

# 2022 SAISC Steel Awards

Innovation, ingenuity and a sense of community within the steel construction industry were recently showcased, when participants across the local steel value chain gathered to attend the highlight of the annual steel industry calendar – the 2022 Southern African Institute of Steel Construction (SAISC) Steel Awards.

This event, which demonstrates excellence in the use of steel in construction, was the first in-person Steel Awards held since 2019, prior to the Covid-19 pandemic. The 2022 Awards very effectively highlighted how the local steel sector has triumphed over adversity in the past two years; as well as showcasing a typically South African 'can-do' approach to the challenges endured during this time.

The annual Steel Awards provide an opportunity for stakeholders across the industry - including engineers, fabricators, designers, architects, processors, merchants and fabricators - to present their work and be honoured for their outstanding achievements.

Members of the Benguela Gem project team with Amanuel Gebremeskel, CEO of the South African Institute of Steel Construction (SAISC)



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#### Local ingenuity and commendable perseverance

SAISC CEO Amanuel Gebremeskel explained: "Even before the global pandemic, South Africa's steel industry had gone through a period of severe challenges. The 'green shoots' theme is an acknowledgement of the importance of continuing to navigate through troubled times. It is also a tribute to our much-loved former CEO, the late Paolo Trincherio, who did so much for South Africa's steel industry.

He was a passionate proponent of the concept of promoting growth throughout the steel sector - or 'green shoots' as he put it - and that one must keep on moving forward and pushing through, even when times are tough. I know he would have been so proud of this year's entries, which are even more noteworthy because they were completed during this very difficult pandemic era."

Gebremeskel explained that many steel construction projects globally were stalled during the Covid pandemic and yet members of the South African steel industry managed to drive projects through to completion.

"A number of high-quality, truly excellent projects have been showcased at this year's annual Steel Awards, and I believe this is a testimony to our character as a nation - as well as the value which the SAISC brings to the local steel construction industry. The SAISC is one of only 6 Steel Institutes around the world, and has a long history as a 'steel sector sage': a custodian of technical knowledge, an educational resource and a trusted authority."

"The SAISC is extremely grateful to its sponsors, who have made the event possible through their generous sponsorships. We would like to thank Safal Steel, Bolt and Engineering, BSi Steel, ProRoof, NJR Steel, Macsteel, Safintra South Africa, Global Roofing Solutions, Unica Iron and Steel, ASTPM, and Stewarts & Lloyds," says Gebremeskel.

I believe the Institute - together with our valued Steel Awards entrants, sponsors, members and partners - has proven once again how much can be achieved across the local steel value chain when all players persevere for the continued success and sustainability of the steel industry," he concludes.

STEEL AWARDS

**Benguela General Treatment Plant**

OVERALL WINNER | MINING WINNER

"While there is tremendous merit across all of our entrants, as well as all our category winners," enthuses Gebremeskel, "the SAISC Annual Awards judges were unanimous in their praise of our overall winner - which was also the winner of the Mining category - the Benguela General Treatment Plant mining facility, aboard the 'Benguela Gem', the world's most advanced diamond recovery vessel. The Benguela Gem is owned by Debmarine Namibia, a 50/50 joint venture between De Beers Group and the government of the Republic of Namibia."

The Benguela Gem is the product of international collaboration: designed in Norway and Poland, built in Romania and fitted out by De Beers Marine South Africa. Diamond recovery by Debmarine Namibia takes place at 90 to 150m below sea level. The exceptional design, fabrication and installation of the 3,000 ton diamond treatment plant on the vessel was carried out ahead of schedule by local engineers and fabricators in the midst of Covid-19 pandemic restrictions.

Gebremeskel advises: "This project stood out in a number of different ways, and presented a first in the history of the Steel Awards: it operates off-shore, and is floating rather than being stationary and anchored - a truly distinctive applicant within the Awards categories. As a sea-faring structure, it is furthermore subject to unusual engineering loads from a naval engineering perspective.

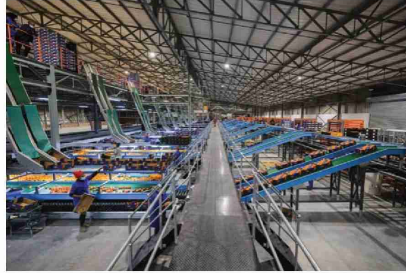


The vessel, built for De Beers Marine operations, is unique in Africa, being able to carry out the entire under-sea diamond dredging and treatment process.

From the vessel arriving at the end of September 2021 with an empty deck, it sailed again in December 2021 with a fully operational mine onboard.

This project was an exceptional showcase of the use and applications of steel featuring South African design, fabrication and construction for an international client." The treatment plant was nominated by designers PBA Projects and completed in collaboration with De Beers Marine and 3C Metal Belmet, Namibia and local fabricators Steel Services and Allied Industries.





**Woodridge Packhouse**  
AGRI-INDUSTRIAL | BEST PROJECT EASTERN CAPE

The Woodridge Packhouse is situated in Addo in the Eastern Cape. The building is 22,000m<sup>2</sup> under roof with a triple storey integrated office within the footprint. There is an internal box distribution mezzanine which is linked to a concrete mezzanine. There is also a box bridge spanning 40m all the way from a box store to the internal mezzanine. Stand out elements of the project are the spacial planning and the synergy of the functions within a relatively simple building footprint.

The rectangular form was chosen due to its flexibility in allowing for future expansion and the ease of moving equipment and machinery around. However the client wanted to create something different from a standard packhouse design. At ±300m long, the challenge was to add interest along these long spans, creating various spaces for visitors and workers. Taking inspiration from the protective netting that covers the orchids, a 'skin' covers the rectangular form of the building. The building is divided into various bays, with the roof lifted at some sections, adding more interest to the façade and also allowing more natural light into the packhouse. The challenge was to work with angles, allowing more light

for a better work environment, whilst not effecting the quality of the fruit.

Another main objective was to look at the entire development as a campus for the farm itself. The campus is divided into five sections: the office block, the main packhouse superstructure, the canteen and the box store. Various thresholds in the office block were created through the use of the triple volume courtyards which then lead to double volume spaces and eventually into single story offices. Structurally the building required minimal columns and needed to span vast areas in order not to inhibit the flow of vehicles, produce, people or machines. A total of 688 tons of structural steel was used and comprised of cold formed lip channels, circular hollow sections, angle irons and both I and H beams.

**Principal Agent:** STANCE Consulting Engineers  
**Architect:** CMAI  
**Structural & Civil Engineer:** STANCE Consulting Engineers  
**Steel Contractor:** Uitenhage Super Steel  
**Sheeting Contractor:** Skyclad Roofing Contractors





**Freshmark Polokwane**  
BEST PROJECT LIMPOPO

Freshmark Polokwane is the latest facility in the network of distribution centres for tenant and operator Shoprite Checkers. Struggling to keep up with the ever-growing needs of the market over the last couple of years, it was time for Freshmark in Limpopo to be upgraded to the standard of its other facilities around the country.

The phase 1 build of the campus was centred around the 7,100m<sup>2</sup> refrigerated warehouse, serviced by 1,100m<sup>2</sup> of offices and 1,200m<sup>2</sup> of auxiliary buildings.

The architects set out to develop the next step in the evolution of industrial design. The team decided to move away from the increasingly popular curved roof design and opted for more striking straight lines, only utilising curves on key connections points and thus creating a sportier modern looking distribution centre. The project made use of particularly innovative cladding: atypical of a warehouse building, and technically challenging to achieve. The result was aesthetically pleasing, with a design element of curved bullnoses from roof to cladding.

The roof shape was adapted to the client's functional requirements for racking heights, while providing a

striking architectural motif that was drawn through the rest of the facility.

The gravity and lateral support structures comprised of pre-cast, reinforced concrete (RC) columns with a structural steel roof. The interplay between the RC and structural steel components ensured that the refrigerated warehouse was constructed to an exceptional standard of quality, while achieving the demanding programme milestones. From the jointless high performance warehouse floors, tailored for the material handling equipment, to the trafficable roof void with a support skeleton for the web of pipework and blower coils, the structure was designed to excel in providing a functional space that could be executed as required by the construction programme.

**Architect:** SLT Architects  
**Structural Engineer:** WSP in Africa  
**Roofing & Cladding Provider:** Safintra  
**Steel Manufacturer:** Safal Steel  
**Steelwork Contractor:** Ferro Eleganza  
**Roofing & Cladding Contractor:** Tate & Nicholson

**Babanango Travellers Camp**  
TUBULAR STEEL | BEST PROJECT KWAZULU-NATAL

This innovative tourist accommodation is situated within the Babanango Game Reserve in northern KwaZulu-Natal. A number of interesting technical details included reconciling complex issues regarding the use of different materials of construction and geometrical factors, to achieve the project's architectural objective: roofing reflecting shapes used in traditional African shields. The roofs of the main public areas consist of steelwork bridge shells made up of circular hollow sections. Each one is between 20 and 24m in height and between 14 to 18m in width. The team constructed these forms using a cementitious membrane fixed onto a timber clad roof that was formed by the steel structure. All members of the roofs are rolled to a radius and the radius falls on the surface of a sphere. The engineers chose

steelwork and specifically circular hollow sections due to the ability to roll them to a tight radius with a fairly tight tolerance. Connections were achieved using the typical wagon wheel type connections. The entire roof structure had to be fabricated and assembled in the fabricator's workshop for shipment to site. Due to the complex nature of the structure and its individual elements, there was no room for error and teamwork was essential.

**Architect:** Luxury Frontiers  
**Structural Engineer:** NJV Consulting  
**Steelwork & Cladding Contractor:** Rebcon Architectural Metalworkers  
**Steel Detailer:** 3Dcon  
**Main Contractor:** Town & Country

**Gary Kirsten Sports Centre Khayelitsha**  
COMMUNITY ENRICHMENT

The Gary Kirsten Foundation focuses on sports development in South Africa, creating healthy alternatives and networks for children and township communities. The goal is to provide quality facilities and coaching for undiscovered talent in SA.

The Foundation had been interested in the development of an indoor sports centre for some time. The concept was to build both an artificial cricket pitch and an indoor sports center with a three lane setup for coaching. The location is Chris Hani Secondary School in Khayelitsha and forms part of the Gary Kirsten Foundation Center of Cricket Excellence. The structure was easy to build, using sustainable products with the capacity to extend if need be and also provided the school with the use of a multi-use facility. Although the structure is basic in terms of construction and the use of steel, what is most important is the flexibility that the structure has to extend to offering more facilities to the children of Khayelitsha. Presently open on one side, the plan is to eventually close up that opening, making the facility better equipped to deal with the South Easterly winds in summer and wet conditions during the winter.



The plan is to add power, connectivity and classrooms as well as complete a mezzanine floor for the use of the cricket coaches.

Establishing this facility in an area with very limited cricket infrastructure will hopefully increase the interest in the sport and identify great talent for the future.

**Client:** The Gary Kirsten Foundation  
**Architect:** ARC Design  
**Main Contractor:** Turftech  
**Structural Engineer:** Cousins Steel International (CSI)  
**Steelwork Contractor, Detailer & Merchant:** CSI

**Ford Package E**  
AUTOMOTIVE

As part of a R3-billion investment by vehicle manufacturer Ford, an automotive assembly plant was erected in Silverton, Pretoria as part of the company's high-volume export programme. This facility was built to house the new production upgrade for Ford's Ranger truck, with vehicles produced in right and left hand versions for local and international markets.

A South African first was the building of a high speed press plant, which will be the fastest in South Africa and one of the fastest in the southern hemisphere. A new body shop also formed part of the facility, which goes hand in hand with the press plant.

The project used extensive steel supplies and comprised a 12,400m<sup>2</sup> warehouse - 24m in height at its peak. The project was completed ahead of schedule,

despite the Covid-19 pandemic and related supply challenges. Luckily the amount of steel specified gave the project an edge with regards to supply in terms of ordering, however due to lack of availability profiles had to be changed. The extensive use of steel gave the design team the flexibility they required to enable the successful design for housing of four 60 ton overhead cranes within the plant.

**Structural Engineer:** Viko Consulting Engineers  
**Steel Fabrication:** B&T Steel  
**Steel Contractors:** RSB Contracts  
**Main Contractor:** JC Van der Linde & Venter Projects  
**Other Contractors:** Dram Industrial Painting Contractors; Industrial Painting Services



**New Biological Oxidation (Biox) Zimbabwe**  
BEST EXPORT PROJECT

Biological oxidation ('BioX') is a technology that ensures the optimal processing of high sulphur gold ore, thereby increasing the achievable gold recovery. This technically challenging structural framing project entailed detailing, fabricating and constructing a gold processing Biox plant. Structural framing was relatively simplistic with the primary objective to provide access to the various areas of the Biox plant as well as piping support system. Since 85% of piping was HDPE, a wide variety of additional structural supports were needed to compliment this fact. Having to incorporate these supports into the other structures whilst keeping weights to a minimum and ensuring an aesthetically pleasing final plant layout was challenging.

The tanks in particular are of a specialised steel structure (SAF2304) to combat highly corrosive plant environment, as needed to achieve the 20 year plan life requirement. The Biox tanks (11.5m diameter x 13m high) were made from 5mm plate to stringent design criteria. Steel material efficiency in terms of structural and platework weights were kept to a minimum to achieve very cost effective project for the end user, Riozim. The

steelwork was painted with an industrial three coat paint specification to withstand the grueling exposure to elements and operational requirements.

**Client:** Riozim  
**Contractors:** Betterect; Metso; Outotec; ADP Marine & Modular; Lycopodium Group; Allied Steelrode; Macsteel



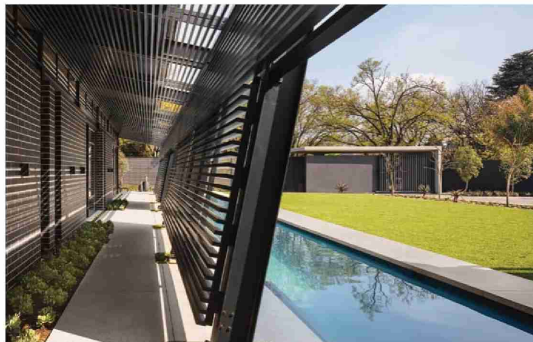
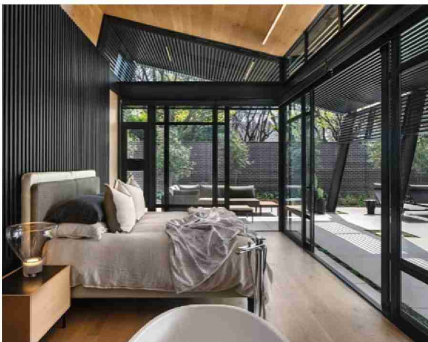
**House Vingos**  
RESIDENTIAL | BEST PROJECT GAUTENG

This home doesn't prescribe to any preconceived ideas of what a home should be - in fact it turns all those preconceived ideas on their head. The combined forms, shapes and materiality of this project are unique. The decision to use a steel portal frame and then go one step further and expose the steel frame home was an unusual approach but one which delivers a striking result. The steel, combined with all the other elements but specifically the natural oak timber, deliver a statement piece of architecture but also a wonderful family home.

The steel portal frame 'skeleton' rotated at 77° delivers a powerful form externally and very interesting volumes internally whilst delivering effective solar control screening on the north side and permitting soft high level natural light in on the south side. The result is

a very unique and interesting architectural form, which also enables very effective sun shading on one side and permits beautiful, soft natural light from the other side. This demonstrates how the creative application of the structural system can also result in very successful passive solar radiation solution and striking architectural gesture. The innovative use of steel, combined with all the other elements of construction, delivers a statement piece of architecture and a warm, welcoming home.

**Architect:** Drew Architects  
**Steel Manufacturer:** Safal Steel  
**Roofing and Cladding Profiler:** Safintra  
**Structural Steel Contractor:** Viva Engineering  
**Painting:** Industrial Painting Services





**KES Aquatic Centre, Houghton, Johannesburg**  
SPORTS FACILITIES | METAL CLADDING & ROOFING

The new KES Aquatic centre involved the redevelopment of the uncovered existing swimming pool into a world class aquatic centre. The 2,750m<sup>2</sup> covered yet naturally ventilated centre includes two pools for swimming and waterpolo plus a learn-to-swim facility. Surrounding the pools is seating including the original retained 1927 entrance, plus a new double storey block with changing areas, upper viewing platform and plant rooms. The design envisaged a feature roof that would span 38m over the pools and connect the new eastern double storey block to the original northern entrance and seating area. The concept called for the stepped apex of consistent height above the pools, to slide on plan by 20m over the 56m length of the roof, or 360mm shift per metre length. The architectural intent of the space required a slim neat structural solution to enhance the

arena. Through several conceptual iterations, the design for the feature roof was chosen as a complementary combination of structural steelwork and reinforced concrete elements.

The long-span steel rafters required a high strength-to-weight ratio and fabrication versatility due to the stepping apex line. The roof was to be a focal point and the desire was for a sleek elegant solution that did not resemble a trussed roofscape. To provide this, portalised structural steel plate girders (720 × 300 × 137 kg/m I-sections) were chosen for the non-identical rafters.

To create a unique and contrasting feature to the lighter and slimmer long span roof, a feature "diving" architecturally exposed RC column and cantilevering beam was proposed for the internal support of the roof rafters. Behind these, and over the eastern block, standard high quality RC beams and external columns completed the eastern portalised support frames. These frame elements were repeated along the length of the building on a grid at a typical spacing of 6m.

**Client:** King Edward VII School (KES)  
**Architect:** Shed Architecture + Design  
**Project Manager & Principal Agent:** Shed Architecture + Design  
**Quantity Surveyor:** Jan Pienaar & Associates  
**Structural Engineer:** Webber Consulting Structural Engineers  
**Steel Contractor:** Tass Engineering  
**Steel Detailing:** 3D Struct  
**Steel Merchant:** CFLC - Allied Steelrode  
**SHS/RHS:** Macsteel/Tubecon  
**Plate Girder Webs & Flanges:** Fast Flame Profiling  
**Roof Sheetting:** GRS Roofing  
**Roofing Contractor:** Lowveld Roofing Solutions  
**Main Contractor:** Akhane Construction  
**Electrical Contractor:** SDS Electrical  
**Façade Contractor/Cladding:** Burger Emoyeni



**Eastgate Solar Trees**  
SCULPTURAL / ARCHITECTURAL

Liberty Two Degrees (L2D) aims to minimise the impact of malls on the natural environment while creating spaces that are agile, adaptable and aligned to Sustainability Development Goals as well as L2D's 2030 Net Zero carbon target. As an aspect of this goal, L2D's Eastgate Shopping Centre has introduced three solar trees to the centre's rooftop piazza.

The solar trees serve to provide a source of renewable solar energy to the centre and increase the public's awareness of alternative and responsible energy sources, while providing an architecturally enriched identity. The solar trees are self-reliant, harnessing energy from the sun to illuminate at night. With a bespoke installation of lights, the trees also contribute to feature lighting in the piazza, while operating off the grid. The solar trees therefore come 'alive' in the evenings of their own accord for approximately 5 to 6 hours. The installation of the solar trees at the centre will contribute towards minimising the centre's impact on the natural environment as well as L2D's Net Zero target.

The solar tree concept at the piazza, inspired by a visit to Baines' Baobabs in the Botswana Nxai Pan National Park, doubles as public art and further aims to bring new energy to the area, enabling photo opportunities and a sense of community and connectedness between visitors.

The trees consist of tubular hollow steel sections that have a 20-year lifespan requiring minor maintenance. The hollow steel sections mostly resemble tree 'trunks' and 'branches' and are extremely flexible, allowing for the necessary bendability, and convenient transporting and installation. The solar panels are set to operate for 10 years and are easily replaced. The solar trees are covered in a stainless-steel net called Jakob Webnet, procured from Switzerland, and within this net, infills were



placed to create an architectural effect. Several solar photovoltaic panels mounted on top of each spiral, are able to provide light.

**Client:** Liberty Two Degrees  
**Architect:** Batley Partners  
**Project Manager:** Profica Project Managers  
**Structural Engineer:** Zutari  
**Quantity Surveyor:** MLC Construction Cost Consultants  
**Electrical Engineer:** MNS Engineering  
**Lighting Consultant:** Pamboukian Lightdesign  
**Contractor:** Anchor ENGINuity

**Jubilee Hospital, Hammanskraal**  
LIGHT STEEL FRAME (LSF) BUILDING

At the height of the Covid-19 pandemic, the innovative use of light steel framing in this field hospital in Hammanskraal, north of Pretoria, allowed for the addition of a significant number of hospital beds to increase existing capacity, using this speedy construction methodology.

Futurecon was awarded the contract for the supply and erection of the Light Steel Framing for the internal and external walls and roofs - clad, lined and insulated with windows installed. They had to complete the project in 10 weeks between July and September 2020. The project entailed the supply of 10,000m<sup>2</sup> of hospital wards and associated buildings, housing beds in general wards and in high and intensive care. The foundations were supplied by Concor.

1,000m<sup>2</sup> of hospital buildings per week had to be handed over. The delivery demands were maintained, barring two weeks when they were not allowed onto the site due to disturbance caused by the local communities.

The installers of the services found installation in the LSF walls very easy and quick, as there was no cutting and chasing of masonry walls required. They were able to carry out their work in tandem with the LSF project teams, speeding up the completion of the final project. Even before this project was finished, enquiries were received to upgrade the existing Jubilee hospital, and to supply hospital buildings in sub-Saharan Africa.

**Light Steel Frame Contractor:** Futurecon