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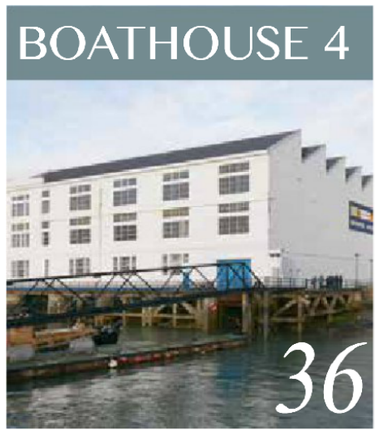

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EDITOR'S NOTE

The first quarter of 2018 is almost behind us and many people will be heading off for a few days' holiday. It is easy to get bogged down in negative news, but there are some positive reminders that the economy is improving in certain sectors.

Take for example the findings of the Afrimat Construction Index (ACI). Compiled by renowned economist Dr Roelof Botha on behalf of Afrimat, this composite index of the level of activity within the building and construction sectors, shows a steady growth in construction and building. "The construction sector at large continues to outperform the economy as a whole by a considerable margin, with the ACI having expanded by 25.4% since the third quarter of 2010 (the base period). This is substantially higher than the rate of growth of 15.8% for the economy over this period (in real terms)."

On that very upbeat note, we would like to highlight our cover feature, which showcases the ambitious Knightsbridge Manor revitalisation project, increasing the GLA from approximately 10 000 m² to approximately 30 000 m² over seven buildings.

We also take a look at the very unusual Genome Centre project in Nigeria. Currently in the construction phases, the building features rammed earth walls and a number of clever architectural features that both allow it to blend in with the environment as well as capitalise on reducing its carbon footprint.

Over to the chillier shores of the United Kingdom, where the Boathouse 4 project looks at redefining a building that was otherwise destined for demolition old into an attractive and functional multi-purpose space.

Finally, find out how Activate Architects have used their philosophy of providing high-performance architecture to survive and thrive over the past two decades.

Allyson Koekhoven

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GENOME RESEARCH CENTRE

FLAGSHIP GENOME RESEARCH CENTRE FOR AFRICA

The new ACEGID genome centre, situated on the Redeemer's University campus in Ede, Nigeria, will be the realisation of a long-standing vision to provide an African facility to diagnose and address infectious diseases.

> *Our vision is to set up an environment where African scientists can express their God-given talents. But, it is not just about the science; rather we envisage the creation of a stimulating environment that will foster interaction between scientists in a way that will provide solutions to the obliteration of infectious disease.*
>
> Professor Christian Happi.

Showcasing the use of local materials together with an evolving human-centred design process, the genome centre is the brainchild of Christian T Happi – a Professor of Molecular Biology and Genomics in the University's Department of Biological Sciences, and Dr Pardis Sabeti – a Professor at Harvard University and the Harvard TH Chan School of Public Health, as well as an investigator at the Howard Hughes Medical Institute and an Institute member at the Broad Institute.

Professor Happi says that although the seed for an African genomic centre was planted a decade ago, the concept only started becoming a reality during the Ebola outbreak in 2014. It was very evident that there were no facilities in Africa that could handle the high-level genomic sequencing process required. In order to find a cure and address all the issues around Ebola, samples had to be sent to the US and Europe. This was a

logistical nightmare, with critical samples often delayed in transit.

Professor Happi, together with Dr Sabeti, envisioned the establishment of a platform where scientists from both Africa as well as other countries, could learn about genomics and translate this knowledge into the tools which could facilitate the control and eradication of infectious disease on the African continent.

An evolving design brief

Sabeti's ongoing professional relationship with the MASS Design Group in Boston, USA, led to a collaborative partnership that saw the embryonic development of a research facility that will be completely unique in the African context.

The 1 300 m^2 building is being constructed on two levels. The first level hosts offices, classrooms, and a gallery and entry space. The sensitive labs are located on the second floor with controlled access. By splitting up the programme this way, the labs remain secure while encouraging the exchange of ideas between scientists as well as between scientists and visitors as they pass from the more public ground floor to the more secure upper lab floor.

"By situating classrooms next to offices and labs next to public spaces, not only will this result in casual interactions which could ultimately encourage knowledge downloads, but it also provides traditionally desk-bound scientists with an opportunity to be refreshed by enjoying the environment and views from the courtyard and upper decks" says MASS architect Caroline Alsup.

Designed in collaboration with the Broad Institute, one of the world's first and largest genome centres, the building houses three high-tech lab zones – a sequencing lab, DNA, RNA, Gel, Library Construction, and Malaria labs, and an Extraction lab where high-level pathogens are deactivated in order for their genetic structure to be mapped. Access to the labs is restricted to lab workers and scientists to ensure adherence to the highest safety levels.

Complementing nature

"As the flagship to fulfil a critical need in both Africa and internationally, the design needed be a reflection of the importance and impact of its

> *We design buildings that focus on the user, creating spaces that dignify the users through the care we put into the design and the resulting beauty of the space. We want to improve health and well-being, and have the greatest positive impact in the communities the buildings serve. We leverage the construction process to maximise economic, educational, and environmental outcomes. Overall, we believe 'Justice is beauty', and dignity is beauty. It is not only that all people deserve a beautiful environment, or that a building that is functional can also be beautiful, but that a building must be beautiful for it to be fully functional."*
>
> Caroline Alsup

existence. It could not be just a typical building, it also needed to push the boundaries of building design as a whole, and what buildings could be in the region," says Alsup.

Often, buildings in the area are understandably trying to protect the users as much as possible from the environment, she says. Because the Nigerian climate and ecology can be considered rather harsh, with a very hot dry season followed by monsoon-like rains in the hot wet season, many buildings are built to simply try to cope with this environment. Windows are usually closed against the glare and heat, and air conditioning is used extensively. However, it can feel like the buildings are trying to ignore the landscape around them. While the temperatures are high, the landscape is quite beautiful. MASS wanted to capitalise on that.

"We saw an opportunity to use the natural trees and shrubs that grow in the area to mitigate the hot and humid temperatures with adequate shade and air movement, making it pleasant for scientists and other lab staff to be outside," Alsup points out.

This is achieved with the large vine-planted trellis structure that shades the decks and courtyard. Slow-moving fans move air outside in the courtyards and decks, as well as inside the spaces, to ensure a constant air flow and maximised occupant comfort. The building is located adjacent to a stream that has some beautiful trees and plants which will be accessible once the site is landscaped.

Often buildings claim environmental stewardship as a fact through the incorporation of technology such as occupancy sensors and low-voltage lighting. However, the genome centre is more than a mere nod to going green, with a number of passive elements that use the natural environment to maximise energy efficiency and provide a reduced carbon footprint. Electrical systems and lighting are as efficient as possible using LED and occupancy sensorts, and provision is being made for all electrical systems to run off a photovoltaic panel array in phase 2 of the building plan.

The entire building will be oriented towards the prevailing wind to provide free cooling power. Another feature that is making people sit up and take note is the use of rammed earth walls. Built using locally sourced materials and local unskilled labour (trained during the construction process), these 972 m2 walls are a modern derivative of an ancient building technique.

Mohamed Bedri, from South African-based rammed earth specialists AsaDuru, says that the walls contain a mixture of local earth and a waterproofing admixture that makes them impervious to the harsh Nigerian weather conditions. There is approximately 70% less embodied carbon in rammed earth than one finds in other wall materials. The walls have a further environmental benefit in that they have a high thermal mass which will effectively reduce the energy requirements of the building, by absorbing heat during the day and releasing it at night.

Not only do the walls blend in seamlessly with the environment, but they have an exceptional load bearing capacity, being able to carry up to three storeys without reinforcement, in spite of the fact that they only need to be 300 mm thick rather than the 800 mm thickness architects generally believe to be the thickness of rammed earth walls.

The rammed earth walls for the ground floor are scheduled for completion in mid-April and the team will return to do the walls on the second floor once the floor slab has been poured. "This is the largest rammed earth project of its kind in Africa and AsaDuru is fast winning favour with South African architects as we can complete a rammed earth wall in one seventh of the time required by those using older rammed earth techniques," says Bedri.

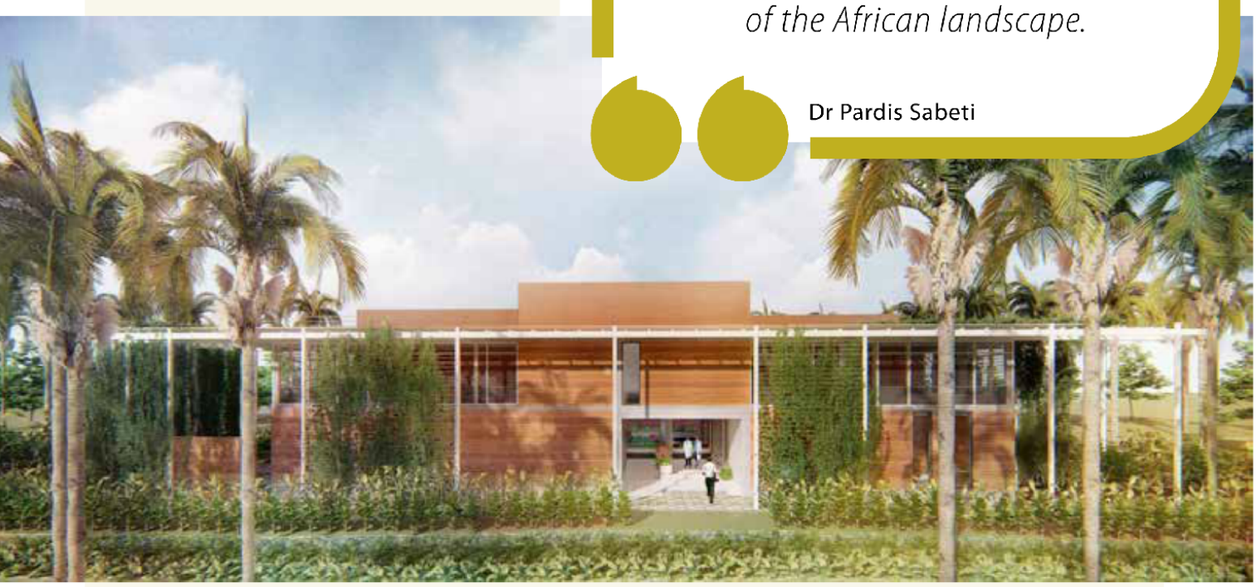
Conclusion

In addition to becoming an iconic example of what is possible in research centre design in Africa, the Genome Centre will form the precedent for the development of the masterplan for the new Redeemer University campus. Moreover, this highly contextual building will provide a blueprint for Nigerian architecture and construction in the future, leveraging the wealth of available natural resources.

Developing a high-tech research facility that offers a better and safer quality of life for millions of people in Africa and beyond is extremely costly. The funding of the development of the centre is based purely on donations from third-party sources. While the ACEGID genome centre has received seed funding from the World Development Bank, much more will be needed to outfit this centre so that it can truly participate as a biosurveillance network on the global stage. It will thereby benefit these scientists and the incredible work they do.

Recent global epidemics of Ebola and Zika have shown that the world remains unprepared to combat the perpetual threat of infectious disease outbreaks. To protect ourselves, the global community needs infectious disease surveillance systems in every country and every setting. MASS Design Group's partnership with ACEGID is making this possible, creating an unparalleled genomics facility in Africa, designed specifically for the highly complex and technologically demanding work within the backdrop of the African landscape.

Dr Pardis Sabeti



ACEGID and MASS, who have given so generously of their time and resources to make this dream a reality, are currently seeking additional funding to outfit the facility.

Should your organisation wish to become involved, please email Kareya Saleh (communications associate at MASS) on: hello@massdesigngroup.org