Asset

Issue 84 | August 2020

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Powered by design
Inspired by sustainability

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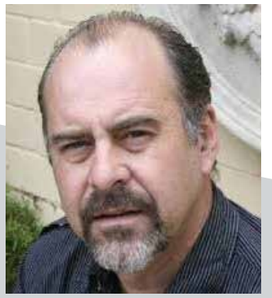
Word from the publisher



Tony Korsten

It was a welcome respite from the current state of affairs globally, to read accounts of how **Craig Sutherland**, who anchors this month's cover story, skippered his crew to a thrilling, record-breaking victory in the 2020 Cape to Rio Yacht Race.

As MD of Sutherland Multidisciplinary Engineers he's used to high-octane projects. Hurtling across the Atlantic with a crew-with-day-jobs, against professionally-crewed race favourite Maserati, must have provided enough high-octane moments to last a lifetime. But Craig plans to do it all again, in his quest to draw attention to the plight of the oceans. His company's quest to engineer buildings sustainably aligns well with this, and more and more clients are following Sutherland's lead.

Safe buildings – both physically and environmentally - remain a high priority, and even more so now. Swedish-based SAFE Shopping Centres has stepped onto South African shores and spoke to Asset about how property owners can add value to their assets by ensuring their buildings are Covid-19 safety compliant as well as fully safety and security compliant. Liberty Two Degrees has already had all its six shopping centres assessed and certified for Covid-19 compliance, with its full certification well-advanced.

And speaking of future-proofing one's assets, Carrick Wealth has recently launched Carrick Property. It now offers offshore property investment opportunities to South Africans who may have considered the possibility unaffordable. In this issue, Carrick's CEO and group sales director set out their reasons for the locations they've chosen, and how to go about investing there. It makes for reassuring reading in a time when it's hard to know how to protect one's assets. **A+**

Craig Sutherland, managing director of Sutherland Multidisciplinary Engineers

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Craig Sutherland and crew celebrate winning the 2020 Cape to Rio Yacht Race and setting a new world record

Supercharged Sutherland engineers the future with optimal sustainable design

Interviewed and written by Ana Lorton

Read time 11min

After a titanic, trans-Atlantic duel against race-favourite Maserati, a professionally-crewed fully foiling trimaran, **Craig Sutherland**, managing director of Sutherland Multidisciplinary Engineers, skippered LoveWater, a huge French-designed and built, 80ft racing trimaran, to a thrilling victory for South Africa in the Cape to Rio race in January this year.

To win one of the world's longest and most iconic yacht races, many factors need to align. From identifying and securing the best-suited yacht to rigorously optimising weight on board; from incorporating and understanding how to use the latest technology to hand-picking the very best, deeply experienced crew with world-class specialists in key positions such as the critical weather router role; from having a likeminded and supportive sponsor to a crew working seamlessly together as one unit at all times no matter how adverse the weather.

In addition, focused and decisive leadership must be aligned with a sound overall race strategy which incorporates well-considered and efficiently executed shorter-term tactics relative to the ever-changing weather systems and competitors' movements. In fact, running a successful business is not that different.

Despite less than ideal weather conditions, LoveWater and its crew won the race for South Africa for only the second time in 27 years, smashing the race record by more than two and a half days to set a new world record time of 7 days, 20 hours, 24 minutes and 2 seconds. The time represented an average speed across the Atlantic of over 23 knots (43 km/hr) and a maximum speed of 39 knots (72 km/hr).

It comes as no surprise that with Craig at the helm, Sutherland's business and engineering model is aligned for success. As one of Africa's leading multi-disciplinary engineering consultancies, Sutherland believes that to remain relevant in a fast-changing world it needs to prioritise the following:

- the ruthless optimisation of every aspect of its engineering designs, across all ten sub-disciplines offered, to ensure absolutely optimal upfront costs as well as optimal annual operational costs thereafter;

2020 Rio HC Presentation H264
video

Hirt and Carter Printing Warehouse, Cornubia Indsutrial Park, KwaZulu-Natal

Love water all clips video

- the incorporation of environmentally sustainable design, construction techniques, materials, technologies, and operational practices that significantly reduce or eliminate the negative impact of development on the environment;
- the continual exploration and evaluation of worldwide trends in offsite modular and prefabricated manufacturing for onsite assembly;
- the early adoption of digitisation especially in terms of design, drafting and detailing in the BIM space seamlessly and collaboratively between sub-disciplines, ensuring thorough co-ordination of services before projects start on site. Collaboration with architects, cost consultants, specialist sub-contractors and suppliers to continually improve supply chain integration will also be facilitated via digitisation;
- the attraction and retention of the best talent and continual upskilling

144 Oxford Road, Rosebank

One on Whiteley, Melrose Arch, Johannesburg

Since engineering award-winning Silo 1, South Africa's first 6 Star Greenstar office building (Design and As Built), at the V&A Waterfront, followed in 2012/2013 by Silo 2, the second multi-unit residential building to achieve a 4 Star Greenstar rating, Sutherland has remained at the forefront of environmentally sustainable design and advances in green building design and technology. When Craig assembled his fourth challenge to win the coveted Cape to Rio race for South Africa and set a new world record in the process, he realised he could use the opportunity to make a meaningful contribution towards raising awareness of the plight of our planet and, specifically, the plight of the oceans.

It is currently estimated that over eight tons of plastic waste (the equivalent of a large dump truck) are dumped into the world's oceans every hour, resulting in devastating levels of plastic pollution.

Craig and his crew facilitated the tie-up with the World Wide Fund for Nature (WWF) and race sponsor, JSE-listed HomeChoice, renaming the trimaran LoveWater. HomeChoice, the sub-continent's largest home-shopping retailer, became a founder member and first signatory of the South African Plastics Pact, committing to the responsible use of plastic. Its example has since been followed by many blue-chip corporates.

"I've always had a great love for the oceans and have developed a real desire to protect them," Craig tells **Asset**. "They feed over a billion people. They absorb 25% of the world's carbon dioxide. They drive the earth's weather systems. They cover 70% of our globe's surface area. When you sail across their vast expanse as much as I have, you become very aware of how important it is to be more environmentally conscious."

"We are fortunate enough to be tasked with designing so many buildings of all shapes and sizes across sub-Saharan Africa, and beyond, every year. I realised some time ago that if we took this compassion for the wellbeing of our planet and this environmentally sustainable ethos into our business, we could hopefully make a significant difference. The construction and subsequent operation of buildings, including our homes, worldwide contributes to nearly 40% of all carbon emissions and uses approximately 40% of the world's energy," he says.

This ardent desire to preserve the planet for future generations is shared right across the structural, civil, mechanical (HVAC, wet services, vertical transportation, rational fire, fire reticulation), electrical, electronic and specialist façade design staff based at the Sutherland head office in Cape Town and branch offices in Johannesburg, Durban and Nairobi in Kenya.

"One of our critical success factors as a firm has always been our very talented, hardworking and loyal staff. We are really proud to have 28 staff members who have been with us for over 10 years and many for much longer. We have 20 shareholders and 22 directors, and are excited about our leadership-grooming for succession. Our pipeline is brimming with potential."

Rockefeller residential building, Cape Town Foreshore

Cover Story
SUTHERLAND ENGINEERS

35 Lower Long, Cape Town Foreshore

Craig believes that Sutherland is ideally positioned to add considerable value to projects across South Africa and the sub-Saharan region as one of the only firms offering all engineering sub-disciplines. This ensures seamless, collaborative, optimal workflow under one roof, utilising the very latest design, drafting and detailing 3D BIM technology to achieve a high degree of accuracy and greater efficiencies through the supply chain.

Sean Couzyn, head of façades, enthuses about the advantages of this iterative, collaborative, and non-conflictual design process between disciplines in the same firm. A prime example, he says, is the synergy required between the specialised façade, mechanical and electrical engineers, in order to fully optimise the most cost-effective glass and façade type choice, taking into account the energy usage and thermal comfort inside a building.

“This is achieved by means of computational fluid dynamics modelling of the conditions inside the building. Then, the upfront cost of the various glass type options and façade structures (single or double skin etc.) are weighed up against the resultant lifecycle cost of operating the building. Our façade design team recently completed a transparent solar-incorporated PV glass façade instead of using conventional glass, thereby generating electricity, on a project in Nairobi. It is now the largest photo-voltaic skylight installation in Africa. It had less than a five-year payback on electricity saved.”

Sutherland were the mechanical and electrical engineers on South Africa’s first Greenstar-rated new hotel project. This was the Radisson Red in the V&A Waterfront. **Noel De Villiers**, one of Sutherland’s mechanical directors, has assisted the GBCSA in developing certain rating tools.

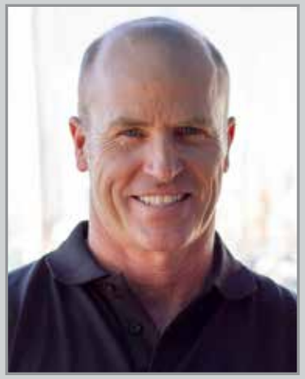
Kings Tower, Lagos, Nigeria

Green School South Africa, Paarl

Radisson Red, V&A Waterfront, Cape Town

One Africa Place, Nairobi, Kenya

Executive Team


Craig Sutherland, MD

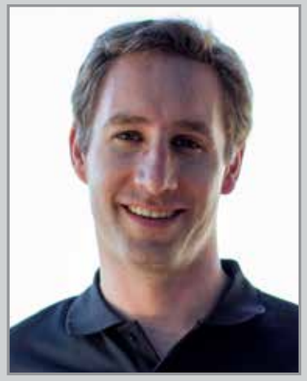

Ian Coleman, director


Wayne Ritchie, director


Ian Sutherland, finance director


Keith Adams, HR director


Thys de Vries, mechanical director


Jonathan Edwards, electrical director


Sean Couzyn, director Kenya and façades


Justin Arendse, technical director, structures, Cape Town


Ian van Rooyen, technical director, structures, Durban

The Link, Rosebank, Johannesburg

The first Green School in Africa (the others being in Bali, Mexico and New Zealand), currently under construction at Val De Vie Estate, near Paarl, aims to achieve the very first exacting Living Building Challenge (LBC) rating in South Africa, a holistic standard which is aimed at a regenerative future.

“This means the building must register net positive energy, waste and water i.e. it must be able to generate more energy than it uses. It is rated only a full year after occupation to prove this. Rammed earth walls, natural clay floors, renewable structural timber rather than reinforced concrete or structural steel, insulated timber panels, with lime rather than cement-based mortar and plaster, and dekriet ceilings are incorporated. It’s an exciting and relevant project for us taking sustainable design up a few notches above Greenstar,” Craig emphasises.

In response to a question as to whether a green building agenda might lose its impetus in an economically weak Covid-19 landscape, Craig believes not. Firstly, pandemic or no pandemic, property owners will increasingly want to go off-grid. Power costs continue to rise exponentially, and the supply is intermittent. In a country like South Africa, dwindling water supplies will remain a problem in the longer term.

“We have designed systems to harvest potable ground water, incorporating reverse osmosis where necessary, on many of our Cape Town projects,” says Craig. “Moreover, new mechanical and electrical renewable energy technologies are becoming more affordable quite quickly.”

“Secondly, it’s not just about the initial upfront capital cost that you may pay a little more for. Payback periods are getting shorter and shorter. You can get full payback in four or five years in some cases and, importantly, negate the unstable supply of power during loadshedding whilst doing good for our planet by harnessing renewable energy rather than burning fossil fuels.”

Global innovations in technology, together with new construction techniques and revolutionary advances in building materials,

feed into Sutherland's love of finding the best possible way of designing a building while making it practically buildable for contractors and as optimally cost-effective as possible for the owner or developer.

Sutherland encourages the use of modular, prefabricated and pre-cast construction techniques using lightweight and renewable materials when applicable. These ensure better quality offsite manufacturing, less wastage, and fewer workers on site. The increased use of renewable, structural timber, in multiple-storeyed buildings, is also being explored as it's a carbon-negative building material. Techniques such as glulam (glue laminated beams) and cross-laminating (CLT), as well as the use of nail-laminated timber (NLT) and dowel laminated timber (DLT) are becoming more widespread.

Utilising these techniques, locally sourced and fully renewable pine and eucalyptus are machined into layers then glued together, sometimes at right angles, to play to the materials grain strengths thereby producing enhanced composite properties. In Canada, Norway and Japan, structural timber buildings of over 20 storeys, and one of 100 storeys currently in planning, are increasingly being constructed.

"We have a focus group headed by **Wayne Ritchie** and **Ian van Rooyen,** structural design directors, staying close to international trends and their adoption in the South African market," Craig reports.

He tells **Asset** that most of the environmentally sustainable advances have taken place on the mechanical side where head of mechanical, **Thys de Vries**, and his mechanical teams have pioneered several innovative systems. One of these is TABS, or thermally activated building structures, incorporated into a recently completed 8,000 m² project called Brickfields Canvas in Woodstock, Cape Town. Hot and cold water pipes were installed within the structure of the building and use the thermal mass of the concrete to maintain a consistent temperature. The system can be designed to operate without the need for standby generators during power outages and has a lower operating cost.

In-slab piping, Brickfield Canvas Office Park

Brickfield Canvas Office Park, Woodstock, Cape Town

"Our electrical and mechanical engineers are also exploring absorption chillers and whether solar power could drive air-conditioning systems. They are looking into solar PV thermal, which is a combination of a water-heating panel and a PV panel, which generates electricity at the same time as it generates hot water."

Craig forecasts continued expansion in the industrial sector as online retail growth accelerates the need for more distribution centres. Sutherland is currently engineering seven new industrial buildings across the country including one in the IDZ zone in Saldanha, and distribution centres for companies such as DHL and Takealot in Johannesburg.

"We have been fortunate to have designed an impressive number and variety of industrial buildings across the country over our 27-year history. Large factories, with and without crane gantries, aircraft hangars, cold storage buildings, pharmaceutical processing and packaging plants, food processing plants, high density as well multiple level storage buildings, and numerous large (up to 65,000m²) and increasingly tall (up to 18m at eaves) distribution centres on every conceivable geotechnical founding condition.

"In many of these buildings, Sutherland has pioneered and adopted early foundation-free tilt-up concrete walls, tall precast columns, precast dock leveller panels, super-lightweight structural steel designs, and various new floor and floor joint types including fibre-reinforced floor panels."

34 Wrench Road, Johannesburg Industrial Warehouse

Unilever Riverhorse Park, Durban

It is clear that the company enjoys continually refining and improving its designs, working in close-knit teams with hands-on clients and specialist contractors, whilst constantly striving to drive down costs, wastage and construction programmes. It is not averse to operating in design and construct teams when this method of working is well-suited to a particular client or project.

"As a sailing team we are hoping to drive the LoveWater legacy further in July 2021 possibly taking on the Transpacific Yacht Race from LA to Hawaii in another chartered, superfast trimaran," Craig discloses. As a legacy project he is also keen to get involved in the organisation, the strategic direction and profile enhancement of the Cape to Rio Race itself. He wants to champion ocean conservation, encourage sailing for the underprivileged and promote the City of Cape Town as an international tourist destination.

There's little doubt that this skipper's trailblazing energy and highly focused sense of purpose is equally embodied by the staff of Sutherland. From Nairobi to Cape Town their commitment is unfailing and their mission is crystal-clear: to engineer their buildings for the future of the planet while combining digitisation and optimal design with the latest trends in modular and pre-fabricated methodology.

Sutherland clients' projects and the planet's future - not to mention the oceans - are surely in the most skilled, safe and caring hands. **A+**