life cycle of the building with products such as Active cladding (both transpired solar collection and integrated photovoltaic) and Comfloor active (heating and cooling in composite floors) as well as designing steelwork for demounting and re-use (versus recycling).



Dr Basson predicted that some 1.5 billion people world-wide will urbanise in the next 20 or so years. This graph from Henk Langenhoven's presentation shows the current situation.

John Moebes, Director of Construction, Crate&Barrel.

Roger Pope gave us some fascinating comparisons of embodied (with a substantial portion being created in the foundations and ground floor slab) versus operational tons of CO_2 with operational being the big culprit. I am sure it will come as big a surprise to you the reader as it was for me to discover that the 'wonder green product' timber, because of its negative end of life issue that decomposing timber generates lots of methane, has a worse embodied CO_2 than the equivalent portal structure in steel!

MARKETING ISSUES AND SOME GREAT WATERSIDE PROJECTS

For me John Cross was the inspirational speaker during the two days. Look out for our separate article on page 64.

Two speakers spoke about entirely different waterside projects. Prof Richard Liew of Singapore covered a daring project to put a 350 metre long sky-bridge sports park on top of three hotel tower blocks. This is a must read separate article – see page 54.

Harish Srivastava of Aurecon Australia described how steel for new and extension jetties has become the material of choice.

BIM (BUILDING INFORMATION MODELLING)

John Moebes took the lead on the subject by taking us through the journey of how Crate&Barrel have used BIM technology. They run a chain of over 100 household goods stores in the USA. They use

Christian Colombo, Vice President, Ficep Spa.

Bosco Verticale (Vertical Forest) is a project in Italy for metropolitan reforestation that contributes to the regeneration of the environment.

BIM methods to help them create their new stores, each with its own character. We can certainly learn a lot from how they do it, efficiently and with a reasonable cost.

David Ratterman of Stites Harbison has concentrated his legal practice on general construction law. He highlighted some of the issues that are happening using BIM in the USA. It is common knowledge that structural steel is leading the construction industry in BIM application. We also know that of the structural disciplines it is steel that has benefitted the most from IT developments such as 3D detailing and management information systems to control all of the thousands of pieces that make up a steel structure.

BIM software requires the designer to model all aspects of the design, creating a virtual copy of the building prior to the start of fabrication.

David emphasised that BIM is not perfect and has a way to go 'to get there', but that thrusting the system on companies who are not prepared for or trained in the use of BIM could be disastrous.

Of concern were his thoughts on the dangers of the construction manager 'taking control' of the construction industry possibly leading to structural steel becoming a commodity.

PROTECTING THE HOME MARKET

Mushir Khan of Worley Parsons TWP gave us an insight into why large companies have decided to buy 'Chinese'. Listening to his comments one cannot but feel that these policies (they differ from company to company) have not been thoroughly thought through. There are clearly issues about quality, delivery times and extra costs associated with these problems.

We then had a fascinating insight into how South Africa (SAISC) and Australia (ASI) have approached the Chines threat. Described by Kobus de Beer as an elephant entering our room, Australia has had the elephant in the room for some time and this has ravaged significant parts of their industry.

The Aussies have adopted a policy of publicising the issue from Government right down to the man in the street, going so far as to organise (peaceful) demonstrations. It is a policy we can learn from getting support from the nation in addition to the protective measures we have successfully managed to get Government to implement and are in the process of trying to extend.

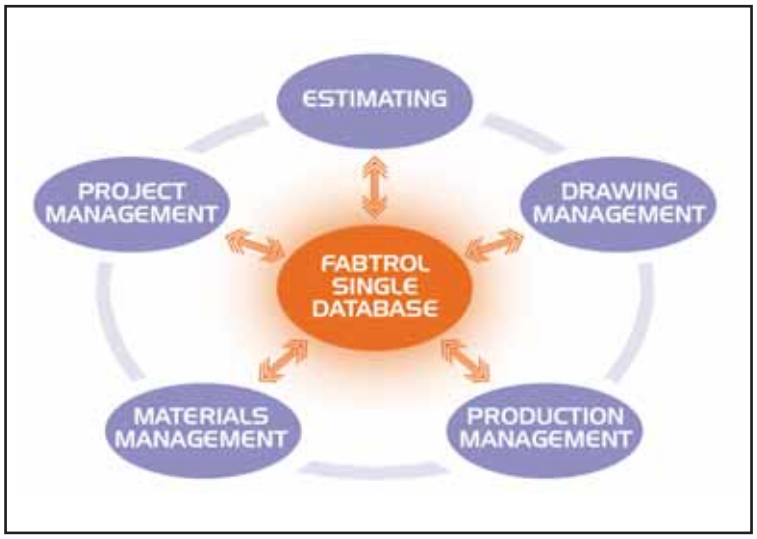
NEW DEVELOPMENTS IN FABRICATION

This was the session dedicated to bringing South African fabricators up to speed with new developments in the fabrication field.

What Ed Whalen of the Canadian Institute of Steel Construction had to say about robot welding is worthy of a separate article on page 68.

Steven Partridge of FabTrol speaking about management information systems; Ian Walker of Peddinghaus covering handling systems and how important they have in

REVIEWS



FabTrol offers a management information system which in a nutshell is a modular integrated solution based around a single database.

productive fabrication, and Christian Colombo of Ficep who spoke about automation of fabrication left a lasting impression on the writer:

- I got into fabrication about 40 years too early when I see just how exciting the fabrication world has become.
- If your company has not had a serious look at management information systems you are doing yourself a serious injustice. What is great about the systems is that they can be introduced into a company in small modular steps, with each step showing great improvement for management. What are you waiting for?
- The same can be said for NC equipment and handling systems, if you have not taken the step, can you afford not to if you want to stay in business?

The afternoon sessions saw the first of the breakaway parallel groups, with interest groups covering contracting and engineering and light steel frame building *(see the separate reports elsewhere in this issue)*.

Has this article whetted you're appetite to know more about what our speakers had to say? Go to www.saisc.co.za - News & Events - Recent events and you will be able to download most of the presentations.

Edwin Basson, Director General, World Steel Association, Belgium.

SETTING THE SCENE

AN OVERVIEW OF DR EDWIN BASSON'S OPENING ADDRESS

By Dr Hennie de Clercq,
Chief Executive Officer, SAISC

Edwin delivered the opening address at SteelFuture and his first message was that steel is a key driver of the world's economy. It is simply impossible to think of a modern economy without steel. Not only is the steel industry a sizeable chunk of the world's economy, but it plays a role in just about everything. "If it's not made of steel, it's made using steel."

Edwin Basson is the sort of person who makes you proud. He's a South African who heads up the World Steel Association, the organisation representing the steel producing companies of the world – the pinnacle steel industry association on the globe.

He also makes you proud of being a steel industry person. Get him and John Cross into a room and soon everybody will be convinced steel is the most wonderful material in the world. He leaves one with a level of confidence that the leaders of the steel industry are indeed thinking long term, they are truly well-informed, and that they are aware of both the opportunities and the challenges the world is lining up for us.

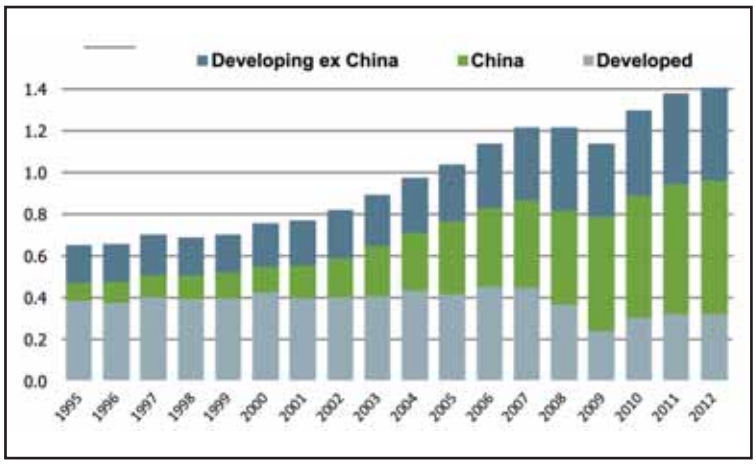
Edwin delivered the opening address at SteelFuture and his first key message was that steel is a key driver of the world's economy. It is simply impossible to think of a modern economy without steel. Not only is the steel industry a sizeable chunk of the world's economy, but it plays a role in just about everything. "If it's not made of steel, it's made using steel." Steel is the big enabler material of all industries. It drives the economy and is driven by the economy.

His second key message was that steel is sustainable in all three dimensions – economic, social and environmental. It is very interesting that, according to Edwin, these three issues will take turns being the primary drivers of the steel industry.

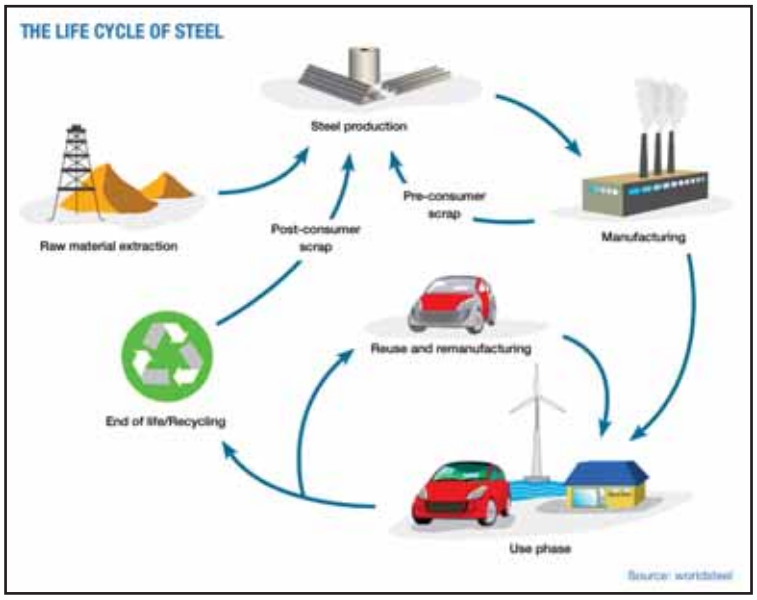
In the short term, economic considerations will be paramount. Huge levels of debt constrain economic growth in many countries. In the developed world growth will be particularly weak and even China is expected to slow down to about 4% growth. Steel mills' margins are squeezed between the price of raw materials and slack demand for steel. As raw materials suppliers in turn experience reduced demand for their products, their margins will diminish, leading to a scenario of cheaper steel.

In the medium term, demographic issues will drive the industry. With the world population growing towards nine billion, billions of people reaching middle class status and rapid urbanisation, the demand for steel will grow and become huge, certainly in building and construction.

In the long term, Edwin expects that environmental concerns will be paramount. They are, of course, already playing a major role in the steel industry. Over the past three decades the steel industry has made major strides in reducing its carbon footprint. The amount of CO_2 produced while producing a ton of steel from iron ore (i.e. using the basic oxygen furnace) is now 50% less than 1985.



Global apparent steel use (Billions of tons, finished).



Sustainability must apply over the life cycle of steel.

Edwin delivering the opening address at the SteelFuture Conference.

The ULCOS (ultra-low carbon dioxide steelmaking) endeavors of leading steel mills are aimed at cutting the carbon footprint by another 50%, but the obstacles are significant. The traditional way to free iron ore of oxygen, leaving iron behind, is to let the oxygen bind with carbon in the form of coke, which produces carbon dioxide. So the chemistry is not on the side of anybody who wants to cut steel's carbon footprint. And sequestering huge amounts of CO_2 underground, which is part of the present ULCOS strategy, has yet to be proven viable.

It is thus not surprising that the steel producers of the world have come to realise that it is not enough for them to look at the production of steel in pursuit of sustainability; they also need to consider how their products are used. The use phase of products often has a greater environmental impact, not to speak of economic and social impact, than the production phase. And with more than 50% of the world's 1.6 billion tons of annual steel production going into construction, with huge future growth for reasons already mentioned, it is clear that the sustainable use of steel in construction will be high on the agenda of the steel industry. An idea of what is under consideration can be obtained from the WellMet 2050 programme of the University of Cambridge which Edwin referred to in his talk. The programme is pursuing four avenues for reducing the carbon footprint of steel and aluminium:

- Reuse without melting
- Less metal, same service
- Longer, more intense metal use
- Supply chain compression

The first three of these relate to what happens to the steel after it has left the mill. Edwin readily admitted that pursuing these objectives will reduce the amount of steel produced by the steel producers. But without major progress along these dimensions the world's steel industry will come under intense pressure as the effects of global warming reach a level where they have a tangible and visible impact on people's daily lives and their expectations of the future.

Against this background Edwin effectively issued a challenge to the steel construction industry: find ways to design, fabricate, build, use and reuse steel in line with the WellMet objectives. The World Steel Association, and many of the mills that are members of this organisation, are eager to cooperate with us in walking this challenging, exciting path.

The SAISC accepts this challenge. We appreciate that the long term future of our industry depends on our success. We also understand that a great deal of ingenuity and innovation will be required to achieve success.

EDWIN BASSON

Director General, World Steel Association, Belgium

Edwin Basson received his PhD in economics from the University of Pretoria. He taught economics at the same university from 1984 to 1990. South Africa's Human Sciences Research Council (HSRC) awarded Edwin the honorary medal for the advancement of science for his research.

After a few years in the banking industry, he joined the steel industry in 1994 as Chief Economist at Iscor Ltd. In 1996 he became Business Units Manager for coated steel products and flat steel products. He later headed Strategic Initiatives at the company.

Edwin joined Mittal Steel (now ArcelorMittal) in 2004 in Europe as a General Manager responsible for global marketing strategy and became Head of Commercial Research and Market Segmentation in 2006. Since mid 2007 Edwin was Vice President, Commercial Co-ordination, Marketing and Trade Policy at ArcelorMittal in London.

Kobus de Beer.

THE HOME MARKET UNDER THREAT

THE AUSTRALIAN STEEL INDUSTRY'S CAMPAIGN FOR LOCAL CONTENT

By Kobus de Beer, Business Development Executive, SAISC

It is clear that many aspects of the Australian situation is reflected in South Africa and that all efforts must be made immediately to encourage the growing awareness of the importance of specifying South African local content.

One of the objectives of SteelFuture was to draw meaningful comparisons from the steel construction industries in the various countries that were represented at the conference.

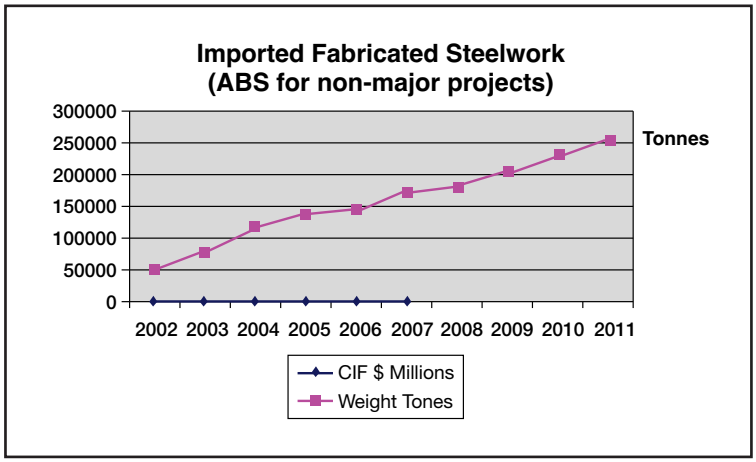
An area of concern in South Africa is the growing incidence of imports of fabricated structural steel with the associated job losses. The Australian experience was therefore of much interest and significance.

Don McDonald, the Chief Executive of the Australian Steel Institute (ASI), reported that in a relatively short period the swing to imported structural steel has grown to the point of them now fighting for (begging for?) a 'fairer share' than 10% of all major project work to be produced locally! The effect on their industry and employment is devastating and has resulted in a range of actions to try to turn the tide. Major companies are scaling down or closing down, many are working well below capacity and job losses are running into many thousands.

Similarly to South Africa the Australians are having to deal with perceptions versus facts and a number of initiatives are in place to advise decision makers that sufficient capacity exists to do major projects; that the industry is up to international standards with quality, equipment and technology and that skills are available even if needed to be imported for short peak periods. The price differentials between local and cheapest compliant international suppliers compare well with South Africa at just over 20% and not 100% as is popularly proclaimed. They are lobbying their government to follow the South African example of imposing 15% ad valorem import duty on fabricated structural steel.

A multipronged campaign was launched to maximise the Australian steel value chain's content in four priority sectors. A National Local Content Reference group was formed under direction of the ASI. They identified different market sectors and planned a media communications plan for each. A public awareness campaign was launched using slogans like "What can be made here should be made here".

A number of formal submissions to government were prepared and submitted personally and formally. Local content rallies were held in various centres and every opportunity to engage with politicians was taken up.



In Australia imported structural steel has grown to around 90% of major project market and is growing at 20% per annum.

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The ASI launched a public awareness campaign and local content rallies were held in various centres to bring the message home.

The ASI reviewed the various policies in place in the industry since these policies were not working for steel and were not delivering desperately needed demand. These included BAHA, AIPP (Australian Industry Participation Plans), EPBS, Tariff Concession Orders, Steel Advocate, ICN, FIRB, Anti Dumping, Steel Industry Innovation Council and State Local Content Policies.

A re-appraisal of the World Trade Organisation (WTO) guidelines was made to push the envelope in line with what other countries are doing. A Major Projects Industry Participation Scheme was developed to become an integral part of the AIP approval process and a proposal was made to give this equal standing to Environmental Approval and Indigenous / LR Approval. The latter scheme relates to South African BBBEE requirements.

Don McDonald.

ITEM	AUSTRALIA	SOUTH AFRICA	NOTES
Jobs created per 1000 tons of fabricated steel	50	100	More labour intensive (jobs lost on imports)
Economic activity from $1bn of structural steel	1 699 500	1 430 000	
Taxes collected on $1bn	330 000	390 000	
Community and social services benefits ($1bn)	95 000	143 000	

Table 1.

They publicised information on the 'multiplier' effect on job creation, economic activity generated and taxes earned from local content. Their numbers relate closely to the equivalent South African numbers. *(See Table 1)*

It is clear that many aspects of the Australian situation is reflected in South Africa and that all efforts must be made immediately to encourage the growing awareness of the importance of specifying South African local content.

The concept of 'designating' certain products and industries, i.e. instructing state owned enterprises and institutions to buy local is a powerful device to assist the creation of jobs for South Africa. This drive must be extended to all other South African buyers for the mining, petrochemical and energy sectors.

A further important action is to preserve existing jobs by avoiding importing any requirements that can be made here!

DON MCDONALD

Chief Executive, Australian Steel Institute, Australia

Don McDonald has held the position of Chief Executive of the Australian Steel Institute, the peak industry body for steel in Australia, and its predecessor the Australian Institute of Steel Construction, for 14 years. His career spans 38 years and comprises 18 years in the steel industry, and 20 years in engineering and construction with a substantial involvement in steel design and construction. Don holds an MBA, degree in civil engineering and post graduate qualifications in structural and municipal engineering.

Prior to his appointment in 1998 with the AISC, Don was employed with BHP Steel for four years as Market Development Manager – Engineering and Construction. Before joining BHP, he held senior positions with leading companies where he participated in the successful implementation of a number of very large and complex projects in resources, heavy engineering and building construction. He worked for multi-national engineering firms Fluor Corporation and Jaakko Poyry and major contractors John Holland and Concrete Constructions.

Don is a director of ASI (Australian Steel Institute), BPIC (Building Products Innovation Council), ACRS (Australian Certification Authority for Reinforcing and Structural Steels) and NASH (National Association of Steel-Framed Housing), and he is a member of two bodies set up by the Federal Industry Minister: the Steel Industry Innovation Council and the Resource Sector Supply Advisory Forum.

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Amanuel Gebremeskel.

THE ENGINEER AND THE FUTURE

By Amanuel Gebremeskel,
Development Engineer, SAISC

The speakers at the engineering sessions see a future of design and construction that is defined by advances in research and standardisation. They say that the ultimate goal is to achieve sustainable societies, economies and natural environments. While research and development efforts generate the sustainable solutions, standardisation makes them accessible to designers and contractors who apply them to real projects.

The one concept that is ubiquitous at nearly every forum on the future is sustainability. It is a broad concept that circumscribes how we should utilise our social, economic and natural resources in such a way that we can 'satisfy our own needs without compromising the ability of future generations to meet theirs'. That's the message Reidar Bjorhovde, one of the fathers of modern structural steel engineering in the US, and a speaker at the SAISC SteelFuture Conference, hopes to convey to the world.

First and foremost sustainability is about keeping us and our children safe from immediate dangers that arise from natural or human-made disasters. These can range from earthquakes to arson and can cause tremendous damage to society. Sustainability is also about choosing materials that are economically accessible and flexible to work with. Moreover we must be able to pass these materials and technologies on to future generations without degrading their usefulness. Finally sustainability requires that our immediate social well being, and our use of materials and technology, not compromise the most important public good that we have; the natural environment.

Therefore a great deal of research is required to come up with solutions that can satisfy our sustainability needs. And whenever we achieve such solutions we need to standardise them so that they are widely accessible. Ongoing efforts in both of these arenas fall squarely on the shoulders of the best and brightest engineers around the world.

ON RESEARCH

We now know that Charles Clifton's research efforts at the University of Auckland in New Zealand, to make buildings safer from the effects of fire, are bearing fruit. Not only is building behaviour under fire better understood but protection is now much more economical. He says that the new 'slab panel method' allows structural steel buildings to be designed and built without the need for wasteful passive fire protection on secondary steel beams. Such floors achieve fire resistance by turning the slab from a one-way system into a two-way slab during a fire. Moreover significant developments have been made, and New Zealand is now leading in the use of radiation shielding to protect structural steel in buildings. It is possible to protect structures by blocking troublesome infrared photons very cost effectively.

Moreover according to Bjorhovde, research in the production of steel is now focused on achieving ever higher strengths and elevating the performance of the material by making it more weldable (lower carbon content) and tougher (more ductile through continuous casting and smaller crystalline structure). 650 MPa high yield strength plates are presently available for high-rise columns and special connections but it is also fascinating to hear about the need for low strength (150 MPa), high ductility steel for use in energy dissipating fuses of earthquake resistant applications.

The fact that modern metallurgy allows for steel to be recycled in electric arc furnaces minimises iron ore mining activities and avoids the use of energy consuming and polluting processes such as the blast furnace. Colin Hautz from ArcelorMittal Europe says that steel makers are actually going the extra mile and reducing the impact on the climate not only at the production phase but also by researching and developing building sub-systems that will help to satisfy stringent future requirements – such as that of the EU to have homes that are energy positive by 2020.

All of these research efforts can help to make the world a safer place while lowering costs and reducing the impact on the natural environment; all primary

The Milwaukee Art Museum by Santiago Calatrava illustrates that design codes are a necessity for the highly complex construction market.

concerns of sustainability. Thus much of Bjorhovde's and Clifton's work also involves taking the more promising results of such research and collating them into standards in order to make them accessible to design engineers. For without the application of research results in real projects it is practically impossible to satisfy our sustainability needs.

ON STANDARDS

Standards are vessels of knowledge about materials and the ways of engineering them into useful products. They aggregate and turn complex data into accessible and rational methods of design and construction. When they relate to safety critical materials such as structural steel they are also commonly incorporated into laws and regulations as minimum requirements for what is deemed to satisfy jurisdictional requirements. Beyond hosting knowledge and acting as legal benchmarks, renewed focus on sustainability has forced standards to facilitate quick standardisation of new innovations without lowering overall performance.

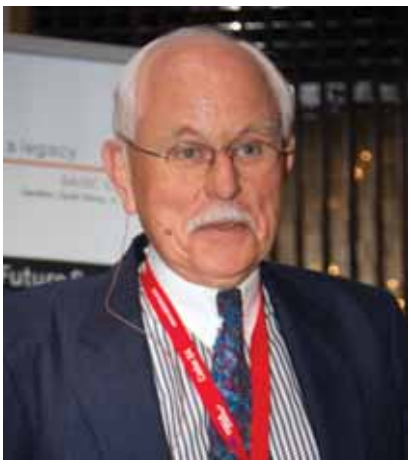
Therefore when Clifton sought to standardise novel fire related design approaches for New Zealand, he used as his basis the Eurocode documents which include a comprehensive approach for how to accomplish such standardisation. According to Roger Pope, who works with the British Constructional Steelwork Association, this makes the Eurocode set of standards unique in how broad, deep and harmonised they are. Richard Liew, who is a professor at the National University of Singapore, supports this contention and says that Singapore has given itself only two years to transition in full from an older standard that was based on British standards to the Eurocodes for structural design and construction.

Despite the UK having adopted the Eurocode, Pope revealed that only a fifth of British engineers actually use the standard because it is too complex for everyday use. This explains why many British practitioners and academics are now exerting significant efforts to simplify Eurocode requirements using design guides and software. In contrast, Bjorhovde and Ed Whalen, President of the Canadian Institute of Steel Construction, say that North American standards are far more concerned with serving practitioners than researchers, software developers and innovators. Not unlike those of New Zealand, researchers and software developers in North America use Eurocode standards when they find it necessary but standard writers there have avoided burdening design engineers with its complexity.

This leaves many countries that lack sufficient resources to develop their own standards with two competing standard development methodologies to choose from. South Africa for instance is in the process of deciding whether to adopt the North American or European approach for standards relating to the design of steel structures. Participants of the SteelFuture conference asked the guest speakers to comment on this matter.

Prof Charles Clifton, Associate Professor of Civil Engineering, University of Auckland, New Zealand.

Ed Whalen, President of the Canadian Institute of Steel Construction, Canada.



Prof Reidar Bjorhovde, President, The Bjorhovde Group, USA.

Dr Roger Pope, Specialist Technical Consultant, BCSA & Tata Steel Europe, United Kingdom.

The responses surprised many. Without exception the speakers think that requiring Eurocode compliance in South Africa would impose considerable burden on designers without the commensurate benefits.

From the ensuing discussions it is possible to conclude that the vast majority of structures in South Africa are designed and built using standard methods and technologies. Therefore the savings that can be derived from using the Eurocode are limited. In fact there are concerns about how much resource South Africa can practically devote towards the development of design aids, software and human capital that has the requisite advanced engineering competence to absorb the Eurocode in the near future.

80 Queen Street in Auckland New Zealand is an example for the 'slab panel method' a new development on the fire protection of steel that allows structural steel buildings to be designed and built without the need for wasteful passive fire protection on secondary steel beams.

As the debates intensified at the engineering session of the conference, important comments in support of South Africa adopting the European steel standards were made. For instance, if South African firms wish to provide services to European, or any other customers that require compliance with the Eurocode then adopting other standards could disadvantage South Africans. However counterpoints were also made about how South Africans who wish to pursue work in Eurocode oriented markets can learn the Eurocode irrespective of the standard that is adopted in South Africa.

The reality for most countries, Bjorhovde points out, remains the adoption of a mixed approach. The Indians, Chinese and various other Asian and Latin American countries have done exactly that. Most African and Middle-Eastern countries are yet to adopt an approach. According to his global survey no single standard today is comprehensive enough to encompass all elements of design and construction. It so happens that the Europeans and North Americans frequently use each other's standards. For instance while American standards are better developed for seismic design, European standards are commonly referenced in relation to fire design.

It may make sense for South Africa to evaluate its choices on a case by case basis. For instance as things stand the loading code SANS 10160 is based on the European EN1991 whereas the steel design standard SANS 10162-1 is based on Canadian CSA S16. Taken at face value this appears inconsistent. However when considering how much more accessible S16 is at this time as compared to its European counterpart EN1993, working to harmonise the European loading approach with the Canadian steel standard may end up consuming less resource than simplifying EN1993 for South African everyday use.

ON MESSAGE

The speakers at the engineering sessions see a future of design and construction that is defined by advances in research and standardisation. They say that the ultimate goal is to achieve sustainable societies, economies and natural environments. While research and development efforts generate the sustainable solutions, standardisation makes them accessible to designers and contractors who apply them to real projects.

In order to make their message more tangible the speakers point to real advances in steel framed systems, metallurgy and steel production at the mills. Moreover they use the example of a standardisation development effort in New Zealand to illustrate modern standardisation techniques. Easy-to-use fire design standards are being incorporated into the New Zealand national standard based on tools that are found in the Eurocode.

As South Africa attempts to expand its industrial base and promote exports into a fast growing and urbanising Africa, the lessons are invaluable. Sitting in one room listening to, and interacting with, speakers of this calibre – and on such pertinent issues – is a rare event. We hope that South African researchers, standards developers, design engineers and contractors have taken good notes - we'll need them to frame our future.

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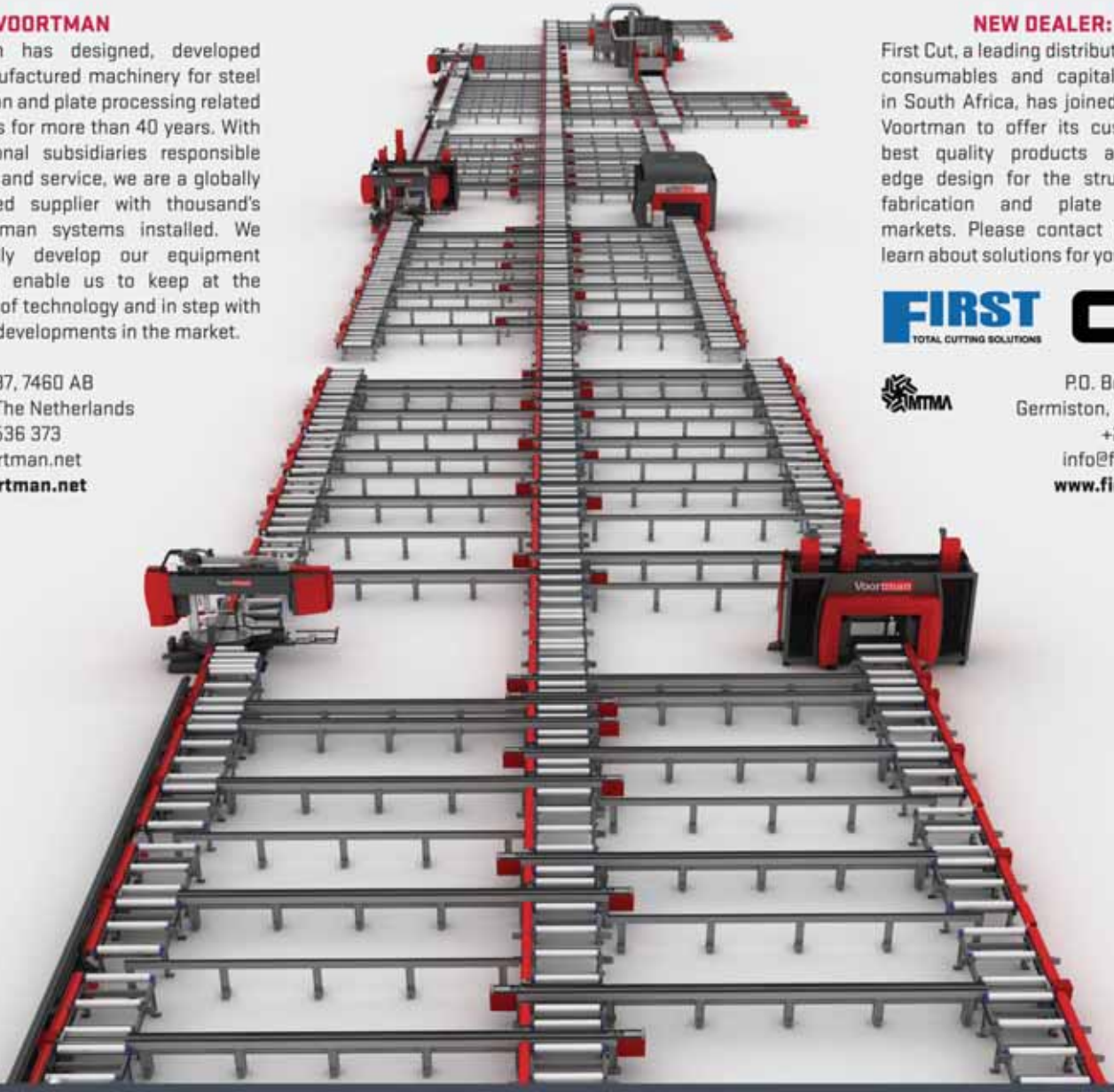

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THE ISCG MEETS IN SOUTH AFRICA

By Dr Hennie de Clercq,
Chief Executive Officer, SAISC

Those who attended SteelFuture will not be surprised to hear that discussions about how to protect one's market from cheap imports formed part of the ISCG agenda too. The meeting's first resolution was to undertake a high-level benchmarking exercise to determine how steelwork costs stack up not only in the ISCG countries, but also in others.

Alistair Fussell presenting during one of the ISCG working sessions.

SteelFuture, as a conference, was an event aimed at gathering and disseminating information, and also at influencing the environment within which the steel construction industry operates. But it was not a "let's take action" type of event with tasks dished out at the end, deadlines for action, etc. Such work was left for a three day meeting of the ISCG that happened in Cape Town immediately following SteelFuture.

The ISCG (International Steelwork Contractors Group) is a loose association of the institutes of steel construction of Canada, the US, the UK, Australia, New Zealand and South Africa. The group has now met, on a bi-annual basis, in each of the member countries over the past 10 years. Its purpose is to share information, learn (and borrow) from each other, and tackle issues jointly. Its power lies largely in the friendship and trust that has developed among the members over the years.

During SteelFuture much was said about BIM (Building Information Modelling). It is a very advanced tool (or set of tools) based on a 3D model of a building as a whole, incorporating detailed information on every aspect of the building and enabling the use of this body of information for fabrication and construction, and for managing the entire construction process. BIM is great for steel, precisely because steel construction involves so much information that has to be created, communicated and used. But a powerful tool also has the power to change relationships between the parties to a construction project, and various people have started exploiting it for their own purposes, sometimes to the detriment of others like the steelwork contractor. As might

The ISCG group representing the institutes of steel construction of the USA, UK, Canada, Australia, New Zealand and South Africa.

REVIEWS

Dinner at Groot Constantia.

be expected, the people most concerned about changing legal relationships and possible litigation are the Americans, and the AISC has done sterling work in developing a best practice standard on BIM. Some work has also been done in the UK on the subject. The existing documents will be studied by all, and a survey will be done among all ISCG countries to determine what further work is required.

Those who attended SteelFuture will not be surprised to hear that discussions about how to protect one's market from cheap imports formed part of the ISCG agenda too. The countries in the Southern Hemisphere are particularly concerned about imports from China. The meeting's first resolution was to undertake a high-level benchmarking exercise to determine how steelwork costs stack up not only in the ISCG countries, but also in others. To be discovered is how the various costs for steelwork compare: steel, consumables, painting, electricity, transport, detailing, erection, etc. Secondly, the study should assess such factors as workshop and site productivity. Another factor to be analysed is overheads (much lower in China than in other countries) and the value clients derive from steelwork contractor overheads, mostly in the form of fabrication-for-erection, but also from value added in other ways. The meeting felt that we can only speak knowledgeably to governments and clients if we have a solid information base.

A whole session was dedicated to discussing the longer-term future of the steel construction industry. The discussions were very interesting and animated and brought one under the impression of how well developed the industry is and how phenomenal a material steel is. In some ways, however, it failed to get to grips with profound issues. "Launch a marketing

campaign to demonstrate to everybody how innovative we already are" was a remark that summarised the tone of much of the discussion. Many suggestions to improve things niggling the industry were made. Yet, one did not come away from the meeting feeling that this group of people have a keen grasp of how things will change in the longer term and have a plan for steering the industry towards some desirable vision. Considering how unpredictable the world has become, this should not be surprising.

No meeting of institutes of steel construction can happen these days without a good discussion of sustainability. It seems that even in developed countries the debate about how to assess the environmental sustainability of a product or process is still raging, with the various industries having a stake in each clamouring for measures that will make theirs look good. The concept of taking what will happen at the end of the life of any facility into account has been accepted in Europe, pushed by the metals industries and fought by those products that don't normally get recycled. In America, however, it has not been accepted.

Words are important in such an environment, and delegates were urged to use the term "thermal capacity of the building", rather than "thermal mass of the structure", since the mass of the structure does not necessarily give any useful indication of a building's thermal inertia. Another term to use and promote is "responsible procurement" which requires taking all aspects of sustainability into account and encompasses issues like local procurement. The meeting is also searching for a catch phrase that can be used internationally to convey steel's sustainability credentials. The SAISC's entry for such a phrase is the by-line for SteelFuture and the Institute: 'steel leaves a legacy'.

The practicalities of safety regulations were also discussed. In several countries the requirements relating to welding fumes are now so strict that a welder is forced to use an expensive and unwieldy respirator. Welders hate these contraptions, which don't promote good welding, but discussions with welding consumables manufacturers have not yet led to alternative solutions. It remains good practice to perform lung function tests on welders when they are appointed and regularly thereafter.

A subject on which there is much for steel institutes to learn from each other is that of electronic communications. An institute of steel construction is basically in the communications business: websites, newsletters, journals, press releases, appearing on the electronic and paper media, emails, Twitter, Facebook,

Spouses and partners were sightseeing while the group was hard at work: Here at J.C. Le Roux for a 'sparkling wine' and nougat tasting.

courses, meetings – every conceivable way of communicating. The associations in the large and wealthy countries have had the resources over the years to become very effective in using electronic media, and there is a lot we can learn from them. An interesting development in this regard is that the Americans have shifted their entire short courses programme to an electronic format. The SAISC will have to give consideration to this soon.

Another interesting session was dedicated to seeing where each association gets its funding from. About the only conclusion one could derive from this was that there is huge variability. For some, such as the SAISC, book sales are quite important, while others sell almost no books at all. The SAISC seemed to be the most 'commercial' one of the bodies, gaining considerable income from advertising, sponsorships, etc.

Edwin Basson, Director General of worldsteel, spent the whole Saturday morning with the ISCG and the discussions with him were very illuminating. At the end it was decided that worldsteel and the ISCG will seek to collaborate on future programmes to promote the use of steel in construction.

At the conclusion of the meeting all the delegates expressed the opinion that the meeting was very worthwhile and also very enjoyable and that the group must continue meeting in future. There is surely enough work to do following this one!

The ISCG meeting was concluded with dinner at Harbour House in False Bay.

















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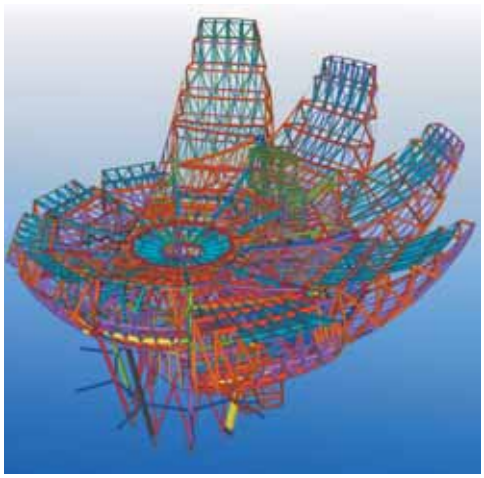

ArtScience Museum, Singapore. Copyright © 2012 Tekla Corporation.

John Swallow of Cadex SA opening the SteelFuture Conference.

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Cadex SA arranges in-house and on-site skill-up training, assisting users to expand their knowledge and skills. These sessions deal with anything from innovative approaches to difficult or complex structures to simple productivity skills and to learning new features in new releases.

Product version updates

Tekla develops improving software year after year making users more and more productive. Tekla Structures product version updates are available to users with current Software Maintenance Agreements without additional charges.

Additional services

Cadex SA maintains the Tekla Structures local environment. This includes up-to-date catalogues of steel profiles, bolts, steel and concrete grades as well as standard connections from the SAISC Red Book. Customers, with current maintenance agreements, are thus ensured of operating at the cutting edge.

Visit www.tekla.com for details about more configurations and tools.

WWW.VITAGRID.COM

VITAL ENGINEERING (PTY) LTD

CONFERENCE LUNCH (DAY 1) SPONSOR

PROVIDING A FIRM FOOTING IN THE STEEL INDUSTRY

Vital Engineering has established a reputation as the leading manufacturer of steel and fibreglass gratings, stair treads, safety handrails and steel expanded metals for a variety of industries including steel, mining, petrochemical and power generation.

The company, which was established almost three-quarters of a century ago, believes that the key to the success of its products lies not only in their focus on quality but also on tailoring complete systems to cater to customer requirements and needs.

Only the highest-grade steel is utilised in the manufacture of Vital Engineering's product range which is designed to comply with the most stringent OHS regulations. Vitagrid, Vitex and Maclock brands have become synonymous with versatility, quality and service, and are used in a number of projects, in various industries, throughout Southern Africa.

The recently released Econotread stair tread offers a significant reduction in cost and mass of materials used combined with a 35% improvement in its load ability when compared to traditional branded stair treads. Another new product is the Vitaclip stainless steel fixing clip, which forms part of the Vitaglass range of products, providing industry with a flush walking surface.

As an internationally ENISO 9000 design rated and certificated South African manufacturer, Vital Engineering's clients and specifiers can rest assured that the company has taken every possible care in the design, performance and development of its products to ensure accuracy and safety.

Vital Engineering reviews all opportunities to expand its footprint into other countries. The company regularly adds new products to its market offering, ensuring that the quality and application needs of clients are anticipated and met.

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MITEK INDUSTRIES SOUTH AFRICA (PTY) LTD

LIGHT STEEL FRAME SESSIONS SPONSOR

Exhibitor - Stand 18

The more recent addition of the Ultra-Span lightweight steel roof truss as well as steel wall framing, now offers South Africans remarkable versatility in the search for affordable roofing and walling solutions.

MiTek Industries South Africa (Pty) Ltd is a full systems supplier to the prefabricated timber and steel roof truss industry. The company is a division of the USA based international MiTek group, which is owned by the legendary investor Warren Buffet.

For over forty years the vast majority of South African roofs have used the tried and tested system of prefabricated timber roof trusses, manufactured with the renowned MiTek M20 nail plate connectors.

The more recent addition of the Ultra-Span lightweight steel roof truss as well as steel wall framing, now offers South Africans remarkable versatility in the search for affordable roofing and walling solutions.

Purposely designed with less steel per metre than any other system, the Ultra-Span truss shape is fabricated with only three components (chords, webs and single size connector). This simple engineering system allows the fabricator to utilise the MiTek 20/20 software suite to lay out, engineer, cut and estimate every type of truss from simple common truss shapes to complicated long clear span trusses.

As per the design the Ultra-Span truss system shape sits flat in the jigging fixture with all of the connection surfaces easily accessible and flush for a quality screwed connection every time. The system also features same gauge connectors for faster screw throughput, same gauge top and bottom chord designs to minimise cutting and handling, and a true truss shape every time including scissor trusses and tray ceilings with no job site modifications.

MiTek offers the combined expertise of Gang-Nail, Hydro-Nail, eCo fasteners, and the lightweight steel Ultra-Span roof truss system, as well as the very best software design, detail and costing packages available, providing the most comprehensive suite of programs available internationally. All products and materials used in the construction of either timber or steel MiTek roof truss systems comply with all the relevant local codes of practice and the relevant international recommendations.

A network of over 170 licensed timber and steel roof truss fabricators and over 800 hardware and DIY outlets supplying eCo builder's products throughout Southern Africa, bring Medoc quality and technology to your doorstep, providing you with international levels of service and expertise locally, offering and maintaining a sustainable, competitive advantage.

MiTek Industries South Africa (Pty) Ltd is the proud recipient of Dekra international's ISO 9001:2000 quality management certification, all of which gives international recognition to MiTek's commitment to excellence.

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Light-steel frame structures on the increase

The low mass of light-gauge steel (LGS), the possibility of steel to be fully recycled and a relatively stable steel price have ensured a steady increase in demand and specification of light-steel frame structures in all market segments. MiTek offers a wide range of Ultra-span and steel wallframing system applications that can be used in a variety of projects.

EXAMPLES ILLUSTRATING THE SCOPE OF APPLICATION

LOW-COST PROJECTS:

Using the Ultra-Span roofing system will result in a reduction in the amount of trusses needed on a project, due to the larger truss spacings of 1.1m to 1.2m. This also saves time in the erection of the structure due to fewer and lighter trusses (about 14kg/truss or 4kg/m2 roof area) having to be handled and positioned. An additional benefit is that there is no wastage of any materials, thereby leaving the site clean after completion of work. This product is ideal for all tiled or sheeting roof structure applications and can even contribute towards site employment.

COMMERCIAL PROJECTS:

As required for commercial projects MiTek's Ultra-Span system allows for large clear-span capabilities of 40m and this combined with a low mass of 6kg to 10kg per square meter of structure. This enables the end-user to erect the structure in less time by lifting complete roof sections. The versatility of Ultra-Span allows it to be applied to almost all roof shapes, making this an ideal product for all tiled and sheeted roof structures with a low pitch.

DOUBLE STOREY / INFILL PANELS:

MiTek's LGS wall-framing systems is ideal for double-storey applications due to the low mass of the walling, resulting in about 4,9kg per square meter of wall. It can also be used in mezzanine floors in offices or warehouses. The flexibility of the product even allows for it to be simply used as infill panels to replace conventional walling. A low self-weight of the structure for reduced load on foundations, the speed of installation and no site wastage are just some of the advantages one can rely on when using this product.

COMPLETE HOUSE:

LGS wall framing can be used in complete building projects where frame construction or modular wall-panel systems are being applied. When choosing a LGS wall-framing system, one can expect the project to be completed faster due to quicker assembly and installation times. The dimensional accuracy of the building is substantially improved, thereby improving the look of all other finishes.

MiTek®

MiTek Industries South Africa (Pty) Ltd

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AVENG TRIDENT STEEL (PTY) LTD

CONFERENCE BAG SPONSOR

Exhibitor - Stand 7 & 8

With the company's sights set to expand and grow, Aveng Trident Steel is technologically sound and strategically poised to evolve and progress in an ever changing global market.

Aveng Trident Steel is an AVENG Group company with our main operation centrally situated in Roodekop, Germiston with additional facilities in Alrode, Durban, Port Elizabeth, Rosslyn and Cape Town. We supply a wide product range to the steel industry in South Africa as well as internationally from our modern, comprehensive processing and service centres as well as our extensive steel yards. Our vision is to be the leading steel distributor and processor in Sub-Saharan Africa offering a 'one-stop' service to the entire spectrum of steel consumers.

Aveng Trident Steel's Merchanting Division stocks a vast range of structural steel sections, plate and sheet products in a wide range of sizes. In addition to our main facility in Germiston, our branches around the country assist in Aveng Trident's objective of delivering confirmed orders between 24 to 48 hours.

Cutting Division: As a comprehensive service centre we offer plate and sheet cut to size including sections cut to length. The processes offered for plate cutting, are by means of our state-of-the-art, fully computerised, high definition plasma, laser and normal gas-cutting equipment. Further options include guillotining, chamfering, bending and hard marking.

Aveng Trident Speciality Steel, a division of Aveng Trident Steel, is ISO listed stocking a comprehensive range of carbon, alloy and spring steels. As an additional service we offer automated band-sawing, cropping to length including de-coiling of round bar. Other services include ultrasonic, hardness and spectographic testing as well as heat treatment.

Aveng Trident Sterling Tube is a division of Aveng Trident Steel situated in Alrode. We manufacture and stock welded tube from 15mm through to 177mm diameter together with an extensive range of square and rectangular sections.

Our Coil Processing Division is one of the largest and most varied in the world. Our world class equipment enables us to supply almost any customer requirement and can process the most demanding specialised qualities and non-standard sizes.

Press and tool cutting: By stocking a wide range of products, both local and imported steels, together with our sophisticated processing plant, we are able to maintain our position as a leading supplier. The Coil Processing Division is an ISO9001:2000 and ISO/TS16949:2002 quality-approved supplier.

We are focused to stay abreast of market trends and customer requirements. We are driven to invest in continuous improvement, playing an active role in the following industries: mining, building, packaging, structural components, roofing, agricultural, automotive and appliances.

With the company's sights set to expand and grow, Aveng Trident Steel is technologically sound and strategically poised to evolve and progress in an ever changing global market.

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AVENG
TRIDENT STEEL

Aveng Trident Steel is situated in Roodekop, Germiston with additional facilities in Alrode, Durban, Port Elizabeth, Rosslyn and Cape Town.

We supply a wide product range to the steel industry in South Africa as well as Sub-Saharan Africa from our extensive steel yards, modern and comprehensive steel processing and steel service centres, speciality steel division and tube manufacturing plant.

We offer our customers a quality product, delivered on time at a competitive price.

Our growth is guaranteed by the contribution we make to the success of our customers.

Aveng Trident Steel (Pty) Ltd
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PEDDINGHAUS CORPORATION

CONFERENCE COCKTAILS SPONSOR & SPONSOR YOUR CUSTOMER

Exhibitor - Stand 11

For decades, Peddinghaus has shown support to the African steel fabrication industry. In 2012, Peddinghaus made the necessary steps to establish Peddinghaus Corporation South Africa (PCSA). As the only structural machine tool provider to open an office in the region, Peddinghaus has illustrated their dedication to the African marketplace.

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GPS: 41.145641, -87.862892 41.145641 -87.862892 N41° 8.7385', W087° 51.7735'

Established in 1903 in Gevelsberg, Germany by Paul F. Peddinghaus, Peddinghaus Corporation has remained the industry leader in steel fabrication equipment for over 109 years.

Headquartered in Bradley, Illinois in the USA, Peddinghaus has evolved into a globally respected company that is currently under its fourth generation of family management. From the beginning, Peddinghaus Corporation established itself as a company based on quality in all aspects of operation.

Renowned for superior craftsmanship and design, Peddinghaus machines are recognised throughout the world for their power, speed, and durability. By maintaining a team of engineers solely for the research and development of structural equipment, Peddinghaus continues to redefine industry standards for efficiency, and cost reduction in all areas of structural steel fabrication.

For decades, Peddinghaus has shown support to the African steel fabrication industry. In 2012, Peddinghaus made the necessary steps to establish Peddinghaus Corporation South Africa (PCSA). As the only structural machine tool provider to open an office in the region, Peddinghaus has illustrated their dedication to the African marketplace. With numerous customers located throughout the continent, PCSA is taking the proper steps to ensure the customers of African Sub-Sahara and South Africa receive the timely service and support expected.

Peddinghaus' mission is to ensure 100% customer satisfaction; this is achieved by maintaining the largest staff of field service technicians and customer support in the industry. Although Peddinghaus offers the 24 hour service and support centre, not all issues can be resolved via webcam or phone call. PCSA employs service staff located in South Africa along with stock of local spare parts. Providing the ability to pay with local currency, PCSA eliminates time and headaches caused by customs and currency conversions. Quality service, replacement parts, and helpful support are readily available when any Peddinghaus customer in Africa requires assistance.

Peddinghaus product lines include:

- Drill lines
- Plate processors
- Angle/detail machines
- Thermal cutting/coping
- Automated layout marking
- Band saws
- Ironworkers
- Raptor 3D CAD/CAM software

With manufacturing facilities located in five different countries and sales and service staff throughout the globe, Peddinghaus' innovative designs and investment in cutting edge technology will continue to grow with the ever changing structural steel industry both within and outside of South Africa.

Peddinghaus

steel
SOUTHERN AFRICAN INSTITUTE OF STEEL CONSTRUCTION

The Betterect Management Team:
Martin Zechner/Nicolette Skjoldhammer/David Jordan

BETTERECT - JOHANNESBURG, SOUTH AFRICA

BETTER THAN EVER

Facing the very same challenges as many other fabricators, Betterect found themselves searching for ways to enhance quality, reduce process time, and minimize their reliance on difficult to locate skilled labor. This required a leap of faith from traditional manual methods to automated processes.

"To date our Peddinghaus machines have significantly reduced production turnaround times and have enabled us to fabricate larger tonnages than before. The equipment has definitely given us a competitive edge in the structural steel arena and has allowed us to take on more jobs in this line of work."

-Martin Zechner
Founder/Managing Director

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Exhibitor - Stand 1 & 14

Macsteel's recent capital expenditure of more than R880 million on additional warehousing and best in practice plant and equipment bears testimony to their unwavering confidence in the future of the steel industry in South Africa and Africa as a whole.

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The elliptical shaped nine-storey Mauritius Commercial Bank building consists of curved asymmetric cellular beams with three different radii.

OPTIMISING THE VALUE IN THE STEEL SUPPLY CHAIN TO UNSURPASSED LEVELS OF EXCELLENCE

With a proud history spanning more than 100 years and operating in 28 countries globally from more than 96 sites, the Macsteel Group has expanded and developed into one of the world's leading independent steel service centres, incorporating extensive metals trading activities and shipping capabilities.

Consisting of 10 dynamic Business Units and operating from a network of 79 service centres, branches and warehouses, MSCSA supplies the entire Sub-Saharan geographic region with the full range of carbon steel, special steel, stainless steel, aluminium products and value added steel processes to all sectors of industry.

Macsteel's branch network is strategically situated in close proximity to its target markets offering reliable, on-time service to its valued customers enabling them to operate more cost effectively whilst reducing their own inventories.

Macsteel Service Centres SA's vast stockholding, comprehensive product range and superb infrastructure combined with its technical competencies and continuous improvement initiatives, enhances its status as the pre-eminent supplier of steel products and value added steel processes.

Macsteel Service Centres SA is particularly proud of its more than 5 300 employees, whose efforts, commitment, ethics and passion further contribute to the company's enviable reputation.

Macsteel's recent capital expenditure of more than R880 million on additional warehousing and best in practice plant and equipment bears testimony to their unwavering confidence in the future of the steel industry in South Africa and Africa as a whole.

MACSTEEL TRADING CELLULAR BEAMS

Macsteel Trading Cellular Beams continues to grow from strength to strength, with projects ranging from commercial and architectural to industrial and mining structures. Efforts to expand the product throughout the African and Indian Ocean Islands are ongoing and the latest to the impressive project portfolio is the unique Mauritius Commercial Bank building.

This elliptical shaped nine-storey building consists of curved asymmetric cellular beams with three different radii. Cellular beams proved to be the most efficient solution for both the design and construction challenges; creating this unique looking structure which quickly became a new landmark.

Other, more recent, cellular beam projects of note in Africa include:

- Kisimu Airport – Kenya
- Vilanculos Airport – Mozambique
- Livingstone Airport – Zambia
- Ongwediva Fresh Produce Market – Namibia
- Rundu Fresh Produce Market – Namibia
- Kenmare Moma Expansion Project – Zambia

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ARCELORMITTAL SA

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Exhibitor - Stand 6

Steel is one of the most recycled materials in the world and ArcelorMittal is the biggest recycler of scrap steel globally, which cuts down on around 36 million tons of carbon dioxide.

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Chromadek® is now Heat Reflective

Two of the colours of the Chromadek® range Charcoal Grey and Dark Dolphin, are produced by utilising an advanced thermal technology paint system. This advanced paint system incorporates a heat reflective pigment into the paint providing up to 8°C cooling and improved durability. The durability of an exterior coating is measured according to its capability of maintaining gloss, colour and film integrity.

Heat reflective Chromadek® offers the following benefits:

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ArcelorMittal's products are branded and/or marked for your protection

We pride ourselves in our brands, trademarks and logos which stand for sustainability, quality and leadership. This is why we ensure that, where applicable, we brand/mark our products with our logos and product information. This guarantees you that the products are from ArcelorMittal and of the highest quality. It is very important to know what you are buying as the quality of the material you use is pivotal to the sustainability and quality of your projects, regardless the size.

Steel is infinitely recyclable

Steel is one of the most recycled materials in the world. ArcelorMittal is the biggest recycler of scrap steel globally, which cuts down on around 36 million tons of carbon dioxide.

One of the most successful projects that we are involved in is Collect-a-Can. Recovery rates of steel cans in South Africa have risen from just 18% to around 70% in the years since the initiative was set up, preventing the cans from being sent to landfills.

ARCELORMITTAL, THE WORLD'S LEADING STEEL PRODUCER

Founded in 1928, ArcelorMittal South Africa is a subsidiary of the world's leading steel and mining company and Africa's largest steel manufacturer. The company operates in 60 countries and employs approximately 260 000 people worldwide. ArcelorMittal South Africa has a capacity of 7.8 million tons of liquid steel per annum with steel manufacturing and chemical plants in Newcastle, Pretoria, Saldanha, Vanderbijlpark and Vereeniging. The company employs approximately 10 000 staff members and contractors across South Africa. ArcelorMittal SA produces carbon steel in both flat and long products which is supplied into all major steel consuming industries and is used extensively in critical infrastructure projects. The company's target market is Sub-Saharan Africa with a specific focus on Southern Africa. Through the ArcelorMittal Group the company has access to extensive global resources including technical and research facilities.

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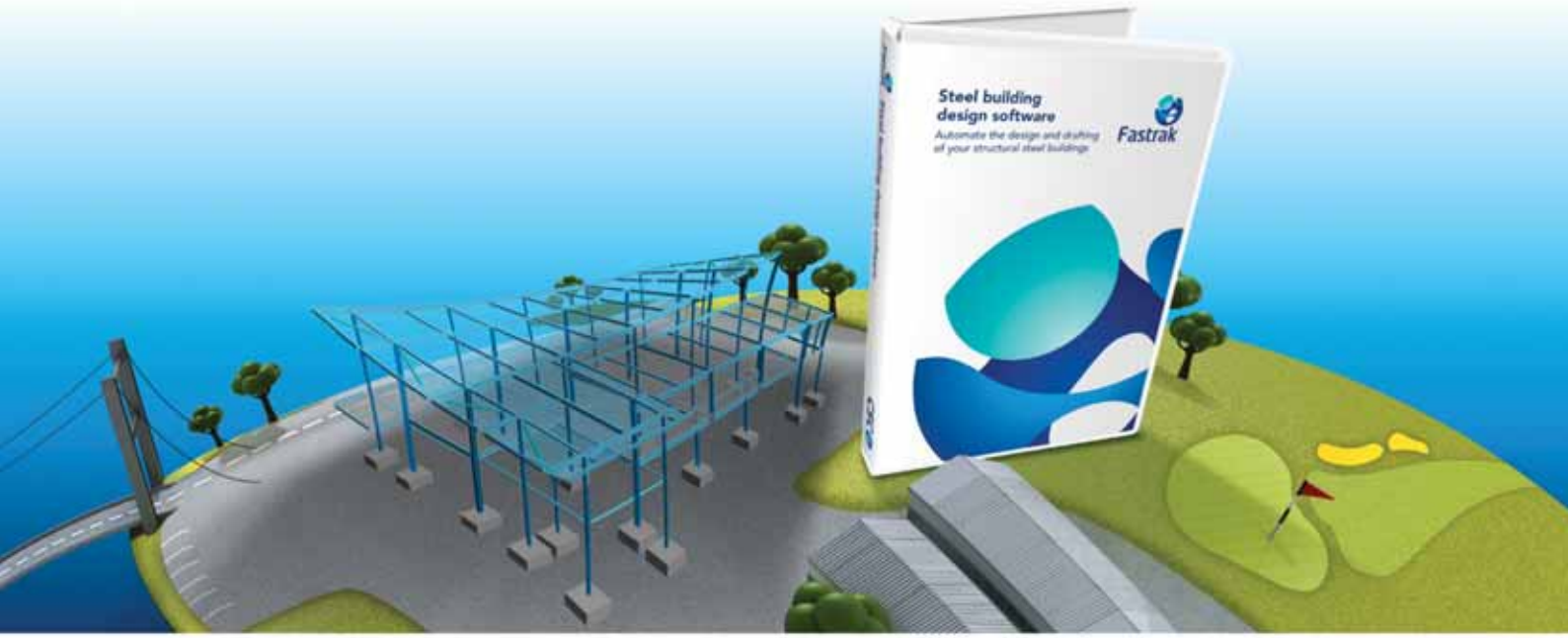

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PHOTO ALBUM

SteelFuture SPEAKERS

LEFT: Spencer Erling and Amanuel Gebremeskel of the SAISC shed some light on the recent developments in using steel in multi-storey construction.

BELOW LEFT: Carl Davies, General Manager, NASH, New Zealand on earthquake testing, a world first for light steel framing.

BELOW RIGHT: Maribeth Rizzuto gave two very informative presentations on cold formed steel framing in the United States.

ABOVE LEFT: Dr Dirk Conradie from the CSIR on the performance of a LSF house in the South African climate.

ABOVE RIGHT: Andrew Etzinger, Senior General Manager, Eskom presented the company's plans for generating and distributing energy for Southern Africa.

BELOW LEFT: David Ratterman gave a fascinating talk after the cocktail function on the rebuild of the World Trade Center site in New York.

BELOW CENTRE: Ken Watson, Executive Director, NASH, Australia on steel frame developments for economy and resilience.

ABOVE RIGHT: Sterik Gerber from Boogertman + Partners talks about the benefits of LSFB using the award winning Deloitte Head Office as a case study.

LEFT: Mushir Khan, Head of Department: Civil & Structural Engineering, TWP Projects, South Africa.

RIGHT: Henk Langenhoven, Chief Economist at SEIFSA gives an overview of the future of South Africa, Africa and the world in terms of the broader economy.

ROGER FERCH

President, American Institute of Steel Construction, USA

I still remember my interview with Bill, the company's president, who became my second mentor and lifelong friend. His simple interview question was "Do you have iron and rust in your blood?" His view was that some of us were destined to be in the steel business, and if you were one of the privileged few, it was not just an interest, but rather an inherent passion.

Roger E. Ferch has been active in the steel construction industry for more than 40 years. He began his career as a Naval Civil Engineer Corps officer then joined the steel construction industry with The Herrick Corporation. His education includes a bachelor's degree in civil engineering from the University of Washington and a Masters in Business Administration from the University of California, Berkeley. He is a licensed civil engineer in California.

The Herrick Corporation in Northern California is the largest structural steel fabricator and erector on the west coast. Ferch joined Herrick in 1974 and supervised various departments during his 30 years with the company. He was promoted to Vice President in 1989 and responsible for managing the Purchasing and Engineering Departments as well as the firm's major projects. Some of the noteworthy buildings he's worked on include the Boeing 777 assembly building, the San Francisco Airport International terminal, and the Frank Gehry designed Walt Disney Concert Hall.

In December 2005 Ferch became President of the American Institute of Steel Construction (AISC). He had previously served on the AISC Board of Directors from 1998 to 2005 and as Vice Chairman of the AISC Specification Committee.

This is his story:

Two thirds of my life has involved the steel construction industry so many of the memories and most of my life story is interwoven between the industry, the challenges I've faced, and the people I've met. The beginning is simple as I needed a job. My girlfriend's father was the president of a Seattle fabricator, and provided me the entry opportunity. I worked my way through college at his firm learning estimating and later project management. While the relationship with his daughter did not last, I look back at Ben as my first mentor and guide into what became a very fulfilling and challenging career path. As the years passed, I frequently would visit Ben to seek his advice and take advantage of his coaching. I should also mention that in addition to running his business, Ben served as a member of the American Institute of Steel Construction's (AISC) Board of Directors.

After college, I fulfilled my military obligation by serving in the United States Navy managing new construction projects first in Alaska and later in California.

Roger and his wife, Nancy during the ISCG meeting in Cape Town.

Roger at SteelFuture giving a talk on some issues around BIM.

The experience was invaluable, and I learned contract management from an owner's perspective. I enjoyed living in northern California near San Francisco and left the navy after three and a half years to return to the steel construction industry with Herrick, a large fabricator and erector in California. I still remember my interview with Bill, the company's president, who became my second mentor and lifelong friend. His simple interview question was "Do you have iron and rust in your blood?" His view was that some of us were destined to be in the steel business, and if you were one of the privileged few, it was not just an interest, but rather an inherent passion. Bill also served on the AISC Board of Directors so the influence to be both an employee in the industry and to serve actively in the association was instilled in me by both of my mentors.

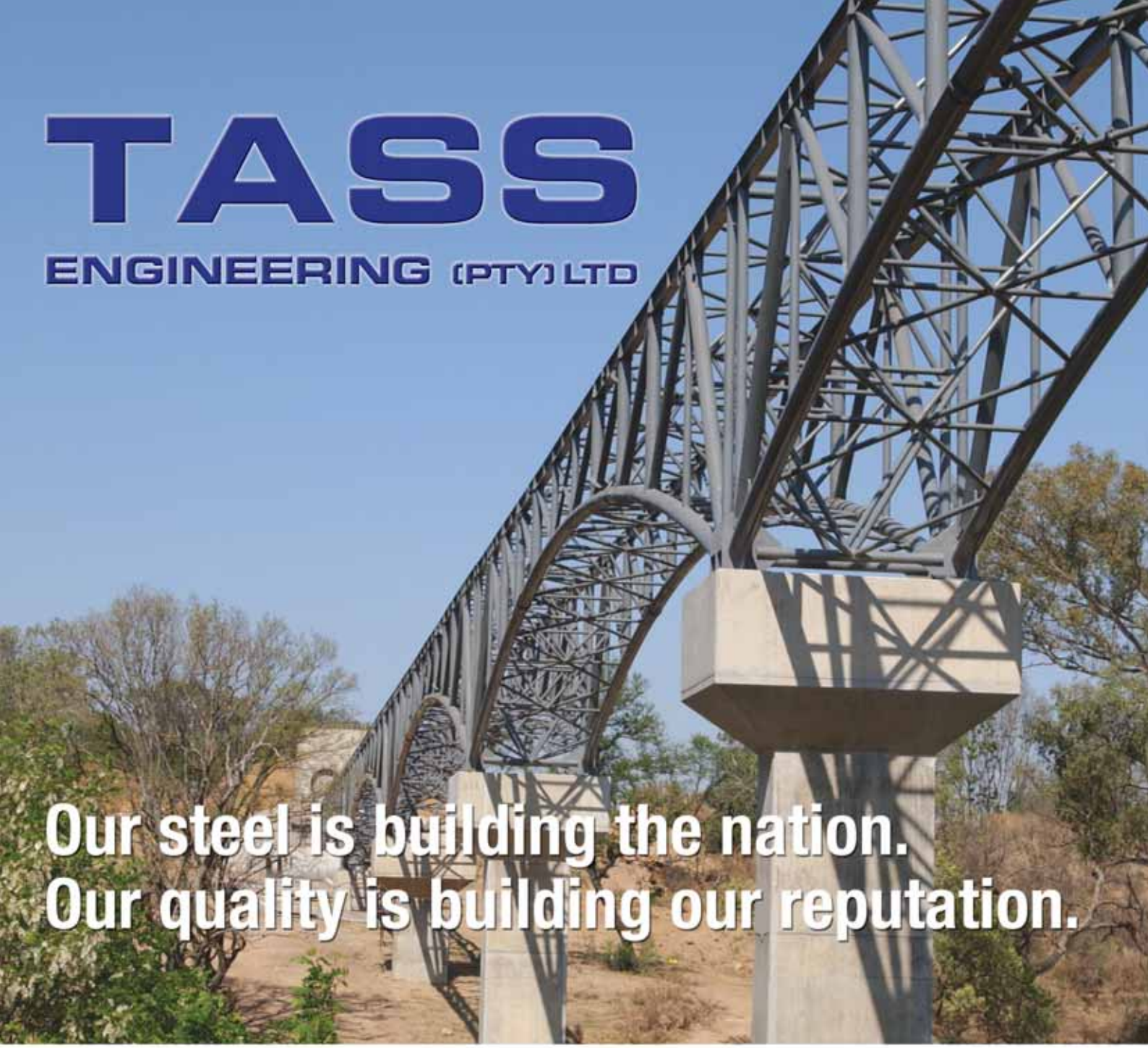
My work at Herrick on the west coast of the United States was varied and challenging. Through my thirty-year career I had positions that included working in the fabrication shop, site engineering for our erection division, estimating, engineering, purchasing, sales, contract management, and executive leadership. While Herrick's projects were located in the United States, we sourced steel globally, and when challenged by offshore fabrication in the 1980s, developed a means to split projects: outsourcing the very labor-intensive work while maintaining the majority of the project for our employees. Later we turned the tide and fabricated a project in California that was constructed in Thailand! I prided myself as a builder and no project was too big or too complex to eventually get built. My projects and memories include many high rise office buildings, hospitals and building a new 250-man fabrication facility being responsible from site selection to completion. There were also more unique structures to be built such as 50 000 tons for the Boeing 777 assembly building, forty story Las Vegas hotel and casino complexes, the San Francisco Airport International terminal and learning early BIM constructing the Frank Gehry designed Walt Disney Concert Hall.

After graduation, I married my college sweetheart, Nancy, who followed me from Seattle to Alaska to California. After our two children had grown, relocation again became more viable. I began to wonder was there something else to do and a way to give some of the lessons learned from my experience as a builder back to the industry. In 2005, I was serving as a member of the AISC Board and the AISC President was soon to retire. While I was living in one of the most beautiful areas with a temperate climate in northern California there was an appeal to move to Chicago, try a new challenge of leading AISC, and live in a true four-season climate. My wife and family were supportive of the new adventure. I was selected to lead AISC, and we moved to Chicago to begin my third career. While this job provides different challenges than either military life or construction, the nature of the issues and the solutions are similar. When one seeks daily to improve communication, build relationships, and foster a collaborative environment no challenge or problem is insurmountable.

As for what I do with my spare time, I truly enjoy spending it with my family. Lisa, our daughter, lives near us in Illinois, and Ryan, our son, lives with his wife Cindy near Boston, Massachusetts. For recreation, my favourite is snow skiing at our vacation home near Lake Tahoe, California. I have always enjoyed anything that takes me outside from gardening to golf. Finding the time to do all I enjoy is the real challenge.

When I was young, one of my favourite songs was "Born under a Wandering Star." My life and career have provided the opportunity to wander geographically and professionally, but the common element has been that my wanderings are all linked to the steel construction industry. My hope is that the future industry provides similar opportunity to others, and that I can use my future years to continue to give back to the industry that has provided me so much.

Christmas with his family.



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

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- Sandton Atrium on 5th Cladding - Liberty Properties
- Kwale Mineral Sands, Kenya: Conveyor and tripper car structures - Base Titanium
- Polyoak Aeropark: New steel roof - Polyoak Properties
- Sedibeng Brewery: Bottling Bay extension - Sedibeng Brewery
- Standard Bank Rosebank - Standard Bank
- Telesure Head Office - Steyn City Properties
- Medupi Coal & Ash Terrace - ELB
- Cradlestone Mall - Sasol Pension Fund
- Sci-Bono Discovery Centre - Gauteng Department of Education
- Gate Houses - Steyn City Properties
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DR. REIDAR BJORHOVDE

President, The Bjorhovde Group, USA

In having to edit the biographies of all the speakers for the SteelFuture website and programme I was immediately impressed with Reidar's long list of achievements and involvement in structural steel research, and thus he seemed to me to be a very serious guy. Meeting him in person at the conference revealed the opposite. Sure he is an expert on many subjects, but always with a mischievous twinkle in his eyes. (Ed.)

Reidar Bjorhovde was born in the city of Harstad, Norway - 200 miles north of the Arctic Circle. He graduated from the Norwegian Institute of Technology (now called the Norwegian University of Science and Technology) in 1964 with the degree of Sivilingenior in Civil Engineering (equivalent of MSc), and received the degree of Dr.-Ing. (Doctor of Engineering) in 1968. He earned a second Ph.D. in Civil Engineering at Lehigh University in Bethlehem, Pennsylvania, in 1972.

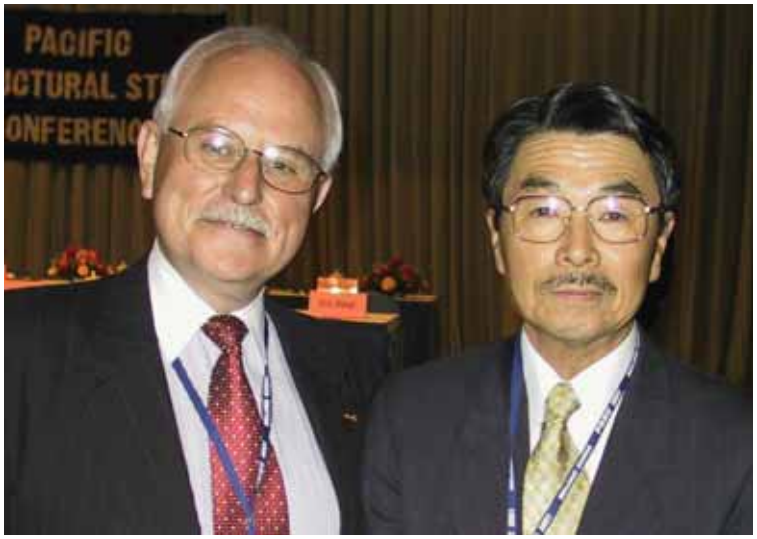
Dr. Bjorhovde was an Assistant Professor and Norwegian Government Fellow in the Division of Steel Structures at the Norwegian Institute of Technology until 1968, when he joined Fritz Engineering Laboratory at Lehigh University. He subsequently worked for the American Institute of Steel Construction (AISC) as Regional Engineer in charge of the Boston office in Massachusetts and as Research Engineer at AISC headquarters in New York. He was a professor at the University of Alberta in Edmonton, Canada, from 1976 to 1981, and at the University of Arizona in Tucson from 1981 to 1987. A professor at the University of Pittsburgh, Pennsylvania, from 1987 to 1998, he was Head of the Department of Civil Engineering. He was also the Director of the Bridge and Structures Information Center (BASIC) at the University of Pittsburgh, a national technical center he established in 1989. He is now President of The Bjorhovde Group, a consulting firm and international engineering consortium, located in Tucson, Arizona since 1998.

Reidar has done extensive research in the field of structural engineering. His study of column stability and reliability was an international landmark study that yielded what is now known as the SSRC Column Curves. Adopted by the Canadian limit states steel design standard in 1974, they are the basis for the column criteria of the AISC Specification, the AISI Specification for cold-formed steel structural members, the LRFD Steel Bridge Design Specification of AASHTO (American Association of State Highway and Transportation Officials), and the South African steel design code. The results for sign structures have been adopted by AASHTO.

He has taught many undergraduate and graduate courses as well as short courses in the US and many other countries on all aspects of steel, cold-formed steel and composite (steel-concrete) structures design, LRFD and limit state design, welded structures, welding technology and construction materials.

Wine tasting at Groot Constantia during the ISCG meeting in Cape Town.

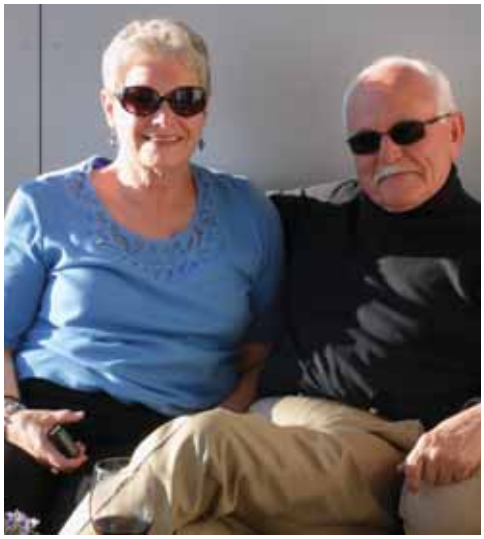
PROFILES



With Prof Yuhshi Fukumoto of Japan.

Through his company, Dr. Bjorhovde has clients in the United States and a number of other countries. Among many assignments, he develops and supervises research and design activities for corporations and industry associations, conducts extensive trouble-shooting for industrial corporations and consulting firms, advises research councils in a number of countries on needs and applications, works with code bodies in the US and many other countries to develop state-of-the-art criteria for the use of steel and other materials as well as for structural design. He is the Editor of the *Journal of Constructional Steel Research* and Research Editor of the *AISC Engineering Journal*.

Dr. Bjorhovde is a member of the Committee on Specifications of AISC and the committee for the Canadian steel design standard CSA S16. He was a member of the Cold-Formed Steel Structures Committee on Specifications of the American Iron and Steel Institute (AISI) 1974-1976 and 1981-2011. He was Chairman of the Structural Stability Research Council (SSRC) 1998-2002 and a member of the SSRC Executive Committee 1987-2008. He was a member of the Executive Committee of the Technical Activities Division of the ASCE Structural Engineering Institute for the term 1999-2004, and served as its Chairman for 2002-2003. He has collaborated extensively with European and Chinese researchers, and is a member of several committees of the European Convention for Constructional Steelwork (ECCS). He continues to be a member of many committees of AISC, AISI,



Reidar with his wife, Pat – they have been married for more than 40 years.

ASCE, SSRC and several other national and international organisations.

Reidar is a Fellow of the American Society of Civil Engineers (ASCE), a Fellow of the ASCE Structural Engineering Institute (SEI) and a member of the European Convention for Constructional Steelwork (ECCS). He has received a number of awards, including the Duggan Medal of the Engineering Institute of Canada, the NATO Senior Guest Scientist Award (France), the T. R. Higgins Award of AISC, the prestigious Research Fellowship of the Japan Society for the Promotion of Science, and the J. James R. Croes Medal, the Shortridge Hardesty Award and the George Winter Award of ASCE, the IMCA Award of the Mexican Institute of Steel Construction (IMCA), the Lynn S. Beedle Award of the Structural Stability Research Council and the AISC Lifetime Achievement Award. He received the Charles Massonnet Award of the European Convention for Constructional Steelwork in 2012. The Singapore Structural Steel Society has named him an Honorary Fellow. In 2012, Tsinghua University in Beijing, China, named him a Tsinghua Chair Professor. He is listed in many editions of Who's Who and similar reference books.

The author of more than 300 archival publications, he has lectured and consulted in numerous countries, and has presented papers at various conferences and industry assemblies more than 500 times. He is a Registered Professional Engineer in the United States, Canada and Norway.

Reidar and Pat celebrated their 40th wedding anniversary in October 2012 – another astounding achievement. In addition to major interest in classical music (see the article excerpt below), he travels a great deal, is an avid photographer, and reads extensively particularly history.

He speaks seven languages and in his own words “dabbles in four more”!

AN ENGINEER AND HIS MUSIC

An excerpt from an article that appeared in Modern Steel Construction November 2011

If actions speak louder than words, then it's safe to say that Reidar Bjorhovde really does love music. Every weekend for nine years Bjorhovde rolled out of bed at 3:30 in the morning to arrive at the studios of Tucson's KUAT-FM by 5:00 a.m., where he hosted an early morning radio broadcast of classical music from 1998 until 2007.

His radio career actually started a few years earlier at WQED-FM in Pittsburgh, where Bjorhovde was serving as the head of the civil engineering department at the University of Pittsburgh.

Where did this deep interest in music come from? In his native Norway, the entire Bjorhovde family was musically involved. All of Bjorhovde's three sisters were musical, and so was he. "For a number of years I played first trumpet in a symphony orchestra," he said. "We were amateurs, but we were actually pretty good." Although he put away his trumpet when he came to the U.S. in 1968 to study at Lehigh University, Bjorhovde's love of music flourished.

Meanwhile, after receiving his doctorate, he joined AISC. Initially he was an AISC regional engineer in Boston, coincidentally the home of one of this country's great orchestras. A promotion brought him to AISC headquarters, which at the time was in New York. While in New York he acquired a copy of the Kochel catalogue, a massive book which is a chronological listing of all the works of his favourite composer, Wolfgang Amadeus Mozart.

In the late 1980s he moved to Pittsburgh, home of another great symphony orchestra. "Then in 1998 I changed careers." Bjorhovde said, "and set up my own consulting firm in Tucson, Arizona." Shortly after his arrival a friend suggested Bjorhovde apply for a part-time opening as a producer/announcer at the local public radio station.

Finding an outlet in classical music radio was one of those fortunate things that happens in life, Bjorhovde observed. "My musical interests are very broad, from the early rococo to 20th century music, from solo performance to orchestral music and concertos. I like 20th century choral music very much, and of course opera. Such beautiful music to listen to, and to simply learn about. I am constantly amazed at how many people say, 'how do you know that?' Well, I just have a good memory."

But as much as he enjoyed his radio days, "after nine years of early hours at the radio station, my wife was happy to get me back," he said.

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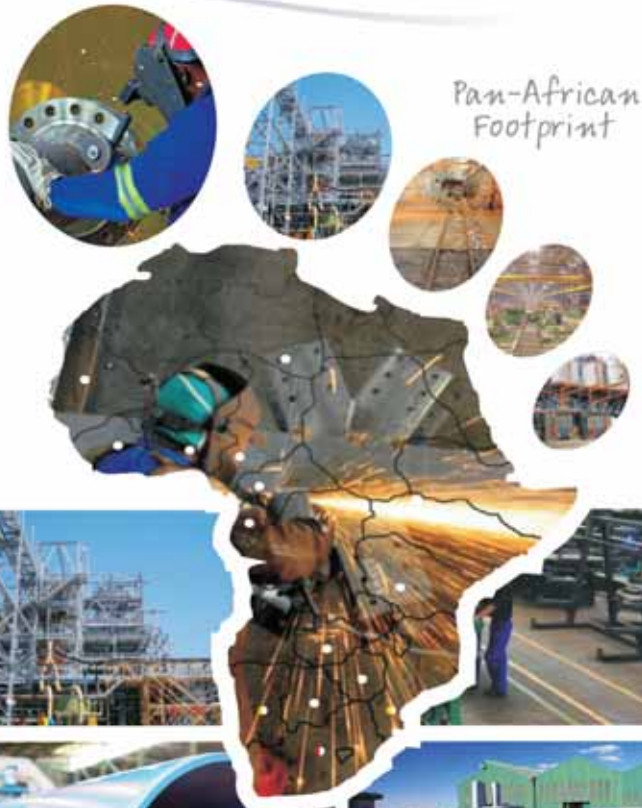










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VUSI NDALA

Managing Director and Chief Strategist, Mzilakatha Strategic Management Services, South Africa

I never had a lack of role models both locally and internationally. I have always looked up to and was inspired by individuals who are successful in life and share my values. For me this formed the treasure of my life. I will ever be thankful for these individuals who had and still have a great influence on my life.

Vusi Ndala is a business strategist and sales specialist with over fifteen years of professional experience in the newspapers, magazines, radio, television, events management, non-government sector and consumer electronics industries with nine of these in senior management. He gained significant corporate and business experience in his 17-year professional career as an employee, executive manager, leader and entrepreneur.

He left South African Broadcasting Corporation (SABC) in the first quarter of 2009 to establish his own business after serving three years between 2006 and 2009 as Head of National Sales & Sponsorships of sport programmes. He's currently the Managing Director of Mzilakatha Strategic Management Services (Pty) Ltd, a company he founded in 2010.

In his own words...

I am a typical child born out of the South African value system of Ubuntu (an ancient African word meaning 'humanity to others') accentuated by the African proverb that "it takes a village to raise a child". All the elders and parents in my community played a significant role in my upbringing. Born in the mid-70s, my childhood resembles that of any Black child raised during that exasperating political era (apartheid) in South Africa. I was born and bred in the dusty rural village of Weltevrede (now Emthambothini) in the former Kwa-Ndebele homeland, 150km north-east of Pretoria. With the passing of my mother at the age of two, I was raised by my grandmother and a cousin. I consider myself fortunate to have been raised in the family of Christians. Consequently, my upbringing was nurtured by strong values encouraged by this spiritual community and home. These values instilled my childhood with a sense of life purpose and self-discipline and carved a journey that I would travel for the better part of my formative years.

I have committed myself to a life philosophy that espouses living a purposeful life contributing to the community and oneself through hard work, meaningful soul-searching, enthusiasm, love and passion. I learned the ropes of leadership and took responsibility at a very young age. I was honoured with a 'leadership of excellence' award at the age of thirteen following a leadership training programme for young bright minds in the late 80s. In the years that followed, the

Speaking on Africa as a market for companies in the steel construction industry at SteelFuture.

During a business trip to Limburg, Netherlands.

training and mentoring that I received helped me with my professional career and my involvement in community development.

While raised in a rural village I came to see the importance of education and it is still one of my top priorities. Overwhelmed by the circumstances under which I lived, I pledged that my family will live a better life. This conviction formed the basis of my childhood ambition. While I pursued a different career path from what I initially dreamt of, I look back with sincere gratitude and appreciation. During my high school years my dream was to become a chartered accountant, but could not fulfill that due to not having studied mathematics. I enrolled for a public administration degree at the University of Pretoria in the mid 90s. I furthered my studies obtaining an honours degree and subsequently a masters degree specialising in public management and labour relations management respectively. For fourteen years I pursued a sales and marketing career in media, a career I discovered by default while at University participating in various student activities. Against all odds and amid vexing circumstances, I worked hard and was determined to achieve my goals. I am not there yet, but I am on my way there!

Life is characterised by challenges that we try to counter by seeking counsel from those who are blessed with the wisdom that we do not have (yet). I never had a lack of role models both locally and internationally. I have always looked up to and was inspired by individuals who are successful in life and share my values. For me this formed the treasure of my life. I will ever be thankful for these individuals who had and still have a great influence on my life.

Besides my family time (married with a 10 year old daughter), I retreat occasionally from my busy professional life through sport, adventure, reading, listening to music, watching movies, and exploring new ideas on various subjects. These could range from education, health, politics to economics, the environment (nature), business (entrepreneurship), technology and entertainment generally. While I am a football fanatic, my favourite sport in which I actively participated during my productive sporting years is table tennis. For an alternative I take my clubs and head to the golf course to hit some balls.

I wish the SAISC, all participants and speakers that attended the SteelFuture Conference success, fruitful deliberations and outcomes. With the potential of steel as a sustainable construction material, the steel construction industry will continue to play a crucial role in the building of a sustainable world. In Africa, the industry has an exciting future given the increase of Africa's needs and demands for both economic and social infrastructure as well as industrialisation. Robust dialogue on innovation, collaboration and the creation of an industry model supporting inclusive value chains are key imperatives for building an industry that will be influential in Africa's sustainable built environment in the future.

A Rendering of Freedom Tower that tapers and twists from a square base through eight isosceles triangles that form a perfect octagon at the midpoint of its height then tapers and twists again into a square top, rotated 45 degrees from the base.
(Image credit: Michael Calcagno. Courtesy of: Silverstein Properties)

THE WORLD TRADE CENTER

DESTRUCTION AND RE-BIRTH

By David Ratterman, Member,
Stites Harbison, Louisville USA

There was never any question that New York was going to rebuild; and it has. The heart of the new World Trade Center is Freedom Tower. Its soul is the September 11 Memorial.

The original World Trade Center was both innovative and radical. It was built inside a concrete bath tub, alongside the Hudson River, and atop three hundred years of waste and fill. Its twin towers were the tallest buildings in the world. Their primary structural support came from 236 exterior, load bearing columns. In theory the height of the towers was limited only by the height to which elevators could climb; thought, at that time, to be about 180 storeys. Fire compartmentalisation for the towers was provided by traditional concrete floor slabs and a double thickness of dry wall around three sets of emergency stairways in the central core.

In July, 2001, Developer Larry Silverstein, then 70 years old, signed a 99 year lease with the project owner, the Port Authority of New York and New Jersey, to manage and sub-lease the WTC buildings. Mr. Silverstein had an early doctor's appointment on the morning of September 11, 2001. He intended to cancel the appointment and go straight in to work in the north tower. His wife found out and insisted that he keep his doctor's appointment.

While Mr. Silverstein was at his doctor's office, American Airlines Flight 11 was being flown south, over mid-town Manhattan. It crashed into the north face of the north tower at 8:46 a.m. United Flight 175, was flown over Staten Island, turned north, and crashed into the south face of the south tower at 9:02 a.m.

Following the impact, the 236 steel columns in each tower shuttered and swayed and then did exactly what they were designed to do. The welds and bolts and design theory held... and then there was the fire. Insulation was blown off much of the steel

in the impact areas and the double thickness of dry wall around the building core was, of course, no protection at all. Jet fuel spread across the impact floors and down interior shaft ways, igniting fires along the way. When fully engaged the fires covered five acres in each building. The instantaneous energy output from each of these fires approximated the energy output of as many as 10 nuclear power stations.

Occupants within and above the impact areas were unable to evacuate because all three stairways were located in the central core area that had been destroyed by the collisions. At 9:59 am, 56 minutes after it was struck, the south tower collapsed. The north tower continued to stand until 10:29 am, one hour and 42 minutes from the time of initial impact, when it also collapsed.

2 982 victims from 90 separate countries died in the attacks on 9/11.

There was never any question that New York was going to rebuild; and it has. The heart of the new World Trade Center is Freedom Tower, 541 meters tall – its height officially set in feet, 1776, to commemorate the year of American Independence. Its soul is the September 11 Memorial.

The entire plan is oriented toward the Memorial. Every year at the exact moment of the attack an uninterrupted wedge of sunlight will strike the Memorial. The central axis of the Transit Hall is aligned to the 9/11 sun. The walls of Tower Two were pulled back to maintain the wedge of light on the moment of attack. The dramatic slope at the top of Tower Two is directed down to the exact center of the Memorial to constantly remind people everywhere in the city of the events of 9/11.

There are seven major projects planned or under way on the site:

1. Three transit facilities – each of which is world class.
2. An underground vehicle security screening facility; the most sophisticated in the world.
3. The September 11 Memorial,
4. The September 11 Museum,
5. A concert hall,
6. Five more high rise structures, and
7. Freedom One.

The seven projects share an enlarged concrete bath tub that holds what may be the busiest, most congested, and most complex construction site in the world; being built under some of the tightest security in the world. The 3 300 workers who enter the site each day are identified by iris scan.

Directly under Greenwich Street, through the center of the bath tub, runs PATH line 1 – the main subway connector through lower Manhattan, severed on 9/11. Shutting down line 1 would have cut off lower

Manhattan, so line 1 was suspended in a 1 000 foot (304.8m) long temporary box 50 feet (15.24m) above the bath tub floor, and has remained in use, 24 hours a day, throughout the construction process. All seven projects had to be built around PATH line 1.

Above PATH line 1, Freedom Tower tapers and twists from a square base through eight isosceles triangles that form a perfect octagon at the midpoint of its height then tapers and twists again into a square top, rotated 45 degrees from the base. The taper and twist breaks up the wind, enabling the Tower, in theory, to survive a 1 000-year hurricane event. A parapet sits atop the 104th floor, on which will rest an illuminated mast and antenna that will rise to the symbolic 1 776 foot level and evoke the further symbolism of the Statue of Liberty's torch. The tower contains enough steel to build 13 Eiffel Towers and enough concrete to fill a string of cement mixers stretching nearly half the distance from Johannesburg to Cape Town.

The first 20 stories of the tower are essentially a bunker. The pedestal at the base of the tower has core walls almost 2 metres thick. The first 20 floors above grade are encased in both steel and concrete. To avoid the metaphor of a bunker, above ground the concrete will be covered by reflective glass panels. Between the pedestal and the spire there is a heavily reinforced system of beams and columns forming another steel tube. Horizontal compartmentalisation is achieved this time by a floor system built to the standards of a highway bridge deck and this time the core of the tower is encased in heavy concrete rather than drywall. As indicated above, at their base the core walls are almost 2 metres thick. Through at least half the height of the building, the core walls are almost 1 metre thick. On the upper floors the walls slim down to over half a metre in thickness.

If the Tower is the project's heart, then the Memorial is an expression of its soul. No remains were found for approximately half the victims. There was nothing for the families of those victims to bury. No cemetery to visit. The Memorial gives those families, and our nation, a permanent place to mourn. The Memorial is comprised of two one-acre, 30-foot-deep reflecting pools that mark the exact footprints of the Twin Towers.

A small forest of 400 swamp oak trees, transplanted from the three regions of America where the attacks took place, landscape the Memorial site. The pools themselves are surrounded by a waste-high parapet, symbolic of the parapets that surrounded the tops of the original towers. The surface of the parapets is sheathed in bronze panels into which have been cut 2 983 names.

The names are placed in a manner that allows people with connected lives to be together. The names of those who worked together or died together are inscribed together in the bronze tablets – this is described as "meaningful adjacency". For the comfort of the millions of hands that will touch those names each year – some

The proposed new skyline of New York with Freedom Tower and Tower Two clearly visible.
(Image credit: dbox. Courtesy of: Silverstein Properties)

PROJECTS & TOPICS

Spanish Architect Santiago Calatrava was commissioned to create a new railway terminal on the site. Above ground, the Transit Hall evokes a dove of peace. It has a giant steel ribcage with splayed wings.
(Image credit: Santiago Calatrava. Courtesy of: Silverstein Properties)

of those hands will belong to the families of the victims – the parapets have a built-in heating system for the winter and built-in cooling system for the summer. The tablets will always be welcome to the touch.

In addition to the Memorial and the towers, New York is rebuilding essentially the entire transit system of Lower Manhattan. Spanish Architect Santiago Calatrava was commissioned to create a new railway terminal on the site. He created two: one, above grade, called the Transit Hall, the other, below grade, called the Path Hall.

Path Hall is built of striking, curved steel ribs, each a solid 30 centimetres of steel thick. They form a back bone with 25 vertebrae into which trusses and beams connect. These support the roof of Path Hall and the Memorial Plaza above it. Above ground, the Transit Hall evokes a dove of peace. It has a giant steel ribcage with splayed wings and is described as being open to the heavens so that angels can come through to collect the souls of the victims.

Meanwhile, the Burj Dubai Tower was opened on January 4, 2011, to "snag the title of the world's tallest building." At 828 meters, it is almost twice the height of Chicago's Sears Tower. On August 15, 2011, Saudi Arabia unveiled plans for Kingdom Tower, designed to reach more than 1 km above the desert floor.

And in waters not too distant from these towers the USS New York (LPD 21), a United States Navy ship-of-the-line, is on patrol. The bow of the ship contains 7.5 tons of recycled steel salvaged from the wreckage of the original World Trade Center Towers. The ship's motto is "Never Forget"!

An aerial view of the progress of the rebuild with a clear view of the Memorial taken in February 2013.
(Image credit: Joe Woolhead. Courtesy of: Silverstein Properties)

DAVID RATTERMAN

Member, Stites Harbison, Louisville USA

David Ratterman is a Member of Stites Harbison's Construction Service Group, concentrating his practice in general construction law, with particular emphasis on the fabricated structural steel industry. His immersion in the construction industry began as a water boy on construction sites at age 10 and evolved through a series of engineering and construction positions with the U.S. Navy, state government and private industry.

David Ratterman.

He has been an officer or advisor to 12 industry trade organisations and professional societies involved in the fabricated structural steel industry. Since 1989, he has served as Secretary and General Counsel of the American Institute of Steel Construction and also serves on that body's Code of Standard Practice Committee and as counsel to its National Steel Bridge Alliance.

David has been lead trial counsel for numerous contractors, design professionals, material suppliers and construction owners involved in complex matters in litigation, arbitration and construction mediation.

Formally trained as a construction arbitrator and mediator and listed on several national construction neutral panels, David has participated as an ADR neutral or advocate in resolution of construction disputes totalling well in excess of a half billion dollars. Mr. Ratterman was also an advisor to FEMA Task Forces that investigated structural damage caused by the 1994 Northridge, California, earthquake and the September 11, 2001, collapse of the World Trade Center towers.

He is a Life Fellow of the American Bar Foundation, is a Fellow and has served on the Board of Governors of the American College of Construction Lawyers and was the Founder and first Chair of the Kentucky Bar Association Section on Construction and Public Contract Law.

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Aerial view of Marina Bay with the Skypark in the foreground and the ArtScience Museum below.

STEEL – THE PREFERRED CHOICE FOR SPECTACULAR STRUCTURES

A summary of Professor Richard Liew's talk by Spencer Erling

After all who would think of a sky bridge, on top of three tower blocks of a hotel, dedicated to use as a Skypark? Or a double helix bridge linking the hotel to other parts of the development, or for that matter an ArtsScience Museum with 10 upward pointing 'fingers' for different gallery spaces with a rain water collection system running through the middle of the finger supports.

What would a 'SteelFuture' conference be without at least some bragging of what we have been able to build in the past, and surely Richard's talk really did our industry proud.

On what was reclaimed land, the Marina Bay Sands Integrated Resort, has been developed by a brave and visionary developer. After all who would think of a sky bridge, on top of three tower blocks of a hotel, dedicated to use as a Skypark? Or a double helix bridge linking the hotel to other parts of the development, or for that matter an ArtScience Museum with 10 upward pointing 'fingers' for different gallery spaces with a rain water collection system running through the middle of the finger supports.

Have I whetted your appetite? Then read on...

THE DOUBLE HELIX FOOTBRIDGE

This 280 metre long double helix foot bridge with a 10.8 metre diameter outer helix and a 9.4 metre diameter inner helix apparently winding in

The double helix bridge links the new development to the Singapore Flyer and the Gardens by the Bay.

opposite directions is the undercover section in a 3.5km long foot path around the marina.

The bridge is made from a duplex stainless steel (for those of you who have not been to Singapore imagine Durban on a hot humid summer's day, well that's what you kind of have all year round in Singapore) to prevent corrosion. The inner helix supports fritted (sand blasted) glass and steel mesh canopies to provide shade for pedestrians. The sides are open to allow for unrestricted views.

This tourist attraction weighs 1 700 tons.

THE WORLD'S TALLEST SKYPARK

This 340 metre long Skypark sits 200 metres above the ground on three tower blocks of a hotel complex and has a mass of 7 700 tons. The cantilever extends some 66.5 metres past the hotel support and weighs a measly 3 500 tons!

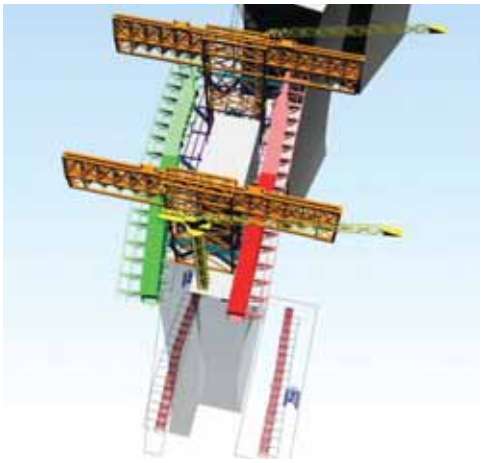
Two enormous box girders, each made up of 22 segments (weighing between 13 and 49 tons), make up the cantilever 'backbones' with the girders fattened up over the support to carry the enormous cantilever moments and limit the deflections.

A LESSON IN HOW TO ERECT SUCH A BEAST

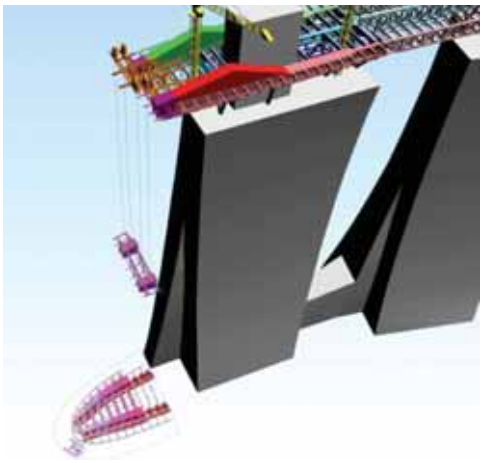
Two large purpose-made, 'Tee' shaped rigging frames (for lifting the girders) were installed on top of and above the tower block. The arms of the tees being long enough to hoist up both girders (at the same time to keep the system balanced) clear of the towers, so that when they were at a height above the top of the towers the girders could be moved closer to each other (by the rigging frames) and lowered into their final positions. The tower crane then installed the tie beams to make the system stable.

Thereafter a new hoisting rig was installed at the end of the cantilever (now just sticking past the end of the tower block) which progressively jacked up and connected the next piece of the cantilever before moving out for the next piece and so on.

A total of 5 000 tons of steel went into the construction of the ArtScience Museum.



The T-shaped rigging frames to hoist up both girders at the same time..



A new hoisting rig was installed at the end of the cantilever which progressively jacked up and connected the next piece of the cantilever before moving out for the next piece.

The roof top houses restaurants, roof gardens with trees and plants and a public observatory with a full 360° view over Singapore as well as a 150 metre long swimming pool!

THE ARTSCIENCE MUSEUM

I think it looks a bit like a water lilies petals (of different length) pointing upward, each of the ten petals (or fingers as described by Richard) are of a different length and allow for natural skylight to the individual galleries.

Rain water is harvested down to the opening at the bottom and allowed to cascade down through the vertical support in the form of a waterfall.

A total of 5 000 tons of steel went into this section of the project.

The two shell shaped biodomes create suitable environments for non-tropical plants to flourish.

GARDENS BY THE BAY

Two 1.8 hectare botanical 'bio-domes' and a cluster of 18 Supertrees

Just imagine it, two enormous shell shaped bio-domes to create a cool dry atmosphere in one and cool moist atmosphere in the other thus creating environments for non-tropical plants to flourish.

A series of parallel large span arches (not symmetrical) laterally tied by stainless steel cables with a maximum span of 90 metres and a maximum height of 35 metres, allow the double glazed grid steel structure to 'hang' under the arches. Six-sided plated boxes make up the cross section of the arches, the height of which varies depending upon where you are on which arch. The maximum height of the box section is 2.35 metres down to a minimum of 1.87 metres.

Then, just imagine it, 18 Supertrees between 20 and 50 metres high, built out of steelwork to compliment the bio-domes. Each has its own massive trunk and branches radiating upwards and outwards. And of course there is an aerial walkway linking the Supertrees (Steel Construction's cover image).

Prof Richard Liew.

Some are fitted with solar panels to harvest electricity and all the trees will harvest their rainwater for use in irrigation and for the fountain displays that are planned. The tallest tree has a treetop café. Some of the trees act as the exhaust system for the bio domes.

AND IN CONCLUSION,

Once again, what can us 'mere mortals' of engineers and fabricators say but "Wow!" (and some more wow's).

Thank you Richard, for sharing these exciting projects with us.

PROF RICHARD LIEW

Programme Director of Hazards, Risks & Mitigation - Department of Civil & Environmental Engineering, National University of Singapore

Richard Liew is a Professor and the Program Director of Hazard, Risk and Mitigation in the Department of Civil & Environmental Engineering at the National University of Singapore. He is a Chartered Engineer in the UK, a Professional Engineer in Singapore, and a Chartered Professional Engineer of the Association of Southeast Asian Nations. He is a Fellow of the Academy of Engineering Singapore, an Honorary Fellow and the Past President of Singapore Structural Steel Society and Honorary Fellow of Hong Kong Institute of Steel Construction.

He has been involved in research and practice in steel concrete composite structures covering a wide spectrum of interests, including lightweight and high strength materials and advanced analysis of structures subject to extreme loads, for applications in offshore, marine, defence and civil infrastructural works. Arising from this work, he has co-authored five books and generated more than 300 technical publications. He serves on the editorial boards of eight international journals.

He interacts closely with the industry in the Asia Pacific region serving as an expert and technical advisor and has been involved in numerous iconic steel projects. He chairs numerous international and national committees related to standards and specifications of steel and composite structures. He is a key person responsible for the development of Singapore's national annexes for the design and steel and composite structures using Eurocodes 3 and 4.

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BUILDING FOR THE DEMANDS OF THE SOCIETY OF THE FUTURE

By Llewellyn van Wyk, Principal Researcher, Built Environment, CSIR, South Africa

The challenge is therefore to move the economy toward a carbon-neutral state, and ultimately to a carbon-free state, an objective of the Green Economy. The built environment, through its formation and operation, has a significant contribution to make in achieving this objective.

Sustainable development is a concept that was coined in the Brundtland Report of 1987 although the term 'sustainable' has its roots in Greek texts most notably those of Aristotle. The first reference in modern times comes from the Club of Rome in its ground-breaking 1972 report 'Limits to Growth'.

The significance of the Club of Rome definition is its ecological recognition of not exceeding the carrying capacity of natural systems which, were it to occur, could lead to collapse.

RESILIENCE IS THE NEW GREEN

In the study of ecology resilience is the capacity of an ecosystem to respond to perturbations or disturbances by resisting damage and recovering quickly. Such events can include stochastic events such as fires, flooding, high winds, insect population explosions, as well as human activities such as deforestation, the introduction of alien plant and/or animal species, a reduction in biodiversity (for example mono-crop cultivation) and many other. Disturbances of sufficient magnitude or duration can affect an ecosystem profoundly and may result in the system reaching a threshold (tipping-point) beyond which a different regime of processes and structures predominate.

For this reason interdisciplinary discourse on resilience is studying the interaction of humans and ecosystems via socio-ecological systems and the need to move away from the notion of maximum sustainable yield thinking to environmental management which aims to build ecological resilience through analysis, resource management and adaptive governance. Resilience can therefore be supported by reducing exposure or impacts (mitigation) and by strengthening resilience by enhancing the adaptive capacity of ecosystems (adaptation).

CLIMATE CHANGE CYCLES

Climate change is a significant and lasting change in the statistical distribution of weather patterns over periods ranging from decades to millions of years. Climate change is driven by oceanic processes, biotic processes, variations in solar radiation, plate tectonics, volcanic eruptions, and more recently human-induced alterations of the natural world.

Severe or unusual weather, i.e., weather at the extremes of historical distribution, are known as extreme events. Extreme weather events are rare and occur 5% or less of the time: the increase in extreme weather events currently witnessed has been tribute to man-made global warming.

ECOLOGICAL GOODS AND SERVICES (EGS)

The significance of supporting ecosystem resilience is located in the supportive role ecosystems play to life forms – a concept referred to as Ecological Goods and Services (EGS). EGS are benefits provided by nature for free, and include 'goods' (food, fibre, fuel, genetic resources, biochemicals and fresh water), 'regulating services' (invasion resistance, herbivory, pollination, seed dispersal, climate regulation etc), and 'supporting services' (primary production, provision of habitat, nutrient cycling, production of atmospheric oxygen etc).

STATE OF THE ENVIRONMENT

There is sufficient evidence to indicate that ecosystem health is decreasing: two instruments are used to measure the health of ecosystems namely the Living Planet Index and Planetary Boundaries.

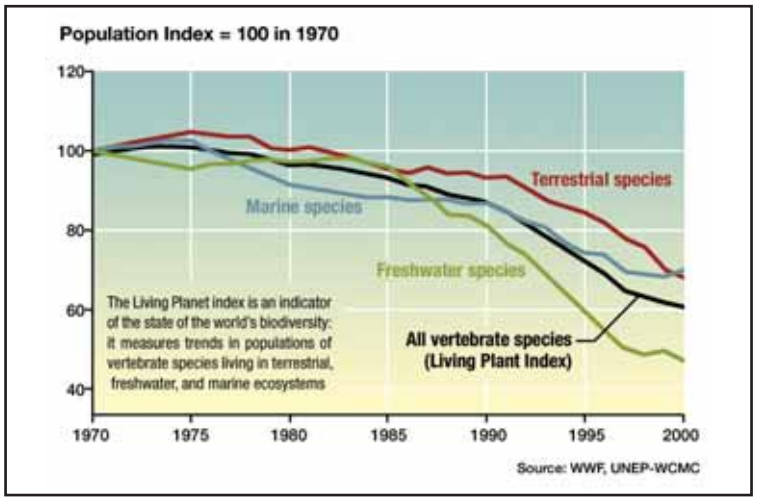

Figure 1: Living Planet Index.

The Living Planet Index is an indicator of the state of biodiversity based on trends in vertebrate populations of species from around the world. Between 1970 (the base year) and 2007 the index fell 28% suggesting a rate of degradation unprecedented in human history.

Planetary Boundaries is a system developed by the Stockholm Resilience Centre in which nine earth system processes are defined with demarcated boundaries beyond which an unsafe operating space is entered. Current estimates are that three of these boundaries have been exceeded namely biodiversity loss, climate change, and the biogeochemical flow boundary (nitrogen cycle).

The ongoing fragmentation of the landscape threatens ecosystem health and resilience undermining the ability of ecosystems to deliver EGS.

THE ECONOMY AND GREENHOUSE GAS EMISSIONS

A greenhouse gas (GHG) is a gas in an atmosphere that absorbs and emits radiation within the thermal infrared range, a process which is a fundamental cause of the greenhouse effect. The primary GHGs are water vapour, carbon dioxide, methane, nitrous oxide, and ozone. Since the beginning of the Industrial Revolution the burning of fossil fuels has contributed to a 40% increase in the concentration of carbon dioxide in the atmosphere: these emissions come from the combustion of carbon-based fuels primarily wood, coal, oil, and natural gas.

Essentially the current global economic model is built on carbon-based fuels, and thus economic growth

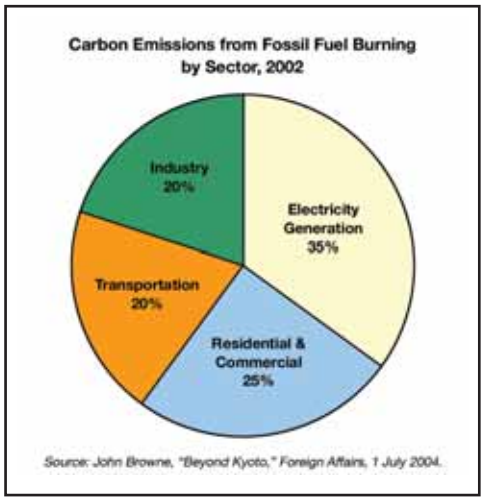

Figure 2: Carbon emissions from fossil fuel burning by sector.

results in carbon emission growth. An examination of carbon emissions by economic sector shows that electricity generation accounts for 35%, residential and commercial property for 25%, transportation for 20%, and industry for 20%.

The challenge is therefore to move the economy toward a carbon-neutral state, and ultimately to a carbon-free state, an objective of the Green Economy.

IMAGINING A DIFFERENT BUILT ENVIRONMENT

The built environment, through its formation and operation, has a significant contribution to make in achieving this objective. It can do this through minimising disturbances caused from the material extraction and manufacturing processes as well as designing eco-neighbourhoods.

Construction materials

Construction materials from the extraction process through to the production process and operational processes in buildings are significant consumers of carbon-based fuels. Iron ore has a melting temperature of 1 375°C with an, on average, 1.9 tons of carbon emitted for every ton of steel produced. The 2012 production of steel was 1 548 Mt. In addition, using a once-through cooling system consumes 100 - 200 000 l/t/steel. Cement has a reaction temperature of 1 450°C and consumes between 90 - 150 Kwh/t of cement and a water consumption of 70l/t in a state-of-the-art production system. Clay bricks have a firing temperature of up to 1 300°C and consumes between 1 840 - 2 800KkJ/kg of fired brick and 7l of water per brick.

Greening the material sub-sector will require that:

- Total energy content is reduced
- Total water content is reduced
- Consumption of natural resources is reduced
- Emissions are reduced
- Raw material consumption is reduced
- Waste generation is eliminated
- Materials are recycled
- Durability is increased

Eco-neighbourhoods

The natural environment consists of a number of species and processes working together. The built environment, on the other hand, works singularly. A piece of infrastructure serves only its specific function: a building, for example, receives the enabling services from the municipality without any interactions with neighbouring buildings. However, like in nature, there are opportunities for buildings to support each other.

In the Lloyd's Crossing development in Portland, USA, building types are assembled that can support each other. A residential block functions at peak activity in the early morning and evening during the week and most of the weekend. An office block, on the other hand, functions at its maximum during weekdays and very little over the weekend. Thus, were the residential block able to send the renewable energy it generates to the office block during weekdays, and the office block were able to send the renewable energy it generates over the weekend to the residential block, a complementarily relationship would exist. This approach could extend across the city.

Green(ing) infrastructure

Infrastructure in the built environment is the equivalent of the ecological goods and services provided by the natural environment – only in the built environment it has to be paid for. This need not be so: green infrastructure relies on natural processes to provide the goods and services typically delivered by conventional infrastructure. Thus rain water is not collected on the streets, channelled into pipes, and disposed of some distance away, but is allowed to filter through permeable or porous pavement into the ground in the manner it would do naturally. In nature rain water is able to be stored in retention ponds like wetlands: in the built environment storm water collects until the storm water system can no longer handle it and flooding occurs. In St. Kjelds Square in Copenhagen the square has been turned into a natural retention pond in anticipation of an increasing risk of flooding. In Quinli Park in China a natural wetland has been retained to provide its range of EGS but has also been designed so that it functions as an urban park.

Eco-buildings

Eco-buildings are buildings that work with nature: they support ecosystems by retaining and enabling the diverse and adaptive processes that nature requires. With the Vancouver Convention Centre, voted the Greenest Building for 2012 by World Architecture, the entire roof is covered in indigenous grasses thereby retaining and supporting the biodiversity of the natural city. The Bosco Verticale Building in Italy takes this even further by cladding the skin of the building with trees thereby ensuring EGS benefits to the occupants of the building while also re-stitching the ecosystem that existed before human settlement.

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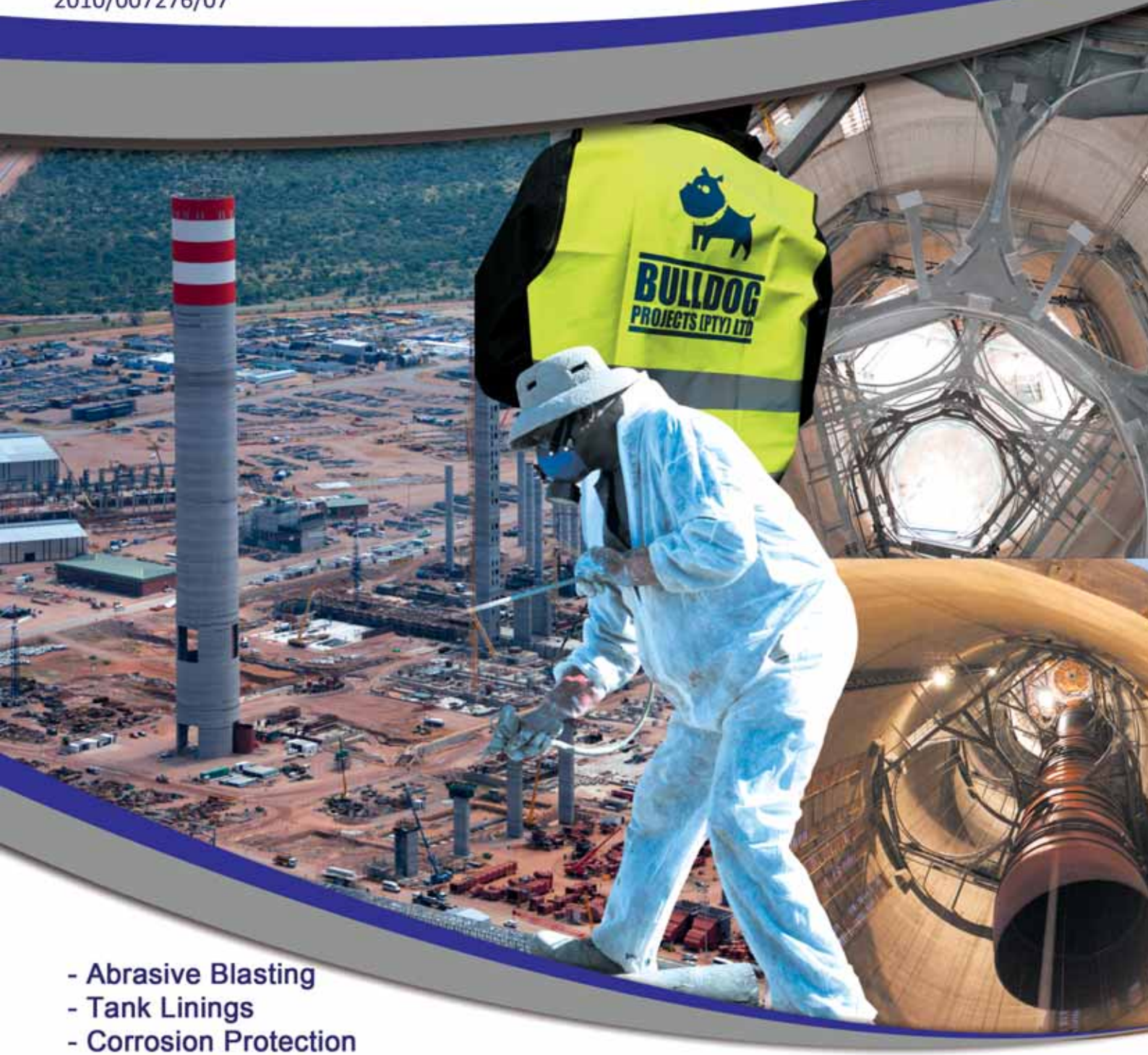

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Figure 3. Net-Zero Building, CSIR Campus, Port Elizabeth.

THE NET-ZERO MOVEMENT

Net-zero energy has become a goal of many new buildings around the world: the net-zero movement extends this to water, waste, biodiversity loss, and emissions. Under this paradigm, buildings are able to provide the services they require themselves, i.e., off-grid. This has a number of ecosystem benefits: firstly, the services provided to buildings come with a huge environmental footprint arising from the energy required to get the services to and from the building, and the water consumed in the production of that energy. Secondly, to get to a neutral point in terms of supply and demand requires that every effort be made to reduce the quantum of services required. This takes careful design to optimise the performance of the building and to reduce occupant consumption. Thirdly, the operation of the services requires very little maintenance and thus the energy required to maintain municipal bulk services is reduced. The CSIR is currently designing a Net-Zero Building for construction on its Port Elizabeth Campus (Figure 3).

Llewellyn van Wyk.

CONCLUSION

The built environment has emerged as it has because the services it requires were beyond the ability of individual building owners to manage. This has changed due, in part, to technology development, and in part, to a realisation that the model is unsustainable. Contemporary demands for resilient ecosystems in the light of anthropological pressures in combination with natural environ-mental processes require that solutions are found at all levels of the human settlement, from the individual building, to the neighbourhood, to the city.

Imagining new ways to do this is what is now required.

LLEWELLYN VAN WYK

Principal Researcher, Built Environment, CSIR, South Africa

Llewellyn van Wyk holds a Bachelor of Architecture degree from the University of Cape Town. He is currently preparing for his Masters degree at the University of Pretoria.

He formed the architectural practice of Norman Calitz and Llewellyn van Wyk in 1982 and completed over 300 buildings throughout Southern Africa. In 1984 he was elected as a City councillor of the City of Cape Town, becoming Deputy-chair of the Town Planning Committee in 1986, Deputy-mayor in 1993 and Deputy-chair of the Executive Committee in 1995. He was a founder member of the 2004 Cape Town Olympic Bid and served as a Director on the Board of the Olympic Bid Company. Llewellyn was elected as the President of the South African Institute of Architects in 1999 and President of the Commonwealth Association of Architects in 2003.

He launched the Digest of South African Architecture in 1999 and served as the editor until 2003. He is the current Editor-at-Large of the e-journal Green-Building South Africa, Editor of the Green Building Handbook (currently in its fourth volume), Editor of the Sustainable Transport and Mobility Handbook (currently in its third volume), all of which he helped launch in 2007. Llewellyn is a Director and founder member of the Green Building Council of South Africa, and served on its Technical Committee.

He joined the Division of Building and Construction Technology at the Council for Scientific and Industrial Research in 2002 where he is a Principle researcher in the renamed Building Science and Technology Competence Area of the Built Environment Unit.

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STEEL CONSTRUCTION'S 21st CENTURY ADVANTAGE

A summary of John Cross' (AISC) talk by Spencer Erling, SAISC

John drew attention to how much research into real issues is ongoing around the world in steel construction, especially in seismic and fire engineering issues. This ongoing research coupled with software development makes steel easy to (confidently) design with. Add to that there is so much access to design tools and advice from technical experts, there is no longer an excuse not to design in steel!

John started by posing the question if you were to create the ideal construction material, what would it be like?

He quickly listed 22 attributes such as strong, easy to design, cost effective etc. - all of which are found in steel, which he described as "the benchmark against which all other materials are measured".

Amongst the attributes he dwelled on were the strength (and to weight ratio), recycle-ability, how well it is documented (he estimates that with all the steel journals around the world we are getting the message to over 100 000 readers).

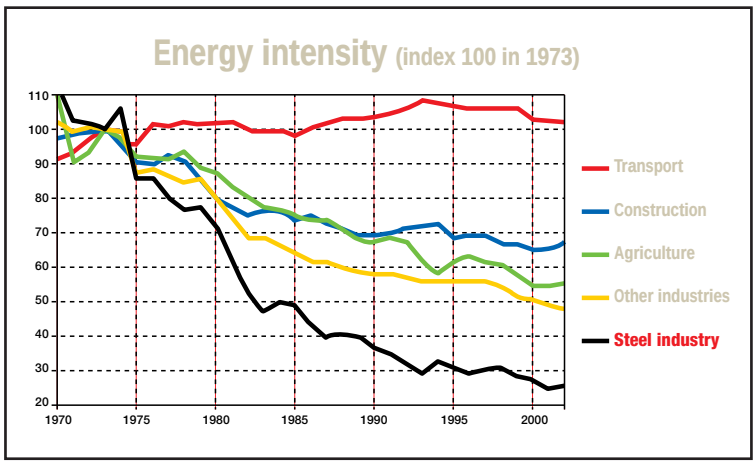
Because of its high strength to weight ratio steel will continue to be a cost effective building material, capable of creating high structures, long span structures in fact any shape or size of structure.

John drew attention to how much research into real issues is ongoing around the world in steel construction, especially in seismic and fire engineering issues. This ongoing research coupled with software development makes steel easy to (confidently) design with. Add to that there is so much access to design tools and advice from technical experts, there is no longer an excuse not to design in steel!

On sustainability issues he reminded us that steel is not just recycled, it is multi cycled (meaning it can be recycled again and again and again). Bear in mind that each ton of steel recycled saves 4.5 tons of newly mined materials. Surely we are saving our natural resources for our grandchildren and beyond. That when the true measure of carbon footprint takes account of the whole life cycle of the structure (including recycling and the reuse of dismantled steelwork) – steel is a clear sustainability winner.

Since renewable energy is on the up throughout the world and that 70% of the energy needed to make steel comes from electricity, steel's carbon footprint will steadily decrease as renewable percentages go up.

Other speakers reminded us (Edwin Basson) that currently there is only enough scrap generated to produce 40% of the world's steel requirements (About 1.5



Energy usage for the steel making process has decreased dramatically and as renewable energy is rising, steel's carbon footprint will steadily decrease even more.

billion tons per annum) and that it will probably be another 20 years before the number approaches 100% of steel requirements.

- Did you know that the average tree consumes 136 million litres of water in its life?
- Did you know that at the useful end of life stage for timber, the only thing left for it to do is rot, giving off methane (which is much worse for the atmosphere than carbon dioxide)?
- Did you know as a result of this when compared like to like a steel portal (say) to a laminated timber portal, the carbon footprint is worse for the latter (so much for the theory "it must be green after all it grows on trees...")?

Above all we have a local industry committed to quality, safety, increased productivity in both fabrication (by an enormous capital investment in new production facilities) and erection, who in the very nature of the product are set on fabricating structures accurate to 2mm (unlike other on site materials that could vary up to 40mm).

Of course steel is rapid to build with, easy to adapt, modify or reinvent structures when it comes to updating existing structures.

John Cross at SteelFuture.

Are you then surprised that steel is the benchmark for other building materials which hope they could be:

"As strong as steel. As fast as steel. As sustainable as steel."

WILL STEEL CONTINUE ITS ADVANTAGES INTO THE FUTURE?

The drivers that lead to material selection, together with research and collaboration will lead to improved driver performance:

Cost	+	Lower cost
Schedule (Speed)	Technology (research)	Faster schedules
Quality	Collaboration (BIM)	Higher quality
Sustainability	=	Greater sustainability

John then explained Moore and Bell's laws about the dramatic effect of IT leading to massive numbers of PC, notebooks and most recently tablets, super-imposing on the graph how structural steel has benefitted first with analysis, then detailing, design and BIM to carry us forward during the rest of this decade (Graph 1). By spreading the wings of BIM from so-called lonely BIM to team BIM, removing any obstacles and/or bottlenecks (including legal contractual issues), will smooth the way for optimum use of BIM and all the efficiencies that prospectively are available.

And the message for you to go out and market and sell is:

We don't just sell steel,

We sell steel expertise

We sell information

We sell solutions

And in answer to the question about "Will the advantages of steel as the ideal construction material continue into the future?"

No! Steel's advantage will be even greater!

The way to profit from our 'unfair' advantage is:

Embrace it

Get excited about it

Document it

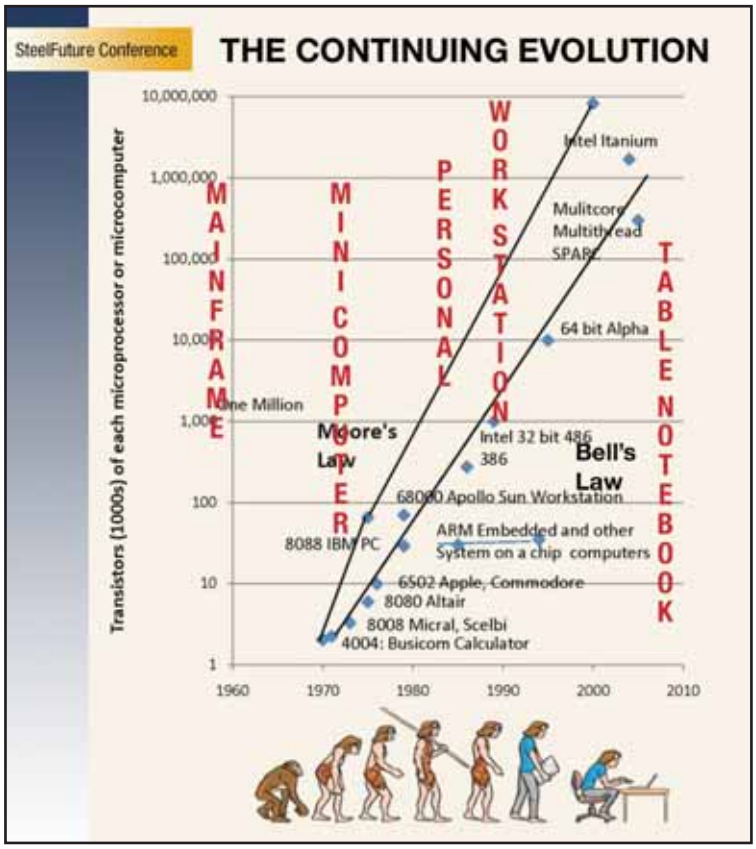
Talk about it

The ideal construction material exists. It is called STEEL and it is only going to get better.

There's always a solution in steel.

CONCLUSION

Who could not become enthusiastic about our building material of choice after such an exciting message about steel's current attributes and how it will improve in the future?



Graph 1: Moore and Bell's laws about the dramatic effect of IT.

Thanks John, you did our material and industry proud. In my opinion you deserve the speaker of the conference award (it's just a pity there isn't one!). Well done!

JOHN CROSS

Vice President, American Institute of Steel Construction, USA

John Cross is Vice President of the American Institute of Steel Construction responsible for market development and finance. He is a frequent speaker at seminars and workshops focussed on construction economics, sustainability, building information modeling and the early involvement of steel specialty contractors in the design and construction process.

He was awarded the 2003 National Press Award from DBIA for contributions to the Design-Build movement and named a finalist for the 2012 Chicago CFO of the Year. In addition, he recently served on the executive committee of the buildingSMART Alliance of the National Institute of Building Sciences and is a member of the 189.1 Committee of the American Society of Heating, Refrigeration and Air-Conditioning Engineers responsible for the ANSI Standard for the Design of High-Performance Green Buildings.

John, a registered professional engineer and LEED Accredited Professional, has been involved in the Chicago building construction market for 40 years. He holds a bachelor's degree in civil engineering from Rose-Hulman Institute of Technology, a master of divinity degree from Trinity Evangelical Divinity School and a MBA from the Keller Graduate School of Management.

ROBOTIC WELDING AUTOMATION FOR STRUCTURAL STEEL FABRICATION

A summary of Ed Whalen's (CISC) presentation by Spencer Erling, SAISC

But of late, developments in IT are leading to software 'talking' directly to 3D software, so what is preventing the 'full steam ahead' for robots in a steel fabrication environment?

Beam assembler.

Robot fabrication and welding has been around for quite some time now, but why has it been slow to make serious inroads into structural steel fabrication?

Apart from the high cost, until very recently, programming of robots has been a slow laborious business. So it was common to find robots working in high volume repetitive situations such as automobile assembly lines or exhaust box manufacturers, but not typically for a classic 'jobbing steelwork fabricator shop'.

NEW DEVELOPMENTS

But of late, developments in IT are leading to software 'talking' directly to 3D software, so what is preventing the 'full steam ahead' for robots in a steel fabrication environment?

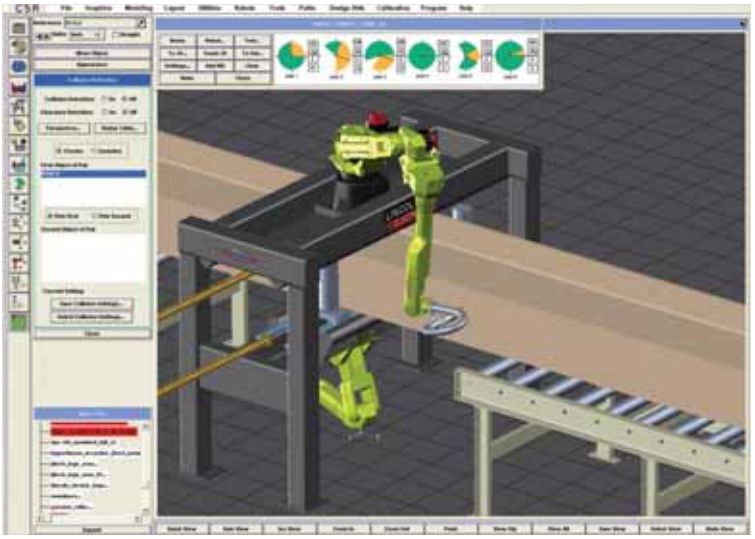
There are of course challenges beyond just the programming such as:

Fit up variations including:

- Accuracy of bevel (preparation for groove welding) angles

Welding and assembly system.

PROJECTS & TOPICS



Advanced software is available for automated systems.

- (Excessive) gaps
- Inaccuracy of back gouged grooves
- Root face dimensional variations. Remember AWS D1.1 structural welding code permits a 10% variation on groove angle preparations and 1mm on root dimensions which all robots are really able to cope with.
- Distortion as welding goes on presents difficulties

Welding procedures (WPS)

- Human welders do the processing.
- But robots will need procedures and lots of them e.g. a 3G qualification would allow a welder to do a whole array of welds in different positions, that a WPS would be required for each size of fillet weld (e.g. 5mm, 6mm, 8mm) by position. The WPS would become more complicated to deal with robot speed, rotation angle acceleration etc.
- Side 1 procedures are different to side 2 especially when pre-heats are involved.
- This leads to manual interventions.

WHAT CAN THE NEW GENERATION MACHINES DO?

- They cope well with simple beams and columns, they can handle material, cope (notch), tack and weld.
- They can and do use detailing information from the 3D software.
- Whilst they claim to be intelligent and can handle variations in gaps, distortion and weld

Ed Whalen.

procedures there are still associated issues.

- Not all of them can do penetration welds reliably.

A good news and bad news story follows, the good news – it only takes an hour to train the operator, the bad news – it can take up to 18 months to become fully efficient.

THINGS TO CONSIDER BEFORE MAKING THE INVESTMENT

- Assessing a ROI is difficult, don't expect a quick return
- They are not ready out of the box but do need customising to suit each company ordering such equipment.
- Of course such an investment in South Africa would be subject to support from DTI for improvement of productivity.
- What will happen if you put this into an existing workshop, how will the workers react? Will they try to be obstructive and make it fail, embarrassing management?
- They need lots of space – does your workshop have room?
- The whole subject of weld procedures, drafting them and feeding them into the computer and issues associated need to be considered.
- What about the operator, should he be a welder, a technician or something in between? Once it is up and running it will be quite boring for the operator.
- Scanning – the robot uses lasers, optical, touch and combinations to find out where it is and should be, shiny material can and does cause problems with some of the devices.
- The whole handling process needs to be carefully considered, how to get the material in and out.
- Be prepared for the unexpected, when things do go wrong repair is expensive.

IN CONCLUSION

Remember if you decide that now is the time to invest, you will be an early adopter, investing in 'first generation' machines with all the associated issues. There is no doubt that there are new developments on the go all over the world to sort out robot welding and integrating it into other NC controlled equipment, perhaps this is the time to be a follower and not a leader.

ED WHALEN

President, Canadian Institute of Steel Construction, Canada

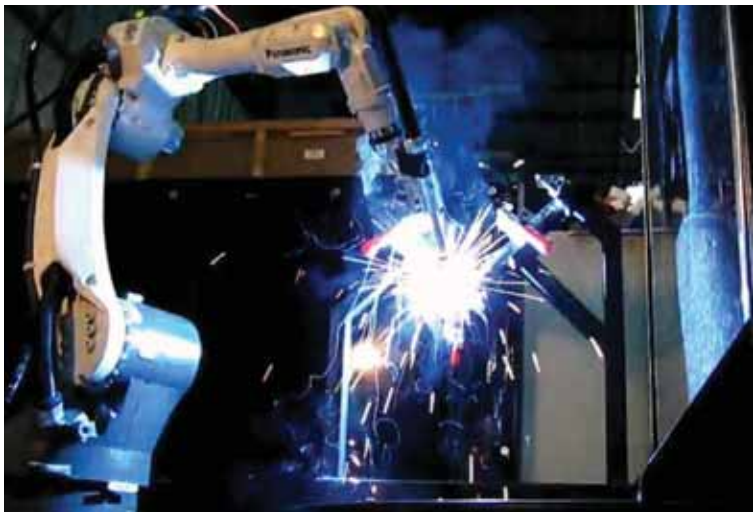
Ed Whalen is President of the Canadian Institute of Steel Construction, Canada's voice for the steel construction industry providing education and training, research and development, industry codes and standards, certification, and advocacy.

He has been in the steel industry for over 25 years. Through his career he has worked on all sides of the steel industry as a fabricator, consulting welding engineer, steel and welding inspector, regulator of welding standards (CWB), registrar of quality, environmental, and H&S management systems, trainer, and in business development.

In addition, Ed is the chairman of the Canadian Standards Association CSA G40.20/.21 General requirements for rolled or welded structural quality steel and sits on CSA S16 Design of steel structures, CSA S6 Design of steel bridges, and CSA W47.1/.2 Certification of fusion welding for steel and aluminium.

Internationally he is a member of ASTM A01, a Canadian delegate and expert in IIW (International Institute of Welding) and the Fabrication Task Group Leader in ISO TC167 WG3.

Ed is a professional engineer, an accredited CSA welding engineer, a certified CSA level 3 welding inspector and holds the diploma for International Welding Engineer (IWE) issued by the IIW.



Whilst robotic welding companies claim robots to be intelligent and able to handle variations in gaps, distortion and weld procedures there are still associated issues.

MM&G Mining and Engineering Services

MM&G overall winner at 2012 Steel Awards

MM&G Mining & Engineering Services walked away as the overall winner at the 2012 Steel Awards. The giant chimney flues and platform steelwork project the company completed at the Medupi Power Station in Lephalale, Limpopo, also won the Mining and Industrial category prize.

The annual Steel Awards, presented simultaneously in Johannesburg, Durban and Cape Town on 6 September, serve to recognise and applaud exceptional achievements within the steel industry and aim to recognise and promote excellence and entrepreneurial development in the industry, principally in South Africa, by profiling innovative thinking and successes from the industry, both locally and internationally.

Boksburg based MM&G competed with entries from local as well as international individuals and companies involved in the production, conversion, distribution, use of recommendation of carbon and stainless steel.

MM&G received the order for a fast track project on the Medupi Power Station in December 2009, said CEO Dawie Vos.

"The project entailed the supply and fabrication of flue gas ducting for two 220 meter high chimneys, each containing three flues. This was the largest project MM&G had ever attempted and completed successfully in its 34 year history. The timely construction and handover of 120 steel units, consisting of 18 stainless steel units (316L material), 102 mild steel units (S355JR material) and the remainder of 24 mild steel lobsters (S355JR material) are evidence that MM&G can compete with the best," said a proud Vos.

The judges stated that in spite of strong competition from the other four category winners, the fabrication of the complex platforms and flue cans for the world-class Medupi chimneys truly showed the "wow" factor that separates the 2012 Steel Awards winner from the rest.

The total weight of all the units was approximately 2400 tonnes, of which the stainless steel component accounted for 330 tonnes and the mild steel components, including lobster, accounted for 2070 tonnes.

Jurie Human, project director, said there seemed to be a perception that MM&G would be unable to complete the project within the agreed upon time frame.

"We proved the nay-sayers wrong. We fabricated our own workshop in record time on the Medupi site during January and March 2010, and the project started in all earnest in May 2010 with the first items of diameter studies, and the first trial assembly done in our Boksburg Workshop," said Human.

All the components for the first three flue gas ducts, for the South Chimney, were due for completion by 20 March 2011, a date to which MM&G kept as a result of excellent planning and execution of the project, said Vos. The completion date for the second delivery of flue gas ducts, for the North Chimney, had been set for 20 October 2011, and was completed early on 9 September 2011.

The total design of the interior stiffening and fabrication methodology for the flue gas ducts was done by MM&G, and was monitored by a computer programme specifically written and developed for this project in-house. Just in time delivery of value added raw material from the Aveng Trident Steel group contributed to the successful delivery of the entire project.

"The strategy was developed around a definite goal with handpicked individuals to deliver the project. The fact that the same project team worked on the project from commencement to completion, played a considerable role in our success. The same key people who designed and planned the project, also brought it to a successful conclusion, and are still with the company today," said Vos.

MM&G did face some safety challenges on the South Chimney with two lost time injuries during November 2010. They learned from the mistakes made, and after that MM&G maintained an excellent safety record throughout the project. The fabrication and erection of the flue gas ducts was completed without fatalities to the workforce, consisting of an average of 80 workers, increasing to a work crew of 107 at peak production times.

MM&G is particularly proud of the fact that the project was completed with local content and workforce.

"There were challenges to overcome, some delays due to labour strikes and xenophobic unrest, as well as the harsh weather circumstances in which the project had to be completed. Our workforce endured and persevered in temperatures that had the mercury rising to up to 54°C. Despite these potential stumbling blocks MM&G managed to complete the work within the agreed upon time frame," said Vos.

MM&G maintained an excellent quality record: The company experienced no quality rejections throughout the project, and to date there have been no rejections due to any defects. This success can be attributed to MM&G's 100% ISO compliant Quality system, said Vos.

LIGHT STEEL FRAMING AT STEELFUTURE CONFERENCE

By John Barnard, SASFA director

The market situation and opportunities with regard to light steel frame building is distinctly different in the countries represented. The major focus is on one to four storey buildings, mainly in the residential sector due to the higher volume of building. Quality is seen as of paramount importance in all the markets, and training of all practitioners is high on the list of priorities.

SOUTHERN AFRICAN LIGHT STEEL FRAME BUILDING ASSOCIATION

All who attended SteelFuture agreed that the international conference, exploring possible future scenarios of the use of steel in building and construction, was a resounding success. Due to the interest in light steel frame building, parallel sessions were arranged to focus on LSFB developments - not only in Southern Africa, but speakers from Australia, New Zealand, Europe and the USA enrolled to present papers covering the application of LSFB, new developments and growth of LSFB worldwide. The light steel frame building sessions were sponsored by MiTek, a Large Manufacturer member of SASFA.

Attendance of the LSFB sessions exceeded our expectations – one attendee summed it up by saying "it is new and exciting, and I want to know more about it!"

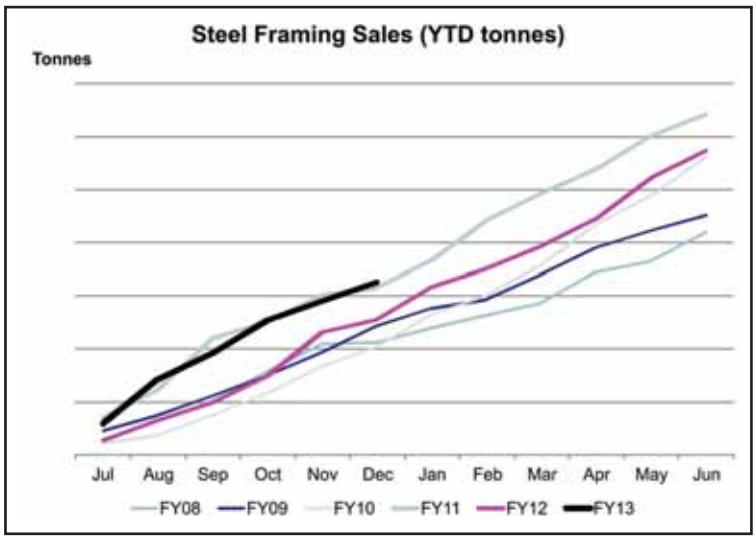
Commenting on the whole conference, an overseas speaker said: "Allow me the opportunity to congratulate you on the excellent organisation of the SteelFuture Conference and exhibition. It was very, very good. Thank you for the truly excellent promotional work which you are doing for steel in construction".

Three different themes were addressed in the LSF sessions:

The market situation and opportunities with regard to light steel frame building are distinctly different in the countries represented. The major focus is on one to four storey buildings, mainly in the residential sector due to the higher volume of building. Quality is seen as of paramount importance in all the markets, and training of all practitioners is high on the list of priorities.

In New Zealand, NASH NZ claims to have captured 7% of the residential market, up from 1% in 2008, according to Carl Davies, General Manager of NASH NZ. As is the case elsewhere in the world except in South Africa, their major competitor is timber frame building, with a market share of some 90%. Through active promotion of the benefits of LSFB – including a 30 second television advertisement – and involving senior politicians, they aim to increase their share of the market. Their LSF market potential is estimated at some 60 000 tons of high strength galvanized steel sheet per year. New Zealand is in the forefront of manufacturing of profiling machines for LSFB, and has supplied thousands of machines to more than 80 countries worldwide.

Just across the Tasman Sea, NASH Australia is also focussing on the low rise market for single residential buildings, says Ken Watson, Executive Director of



LSF has captured 7% of the residential market in New Zealand, up from 1% in 2008.

The Narrabri Hospital, New South Wales is a LSF project in Australia, where they are increasing their market share in non-residential markets.

NASH Australia. Australia is widely regarded as the leader in modern light steel frame building – they were involved in developing design software which is used in conjunction with low cost profiling machines and thin gauge, high strength galvanized steel sheet (typical thicknesses ranging from 0.55mm to 1.0mm). They have captured an average of 10% market share for LSFB against timber frame construction, reaching up to 30% in certain regions and cities. Other markets include retirement villages, hospitals, schools, and retail buildings. NASH AU is very active in improving and expanding their building code.

Maribeth Rizzuto is the Director of Education for the Steel Framing Alliance (established in 1998), and the MD of the Cold-formed Steel Engineers Institute of the USA. LSFB has been actively

John Barnard gave a presentation on the rapid growth of LSFB in South Africa.

Seismic testing was done in New Zealand on a LSF test house. It was subjected to nine shakes of increasing magnitude on an approved shaking table.

promoted in the low rise building market in the USA since the early 1990s. They are competing against mainly timber frame construction for a 13 million ton/yr market. Convinced that LSF is the better solution, they decided that more needs to be done to make it price competitive. Design aids were compiled to make things easier for designers, and improved steel sections were developed. In 2000 they expanded their scope to mid-rise buildings (four to nine storeys) in the dormitory and apartment building markets. Regular training courses are held for designers and artisans, including 'webinars' which enables interested parties to 'attend' seminars via the internet.

Light steel framing with EIFS enabled the designer of the building to bring relief into the facade and to break away from vertical lines normally prescribed by heavy masonry or precast cladding systems.

Research topics include seismic design optimisation, thermal improvements, acoustics, fire-rating and improved structural design programs. Sustainability of steel framed buildings is being used to leverage market growth.

John Barnard, Director SASFA, gave a summary of the rapid growth of LSFB in Southern Africa. Development of this market is especially challenging, as the major competitor is masonry building – a totally different construction methodology. SASFA was formed only in 2006, and immediately set off to develop a South African LSF building code, with help from NASH Australia. Training programmes were developed for designers, inspectors and building contractors. Supported by the major material suppliers – ArcelorMittal SA, Saint-Gobain, Everite and Lafarge Gypsum, SASFA membership grew steadily to 78 company members in early 2013. The middle to upper income residential market developed first, followed by schools, clinics and office buildings. Local architects saw the opportunity to use LSF for external curtain walls for multi-storey commercial and office buildings – resulting in some very exciting structures. Not only is LSFB taking off in South Africa, its use is also expanding in Sub-Saharan Africa.

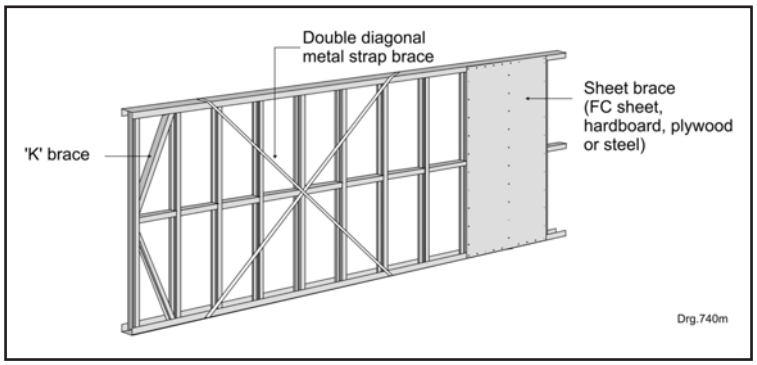
LSFB in multi-storey or non-residential applications: The application of light steel framing is certainly not limited to single or double storey residential buildings. Sterik Gerber, a director of the architect firm Boogertman + Partners, presented a paper on the benefits of using LSF for the external walls of an award-winning office building. Having decided that the building must have visual impact, the architect emulated the texture of the trees and grasses that had to be removed to make place for the building, in the facade. Light steel framing with EIFS (external insulation and finishing system), enabled the designer to bring relief into the facade and to break away from vertical lines normally prescribed by heavy masonry or precast cladding systems. The speed of building, the much cleaner and safer building site, the accuracy that can be achieved with LSFB, earlier access for the following trades and the improved insulation of the building (resulting in savings on air conditioning plant and electricity consumption), are some of the benefits he listed. He concluded "and we believe this construction method to be the future of commercial building in South Africa".

SASFA

A well insulated LSF building, with photo voltaic panels on the roof, produces more electricity than is required for normal operation.

The Villa Mall near Pretoria is another example of the huge advantage offered by LSF for external and internal walling of multi-storey commercial buildings. Apart from the better insulation, speed of construction and the other mentioned benefits, this project exemplifies the impact of mass savings in the walling materials – the thickness of the concrete slabs could be reduced due to the significant load reduction from using LSF instead of masonry cladding and walling. This in turn made it possible to reduce the RC column sizes, which added to the load reduction which made huge savings possible on the piles supporting the building. Reduction of wet trades on site resulted in savings in water consumption during the construction period.

The cold-formed steel building industry in the USA is increasingly using LSF for mid-rise construction – four to nine storeys – according to Maribeth Rizzuto. This is due to the excellent set of design standards that has been developed for LSF in the USA, the durability offered by the pre-galvanized steel sheet, the termite resistance of steel framing as well as the non-combustibility of the structural and cladding materials. LSF also promotes a healthier indoor environment, as it contains no volatile organic compounds (VOCs). Add to that the environmental benefits of reduced scrap and high recycling rate of steel – 'the most recycled material in the world'. Market factors are driving residential buildings to higher levels – the higher cost of land favours mid-rise buildings. Accordingly there is an upward trend from the three to four storey buildings up to nine storeys, creating a growing potential market for mid-rise LSFB.



The University of Pretoria is currently busy with LSF research projects on wall bracing, floor stiffening, and anchorage of LSF buildings.

Research for improved performance of LSFB, and new developments: Interesting research projects, with a wide range of objectives were presented, from improving structural aspects of the steel frame, to assessing the thermal efficiency of a well insulated LSF house compared with an identical masonry building.

The performance of LSFB in bushfires was researched by NASH Australia. Ken Watson reported that a full scale building was put to the test, with flames fuelled by gas enveloping the entire building for up to 30 minutes. It was found that the integrity of the steel structure remained intact, and that post fire repair costs were relatively low compared with other building methods. NASH NZ coordinated tests on a full scale one-roomed building to measure the resistance of LSFB (with brick veneer as external cladding) to an earthquake. Carl Davies reported that the steel frame was able to resist an earthquake of 9 on the Richter scale, without dramatic damage to the external walling.

Dr Dirk Conradie, CSIR, reported on research carried out on the current and expected future climatic conditions in Southern Africa, and the predicted thermal performance of a LSF built dwelling in different climatic zones. In all cases, the heating and cooling energy requirement for a standard LSFB was lower than that for a geometrically identical masonry building.

Prof Ben van Rensburg, University of Pretoria, reported on research projects on wall bracing, floor stiffening, and anchorage of LSF buildings. Alternative methodologies are suggested for some aspects, and in certain cases additional research work is recommended. It is of significance to the industry that tertiary institutions are becoming interested in LSFB.

Finally, Colin Hautz, ArcelorMittal Corporate, Belgium, presented a paper on a possible low energy house in 2020. Using a well insulated LSF building, with photo voltaic panels on the roof, the house produces more electricity than is required for normal operation, allowing for charging an electric car!

CONCLUSION

After all was said and done, it was abundantly clear that light steel frame building is on an upward curve in the US, Australasia and in Southern Africa. We should learn from each other to optimise the application of this building method, whether on its own, or in conjunction with heavy steel or reinforced concrete framed buildings.

SASFA

KEN WATSON

Executive Director, NASH Australia

I think that the future of the lightweight steel framing industry is very bright and exciting. Light steel framing gives substantial sustainability advantages through the use of high strength steels, efficient optimised sections and very little waste as items are cut to length and reused or recycled at the end of its life.

Ken Watson is considered among his international peers as one of the most knowledgeable people in the lightweight steel frame building industry. The LSFB industry is relatively young (especially when compared to the old fashioned steel one), but has been around the longest in Australia. Thus the National Association of Steel-Framed Housing (NASH), Australia of which Ken is the Executive Director is one of the longest running associations for LSF internationally.

Ken followed in the footsteps of his father and realised his childhood dream by graduating with a BE(Civil) degree from the University of Melbourne. He obtained a MEngSc from the University of Sydney.

Prior to joining NASH Ken managed the large engineering fabrication business of J Furphy & Sons which fabricated galvanizing kettles and stainless steel tanks as well as undertaking a wide range of general fabrication work. He joined BHP Steel's Structural Steel Development Group in 1985 and served in a number of roles including Manager, Research and Development Manager and Market Development Engineer. Here he honed his valuable skills that would greatly benefit the LSF industry in Australia. This Group undertook market development activities to grow the market for steel in construction with a focus on the multi-storey building market. He also worked as a structural engineer on various projects in both the building and engineering construction markets.

Ken is a Fellow of the Institution of Engineers.

When asked what the future holds, he answered the following:

The next couple of years will be very challenging as the world works out their current financial issues. This is further compounded by the changing economic dynamics of the world economy. However these times will provide opportunities for people with vision who can think outside the square.

In general, some obvious issues that we will have to deal with are:

- *The aging population of developed countries*
- *Lack of skilled trades' people*
- *Greenhouse gases and global warming*
- *Ensuring the population is productively employed*
- *The increasing computerisation of all our activities*

Feeding the monks in Laos.

Ken Watson (centre) with members at NASH Business Improvement Workshop.

■ *Valuing human interactions and discussion and exchange of ideas*

Although the challenges for the future in broader terms seem to outweigh the opportunities, I think that the future of the lightweight steel framing industry is very bright and exciting. Light steel framing gives substantial sustainability advantages through the use of high strength steels, efficient optimised sections and very little waste as items are cut to length and reused or recycled at the end of its life.

The challenge for the industry is to use these benefits to produce innovative new products to meet the construction industry's needs. The steel industry needs to collaborate extensively with all parties during the development of these new products. The challenge for the steel framing industry is to lift its efforts and expertise to successfully market these products.

As part of this exercise we need to educate and train all sectors of the construction industry including owners, architects, engineers, builders, detailers and trades' people.

Apart from work Ken is a seasoned traveller. He enjoys travelling to new and exciting places to gain an understanding of the cultural, political and historical aspects of the country but also to complement his interest in photography. Over the recent years he visited New Zealand, Thailand, Laos, Vietnam, Cambodia, Ecuador, Peru, Bolivia, Hawaii, Namibia, Japan, China and of course South Africa and travelled widely in Australia including the Great Barrier Reef and the Kimberleys. These trips have included trekking to places of interest. He is looking forward to visiting Antarctica and Patagonia in the next year or so. Other places on the 'to see' list include Ethiopia, Burma and Bhutan.

The last bridge of the Routeburn Track NZ.

When he is not travelling Ken enjoys gardening, reading, cooking and attending theatre productions. He is a keen follower of his favourite Australian Rules Football Club of Hawthorn which has been reasonably successful over the last few years. He enjoys keeping fit with regular gym sessions and walking.

Ken is currently reading *Lockdown* by Drauzio Varella and also enjoys detective stories for light relief. He naturally enjoys watching travel and historical documentaries. He learnt to play the piano as a child and still enjoys listening to classical music.

My philosophy of life is to enjoy it as you only have one! I navigate my way through life by always trying to gain an understanding of why people act in a particular way. I also believe that we need to look after our planet by taking real action to address the issues that are backed by scientific evidence.

ABOUT NASH, AUSTRALIA

Similar to SASFA, NASH is an active industry association centred on light structural steel framing systems for residential and other relevant structures. It represents the interests of suppliers to; practitioners in; and customers of steel framing systems.

NASH key objective is to support the long term growth and sustainability of the steel frame industry in Australia. Its current initiatives include:

1. Development of a national training approach for Steel Frame fabrication and erection capability
2. Development of efficient methodologies for safely erecting steel frames, trusses and associated items at height
3. Development of NASH Standards and manuals for the efficient design and construction of steel framing in low-rise structures. These publications will be used as a tool to promote steel framing to all participants of the construction industry.

SASFA

THE USE OF COLD-FORMED STEEL IN MID-RISE CONSTRUCTION IN THE UNITED STATES

CASE STUDY: PIATT PLACE, PITTSBURGH

By Maribeth Rizzuto, Director of Education and Sustainable Construction, Steel Framing Alliance and Managing Director, Cold-Formed Steel Engineers Institute, USA

This article originally appeared in Walls & Ceilings magazine

Enlarging the footings would have increased costs, lengthened the schedule, and disrupted the operations of the existing building to the point of making the project unfeasible. Conventional framing methods using structural steel and concrete proved too heavy. With attributes of high strength-to-weight ratio, cold-formed steel was the natural choice.

Piatt Place, a feather in the cap for cold-formed steel, is part of the revitalisation of downtown Pittsburgh.

The building community has became more aware of cold-formed steel's capabilities which has led to new and challenging uses for the material once limited to partition and curtain walls. Today, load-bearing applications for cold-formed steel are being used across the US for exciting projects in the hospitality, retail, assisted living, multi-family and mid-rise markets.

It is hardly surprising that in a down economy, developers are implementing strategies to maximise their return on investment all while producing award winning projects. In some cases, in densely populated urban areas especially, the only way to go is up, and that is just where the developers of multi-purpose, mixed-use projects have gone to fulfil their goals.

The urban setting for this project was downtown Pittsburgh. Once described as "hell with the lid lifted," Pittsburgh continues to undergo a rebirth of its central core with visionary projects. Combining the tried-and-true building stock of the past with revitalised transformation, these projects offer all the amenities of a major city but with a 'down-home' feel. One such project that has led the charge is Piatt Place, the site of a former four-storey department store with three storeys of underground parking which has been converted into what some have referred to as an urban oasis. This new seven-storey mixed-use structure combines 50 000 square feet (4 650m²) of retail space, 180 000 square feet (16 700m²) of office space and 65 high-end condominiums.

And as valiant strides are being made to focus more attention on sustainability efforts through the reuse of existing building infrastructure, developers have also become extremely creative. The project owners wanted to build up on the roof by adding three new storeys on the top of the existing building for upscale living spaces to offer spectacular views of the city.

Like any project, Piatt Place had its share of challenges, namely how to add three additional storeys for residential use to the existing structure with minimal cost and disruption to the existing structure, coupled with a very tight footprint surrounded by the existing workings of a major downtown landscape without

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Maribeth Rizzuto.

enlarging the footings. Enlarging the footings would have increased costs, lengthened the schedule, and disrupted the operations of the existing building to the point of making the project unfeasible. Conventional framing methods using structural steel and concrete proved too heavy.

With attributes of high strength-to-weight ratio, cold-formed steel was the natural choice. Long-term durability and flexibility in design afforded the owners the opportunity to produce these high-end condominiums at prices acceptable to the market. The duration to install the three-storey structure atop the new steel platform was four and a half months. Cycle time savings were realised in the exterior envelope also being substantially completed during this same timeframe as the cold-formed steel framing system was panelised off-site.

The residential portion of the project incorporated a structural steel frame with a composite metal deck to create a platform over the existing roof.

This platform was necessary to support three storeys of residential condominiums built around the central courtyard on top of the existing building. The additional residential storeys were constructed atop the concrete slab using cold-formed steel and a lightweight gypsum-concrete topping.

The addition was designed using cold-formed steel to serve as the primary axial load-bearing and lateral load-resisting system on the new floors. The use of cold-formed steel, a lightweight material, allowed them to minimise the additional weight on the foundation and footing so the existing structural framing could be used and upgraded to meet building code requirements for the extra loads with minimal additional costs, making the project economically feasible. Architectural requirements to make this an outstanding project required open floor layouts with continuous glass exterior walls to open the condo units to the exterior views of the city. As a result, no significant lengths of solid walls were available in the exterior walls for conventional diaphragm or x-braced shear walls. To overcome this framing challenge, the cold-formed steel joists and decks of the floors and roof were designed to act as a diaphragm to transfer the lateral loads from the corners and exterior walls of the building to an inner core of beefed-up and overlapped patented x-braced shear walls.

The end result: An outstanding example of urban living contained in a structure boasting many attractive shops, offices, and other services supported by a wonderful revitalised downtown have indeed made it the place to live in downtown Pittsburgh.

MARIBETH RIZZUTO

Director of Education and Sustainable Construction, Steel Framing Alliance and Managing Director, Cold-Formed Steel Engineers Institute, USA

Maribeth Rizzuto, LEED AP BD&C, is director of Education and Sustainable Construction, for the Steel Framing Alliance and Managing Director of the Cold-Formed Steel Engineers Institute. In these positions, she is responsible for the infrastructure development to enable the widespread, practical application and use of cold-formed steel framing. An eighteen year veteran of the steel industry, Ms. Rizzuto has conducted information and education training seminars, providing the latest information on advancements in sustainability/green building, construction applications, tools, fasteners, and codes. The seminars have been conducted for the AIA, ASCE, CSI, ICC, National Association of Home Builders and various construction related organisations for continuing education credits.

Inside a mid-rise building during construction with cold-formed steel.

SASFA

NASH (AUSTRALIA) LEADS RESEARCH IN BUSHFIRE CONSTRUCTION

By Ken Watson, Executive Director, NASH, Australia

The inherent non-combustibility of steel framing allows steel to provide a very economical solution for houses constructed in bushfire areas whilst substantially increasing the ability to withstand a bushfire attack.

Before... In 2010, an experimental steel framed steel clad building was tested for its capacity to withstand bushfire flame zone conditions at the NSW Rural Fire Service Eurobodalla Training Centre.

As bushfire risk seasons come and go in Australia, the research effort to develop more effective and economical methods of construction in bushfire areas is ongoing. The National Association of Steel-framed Housing (NASH) is a leading participant in that effort, working with CSIRO Sustainable Ecosystems and industry partners to conduct a variety of bushfire resistance tests on steel floor, wall and roof systems constructed from familiar, readily available and easily installed products and materials.

In the initial test in April 2010, an experimental steel framed steel clad building was tested for its capacity to withstand bushfire flame zone conditions using the Bushfire Flame Front Simulator at the NSW Rural Fire Service Eurobodalla Training Centre at Mogo, New South Wales (NSW). Developed by CSIRO scientists working with the NSW Rural Fire Service, Victorian Country Fire Authority and engineering consultants, the outdoor simulator uses a controlled liquid propane fire to recreate actual bushfire flame temperatures and radiant heat flux profiles. This is an accepted method of testing fire fighting vehicles and equipment and the simulator has been used in this way for over 10 years. At the encouragement of NASH, the simulator was adapted by CSIRO for testing of buildings to allow for size and details that are difficult to model with laboratory tests alone. The exposure profile developed by CSIRO for this test was based on the thermodynamic principles and assumptions of AS 3959.

The 2010 test building was constructed from conventional, readily available non-combustible materials and assembled by trade contractors. Its external envelope consisted of steel cladding to provide an ember and flame barrier. The use of non-combustible materials on the building envelope and in the roof cavity provides excellent resistance to ember attack which is the primary cause of most house loss in Australian bushfires. The building was insulated to a 6-star energy rating but did not incorporate specialised fire resistant construction in the primary floor, wall and roof structure.

The exposure profile comprises 47 minutes of radiant heat during which the bushfire flame front approaches, contacts and then recedes from the subject

The wall panels were tested using different insulation details.

building. This profile is quite different to the standard fire tests on which the deemed-to-satisfy tests in AS 1530.8 are based, being shorter in duration but much hotter in peak temperature. The roof and floor systems of this building withstood the exposure with minimal damage, while the wall system, insulated with economical glasswool batts, showed some thermal and structural failures.

The NASH research team identified that the main weakness in the wall system was the absence of an effective primary thermal barrier to delay the heat flux through the wall in the brief but critical period of maximum thermal exposure during flame contact. The team investigated numerous solutions to the problem using, as far as possible, techniques that did not involve specialised or expensive products or materials. Products considered were conventional and fire-rated plasterboard, various types and grades of glasswool and mineral wool, and a number of insulation panel products.

In August 2011, further testing using four alternative wall designs was conducted using the Radiant Panel Test Facility at CSIRO Sustainable Ecosystems at Highett, Victoria. This facility can test building elements up to approximately 1 000 x 1 000mm under radiant heat only or radiant heat plus flame contact. The test rig can be programmed to model the same radiant heat exposure curve and flame contact interval as the outdoor simulator.

The four wall panels were tested using different insulation details. All panels included a lightweight steel frame, steel wall cladding on steel battens and plasterboard internal lining. Insulation materials used were mineral fibre insulation batts, standard plasterboard with glasswool batts and a rigid phenolic foam panel with and without a fire-rated plasterboard layer. The test panels were instrumented in the same manner as the outdoor tests to measure flame body, cavity, batten, stud, and plasterboard surface temperatures.

Assessment of the test results showed that all four wall systems performed significantly better than the original specification, with the maximum temperature experienced on the interior wall surface for any of the wall panels tested being under 50°C.

The exposure profile comprises 47 minutes of radiant heat during which the bushfire flame front approaches, contacts and then recedes from the subject building.

These most recent tests confirm that readily available, economical, easily installed, non-combustible materials may be used successfully for Flame Zone construction. The results of the tests are forming the basis of a NASH standard on bushfire construction using steel structural and architectural products.

The Standard allows normal steel frame construction of cold formed steel roof and wall cladding, steel frames and trusses with glass or mineral wool insulation for Bushfire Attack Levels (BAL) up to BAL-40. This represents a fire load of 40kW/m^2. For a building constructed in a very high bushfire prone area where flames can impinge on the building i.e. Flame Zone (FZ), additional insulation is placed under the metal roofing and in the walls. The inherent non-combustibility of steel framing allows steel to provide a very economical solution for houses constructed in bushfire areas whilst substantially increasing the ability to withstand a bushfire attack.

After... The roof and floor systems withstood the exposure with minimal damage, while the wall system, insulated with economical glasswool batts, showed some thermal and structural failures.

AND THE 3RD STEEL AWARDS PHOTO COMPETITION

THE STEEL CONSTRUCTION AWARD FOR EXCELLENCE IN THE USE OF STRUCTURAL STEEL

SAISC Steel Awards dinner in Gauteng, KZN & the Western Cape: 19 September 2013

ENTRY DEADLINE - 30 APRIL 2013

CATEGORIES

- No fixed categories – except the Tubular and Light Steel Frame Categories.
- Judges decide on the categories and winners based on the actual entries received.
- However in the light of our theme, special attention will be given to export projects on the African continent.

In 2012 the following categories were covered:

- Overall Winner
- Tubular Structures
- Mining and Industrial
- Architectural (Combined with Light Steel Frame Building)
- Bridge
- Sustainable Development

We do our best to give A**LL** projects entered some publicity – so please enter the projects you are most proud of.

CRITERIA

Does the project illustrate what can be achieved with steel?

Other factors to be considered:

- The importance of steel as a structural component of the project
- Benefits achieved by using steel construction
- Aesthetic appeal
- Environmental/ sustainability consideration
- Innovation in design, fabrication or construction
- Technical prowess required for realising the project
- Engineering expertise
- Exceptional quality of workmanship

MORE CRITERIA

- Tubular content
- Export project with special focus on Africa
- Satisfaction of client's brief, particularly cost and/or time efficiency (speed of construction)
- Special details: cladding, bolted or welded connections, or the like
- Value to society/ community development
- Any other unique features

CONDITIONS OF ENTRY

Go to www.saisc.co.za/steel_awards_2013 to see if your project qualifies or send an email to Reneé Pretorius at renee@saisc.co.za

ENTRY FEES

1. Projects with a mass of less than 10 tons a fixed rate of R750.00 (incl. VAT) will be charged.
2. For larger projects a fee of R3000 (incl. VAT) will be charged which will entitle the nominator company to one complimentary seat at the Steel Awards dinner at the venue of their choice - Johannesburg, Cape Town or Durban on the condition of booking more than one seat.

MATERIAL TO BE SUBMITTED BY 30 APRIL 2013

1. The fully completed entry form
2. Pictures of the project (one will be considered for the Photo Competition)
3. A description of the project and a motivation for entering the project

For the details and to submit your entry - go to: www.saisc.co.za/steel_awards_2013

PHOTO ALBUM

SteelFuture EXHIBITORS

ABOVE LEFT: Steve van Wyk (First Cut) chatting to Maurice Zermatten (Retecon) – Retecon/Ficep Stand 4.

ABOVE: Cadex SA (Main Sponsor and Exhibitor Stand A).

TOP RIGHT: Rencia Grundlingh representing the SA Institute of Welding (Stand 12).

RIGHT: Steven Patridge from FabTrol Systems UK (Stand 17).

ABOVE: John Chalmers and Francois Basson from Simpson Strong-Tie (Stand 22).

RIGHT: Ian Walker and Patrick Pereira from Peddinghaus (Sponsor and Exhibitor Stand 11).

FAR RIGHT: Monya de Kok representing Genrec (Stand 16).

BELOW: Paul Marais and Carlo Verster – AceCad Software Southern Africa (Stand 3).

ABOVE: ArcelorMittal SA (Exhibitor Stand 7 and Conference Notepad and Pen Sponsor).

LEFT: John Barnard, SASFA Director on the SASFA stand (C). The roof trusses were custom made by MiTek Industries.

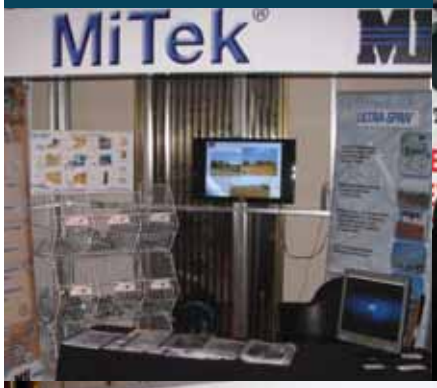
FAR LEFT: Voortman Stand 13 – Peter van Grol (Voortman) and Richard Brotherton (AceCad).

PHOTO ALBUM

ABOVE: Michelle Nel and her team from Aveng Trident Steel (Conference Bag Sponsor and Exhibitor Stand 7 & 8).

RIGHT: Adelaide Ruiters from Structa Group (Stand 10).

BELOW: MiTek Industries was the Light Steel Frame Building Sessions Sponsor and exhibited on Stand 18.



TOP & ABOVE: Macsteel Trading Cellular Beams – Stand 14 (Macsteel was the Innovative Sponsor and Conference Lunch Sponsor on Day 2).

LEFT: Colin Shaw (ASTPM Executive Director) with Franco Mordini (Macsteel Tube & Pipe) at the ASTPM stand.

BELOW: Lindapter/Struttfast (Stand 21).

ABOVE: The SAISC School Of Draughting shared a stand (B) with the SAISC.

RIGHT: Owen Manwatha representing Grating World (Stand 2).

FAR RIGHT: Johan Joubert and Jacques Spies from B & T Steel (Stand 5).

EXHIBITORS

ASSOCIATION OF STEEL TUBE AND PIPE MANUFACTURERS OF SOUTH AFRICA

Exhibitor – Stand 19

CONTACT: COLIN SHAW OR MARGIE OLIVIER

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Postal Address: PO Box 18587, Sunward Park 1470

The ASTPM was established in 1983 and represents the welded carbon steel tube and pipe manufacturers in South Africa. The members account for 90% of the installed capacity for conveyance, mechanical and structural tubular products which are supplied to international specifications.

The product range for spiral, large and small diameter tube and pipe is comprehensive. Full details of our member's product ranges, tube specifications and value added services are available on the individual member's web page on our website www.astpm.com.

The Association is a non profit organisation and membership is open to bone fide tube and pipe manufacturers in South Africa.

B&T STEEL

Exhibitor – Stand 5

CONTACT: BRYAN WILKEN

Tel: +27 (0) 13 665 1914
Fax: +27 (0) 86 528 3349
Email: marketing@btsteel.co.za
Website: www.btsteel.co.za
Physical Address: 16 Flambojant Street, Delmas 2210

B&T Steel was established in 1995 and specialise in detailing, fabrication and erection of structural steel in South Africa and Sub Saharan Africa.

The workshop is situated in Delmas, Mpumalanga and houses state of the art CNC machinery that allows the business to fabricate 500 tons of structural steel a month.

Recent projects include: Workshops in Mauritania, Sierra Leone, Bakino Faso, Namibia, Guinea, Angola, Mozambique and Zambia; Burgersfort Shopping Mall; Elim Shopping Mall; Mahwelereng Shopping Centre; Namakgale Shopping Mall and an automotive plant for Ford.

B&T Steel is ISO 9001 accredited and is a member of the SAISC as well as the ISF.

BRONX INTERNATIONAL

Exhibitor – Stand 20

CONTACT: JACO DE WAAL

Tel: +61 2 9534 4233
Fax: + 61 2 9534 4732
Email: jacodewaal@bronx.com.au
Website: www.bronxintl.com

Bronx International is a world innovator in the design, manufacture and technology of coil colour coating lines and galvanizing lines.

Continual research into market requirements has led to the advent of the Bronx Warehouse range of lines. The Warehouse lines are a group of cleverly designed compact colour coating lines that minimise the factory floor area and height required, which in many cases allows a line to fit within an existing warehouse.

Bronx has 13 references in Africa, two of which are warehouse lines. Bronx will be available to discuss the opportunities this represents to new entrants into the market.

FABTROL SYSTEMS UK LTD

Exhibitor – Stand 17

CONTACT: STEVEN PARTRIDGE

Tel: +44 (0) 1274 590865
Email: info@fabtrol.com
Website: www.fabtrol.com
Physical Address: 2 Ashley House, Commercial Mills, Wharf Street, Shipley, England

FabTrol Systems, a global leader in steel fabrication management solutions since 1984, is a proud member of the Dowco Group.

Founded by steel fabricators, and still built around a core team of former steel fabricators, the company continues its commitment to the industry by continuously researching fabricators' needs, developing new software solutions, actively seeking feedback from its customer companies – over 1 000 globally – and by working with other industry leaders to address existing and future needs.

EXHIBITORS

FIRST CUT / NUOVACMM

Exhibitor – Stand 15

CONTACT: STEVE VAN WYK

Tel: +27 (0) 11 614 1112
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Email: stevev@firstcut.co.za
Website: www.firstcut.co.za
Physical Address: 18 Adam Road, Benrose

With over 50 years' experience, First Cut is one of southern Africa's leading distributors of international capital equipment and consumables. Employing 240 people, First Cut has a national footprint with branches and distribution facilities across South Africa, including Johannesburg, Cape Town, Port Elizabeth and Durban. This allows the company to provide quick and efficient maintenance, and support on a just-in-time basis.

The company's capital equipment division specialises in sheet metal processing, structural fabrication machinery, tube manipulation, a large selection of bandsaw machines, lasers, benders and water jets for the industrial, engineering and general manufacturing sectors.

GENREC ENGINEERING (PTY) LTD

Exhibitor – Stand 16

CONTACT: MONYA DE KOCK

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Fax: +27 (0) 86 765 0363
Email: monya.dekok@murrob.com
Website: www.genreceng.co.za
Postal Address: Private Bag X035, Wadeville, 1422

Fabricating Innovative Steel Solutions

At Genrec Engineering, our values deliver your vision. We know that a company's products are a reflection of the team that creates them. Our people are the underlying force driving the delivery of your vision with embedded values to deliver beyond our customers' expectations.

Working with honesty, accountability and care, our collective team is committed to fabricating innovative steel solutions to meet your specific needs.

Genrec's capabilities include: Total project management; steel detailing solutions; light, medium and heavy structural fabrication; heavy machining; planning and programming; material logistics and erection.

GRATING WORLD (PTY) LTD

Exhibitor – Stand 2

CONTACT: GARY CRAWFORD

Tel: +27 (0) 11 452 1150/1/3
Fax: +27 (0) 11 452 2536
Email: gary@styria.co.za
Website: www.gratingworld.co.za

Grating World is dedicated to being Southern Africa's one-stop source for world-class solutions in access platforms, walkways, stairtreads, handrailing and flooring in carbon steel, stainless steel (3Cr12, 304, 316) and composites (FRP).

It is a member of a specialised equipment group which has provided solutions since 1956 – from minerals beneficiation, petrochemicals and chemicals, pulp and paper, to foods and beverages.

Focussing on practical and aesthetic engineering design and a wide product range, Grating World provides cost-effective, value-engineered solutions.

Decades of valuable experience in design and fabrication ensure turnkey service to satisfy your expectations.

LINDAPTER / STRUTFAST

Exhibitor – Stand 21

CONTACT: STEVE ENDLEY

Tel: +27 (0) 11 473 1212
Fax: +27 (0) 11 473 1919
Email: stevene@strutfast.co.za
Website: www.lindapter.com / www.strutfast.co.za

Established in 1934, Lindapter manufactures high quality products for connecting steel sections without drilling or welding – a unique 'clamping' concept proven to reduce installation time and labour costs.

Products include:

Girder Clamp – Safe, high strength connections (SWL up to 250kN) achieved by simply clamping two steel sections together.

Hollo-Bolt – The expansion bolt for structural hollow section is quickly installed by inserting into pre-drilled SHS and tightened using a torque wrench.

Lindapter's steelwork connections allow a faster installation, on-site adjustability, reduced labour costs and no damage to steel sections or protective coatings.

EXHIBITORS

RETECON / FICEP

Exhibitor – Stand 4

CONTACT: MALCOLM MORIARTY

Tel: +27 (0) 11 976 8600
Fax: +27 (0) 11 394 2471
Email: machines@retecon.co.za
Website: www.retecon.co.za
Physical Address: 100 Plane Road, Spartan, Kempton Park

Retecon, which stands for Reliable, Technical Consultant, was established in 1971 with a focus on supplying machine tools to the South African industry, and now with offices in Durban, Port Elizabeth and Cape Town. Our overseas partners include world leaders in machine tools such as: Dmg Mori Seiki, Trumpf, Agie Charmilles, Ficep, Heller, Kasto and Hexagon Metrology to name a few.

Retecon has a wide variety of products available, ranging from vertical and horizontal machining, turning, multi-spindle lathes, universal milling and boring, grinding machines, laser cutting systems, bending systems, punching and forming machinery, automatic sawing equipment, roll forming and tube bending machinery, manufacturing lines, measuring equipment and much more.

STRUM.I.S / ACECAD

Exhibitor – Stand 3

CONTACT: PAUL MARAIS

Tel: +27 (0) 87 150 5556
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Email: p.marais@acecad.co.za
Website: www.acecadsoftware.com
Physical Address: Cnr Hendrick Potgieter and 7th Avenue, Edenvale

AceCad is a leading developer of software solutions for the structural steel industry and construction sector since 1986. Our software products include steel estimating, steel fabrication information and production management, visual project collaboration and BIM project management tools.

StruM.I.S is a complete steel fabrication management information and production system for engineering and steelwork fabrication companies looking to manage their business more effectively. The system harnesses work processes through the steelwork contract between departments, suppliers and clients; from estimate tendering, through procurement and production into construction. Essentials is our new low cost, fabrication and shop management system, for smaller to medium sized fabricators.

AceCad has international operations providing sales, training and technical services that support our customers around the world.

SAISC SCHOOL OF DRAUGHTING

Exhibitor – Stand B

CONTACT: JENNY CLAASENS

Tel: +27 (0) 11 876 5324
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Email: jenny@saisc.co.za
Website: www.schoolofdraughting.org
Physical Address: Steeledale House, Power Street 669, Germiston

The SAISC School of Draughting, a subsidiary of the SAISC, offers a 2 year National Diploma in Structural Steelwork Detailing (SAQA QUAL ID 48636). The school is an accredited CETA Training Provider. (Accreditation No.5P53432).

The school, established in 2008, has been steadily turning out detailers not only with a national diploma, but with a high standard of training behind them.

The programme ensures that graduates can operate Cad software and are fully trained on Tekla 3D software. They fully understand the technology required by steel detailers, have a good introduction to the behaviour of steel structures and how to select simple connections from tables in the SA Steel Construction handbook (The Red Book). They also understand welding requirements. They have been introduced to estimating.

SOUTHERN AFRICAN INSTITUTE OF WELDING

Exhibitor – Stand 12

CONTACT: DIMITRA KREOUZI

Tel: +27 (0) 11 298 2102
Email: kreouzid@saiw.co.za
Website: www.saiw.co.za

The Southern African Institute of Welding (SAIW) is a non-profit technical organisation dedicated to furthering standards in welding-fabrication and related technologies. Established in 1948, it is a founder member of the International Institute of Welding (IIW).

SAIW provides training programmes, consultancy and industry support services. Based in Johannesburg, with branches in Cape Town and Durban, we are active throughout Southern African and also have experience further afield – predominantly in Central Africa, the Indian Ocean Islands and the United Arab Emirates.

SAIW has offered training courses for more than 30 years. An SAIW qualification has long been regarded as the industry standard in South Africa and also enjoys international recognition.

EXHIBITORS

SIMPSON STRONG-TIE

Exhibitor – Stand 22

CONTACT: FRANCOIS BASSON

Tel: +27 (0) 87 354 0629
Fax: +27 (0) 21 702 3679
Email: FBasson@Strongtie.eu
Website: www.strongtie.com

For more than 50 years, Simpson Strong-Tie has focused on creating structural products that help people build safer and stronger homes and buildings. Considered a leader in structural systems research, testing and innovation, Simpson Strong-Tie is one of the largest suppliers of structural building products in the world.

The company is committed to helping customers succeed by providing exceptional products, full-service engineering and field support, product testing and training. Simpson Strong-Tie works closely with industry professionals to provide code-listed, field-tested products, and value-engineered solutions.

Simpson Strong-Tie products are known for their consistent quality and availability as well as for helping structures resist high winds, hurricanes and seismic forces.

STRUCTA GROUP

Exhibitor – Stand 10

CONTACT: ADELAIDE RUITERS

Tel: +27 (0) 82 338 3545
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Email: adelaide@structa.co.za
Website: www.structa.co.za

The Structa Group of companies, comprising of eight subsidiaries, are suppliers of structural steel products and related services for infrastructure (electrification and telecommunications), petrochemical plants, industrial plants, water and mines in Southern Africa. Structa, through its subsidiaries CIS Engineering, Structa Technology, ERD Fab and Turnmill Proquip Engineering, offers the electricity industry services that include the manufacturing of masts for both distribution and transmission lines, structural steel work for substations as well as steel fabrication work for generation.

The Structa Group also offers in house services such as structural design and analysis quality control testing, profile cutting, painting and sandblasting. The Structa Group adhere to ISO 9001 quality control management systems.

VOORTMAN

Exhibitor – Stand 13

CONTACT: MARC VAN DETH

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Email: info@voortman.net
Website: www.voortman.net
Postal Address: PO Box 87, 7460 AB Rijssen

Voortman has designed, developed and manufactured machinery for steel fabrication and plate processing related industries for more than 40 years. With international subsidiaries responsible for sales and service, we are a globally recognised supplier with thousands of Voortman systems installed.

We continually develop our equipment range to enable us to keep at the forefront of technology and in step with any new developments in the market.

Contact us for the possibilities in your workshop and experience the future in steel processing.

SteelFuture NETWORKING ETC.

ABOVE: Tim Tasioulas (chairman of the session) hands John Cross a gift of thanks for presenting at SteelFuture.

TOP LEFT: Frederica Herbert (BSM Baker) and Rob Young (Young + Satharia).

TOP CENTRE: Aveng Trident Steel sponsored the conference bags

LEFT: Cathy del Mei provided some saxophone ambience to the cocktail party.

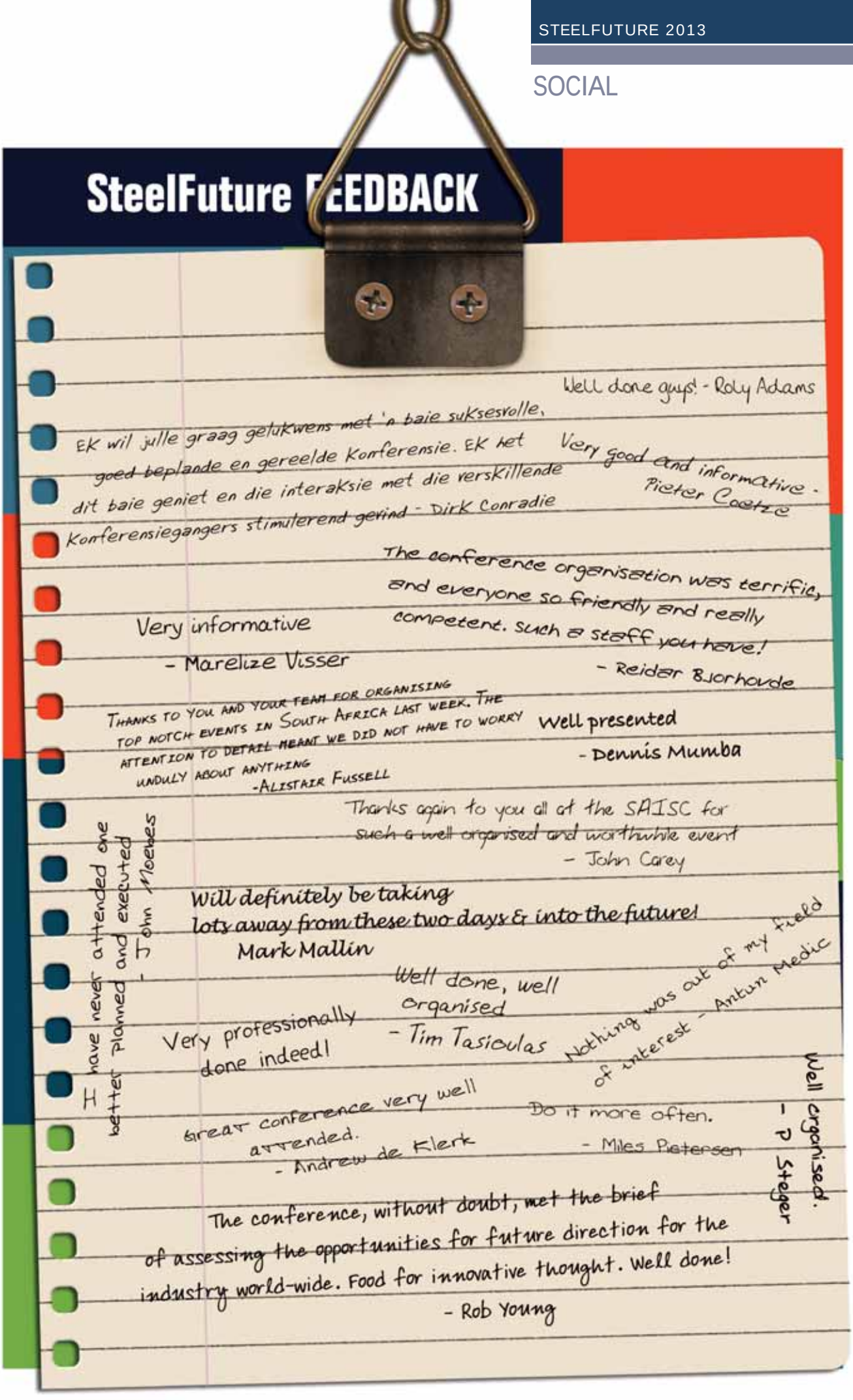
ABOVE: The Department of Trade and Industry delegation with Kobus de Beer. (From left: Freddie Herselman, Mahadi Granier and Umeesha Naidoo).

BELOW: The SAISC SteelFuture (ladies) team. From left: Marlé Lötter (main co-ordinator), Nadine Piek (Ping-Pong Communications), Tiana Ferreira (speaker & session co-ordinator), Debbie Allcock (invoices and other money matters for SteelFuture), Jenny Claassens and Stacey Van Bosch (SAISC School Of Draughting).

ABOVE: Students of the SAISC School Of Draughting directed delegates to the conference venue and also served as 'information stations'!

RIGHT: What is next on the programme?

BELOW LEFT, CENTRE & RIGHT: Networking, networking, networking...


SteelFuture FEEDBACK
Well done guys! - Roly Adams
Ek wil julle graag gelukwens met 'n baie suksesvolle, goed beplande en gereelde Konferensie. Ek het dit baie geniet en die interaksie met die verskillende Konferensiegangers stimulerend gevind - Dirk Conradie
Very good and informative. - Pieter Coetze
The conference organisation was terrific, and everyone so friendly and really competent. Such a staff you have! - Reider Bjorhovde
Very informative - Marelize Visser
THANKS TO YOU AND YOUR TEAM FOR ORGANISING TOP NOTCH EVENTS IN SOUTH AFRICA LAST WEEK. THE ATTENTION TO DETAIL MEANT WE DID NOT HAVE TO WORRY UNDULY ABOUT ANYTHING -ALISTAIR FUSSELL
Well presented - Dennis Mumba
Thanks again to you all at the SAISC for such a well organised and worthwhile event - John Carey
I have never attended one better planned and executed - John Moebes
Will definitely be taking lots away from these two days & into the future! Mark Mallin
Well done, well organised - Tim Tasioulas
Very professionally done indeed!
Great conference very well attended. - Andrew de Klerk
Nothing was out of my field of interest - Anton Medic
Do it more often. - Miles Pietersen
Well organised. - P Steger
The conference, without doubt, met the brief of assessing the opportunities for future direction for the industry world-wide. Food for innovative thought. Well done! - Rob Young

SAISC MEMBERSHIP

SAISC MEMBERSHIP

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Okirand Construction
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Peddinghaus Corporation of South Africa
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www.peddinghaus.com

Retecon (Pty) Ltd
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Fax: +27 11 394 2471
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www.retecon.co.za

Voortman
Supplier of CNC controlled machinery for the steel processing industry
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Fax: +31 548 53 63 74
marketing@voortman.net
www.voortman.net

SASFA MEMBERSHIP LIST

MAJOR MATERIAL SUPPLIERS

ArcelorMittal South Africa
Producer of steel
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Tel: +27 16 889 3189
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www.arcelormittal.com

Everite Building Products (Pty) Ltd
Producer of fibre cement board
Andrew de Klerk
Tel: +27 11 439 4400
Fax: +27 11 439 4933
adeklerk@groupfive.co.za
www.everite.co.za

Lafarge Gypsum (Pty) Ltd
Producer of gypsum board
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christo.newman@gypsum-za.lafarge.com

Saint-Gobain Gyproc SA (Pty) Ltd
Producer of gypsum board
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Garry.powell@saint-gobain.com

Saint-Gobain Isover
Producer of insulation products
Tel: +27 11 360 8200
www.owenscorning.co.za

OTHER MATERIAL AND COMPONENT SUPPLIERS

Avlock International
Fastener and equipment supplier
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www.avlock.co.za

Kare Industrial Suppliers
Distributor of fasteners
Reitze Hylkema
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www.kare.co.za

Marshall Hinds
Distributor of Tyvek Building Wrap
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Speedfit Africa
Distributer of John Guest Plumbing and associated technology solutions
Gavin van Heusden
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Fax: +27 31 569-3074
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www.speedfitafrica.co.za

United Fibre Cement Company
Distributer of fibre cement products
Leon Bekker
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leon@ufcc.co.za
www.ufcc.co.za

LSFB MANUFACTURERS

Allenby Housing cc
Planning, design, development & manufacture of modular building solutions
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www.containerhouses.com

Circle Capital Developments
Profiler and assembler
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Dezzo Roofing
Profiler and assembler
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www.dezzoroofing.co.za

DURObuild (Pty) Ltd
Building material
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Tel: +27 21 981 1460
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www.kithomes.co.za

Hazycrest Lightweight Steel Structures (Pty) Ltd
Large manufacturer
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Innosteel (Pty) Ltd
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Kusasa Commodities 148 (Pty) Ltd
Manufacture lightweight steel frame roof trusses and panels
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Kwikspace Modular Buildings Ltd
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MiTek Industries South Africa (Pty) Ltd
LSF roof trusses, floors and panels
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www.mii.com/southafrica

Monl Frames (Pty) Ltd
LSFB systems & trusses
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Fax: +27 16 455 3655
tshepom@monlframes.co.za
www.monlframes.co.za

SA Steelframe Systems
Profiler and assembler of LSF & trusses
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www.steelframe.co.za

Siteform Framing
Profiler and assembler
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Steel Frame Developments
Roll-forming and steel frame kits supplied
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Simpson Strongtie South Africa (Pty) Ltd
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Tahzade Disaster Management
Manufacturer
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SAISC MEMBERSHIP

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www.bluescopesteel.co.za

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Scottsdale
Distributor of LSFB equipment
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Frame erector
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RH Construction (Pty) Ltd
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Shospec (Pty) Ltd
LSFB builder, ceilings, partitions, turn-key projects
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