

CONCRETE

trends

The voice of the industry



BIG FIVE CONSTRUCT

Previewing events in Egypt, Ethiopia and Southern Africa

WOMEN IN CONSTRUCTION

Three women involved in construction share experiences

PROJECTS

Four innovative precast projects

WE ARE

CEMZA NSI

Engineered cement



We are proud to play a role in reducing South Africa's carbon footprint



Our premium cement is locally manufactured, providing jobs and uplifting communities



We use the latest technology at our factory in the Eastern Cape

Cemza is born and bred in Mzansi,
for South Africans, by South Africans.

Our people. Our country. Our pride.

#cemzansi

cemza.co

 **cemza**[™]
ENGINEERED
CEMENT

CONCRETE trends

The voice of the industry



COVER

Once a backbone of South Africa's economy, the construction sector has seen a precipitous decline over the last decade or more; *AfriSam Sales and Marketing Executive Richard Tomes highlights why the industry remains central to the country's future.*

CONTENTS

Editor's comment2
 Association trends
 The central role of precast elements in reducing CO2 emissions ... 3 - 4
 CorriSA's annual awards celebration.....5
 CESA Presidential meeting: Make a difference by collaborating for change 6 - 7
 Industry trends:
 Mega-projects set to shield Mena cement producers from global blows..... 8 - 9
 The future looks bright for SA's MICE industry..... 10
 Terraforce launches on-line ideas book for inspiration and practical assistance 11
 Events and exhibitions
 Africa's only event for concrete & cement professionals..... 15
 Big 5 Dubai reports strong bounce back in attendance and revenue .. 16
 Ethiopia is now the largest economy in East Africa 17 - 18
 Women in Construction
 Women in Construction Forum 19
 Hear about Everything Architecture from Esra Lemmens..... 20 - 21
 Phophi Nematangari: new SARACCA NEC member 22 - 23
 OHS trends
 Concrete risk on site..... 24 - 25
 Project trends
 Precast concrete safety barriers preferred for Cape Town's formula E race..... 26 - 27
 New Sea Point Hotel and apartment complex framed with bespoke paving..... 28 - 29
 Massive firewall built with precast concrete for Cape fruit distributor 30 - 32
 Innovation in precast-concrete keeps sports centres on track... 33 - 34
 CMA member list..... 35 - 36



16



26



30



33

VICE PRESIDENT:
Devi Paulsen-Abbott
 email: DeviPaulsen@dmgevents.com

MANAGING EDITOR:
Eamonn Ryan
 email: EamonnRyan@dmgevents.com
 T: +27 21 700 5608 M: +27 82 560 8718

PROJECT MANAGER:
Tracy-Lee Behr
 email: TracyLeeBehr@dmgevents.com
 T: +27 21 700 5512 M: +27 73 367 9647

MARKETING:
Yaseen Dalvie
 email: yaseendalvie@dmgevents.com
 T: +27 21 700 5506 M: +27 79 403 0683

EXHIBITION & PUBLISHING SALES MANAGER:
Kenneth Masvikieni
 email: KennethMasvikieni@dmgevents.com
 T: +27 21 7005509 M: +27 72 686 6998

DESIGN & LAYOUT:
Virgil Jacobs
 email: rykim@mweb.co.za
 M: +27 83 524 5024

PRINTED BY:
Onyx Press
 T: +27 21 593 9173

dmg events

Published by dmgevents: Units 5 & 6, EDGE HOUSE, 16 Bell Crescent Westlake Business Park, Westlake, 7945, Cape Town, South Africa
 Tel +27 (0)21 700 5500 | Fax +27 (0)21 700 5519
 76 11th Street, Parkmore, South Africa, 2196 | PO Box 650302, Benmore 2010 | Tel + 27 (0)11 783 7250 | Fax: +27 (0)11 783 7269



ISSN 1560-2710

Endorsed by industry:



Official host publication of TCE



dmgevents and the editorial team accepts no responsibility for any opinions or statements in this publication. Consequently no person connected with the publication of this journal will be liable for any loss or damage sustained by any reader as a result of action following any statements or opinions expressed herein.

Do we REALLY want investment?

At the Mining Indaba in February, many potential investors applauded the way Zambia has made itself attractive as an investment destination. This demonstrates that it is not difficult to turn matters around, given that not long ago Zambia's light did not shine any brighter than South Africa's.



Eamonn Ryan

South Africa's President Cyril Ramaphosa might want to look at what makes neighbouring countries such as Zambia and Botswana more attractive investment destinations than South Africa.

Comments made in the Business Day about Zambia at the Indaba included: "The people there really want investment, the government is accessible, there's no BBBEE, the legislation is

clear, information is readily available (in mining in this instance) as to which companies have mining rights and permits, and where." Under the previous Zambian president, corruption had been widely perceived to have flourished and the mining sector was a frequent target of political wrath – much like South Africa today.

While Zambia's star is on the rise, similar to the 'Ramaphoria' of just a few years ago, Ramaphosa's star is definitely on the wane through inaction.

Five years ago in his SONA and annual budget, Ramaphosa was talking of spearheading a drive to generate billions in private sector investment over the next five years in order to create 1–1.5 million new job opportunities in South Africa.

Fixed Direct Investment (FDI) is an important enabler of economic growth. For emerging market economies, such inflows are crucial for transferring money and expertise from multinational companies to local enterprises and to help finance infrastructure deficits. This is crucial in the construction, cement and concrete sector given how much equipment is either imported or manufactured locally under foreign license.

Economic growth and FDI in this country has been on a downward trajectory for two decades, barely ever rising above 2% when the National Development Plan's (NDP) goal was for economic growth to exceed 5% a year towards 2030. The NDP originally envisioned the unemployment rate falling from 25% in 2012 to 14% by 2020 and 6% in 2030 — instead every economic indicator has gone in the opposite direction, with key unemployment increasing since 2012 to soar above 30% today.

As this issue of *Concrete Trends* goes to print the 2023/24 National Budget has just been announced.

Dr Azar Jammine, director and chief economist of Econometrix has a speciality in the construction industry and at an AfriSam Budget Breakfast hosted on 24 February, pointed out some anomalies in the budget. One is that the amount which government plans to dedicate to capital spending – that amount that goes into building and construction – is set to double. On the surface that seems positive.

However, he points out that this figure has been declining for years to less than 3% whereas fast-growing developing countries like India and China spend well over 20%. As a result, they have GDP growth rates in excess of 6-7%. He also pointed out that the steady decline in capital spending is entirely due to government itself – the private sector has continued to invest at more or less the same rate over the past ten years. This private sector investment may not sound incredibly good, but it is when compared to the fact that during that decade government capital spending has collapsed.

The decline in capital investment is entirely linked to the deterioration of state-owned enterprises which have been "completely annihilated over the last six years". National Treasury has in fact been extremely conservative in projecting an increase in capital expenditure to about 4% if one simply looks at projects that have been previously promised by government in previous budgets. Had those promises materialised our growth rate would be above 6% and every aspect of the construction industry would be booming at the moment. Clearly, government is quite accustomed to making empty promises.

If the amounts promised by the government over the past few years – over a trillion rand – of which the actual roll-out has been non-existent according to a SEIFSA report which described it as "very little implementation" – then these numbers are so big, that if we were to actually see full implementation, it would be a game changer not only for the construction sector, but for the entire economy, claims Jammine. It would mean capital investment would start growing by 20 to 30% a year, not the measly three or 4% that the Budget anticipates. More to the point, construction has the highest job creation factor of any sector and it would stimulate massive job creation. The economy would grow by between five and 6% a year. ■

Source of figures: econometrix.co.za

CONCRETE
trends

The voice of the industry

Keeping the industry up to date with the latest news, innovations, trends and connections.

Subscribe to the **FREE** e-news letter today!

www.concretetrends.co.za

The central role of precast elements in reducing CO₂ emissions

Submitted by the Concrete Manufacturers Association

“Factory produced precast concrete can reduce CO₂ emissions by 25% and has the potential to save billions of tonnes of CO₂ emissions annually. So why is the issue so neglected?” asks Mats Jungar, CEO of Finland’s Elematic Group.

While raw materials for concrete are abundant and the production of concrete structures cost-effective, concrete contributes about 8% to global CO₂ emissions. There is widespread consensus that this figure needs to be reduced in order for the world to meet its commitments under the Paris Agreement, COP26 and other climate-based initiatives.

“The problem is there are no affordable alternatives to concrete. Replacing concrete with steel, brick or wood is not economical and, if used in the quantities needed worldwide, would cause its own environmental problems. Finland, for example, would have to cut down all the trees in its heavily forested landscape in just a few years to substitute wood for concrete. So concrete is easy to criticize, but hard to replace,” says Jungar.

While efforts are being made to make the concrete supply chain cleaner, such as developing CO₂-free steel for rebar, eliminating coal-fired kilns to produce cement clinker, or replacing cement with fly ash, these initiatives are not likely to solve concrete’s CO₂ problem on their own.



Mats Jungar, Elematic CEO (Figure: Elematic)

PRECAST ELEMENTS – THE CLEANER ALTERNATIVE

One solution is the replacement of solid in-situ cast floors with hollow-core flooring which is made in strictly controlled precast plants and only requires slightly more than half the concrete. Moreover, cement consumption is reduced by a third because the compaction process in precast plants is much more effective. Even steel consumption is lowered because it is prestressed and hollow-core uses about 10 to 15 kg less steel per m². And that’s not all – because precast hollow-core slabs are so much lighter, less concrete is needed for the foundations and the number of interior load-bearing walls can be significantly reduced.

The list of advantages of using precast concrete elements as opposed to cast in-situ concrete is long. The ability to incorporate insulation into the process not only lowers heating costs in winter, but can also dramatically reduce air conditioning costs (and associated CO₂ emissions) in hot climates. Scrap is a major problem with on-site concreting whereas with precast, excess material can be recycled back into the production process. Unlike dry-hot desert climates, where large amounts of water are needed to protect fresh concrete, no additional water is needed in a factory-controlled precast environment.

Aggregate Batcher

Concrete Mixers

Brick, Block & Paver Making Machines

Kerb Making Machines

Roof Tile Forming Machines

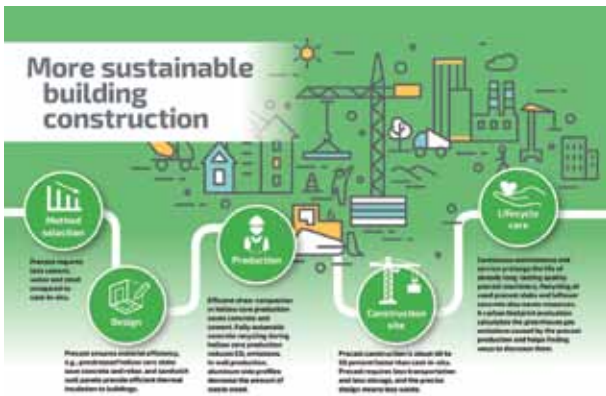
Lintel Forming Machines

Wet-Block Pallet Stackers & Brick Handling Systems

sales@revaro.co.za
+27 11 794 8271

www.revaro.co.za
+27 83 893 5516

Revaro Concrete Equipment (Pty) Ltd is a member of the Revaro Group of Companies. Established in 2000



More sustainable construction (Figure: Elematic)

A BREATH OF FRESH AIR

Pollution is not limited to CO₂. Up to 25% of air pollution in major cities is due to dust generated by concrete construction. Therefore the use of precast elements offers enormous potential for improving air quality in inner cities. Last but not least, the use of precast floors and walls can reduce construction time by a third.

The fact that precast elements are subject to strict quality control and can be lifted and assembled on site (often without scaffolding) improves safety as well as security throughout the life of the building.



Building construction using precast flooring and walling.

“WE’RE FIXING OUR HOUSE”

“For all its advantages over cast in-situ concrete, precast concrete manufacturing is not perfect, and we are working to improve our own carbon footprint. To this end, Elematic has recently met the requirements of the ISO14001 standard, which helps us to improve our environmental performance through more efficient use of resources and the reduction of waste, and it helps us reduce our own CO₂ emissions,” explained Jungar.

Elematic is aware that most CO₂ emissions generated by precast elements occur on site during construction. For this reason, a range of services is offered to help determine carbon footprints and the means of reducing them. Establishing the carbon footprint of a facility is the first step toward low-carbon element manufacturing. To determine the CO₂ emissions of a building product, the CO₂ footprint of the production process must be known, including the emissions impact of the energy and raw materials used and the CO₂ emissions of the concrete elements produced. Detailed reports help determine the most effective ways to reduce carbon emissions from precast plants.

“In our day-to-day work, our mission is to make precast production as efficient as possible – using less material, energy and time – and CO₂. At the heart of this modernization technology is process automation and Plant Control, a software suite that combines precast process optimization with the latest IT. And at the most recent Bauma exhibition, we showcased a range of innovative products which help our customers do more with less,” said Jungar.

Looking to the future, Elematic is also involved in funding the Loikka project, a joint venture that aims to drastically reduce greenhouse gas emissions in the concrete industry. This project will test low-CO₂ precast concrete products. The transition to low-emission concrete elements presents precast concrete plants with a productivity challenge: How can production be maintained when low-carbon concrete elements dry more slowly than conventional concrete elements? Elematic’s customers operate hundreds of factories around the world. If the Finnish equipment manufacturer can help them make the transition to low-carbon concrete, it will have a far-reaching impact on the climate.

CLIMATE PROTECTION DESERVES A HIGHER PRIORITY

“So if precast concrete offers so many benefits, why isn’t it even more popular? Unfortunately, the answer lies in the fact that construction companies usually win tenders based on price, irrespective of environmental considerations. In addition, no one in the construction value chain is responsible for a building’s CO₂ emissions. Of the major economies, only China promotes the use of precast construction.

And only new laws and regulations can break the environmentally damaging cycle of cast in-situ construction. The irony is that cast in-situ concrete’s reputation for being the cheapest option is not really justified. When shorter construction times, lower labour requirements, and less waste are factored in, precast construction costs are compare favourably to cast in-situ concrete construction costs.

With global warming on the rise, the technology to radically reduce CO₂ emissions in concrete construction is available today. We have the relevant know-how. The only question is whether the construction industry is prepared to take advantage of this opportunity,” concludes Jungar. ■

Text: BFT International

CorriSA's annual awards celebration

Each year the Corrosion Institute has the great privilege of recognising achievement excellence within the Corrosion Industry.

The prestigious Corrosion Institute Annual Awards provide recognition to individuals and companies for their contributions towards furthering the objectives of the Institute and in so doing helping to champion the cause of corrosion control.

Gold Medal Award: This is the Institute's most prestigious award and is only awarded from time to time in cases of exceptional merit. Criteria on which the medal would be presented: Outstanding research of an original nature carried out in South Africa and leading to new developments in corrosion technology. Exceptional achievements in the development of corrosion science and technology. Meritorious contribution in the dissemination of knowledge about corrosion science and technology.

Silver Medal Award: Is presented for 'Service to the Corrosion Industry'. There are many people who have spent their lifetime in the industry and make significant contributions in their own field without making a song and dance about it. The intent is to recognise people who have served the industry with passion and dedication throughout their working lives.

Bronze Medal Award: Is awarded for exceptional and long-standing service to the Institute.

The winners of the night included the first woman to be awarded the Gold medal, Vanessa Sealy-Fisher. The Silver medal was awarded to Johannesburg Water's great, Edward Livesey. The Bronze medal was awarded to a gentleman who has been instrumental in forging CorriSA's relationship with NACE, now known as AMPP, Craig Botha.

EDUCATION CATEGORY:

The Institute also actively promotes research into corrosion and corrosion control in South African universities and Technikons known as the Ivan Ogilvie Research Scholarship: To this end, awards are made to outstanding post graduate/diplomate students, who undertake research in the field of corrosion control. The winner of this award was awarded to Tshimangadzo Nesane from the University of Venda a PHD student working on corrosion inhibitors (Greener Corrosion Inhibitors)

TOP STUDENT AWARDS WENT TO:

Corrosion Engineering: Volker Hansen from Langer-Heinrich Uranium Mine

Corrosion in the Water Industry: Ambrose Diale Isinyithi Cathodic Protection

OTHER AWARDS INCLUDED:

Best stand for the corrosion awareness day: SGB Rope Access CorriSA is hosting its Corrosion Awareness Day 2023, please see the poster attached."

Best CorriSA Event Attendee: Bruce Trembling

Honorary Life Member Award: Bruce Trembling

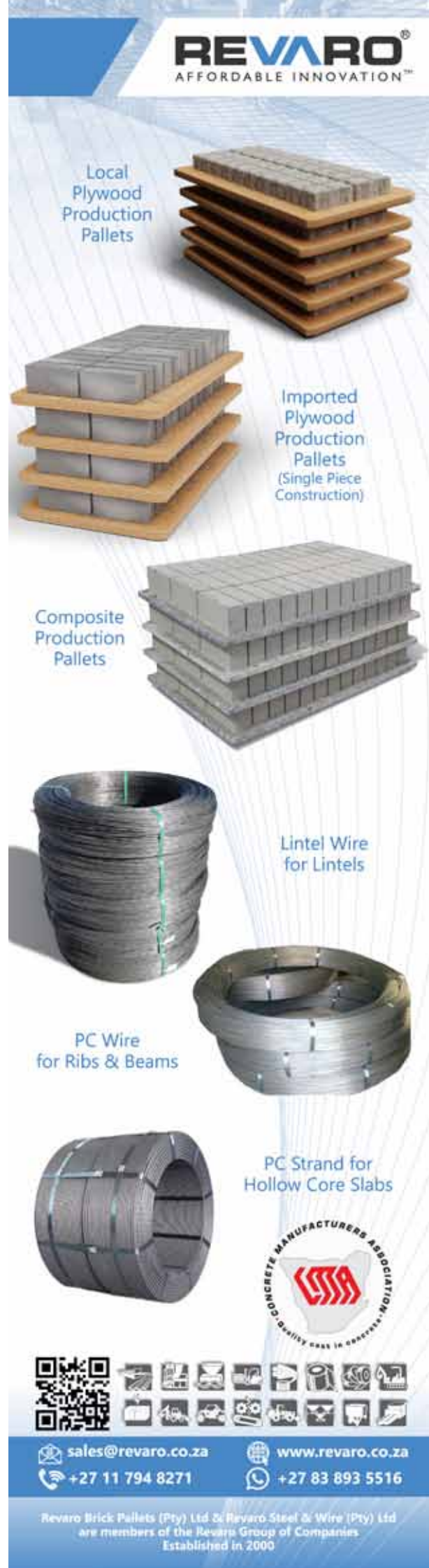
THE FINAL AWARD FOR THE EVENING WAS THE PROJECT AWARDS:

The Corrosion Institute Annual Award is awarded in recognition of the achievement of individuals, processes and projects that have made a significant contribution to the prevention of corrosion.

The Annual Award for stood the test of time went to: A team that has shown an excellent demonstration of the principle of the correct choice of product for the circumstances / good surface preparation and high quality application resulting in an end product which withstands the test of time The project that is a worthy recipient of the 'stood the test of time':

Asset Owner: Anglo American Polokwane – Anglo Raw Water exposed pipeline project and Denso SA

Full details of all projects submissions and citations of winners are available on www.corrosioninstitute.org.za ■



REVARO
AFFORDABLE INNOVATION™

Local Plywood Production Pallets

Imported Plywood Production Pallets (Single Piece Construction)

Composite Production Pallets

Lintel Wire for Lintels

PC Wire for Ribs & Beams

PC Strand for Hollow Core Slabs

CONCRETE MANUFACTURERS ASSOCIATION
QUALITY MADE IN CONCRETE

QR Code and icons for various services

sales@revaro.co.za www.revaro.co.za
+27 11 794 8271 +27 83 893 5516

Revaro Brick Pallets (Pty) Ltd & Revaro Steel & Wire (Pty) Ltd are members of the Revaro Group of Companies
Established in 2000

CESA Presidential meeting: Make a difference by collaborating for change

By Eamonn Ryan

Olu Soluade, president of Consulting Engineers South Africa (Cesa) addressed the media on 2 February at the Radisson Blu hotel in Sandton, Gauteng. He described the organisation's theme and focus for the year ahead is as appropriate to engineers in the civils and concrete sectors.

Our 2022 theme was 'A Call to Service'. During this period, we called on our members and industry stakeholders to serve and work together as a team with a common goal and focus. The four key areas emphasised for us to be of service were:

- Availability
- Willingness
- Sacrifice, and
- Vision

"In this new year, we are delving deeper into actualising this call to service by collaborating for change ensuring that we work effectively towards that common goal.

"Member companies are integral to the engineering that is incorporated into these buildings, making it possible for us and our industry partners to showcase how as an industry we innovate through collaboration."

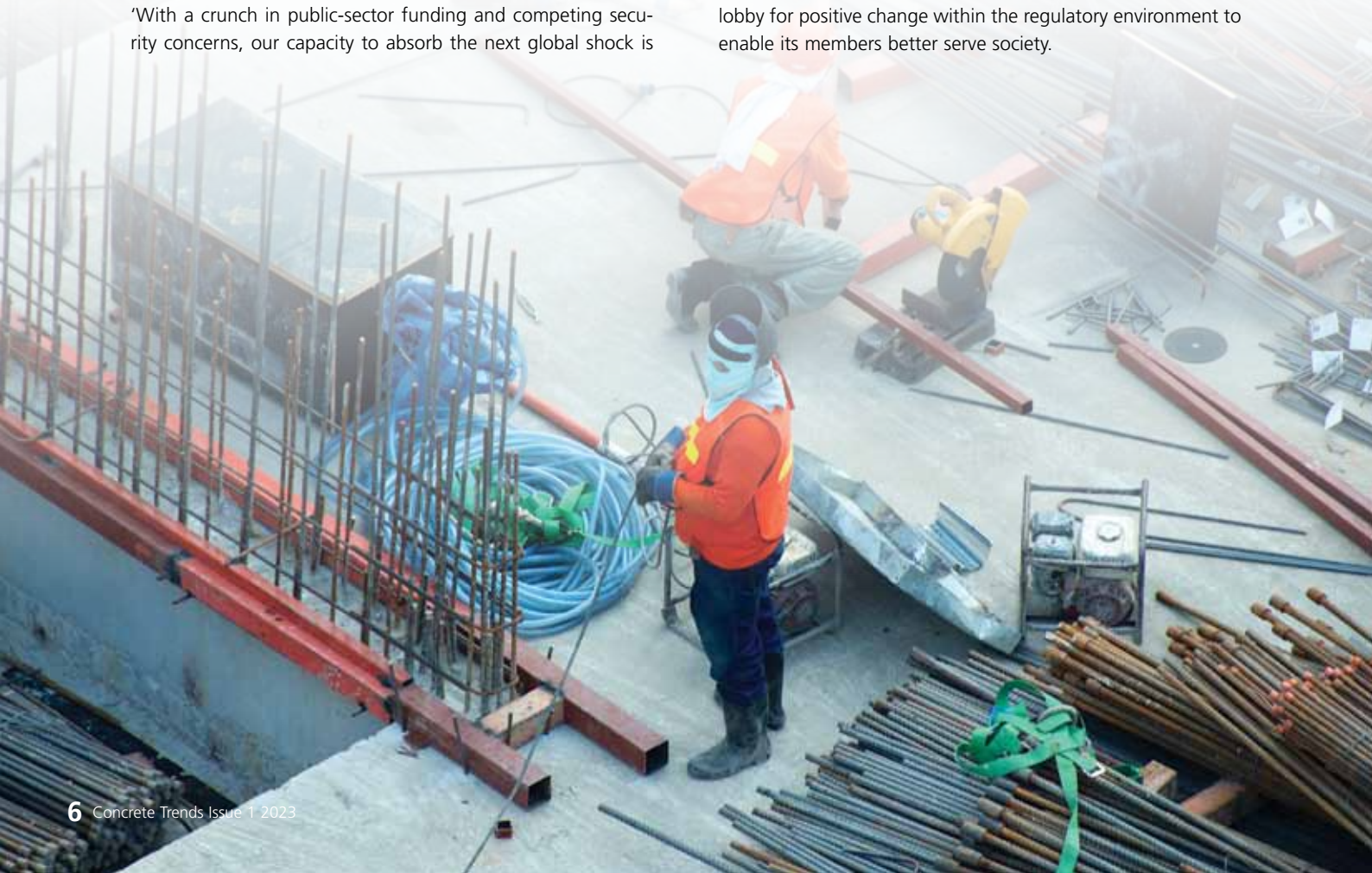
He quoted an excerpt from a recently released World Economic Forum's Global Risks Report 2023 that explores some of the most severe risks we may face over the next decade: 'With a crunch in public-sector funding and competing security concerns, our capacity to absorb the next global shock is

shrinking. Over the next 10 years, fewer countries will have the fiscal headroom to invest in future growth, green technologies, education, care and health systems. The slow decay of public infrastructure and services in both developing and advanced markets may be relatively subtle but accumulating impacts will be highly corrosive to the strength of human capital and development – a critical mitigant to other global risks faced.'

"President Cyril Ramaphosa, speaking at the recent ANC Conference said the most important priorities were tackling the energy crisis to end load shedding, improving the delivery of services, and combating crime and corruption. Another area of focus for him was local government, especially poor service delivery seen at this level. He said one of the solutions was for the ANC to continue with its aim of professionalising the public service.," said Soluade.

"Our organisation wholeheartedly supports governments focus on professionalising the state as well as the private sector to raise competency levels to be able to realise the progress that is required."

CESA, like other industry organisations has a mandate to lobby for positive change within the regulatory environment to enable its members better serve society.



- Engineering profession:** “When it comes to the engineering profession as part of our efforts in making a difference towards professionalising the state, Cesa was part of the task team appointed by the Minister of Public Service and Administration to develop the Framework for the Professionalising of the State, released by the President in 2022 and will continue to support this process going forward as there is much at stake. Cesa member companies have the skills and are ready and willing to collaborate with government and all industry stakeholders.
- Consulting engineering environment:** “As mentioned by the Minister of Finance at our 2022 Indaba – the current supply chain processes simply do not work. We need to ensure that the value for money perspective does not get lost in the pursuit of least cost. Through industry collaboration we were directly involved in the compilation of the new Public Procurement Bill that is due to go before parliament in the near future. This bill promises to ensure that the procurement of infrastructure is treated differently from that of general goods and services. A fundamental shift in principle and in law that will ensure that value for money is equated to the quality of services procured in the infrastructure delivery process. In addition, Section 217 of our Constitution talks about ‘Cost Effective’ – let me reiterate this – it refers to ‘Cost Effective’ and NOT ‘Least Cost’. We need to stop here and emphasize that there is an important relationship between quality and cost. We believe that the correct approach should be to include the total cost of lifecycle ownership – cheap simply does not last and puts lives at stake. The impact of an inadequate design, that only equates to 2% of the lifecycle cost of a project, can have a catastrophic cost impact on operations and maintenance costs, that equate to approximately 60 to 70% of the total lifecycle cost, over the pursuant 30 years,” said Soluade.
- Grassroots development:** “With the shortage of experienced engineering capacity within the public sector, the partnership with the private sector is the easiest to implement. The private sector capacity is not fully utilised.”
- Funders and development:** “These parties will have higher levels of confidence that their money is being well spent if we achieve our goal of rooting out corruption, developing value for money infrastructure.”
- Infrastructure development:** “We are aware of the popular rhetoric of the idea for the formation of a State Construction Company. Understandably such utterance will become commonplace with an election looming in 2024, however, if there are capacity challenges in public sector currently, it is hard to see how this will be implemented with any speed or certainty.
- “As a Nation we are facing many challenges, but we are resilient. Our current water and energy challenges are stretching our resilience to the maximum. In addition we face added challenges with:** Transport systems affecting logistics; Healthcare systems; and Educational institutions, to name a few.”
- Begin at home:** “Most importantly we need to Begin At Home and engineering firms are actively engaged in not only infrastructure development, but also in various corporate social responsibility programmes that seek to make a difference in the daily lives of ordinary citizens. To compete globally and develop locally South Africa needs engineers. Engineers are the designers and developers of infrastructure that results in economic growth and job creation. In 2020 we embarked on our very successful, and internationally acclaimed, Protecting Lives and Livelihoods campaign that is now entering its 4th year. The aim of the campaign is to raise the profile of the industry and highlight the role that engineers play in protecting the lives and livelihoods of the citizens of our country, by showing the public what a Consulting Engineer is, and the value that we bring to society,” said Soluade.

The industry’s focus going into 2023 is on skills development and growing the pipeline of engineers by highlighting the importance of STEM subjects. “Through this campaign, we once again, showcase why engineers need a seat at government’s decision-making table - and not be on the menu - when it comes to the development of value-for-money infrastructure.” ■

Backhoe Loaders (TLB's) 76, 96 & 100HP

Front-End Loaders 1.2 - 9T

Mini & Small to Large Excavators 0.8 - 70T

Jaw, Cone & Impact Crushers 5-1050T/H

Standard, All-Terrain & Rough Terrain Diesel Forklifts 1-10T

Diesel Power Generators 30 - 2500kVA

sales@revaro.co.za
+27 11 794 8271

www.revaro.co.za
+27 83 893 5516

Revaro Equipment (Pty) Ltd & Revaro Materials Handling (Pty) Ltd are members of the Revaro Group of Companies
Established in 2000

Mega-projects set to shield Mena cement producers from global blows

By Eamonn Ryan

Big 5 Construct is being held in Egypt on 19-21 June at the Egypt International Exhibition Centre, Cairo, in the context of a strong year predicted for the Gulf region due to a healthy construction pipeline.

This optimism comes even though many Middle Eastern cement producers reported losses in 2022 due primarily to global trends such as the looming recessionary environment which would continue to impact 2023.

Business consultancy IA Cement has said in its *Cement 2023* report that the Middle East and India “stand out as relative bright spots” for the industry this year. It forecasts 3-4% growth in cement demand in Saudi Arabia resulting from the construction of mega projects such as Neom and the Red Sea development.



Bassam Abd El Rasoul, the Group Chief Technical Officer at Misr Cement Company – Qena, Egypt

Egypt has its own issues. For instance, HeidelbergCement summed up the recent state of the Egyptian cement market in its annual report as follows: “The development of the Egyptian cement market continues to be determined by government intervention.” What happens next is therefore in the hands of the state as it decides whether to extend the production cap, which fuels to subsidise, whether to allow exports and where to invest in infrastructure projects. One variation on this theme may be local decarbonisation targets.

Last year was commonly regarded as a tough, inflationary year. Bassam Abd El Rasoul, the Group Chief Technical Officer at Misr Cement Company – Qena, Egypt, describes the cement and concrete industry in Egypt taking into account excess

capacity in various regions and the threat of cement dumping, in the following way:

“Actually, the market has just started to recover from two dramatic issues, the Covid-19 pandemic and the Russian Ukraine war, which has led to plants reducing outputs to the local market due to the excess capacity. This was in response to the available production capacity being 83 million tons a year with market demand in the region of just 50 million tons a year. Accordingly, cement producers face major difficulties amid declining demand and surging supply which is badly affecting business continuity.

“It is clearly tough conditions and very hard to run a business in the face of such variables which destroy any planning. There are consequences with direct and indirect effects on the cement industry and we expect this to continue until the end of 2023,” says Abd El Rasoul.

“For the cement industry, energy is considered the main factor affecting production costs, as it is the big weight on the cost per ton from a historical perspective. Plants used heavy oil, then natural gas, and now are starting to intervene with investments in alternative fuels. Finally, all cement plants are currently making additional investments to convert to solid fossil fuels (coal and petcock) which is affected by changes in exchange rate and the global worldwide price increases during year 2022 (clear in the coal market index).

“The other lever for cement cost is the kraft paper cost as the [Egyptian] market still uses bags rather than bulk - not less than 80% of the cement delivered is by bags,” he says. “Raw material costs are affected by rising transportation costs - primarily fuel, lubricants, wear and tear, and spare parts – all adding to official fees paid to the quarries.

“All these management and financial issues with reduced capacity, energy cost and rising costs of other supplies, have affected plant operation efficiency, optimisation and performance,” explains Abd El Rasoul.

There have been a number of key macro-economic challenges in 2023 and the years ahead. “Egypt closed the year 2022 by having COP 27, which give us good opportunities to move forward using new zero-emission technologies and best available parties and techniques in our field. For 2023 and the years ahead, a huge inflation rate and weak currency exchange rate will continue to affect us, as well as challenges relating to the following:

- Operation excellences for the cement facilities are the most important challenges, including cost estimation and economical way of operations and management of all plant facilities

- The push to use alternative fuels through supporting the supply chain and availability, especially of agriculture waste, biomass and RDF
- Reconsidering the taxes and fees imposed on the raw material from quarries
- Support for plants that rely on alternative energy to motivate them and expand use of these kinds of energy, for instance towards thermal-electrical
- Supporting plant so as to environmentally comply with laws and increase production
- Restoration of incentives of the export of cement and opening of new markets
- Building a river transport network to facilitate export to Africa
- Producing low carbon cement which is more economic and environmentally friendly
- Building codes for innovation, including green buildings and updates of cement and concrete standards
- Expanding the use of cementitious products using bypass dust
- Construction companies could act as per Scope 3 CO₂ emissions to have more savings
- Expanding the use of concrete in road construction

GROWTH AND INVESTMENT OPPORTUNITIES REGIONALLY AND IN EGYPT

“Although we are still in a phase of reducing capacity - as per the competition authority’s direction - we have great opportuni-

ties to export into Africa on the one hand and to invest in grinding stations in various African countries on the other. This will support our plant operations and exports as well without any effect on the local market. This is important in our case, given the current production capacity issues,” says Abd El Rasoul.

“Locally, we need to invest in the alternative fuels supply to support the plant operation and cost.”

The local cement and concrete association in Egypt has a role in driving innovation in cement and concrete production. “A lot of effort is still badly needed to change Egypt’s cement usage culture such as expanding usage to bulk cement instead of bags.

“The local cement and concrete association cooperates with cement companies, research centres and universities to work hard in new low carbon cement types, low carbon concrete and cementitious products through local joint research to update the building and cement codes accordingly,” he says.

While some countries have a localisation programme which may include cement, not all businesses agree with this, given the competing contexts of maintaining cement national standards and in free trade.

Abd El Rasoul concludes: “From my point of view, we are in complete agreement with the direction of Egypt having its own localisation programme. This includes cement and concrete, while taking into consideration international standards. We follow Egypt’s directions in cement production as well free trade - as we are in one world to avoid any conflict when export exist.” ■



- Tel: + 27 11 822 2320
- Fax: + 27 11 822 2354
- e-mail: cindy@ashak.co.za

For application-specific Release Oils as well as other Quality Formulated Products to enhance Creativity in Concrete Construction!

- *Bonding Agents*
- *Chemical Anchors*
- *Concrete Bonding*
- *Concrete Crack Repairs*
- *Concrete Release Agents*
- *Concrete Repair Mortars*
- *Curing Compounds*
- *Epoxy Adhesives*
- *Epoxy Grout*
- *Joint Sealants*
- *Non Shrink Grouts*
- *Pre Cast Repairs*
- *Water Proofing*



The future looks bright for SA's MICE industry

By Projeni Pather, Founder and Managing Director of Exposure Marketing

February's National Budget provided some encouraging signs that South Africa's economy could turn around, including thorough incentives to stimulate short-term investment.



Projeni Pather, Founder and Managing Director of Exposure Marketing.

This contributes to a fruitful outlook for the Meetings, Incentives, Conferences and Exhibitions (MICE) industry, as various provisions align with promoting tourism and events locally.

Among these is the incentive for businesses to reduce their taxable income by investing in renewables. Placing no limit on the size of projects that qualify can only help to encourage investment sooner than later, with the 125% tax rebate valid for two years. I believe this boost will carry through to event organisers and venues who are doing all they can to counteract the effects of Eskom's loadshedding, while doing what is best for the environment.

ESG (Environmental, Social, Governance) plans are on the horizon in the event industry through the Association of African Exhibition Organisers (AAXO), which strives to encourage investment and participation from businesses into events and exhibitions. It's important to make sustainable choices towards the longevity and success of the global event industry, in which South Africa is a key player.

Plunged into darkness at the start of the Covid-19 pandemic, the MICE industry must work even harder to manage the present loadshedding pandemic, while building back the industry and attracting further interest in South Africa as a top MICE destination.

Improving infrastructure is crucial here and was high on the Budget agenda beyond the provision to reduce Eskom's debt. Transport and logistics received an estimated R351.1 billion commitment to SANRAL to enhance SA's road infrastructure network. Additional plans projected to cost R132.5 billion over the next three years will improve water and sanitation services. These are excellent steps towards making the country more resilient, capable of managing an influx of business and leisure tourists balanced with a growing population.

The country offers so much potential from its landscape to its blend of cultures, with a well-developed tourism and events industry boasting many high-quality venues, suppliers, and service providers to support any type of event.

World-class convention centres and exhibition venues, such as the Cape Town International Convention Centre and the Durban International Convention Centre can – and do – host large-scale international events. There is also a diverse range of accommodation and extra-mural activities available locally to cater to the needs of tourists and event attendees, including natural attractions, great restaurants and shopping malls.

South Africa is an appealing and competitive destination for hosting events with the favourable advantage of the Rand's exchange rate, making it more cost-effective to hold African or international events here. While the total spend on an event will depend on many factors, items like accommodation, transportation, and food and beverage are generally lower in South Africa than in many other developed countries.

But due to loadshedding particularly, the MICE industry is feeling the pressure. Food for example is a major component of any event, so it was great to see the Budget recognise how tough it has been through extending the Road Accident Fund levy refund for diesel to help manufacturers of food stuffs, compensating for the cost of generators and the impact of the electricity crisis on food prices¹.

South Africa has its struggles, but it is still among the most developed and stable destinations on the continent, which reassures event organisers and attendees. If the Budget provisions and tax-saving measures can help to keep the lights on and make it easier to do business in South Africa, we should expect to see more events coming to our local shores. ■

1. Govt extends diesel fuel levy refund to foodstuff manufacturers (engineeringnews.co.za)

Terraforce launches on-line ideas book for inspiration and practical assistance

Concrete Manufacturers Association member, Terraforce, has launched an on-line ideas book to showcase what can be achieved when using the full suite of Terraforce hollow-core retaining wall blocks in retaining wall, outdoor seating and staircase construction.



Front cover.

Rock-face and Round-face L Range blocks applied in staircase and wall construction.

Plant pockets created by reversed L Range blocks at Jalila Children's Hospital in Dubai.

"Our reversible hollow-core retaining wall block is extremely versatile offering the professional designer and landscape architect almost limitless scope for design creativity and the book highlights many examples of what can be achieved," says Holger Rust, Terraforce managing director.

Comprising seven chapters, the manual covers the complete Terraforce product range, illustrated with diagrams and photography. *Patterns and Plantability*; *Features and Inclinations*; *Corners*; *Steps and Stairs*; *Seating*; *Typical Cross Sections*; and *Contractors Check List* are the chapter headings.

"Besides inspiring through visual appeal, the publication plays a practical role in that if a particular design or application catches the eye, interested parties can contact us and we will supply them with the drawings in DWG files which they can then integrate with their AutoCAD software," says Rust.

Patterns and Plantability covers flat and round-face retaining wall permutations as well as rock and round-face combinations, some of which are either partially or fully planted. Pattern

variations such as stretcher bond and stack bond are shown, as are stepped and straight foundations.

Several styles of retaining-wall construction are revealed in *Features and Inclinations* and the chapter includes culverts and small bridge details as well.

Corners presents numerous corner configurations and the internal vertical corner, corner detailing, V-shaped corners and inside corner variation, are just some examples. And photographic images of corner construction with or without cutting blocks are shown.

Seating demonstrates how Terraforce 4x4 Step blocks can be used for the construction of steps as well as retaining walls.

"While we have aimed predominantly at the design engineer and landscape architect, the book does not omit the do-it-yourself home enthusiast

and instructions are given on how to build a 1m high retaining wall. Similarly, guidelines on step construction are also covered under *Steps and Stairs* and various types of Terraforce staircases are presented, as are steps constructed in combination with seating and seating arenas.

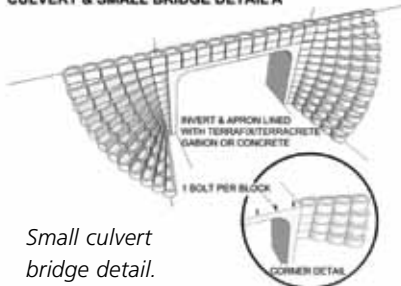
"What's more, advice is given for the construction of seating using the 4x4 Step block and some typical cross-section examples such as the Düzce University in Turkey, the amphitheatre detail at Sirte Park in Lybia, and Rhodes School in Cape Town are presented," explained Rust.

Based in Cape Town for over 40 years, Terraforce maintains a strong presence in the South African retaining wall market. Moreover, the past decade has seen the brand make steady inroads into the global market; the company's international reach is extensive and includes flourishing production plants in Canada, Australia, Spain, India, Morocco, Nigeria, Swaziland, Lesotho, Ghana, United Kingdom, Namibia, United Arab Emirates, and most recently, Egypt. ■

The Terraforce Ideas Book can be accessed on

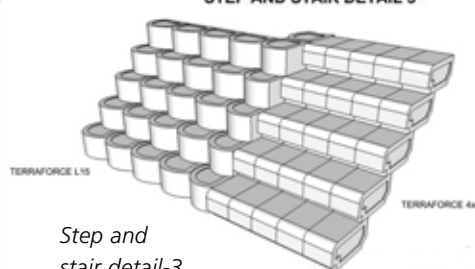
<http://designguide.terraforce.com/download-pdf/>

CULVERT & SMALL BRIDGE DETAIL A



Small culvert bridge detail.

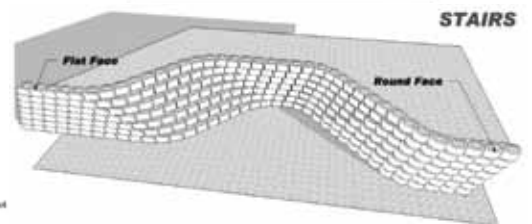
STEP AND STAIR DETAIL 3



Step and stair detail-3.

TERRAFORCE®

The original, reversible, hollow core retaining block.



Staircase detail-2 using L Range standard block using L15 and 4x4 Step blocks

In SA'S maelstrom, construction holds the key

Once a backbone of South Africa's economy, the construction sector has seen a precipitous decline over the last decade or more; AfriSam Sales and Marketing Executive Richard Tomes highlights why the industry remains central to the country's future.

Tomes looks back to the days leading up to the FIFA Soccer World Cup in 2010, when South Africa was "the place to be" for contractors. The urgent need to build and expand soccer stadiums around the country created a boom that severely stretched the capability of local construction firms and their supply chain.

"After the World Cup, the Competition Commission zoomed in and fined many companies for the way they went about delivering on some of these contracts – which had a significant impact," Tomes says. "In the years that followed, there was also a redirecting of government expenditure towards social spending and grants – and away from infrastructure."

COVID DISRUPTION

More recently, the Covid-19 pandemic exacerbated this trend, forcing governments around the world to deal with the social challenges arising both from the illnesses and the economic



Richard Tomes, AfriSam Sales & Marketing Executive



lockdowns. The pandemic has also created hybrid working models where many employees are no longer based solely in business premises – reducing demand for the building of commercial office space.

"The positive side of this was a rise in renovations, with home owners upgrading their houses to create home offices," he says. "In fact, in the second half of 2020, there was even a spike in demand for cement as this uptick was quite unexpected."

This supported the small and medium-sized contractors, but not the larger firms who were traditionally focused on road, rail and water infrastructure. The latter projects continue to lag in terms of the necessary investment, he says.

MISSED OPPORTUNITIES

"One of the results of this lag in investment in infrastructure is that the country has missed out on much of the benefit of high coal export prices, as our rail infrastructure has not been maintained," he said. "Even the coal export ports have not been sufficiently upgraded to deal with higher volumes – which could have brought us considerable benefit."

Tomes points out that the resulting economic loss has been not just in private sector profits and government tax revenue, but on consumers' pockets directly. With the effective collapse of rail infrastructure, there are more trucks on the road to transport food and consumer goods. The rise in oil prices raises the cost of these goods and pushes inflation up; this erodes the spending power of all consumers, especially the poor.

"There was some hope that the final awarding of long delayed road construction projects would help contractors to



A well-functioning construction industry – with enough of the right skills – can help government to deliver on much needed services.

maintain their skills base and build capacity for the future,” says Tomes. “Unfortunately these have been awarded to foreign companies, creating yet further risks for the local sector. This is starting to set a trend similar to what we see in the rest of Africa, where there is a growing presence of companies from countries like China, for instance.”

CRITICAL ROLE

Despite this challenging context, he argues that the construction industry continues to play a critical role in South Africa, which has seen population growth rising at about a million people a year over the past decade. This means an urgent need for more homes, schools, hospitals and other infrastructure.

“For the country to deliver on these services, we need a functioning construction sector that functions well – with enough of the right skills – to help government to deliver on these much needed services,” he says. “We also need municipalities who can direct their funding correctly to address local infrastructure needs.”

As a Level 3 B-BBEE company, AfriSam has long been committed to transformation and development, and targets a portion of profits to promote socio-economic development in the communities where it operates. This includes developing and training small businesses owned by black women and youth in AfriSam’s supply chain and wider industry.

COMPETENCE

“At the heart of every modern economy, however, is the technical and other competence that underpins the construction and maintenance of our infrastructure – whether for our

highways and bridges, our energy network, our rail lines, our harbours, or our water facilities,” says Tomes. “This all needs specialised skills and experience, so that the limited funds available to government can be responsibly and effectively invested in our future.”

Without this clear appreciation, the country will fail to deliver what its citizens expect and deserve, he argues. This requires sustaining the right skills not just in the industry but among public sector decision makers.

“We need skilled people making the decisions on funding infrastructure projects, so that resources are deployed effectively in the interests of the country and the end-users,” he explains.

FOCUSING ON DELIVERY

There remains the devastating impact of the construction mafia, which has made it difficult – and in some cases impossible – for government expenditure to lead to real service delivery.

“It should not matter whether some of the work is carried out by South Africans from other provinces or communities,” argues Tomes. “What is important is for the work to be done cost effectively to the highest level of quality, so that the community benefits from reliable water and electricity supply, and can have schools, hospitals and trains that work.”

He highlights that transformation will remain a key imperative of all responsible businesses; indeed, there are compliance requirements to be observed, in addition to the forward-looking values that most companies embrace. Alongside this, there is now an equally important imperative: to ensure that there are enough people with the requisite skills to deliver what the country needs.

“Now more than ever, we need to make sure we strike the right balance between transformation and having the right skilled people who are able to deliver,” he says.



Developing and training small businesses owned by black women and youth in AfriSam’s supply chain and wider industry remains important.

CLIMATE CHANGE IMPACTS

Recent flooding around South Africa has heightened the general awareness of climate change, as well as the country’s vulnerability to its impacts. For companies like AfriSam, this means continuing to evolve innovative ways of lowering car-



Technical and other competence underpin the construction and maintenance of our infrastructure.

bon emissions in the production of cement and other construction materials.

“With states of disaster declared in seven of our nine provinces, it is clear that climate change is playing an increasing role in our weather systems, with rainfall variability bringing growing risks,” he says. “For AfriSam, it is important to reduce the use of fossil fuels and move toward renewable energy sources – to deliver lower carbon products without compromising quality.”

As important as the trend towards products with reduced carbon footprints, he adds, is the need to focus on the durability of the infrastructure created with those products. The financial pressure on both the private and public sector is leading to spending decisions which undermine long-term sustainability.



A focus on the durability of the infrastructure created with quality products is key.

VALUE FOR MONEY

“Where the focus is purely on achieving a low upfront cost in construction, the result is often that only very poor value for money is achieved,” explains Tomes. “This is particularly relevant because our infrastructure will need to become

more resilient in the face of climate change impacts such as increased flooding.”

He points out where decision makers try to limit expenditure on construction projects unrealistically, this can only lead to corners being cut and inferior resources being employed. The challenge here is that work must then often be repeated too soon – as the initial execution was not up to standard. This leads not only to service delivery disruption, but the project ends up costing even more than it should have.

“With a growing population, the pressure on infrastructure is becoming more intense, so the wise strategy is to ensure that it lasts as long as possible,” he says. “This in fact lowers the life cycle cost, as it can be spread over a longer period. Investing carefully in good quality engineering and inputs can put us on a more sustainable road to a successful future.”

UNPLANNED MAINTENANCE

He points to good examples of this, which South Africa has already achieved: the busy M1 highway in Gauteng between Johannesburg and Tshwane, and the critical Du Toits Kloof Pass in the Western Cape. This kind of infrastructure is a vital platform to economic growth and service delivery, he points out, and cannot afford to be disrupted by frequent repairs.

“We need to shift our thinking toward the life time cost of our national infrastructure, so that our investments actually serve their purpose properly while doing so in a cost-effective way,” says Tomes. “This is the only way that public money can be spent responsibly, while avoiding the need for unplanned maintenance.”

He concludes that creating a positive African future, built on a solid infrastructural base, will require the continuous development of young talent to replace the older generation of construction experts who are reaching retirement age.

“This includes having the skills to beneficiate our local resources – where possible taking minerals through to final products,” he says. “The cement sector has shown this can be done, and there may be more opportunities as the world transitions to the battery economy.” ■



Africa's only event for concrete & cement professionals

Totally Concrete Expo will take place alongside The Big 5 Construct Southern Africa, African Smart Cities Summit, Deck and Flooring Expo and WoodEX for Africa on 27 – 29 June 2023 at its customary location, Gallagher Convention Centre.

The 10th annual Totally Concrete Expo offers contractors, engineers, quantity surveyors, architects, designers and property owners a one-stop-shop to identify viable project tenders and the materials that would help them complete their projects on budget and on time.

Manufacturers, transporters, and processors of concrete will be provided with access to South Africa and Africa's most influential project owners to build relationships, evaluate new technologies, overcome industry challenges and identify new and future commercial partners.

To excel in a changing industry, you need the latest trends, the most sound best-practices and a crystal-clear picture of where the industry is headed. Readymix and pre-cast concrete producers, specifiers, contractors, engineers, architects – if you manufacture, sell, specify or work with concrete in any capacity then this is your show.

Products Featured:

- Aggregates
- Cement and admixtures
- Chemicals and additives
- Concrete solutions
- Concrete mixers
- Concrete pumps
- Concrete repair equipment
- Decorative concrete
- Formwork solutions
- Precast concrete solutions



Big 5 Dubai reports strong bounce back in attendance and revenue

Strong government support underlines the importance of the construction sector for UAE and the wider region.

Big 5 to rebrand to BIG 5 Global for next year's event, set for December 4 - 7. The Big 5, the largest and most influential construction industry event in the Middle East, Africa, and South Asia (MEASA), lived up to its name for its 2022 edition recording a strong bounce back in global attendance with over 65 000 industry professionals from 150 countries filling the Dubai World Trade Centre for a mega event that featured product innovations, high-level summits, industry talks, start-up competitions and more.



The 43rd edition of the Big 5 attracted high-profile government support throughout following its opening.

The four-day event, which ran from 5-8 December 2022, generated US\$766 million in onsite declared business with its 2 000 exhibitors anticipating a further US\$2.7 billion over the next 12 months.

And the 43rd edition of the Big 5 attracted high-profile government support throughout following its opening by His Highness Sheikh Ahmed bin Mohammed bin Rashid Al Maktoum, Chairman of Dubai Media Council, alongside His Excellency Suhail Mohamed Al Mazrouei, the UAE Minister of Energy and Infrastructure. Other government leaders attending the four-day event included His Highness Sheikh Mohammed bin Rashid Al Maktoum, Vice President and Prime Minister of the United Arab Emirates and Ruler of Dubai; His Highness Sheikh Hamdan bin Mohammed bin Rashid Al Maktoum, Crown Prince of Dubai, and His Highness Sheikh Mansoor bin Mohammed bin Rashid Al Maktoum, Chairman of Dubai's Supreme Committee of Crisis and Disaster Management. A number of delegates from Dubai Municipality, Dubai Chamber of Commerce & Industry, and Dubai's General Directorate of Civil Defense were also in attendance.

"This year's event was an impressive gathering of the global construction community here in Dubai - the heart of MEASA region, exploring the enormous and fast-growing opportunities for the sector. We are also humbled by the solid government support we received for the event this year, which is a true testament to the importance of the sector for economic growth," said Josine Heijmans, Vice President - Construction at BIG 5 Global, which is organized by dmg events.



The impressive turnout underlined the event's ability to span the sector's entire ecosystem

"The programme of powerful discussions, keynotes, and impressive innovation underlined the transformation driving the sector and saw an industry coming together to make meaningful connections, find valuable leads, and get access to premium content. The result is the event has now returned to pre-pandemic levels, and with international players keenly eyeing the Middle East, Africa, and South Asia markets, we are rebranding the event into the BIG 5 Global to reflect its expanding footprint."

The impressive turnout underlined the event's ability to span the sector's entire ecosystem addressing key sector challenges, pushing technology adoption, promoting sustainability, and providing start-up support. Big 5 2022 featured eight major product segments and six specialised events that hosted a combined 20 national pavilions, including newcomers Oman, Pakistan, and Singapore.

The co-located exhibitions and specialised events included The Big 5 Heavy; Middle East Concrete; Middle East Stone; HVAC R Expo, the Urban Design & Landscape Expo and FM Expo for the facilities management segment. Alongside the six specialised construction events, Everything Architecture was launched, consisting of innovative and inspiring products, materials, and services transforming the world's architectural and design sectors. Exclusively created for architects, designers, specifiers, and property developers, the inaugural event drew an audience of 1 700 industry professionals. ■



Big 5 2022 featured eight major product segments and six specialised events that hosted a combined 20 national pavilions, including newcomers Oman, Pakistan, and Singapore.

All images courtesy: dmgEvents

Ethiopia is now the largest economy in East Africa

By Eamonn Ryan

Ethiopia has become the largest economy in the East Africa region and the third in sub-Saharan Africa, with the second largest population.

With a market friendly government it is sometimes referred to as the 'China' of Africa – though China isn't overly present in the economy.

Ethiopian Prime Minister Abiy Ahmed recently described Ethiopia's macro economy as resilient and continuing to register growth amid various bottlenecks resulting from man-made and natural challenges including the bloody conflict in the Tigray region, the Ukraine-Russia crisis, the Covid-19 pandemic and drought.

During the concluded Ethiopian fiscal year, the gross domestic product (GDP) of the nation witnessed 6.4% growth and the nation plans to achieve 7.5% growth this year. Over the past 15 years, Ethiopia's economy has been among the fastest growing in the world (at an average of 9.5% a year) and it aims to reach lower-middle-income status by 2025.

ETHIOPIA CONSTRUCTION PROSPECTS

There exist huge opportunities for civil industrial companies following the extension of specialised projects requiring advanced technology. The country's 10-year masterplan 'Ethiopia 2030: The Pathway to Prosperity' relies heavily on the private sector to lead growth enhancement, strengthen public-private partnerships (PPPs) as well as improving fibre connectivity. All of this requires specialised expertise that international players could bring to the country, including talent, skilled labour, technology, systems, processes and the like.

There is immense government support for international companies investing in the country to launch large-scale projects, such as received by the China Communications Construction Company, China Rail Engineering Corporation, and others.

In recent years, the country has initiated several governmental policies aimed at boosting fixed direct investment (FDI) inflows. For instance, over 30 bilateral investment promotion and protection agreements have been signed by the country, which is a member of the Multilateral Investment Guarantee Agency (MIGA). Foreign investors have the right to make remittances out of the country in convertible foreign currency at the prevailing rate of exchange, and there are fiscal incentives in place <https://investmentpolicy.unctad.org/investment-policy-monitor/measures/4003/ethiopia-adopts-new-investment-incentives>.

The government has embarked on a process of economic

liberalisation and is heavily vested in diversifying the economy, particularly to reduce reliance on natural resources. See a report on Effects of Fiscal Policy on FID in Ethiopia: <https://www.abacademies.org/articles/Effects-of-Fiscal-Policy-on-Foreign-Direct-Investment-in-Ethiopia-1533-3604-22-3-222-pdf..pdf>

List of cement companies in Ethiopia:

- Derba MIDROC
- Muger
- Messebo
- National Cement
- Dangote
- Habesha Cement
- HuangShan Cement
- Abyssinia Cements

List of construction companies:

- Sur Construction
- MIDROC Ethiopia Construction
- Sunshine Construction
- Saba Engineering
- Rama Construction
- Tesfaye Legesse Construction
- Yirgalem Construction
- Gutema Firisa Construction
- Afro-Tsion Construction
- Tekleberhan Ambaye Construction (TACON)

DEVELOPMENT CHALLENGES

A World Bank report says: "Ethiopia's main challenges are continuing its positive economic development on a sustainable basis and accelerating poverty reduction – which both require significant progress in job creation, as well as improved governance, to ensure that growth is equitable across society. Large-scale donor support will continue to provide a vital contribution in the near term to finance the cost of pro-poor programs.

Key challenges are related to:

"The incidence of conflict has increased, particularly in the north since November 2020 [until a ceasefire in November 2022], having a substantial impact on lives, livelihoods, and infrastructure.

"Like the rest of the world, Ethiopia has been experiencing the unprecedented social and economic impact of the Covid-19 pandemic. While exports and FDI rebounded



Ethiopia flag
Credit: Freepik

in 2020/21 and jobs have been recovering, some lasting scars are likely to remain. Urban employment levels have not recovered fully, some households and firms continue to report income losses, and poverty is estimated to have increased.

“Ethiopia’s Human Capital Index is at a low 0.38 (2020) which means that a child born in Ethiopia today

will be 38% as productive when s/he grows up as s/he could be if s/he enjoyed complete education and full health. This is lower than the average for the sub-Saharan Africa region but slightly higher than the average for low-income countries. Learning poverty stands at 90% and 37% of children under 5 years of age are stunted.

“Ethiopia has a fledgling private sector, whose growth and job-creation abilities have been hindered by constraints in the business climate and competitiveness.

“The country’s growing workforce (with roughly two million persons reaching working age per year) puts pressure on absorption capacity of the labour market, necessitates improving current jobs, while creating sufficient new jobs.”

CONSTRUCTION OF THE GRAND ETHIOPIAN RENAISSANCE DAM NEARS END

Constructed on the Blue Nile River, the Grand Ethiopian Renaissance Dam and hydroelectric project is located 700km northeast of the capital city Addis Ababa. It is the largest dam in Africa featuring the largest roller compacted concrete volume dam in the world at 10.2 Mm³. Its reservoir of 70 km³ is among the biggest in the world. The approach allowed a radical reduction – at least 50% – of total project implementation time and full control of project cost.

State-owned Ethiopian Electric Power (EEP) hired Salini-Impregilo SpA as the Engineering, Procurement and Construction (EPC) Contractor. Studio Ing. G. Pietrangeli, based out of Italy, is the civil works designer.

GERD’s water retaining structures include the following: the main dam, a roller compacted concrete (RCC) structure that is 1 800m long and 175m high, and a saddle dam, a concrete faced rock fill (CFRD) structure, 5 000m long and 60m high, with embankment volume of 17 million m³.

Two powerhouses located at the toe of the main dam will house 16 Francis units at 375 MW each, totalling 6 000 MW in capacity, for an expected annual generation of 15 TWh. The project also includes a gated spillway, two non-gated emergency spillways, one 500kV substation and switchyard, a 240km transmission line and 120km of access roads.

The main challenges for schedule control of GERD were the size of the related works, combined with its remote location. Neither of these two challenges is unique in the water infrastructure industry, but its combination were acute at GERD.

Maximising the use of national resources for project implementation is an essential element for harvesting both direct



Blue Nile Waterfall in Ethiopia.
Credit: Freepik

and indirect economic impacts of the large investment associated with GERD. At the same time, maximum use of national resources entailed management issues that need to be addressed. Typical examples included: difficulty in securing adequate staffing due to the remoteness of the GERD site, sufficient and reliable provision of cement to meet the

extremely high demand associated with the required RCC placement rates. Ethiopian cements proved initially unsuitable for RCC. The issue was solved with extensive laboratory and field tests that finally led to the definition of suitable RCC mixes employing improved locally produced cements.

This experience, obtained in co-operation with the major Ethiopian cement producers, contributed to improve the cement manufacturing process and the quality of cement available on the local market resulting in beneficial effects for the overall Ethiopian economy.

Two types of cement were used:

- CEM I 42,5 LHHS (Portland Low Heat of hydration and high sulfate resistance), and
- CEM IV-A 32,5 R (Pozzolanic cement).

Cement contents varied, through the cross section of the dam. Equivalent values in the case of pozzolanic cement are: 138/90/100 kg/m³, in zone A, B and C respectively.

Comprehensive testing on plasticiser/retarder admixtures allowed such setting times to be attained to maintain warm joint conditions up to 12-16 hours after RCC spreading. Admixture dosages vary, at GERD, between 1.0% and 1.75% of cement weight. Achieving warm joint conditions guarantees design cohesion values for the lifts, while minimising joint treatment time.

Tests during RCC production included: VeBe time, air content, fresh density, and in situ density. Quality control of placed RCC involved core drilling after three months from laying and include: density, compressive strength, direct tensile strength (on parent RCC and joints), joints cohesion, friction angle and permeability.

A world record for roller compacted concrete placement was set at the construction site in December 2014, with peaks of 23,200 Mm³/day.

The main measures to control temperature rise in the Grand Ethiopian Renaissance Dam were: pre-cooling of materials, mixes with low cement content, appropriate construction schedule, and solar radiation protection by continuous curing. Furthermore, a temperature monitoring and early warning procedure was implemented in order to verify, during the progress of works, agreement between calculated and recorded temperatures. The early warning procedure includes the definition of threshold values and an indication of prompt actions to be taken in case anomalous temperatures are detected. ■

Women in Construction Forum

Also taking place at this year's Big 5 Construct conference and exhibition in Dubai in December, was the Women in Construction Forum, a platform promoting female empowerment within an industry in which women make up just 10% of all workers.



Her Excellency Chaltu Sani, Ethiopia's Minister of Urban and Infrastructure Development.

The Forum was officially opened by Her Excellency Chaltu Sani, Ethiopia's Minister of Urban and Infrastructure Development, who highlighted the positive work being done in her country in terms of equal opportunities and invited attendees to visit Big 5 Construct Ethiopia, set to take place from 18-20 May 2023 in Addis Ababa.

"It is a pleasure for me as a woman to share worldwide experience and witness a global trend in the construction sector shifting towards gender balance, even if we still have a long way to go," she said. "Fortunately, this has resonance in Ethiopia where our modern government's priority is to promote women to challenging positions of leadership. Women now account for 36 per cent of cabinet members, [so] part of the solution is right in front of us: Unleashing the leadership of women.

"Yet it's not just about promoting diversity and giving more opportunities to them. It's also about utilizing the undervalued gem of female leadership – and to achieve this we must work to inspire future generations."

Ms Sani's introduction was followed by a stirring keynote address from the UAE's first female aviation engineer, Dr Engineer Suaad Al Shamsi, who discussed her unique journey and urged women to follow their dreams and inspire other women. Dr Al Shamsi is an aircraft engineer and aviation advisor at Abu Dhabi International Airport's new Midfield Terminal.

"When I graduated, during my first interview they told me I am the first Emirati engineer and I was dancing and jumping for joy," said Dr Al Shamsi, who has since accumulated 18 years of industry experience. "But soon I realized the most

important thing is not the title, but how we support the new generation – we need to inspire, not just tell our story. We never believe women with high heels or small shorts or an abaya or jeans, can work in aviation. Why not? If she can run a house and control a man and kids, why can she not work in construction?"

Dressed in a black abaya, Dr Shamsi added: "At work, I don't wear the abaya and the makeup – I love the heat. When you are passionate about your career, it means you can handle any heat. People often think if you are an engineer or a minister or whatever, your social life must be a disaster, but it's not true. The most important thing is finding the balance: Be passionate about your career, be passionate about your life, be passionate about the coffee you are drinking. That is what will make you successful, in any field. If you can dream it, you can do it – and achieve it with a big smile." ■



Hear about Everything Architecture from Esra Lemmens

Speaking at the Big 5 Dubai conference and exhibition, chairperson for the Architecture & Design Talks at Everything Architecture Esra Lemmens, answered some topical questions.



*Esra Lemmens, Chairperson: Architecture & Design Talks, Everything Architecture.
Credit: dmgEvents*

You are the chairperson for the Architecture & Design Talks at Everything Architecture. What are your thoughts about this exclusive event dedicated to the architecture and design community?

Architecture and Design are a ubiquitous force that influences all areas of our lives, including ecological, social, political and cultural developments. Architecture and design are dynamic and are always in a state of flux, so it is of paramount importance to maintain an ongoing dialogue with industry peers and stakeholders. Together, we hold tremendous responsibility in positively shaping the future.

In order to ensure that the role is understood by the entire community and a means of addressing complex problems rather than just being pleasing to the eye, our industry continuously makes constructive contributions through innate lateral thinking, analysis, visualisation and open communication at platforms such as the Architecture & Design Talks at Everything Architecture.

There are a lot of futuristic discussions at the Talks. What, according to you, is the future of architecture and design? What are the innovations expected in the industry?

It's imperative that architects and designers are responsive to the environment and their users. Innovation guides us to develop meaningful projects and allows us to explore physical and cultural contexts far from traditional and conventional processes and analysis of development in every aspect of design and construction. This will be a red thread throughout the Talks but it will be given special attention in the conversation about "Reimagining electrified cities" and "Conservation, modernization, and adaptation of existing buildings".

There are a select few 'starchitects' showered with praise; however, in reality, architecture falls at the bottom of 30 professions surveyed, well below civil servants. Dana Cuff recently illustrated in her book *Architecture, The Story of Practice*, that this is a Dubai and further world phenomenon. Architects are generally dismayed by the intangibility of success and its fading impact, working long hours at an increasingly rapid pace. Our product-obsessed society presents overwhelming problems since only some clients possess an understanding of the complexity surrounding the design and production of custom products and are willing to pay the often-high prices. Whilst digital technology offers designers and architects new solutions for creativity; they take precautionary evolutionary steps relying on stayed traditional techniques.

Forward-thinking professions are muscling into the domain that was once solely for architects. Furniture system designers, sustainability consultants, construction managers, and engineers are pushing so hard that they may eventually eradicate the need for architects, except for those that are keen exterior designers. By 'pulling the wool over their eyes' and the refusal to embrace technological innovations are encouraging their extinction. Architects must embrace modern technology and satisfy consumer desires. There is hope if they seize revolutionary opportunities and enhance predictability, complexity, branding, feedback and world economies.

Since the start of the twentieth century, information has afforded the industry to connect through research, design and interpretation. Buildings of the future will bring together a union between digital design and automated rapid fabrication and no longer be limited to traditional forms and capable of proliferating complex shapes. Structures such as electrical and plumbing conduits, showers, shelving, and furniture will be 'printed', eliminating traditional outlets. Interestingly, over 90 per cent of building waste is the result of demolition and renovation so environmentalists will celebrate printed buildings because of their renewable nature and ease of disassembly.

Architects will be able to analyse structural elements to understand a new comprehension of durability, materials and costs in advance. The inevitable introduction of digital modelling softwares, the metaverse, combined with 3D printing, will ensure bring lively design debates to this year's program.

Architecture is at a tipping point in the light of unprecedented change as the world expects architectural perfection. The architectural model is burdened by centuries of outdated working methodologies and singular prototype creation. Industrial designers, engineers and manufacturers are already celebrating prototyping technology, but until now, it has been unnoticed by architects. Architects must consider increasingly accessible tools and uncover the benefits of artificial intelligence, the Metaverse and NFTs. People have huge expectations from their increasingly positive web ordering experiences, including digital architecture that is meaningful, useful and sustainable. Architects must rapidly consider substantive feedback, one-off productions and architecture that evokes status to succeed. The initiation of Building Information Management, BIM, automatically allows pre-visualisation before construction, parametric design, and prefabrication, diminishing ambiguity, reducing errors and generating client savings.

Which are some of the upcoming projects that excite you the most?

There is much excitement surrounding introducing the United Arab Emirate's first gaming facility in Ras Al Khaimah. The forthcoming Wynn Resort has sparked a keen interest in local architectural, interior design and outdoor design industries.

The Metaverse, AI and virtual reality were hot topics this year. Much discussion was around the introduction of the gaming industry in Ras Al Khaimah and how the design and architectural industries will utilise these new trends in a built environment. Industry leaders highlighted that innovation,

knowledge-sharing, and camaraderie have never seen a more critical time. The post-pandemic world has given the industry much food for thought and changed the trajectory forever.

Architecture is not the most environmentally friendly industry yet. Not only does it rely on unfavourable carbon-emission-heavy concrete, but it also has a severe waste problem from demolishing previous structures. Circular economy encourages the elimination of waste and the continual use and re-use of resources; satisfyingly, the architecture industry is beginning to provide support and take collective and personal responsibility as a profession by reducing waste and pollution.

Architects must incorporate a range of quantitative and qualitative health considerations. However, this can lead to 'just good enough' plans that increase diversity and adaptability for the planet rather than purely 'perfect' designs. There must be a future of balance to improve the well-being of the wider population. It is essential that architects design for humans and their well-being by providing sustainable buildings. It is necessary to consider the circular economy for the entire value chain, including the stakeholders and architects responsible for creating an infrastructure or a city.

The design of built environments profoundly affects our overall health and well-being and can have long-lasting implications for our quality of life through choice architecture. It's evident that design-led innovations can encourage or constrain behaviours. By understanding the potential implications and opportunities in building design, architects can encourage positive well-being rather than merely removing the attributes of ill health. To enhance human well-being, architects need to consider holistic health-supporting human behaviour. It is essential to support optimal mental well-being, which in turn, has implications for physiological health. However, a relatively recent consideration, well-being within a built environment, is beginning to reveal consistent and widely accepted findings, particularly when a range of quantitative and qualitative health considerations are defined. ■

Phophi Nematangari: new SARACCA NEC member

By Eamonn Ryan

SARACCA (SA Refrigeration and Air Conditioning Contractors Association) has appointed Phophi Nematangari (also known as Nematangale due to a Home Affairs department bungle) to its National Executive Committee (NEC), as well as its Vice Chair.

Nematangari is the owner and managing director of Mumy & Sons Projects and Construction, a fully black female owned business established in 2009. The company has experience in construction, facilities management and project management, primarily for the public sector. Some of its clients include the Department of Public Works (Pretoria regional office) and City of Joburg Property Company.

With a father who was a car mechanic and being somewhat of a tomboy not afraid to climb ladders and repair fridges, a trade career was in her blood from the earliest age. The building industry was her first choice – not an accident. “I wanted to work like my father, and as soon as I started working in this field, I felt HVAC&R (Heat, ventilation, air conditioning and refrigeration) was where I wanted to be. Now his toolbox is with me,” she explains.



Phophi Nematangari.

In 2003, she responded to a Transnet Properties advertisement for apprenticeships to NQF level 2 to 4, training for three and a half years at a private trade college. Following the training she worked as a junior artisan from 2006 for Transnet, using more her project management skills than the technical training – such was the need for completing projects at the Carlton Centre in central Johannesburg.

“I was one of the first group of four HVAC&R artisans at Transnet Properties,” Nematangari says. Her functions included managing projects, heat load calculations in order to draft specifications and managing the contractors. “I got priceless experience and exposure to running projects. This enabled me to join a facilities management company in 2009 as operations manager running all the Presidency facilities, where I broadened by exposure to electrical, access control, building main-

tenance and general construction. I found my air conditioning and refrigeration technical experience made these other trades relatively easy to learn.

“The company that appointed me had a contract with Public Works for the Union Buildings and the Presidential residences, and that contract was extended to five years. Then in 2013, I resigned and started my own company, which today does all the facilities functions I had learned and which I decided to include in our scope,” says Nematangari.

It is a project facility management company that primarily focuses on construction and building maintenance, combined all disciplines.

Her love of construction gave her a strong urge to make the younger generation and her fellow females more aware of the opportunities that lie in construction. “Anyone who trains to become an HVAC&R technician or other trade is guaranteed work – they are snapped up as soon as they qualify, yet so few learners are aware of this brilliant career. My role on the NEC will be to focus on spreading this message,” she explains.

“Most South Africans, when they want to study further, think of university or civil engineering because trades are not top of mind. They know little about the sector and its career prospects. Contracting companies struggle to recruit technicians, and you find that most of the black artisans in this country are not South African but from our neighbouring countries,” says Nematangari.

She says the biggest challenge facing a small contractor such as Mumy & Sons is getting the government to finalise tenders. “There are constant delays, inviting people to tender and then repeatedly re-inviting them, which means there’s no work until a final decision is made. Nonetheless, there is work that is ultimately commissioned and we have been successful in earning our share.

“For a woman in the construction sector in South Africa, it is a motivation for other women. When they see the physical evidence of women doing the work, even basic manual work, they often feel inspired to emulate it.”

There are cultural issues, she admits, with men not readily accepting women in what they consider physically demanding ‘man’s work’. However, the more women enter the sector the more negative discrimination will wane. For instance, South Africa’s municipalities have made great strides in employing many women to such jobs, where they have proven they can do the demanding labour as well as any man.

The challenge, she says, is that transformation has not yet acquired the necessary scale: “Whenever I advertise for a worker there are extremely few applications from women which

means the best applicants would always be men. Such work is still something of a taboo for women, and I think where the failing lies is in a lack of networking opportunities for women. Often they don't even know where to start looking for technical work, how to market themselves or acquire the necessary skills. As a result, when I do get applications from women it is usually for unskilled work. Even when a female qualifies at a trade, sometimes she can remain unemployed. And when I do employ a women, even though this is a woman-owned business the men still undermine their female colleagues. The stereotyping is deeply entrenched in men.

"I also don't see much encouragement to women from either the private or public sector to enter construction. Therefore we women are alone and it requires out own passion for the work for us to get ahead."

Another issue is pricing. "In my business, I am able to win contracts from government but the issue then arises of price. Government awards tenders primarily to the cheapest price – they reduce the number of tenders to about five and then ask those that still qualify to cut their price to match their estimate. Typically, I accurately calculate my pricing on labour and materials - when I have to then cut that price to get the contract it means sometimes I work at a loss or sometimes have to (reluctantly) use inferior materials to what is specified."



Nonetheless, Nematangari describes herself as "positive that this year will be an improvement over previous years".

She believes participation levels by women will increase over the coming years, but slowly. "It will grow once we establish proper mentoring and networking. It requires more successful women like me to provide role models and mentors, and through SARACCA I intend to visit schools and encourage girls to enroll in the various technical trades – construction, plumbing, electrical and HVAC. Transformation will thereafter depend on female technicians and entrepreneurs proving on the job they can do the work as good if not better than any man," says Nematangari. ■



Concrete roof tile equipment manufactured by
JESSOP & ASSOCIATES (PTY) LTD



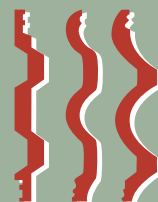
JESSOP & ASSOCIATES is the only manufacturer in the southern hemisphere producing high speed concrete tile extrusion plants



Installed more than 100 concrete roof tile plants in Africa to date



Supplies over 1000 different spare parts from its stores in South Africa



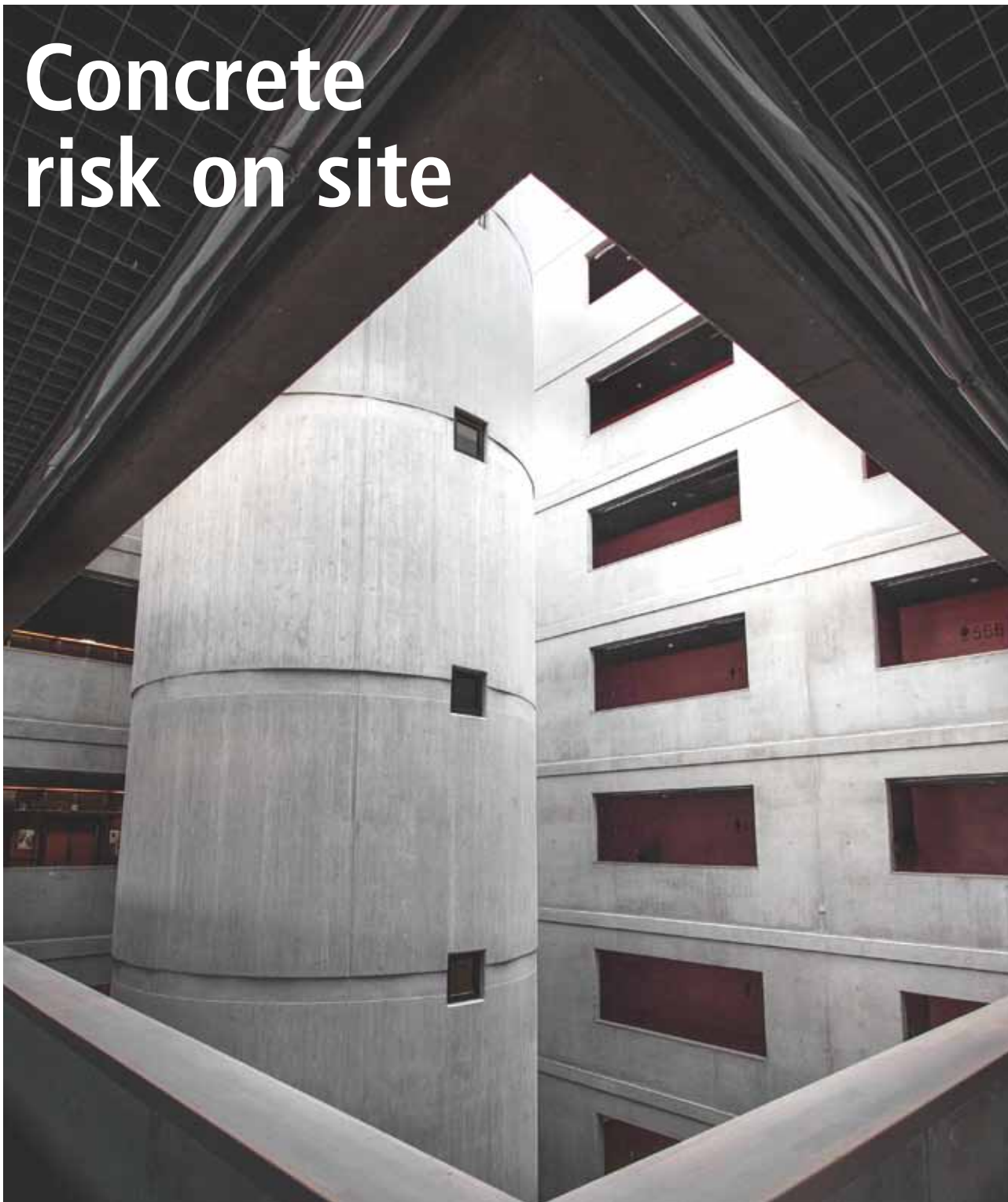
Manufactures extrusion machines capable of multi-profile concrete roof tile production

TEL: +27 16 421 2521
INFO@PROTILE.CO.ZA
WWW.PROTILE.CO.ZA

SCAN FOR MORE
INFORMATION



Concrete risk on site



Chris Coetzee, Owner of OHSS Consulting

When a concrete contractor arrives on site, there are hazards and risks that follow the tasks. Let us look at just a few of these risks and determine the best course of action.

MOVING MACHINERY

A concrete truck arrives on site and needs to be parked, positioned for delivery, moved to and from the work area, and safely exit the site. All these areas result in the potential for injury to multiple persons, including the driver and operator, the contractor employees, and others in the vicinity.

A moving truck can cause serious injury and damage if not properly directed and driven into place. Bumping, crushing and fatal accidents have occurred when vehicles on site are not operated in a safe manner, or when the driver/operator is distracted by other things, such as not looking in the direction of travel.

One can prevent this type of risk through proper planning beforehand. This means that before a moving machine carrying concrete to site arrives, one should already know where it is to park, what is the best route for travel on site, what is the best route for travel to and from the work area, and making sure that a flagman is readily available for all of these movements on site.

CONCRETE POURING

Once the task of pouring starts, we should be aware that this will cause risks to those who may be working around the concrete contractor. Wet concrete can be dangerous if not avoided, so proper barricading and signage will be necessary before, during and after the pour. It is not enough to just place danger tape around an area, the area needs to be identified as hazardous to those who are walking and working in the vicinity of a concrete pour.



Chris Coetzee

TIME

A risk that is often overlooked until it is too late, is time. What do this mean? A construction site is made up of contractors trying to perform a series of tasks as quickly as possible with the most effective quality management to ensure they complete the project on time and also to the satisfaction of the client. This is going to cause issues between contractors who need to work in the same place at the same time. This risk is often omitted from the risk assessment as we usually place emphasis on task related injuries and incidents.

Remember, to complete a project on time is something that all contractors need to do, including yourself. What is needed? Again, proper advanced planning. Now we know that this is easier said than done. Often timeframes are changed, weather can be a factor as well as tasks overlooked by the clients – factors which may each interfere with work completion. But just because these things occur, does that mean you should leave your project dates to chance?

There are weather apps available, calendar reminder apps and even digital solutions to communicating with all parties involved in a project. Make good use of the resources available to you and ensure that you have covered yourself for any eventuality. No doubt you have worked on many sites, experienced a lot of distractions, delays and frustrations? Why not use that experience to create a new risk profile and management plan.

Time can be your ally, but also quickly become your foe. And we all know that rushing a job can be the start of a disaster that ends in fatalities. You will never have time, if you do not take time. Take time now to plan for the needed time of the project.

RISK ASSESSMENT

A vital programme and document to have, is the risk assessment procedure. This procedure is usually carried out by a competent person who understands both the health and safety aspects of the tasks at hand and the actual work to be completed.

For many contractors, these programmes are outsourced to consultants, and there is nothing wrong with this. Calling in

a consultant who is the expert in their field of OHS is a wise choice to assist in making sure all areas of health and safety are covered. But what is your input when the process is carried out? Paying the invoice?

For any employer and employee working in the dangerous areas of concrete on site, the risk assessment programme is the key to a safe working environment. It identifies what could go wrong, explains the consequences and provides control measures to implement for a safe working environment.

Since it is such a vital and serious risk mitigation tool, would you not agree that the more information the better on what needs to be done should be available? When last did you read through the risk assessment? Did you find that the sequence of the task matches up to how it is actually being done on site? Are

the control measures practical and sufficient, in other words, is what is written down on the document, factual and actual?

You are the expert in your field, and you have a lot of experience. Your input is vital to the safe outworking of the risk assessment. So have an input! Speak to the risk assessor, discuss what is in the assessment, or perhaps missing, make the risk assessment bespoke to what you are actually doing. This way, you will have a practical risk assessment with control measures that protect you, your employees and any person who may be impacted because of the work you perform.

CONCLUSION

A safe system of works and a safe working environment are achievable. Make it solid, make it "Concrete"! ■



Precast concrete safety barriers preferred for Cape Town's formula E race

By David Beer on behalf of Concrete Manufacturers Association

Concrete Manufacturers Association member, Cape Concrete, supplied all the concrete barriers for the international Formula E Championship race which was staged to great acclaim in Cape Town on February 25. Cape Concrete was sub-contracted to Martin and East which won the barrier supply and deployment contract from E-Movement (Pty) Ltd, the authorised promoter of Formula E Cape Town.



Barriers stacked in Cape Concrete's yard prior to delivery.



The pre-assembly of some barriers and fencing in Cape Concrete's yard.

Skirting the DHL Stadium and winding through the city's foreshore area, the 2.84km track was erected on a section of the city's existing road network, specially adapted for the race.

The barriers lined both sides of the entire track as well as the pit feeder lanes, and Martin and East began the installation three weeks before the event took place. They were manufactured to a Formula E design which is approved by the FIA (Fédération Internationale de L' Automobile), the governing body responsible for safety standards in motor racing, including Formula 1.

In addition, Cape Concrete cast special concrete kerbs, which were lowered to create a flat surface during the race and then subsequently elevated into a conventional road kerb format.

Formula E uses five barrier types for its 17 global race events and four, Types 1, 2, 4 and 5, were deployed in Cape

Town. All told Cape Concrete cast 1 988 units: 1 800 Type 1; 96 Type 2; 82 Type 4; and 10 Type 5.

Type 1 is the standard size measuring 4m (length) x 1m (height) x 600mm (base width). Type 2, which is generally used on tight corners, has the same dimensions as Type 1 except for its length, which is 2m. Similarly, Type 4 has the same dimensions as type 1 apart from its height which is 600mm and is used on the pit lanes. And Type 5 is a replica of Type four but is 2m long as opposed to four.

Due to unforeseen program revisions, the confirmation of the Cape Town race was delayed by several weeks. This meant that Cape Concrete was obliged to adhere to a very tight production schedule to meet the January 27 delivery deadline. It required two shifts every 24 hours as well as working through the December/January builders' break.

"Martin and East introduced us to Cape Concrete when our time frames were very tight," said E-Movement chairman,



Cape Town's Formula E track with Signal Hill and Table Mountain in the background.

Pic courtesy: Greg Beadle

Iain Banner. "However, after a visit to Cape Concrete's plant, we were 100% confident that everything would be ready and in position on time, which it was."

Cape Concrete director, Johan Nel said, "We were fortunate that Martin and East had bought 15 Type 1 moulds from Pan Mixers South Africa (PMSA) before we were given the green light, which meant we were able to begin production during the first week of November. Further moulds followed and this enabled us to complete the order ahead of schedule."

Reinforced with normal stirrup rebar and steam cured for quick turnarounds, the barriers were cast to a 40MPa strength rating.

During installation, the barriers were interlinked with six steel loops, three loops having been cast into each barrier end. They were cast at slightly different elevations so that the loops of one barrier end overlapped those of the adjacent unit. Once the barriers were in position, 90mm (diameter) galvanized steel posts were inserted through the loops to secure the connections. The posts extended above the top of the barriers to facilitate the attachment of galvanized steel fencing which was mounted on the barriers and manufactured by Qhubeka in Blackheath.

After casting, the barriers were spray-painted Dulux Atlantic Blue by Painters On Site and stacked in Cape Concrete's yard prior to delivery at the end of January. They were also cast with two lifting points which were used with quick release pins during installation. ■



A barrier section on the Cape Town track.

Two paving layouts, with the mixed-use Jura Cobble on the left and four single-coloured bands used for the main entrance to Station House on the right.

New Sea Point hotel and apartment complex framed with bespoke paving

By David Beer on behalf of Concrete Manufacturers Association

Multi-coloured Jura Cobbles have been used to pave the sidewalks abutting Station House, a recent addition to Sea Point and one of the Atlantic Seaboard's most iconic properties. Specified by Vivid Architects and manufactured for the project by Concrete Manufacturers Association member, Revelstone, the pavers beckon the eye to a building with an amenities offering both cutting edge and world class.

Developed at a cost of R650 million by the Berman Brothers Group and D2E Properties, Station House was completed in November 2022 as a mixed-use 10-storey development. It houses 199 apartments of which 44 are owned and managed by the Home Suite Hotel Group.

Designed by Vivid Architects and built by R&N Master Builders Cape and Viva Formwork and Scaffolding, the struc-

ture offers a formidable array of features to hotel guests and permanent residents alike. A pool deck on the 10th floor and an open-decked restaurant and bar on the floor below, enjoy spectacular views of Sea Point's Atlantic coast.

And an outdoor kinetic gym, pilates studio, lounge, braai areas, and a deli-bar styled restaurant which opens out onto one of the Jura-cobbled pavements, add to the facilities pack-



Single-colour Jura Cobble paving bands create an imposing front entrance.



age, as do other amenities such as a small bakery and coffee bar, and a Pick n Pay convenience store on the ground floor. Station House is also pet-friendly and includes a dog walking area.

Accommodation ranges from studios and includes one, two and three bedroom suites, as well as two penthouses, each with its own private pool.

"We were fortunate in that we had a whole city block to work with and were able to uplift the area by paving with the Jura Cobbles. What's more the paving was expertly laid by Brutus Paving," said Nic Cloete of Vivid Architects.

"We deliberately avoided a paving layout which was parallel or perpendicular to the road, opting instead to lay the pavers in a staggerbond pattern at an angle to the road. Rather than picking lines from the building or introducing too

many material variations we kept to a simple design. The Jura Cobbles were laid in three colours, mid-grey (70%), granite (20%) and light grey (10%) to create a homogenous effect, and it worked really well.

"The only exception to our layout design was at the imposing main entrance to the building where we used six single-colour Jura Cobble bands between the road and the staircase leading up to the foyer.

"The pavers were 50mm thick except in areas where there was a high loading requirement such as the entrance to the Pick n Pay loading bay and a sub-station next to it, and in this instance we used a 75mm cobble," explained Cloete.

Station House draws its name from the Sea Point Tramway station which was erected on an opposite site in 1862 and provided a tram link to Camps Bay. ■



Station House sidewalks laid with Revelstone's multi-coloured Jura Cobbles.



Precast concrete columns being lowered into position.



Precast concrete panels are lowered into position in the open area.

Massive firewall built with precast concrete for Cape fruit distributor

By David Beer on behalf of Concrete Manufacturers Association

A massive firewall has been built between two Controlled Atmosphere (CA) storage facilities at Two-A-Day's (TAD's) apple and pear distribution centre in Grabouw, Western Cape.

A hundred and thirty four metres long and rising to a height of 12.9m at its apex, the wall was built with mechanically anchored precast concrete columns and panels supplied by Concrete Manufacturers Association member, Cape Concrete.

TAD is one of the leading fruit growing, packing and marketing companies on the African continent, comprising more than 50 farms.

The wall was recommended by TAD's insurance company, Swiss Re Corporate Solutions Africa Ltd, which regarded the two CA units as a single storage facility due to their close proximity. This assessment attracted a high insurance risk which was reduced after the wall had been built.

The wall was designed by structural engineer, Herman Smith of Merlicon, to a four-hour fire rating and was installed by Cape Concrete together with Teemane Cranes using Peikko bolting systems. Main contractor, Francois Marais Construction, prepared the earthworks and cast the foundations for the columns and panels.

"The design was premised on a 125 page design brief submitted by Swiss Re and prepared by FM Global as the industry standard for Maximum Foreseeable Loss Limiting Factors, and it had to comply with international firewall requirements as well as local SANS regulations. Essentially, this meant that if one of the buildings caught fire the other would be protected for four hours," said Smith.



A precast concrete panel is installed between columns in the narrow strip section.

"The wall had to be robust enough to resist any impact loads produced by falling debris during a fire. Another design consideration was that if either building was destroyed by fire and not rebuilt the wall would require sufficient strength to handle a full frontal wind load.

"And when the structure tops out at a height close on 13m it must be extremely robust to withstand wind forces which can be enormous. Had wind been the only design factor at TAD the columns could have been cast with high-density, high-strength concrete. But the higher a concrete mix's density, the greater its explosive spalling potential when exposed to extreme heat. This is because high-density concrete has a low permeability which inhibits free water evaporation. Therefore we opted for a fairly low-density 30Mpa concrete for the columns and the panels, and this affected the dimensions of the columns and the reinforcement requirements.

"The columns are 600mm wide and 1.2m deep and vary in height between 10.5m and 12.9m. Fire and wind were the essential design drivers, giving the columns sufficient tensile strength to withstand a full frontal wind load on the one hand and enough concrete cover for fire protection on the other.

"When a column bends, the windward side is tensioned and the leeward side compressed. The tension force is resisted by the rebar which functions in tandem with the internal lever arm. And if the concrete cover over the rebar is increased as it was for this project, then the lever arm dimension is reduced. Therefore, to counter the reduced lever-arm effectiveness, rebar with a higher cross-sectional area had to be used to achieve the required tensile strength to resist the column moments. And we specified a concrete cover of 65mm with a sacrificial layer of steel mesh inserted just beneath the column faces to further inhibit spalling.

The main wall sections comprise concrete panels which were installed in a staggered configuration, because it stiffens the system and is one of the most efficient ways of designing a traditional boundary wall. Moreover, if we had placed the panels in a straight line, it would have meant that the installation grooves in the columns would have been opposite each other and that would have weakened the columns," said Smith.

The areas which will experience the greatest wind forces are located at the wall ends, whereas the lowest wind forces will be at the wall's mid-point. What's more, wind-induced vortex forces can wrap around the wall ends and wrench them from the footings. To counter this scenario the wall ends had to be strengthened.

"Half the space in which the wall was erected was confined to a narrow strip five metres wide between the one building and the canopy of the other. So instead of increasing the size of the columns, we increased the number of columns at the wall ends by reducing their centre-to-centre spacing. Additionally, we combined three column footings into one, thereby creating additional mass to resist overturning. This meant that the panel widths between these end columns were reduced from 6m to 3.54m. And the dimensions of these peripheral footings were 11m wide x 4m long x 700mm deep as opposed to the other footings which measured 4m x 3m x 700mm.

"All the panels were 180mm thick and we restricted the number of panel sizes to fourteen because fewer moulds meant cost savings and quicker installations. The latter was a crucial element because we needed to have the wall completed before the end of 2022 so that the insurance requirements could be adhered to.



A precast panel is offloaded prior to installation in the strip section.

"Most panels were 6m wide x 2.4m high and weighed close on seven tonnes. Initially they were only going to be 1.2m high but we decided to double this figure because we were using a 120 tonne crane for installing the columns which weighed 24 tonnes apiece; this meant we could increase panel heights to 2.4m because even the largest panels weighed only 6.5 tonnes. Some of the panels had individual heights to accommodate the varying column heights but in the end we managed to reduce the number of panels from 242 to 132."

The fire proofing requirement for the panels was not as stringent as it was for the columns, because only one face of each panel could be exposed to fire as opposed to three



Some of the fireproof sealing which was installed on the panel-to-panel and panel-to-column jointing.



A section of the wall nears completion.

faces for the columns. The amount of vertical rebar used in the panels was equivalent to one percent of the concrete's cross section. This was the amount required for the panels to be classified as a four-hour rated structural wall and not a plain concrete wall, as referred to by SANS 10100-1.

The panels were slotted into 200mm wide column grooves and were attached into each other with tongue and groove jointing. The bottom panels were all shimmed to ensure they were perfectly level. Low density, closed-cell expanded polyethylene was fixed to the vertical and horizontal joints as backing chords which were then sealed with a fireproof sealant supplied by Den Braven.

The columns were secured to the footings using Peikko bolted connections which made for fast and safe column installations. Peikko was very much involved in the design of the connections using its own bolting systems software to calculate the connection requirements. And Peikko anchor bolts and the column shoes were sourced from Peikko Gulf in the Middle East, one of 12 Peikko factories worldwide.

Cape Concrete cast two columns a day using steam curing for early strengths. It cast column shoes into the columns and manufactured anchor bolt templates based on drawings supplied by Peikko.

The templates were aligned on the footings by a surveyor using laser and gut lines. The columns were installed by lowering them onto levelling nuts attached to the anchor bolts. The levelling nuts were used for the vertical alignment of the columns, which once done, tightening nuts were used to secure the column shoes to the anchor bolts, thereby creating a permanent connection between the columns and the footings. The bases of the columns were grouted after the installations were completed to ensure a full connection and to protect the steel components from the elements.

Peikko project engineer, Winston Visser, said that the

number of bolted connections in each column depended on the moment forces applied to each column.

"Because wind forces diminish towards the centre of the wall, the number of bolted connections we used on each column decreased as we moved towards the centre. Each of the outer columns were given 14 bolted connections whereas only six were required for the centre columns," said Visser.

The installation of the columns and panels in the narrow five metre strip between the canopy and the adjacent building was complicated by the fact that the 120 tonne mobile crane, which was parked on the strip, was prevented from offloading the columns directly off the delivery trucks by the canopy which was immediately above the offloading area. Therefore the columns first had to be hoisted by two truck cranes parked under the canopy in the loading-yard. They were then shifted into the narrow construction strip where the mobile crane had access. A harness from the mobile crane was attached to the top end of the columns and the truck-crane harness at that end was disconnected. Once the columns had been lifted into a vertical position the harness of the second truck crane was disconnected. The columns were then lowered onto the footings and attached to the anchor bolts.

The installation of the panels in this confined section was undertaken in a similar fashion except that only one truck crane was used to lift them off the delivery trucks. The installation of the columns

and panels in the open wall section was much simpler because the mobile crane had full freedom of movement to install them the normal way.

"The construction of the wall was further complicated by a fire water-line and an 11kVA electrical cable running under the strip where the wall was installed. The cable was rerouted and the water-line installed at a deeper level. Another design consideration was the canopy's steel columns which were founded on concrete plinths. This affected the depth of the column footings because we did not want to undermine the canopy's column bases.

"This precast wall system is by far the safest construction method because it precludes working on scaffolding at heights. Once the foundations were in place it only took 15 days to erect the wall. And one of the beauties of the Peikko bolting system is that only two workers, working on the ground, are required to install a column," concluded Smith. ■

Project Team

Client	Two-A-Day
Consulting engineers	Merlicon
Main contractor	Francois Marais Construction
Precast concrete	Cape Concrete
Column bolting	Peikko South Africa
Crane hire & installation	Teemane Cranes

Innovation in precast-concrete keeps sports centres on track

By Kobus Kotze, Director Infinite Consulting Engineers, and Willie de Jager, Managing Director of Corestruc

Municipalities are harnessing precast-concrete technology to help significantly fast-track the construction of large grandstands for community sports and recreational centres. The technology is also providing a more cost-effective means of building these structures and an end product of a higher quality, both in terms of durability and aesthetics.

However, one of the major benefits of the precast-concrete system is that it is helping to empower emerging contractors. The grandstand is the most complicated aspect of these projects. Constructing an in-situ structure with the same aesthetic design as the precast concrete grandstands deployed on these projects can only be undertaken by a handful of established contractors. While subcontracting the construction of the precast-concrete grandstand to a specialist in the field, emerging contractors are involved in all other aspects of the work scope. Among others, this includes the earthworks and site terracing; installation of the various services and perimeter fencing; and the construction of the buildings and the pitch. There are also many opportunities to train and develop members of communities located within the construction footprint and who are the beneficiaries of the final infrastructure.

A case in point is a sports and recreational centre that is being constructed in a municipal district in Limpopo. It is being built by an emerging contractor that has made steady progress on this Expanded Public Works Programme project.

It features a grandstand that is able to seat 3 500 people, making it the largest such structure to have been designed by Infinite Consulting Engineers and erected by Corestruc, to date. The companies have jointly built more than 20 grandstands in Limpopo over the years.

Constructing the grandstand in this manner has provided an almost 40% reduction in construction costs for the municipality. This is by eliminating the need to manufacture bespoke shutters and operating a tower crane for almost 12 months on site, among other preliminary and general costs associated with such a project.

The grandstand was erected in as little as four months. This is opposed to the 10 months it would have taken to build a similar structure using conventional in-situ techniques. Material procurement, such as the special shutters for the seating benches, columns, raker beams, side panels and closures, and establishing the stacking area, alone, would have taken almost four months using cast-in-place methods of construction. It would have taken three months just to construct the 9m-high back columns. This includes setting up the shutters and support, as well as the reinforcement and concrete works. Constructing the 20 bottom, middle and top raker beams and the seating using traditional cast-in-place methods would have been an onerous seven-month long process. It is for this reason that some municipalities will opt for less aesthetically appealing grandstands for their sports and recreational facilities. At



The grandstand is able to seat 3500 people.

times, they may be constructed from steel, which also requires more maintenance than concrete structures, increasing the total cost of ownership of the assets. In other instances, a very simple brick and mortar structure is built. However, this option is more suited to smaller facilities. This is despite many precast concrete structures having also been erected for smaller sports and recreational facilities, considering the numerous benefits that they also offer municipalities.



Constructing the grandstand in this manner has provided an almost 40% reduction in construction costs for the municipality.

Coreslab commenced manufacturing the various precast-concrete elements for the grandstand in mid-October 2021. The manufacture of the 20 tapered columns, as well as 20 front-end and 20 top raker beams were completed in mid-January 2022. This is in addition to the more than 340 seating benches, 19 back benches, 34 side panels and 76 steps, as well as the structural steel bracing for the structure.

Meanwhile, the principal contractor commenced constructing the foundations and the cast in-situ bases for the structure in mid-October 2021. They were completed before the builders' shutdown period that year to enable Corestruc to start erecting the structure in January 2022. This preliminary work included excavation; placement of the stabilised fill; and construction of the in-situ 10MPa concrete bases. Constructed in sound founding material, the concrete bases for the front raker beams and front columns are 3 200mm in width and length and 500mm thick. For the back columns, the concrete bases are 3 900mm in width and length and 600mm deep. The chemical anchors that are used to connect the precast concrete columns extend between 300mm and 400mm into the concrete bases and have pull-out resistance of more than 150kN.



The grandstand was erected in as little as four months.

A single column was installed a day, starting with the middle precast-concrete elements. The top of the columns was set out with coordinates to confirm the plumb and position. This was followed by the lining up of the front raker beams with the top and bottom bolts of the columns and then fastening them in place. Corestruc then installed the rear columns, again setting out the top of the precast-concrete elements with coordinates to confirm the plumb and position. Afterwards, the back columns were braced vertically with structural steel. By bracing the first and second, third and fourth, fifth and sixth, seventh and eighth, and ninth and tenth columns, five frames spaced 5,5m apart were created. This provided the critical stability that was required at this stage of the erection process, considering the slenderness of the columns. The top raker beams were then installed in the same way that the front elements were placed. Afterwards, they were braced horizontally in a similar sequence to that used for the back columns. This was followed by the placement of the many seating benches. They were lined up with the raker beams and then grouted into position and, in doing so, forming a single monolithic structure. The process was followed by the installation of the side panels and steps. This structure will feature a roof comprising galvanised structural steel elements, fixed to the concrete structure at strategic positions.

Infinite Consulting Engineers and Corestruc have been refining and perfecting this modular system since 2016. The focus has been on designing an "off-the-shelf system" that reduces erection time and only requires minor design modifications – if necessary. This has been achieved by standardising and reducing the number of prestressed precast-concrete elements, while the use of curved columns and flat surfaces for the rakers, benches and side panels has also facilitated quick and efficient installation. Infinite Consulting Engineers has also refined the method of connecting the various precast-concrete elements over the years. The columns are connected to the in-situ bases by components that have been cast into the precast concrete elements and secured using hold-down bolts in the base. The raker beams, seating benches and side panels are secured with dowels that fit seamlessly into sleeves that have been cast into the various precast-concrete elements and into which the grout is then poured. The dowels have also been strategically positioned to facilitate ease of installation. These innovations have ensured that clients derive maximum benefit from the precast-concrete technology.

The design team uses Building Information Systems to model the structures to further ensure precision. BIM creates models of each precast-concrete element and provides updated design statuses. It also facilitates quality control by enabling seamless tracking and tracing of each precast-concrete element from the design phase through to their integration on site.

Infinite Consulting Engineers also uses a suite of commercial software for structural analysis and design.

The production of the system was undertaken by Coreslab as an approved manufacturer. By undertaking the production of the various elements in a controlled factory environment, the professional team is able to deliver a final structure of a very high quality. The factory features a computerised batching plant and optimised curing processes. Enhanced mix designs are also deployed to produce the concrete that is used to manufacture the various precast-concrete elements, all of which have a 50Pa compressive strength. A self-compacting concrete eliminates the need for concrete pokers and provides an excellent finish. Significant planning also goes into ensuring practicality and turnaround efficiency of the specialised forms used to produce the various precast-concrete elements. To ensure precision, they have been manufactured from steel that has been cut using laser-cutting machines. They enable fast production and are user-friendly to help facilitate the accurate placement of the various cast-in components. There is very little scope for error at this project stage, considering the precision with which the various precast-concrete elements are installed on site. Corestruc's team achieves tolerances of 3mm when connecting the precast-concrete elements to the foundations and 5mm when integrating the other components of the system.

Members of the South African Institution of Civil Engineering's (SAICE) Limpopo branch recently visited the project.

Cuthbert Ngairongwe, who heads SAICE's Limpopo branch, described the innovation as the future of structural engineering and a means of fast-tracking infrastructure delivery in the country. "Your precast technology has taken delegates out of their comfort zones. They have seen for themselves the innovation that has been deployed across the precast prestressed-concrete value chain to fast-track the construction of projects, while also providing a high-quality final build," Ngairongwe said. ■



CONCRETE MANUFACTURERS ASSOCIATION (CMA) MEMBER LIST

Producer Members



BERTS BRICKS
TEL: (018) 292 1615
PROVINCE: NW | PILLAR: PB



BETA HOLDINGS
TEL: (018) 292 1615
PROVINCE: NW | PILLAR: PB



C.E.L. PAVING PRODUCTS (PTY) LTD
TEL: (021) 905 5998
PROVINCE: WC | PILLAR: PI



CAPE CONCRETE WORKS (PTY) LTD
TEL: (021) 905 1200
PROVINCE: WC | PILLAR: PB/PI



CEMBLOCKS (PTY) LTD
TEL: (014) 538 0311
PROVINCE: NW | PILLAR: PB/PI



CEM BRICK MANUFACTURERS (PTY) LTD
TEL: (051) 433 4479
PROVINCE: F/STATE | PILLAR: PB/PI



CONCRETE UNITS (PTY) LTD
TEL: (021) 386 1923/ (016) 362 2236
PROVINCE: WC/GAUT | PILLAR: PB/PI



CONTICRETE
TEL: 041 365 7616 / 041 365 0062
PROVINCE: EC | PILLAR: PB



CORESLAB (PTY) LTD
TEL: (087) 232 2462
PROVINCE: LMP | PILLAR: PB/PI



CONFRAMAT (PTY) LTD
TEL: (0861) 33 5599
PROVINCE: GT | PILLAR: PB/PI



COROBRIK (PTY) LTD
TEL: (031) 560 3252
PROVINCE: KZN | PILLAR: PB/PI



DERANCO PRECAST (PTY) LTD
TEL: (041) 463 3338
PROVINCE: EC | PILLAR: PB/PI



ELEMATIC SA (PTY) LTD
TEL: (011) 423 2700
PROVINCE: GT | PILLAR: PB/PI



FICK SEMENTWERKE BK
TEL: (022) 913 1921
PROVINCE: WC | PILLAR: PB



HORIZON CONCRETE WORKS
TEL: (012) 943 3701
PROVINCE: NW | PILLAR: PB



AGW TRADING T/A KOLBE BLOCKS
TEL: (041) 406 7900
PROVINCE: EC | PILLAR: PB



LATEGANS CEMENT WORKS (PTY) LTD
TEL: (021) 873 1154
PROVINCE: WC | PILLAR: PB/PI



MOBICAST (PTY) LTD
TEL: 086 111 2346
PROVINCE: WC | PILLAR: PB/PI



MVA BRICKS CC
TEL: (012) 386 0050
PROVINCE: GAUT | PILLAR: PI



NORTHWEST BRICK
TEL: 053 927 1034
PROVINCE: NW | PILLAR: PI



REMACON PRODUCTS CC
TEL: (011) 393 5504
PROVINCE: GAUT | PILLAR: PI



REVELSTONE (CAPE) (PTY) LTD
TEL: (0861) 173 835/ (021) 761 9737
PROVINCE: WC | PILLAR: PI



ROCLA (PTY) LTD
TEL: (011) 670 7600
PROVINCE: GAUT | PILLAR: PB/PI



SHUKUMA BRICKS (PTY) LTD
TEL: (041) 372 1013
PROVINCE: EC | PILLAR: PB



SHUKUMA FLOORING SYSTEMS T/A ZITTLAU EIENDOMME (PTY) LTD
TEL: (041) 372 1933
PROVINCE: EC | PILLAR: PB



DELTABLOC SOUTH AFRICA
TEL: (064) 898 1723
PROVINCE: GAUT | PILLAR: PI



ALARN CONCRETE PRODUCTS
TEL: (016) 1001573
PROVINCE: GAUT | PILLAR: PI



ZENZELE BRIX (PTY) LTD
TEL: 079 491 1809
PROVINCE: GAUT | PILLAR: PB

Precast Pillar

Precast Infrastructure

- PI

Precast Building

- PB



TECHNICRETE (PTY) LTD
TEL: (011) 672 1425
PROVINCE: GAUT | PILLAR: PB/PI



VIBRO BRICKS & PAVING (PTY) LTD
TEL: (012) 374 5533
PROVINCE: GAUT | PILLAR: PB/PI



WEST END CEMENT BRICKS (PTY) LTD
TEL: (011) 851 1005
PROVINCE: GT | PILLAR: PB/PI



VANSTONE PRECAST (PTY) LTD
TEL: (012) 541 2056/1808
PROVINCE: GT | PILLAR: PB/PI



WZ BETONWERKE
TEL: (057) 733 1626
PROVINCE: FREE STATE



ELDOCRETE (PTY) LTD
TEL: (012) 666 8158
PROVINCE: EC | PILLAR: PI

CMA MEMBER LIST

Non-Producer Members

Machinery, moulds, technology, admixtures, chemicals, etc



ABEL EQUIPMENT CC
TEL: (044) 874 1876
PROVINCE: EC



BIRKENMAYER H (PTY) LTD
TEL: (011) 970 3880
PROVINCE: GT



CHRYSO SOUTHERN AFRICA (PTY) LTD
TEL: (011) 395 9700/
(031) 564 0325/(021) 928 1660
PROVINCE: GT/KZN/WC



CVZ CONSULTING TRAINING
TEL: 083 701 4167
PROVINCE: GT



DICK KING LAS SUPPLIES (PTY) LTD
TEL: (011) 499 9400/
(031) 700 2551
PROVINCE: GT/DBN



KERNEOS SOUTH AFRICA (PTY) LTD
TEL: (011) 444 3090
PROVINCE: GT



KOBRA MOULDS B.V.
TEL: 003111 356 2460
COUNTRY: NETHERLANDS



OLI ELECTRICAL VIBRATORS (PTY) LTD
TEL: (011) 392-1054
PROVINCE: JHB



Concrete Equipment Solutions and Technology

PAN MIXERS SA (PTY) LTD
TEL: (011) 578 8700/ 8600
PROVINCE: JHB



QUANGONG MACHINES CO LTD
TEL: +865 958 679 9557
COUNTRY: CHINA



REVARO CONCRETE EQUIPMENT
TEL: (011) 794 8271
PROVINCE: JHB



SIKA SOUTHERN AFRICA
TEL: +27 31 792 6500
PROVINCE: GT



TERRAFORCE (PTY) LTD
TEL: (021) 465 1907
PROVINCE: WC



WAM South Africa

WAM South Africa
TEL: (021) 951 1840
PROVINCE: WC



Wacker Neuson South Africa
TEL: (011) 672 0847
PROVINCE: GT

Cement Member



AFRISAM SOUTH AFRICA (PTY) LTD
TEL: (011) 670 5500
Website: www.afrisam.co.za

Associate Members

Engineers, architects, quantity surveyors and associations.



AF CONSULTING ENGINEERS & ASSOCIATES (PTY) LTD
TEL: 079 245 0900
PROVINCE: JHB



ASPASA
TEL: (011) 791 3327
PROVINCE: JHB

JC PAVING CONSULTING
TEL: (011) 431 0727
PROVINCE: JHB

SEKHUKHUNE & ASSOCIATES
TEL: (012) 346 1945
PROVINCE: PTA



STEFANUTTI STOCKS CIVILS
TEL: (011) 571 4300
PROVINCE: GAUTENG



YOUNG & SATHARIA CONSULTING CIVIL ENGINEERS (PTY) LTD
TEL: (031) 207 7252
PROVINCE: KZN

FIND THE CMA ASSOCIATE MEMBERS ONLINE HERE:



Contractor Members

Precast concrete installation experts



DECORTON RETAINING SYSTEMS (PTY) LTD
TEL: (021) 875 5155
PROVINCE: WC



VALCAL INTERNATIONAL EXPORT CC
TEL: (011) 867 2471
PROVINCE: GAUT



FLEXIBLE RETAINING STRUCTURES
TEL: (011) 608 4321
PROVINCE: GT | PILLAR: PB/PI

PLEASE NOTE:

The member list is correct at the time of going to print. For any additional information regarding CMA membership or current members please contact the CMA at marketing@cma.org.za or give us a call on tel: (011) 805 6742.



27 - 29 JUNE 2023
GALLAGHER CONVENTION CENTRE,
JOHANNESBURG, SOUTH AFRICA

CONNECT WITH SOUTHERN AFRICA'S CONSTRUCTION INDUSTRY

Get ready to experience the ultimate construction event of the year. Big 5 Construct Southern Africa is celebrating its 10th edition and you're invited!

Big 5 Construct Southern Africa is a significant contributor to the economic growth, recovery and transformation within Southern Africa's construction industry with a special focus on facilitating buyer/seller face-to-face connections and showcasing the most innovative solutions for the region.

Join thousands of your construction industry peers for three days of valuable business and gain FREE access to:



GROW your network with over 8,500 construction industry professionals



DISCOVER the most innovative products and technologies available



ENGAGE with public and private sector stakeholders over the most critical issues



LEARN about the latest trends, best practice and upcoming construction projects

REGISTER FOR FREE NOW

Simply scan the QR code with your phone's camera app



Co-located with:





1012347

WITH YOUR COMMITMENT TO QUALITY,
IT'S A QUALITY BUILD FROM START TO FINISH.

**TOGETHER, WE MAKE
IT POSSIBLE.**



ASK FOR AFRISAM

AfriSam's wide range of locally-produced and fit-for-purpose superior quality products are suitable for both construction and structural work. Enabling you to build from the ground up, quickly, and with the peace of mind that you're off to the best possible start – without compromising on quality. Together, we make it possible. **Ask for AfriSam.**