steel CONSTRUCTION
OFFICIAL JOURNAL OF THE SOUTHERN AFRICAN INSTITUTE OF

VOL. 43 ISSUE 3 – 2019

STEEL IN COMMERCIAL DEVELOPMENTS

STRENGTH IN UNITY

LAMINATIONS: DON'T BE CAUGHT UNAWARE!

SOUTHERN AFRICAN INSTITUTE OF STEEL CONSTRUCTION

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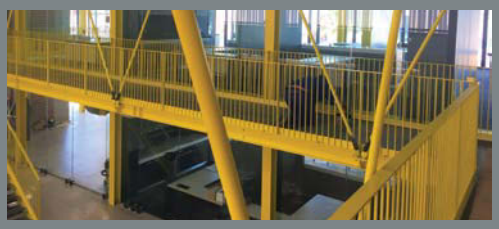
COVER PHOTO: Rosebank Link
PHOTO BY: KRU Detail on behalf of Central Welding Works



FEATURES

THE SOUTHERN AFRICAN INSTITUTE OF STEEL CONSTRUCTION

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REGULARS

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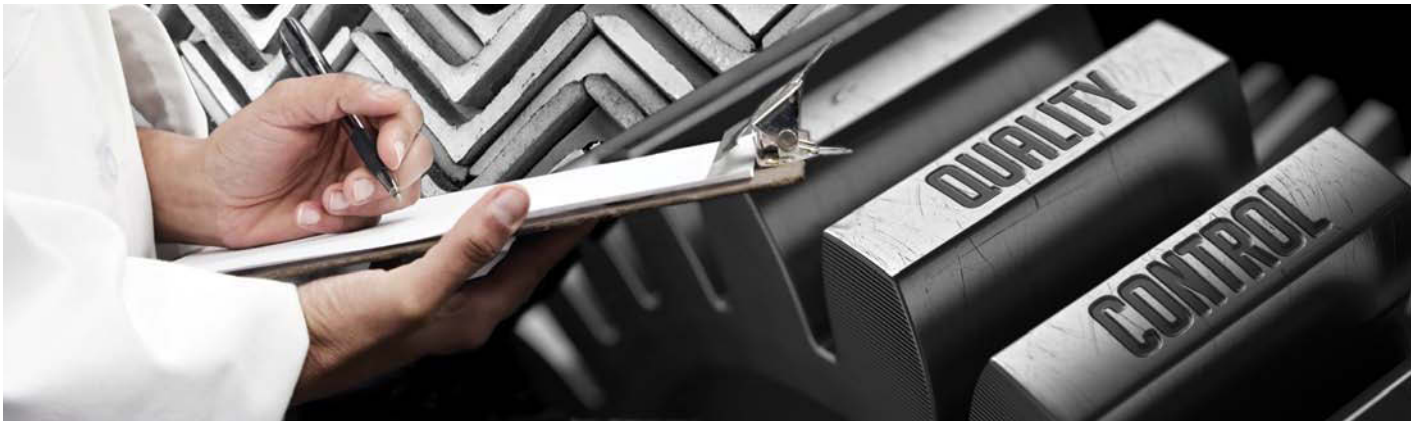
SAISC FEATURE

AMANUEL GEBREMESKEL,
TECHNICAL DIRECTOR

STRUCTURAL STEEL AND LAMINATIONS – **DON'T GET CAUGHT UNAWARE**



The Southern African Institute of Steel Construction has been informed that angles of inferior quality were recently supplied on a relatively large project. We have since discussed the matter with the affected suppliers and been assured that these angles were all sourced from a single, (non-SAISC Member) steel mill and that the problem is thus contained and unlikely to be repeated.

Laminations in structural steel plates and members are not as common as they used to be. That they have reappeared at a time when current standards no longer explicitly address laminations is worrying. The degree and extent of laminations in the recent report indicate a larger quality problem at the (non-SAISC Member) steel mill and possibly the entire supply chain. Given the popularity of structural steel, and supply of structural steel from new markets and steel mills, we at the Institute believe that such quality problems may arise again and recommend the following actions by members of the industry.

Merchants, be on high alert regarding quality

It is critical that merchants of structural steel confirm that the mills which produce structural steel plates and members have adequate quality control and quality assurance management systems in place. This requires that merchant quality departments be aware of emerging risks as they arise and address them in a timely fashion.

Fabricators, be vigilant regarding the quality of steel supplied to you

Fabricators will also need to be more vigilant with the quality of steel that is supplied to them. In addition to obtaining the required documentation, a consistent program of visual inspection may be required before fabrication commences. It will also fall on fabricators to carefully manage the possible trade-off between the quality and price of structural steel that they buy.

Engineers, be careful what you specify

Finally engineers may have to start paying more attention to the quality of the steel that they specify. Actively confirming the compliance of the steel with established standards is crucial. In addition, it may be necessary to specify third party inspection or special tests if such problems persist.

If laminations are discovered early then it is typically possible to resolve the problem quickly. However, if these quality problems are discovered late in the fabrication and erection process then close coordination between merchants, fabricators and engineers is crucial.

We will continue to monitor this issue. Moreover, we are in the process of compiling a short guideline to help mitigate the adverse impact of future quality issues. In any case it is imperative that engineers, fabricators, merchants and steel mills contact the Steel Institute for technical support on technical@saisc.co.za or (011) 726 6111 when such problems arise so that they can be addressed promptly.

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BRIDGING THE GAP: STEEL SHOWS ITS 'METTLE' IN BRIDGE CONSTRUCTION

When deciding whether to build a bridge from steel or concrete, there are a number of factors which need to be considered. Steel offers numerous advantages, including quick construction in the field, the ability to prefabricate sections, predictable material properties, the lower weight of steel compared to that of concrete – and the fact that any structural damage is readily accessible for inspection.

"Contemporary bridge designers have the choice of steel or concrete for their construction material. However, these days, bridges are often not constructed exclusively of concrete or exclusively of steel, an example being the steel-beam and concrete-deck bridges we see today," explains Amanuel Gebremeskel, Technical Director of the Southern African Institute of Steel Construction (SAISC).

"Design of the bridge greatly affects its initial cost and naturally, the more efficient the design the lower the cost. A further consideration in the design of the bridge is its purpose. That is, whether it will be carrying pedestrians, motor vehicles or railway rolling stock," Gebremeskel explains, adding that one of the major advantages of constructing bridges from steel is the decreased weight.

This means lower erection costs, since the bridge sections can be handled using lighter construction equipment. If designed soundly, the lighter weight of the steel bridge will also allow for lighter foundations. Generally, it is easier to make spans continuous for both live and dead loads - and to develop composite action with steel designs rather than with concrete ones.

"However, the major advantage in the construction of steel bridges is that they are considerably faster to complete, with fewer logistical challenges. Where a bridge is being constructed over a busy highway, for example, disruption to traffic is far less. With steel construction, the need for time-consuming and elaborate formwork is also eliminated. If necessary, steel sections can be prefabricated off-site and then bolted and welded together to complete the final structure," he comments.

In terms of maintenance, historically, decks are the most vulnerable part of the bridge. To replace a concrete bridge deck requires removal of the entire section at one time; whereas steel bridge decks can be replaced one lane at a time, allowing for uninterrupted – albeit reduced – traffic flow.

Where bridges cross other infrastructure or (particularly in Africa with the often rugged terrain) geographical features such as a deep ravine or river, steel has the advantage that the section of the completed bridge can be shallower than its concrete counterpart.

"Over and above these considerations – not just locally but globally – environmental considerations are also an important factor in the use of steel," he adds.

In this respect, today, the raw material used to construct bridges is often scrap steel. In a white paper, the (American) National Steel Bridge Alliances states that new steel bridge construction in the US annually consumes about 350 000 tons of scrap metal. And, when a steel bridge has reached its

allotted lifespan, the raw material can be recycled. Although not a perfect example, the steel from the World Trade Centre has now been recycled into other products.

When bridges have to be constructed in environmentally sensitive areas, the fact that steel spans can be longer than their concrete counterparts minimises the environmental impact as fewer piers are needed to support the bridge.

In addition, high-performance 'weathering' steels offer greater weather resistance, and feature toughness and weldability at affordable prices. "This technology is readily available in South Africa," Gebremeskel points out.

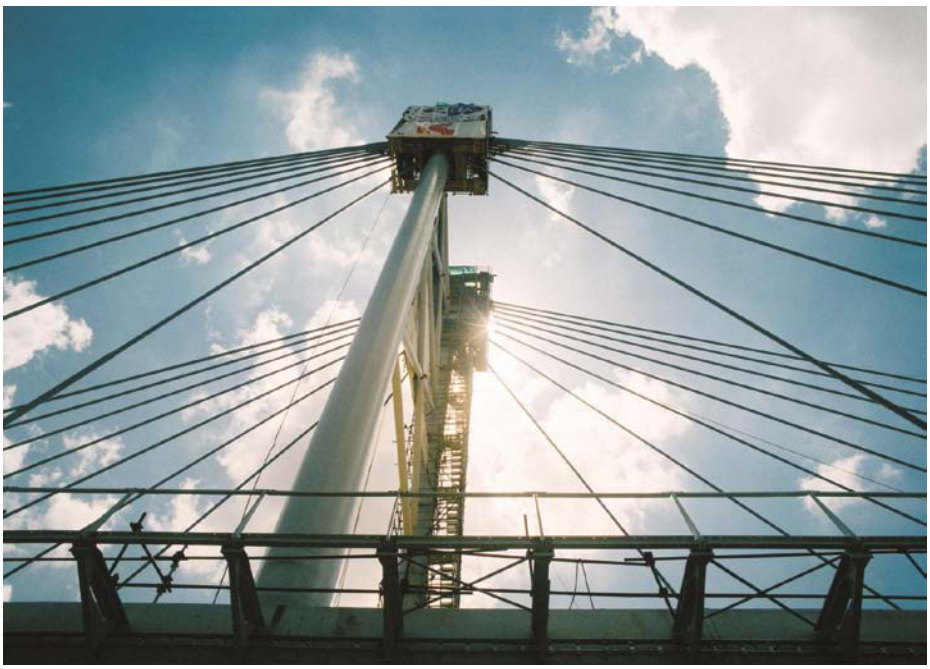
"Over the past two decades steel construction profiles have appeared in new forms, both internationally and locally. For example, tubular steel is now widely used, and is known for its aesthetic appeal, its light weight and its superior strength.

Furthermore, with the advent of laser fabrication, steel tube can very quickly be processed into interlocking bridge components, thereby improving the strength, speed and efficiency of welding, resulting in stronger and more aesthetic appealing structures," he says.

The choice of whether to build a steel or concrete bridge is also dictated to some extent by which region of the world the bridge is being built in – as concrete is cheaper in some areas. In other areas, the ruling price and availability of steel may well make it the preferred construction option.

"Bridges play a mostly unacknowledged yet cardinal role in all of our lives. While offering design and economic benefits, the use of steel as a construction medium for bridges also offers the more lasting appeal of design excellence. If one thinks of the internationally renowned San Francisco 'Golden Gate' bridge, Millennium bridge in London or the Sydney harbour bridge, one has excellent examples of structures that are of immense practical use - and yet at the same time are highly visually pleasing examples of superb engineering design.

As with many other bridges around the world, the element which has made these enduring and iconic structures possible was the versatility and excellence of steel," he concludes.



Left: Nelson Mandela Bridge.

Below left: Thelle Moegoerane Natalspruit Hospital Bridge.

Below right: Markgraaf Pedestrian Bridge.

MARKETING

DENISE SHERMAN
MARKETING MANAGER, SAISC

MARKETING **MATTERS!**

Yes. Market and economic climate do play a very big role in the success of a business. However, even in a booming business environment, building strong customer and prospect relationships is key to sales success. Whether you're building those networks face to face, or through digital channels, very similar principles apply. It's about identifying what is important to your audience, establishing a relationship based on common ground, and demonstrating how you can add value.

In this edition of Steel Construction, I'd like to share a few tips on how (and how NOT) to use LinkedIn, and perhaps why, if you're not using it currently, you really should.

Why bother with LinkedIn as part of your sales and marketing strategy?

Digital tools enable sales teams to make more effective use of their time when identifying and qualifying prospects. With the ability to search by geographic location, job title, industry and company size LinkedIn is powerful and cost-effective tool for identifying and building relationships with potential clients, or reinforcing relationships with your existing customer base.

"In the digital world of today, where roughly two-thirds of the B2B buyers make their decision via online content, the rules of sales prospecting have changed." – *https://business.linkedin.com/sales-solutions/b2b-sales-prospecting/techniques-for-successful-prospecting*

Business to business buyer decisions are influenced by what individuals see and experience online. If you've created a positive and professional impression by engaging and sharing quality content, then when it gets to decision time you'll be at your customer's "top of mind".

Once you've identified your prospects, take a look at the kind of content they share, comment on or like. Engage with them by sharing their posts, or adding an insightful comment. This is a great way to get on their radar and start developing the relationship BEFORE you hit them with a sales pitch. The temptation might be strong, but please… don't spam your new contacts with a template sales pitch. Nothing says "I haven't taken the time to understand what you really need, I just want to sell stuff FAST" like a copy paste email. Sales can grow out of developed relationships, but it's a marathon – not a sprint.

Create a professional first impression

Whether face to face or in the digital world, first impressions last. Your LinkedIn profile could be your chance at a creating a professional first impression with prospective clients, suppliers, business partners and employees. Make sure you have a high quality, well lit, well composed, work appropriate profile picture. Your LinkedIn profile picture is not the place for wedding photos or showcasing your hobbies (save those photos of friends and family on Facebook). If you're using your LinkedIn presence to build relationships with a view to securing new business – your profile picture needs to exude professionalism.

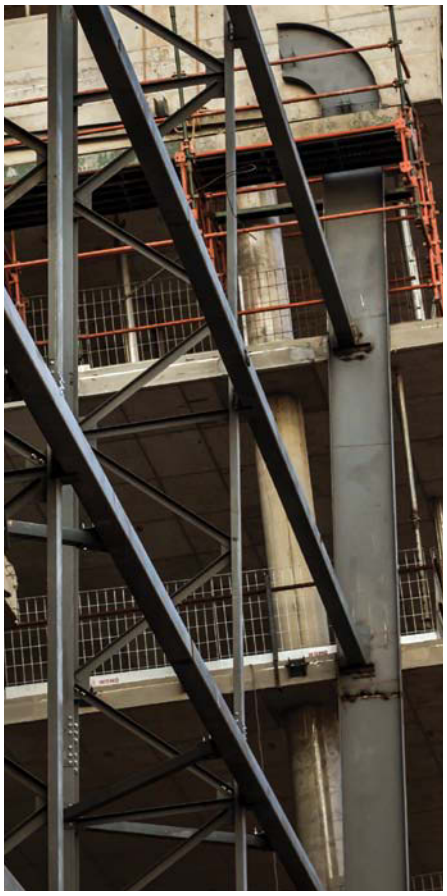
Familiarise yourself with the platform

LinkedIn has some great guides available on how to use the platform effectively (for example – *https://business.linkedin.com/sales-solutions/b2b-sales-prospecting/techniques-for-successful-prospecting)*, which I highly recommend you take the time to read and apply.

If you'd like some friendly advice, assistance with a new profile photo, or perhaps just some practical pointers on how you can improve your LinkedIn profile – pop into the SAISC's office. We're happy to help!

PROJECT **PROFILES**

STEEL IN COMMERCIAL DEVELOPMENTS



ROSEBANK LINK

PROJECT TEAM

Nominator – KRU Detailing cc I **Client/Developer** – Redefine I **Architect** – Paragon Group
Structural Steel Detailer – KRU Detailing cc I **Structural Engineer** – Sutherland I **Engineer** – Sutherland
Quantity Surveyor – MLC I **Project Manager** – WBHO I **Main Contractor** – WBHO
Steelwork Contractor – Central Welding Works I **Steel Erector** – Central Welding Works
Cladding Manufacturer, Supplier and Contractor – Façade Solutions

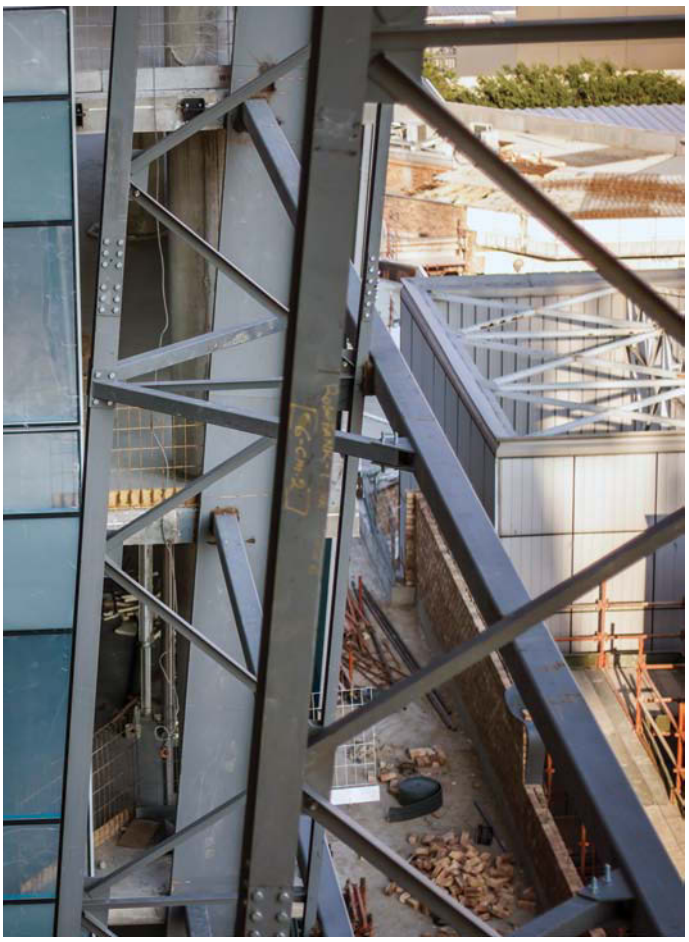
At 15 stories above the ground, the Rosebank Link building consists of two basement parking levels, a ground floor or public/retail level, five parkade levels, and nine stories of offices from a podium level.

The iconic structure in the centre of a developing cosmopolitan area, materialised from the clients' desire for a building that would meet the needs of multiple stakeholders, including the public in a new, exciting, and smart way. The Meeting Pods, Atrium, and Media screen were all envisaged in steel from the start.

The Meeting Pods can be viewed from the landscaped thoroughfare which forms part of the showpiece of the buildings. The architectural intent was for the pods to be as open as possible, embedded in the glass. These retrofitted pods are cantilevered from the concrete frame. Loads were the main consideration, concentrated around one axis and normal I-section portals bolted to the concrete.

The Atrium structure forms part of the glass façade and skylight structure, spanning over six stories. The structure spanned large distances and had to be as slender as possible while limiting deflection.

The inner–and bottom chord of the Atrium vertical truss and roof truss were determined by architectural constraints. The outer chord is braced by transom beams for the façade glass, however, the inner chord had a large unbraced length due to the omission of regular knee-bracing. Similarly, the



bottom chord had a large effective length for the uplift load case, due to knee bracing not being able to pierce the bulkheads of the skylights butting up snug to the truss either side. This resulted in a relatively large PFC inner chord and large I-section for a bottom chord. The purlins (bracing for the top chord) of the roof had to step, due to the skylight glass line and sheeting line being on different levels. Additionally, the purlins form part of the skylight substructure. The load path was fairly two dimensional and an RHS section was used. For the Atrium glass transoms, large SHS were used due to the wind, and gravity load cases being very similar correlating the sections' similar radii of gyration in each direction, it was also aesthetically preferred.

The LED panels required special connections at very particular points, while constrained by the removal time by the crane, steel allowed achieving these challenges.

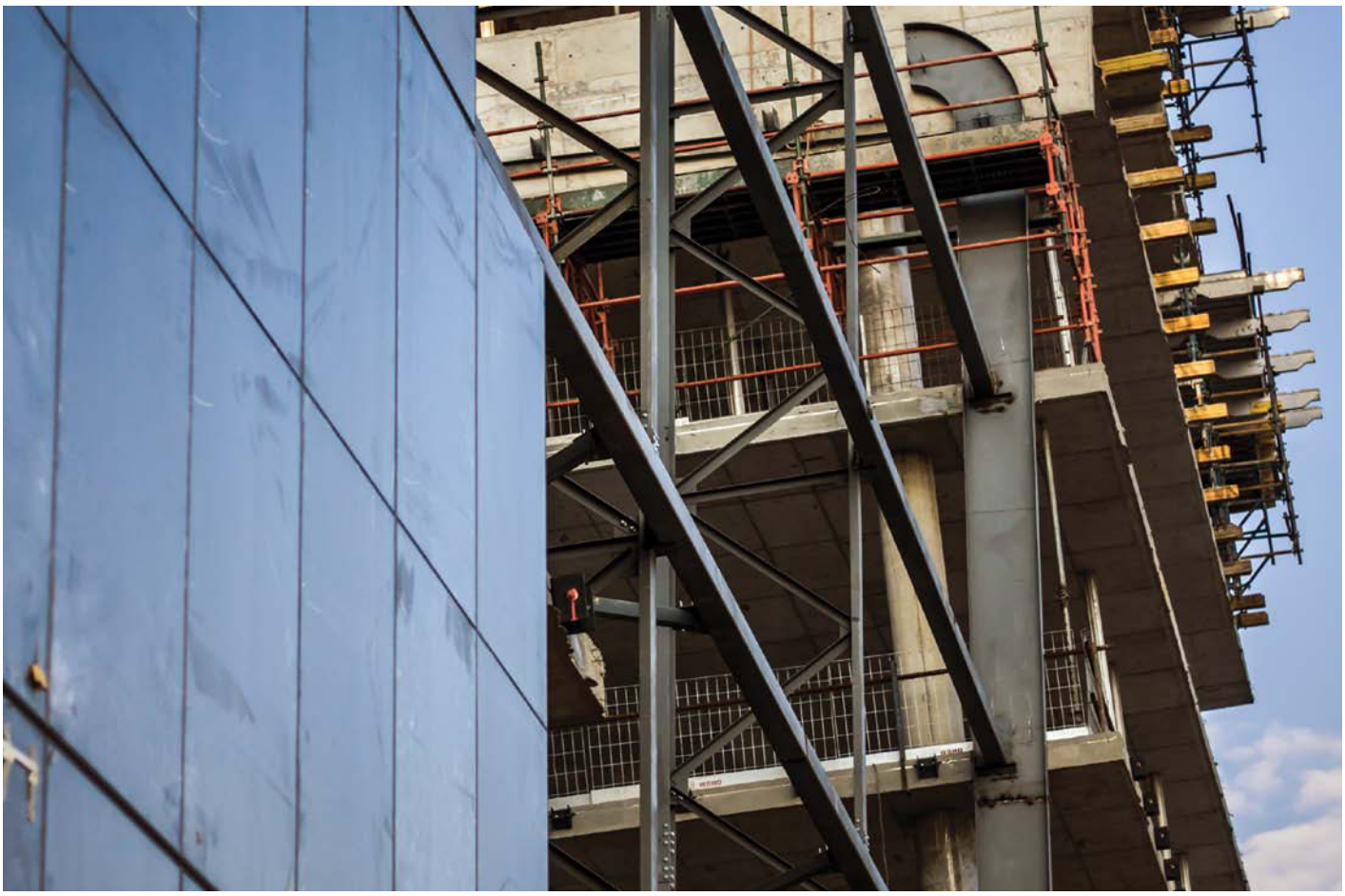
The screen consisted of a large SHS outer frame, as the facade and surrounding over cladding required a 200mm flat fixing face, it was also beneficial at the one end, as a part of the screen had to remain cantilevered to span across the crane void, which would only be filled later with structure. Considering hollow sections' optimal spread of material away from the center of gravity it gave good results when relating stiffness/size ratios.

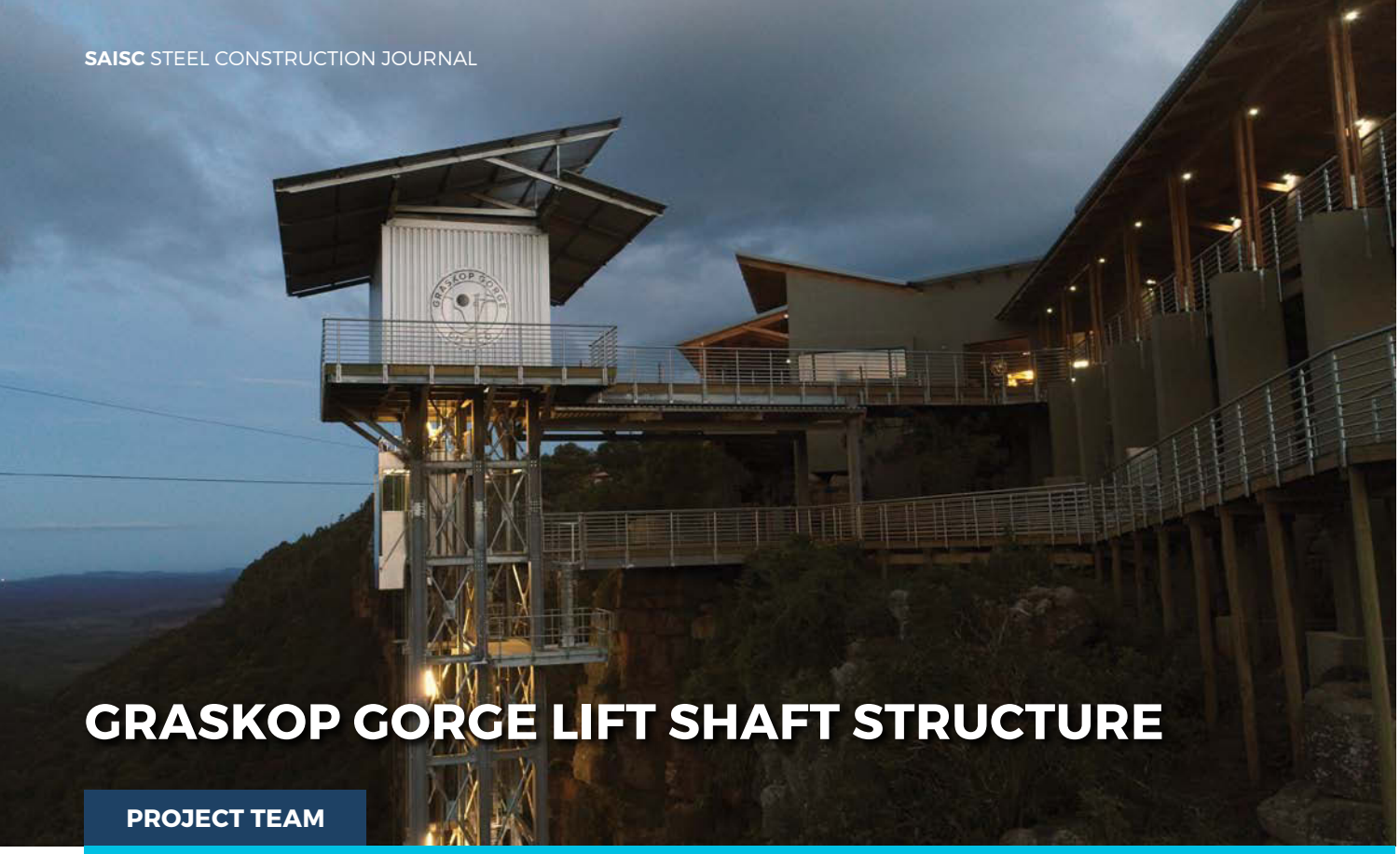
While the manufacturing was straightforward, the main difficulty was during erection. The site had virtually no laydown areas with very limited access. The internal cladding support was all done by hand, accurate setting out of bevelled columns gave a suitable platform to fix the substructure at awkward angles and positions as per the architect's design. The main Atrium roof is very high, and tower cranes were relied on for erection, difficulties were accessed and space as well as supporting lattice columns until the trusses were fixed in place.

The final steelwork visual was not part of the architectural intent, therefore hiding it as effectively as possible while forming part of multiple systems and serving its purpose. To accommodate this architecture, it resulted in large unbraced lengths and a peculiar arrangement of members. There was also a large emphasis on keeping the tonnage down to accommodate the Green Star rating.

Tons of structural steel used: 115 Tons

Structural profiles used: All readily available profiles





GRASKOP GORGE LIFT SHAFT STRUCTURE

PROJECT TEAM

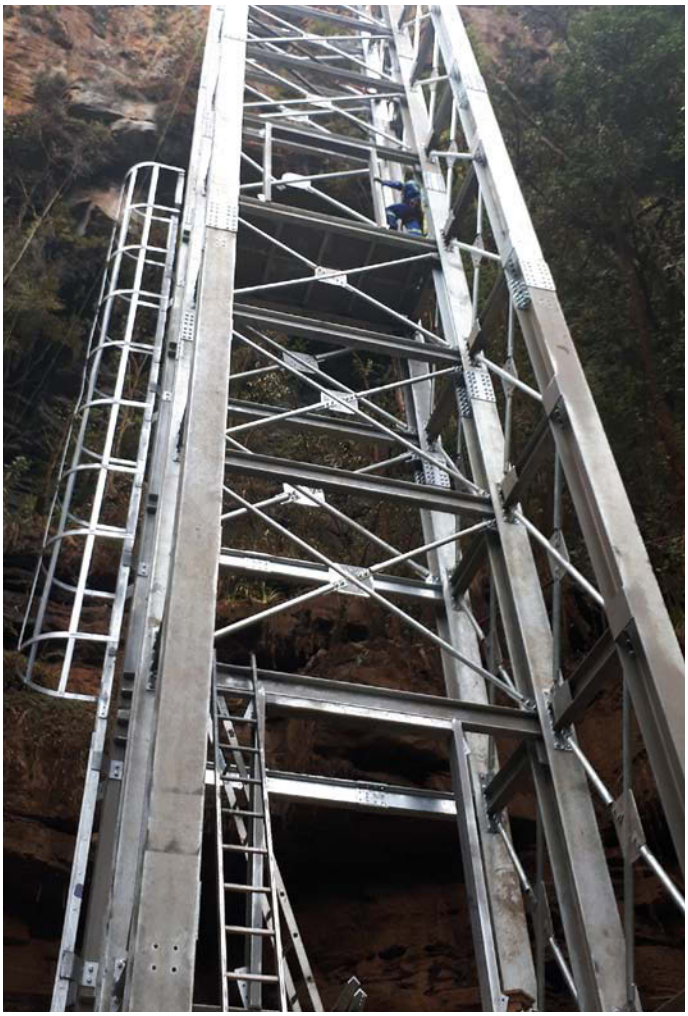
Nominator – Fourie Consulting Engineers I **Client/Developer** – Graskop Gorge Lift Company in partnership with the NEF (National Empowerment Fund) I **Architect** – Förtsch and Associates Architects I **Main Contractor** – ENZA Construction (Pty) Ltd **Structural Engineer and Engineer** – LEW Consulting Engineers (Pty) Ltd I **Quantity Surveyor** – Siyakha Quantity Surveyors (Pty) Ltd **Project Manager** – Purlin Consulting I **Steelwork Contractor and Steel Erector** – Quality Steel Construction (Pty) Ltd **Cladding Manufacturer** – Safintra (part of the Safal Group) I **Cladding Supplier** – Safintra Roofing Nelspruit (part of the Safal Group) **Cladding Contractor** – Roofing Solutions cc I **Corrosion Protection (galvanizing)** – Babcock Nthuthuko Powerlines (Pty) Ltd

The purpose of the Graskop Gorge Lift Shaft Structure was to create an exciting and popular tourist stop over point on the Panorama Route at Graskop, Mpumalanga. The structure features a glass viewing panoramic lift taking visitors 51m down the face of the Graskop Gorge into the forest below, where wooden walkways and suspension bridges meander along a 600 metre trail through the indigenous forest with interactive exhibits. The gorge has established itself as an adventure destination through the Big Swing, which is a well-known operation, so there had been some "human footprint" in the gorge for a while.

The client wanted to expand on the adventure concept and added the lift and interactive walking trail in the rain forest below. The site was chosen adjacent to a structure for informal curio traders and a protruding rock outcrop which had been a viewing point with a small pub. This was the ideal position for the lift shaft. The brief was to incorporate the traders into the adventure tourism complex and upgrade the existing structure. A viewing platform was subsequently added around the lift motor room as an extension to the public deck.

Structural Steel was the choice of material for the Lift Shaft Structure from the beginning. Reasons include compatibility with the lift installation, and the open truss-like nature of the shaft structure to simulate the waterfall on the opposite side of the gorge.

The distance from the base to the top of the shaft is 60m, with the total vertical lift travel distance of 51m. The shaft



structure was designed as a vertical structure with two top fixing points apart from the fixing at the concrete base. UC 305 x 305 x 97 H-profiles were used for the 6 main shaft columns, because adequate l/r ratios were required for 10m segment lengths. Each segment was fully braced using 63.5 x 3 and 88.9 x 2.5 Circular hollow sections cross bracing between 203 x 133 x 25 UB lateral stiffness beams. 305 x 165 x 46 UB profiles were used for the access platform beams at the top of the shaft with 80 x 80 x 6 Angles for bracing. UC 152 x 152 x 23 profiles were used as knee brace elements to support and fix the top viewing platform to the main shaft structure.

A national shortage of 305 x 305 x 97 H profiles presented a challenge, requiring the design to be altered to use 254 x 254 x 73 in the top part of the shaft. For the erection of the shaft a 70 tonne crane was planned, but it would require the crane to be too close to the edge of the cliff, and the crane cables were too short to reach the 51m deep bottom. Instead a 9 tonne Spierings Mobile Tower Crane had to be hired that could lift 2.5t per lift at a 27m reach, with adequate cable length to reach down to the bottom.

The exquisite setting of the lift shaft structure opposite the Panorama Waterfall forms a truly aesthetic pleasing view from a distance, with the natural waterfall at one side of the gorge and the grey coloured, open truss-like lift shaft structure simulating the waterfall on the opposite side of the gorge, forming a beautiful parallel with each other.

Tons of structural steel used: 110 Tons

Structural profiles used: Hot rolled H-profiles, hot rolled I-profiles, angle profiles, circular hollow sections

HEINEKEN – PROJECT BIG

PROJECT TEAM

Nominator – ESABA Consulting Engineers (Pty) Ltd I **Client/Developer** – Heineken South Africa
Architect – Designdex Architect I **Main Contractor** – AVENG Grinaker LTA
Structural Engineer, Engineer, Quantity Surveyor and Project Manager – ESABA Consulting Engineers (Pty) Ltd
Steelwork Contractor, Steel Erector and Corrosion Protection (galvanizing and paintwork contractor) – BOKSAN Projects cc
Cladding Manufacturer, Supplier and Contractor – Chartwell Roofing (Pty) Ltd

The 18 800m² expansion project was implemented to accommodate for market growth and centralise logistic facilities for more cost effective and efficient operations. The project had to be completed in a record 5 months as the new warehousing had to be in operation before the client's peak sales period over the December holidays.

The warehousing was initially envisaged by the client as imported tent structures clad with canvas due to financial considerations. The professional team however showed that new predominant steel structure warehousing with IBR cladding built in similarly configuration to the existing predominant concrete structure warehousing proved more cost effective and more suitable to the client's environment and needs.

After careful design considerations, the structural engineer identified opportunities to further optimize the new structural members by deviating from the original structure which had been designed for European snow loads. As a result, hot rolled I-sections were used instead of cellular beams. The original concrete box gutters were also replaced with steel girders and gutters in order to reduce cost and increase the speed of construction. This demonstrated the versatility of structural steel as a construction material. The steel also provided the benefit of acceleration by not having to endure a curing period before the structural members could be loaded. The cladding was specified as 0.58mm thick IBR Chromadek Z200 to suite existing warehouses.

The construction programme necessitated the complete construction of the 18 800m² warehouse inclusive of concrete raft foundations in a period of 5 months with 3 partial completion dates for sections of the construction. This resulted in an extremely tight schedule for manufacturing and erection of the steel. Space frame steel trusses were constructed as cantilever canopies over loading bays. Overhead steel beams were used to increase span lengths between supports and subsequently reduce the number of internal steel columns to optimise floor stacking area. Historically concrete beams were used to support roof structures and box gutters, which were replaced with light weight steel girders in the new warehousing.

Light weight structural steel components replaced historic reinforced concrete elements resulting in more efficient and cost effective warehousing. Space framed steel truss canopies is more functional and aesthetically pleasing. Steel girders were also used in lieu of the original concrete box gutters. Circular hollow sections were used for the loading bay canopies to compliment the warehouse aesthetically and also proved to be the most effective structural members that could accommodate the excessive cantilever requirements (12.5m). Steel was also ordered early based upon workshop approval of certain components in order to speed up delivery and manufacturing.

The 5 months construction period was initially considered unrealistic with inherent risks to all parties involved. The new warehousing was however completed on time and within budget, which proved to be a huge success. This achievement is attributed to the pro-active solution driven approach adopted by all team members from the start of the project. Good governance, management, site control, communication, support and cooperation between all team members ensured that challenges were resolved timeously.

Tons of structural steel used: 692 Tons

Structural profiles used: Various I-Sections, PFC Channels, Equal Angles, CFLC and Circular Hollow Sections (CHS)

VIDEOJET PAARL

PROJECT TEAM

Nominator – Emerging Architecture I **Client/Developer** – HG Molenaar – Videojet I **Architect** – Emerging Architecture
Structural Engineer – Ekon Engineers and Project Managers I **Main Contractor** – T R S Construction
Steelwork Contractor – HG Molenaar I **Steel Erector** – HG Molenaar I **Cladding Manufacturer** – HG Molenaar
Cladding Supplier – HG Molenaar I **Cladding Contractor** – HG Molenaar

The Videojet Paarl project is located on the street face of an existing factory setup, and needed to integrate with an existing building. HG Molenaar are pioneers in food process machines, able to manufacture high end steel features. This project was intended as a showcase for their ability, an architectural statement to existing and prospective clients intended to garner respect, trust and faith in HG Molenaar, and act as a tactile example that the brand delivers what it promises. The building is used as an office space, reception and workshop for the VideoJet brand, its MD, support staff and sales components.

The project was envisaged in steel from the start, enabling the client to implement a fast, simple solution by connecting to the existing steel structure.

The structural framing consists of

- IPE 200 – considered for its aesthetic appeal as well as its structural strength
- 305 x 165 x 40 I-Sections – all beams
- 406 x 140 x 46 I-Section – for its cantilever
- 101.6 x 4.0 CHS struts on custom plates – with custom turned steel connections
- 25 Dia solid rounds to hang the bridge and floors
- Y10 and Y12 structural steel to concrete reinforcement
- Façade lasercut screens by client hung on steel angles – sheets are 3 000 x 1 500 x 2mm mild steel

All steel was worked and machined on site. The client's involvement assisted greatly with the process. It was also 3-dimensionally pinpointed prior to construction – so the fixing and bolting was a precise mathematic. The entire building was documented up front – no variations, no site supervision, no changes – smooth, simple and exact.

Tons of structural steel used: ±2 Tons

Structural profiles used: US203*203*46; UB406*140*46; UB305*165*40; UB305*133*25; PLT20*210; PLT10*250; PLT10*144.6; PLT8*200; L100*100*10; IPE120; FL12*250; FL20*200; FL12*180; FL12*130; FL10*220; FL10*150; FL8*90; D20; CHS101.6*4.0

ALLIED STEELRODE'S STEEL PROCESSING TECHNOLOGY 'DRIVES' OPTIMISED EFFICIENCIES **WITHIN SOUTH AFRICA'S AUTOMOTIVE MANUFACTURING SECTOR**

The local automotive industry is one of the most critical manufacturing sectors in the country, with vehicle and related component production accounting for approximately one third of South Africa's manufacturing output. Total earnings from South African automotive exports reached R164.9-billion in 2017, comprising 13.9% of South Africa's total export earnings.

In a further demonstration of the pivotal nature of the local automotive sector, the industry received a significant shot in the arm recently, with the announcement by Nissan South Africa that it intends investing R3-billion in its vehicle plant at Rosslyn north of Pretoria, in order to start producing its Navara model locally. Production will commence in 2020.

As long as a decade ago, local steel major and value-added processor Allied Steelrode understood the importance of the automotive and automotive component industry to South Africa's economy – and the urgent need to supply products which would allow these essential sectors to be competitive in the world market.

"This has led Allied Steelrode to make several bold and visionary investments in advanced steel processing technology, which has notable benefits for our customers – particularly those within the automotive industry," explains Allied Steelrode General Manager: Sales – Automotive, Lee-Ann Geyser.

Allied Steelrode's suite of state-of-the art steel beneficiation equipment ranges from high-speed cut-to-length and slitting lines, to fully automated high-precision and high-speed guillotines, which are able to supply a wide range of products and sizes to the automotive industry.

"Change is constant, and nowhere more so than in the automotive

industry. With the need to meet the market's prevailing expectations concerning quality and reliability, excellent customer service and the shortest possible turn-around times are required by automotive Industry customers," Geyser comments.

For its part, Geyser explains that Allied Steelrode has continued to evolve its market offering, and ensure that it is sufficiently versatile to meet customers' requirements.

The various steel processing technology investments made by Allied Steelrode were therefore in response to – amongst others – the requirements of the local automotive sector.

Geyser comments: "Partnering with our customers by tailoring our offering to their requirements not only enhances our efficiencies - but our customers' efficiencies as well, ultimately creating a demand for smaller cut-to-size products."

"Part of our steel investment strategy 'roadmap' was to acquire an Amada fully automated guillotine; as well as the Samis disc press. In addition – and most significant of all – are our two stretcher levellers, which with their hugely powerful capability remove latent memory and inherent trapped stresses in raw steel. This means that laser cutting and subsequent welding can be more efficient, and the manufacturing scrap rate can be effectively reduced" she adds.

The company's cut-to-length line and synchro-shear also play a key role delivering accurately sized product, quality of levelling and greatly reduced turn-around times.

"This huge investment in technology – often during tough economic times – has been a substantial leap of faith for Allied Steelrode as a company, and therefore not a decision we took lightly," comments Allied Steelrode's CEO, Arun Chadha.

"However, when we see our local automotive manufacturing industry growing – as evidenced by the very positive news from Nissan recently – we are greatly encouraged.

"Furthermore, we are confident that our steel processing technology investments will specifically prove of invaluable support to the South African automotive sector, as it becomes an increasingly significant contributor to our national economy," he concludes.

SASFA FEATURE

JOHN BARNARD
DIRECTOR, SASFA

COFIMVABA **SCIENCE CENTRE**

Introduction and background

The Department of Science and Technology (DST), in collaboration with the Department of Basic Education (DBE) and the Eastern Cape Department of Education (ECDE), led an initiative that sought to examine whether the introduction of innovative and tested technologies would improve the quality of learning and teaching in the Cofimvaba Schools District, Eastern Cape, some 60 kilometres east of Queenstown. It is within this initiative that the development of a science centre in Cofimvaba was conceived. Science centres, in addition to their primary role of bridging the gap between science and society, complement formal classroom learning and teaching of Mathematics, Science and Technology (MST).

The Science Centre will advance the goals and objectives of the DST-led campaign to promote public awareness of and engagement in science and contribute to the development of a pipeline for skilled and capable workforce to support an inclusive growth path, particularly scarce high-level research skills in science, engineering and technology (SET) areas.

The centre comprises of the following:

Educational spaces

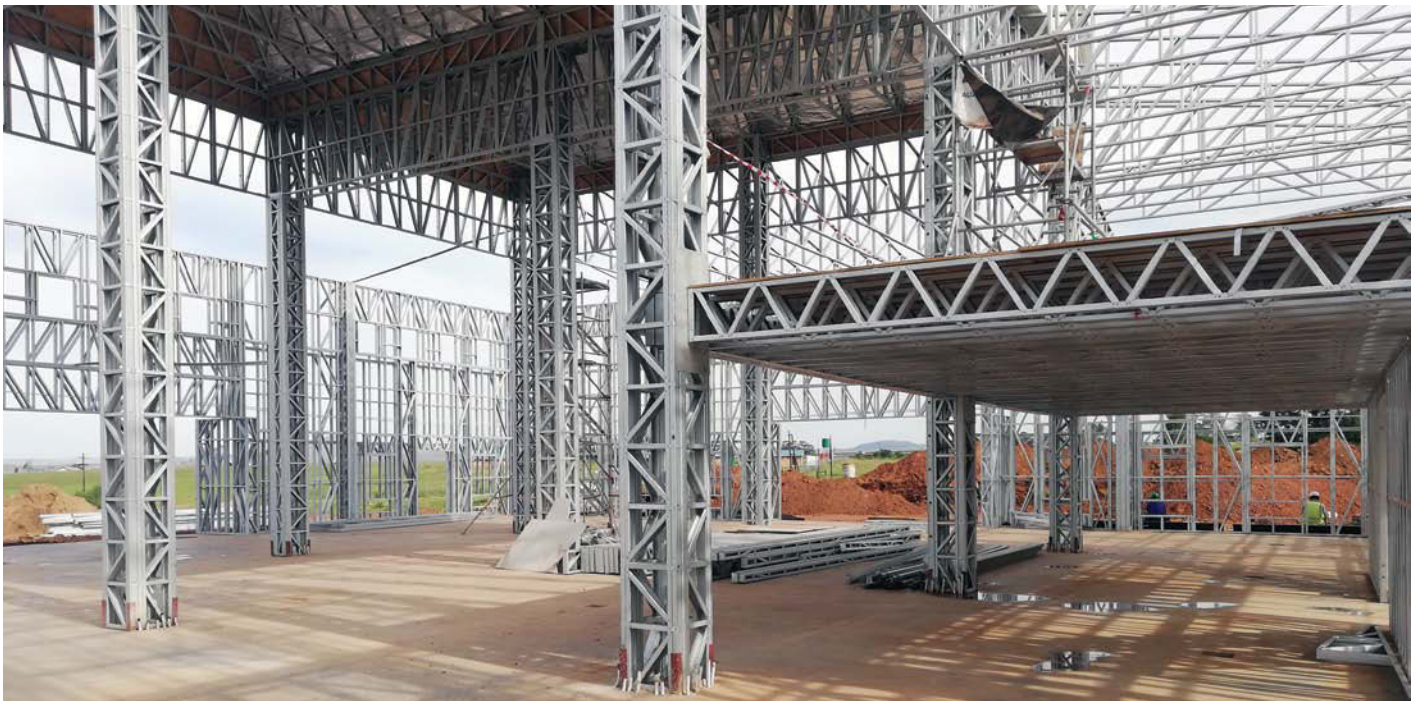
- Four multipurpose classrooms plus storage rooms attached to each classroom
- Two technology innovation pods

Exhibition spaces

- Science engagement interactive exhibits
- MST curriculum-linked hands-on exhibits
- Workshop (for repairs and maintenance of exhibits)

Administration spaces

- A staff administrative area
- Centre Head's office



CONNECT WITH SASFA: **Contact:** John Barnard **Email:** john.barnard@saol.com **Web:** www.sasfa.co.za

- Ablution space
- Kitchen & storage

Innovative building technologies

Because the centre aims to promote technology and innovation it was decided to use the opportunity to test and showcase various innovative building technologies in the design of the building. To this end the building fulfils one of the objectives of the IBT Cabinet resolution of August 2013 namely, the construction of demonstration buildings. Two key decisions taken in this regard are the use of innovative building systems, and off-grid services.

Innovative building systems

Two building systems were selected namely light steel frame (LSF) and insulated concrete composite (ICC). A third technology was also selected but unfortunately challenges arose regarding the availability of that system. The LSF system is used for the double storey sections of the building namely the double volume exhibition area and entrance foyer, and the double storey administration area. The ICC system is used for the single storey classrooms, stores, and ablution facilities.

The LSF system was selected for its ability to cope with double volume construction, a factor that rules out many IBTs. Additional considerations were speed of erection; ability to prefabricate offsite and deliver to site for erection purposes only (an important consideration given the remote rural location of the centre); thermal insulation value; a reduction in the use of cement and water; and the reduction of waste.

The experience to date has validated the selection: the LSF erection process has saved time; the delivery of the prefabricated light steel components has been seamless; significant water saving has been effected; and no waste is visible on the site.

We were surprised by the accuracy of construction (each component was installed without any need for adjustment or modification), and the versatility of the system. The LFS system has lent itself to the complete construction of innovation pods in the exhibition area (floor, stairs, walls, and internal ceiling); the construction of two solar chimneys; and the construction of a planetarium, including the domed ceiling.

Off-grid services

The opportunity has also been used to evaluate to what extent public buildings can go off-grid. This research aims to demonstrate that social infrastructure can be provided in areas where no municipal services are available. To this end the building is designed to be:

- Energy independent – five energy sources are employed namely photovoltaic panels; building-scale wind turbines; hydrogen fuel cells; battery; and Eskom power (as a back-up);
- Water independent – the building relies on rainwater harvesting and water recycling for its water supply. To achieve water independence the toilets are connected to a closed-loop bio-based system that recycles its own water, and the greywater is recycled through a constructed wetland;
- Sanitation independent – as stated above, the sewerage treatment occurs on site through a bio-based treatment system that converts the solid wastes to a fertilizer, and recycles the water for reuse in the toilets;
- Solar heating, cooling and ventilation – the building makes use of solar chimneys to heat and cool the building, and to boost cross-ventilation. In this way it is designed to be HVAC-free.

Conclusion

The project is demonstrating the benefits of using IBTs thus far. The facility is due for completion in August 2019. A thorough post-construction evaluation will take place to measure the performance of the system, and its efficacy in-use will be measured through a post occupancy evaluation (POE) after twelve months of use. The lessons learnt will also be included in these reports.

Credits

Implementing agent: CSIR Lead Person: Llewellyn van Wyk

Construction and Project Managers: Royal Haskoning

Architects: Ngonyama & Associates

Consulting Engineers: Element Consulting

Quantity Surveyors: CBI Quantity Surveyors

Main Contractor: Helm Construction

LSF Subcontractcor: Siteform

Comments from Johan Fourie

MD of Siteform, the LSF subcontractor

'We were very fortunate to be involved in the project from the planning stages to avoid major design difficulties once the project gets to the actual building phase, which in turn saves cost as the building was pre designed and quoted accordingly. Therefore the changes were minor and more of cosmetic nature. The major material suppliers were Marley Building Systems, United Fibre Cement Company, and Saint-Gobain.

The challenges we had with the design included the central part of the building, approximately 14m x 14m in plan, which had a 9m high double volume atrium. The surrounding display area has walls of 6.2m high with two mezzanine floors.

The two solar chimneys which will be utilised for heating and cooling of the building (without the use of electricity) stands 11m high.

A further challenge was that this building is built in an area where snow is bound to fall from time to time, therefore all the roofs had to be designed to incorporate a snow load.

I believe that this Science Centre will stretch the boundaries of what Light Steel Framing is capable of in South Africa, and that it is a truly viable alternative building method for bigger commercial structures as well as residential buildings".

JOHANN STRAUSS,
SAISC BOARD MEMBER AND
CEO OF KRU DETAILING

STRENGTH **IN UNITY**

Unity is Strength is an old proverb. It holds as true in the current times as it did when it was first introduced. It implies that we become stronger if we stay united. This is a commonly used proverb that holds good in almost every sphere of life – be it a person's professional life, relationships or the society as a whole. It is passed down and taught from generation to generation but do we practice what we preach? We would like to believe so, but take a step back, look at South Africa; the construction sector; the steel industry; or even in our own companies and the answer is clear. Right now and every day we have a choice, we can blame and deny or we can take ownership and responsibility. In other words, we can sit back and wait for others to change (while we judge with a skeptical eye from afar) or as Gandhi said: "Be the change that you wish to see in the world."

We are who we are today because of our past. The current economic crisis, corruption and whatever blame or denial you want to add to your reasoning to why we are not united are the reasons we will not find strength in unity unless we let go of our past and base our actions today and every day going forward on the future we want. Albert Einstein said, "The definition of insanity is doing the same thing over and over again and expecting a different result." I doubt that our industry is a collection of insane people yet we continue doing the same thing over and over again and expecting a different result.

We, as a structural steel detailing company, have little influence even though I feel we play a very important role in the construction process. This industry (and the world) tends to determine influence by who has the most "meat" in the game. In our company, we did a small case study and found that on a R400m shopping center the steel contractors portion was only 3.33%. Our portion is 1.98% of the steel contractors portion which comes to 0.07% of the overall cost. Based on my previous statement, we as a detailing company would then have less than 0.1% possibility to bring on change. With that conclusion on the table, you can decide if I am crazy, a sucker for punishment or as I like to believe an extreme optimist. The point I am trying to make is that as individuals we cannot change the industry; the country; the world; but unity is a choice individuals make that lead to actions individuals take to strengthen unity.

If you Google the proverb *"Unity is Strength"* you will find references like:

"All power is weak unless united" (1668),

"Unity makes strength, strife wastes" (1685),

"Strength lies in union" (1867),

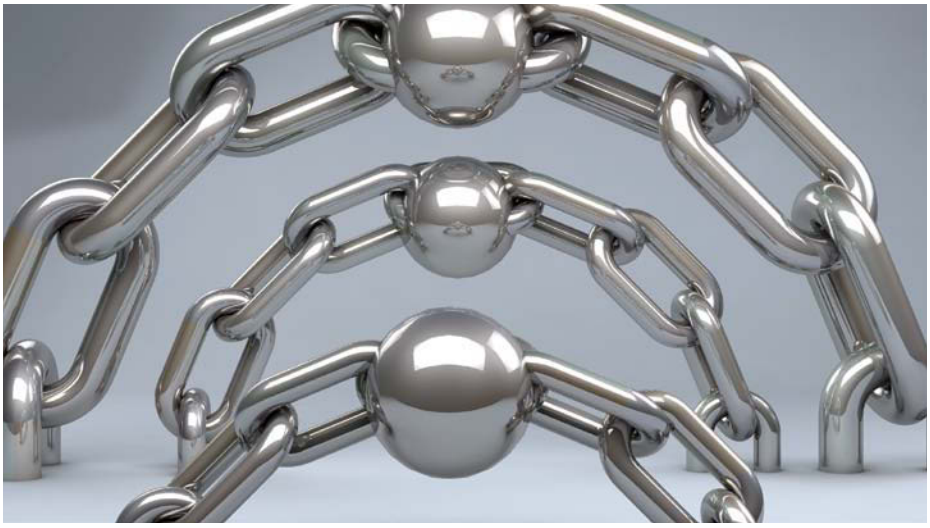
"Strength is in unity" (1887),

"Unity is strength" (1894),

"Union is strength" (1912),

"In unity is strength" (1919).

I only listed references more than a century old because in the last century there are more than I can mention. This means that as individuals we have believed Strength lies in Unity for at least the last 350 years but what have you done today to strengthen unity in your home, family, company, industry, country and in the world? Strength in Unity, unity starts with you.



SAMCRA FEATURE

DENNIS WHITE
DIRECTOR, SAMCRA

SAMCRA
SOUTHERN AFRICAN METAL CLADDING AND ROOFING ASSOCIATION

NOT SO PROFESSIONAL **PROFESSIONALS**

The current economic climate that has seen large numbers of retrenchments and resizing or closing of businesses has created a demand for recycled old buildings in declining established residential suburbs to be converted into workshops, offices and showrooms. The most favored being those adjacent to local suburban business areas located along main arterial roads or rapid transport systems.

In their simplest form these premises merely require converting rooms in a house to offices with a reception area and adding a few steel framed carports. However, once it becomes necessary to increase the floor area the choice is between going up or out. The most common choice is to build an extension out into the garden or service area behind the building with a structure covered by an almost flat mono pitch metal clad roof, the apex of which is tucked under the eaves of the original pitched roof. Invariably the new roof is tucked behind parapets for esthetic reasons and some form of rooflight is included to increase the amount of natural light within.

This is one instance where it is essential to employ the services of an experienced and conscientious professional architect rather than a person who simply draws plans. There is a large number of 'architects' who choose to circumvent the requirements of mandatory regulations, disregard the merits of specifying voluntary national standards, use inappropriate cut and paste contractual notes and/or specifications (or neither), plus leave the resolution of functional details

and choice of materials to builders and other tradesmen. All to the detriment of the owner. Heaven forbid you have one of these as principal agent.

When it comes to small builds there are very few competent builders available and even fewer skilled roofing contractors. This is the realm of chancers, fly-by-nights and believers that any roof can be effectively sealed with paint-on membrane or expanding foam.

When it comes to the design of flat (less than 5° slope) metal clad roofs there are a number of mandatory and practical requirements;

1) SANS 10400-L: 2011 limits the slope to a minimum of 11° for conventional pierce-fixed profiles and 3° for concealed-fix profiles.
2) Sheets to be in a single length from apex to eaves i.e. no end laps.
3) Side laps of pierced-fix profiles to be sealed with reinforced butyl based sealer strips.
4) Junctions between roof cladding and walls to be comprised of two parts i.e. standard head or sidewall flashing covering the greater of 230mm or two ribs and a counter flashing fixed into the wall. Under no circumstances are the two components to be mechanically fixed to each other.
5) Gutters to preferably be fitted to the outside of walls.
6) Gutters to be sized to facilitate easy clearing of leaves and debris.
7) Gutter to be fitted with hailguards in areas prone to large falls of small hail.
8) Rooflights to be of the out-of-plane variety. It is impossible to achieve a long term durable seal between translucent (plastic) and metal roof cladding on a flat roof.
9) Small penetrations through the roof cladding to be sealed with proprietary flexible flashings. Large (greater than 300mm) penetrations to be fitted with two part flashings plus back flashing to apex.

For details of hailguards and flashings please refer to the SAMCRA website.

MEET THE **UJ CIVIL TECH STUDENTS FORUM**

The SAISC team had the opportunity to catch up with some bright eyed and eager students from the UJ Civil Tech Forum recently when they came to collect copies of the famous "Red Book." *(a.k.a – The Southern African Steel Construction Handbook)* from our offices. Their enthusiasm was really inspiring, as was their proactive request to meet and discuss potential future collaboration opportunities with the SAISC.

Christian Heri, General Secretary, shared some insight into the structure and function of the student group.

"The Forum, together with key UJ staff members and supporting industry bodies, including SAICE, is tasked with supporting students from an academic and community development perspective. Succession planning is not only something for people in industry who are reaching their retirement, but also for young leaders like us. As we reach the end of our qualification, it's something we as the Executive of the Forum think about too. Equipping those who follow and building a legacy that will stay long after we graduate and enter industry is something which is really important to us" he asserts. After his studies, Christian wishes to continue with postgraduate studies and pursue a career in structural engineering.

As 3rd years, the Executive team are of the opinion that following a career path in civil engineering means having the opportunity to be part of a profession that makes history. When asked about his passion for the field, Chairperson Aaron Kapata intimated that engineering as a profession is often rooted in personal conviction to make a real difference. "For me, is more than just an application of scientific knowledge to finding efficient and economical solutions to real life problems. It is a lifestyle." he asserts. Driven by his observations, Kapata choose to study civil engineering. "I grew up in an environment where access to clean water, decent housing infrastructure and proper waste disposal programs were all issues that people faced on a daily basis. I will gladly dedicate my life to the profession." he concludes with confidence.

Kapata's views are echoed by his fellow executive team member and Logistics Officer, Pule Moeketsi. "What makes Civil Engineering different from other professions is that it is a discipline that plays a key role in society's infrastructure. That's what motivated me to study it" Moeketsi reveals.

In addition to academic support the Forum organises student socials and project site visits. "Our membership is open to all students who are interested in the enriching benefits we offer," says Marketing Officer, David Isiguzo. David is looking forward to making a difference as he enters the world of work. "I believe the academic training I've received is a valuable starting point for entering a profession committed to solving the challenges of the world, be it related to service delivery, infrastructural development or aiding the progress of civilization. Structural engineering, I hope, will be my niche in contributing to the advancement of any society I may find myself in'' he concludes.

The SAISC would like to commend the UJ Students Forum for their vision and passion. If Structural Engineering is a career path you would like to follow and you need advice or academic support, then pop in to our office for a cup of coffee and a chat. Let's get to know each-other a bit better!

UJ Civils Executive team members (from left to right): Aaron Kapata, Paulos Chirwa, Valentine Moeketsi, Christian Heri and David Isiguzo.

Chairperson, Aaron Kapata.

The UJ Civil Tech Students' Forum Committee.

Marketing Officer, David Isiguzo.

Southern African Institute of Steel Construction

WOMEN OF STEEL **2019**

8 AUGUST 2019
WOODMEAD COUNTRY CLUB

As part of recognising and celebrating the industry's "unsung heroes", the Southern African Institute of Steel Construction will be hosting its second "Women of Steel" event on 8 August 2019 at the Woodmead Country Club.

Join us for an inspirational lineup of guest speakers, networking opportunities and delicious snacks!

Cost of attendance

R250 per person

Table bookings (8 people) – R 2000

For more information or to book, please email **Liezel Weber – liezel@saisc.co.za**

SPONSORSHIP OPPORTUNITIES AVAILABLE

MACSTEEL COLLECTS TWO AWARDS IN RECOGNITION OF SIGNIFICANT ADVANCES IN SUPPLIER DEVELOPMENT

Macsteel has garnered two awards at the Absa Business Day Supplier Development Awards which recognise and celebrate businesses committed to building better South Africa via inclusive and transformed supply chains.

Macsteel won the Small Supplier and Local Manufacturing Award in acknowledgement of companies who have developed an ecosystem of small suppliers, manufacturers or value-add services and products from the local industry.

It was also was recognised as a partner in South African Breweries Market Access Platform (MAP) Steering Committee which collected the Collaboration Award in acknowledgement of companies who recognise the importance of industry relationships and cross-sector collaboration for the benefit of the wider ecosystem. Together with SAB, Total, KFC, General Electric and Coca-Cola Beverages Africa, Macsteel's involvement in the MAP Steering Committee supports preferential procurement and localisation in the spirit of collaboration and towards building a more resilient economy.

"These awards are truly meaningful to Macsteel as they are testament to how we truly go beyond the scorecard and show true leadership, co-operation and long-term commitment in sustainably building our economy," says Kim Allan, Macsteel's Group CSR Manager

In three and a half years, Macsteel has invested R27.2 million in the development of its enterprise and supplier development initiative, the Macsteel Usizo Supplier Development Programme. This initiative is designed to strengthen the capacity of SMMEs within the steel manufacturing sector to better enable them to deliver high quality, fabricated products at competitive prices

Allan says the company's strong belief in providing sustainable support led to the development of Usizo, offering offers small-business customers a sustainable solution to overcome their operational limitations. Macsteel was the first corporate to enter into a private-public partnership with SEFA (Small Enterprise Finance Agency), and the first in the steel industry to implement a supplier credit programme.

"The programme aims to increase the participation of black-owned SMMEs in the steel sector where access to credit enables them to secure input goods for their businesses and build their credit profile. Many have been declined from obtaining credit via traditional channels yet to date, shared risk on defaults represents 4.1% of total credit, an excellent result which is testimony to the success of the programme."

She says the initiative comprises three key components: providing less stringent access to trade credit for small businesses with favourable cash flow terms, in order to bring previously excluded entrepreneurs without collateral into the credit value chain, providing programme participants with access to non-financial support through business mentorship and industry-related transfer of skills and thirdly, by deliberate action to provide further access to market opportunities for SMMEs in the Usizo programme.

Lenny Govender and Kim Allan.

The project was launched in May 2015 in partnership with the Small Enterprise Finance Agency (SEFA) and within 21 months, 114 SMMEs, primarily involved in some form of steel fabrication or construction, engineering, air-conditioning, irrigation or equipment maintenance industries, had benefitted from a R10 million credit facility. In February 2017, informed by the DTI's revised BBEEE codes, the Usizo Supplier Credit Programme qualified for enterprise development.

"For many businesses trade credit is an essential tool for financing growth. Prior to the launch the project, there was no comparable finance product available to support SMMEs for their start-up and early-stage business development," Allan comments.

She adds that while access to credit is a primary element, all Usizo customers are encouraged to participate in Macsteel development programmes where each SMME is assigned an internal mentor to facilitate industry-related skills transfer.

The results are clear. The impact of the programme has enabled a contribution in excess of R89.6 million to the economy and has resulted in 765 jobs (585 maintained and 180 new jobs created).

"Right from the outset, Macsteel's desired result was to bring previously excluded SMMEs into the finance value chain. In just three years, this initiative has made a tangible and immediate difference in supporting local manufacturing suppliers via a sustainable enterprise and supplier development model and Usizo is now fully integrated throughout our business operations. We are delighted with these awards which echo our commitment to building capacity, expertise and knowledge and to create a platform which materially contributes to the economy," Allan concludes.

The publicly-accessible ground floor boasts a health-focused work cafe.

PARAGON GROUP, AECOM ACHIEVE DOUBLE GREEN RATING FOR **GE AFRICA INNOVATION CENTRE**

A unique collaboration between architecture and interior architecture specialist Paragon Group, and integrated infrastructure delivery company AECOM, has resulted in the GE Africa Innovation Centre (GEAIC) in Melrose Estate, Johannesburg receiving a top sustainability accreditation from both South Africa and the US.

Not only has the GEAIC clinched a Green Star Interior rating from the Green Building Council of South Africa (GBCSA), it also boasts a Leadership in Energy and Environmental Design (LEED) Silver rating from the US Green Building Council (USGBC). Both the Green Star and LEED ratings are essential for GE as a global company, which ensures its sustainability credentials are recognised in Africa and the rest of the world.

The GEAIC serves Sub-Saharan Africa. One of over ten GE Innovation and Technology Centres worldwide, each centre is dedicated to specific regional needs, and is therefore uniquely resourced. The GEAIC showcases the best of global GE innovation, invention, practices, and methodologies.

The building, with a Gross Lettable Area (GLA) of 2 454m², is located in close proximity to the key commercial and shopping precinct of Rosebank in Johannesburg. Consisting of a three-storey, mainly east-facing glazed structure, it takes advantage of the extensive African sunlight and mild climate, with access and parking on the west, while overlooking an iconic golf course to the south.

The publicly-accessible ground floor boasts a health-focused work café and digital exhibition centre, collaboration zones, and an outdoor collaboration area. The first floor is restricted to tenants only, and incorporates agile

Paragon Group Senior Project Architectural Technologist, Anthony Karam.

AECOM Sustainability Practice Area Lead, Candice Manning.

The design serves as a dynamic collaboration between various African artistic drivers and high performance workplace design.

workspaces, as well as a fully-equipped GE Africa Healthcare training centre.

The top floor includes a flexible learning and development centre, collaboration rooms, and a multi-disciplinary laboratory. Facilities have been provided for those accessing the building by bicycle or fuel-efficient car. The basement parking features showers and bicycle racks, together with green vehicle bays.

The Paragon Group oversaw the interior fit-out. "The vision was to provide accessibility to a healthy environment, and internalise this in the workplace, promoting an integrated and balanced health and wellness-driven work environment," Paragon Group Senior Project Architectural Technologist Anthony Karam comments.

Furthermore, the design called for localising a global company's identity within the African context, forming a place where 'GE and Africa Meet'. The overall design serves as a dynamic collaboration between various African artistic drivers and high-performance workplace design.

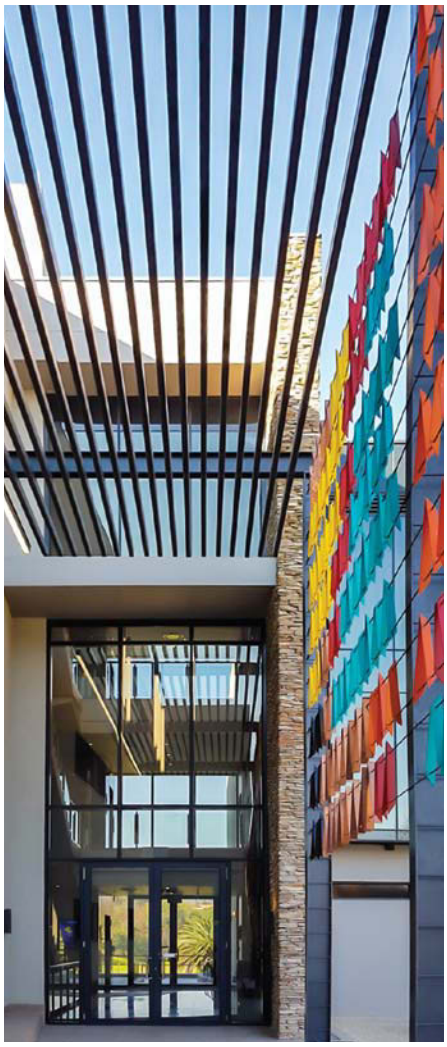
AECOM was appointed to carry out full engineering services for the project, including project management and sustainability. The latter encompassed all electrical and mechanical services. One of the most stringent sustainability requirements for the dual rating was the energy-consumption criteria.

This included the HVAC, the domestic hot water system, and even appliance selection. The building is monitored through a network of submeters to assist facilities management in operating it efficiently. Waste management was also crucial during construction, and a requirement during operation. The project achieved a high level of diversion from landfill.

During construction, an on-site commissioning agent, reporting to both the Paragon Group and AECOM, administrated the commissioning process. This was to ensure that all building systems would operate post-completion as per the initial design requirements. Simultaneously, AECOM engineers guided sub-contractors, making certain that all LEED processes were followed to completion.

AECOM Sustainability Practice Area Lead Candice Manning says the USGBC accreditation is "a significant achievement, as there are only a handful of LEED-rated projects in South Africa. We are certainly very proud of being at the vanguard of managing the certification process for both Green Star and LEED rated projects in Africa."

According to Manning, the major challenges of the GEAIC project



The east facing glazed structure takes advantage of the extensive African sunlight and mild climate.

was complying with the various standards and benchmarks of both rating systems, as well as the seamless management of these processes. She also regards these as the project's greatest achievements.

In addition to their latest accolades, the GEAIC won both the SA Property Owners' Association (SAPOA) Award for Innovative Development 2017, as well as a BASA Strategic Project Award for localisation and Industrial Design.

Another example of where the Paragon Group and AECOM have collaborated successfully on a flagship project is Pran Boulevard in the Ridgeside precinct in Umhlanga, KwaZulu Natal. This two-building project realised a 60% improvement in carbon emissions over the SANS 204 National Building standard, and was awarded a 4-star Green Star rating in May 2018.

SA FIRE-PROTECTION REGULATORY FRAMEWORK STILL IMMATURE, **WARNS ASP FIRE**

Buildings that accommodate large numbers of the public are often not designed with specific occupant characteristics in mind. Shoppers are often unfamiliar with the layout of the emergency escape paths and are unaware of sounding fire alarms and other emergency systems.

Large buildings such as shopping centres, very tall buildings, or highly-hazardous industrial environments are not specifically catered for in South Africa's codes and standards, according to ASP Fire CEO Michael van Niekerk.

"South Africa's fire-protection regulatory framework is relatively young compared to British, European, and North American standards and codes. We often have to refer to standards and codes outside of our framework, or we have to resort to performance-based fire-engineering designs to develop a safe and practical fire-protection solution," van Niekerk comments.

"We have experienced a high demand for assistance in developing designs for new buildings, as well as requirements for bringing existing non-compliant buildings, especially older buildings, up to standard. I see the industry growing both in terms of size and depth of knowledge as more engineers specialise in fire engineering."

As a turnkey fire-engineering solutions provider, ASP Fire works closely with the professional design team to provide cost-effective, compliant fire-protection solutions, and either supplies and installs equipment directly, or manages sub-contractors installing the equipment. With about 13 shopping centre fire-risk evaluations to date, ASP Fire is well-placed to comment on the regulatory and health-and-safety requirements for smaller shopping centres.

"The nature of retail stores implies that there will always be a degree of fire risk that shoppers or retailers are exposed to. The key is limiting the exposure, or mitigating the fire risks, so that the environment is safe for everyone, including the young, the elderly, and those with disabilities. This process requires careful assessment of the fire risks, and a comprehensive fire safety design that integrates all aspects of the mall's

Highly hazardous industrial environments are not specifically catered for in South Africa's fire code.

fire-safety elements," van Niekerk explains.

Most retailers and shopping mall owners are not aware of the full extent of the regulatory fire-safety requirements that they must comply with. Retailers often believe that the mall management is responsible for their fire safety, while the mall management holds the opposite view. Certain malls have outdated or unserviceable fire detection or sprinkler protection equipment installation, and management is unaware that the systems will not work in the event of a fire.

Fires can be dealt with through three main actions: The first is controlling the growth of the fire to prevent it from spreading; the next is suppression, which involves cooling the fire rapidly. Finally, extinguishing the fire means that there is no heated substance remaining. Evacuation should also be safe and easy, while allowing unrestricted access for emergency services. The installed fire-detection system must be able to detect the fire as soon as possible, warn occupants, and allow them to escape in time.

ASP Fire works closely with the design team on compliant fire protection.

"We also provide flammable liquid-store designs and certification, special-risk fire protection systems, visual safety-awareness programmes, SHEQ safety file drafting and implementation, emergency response and business continuity plans, emergency evacuation plan design, emergency evacuation drills, and fire equipment training," van Niekerk elaborates.

ASP Fire also offers standardised and customised client training. The client has the option to select a standard fire risk and safety course, or have a customised training programme developed around individually specific needs, or the areas indicated in the fire-safety risk-assessment report.

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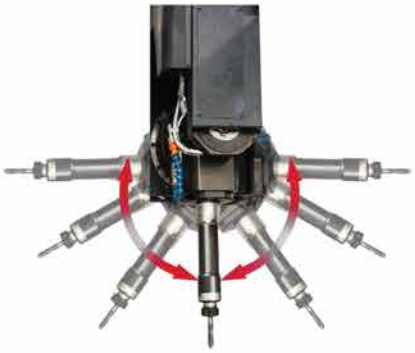

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