AECOM

2022/23 Property & Construction

Africa Cost Guide

AECOM AFRICA PROPERTY & CONSTRUCTION COST GUIDE 2022/23

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Delivering a better world.

AECOM is the world's trusted infrastructure consulting firm, delivering professional services throughout the project lifecycle – from planning, design and engineering to programme and construction management.

On projects spanning transportation, buildings, water, new energy and the environment, our public and private-sector clients trust us to solve their most complex challenges.

Our teams are driven by a common purpose to deliver a better world through our unrivaled technical expertise and innovation, a culture of equity, diversity and inclusion, and a commitment to environmental, social and governance priorities.

> At AECOM, we believe infrastructure creates opportunity for everyone.

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Foreword

Herman Berry

Director,
Program Cost Consultancy,
Africa

Welcome to our Africa Property and Construction Cost Guide 2022/23.

It's a huge honour for me to introduce this latest edition of the Cost Guide, especially as 2022 marks the 100-year anniversary of our cost management offering in Africa.

We are amid a constantly changing environment that requires strong leadership and grit to keep steadfast in our value base. The Cost Guide has become an institutional tool to the wider built-environment - our friends and colleagues in the industry utilize the guide for the benefit of our industry. It's our aim at AECOM to continue delivering excellence and enhancing this tool.

The only testament to the excellent work that our teams are delivering is in the feedback and repeat business we receive from our clients. We believe in maintaining and fostering these valuable client relationships and want to thank our loyal clients for their support.

Over the last year, we have been making advances in the digital space. Research has shown that the QS profession has been slow in adapting to change, and in general, reluctant to invest in BIM technologies. Studies by the RICS has proved that BIM will enhance the profession, but significant change will be required to meet renewed client expectations. We have invested in industry-leading 5D-digital tools to ensure we remain a pioneer in our market.

Other advances have been made with our commitment to sustainability. Last year we launched our transformative ESG strategy, Sustainable Legacies. The key pillars of this strategy includes: achieving net zero emissions, embedding sustainable development and resilience across our work, improving social outcomes and enhance governance.

Focused on investing in the development of our people, we are proud to report that we have maintained our level one B-BBEE scorecard - a reaffirmation of our commitment to contributing to a better South Africa.

Our team is looking forward to connecting and working with you as your trusted advisors.

Kind regards,

Exxaro Headquarters,
South Africa

Section 1

The changing landscape of Africa

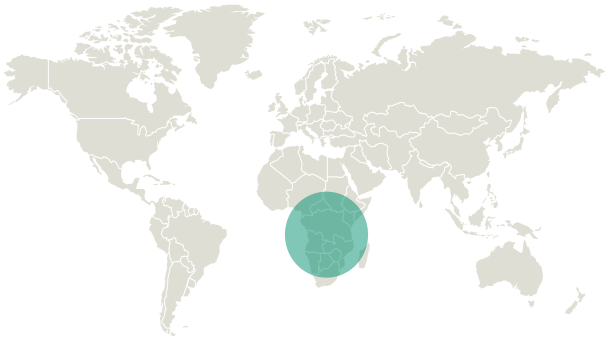
Section
01

The changing landscape of Africa

We are passionate about the development of Africa and continually seek to align ourselves with initiatives that aim to bring this development to life.

We serve private and public clients, delivering technical excellence on infrastructure and program projects, whilst keeping our communities at the forefront.

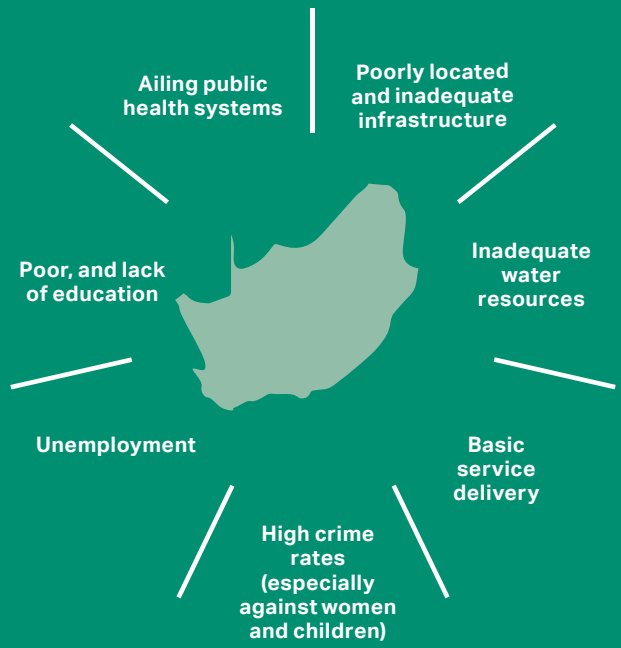
Our multidisciplinary team of award-winning engineers, planners, architects, environmental specialists, scientists, consultants, quantity surveyors (cost managers) and project and programme managers are committed to delivering projects that improve the quality of life for Africa's communities.



Improving lives

As a relatively new democracy, South Africa must deal with many challenges resulting from the past, as well as the new challenges which will have a major impact on the social wellbeing of the country.

The key challenges facing South Africa are:



When it comes to making decisions over infrastructure, a more holistic approach is needed that takes account of social and economic benefits. With evidence showing that social values such as health, quality of life and social inclusion can boost long-term economic growth, we make sure our projects and operations evaluate the whole picture and put people at the forefront to create a safer, more resilient country prepared for the future.

Bridging the skills divide

Our strategy is aimed at facilitating empowerment of talented individuals through university and in the workplace. We believe that by providing these opportunities, young people will realise their potential to successfully enter the built-environment professions.

In 2017, AECOM established the AECOM Educational Trust with the objective of providing bursaries to young black women to further their tertiary education in the built-environment.

AECOM's Learning and Development department, in partnership with Skills College, launched its sixth 12-month Disabled Learnership Programme this year. Learnerships are intended to address the gap between education, training and the needs of the labour market. To date, AECOM has sponsored nearly 100 disabled learners on this work-based approach to learning that culminates to a Business Administration NQF level two and three qualification.

As part of our commitment to improve skills, experience and excellence in the industry, AECOM offers bursaries each year to aid full-time employees and meritorious students that are studying towards the main fields of our core business. On average, eight full-time bursaries are awarded annually to talented students from disadvantaged backgrounds.

> “Learnerships are intended to address the gap between education, training and the needs of the labour market.

Candidacy Support and Mentoring Programme

At AECOM, mentorship is deeply-rooted in our business offering and we understand its importance and how these relationships significantly impact our more junior team members, as well as our business.

The Candidacy Support and Mentoring Programme is a world-class structured programme that creates a focused learning and mentoring environment that supports and accelerates the candidacy journey across the whole built-environment, as well as other appropriate professional bodies applicable to AECOM Candidate Professionals.

It is a full lifecycle programme that will benefit everyone, whether they are graduates not registered as candidates, young candidates, or mature candidates who have been registered as candidates for more than five years.

The programme is supported by our own internal pool of mentors and an external service provider (Mentoring 4 Success).

During the programme, mentors themselves participate in substantial leadership/personal development training, encompassing relationship building, emotional intelligence, generational theory, behavioural theory, coaching skills and goal setting. Mentors who participate will be able to make up almost their full CPD requirement and possible accreditation as a registered mentor via M4S with SABPP.

The programme is further enabled via two unique mobile knowledge mentoring applications and analytic dashboards provided exclusively by M4S under an exclusive Africa licence agreement.

The **KnowledgeMentor™** and **Mentoring Head Quarters app**, and the **MentorExcellerator™** and **Career Head Quarters**.

These unique technology platforms allow for M4S and AECOM to gather, monitor and report on engagement analytics critical to validating the effective impact and accelerated professional development. The analytics also provide substantial evidence of professional development for the annual CETA grant applications and the B-BBEE verification audits.

New Ashton Arch Bridge,
Western Cape, South Africa

Broad-Based Black Economic Empowerment (B-BBEE)

Transformation is an important factor in South Africa's transition towards the vision of a non-discriminatory, democratic and prosperous society as summarized in the Freedom Charter. Equity, diversity and inclusion is vital at AECOM and we know that transformation opens a path to inclusive economic growth and development.

Our B-BBEE journey continues as we set ourselves targets to continuously improve in all categories with investment in our people. We are proud to report that we have maintained our level one B-BBEE scorecard (as outlined below) in terms of the Department of Trade and the industry's revised codes - a reaffirmation of our commitment to contributing to a better South Africa.

B-BBEE Level Status:	**Level 1**
Procurement Recognition Level	135%
Black Ownership	20.47%
Black Women Ownership	20.47%
Black Youth Ownership	20.47%
Scorecard Information:	
Ownership	18.49 points
Management Control	16.14 points
Skills Development	32.53 points
Preferential Procurement & Supplier Development	28.51 points
Socio-Economic Development	6 points
Total	**101.67 points**
Empowering Supplier	YES
Designated Group Supplier	NO
Scorecard	Generic – Construction BEP Sector (17 December 2021)

Sustainable Legacies – our environmental, social and governance strategy

In ways that are both devastating and transformational, the coronavirus pandemic has highlighted weaknesses and inequities in the systems that support quality of life and prosperity in our already fragile world.

It has led us and our clients to rethink what's next, reorder priorities and accelerate changes that not only help repair what's broken, but lead to improved, lasting outcomes.

As the world's trusted infrastructure consulting firm and a leader in environmental, social and corporate governance, we are determined and well positioned to deliver positive, impactful and sustainable legacies for our company, our communities and our planet.

Whilst working with you, we aim to deliver a better world.

The strategy has four themes, each of which are detailed below:

- **Embed sustainable development and resilience across our work**
- **Achieve net-zero carbon emissions**
- **Improve social outcomes**
- **Enhance governance**

#2

In Engineering News Record's 2022 top environmental firms

SUSTAINABILITY Innovation Awards 2022

Winner - Green Consultant of the Year Sustainability Innovation Awards 2022

greenstar

GREEN STAR SOUTH AFRICA

Employees across our South African business have completed the 'Green Star South Africa' accredited professional course.

Our people are well-versed in sustainable construction and are available to help clients achieve their environmental responsibilities, as well as their financial objectives in terms of infrastructure and building development.

Green building ratings currently undertaken by our team of sustainability consultants include: Green Star Office, Green Star Interiors, Green Star Existing Building Performance, LEED Design and Construction and LEED Interior ratings.

The Green School, Paarl

Article 1

ESG – It's both a journey and a destination

Elisabeth Nortje
Associate Director - Environment, Africa

For a number of years, the practice of environmental management has recognised that for us to manage the impact and risk of climate change requires an integrated approach. This includes not only evaluating the biophysical, but also the social and economic impact of any proposed development. Viewing these aspects of our environment as a system with interconnections between the parts is critical.

Closely related to integrated environmental management is sustainable development. The official definition coined in the Brundlandt Report in 1987, also known as *'Our Common Future'*, is "development that meets the needs of the present without compromising the ability of future generations to meet their own needs". By thinking of sustainable development as an organising principle for meeting our development needs today, it also supports the capacity of our natural systems to provide the resources and ecosystem services on which the economy and society does and will depend on. Climate change, the triple bottom line and the Sustainable Development Goals go hand-in-hand with sustainable deployment.

This brings us to environmental, social and corporate governance (ESG). The term ESG is not new and was first used in a landmark study entitled *'Who Cares Wins – Connecting Financial Markets to a Changing World'* in 2005. Today, ESG is broadly understood as the integration of environmental, social and governance factors into investment processes and decision-making. In terms of integrated environmental management, as well as sustainable development, you cannot ignore ESG and more and more businesses are starting to integrate this way of thinking.

AECOM understands the need to adopt environmental, social and corporate governance commitments, and how by doing so this helps to deliver a better world. Committing to a robust environmental strategy in 2021, AECOM's Sustainable Legacies is centered around four themes; embedding sustainable development and resilience across their work, improving social outcomes, achieving net zero carbon emissions and enhancing governance.

In each area, AECOM has taken stock of its progress, identified opportunities to do more and reviewed its objectives.. With ESG principles embedded into everything they do, the goal of Sustainable Legacies is straightforward; to ensure that the work they do, in partnership with their clients, leaves a positive, lasting impact for communities and the planet. Their work on a confidential Vision 2030 project in the Kingdom of Saudi Arabia being a great example.

The Kingdom has set bold ambitions on this project, including goals to be net zero carbon and to be powered 100 percent by renewable energy. Currently overseeing the program management of this substantial initiative, AECOM have brought in a whole host of technical experts who are engaged in engineering the backbone infrastructure of this development. This work underscores the type of value AECOM are uniquely bringing to clients to helping them build a better and more sustainable world.

Another great example is the work AECOM are doing in Bronzeville, Illinois; a neighborhood on the southside of Chicago in the United States. Working with ComEd and the Chicago Housing Authority, AECOM are developing the first renewable powered microgrid in this underserved community. This project will help address transportation, electrification, and broader community benefits, such as jobs and education. At the same time, energy-saving programs are helping residents and businesses reduce their utility bills, while other initiatives are creating jobs, training the future workforce and preparing low-income high school students for careers in science, technology, engineering and mathematics.

A key aspect of AECOM's ESG strategy is their response to climate change. By not limiting their thinking solely on emissions reductions they think about wider environmental issues.

They also consider the impact climate change will have on all the communities they serve, especially people who live in vulnerable areas who will be disproportionately affected.

The 2018 Intergovernmental Panel on Climate Change report suggested the need to limit global warming to 1.5 degrees to avoid the worst effects of climate change. This requires significant changes globally, including from companies.

Also echoed by the goals of the Paris Agreement, this is the first-ever universal, legally binding global climate change pact. The science therefore requires the reduction of greenhouse gas emissions in line with the Paris Agreement, as well as achieving net zero emissions ahead of 2050 to avoid the worst impacts of climate change.

AECOM's new net zero targets align with the Science-Based Targets Initiative and with this aim to be net zero by 2030.A science-based net zero target is a new concept that commits a company to decarbonizing as quickly as possible across its value chain (in line with the Paris Agreement) and then neutralizing any remaining emissions through carbon offsetting.

Operational net zero allows AECOM to make their own mark in tackling climate change and be ready for their science-based net zero target. As such, AECOM complies with all applicable legal and regulatory requirements to control and reduce emissions and energy usage in their operations.

AECOM commits to embed environmental sustainability into its work, including through its 'ScopeX™' process, requiring carbon reduction on major design projects. AECOM are also partnering with clients to advance their sustainability initiatives to progress more environmentally conscious infrastructure.

> "AECOM understands the need to adopt environmental, social and corporate governance commitments, and how by doing so helps to deliver a better world."

An example of this is how AECOM are helping energy giant, Shell, with transitioning fuel stations to hydrogen stations to support the Los Angeles Department of Transportation's transition to electric buses. This transition is leading on decarbonization measurement and biodiversity impact through innovative work at the Natural Capital Laboratory in the UK and further afield.

Closer to home in Kenya, AECOM worked with the Government of Kenya and the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (German International Climate Initiative IKI) on the GNIPlus project to help the Government achieve its climate and development goals.

GNIplus brought together the combined expertise of AECOM, Climate Policy Initiative, Pollination (previously Baker McKenzie), and Ricardo, to provide the government with the best available policy, technical, financial, governance and legal expertise to support the implementation of their Nationally Determined Contributions (NDCs).

GNIplus also supported the government as it worked to mobilize private investment and create long-term, sustainable growth and development. GNIplus maximized impact by building on its partners' existing collaborations with governments, multilateral agencies and private investors to facilitate climate action by enhancing current national strategies and initiatives.

Another exciting opportunity in Kenya is the Urban Planning and Infrastructure Investments in Urban Areas, which has just started. This World Bank's Kenya Integrated Devolution and Urban Support Program (KIDUSP) aims to enhance institutional capacity of counties and urban areas to improve access to selected urban services and improve private sector competitiveness. AECOM are providing technical support to assist with the project preparation. Part of the assignment included a climate and disaster risk assessment to inform the urban resilient infrastructure assessment report.

To ensure AECOM delivers social value through its project work and operations, their teams must also reflect the diversity of the clients and communities in which they serve. Recognizing that promoting diversity in ideas and perspectives makes us a better, more innovative company. AECOM reaffirmed its commitment to extending a culture of equity, diversity and inclusion (ED&I) throughout its global enterprise. As a result, AECOM globally continues to make progress on gender diversity targets, with 33% of its total workforce being women, with a target of +35%, and 18% women in leadership roles, with a target of +20%. In South Africa specifically, the total company workforce is just over 40% female at present.

AECOM has also set non-gender diversity goals across the business for 2022, in addition to undertaking an external ED&I accreditation process.

An example from a project perspective is the work that AECOM is carrying out in terms of an Environmental and Social Management Framework (ESMF) as part of a larger feasibility study for a market-driven irrigated horticulture project in Lesotho. The project is being facilitated by the Millennium Challenge Corporation (MCC) in partnership with the Lesotho Millennium Development Agency (LMDA), also part of the Lesotho II Compact between the United States of America, acting through the MCC, and the Kingdom of Lesotho. The Compact was signed on 12 May 2022.

The objectives of the project are to increase rural incomes related to commercial horticulture, including for women, youth, and the rural poor, and establish a sustainable and inclusive model of irrigation, water resource, and land management. A gender transformative approach is being applied throughout the project with the aim of ensuring the sustainability of the project.

Another example is the Green School South Africa in the Drakenstein Valley near Paarl in the Western Cape. Green School South Africa's mission is to educate for sustainability, and has strong focus on sustainability in every component of the project. It produces 105% of its own electricity consumption, thus giving back to the grid. It uses less water than what the site naturally receives per year in terms of rainfall, hence topping up the groundwater aquifers. It is a zero waste-to-landfill site, even taking in waste from neighbours and the community.

The construction process ensured that no materials on-site had any red list ingredients, including those used in the manufacturing process. Endemic flora was re-established in the gardens to boost the biodiversity of not just the site, but the entire area.

Finally, the project incorporated vegetable gardens, fruit forests,

The Green School, Paarl

medicinal gardens and herbal corridors in the campus landscape. The school day includes growing, caring for and harvesting fruit and vegetables – all with the aim of re-establishing people's connection to the land and food.

AECOM have set their ESG destination through their Sustainable Legacies strategy and have committed to working toward a more sustainable and equitable future through their operational commitments and by helping clients achieve their ESG ambitions. They firmly believe that there is no better time to act than right now.

AECOM also recognises that they are on a journey to achieve their goals. The AECOM global ESG Report was released in November 2021, incorporating the global disclosure standards from the TCFD (Task Force on Climate-Related Disclosures) and SASB (Sustainability Accounting Standards Board). The company is reviewing its ESG-related risk framework (implemented in 2021), and developing recommendations for respective updates – including how it can better support clients transition away from fossil fuels.

AECOM's ESG ratings are improving. Sustainalytics, a provider of ESG research, ratings and data, has ranked AECOM 12 out of 307 in the industry group for construction and engineering in terms of ESG risk.

AECOM's score improved from 31 to 24, which is a significantly lower risk profile. The MSCI ESG Rating, which measures resilience to long-term industry material ESG risks, also improved in February 2022 to AA from A.

In ways that are both devastating and transformational, the pandemic has brought increasing focus on the weaknesses and inequities in the systems that support quality of life and prosperity in our already fragile world. It has led AECOM and their clients to rethink what's next, reorder priorities, and accelerate changes that not only help repair what's broken, but lead to improved, lasting outcomes.

“Sustainalytics, a provider of ESG research, ratings and data, has ranked AECOM 12 out of 307 in the industry group for construction and engineering in terms of ESG.”

Tema Port, Ghana

Section 2

Our digital transformation

Section
02

Innovation

Our clients count on us to think without limits. By harnessing the power of digital technology and innovation, and connecting our technical experts and visionaries around the world, we deliver tailored solutions and transformative outcomes for our clients and communities.

Digital Project Delivery (DPD)

AECOM promotes a collaborative working environment underpinned by digital technologies. Our focus is on implementing more efficient methods to design, procure, construct, operate and maintain built assets and infrastructure.

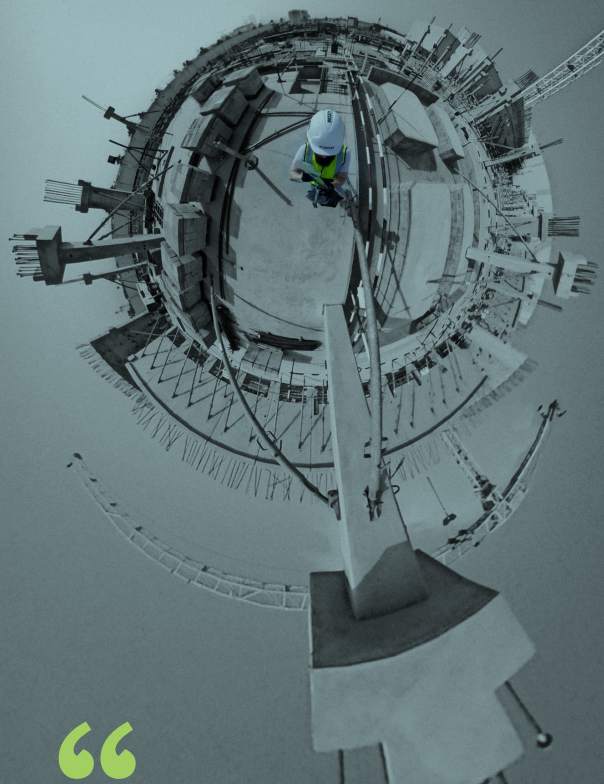
Our cost managers and consultants are fully aligned to standard DPD protocols and procedures. This ensures consistency and successful outcomes in our daily working practices. Our teams are committed to the development of 5D BIM through a collaborative workflow that aims to improve BIM data quality and facilitate improved digital outcomes.

These include the ongoing development of the following:

- Design/measurement coordination
- Risk/change management
- E-tendering
- Global collaborative tools
- Construction progress reporting
- 5D BIM Implementation
- Mobile connectivity to monitor site progress
- Paperless communications and reporting

Reality Capture

- **Visually documenting construction site progress through the use of 360 degree images.**
- **Dedicated micro-site for stakeholder access to an immersive virtual site walk-through.**



“Pairing our own digital tools with the latest software programmes from our partners, we are transforming project delivery and the infrastructure sector.

Cape Station, South Africa
Boogertman + Partners
Developed by Eris Property Group

Building Information Modelling

The 5D BIM process

For the cost management team, our focus is on 5D BIM. This refers to the linking of cost information to a 3D model. The number "3, 4 or 5", in connection with BIM, relates to the type of information associated with the model. It refers to other dimensions, such as time (4D) or cost (5D). 2D and 3D essentially refer to CAD 2D plans and 3D models, while 5D BIM entails the intelligent linking of individual 3D CAD components to cost-related information.

The possible benefits of BIM from a cost management perspective:

- Fast, reliable and accurate quantity take-off and cost estimation.
- Auto computation of calculations, hence reduced calculation mistakes.
- Categorised cost reporting and estimation via the use of zones/locations.
- Improved visualisation of the elements for measurement and costing purposes.
- Enhanced communication and collaboration amongst the professional and project team.

Our PCC team have developed a thorough leadership document that is an essential guide for quantity surveyors, cost managers and cost estimators looking to be involved within a project utilising BIM.

The document further acts as guidance notes to the design team about modelling best practices and requirements for the quantity surveyor to be able to rely on the object data within the 3D model. The document makes recommendations based upon 5D-friendly modelling practice to standardise the output of 3D models in a format that is 5D compatible.

By applying the guidance within the document, the need for manual take-off will be greatly reduced. The ultimate goal is that the development of consistent modelling best practice improves the quality and usability of model data.

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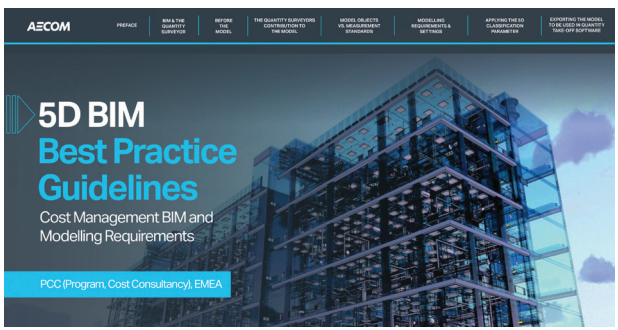


Research support

Research is a key part of AECOM's aspirations to embrace complex challenges and deliver innovative outcomes.

Through our research and knowledge creation activities, we aim to stimulate beneficial cultural and business changes, resolve industry-specific problems, support our knowledge database and deliver cost-effective, high-quality and relevant services.

We also undertake contract research on assignment for clients.

Globally, we have a tradition of supporting research collaborations, and in South Africa we are currently pursuing a wide-range of research studies with local academic and research institutions, professional bodies and the government.

Current research nationally and internationally centres around:

- Local, regional and international influences on construction costs and prices.
- BIM cost models.
- Sustainability and green buildings — drivers of green design, construction and operations within different building types.
- Improving infrastructure project delivery in South Africa.
- Tall, large and complex buildings — efficiencies in construction and life-cycle costing.
- The triple bottom line in construction and property development.
- The soft landings process for buildings.

We have ongoing collaboration with our international offices with specific regard to global infrastructure sentiment surveys, sector-specific research and developing global project-cost databases.

Finally, we aim to work closely with the industry on continuing educational workshops and in developing relevant industry reports and publications.

Section 3

Our services

Section 03

Our services

Quantity surveying and cost management

AECOM provides comprehensive cost management services through all six stages of a project cycle, as identified by The South African Council for the Quantity Surveying Profession, Tariff of Professional Fees, Quantity Surveying Profession Act 2000 (Act 49 of 2000), which is summarised as follows:

Stage one

- Assisting in developing a clear project brief.
- Advising on the procurement policy for the project.
- Advising on other professional consultants and services required.
- Advising on economic factors affecting the project.
- Advising on appropriate financial design criteria.
- Providing necessary information within the agreed scope of the project to the other professional consultants.

Stage two

Agreeing on the documentation programme with the principal consultant and other professional consultants.

Reviewing and evaluating design concepts and advising on viability in conjunction with the other professional consultants.

Preparing preliminary and elemental or equivalent estimates of construction cost.

Assisting the client in preparing a financial viability report.

Auditing space allocation against the initial brief.

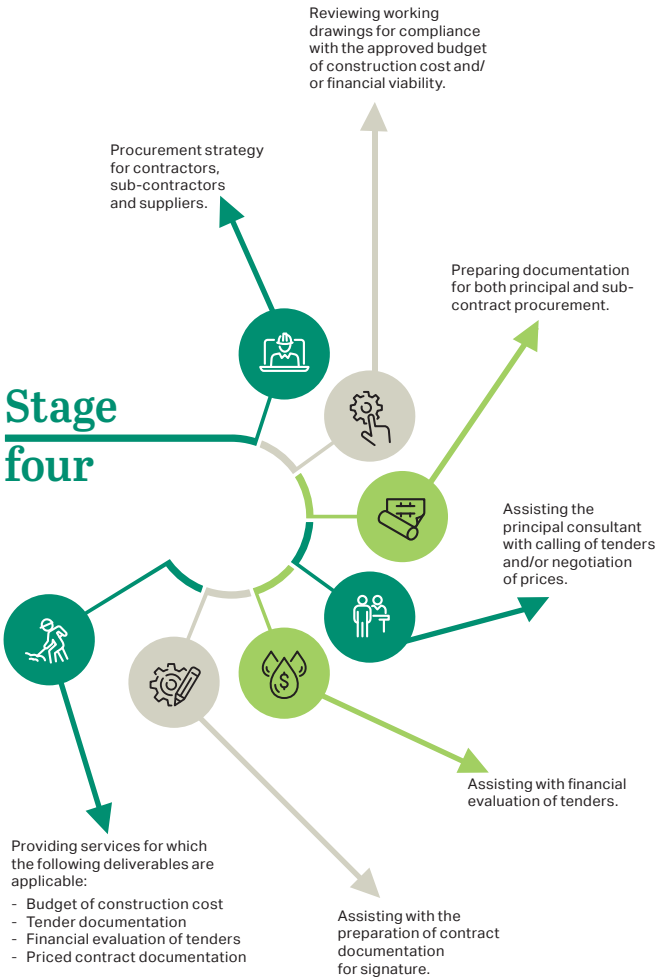
Providing services for which the following deliverables are applicable:

- Preliminary estimates of construction cost
- Elemental or equivalent estimates of construction cost
- Space allocation audit for the project.

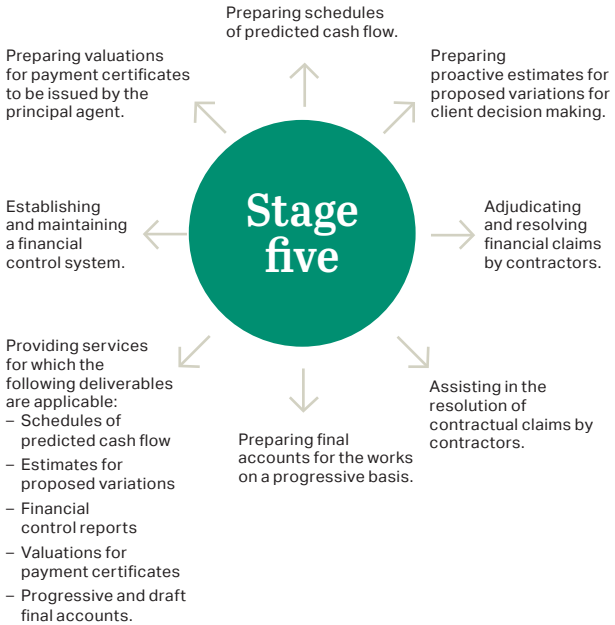
Stage three

- Reviewing the documentation programme with the principal consultant and other professional consultants.
- Reviewing and evaluating design and outline specifications, as well as exercising cost control in conjunction with the other professional consultants.
- Preparing detailed estimates of construction cost.
- Assisting the client in reviewing the financial viability report.
- Commenting on space and accommodation allowances and preparing an area schedule.
- Providing services for which the following deliverables are applicable:
  - Detailed estimates of construction cost
  - Area schedule

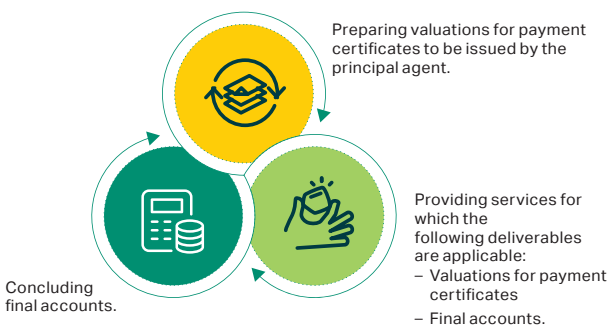
Stage four



Stage five



Stage six



Engineering cost management

Engineering cost management operates as a specialist service within AECOM. It comprises specialist skills and applications that enhance the risk and value management techniques required by the mining, infrastructure, minerals, metallurgical and petrochemical sectors.

Our engineering cost management group includes dedicated independent teams specialising in, and responsible for the estimation, procurement, cost management and contract administration activities relating to the above-mentioned sectors.

The engineering cost management team operates throughout Africa using infrastructure support from our major local offices.

Our group employs professionally-qualified quantity surveyors, cost managers, cost engineers and contract administrators. Mining, infrastructure, minerals, metallurgical and petrochemical projects are generally of a high monetary value. It therefore is most beneficial to involve the mining and engineering cost management team at an early stage in the project cycle.

Imposing robust financial discipline from a very early stage will positively impact a project. This includes, accurate and structured estimating, timely and cost-effective procurement, accurate and up-to-date maintenance of costs to completion, the cost management of design changes and the prompt close-out of contracts. The implementation of these financial management principles will thereby deliver maximum shareholder value, as well as significantly influencing project outcomes to benefit all stakeholders.

Our engineering cost management group provides much experience, expertise and independence that contributes to and complements the client's team. This is critical, particularly in the early stages of a project, when the opportunity to add value, as well as recognise and define cost, is established.

Simultaneously, formalising project principles is equally critical throughout the project, with cost management continuing through to the post–contract period and final closeout.

Project controls and support services

Areas of expertise:

- Scope and change management
- Resource and material management
- Project cost controls and budgeting
- Performance and earned value

Project success is most often measured in terms of cost, schedule and budget. An effective Project Manager will oversee these vital elements through 'control'.

Timely and accurate project information empowers the decision making process, ensuring access to the right tools and skills for planning, tracking and reporting project information. AECOM provides project controls and support services with a 'project controls by design' approach.

This concept provides a powerful, cost efficient service that satisfies the unique management and reporting needs of each individual project. Our project controls specialists deliver reliable and accurate information, allowing flexibility and scalability, based on project complexity and needs.

Scope management
AECOM utilises software platforms to apply critical path management techniques to capture and organize the fundamental elements of work scope, task durations, logic ties among tasks, and key milestones.

Resource and material management
By using resource-loaded schedules and activity sequencing to facilitate contractor involvement, this minimizes work conflicts and ensure that resources, equipment, and materials are available and appropriately staged for maximum project efficiency.

Project cost controls and budgeting

AECOM uses cost-loaded schedules to integrate multiple project cost estimates and resource data to establish a budget, integrated baseline plan, and cost analysis process. This approach transforms static cost data into accurate 'time-phased' spending plans, budgets, cost forecasts, and specialty reports designed to facilitate a realistic project execution plan.

Performance and earned value measurement

AECOM establishes and facilitates a project delivery process that collects and compares actual project costs against the integrated baseline plan to obtain an objective measure of project scope, schedule, and budget performance to date using earned value methods.

Building services cost management

Effective cost management of building services

Building services such as electrical, air-conditioning, fire protection and electronic installations usually comprise 25-40 per cent of the total construction cost, meaning effective cost management of the building services is essential to ensure the client's budget expectations are met.

The most effective way to ensure that the building services are cost managed in the same way as the rest of the building works is to allocate this responsibility to one consultant—the quantity surveyor—rather than spreading it among the building services design consultants.

> The most effective way to ensure that the building services are cost managed in the same way as the rest of the building works is to allocate this responsibility to the quantity surveyor.

Independent financial management and cost control of building services ensures transparency and a dedicated service. This, in turn, allows the building services consultants to focus on their primary design responsibility.

Our expertise

The team provide financial management and contract administration of all building services including:

- Electrical installation
- Heating, ventilating and air-conditioning (HVAC) installations
- Fire protection systems (sprinklers)
- Fire detection and evacuation systems
- Electronic systems such as access control, surveillance, and structured cabling
- Lifts and escalators

Services provided

Working in close conjunction with the appointed mechanical, electrical and fire protection consultants, our building services team provides a comprehensive service that covers all aspects of procurement and cost management throughout all the project stages including:

- Cost planning at an early stage prior to detailed design.
- Cost studies to compare alternative materials and designs.
- Evaluating the design as it evolves to ensure compatibility with the approved cost plan.
- Procurement from tender documentation to adjudication.
- Cost management, monitoring and reporting throughout the contract.
- Valuation of work done during construction.
- Settling final costs with the contractor.

Department of Rural Development and Land Reform, South Africa

AECOM

Article 2

Embodied carbon and the industry's role in reducing global emissions

Matthew Anthony
Associate - Advisory, UAE

This article explores the nature of embodied carbon, where it is found in the built environment and how it can be measured, documented and reduced with reference to current initiatives, tools and examples in the construction industry.

The chances are that you are reading this article on an electronic device rather than in printed form, such as a magazine or journal. But which medium produces the least carbon emissions? Straight away you can differentiate the two by the fact that an electronic device requires a power source, such as a battery charged by electricity to operate. The magazine or journal though does not, so you may reasonably conclude that the printed matter has less carbon emissions. However, it is not as simple as that when you consider the embodied carbon.

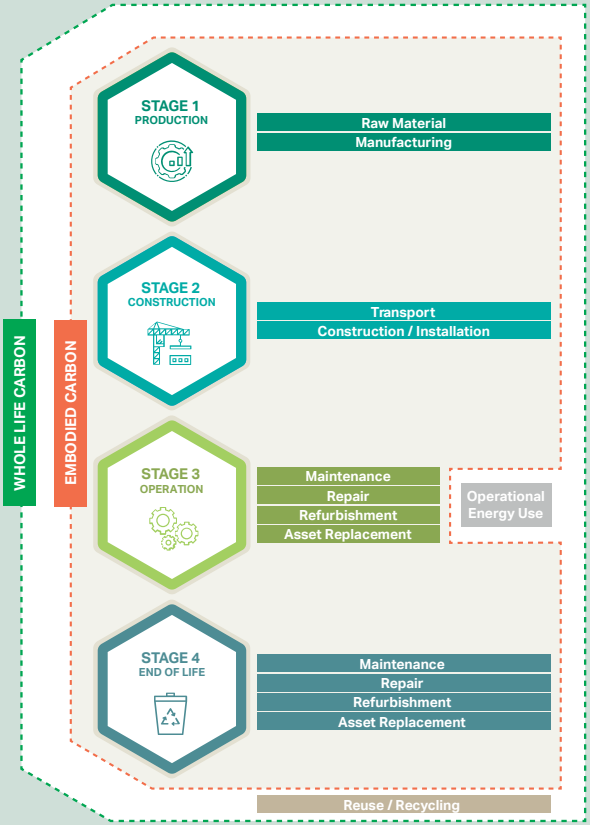
A study by Alma in Finland determined that it takes between 150-190kg of CO2e (carbon dioxide equivalent, the common scale for measuring the climate effects of different gases) to produce a newspaper or magazine. Apple, the producer of iPads on which millions of publications are read every day, claim that the total lifecycle emissions of a typical model are 130kg CO2e of which only 30 per cent are associated with customer use (iPad Environmental Report, Apple). Clearly there are many factors at play that could influence these findings, such as where the energy is sourced for production and use of sustainable materials. Although these figures cannot be taken as absolutes, they do provoke holistic thinking to carbon emissions and suggest that while the humble magazine or newspaper may have zero 'operational' emissions, its carbon footprint can be higher than an electronic device.

Turning this thinking to the construction industry and the built environment, we see the clear importance this sector has in reducing global emissions. According to the World Green Building Council and the UN Environment Global Status Report, of all emissions produced from all human activity worldwide (including printing newspapers and manufacturing iPads), buildings are currently responsible for 39 per cent: 28 per cent from operational emissions from energy required to heat, cool and power them, and 11 per cent from materials, construction and maintenance activity. These figures aren't likely to decline either. As the world's population continues to grow, the International Energy Agency projects that the total global building stock will double in size by

2050. Numerous plans for action have been announced by governments and organisations worldwide on how they will achieve net-zero carbon emissions over the coming decades, with an obvious focus on reducing operational emissions. However, if these targets are going to be met, the embodied carbon responsible for 11 per cent of global emissions from the construction industry alone must be understood, measured, and minimised where possible.

Embodied carbon in the built environment

In the context of the built environment, embodied carbon accounts for approximately 58 per cent of all emissions of a building, with the remaining 42 per cent associated with operational energy use. The lifecycle carbon impact of a building can be split into four stages: production, construction, operation and end-of-life.



The production stage accounts for approximately 33 per cent of a building's carbon impact and includes the extraction of raw materials, transportation and manufacturing into building materials and products. The construction stage accounts for a further eight per cent of a building's carbon impact and includes all construction activity, including transport of materials and labour to site, installation and commissioning. This means that before a building is ready for occupation it has already incurred approximately 41 per cent of the total carbon impact 'up front'. During occupation, we enter the operation stage where all direct emissions from energy consumption are incurred, accounting for up to 42 per cent of lifecycle carbon impact, with embodied carbon seen in maintenance, repair, refurbishment and asset replacement activity accounting for a further 11 per cent. The remaining six per cent of carbon impact is found in the end-of-life stage where demolition, waste processing and disposal activity is undertaken.

The greatest potential for a reduction in the carbon impact of a project is therefore found within the design stage. Research by C40 Cities, Arup and the University of Leeds suggest some key ways in which a reduction in embodied carbon can be achieved, and highlights the importance of switching to lower carbon materials and using materials more efficiently to reduce the upfront carbon incurred. This can only be substantially achieved with an understanding of a material's embodied carbon, quantified by an embodied carbon assessment. More general practices during the design stage can be implemented, such as decreasing reliance on duplication in specifications and ensuring buildings are not over-specified either for intended loads or functionality.

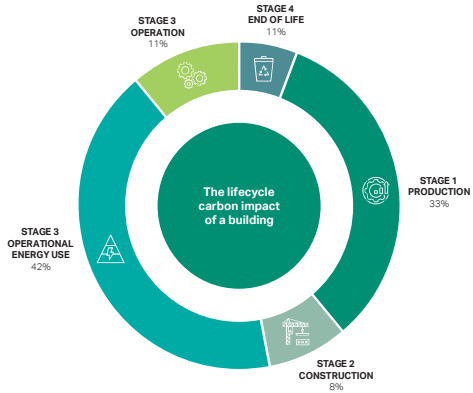
An additional stage beyond the lifecycle of a building that includes recycling and reuse of materials can also be considered, but is not usually included in an embodied carbon assessment. However, as attempts to standardize measurement of embodied carbon continue, this is becoming a point of contention with some suppliers of materials and products that have high reuse or recycling potential that would offset otherwise high carbon impacts from production.

> "This means that before a building is ready for occupation it has already incurred approximately 41 per cent of the total carbon impact 'up front'."

The challenges of measuring embodied carbon

Key to understanding the embodied carbon within a project is attributing the CO2e to a product or material specified for it. This is usually expressed as a rate per unit of said product or material. There is currently a reliance on stated embodied carbon quantification from environmental information on the lifecycle of a product, for which a standardized Environmental Product Declaration (EPD) process has been outlined by the International Organisation for Standardization (ISO) in ISO 14025. However, there are several challenges with using EPDs, not least because they are constantly being updated as manufacturing processes and material selections change, resulting in complex and inconsistent databases. Further complications are found in the methodology for creating an EPD, which relies on the definition of the product using appropriate Product Category Rules (PCRs) that use Life Cycle Assessment (LCA) studies. LCA studies vary in terms of assumptions and considerations depending on the availability of data, and can therefore lead to inconsistencies in comparing products that fulfil the same function. Factors such as location, production methods, supply chain conditions and lack of third-party review create additional inconsistencies in EPDs that see various databases being used and no clear benchmark data available.

Progress is being made by private companies and non-government organisations to collate as much data as possible to ensure EPD databases evolve and become more robust. This is while attempting to standardize the way in which embodied carbon assessments are undertaken. The Royal Institution of Chartered Surveyors (RICS) has taken the lead in developing procedures for their members, recognizing their role in the industry and the impact surveyors can have in facilitating carbon reduction strategies. Publishing a mandatory practice statement for members, the Whole Life Carbon Assessment for the Built Environment, in 2017, they provided a methodology for calculating embodied carbon throughout the built asset's lifecycle and prescribed acceptable sources of carbon data. This followed their information paper published as early as 2012 in support of the whole life analysis of the construction lifecycle (Methodology to Calculate Embodied Carbon of Materials Information Paper IP 32/2012, first edition). Unfortunately, the carbon data is still reliant on the EPD system, and while a database of EPDs in the UK has been developed to produce the RICS Building Carbon Database in 2019, this is still evolving.



The development of embodied carbon measurement tools

Developing embodied carbon measurement tools, just like the databases on which they rely, is an ongoing process. There are already several tools available to measure embodied carbon, such as Carbon Designer, EcoCalculator and EC3. However, Carbon Designer and EcoCalculator are limited to early phase modelling, whilst EC3 places strong reliance on EPDs. Indeed, EC3 has been developed specifically to address the significant variances in EPD data by providing results as ranges, rather than absolute numbers, whilst at the same time acknowledging its limitations through lack of available data.

As part of their Sustainable Legacies initiative, AECOM have utilised the advances in carbon data and database development to produce their own embodied carbon assessment tool. Known as ScopeX™, the tool has been developed with the intention of helping architects and engineers understand the carbon impact of their projects, allowing clients to identify where reductions in embodied emissions can be achieved. While targeted for projects in their design stage, it can also be applied to existing buildings considering refurbishment. In the Middle East, AECOM's Asset Advisory team are developing this tool further to work alongside their cost management teams, incorporating embodied carbon assessment into a wider lifecycle cost analysis using regionally specific data and location factors. It is intended that this tool will be adapted to all geographies in which AECOM operates, helping to deliver real reductions in CO2e around the world, from multiple projects where AECOM are engaged as a consultant, project manager, designer or engineer. Elsewhere in the Middle East, Majid Al Futtaim Properties, a leading developer, owner and operator of built assets, have also developed their own in-house tool for embodied carbon measurement with reference to the methodologies published by the RICS.

Practical applications and demand for embodied carbon measurement

Practically, embodied carbon assessments are meeting an increasing market demand driven by corporate ESG policies, certification requirements (such as LEED), government strategies and, in limited instances, legislation. There have been many publications on the issue, but awareness has only been raised relatively recently. A significant paper entitled "Bringing Embodied Carbon Upfront" was published by the World Green Building Council in 2019, describing itself as a call to action.

Arguably the most accessible publication on embodied carbon to date, this paper has been referenced by multiple sources as governments develop and announce their net zero strategies one after another.

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In the UK, where the RICS has undertaken most of their work to date in developing embodied carbon measurement methodologies, there has been pressure on the government to act to reduce embodied carbon through incentives and legislation. In particular, if they are to achieve a target of net-zero emissions by 2050. For instance, the 'Part Z Group' of architects, developers and contractors, including the Royal Institute of British Architects (RIBA) and the Institution of Structural Engineers (ISE), proposed that a new section (Part Z) is added to UK building regulations to compel projects over 1,000m2 to report embodied carbon emissions.

The ISE have followed this with their own guide for members, "How to Calculate Embodied Carbon", in 2020 that highlights the need to calculate CO2e in all projects and provided a structural carbon rating system (SCORS) to allow structural engineers to classify projects on a scale of A to G. Perhaps, understandably in the context of market and political pressures from their exit of the European Union and the coronavirus pandemic, the UK government has been reluctant to consider implementation of further complications in a major sector within a struggling economy. However, as a recovery is now underway, they have begun to consider how to address embodied carbon within a wider heat and building strategy, a move supported by the sector by the UK Green Building Council.

There is far more that can be done though. The UK government itself is the subject of an environmental campaign over the construction of a new Justice Quarter in the City of London, which aims to combine police and judicial headquarters on Fleet Street. Campaigners say the plan, that currently involves demolition, could be amended to refurbish the existing buildings instead, saving approximately 19,000 tonnes of CO2e in the process. This highlights how refurbishment, rather than building new, can help to reduce carbon emissions. It also demonstrates how an understanding of embodied carbon could be used to reduce the carbon impact of a project, and how much influence governments could have to achieve the reduction.

In the UAE, the Emirates Green Building Council (EGBC) is taking the lead in establishing working groups and raising awareness of embodied carbon in the construction industry, but acknowledges there is a way to go. The EGBC Embodied Carbon Working Group has been formed to provide useful guidance to the industry with the aim that some legislation may follow to compel the sector to meet targets. While no specific legislation exists, the UAE National Climate Change Plan (2017-2050) and a recent declaration of UAE becoming a net-zero carbon country by 2050 – the first Middle East country to make such an announcement – provides a framework to which the issue of embodied carbon cannot be ignored if these targets are to be achieved. The plan itself, which does not explicitly mention embodied carbon, positions the Ministry of Climate Change and Environment as leader in raising awareness in partnership with stakeholders to take action.

> In the UAE, the Emirates Green Building Council (EGBC) is taking the lead in establishing working groups and raising awareness of embodied carbon in the construction industry, but acknowledges there is a way to go."

Perhaps the most exciting opportunity to incentivize embodied carbon reduction is found within project financing, where performance against sustainability goals influence the interest rates available and access to loans. Widely referred to as 'Sustainability Linked Loans' and guided by principles such as those published by the Loan Market Association (Sustainability Linked Loan Principles, May 2021), these financial products reward borrowers for achieving pre-determined sustainability targets, which rely on the ability to measure, quantify and convey performance against them. This way of financing also meets the ESG demands of the lenders, who are under increasing scrutiny for lending to fossil fuel industries in particular. High profile examples of sustainability linked financing include the first such agreement between ING and Philips in Europe in 2017 and between Bank of America and General Mills in the United States in April 2021. While Europe is still at the forefront of this way of financing, the United States have seen a huge increase in demand in the last two years and lenders such as HSBC made Sustainability Linked Loans available for all their commercial clients in summer 2021.

In the Middle East, Aldar Properties announced in July 2021 that they have secured an AED 300 million Sustainability Linked Loan with HSBC linked to KPIs, becoming the first MENA company to do so.

Summary

Absolute values of embodied carbon measured are dependent on many factors that produce a level of uncertainty on a definitive value of CO2e, in keeping with internationally accepted methodologies for conducting lifecycle analysis. The key to their effectiveness is consistency in approach. So long as the methodology and reference points for embodied carbon measurement stay consistent, embodied carbon assessments can be an effective tool for the measurement and reduction of carbon within the built environment as comparisons between materials are being made on a level playing field. The need to maintain EPD databases and their growing datasets from increased numbers of EPDs undertaken over time will provide more robust data points and more accurate assessments. Tools developed and used to provide embodied carbon assessments need to understand the multiple variables – such as geographic location of a project – to provide meaningful, relevant results.

An understanding of the challenges helps to produce effective tools for measuring CO2e in projects and there are currently only a handful of companies and organisations that have the ability to do this. The effort and resources required to develop such capability mean that such abilities may be restricted to larger organizations in the short to medium term. Motivation to invest in the development of this capability may come from internal ESG policies, or external demand factors driven by legislation and market need to quantify CO2e within projects.

> Conversations around reducing our carbon impact are usually focused on emissions resulting from direct user activity. We all need to drive less, fly less, use less electricity, produce electricity from sustainable sources, recycle and reuse where possible. However, the traditional focus on operational carbon reduction and a misunderstanding of the true impact of embodied carbon remains and needs to be addressed. Direct emissions from any built asset can be roughly equivalent to the embodied carbon incurred 'up front' during manufacturing and the construction phase alone and continue to be incurred throughout the asset's lifecycle from maintenance, repair, replacement and demolition.

The need for the construction industry to understand, measure and reduce embodied carbon within projects to meet the demands of an informed client is therefore critical to the effort to reduce global carbon emissions if current targets are to be met. Raising awareness of the issue is just the first step.

Section 4

South African cost data

Section 04

South African cost data

Building cost rate influences - inherent difficulties and pitfalls

This section highlights the inherent difficulties and pitfalls that may occur when inclusive or single rates are used to establish the estimated cost of a particular building. Construction cost estimation is complex. Comprehensive exercises based on detailed and accurate information are required to achieve reliable levels of comfort. For various reasons, however, decisions are often based on inclusive rate estimates, i.e. rate per square metre (m²) of construction area or rate per unit in number.

The most widely used and quick method to obtain an indication of the construction cost of a building is by the rate/m²-on-plan method. This is often also referred to as the 'order of magnitude' method of cost estimation. It certainly is both quick and convenient, but it can be very misleading if used indiscriminately and without taking care when calculating the construction area and selecting the rate.

Cost comparisons of various buildings are often made by comparing the individual rates/m² without due consideration of a number of factors that can affect the rate/m² to a substantial degree.

Very often the cost of a building is expressed in rate/m² and the unit cost is ignored, if calculated at all. This rate/m² is then used as the sole yardstick for the building costs.

For example, a security guard's shelter measuring 2m x 2m consisting of brick walls with windows, one door and a simple roof construction may cost R9,000/m². This rate, when compared with the rate for a 200m² house containing plumbing, carpets, etc., at R7,000/m² would seem very expensive. However, the unit cost of the shelter is R36,000, compared with R1.4 million for the house.

Below are some criteria to be considered when determining rates/m².

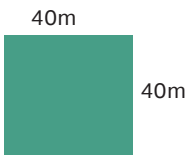
Specification

Two buildings of the same shape with identical accommodation can have vastly different rates/m², as one building may have finishes of a different standard. For example, expensive carpets in lieu of vinyl floor tiles can increase the rate by R150/m².

Wall-to-floor ratio — plan shape

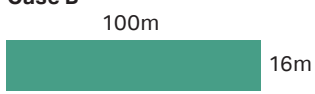
The most economical shape for a building is square. This shape requires the minimum wall length to enclose a given floor area. For example:

Case A



Area	1,600m²
Wall length	160m
Wall height	3m
Wall area	480m²
Wall-floor-ratio	480/1,600
Cost of external façade in terms of rate/m² of floor area to each rate/m² of façade area	30.0%

Case B



Area	1,600m²
Wall length	232m
Wall height	3m
Wall area	696m²
Wall-floor-ratio	696/1,600
Cost of external façade in terms of rate/m² of floor area to each rate/m² of façade area	43.5%

The rate/m² on-plan of a façade costing R800/m² on elevation in each case is:

Case A R800 x 30.0% = R240/m²

Case B R800 x 43.5% = R348/m²

A reader with a good knowledge of mathematics will fault the above argument correctly by stating that a circle is the geometric shape requiring the minimum wall length to enclose a given floor area. However, in very few cases, this is the most economical plan shape of a building as, due to various reasons, the cost of constructing a circular, as opposed to a straight external envelope, is generally greater than the saving in terms of the quantities required by the envelope.

Floor-to-ceiling heights

Two buildings of an identical plan, shape and area, but with different floor-to-ceiling heights will have different rates/m² due to the additional cost of walling, finishes, etc., in the building with the greater floor-to-ceiling height.

Plumbing, mechanical and electrical installations

The concentration of plumbing installations has a marked effect on the rate/m² of the building. The cost of a toilet block per square metre is much greater than that of a house containing one bathroom as the high cost of the bathroom area is spread over the less expensive remaining areas of the house.

Similarly, in commercial and industrial buildings the rate/m² will depend greatly on which air-conditioning, security systems, sprinklers, smoke-detection systems, electrical installations, acoustic treatment or other specialised installations are incorporated into the design.

Construction areas

The rate/m² for a building with large balconies or access corridors included in the construction area cannot be compared with the rate/m² for a building without similar low cost areas.

Internal subdivisions

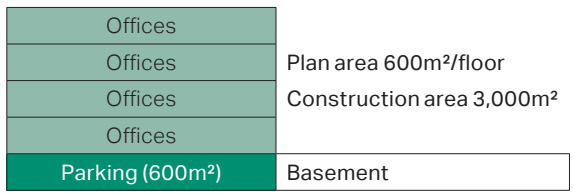
The rate/m² for open plan offices should not be compared directly with the rate/m² for offices with internal partitions without the relevant adjustments being made. The inclusion of partitions can increase the overall rate/m² by up to R300/m² of office area.

Parking

Should the building contain parking areas, the average rate/m² will be less than that of a building with identical accommodation, but with parking outside the building structure. For example:

Case A

Building with parking in the building area.

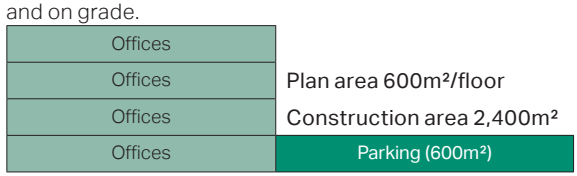


Cost of building

Offices	2,400m² @ R15,000	= R 36,000,000
Parking	600m² @ R6,000	= R 3,600,000
Total		**R 39,600,000**
Average rate/m²		R 13,200

Case B

A building with parking outside of the building area and on grade.



Cost of building

Offices	2,400m² @ R15,000	= R 36,000,000
Parking	600m² @ R 800	= R 480,000
Total		**R 36,480,000**
Average rate/m²		R 15,200

Sol Plaatje University,
Kimberley, South Africa

Under Case B, the parking area is not included as part of the construction area for the purpose of calculating the rate/m². Similarly, the rate/m² for a supermarket or shopping centre should be qualified as to whether the cost of on-site parking and ancillary site development has been included, a cost which could be in the region of R800/m² of construction area.

There are further points that need to be taken into consideration. Amongst these are site works particular to each contract, the number of storeys, floor loadings, column spans, concentration of joinery and other fittings, overall height of the building, open-atrium upper volumes, etc.

In conclusion, rates/m² must be used with circumspection. The degree of accuracy of the answers provided must be in direct proportion to the research and surveys undertaken to establish the rate for the building in question.

Approximate inclusive building cost rates

Building cost rates

This section provides a list of approximate inclusive building cost rates for various building types in South Africa. Rates are current to 1 July 2022, and therefore represent the average expected building cost rates for 2023. It must be emphasised that these rates are indicative only, and should be used circumspectly, as they are dependent upon a number of assumptions. See inclusive rate estimates herein.

The area of the building expressed in square metres is equivalent to the construction area where appropriate, as defined in Method for Measuring Floor Areas in Buildings, Second Edition (effective from 7 November 2007), published by the South African Property Owners' Association (SAPOA).

> "It must be emphasised that these rates are indicative only, and should be used circumspectly, as they are dependent upon a number of assumptions."

Regional variations

Construction costs normally vary between the different provinces of South Africa. Costs in parts of the Western Cape and KwaZulu-Natal, specifically upper class residential areas, for example, are generally significantly higher than Gauteng due to the demand for this type of accommodation. However, these rates are based on data received from Gauteng, where possible. Be mindful that cost differences between provinces at a given point in time are not constant and may vary over time due to differences in supply and demand or other factors. Specific costs for any region can be provided upon request by any AECOM office in that region.

Building rates

Rates include the cost of appropriate building services, for example, air-conditioning, but exclude costs of site infrastructure development, parking, any future escalation, loss of interest, professional fees and value-added tax (VAT).

Offices	*Rate per m² (excl. VAT)*
Low-rise office park development with standard specification	R 9,300 – R 11,500
Low-rise prestigious office park development	R 12,000 – R 17,800
High-rise tower block with standard specification	R 13,500 – R 17,800
High-rise prestigious tower block	R 17,800 – R 22,500

Office rates exclude parking and include appropriate tenant allowances incorporating carpets, wallpaper, louvre drapes, partitions, lighting, air-conditioning and electrical reticulation.

Parking	*Rate per m² (excl. VAT)*
Parking on grade, including integral landscaping	R 650 – R 850
Structured parking	R 4,600 – R 5,000
Parking in semi-basement	R 5,000 – R 6,800
Parking in basement	R 5,300 – R 9,300

Retail	*Rate per m² (excl. VAT)*
Local convenience centres (Not exceeding 5,000m²)	R 9,100 – R 12,000
Neighbourhood centres (5,000 – 12,000m²)	R 10,000 – R 12,800
Community centres (12,000 – 25,000m²)	R 10,900 – R 14,000
Minor regional centres (25,000 – 50,000m²)	R 12,000 – R 14,900
Regional centres (50,000 – 100,000m²)	R 12,800 – R 15,500
Super regional centres (exceeding 100,000m²)	R 13,500 – R 17,400

Super regional centres and regional centres are generally inward trading with internal malls, whereas convenience, neighbourhood and community centres are generally outward trading with no internal malls.

Retail rates include the cost of tenant requirements and specifications of national chain stores.

Retail costs vary considerably depending on the tenant mix and sizing of the various stores.

Industrial	*Rate per m² (excl. VAT)*
Industrial warehouse, including office and change facilities within structure area (architect/engineer designed):	
Steel frame, steel cladding and roof sheeting (light-duty)	R 4,600 – R 6,800
Steel frame, brickwork to ceiling, steel cladding above and roof sheeting (heavy-duty)	R 5,300 – R 7,600
Administration offices, ablution and change room block	R 8,600 – R 11,000
Cold storage facilities	R 16,100 – R 23,000

Residential	*Rate per site (excl. VAT)*
Site services to low-cost housing stand (250–350m²)	R 58,000 – R 93,000

	Rate per m² (excl. VAT)
RDP housing	R 2,800 – R 3,000
Low-cost housing	R 3,500 – R 6,000
Simple low-rise apartment block	R 8,500 – R 11,800
Duplex townhouse – economic	R 8,500 – R 12,100
Prestige apartment block	R 16,600 – R 24,300

Cape Town Station, South Africa

AECOM

Residential		*Rate per m² (excl. VAT)*
Private dwelling houses:		
Economic		R 6,500
Standard		R 8,100
Middle-class		R 9,800
Luxury		R 13,600
Exclusive		R 21,500
Exceptional ('super luxury')		R 30,000 – R 65,000
Out buildings	– standard	R 6,000
	– luxury	R 8,600

		Rate per no. (excl. VAT)
Carport (shaded)	– single	R 5,200
	– double	R 10,500
Carport (covered)	– single	R 8,200
	– double	R 16,000
Swimming pool		
Not exceeding 50 kl		R 103,000
Exceeding 50 kl and not exceeding 100 kl		R 182,000
Tennis court		
Standard		R 607,000
Floodlit		R 750,000

Hotels	*Rate per key (excl. VAT)*
Budget	R 730,000 – R 1,200,000
Mid-scale (3-star)	R 1,200,000 – R 1,750,000
Upper-scale (4-star)	R 1,750,000 – R 2,500,000
Luxury (5-star)	R 2,500,000 – R 3,500,000

Hotel rates include allowances for furniture, fittings and equipment (FF&E).

Studios	*Rate per m² (excl. VAT)*
Studios — dancing, art exhibitions, etc.	R 16,000 – R 23,000

Conference centres	*Rate per m² (excl. VAT)*
Conference centre to international standards	R 30,000 – R 38,000

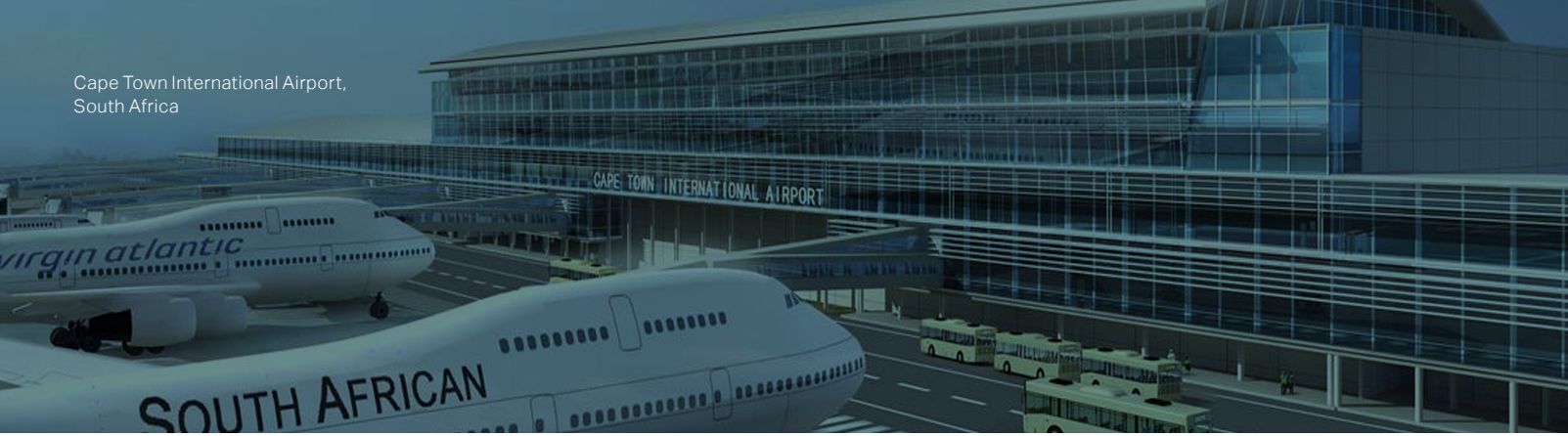
Retirement centres	*Rate per m² (excl. VAT)*
Dwelling houses	
Middle-class	R 9,500
Luxury	R 13,500
Apartment block	
Middle-class	R 9,900
Luxury	R 15,300
Community centre	
Middle-class	R 13,000
Luxury	R 18,900
Frail care	R 15,300

Schools	*Rate per m² (excl. VAT)*
Primary school	R 7,600 – R 8,800
Secondary school	R 9,100 – R 9,800

Hospitals	*Rate per m² (excl. VAT)*
District hospital	R 31,300

Hospital rates exclude allowances for furniture, fittings and equipment (FF&E).

Stadiums	*Rate per seat (excl. VAT)*
Stadium to PSL standards	R 39,000 – R 60,000
Stadium to FIFA standards	R 90,000 – R 120,000
	Rate per pitch (excl. VAT)
Stadium pitch to FIFA standards	R 26,000,000 – R 30,000,000



Cape Town International Airport, South Africa

Prisons	*Rate per inmate (excl. VAT)*
1,000 inmate prison	R 680,000 – R 725,000
500 inmate prison	R 725,000 – R 810,000
High/maximum security prison	R 1,080,000 – R 1,400,000

Infrastructure airport development costs

Rates exclude any future escalation, loss of interest, professional fees, VAT and ACSA direct costs.

Apron stands (incl. associated infrastructure)	*Rate per m² (excl. VAT)*
Code F Stand (85m long x 80m wide = 6,800m²)	R 6,400
Code E Stand (80m long x 65m wide = 5,200m²)	R 6,800
Code C Stand (56m long x 40m wide = 2,240m²)	R 8,600

Taxi lanes (incl. associated infrastructure)	*Rate per m (excl. VAT)*
Code F taxi lane (101m wide)	R 215,000
Code E taxi lane (85m wide)	R 180,000
Code C taxi lane (49m wide)	R 107,000

Service roads	*Rate per m (excl. VAT)*
Service road (10m wide)	R 21,500
Dual carriage service road (15m wide)	R 27,000

Taxi ways (incl. associated infrastructure)	*Rate per m (excl. VAT)*
Code F taxi way (70m wide)	R 160,000

Runways (incl. associated infrastructure)	*Rate per m (excl. VAT)*
Code F runway (3,885m long x 60m wide = 233,100m²)	R 360,000

Parking (excluding bulk earthworks)	*Rate per bay (excl. VAT)*
Structured parking	R 220,000
Basement parking	R 330,000

Perimeter fencing/security gates	*Rate per m (excl. VAT)*
Perimeter walls with perimeter intrusion detection (PIDS)	R 10,000

Terminal buildings	*Rate per m² (excl. VAT)*
Terminal buildings (excl. baggage and X-ray systems, air bridges, seating and aircraft docking systems)	R 35,000

	Rate per unit (excl. VAT)
Telescopic air bridges	R 13,250,000
Aircraft docking system	R 1,908,000

Building services

The following rates are for building services (mechanical and electrical), which are applicable to typical building types in the categories indicated. Rates are dependent on various factors related to the design of the building and the requirements of the system.

In particular, the design, and therefore the cost of air-conditioning, can vary significantly depending on the orientation, shading, extent and type of glazing, external wall and roof construction.

Electrical installation	*Rate per m² (excl. VAT)*
Offices	
Standard installation	R 900 – R 1,300
Sophisticated installation	R 1,300 – R 1,650
UPS, substations, standby generators to office buildings	R 600 – R 825
Residential	R 800 – R 1,300
Shopping centres	R 1,300 – R 1,650
Hotels	R 1,400 – R1,900
Hospitals	R 1,850 – R 2,700

Electronic installation	*Rate per m² (excl. VAT)*
Offices	
Standard installation	R 420 – R 600
Sophisticated installation	R 580 – R 880
Residential	R 370 – R 580
Shopping centres	R 850 – R 1,100
Hotels	R 800 – R 1,100
Hospitals	R 850 – R 1,200

Electronic installation includes access control, CCTV, public address, fire detection, data installation, WiFi, CATV, PABX (Private Automatic Branch Exchange) and Building Management System (BMS).

Fire protection installation (offices)	*Rate per m² (excl. VAT)*
Sprinkler system, including hydrants and hose reels (excluding void sprinklers)	R 340 – R 460

Air-conditioning installation	*Rate per m² (excl. VAT)*
Ventilation to parking/service areas	R 340 – R570
Offices	
Console units	R 950 – R 1,400
Console/split units	R 1,100 – R 1,750
Package units	R 1,600 – R 2,400
Central plant	R 2,000 – R 3,100
Residential–split units	R 1,100 – R 1,750
Shopping centres	
Split units	R 1,300 – R 1,850
Package units	R 1,600 – R 2,400
Evaporative cooling	R 1,000 – R 1,500
Hotels — public areas	R 2,000 – R 3,100
Hospitals central plant	R 2,600 – R 4,100

Hotels	*Rate per key (excl. VAT)*
Console units	R 25,000 – R 34,000
Split units	R 34,000 – R 52,000
Central plant	R 68,000 – R 102,000
Hospitals — operating theatres	R 750,000 – R 1,250,000

Section 5

Global sentiment and building costs

Section 05

Global sentiment and building costs

Africa outlook 2022

In recent years, Africa's economies, have generally remained resilient. Sound macroeconomic policies has enabled the continent to maintain its expected growth.

Africa's overall economic performance remains one of the fastest growing continents. Ethiopia, Ghana and Côte d'Ivoire are three of the fastest growing economies globally in terms of increased GDP. Africa's growth is further helped by several East African countries contributing collectively through increased exports and cross-border trade to grow this region's economy.

According to *The Economist* (7th May 2022), fuel shortages are spreading across Africa. Consequently, oil is expensive and 'not just driving up prices'. The economic cost of shortages are huge and, in many instances, tends to bring commerce to a grinding halt.

A demand for fuel surged across the world last year as economies recovered from the coronavirus pandemic, yet for the first time in 30 years, global refining capacity fell causing fuel prices to rise. Russia's invasion of Ukraine pushed costs higher still. In most places, fuel has remained available and expensive, but not in Africa, which is going through the worst supply crisis in 40 years, according to the world's biggest independent oil trader.

Further, the problem is being aggravated by a turn in the futures market. The price for deliveries of oil at a future date has fallen far below that for immediate delivery. In more usual times, traders would park dozens of full oil tankers (known as 'floaters') off the West African coast, where they would wait for higher prices. Now, traders unload them as quickly as possible and send them to Asia through the Suez Canal, avoiding Africa altogether.

After this, things became even worse when big oil traders started reducing purchases of Russian oil to comply with European sanctions. This will further cut the flow of fuel refined in Europe from Russian oil to Africa.

In the long run, much hope is invested in a large refinery being built in Nigeria by the Dangote Group.

The Dangote Petroleum Refinery is a 650,000 barrels per day integrated refinery project under construction in the Lekki Free Zone near Lagos. It is expected to be Africa's biggest oil refinery and the world's biggest single-train facility.

The pipeline infrastructure at the Dangote Petroleum Refinery is the largest anywhere in the world, with 1,100 kilometers to handle three billion standard cubic feet of gas per day. The refinery alone has a 435MW power plant that can meet the total power requirement of Ibadan DisCo.

The refinery will also meet 100% of the Nigerian requirement of all refined products and have a surplus of each of these products for export. Dangote Petroleum Refinery is a multi-billion-dollar project that will create a market for 21 billion dollar per annum of Nigerian crude. It is designed to process Nigerian crude with the ability to also process others.

There is an ever-growing need to finance infrastructure on the continent. Several countries are now prioritising this after realising the importance of industrialisation, to not only maintain growth in their economies, but to also diversify through the exportation of goods and services. This has consequently created jobs that are needed for an increasing younger population. A developing industrial sector on the continent will require more infrastructure investment, particularly in power, water and transportation services that are already over stretched.

Predictions of collective growth are around three per cent for 2022/23, with individual countries increasing by as much as five per cent.

In sub-Saharan Africa, we are seeing steady growth in the infrastructure and construction sectors, as well as in East and West Africa. After following favourable environmental impact studies and subsequent government approvals, in Mozambique we have seen the signing of mega gas deals for Liquefied Natural Gas (LNG) development contracts.

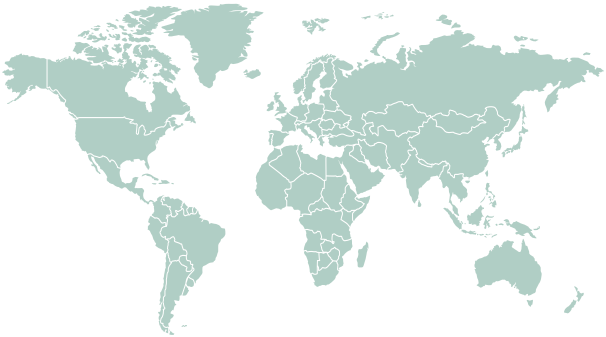
The expected results are estimated to create thousands of job opportunities, impact significantly on Mozambique's GDP, as well as creating collaborative opportunities for neighbouring countries. Although, most of these projects are currently 'on hold' due to unforeseen circumstances, the immense future potential growth of the region cannot be ignored.

Feedback from our colleagues in Eastern Africa indicated that the impact of the coronavirus slowed down all planning, construction and other related activity. Recovery after the easing of lockdown levels is also slow. They are, however, confident that productivity will return to normal soon.

Over recent years, we have seen several national elections across Africa that have been free and fair, and the transition of leadership has been stable, including some of Africa's more high-profile leaders. This has shown the world Africa's willingness to implement good governance and curb corruption at all levels.

Further foreign direct investment across the continent is therefore encouraged. This type of investment has been increasing steadily over several years and is a catalyst for growth in demand for Africa's imports and exports.

Africa continues to grow. There is a steady increase of larger infrastructure and construction projects coming to market for the needs of over 1.2 billion people and this will provide opportunities for investment and service providers for 2022 and beyond.



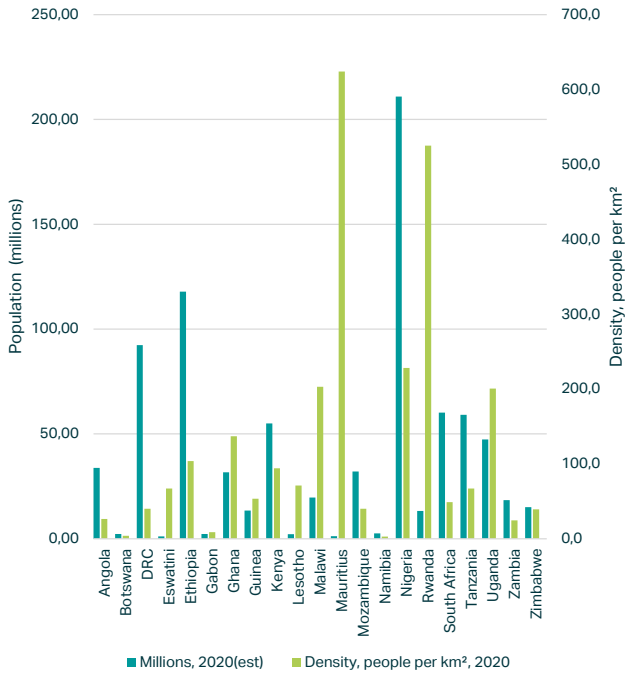
The Marc, Sandton, 129 Rivonia Road, South Africa

Africa in figures
Area and population

Country	Land area (000km²)	Population		
		Millions, 2020 (est)	Average annual % population growth rate, 2000–2020	Density, people per km², 2020
Angola	1,247	33,83	3,2	26,4
Botswana	581	2,30	2,2	4,0
DRC	2,267	92,37	3,2	40,0
Eswatini	17	1,17	1,0	67,0
Ethiopia	1,112	117,88	2,6	103,7
Gabon	267	2,27	2,3	8,8
Ghana	238	31,73	2,1	137,0
Guinea	246	13,43	2,8	53,5
Kenya	582	54,98	2,2	94,0
Lesotho	30	2,17	0,8	71,0
Malawi	118	19,65	2,7	203,0
Mauritius	2	1,27	0,1	624,0
Mozambique	801	32,07	2,9	40,0
Namibia	824	2,59	1,8	3,0
Nigeria	923	210,87	2,5	228,0
Rwanda	26	13,26	2,5	525,0
South Africa	1,219	60,14	1,2	49,0
Tanzania	945	59,15	2,9	67,0
Uganda	241	47,40	3,0	200,5
Zambia	752	18,40	2,9	24,4
Zimbabwe	390	15,09	1,5	39,2

Source: World Development Indicators 2020

Population and density 2020



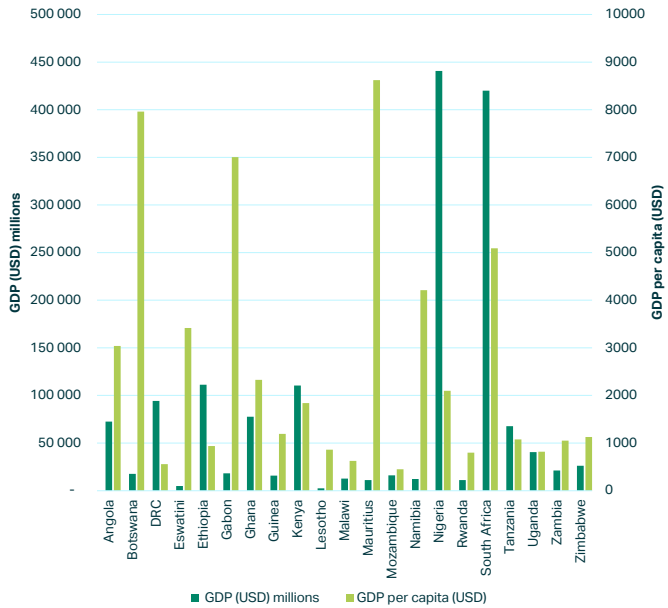
Source: World Development Indicators 2020

Gross Domestic Product (At constant 2,000 prices)

Country	GDP (USD) millions	GDP growth (annual % since 2000)	GDP per capita (USD)	Gross capital formation (% of GDP)	Inflation, consumer price (annual %)
Angola	72,547	0,7	3,038	2,0	17,1
Botswana	17,613	11,4	7,961	3,3	7,2
DRC	94,243	12,3	557	3,1	8,2
Eswatini	4,941	7,4	3,415	1,3	2,6
Ethiopia	111,271	5,6	936	2,8	26,8
Gabon	18,269	1,5	7,006	1,9	1,2
Ghana	77,594	5,4	2,329	1,9	10,0
Guinea	15,850	3,1	1,194	2,5	12,6
Kenya	110,347	7,5	1,838	2,0	6,1
Lesotho	2,518	1,0	861	3,0	6,0
Malawi	12,626	2,8	625	0,0	8,6
Mauritius	11,156	4,0	8,623	1,9	4,0
Mozambique	16,095	2,2	449	5,8	3,1
Namibia	12,236	2,4	4,211	1,6	3,6
Nigeria	440,776	2,2	2,097	3,4	17,0
Rwanda	11,070	10,9	798	2,6	-0,4
South Africa	419,946	4,9	5,091	1,3	4,6
Tanzania	67,775	4,3	1,076	3,4	3,3
Uganda	40,434	3,4	817	2,4	3,8
Zambia	21,203	3,9	1,051	3,2	22,0
Zimbabwe	26,217	1,4	1,128	0,7	98,5

Source: World Development Indicators 2020

Gross Domestic Product 2020



Source: World Development Indicators 2020

Africa building costs

This section makes provision for the comparison of Africa's building costs, international building costs and international rental rates.

The Africa Building Cost Comparison table (page 81), summarises the estimated building costs for different types of buildings in various locations in Africa. Rates are based on costs from 1 July 2022 and provide an indicator for the expected building cost rates during 2022. Exchange rates are based on those from 1 May 2022.

Rates include the cost of appropriate building services, such as air-conditioning and electrical, but exclude costs of site infrastructure development, parking, any future escalation, loss of interest, professional fees and VAT. These rates are of an indicative nature and therefore the qualifications dealt with elsewhere in this publication would apply.

These are estimated costs and should only be considered in the context of acceptable building standards in each relevant country. These standards, both at a technical level and pertaining to quality, do vary from country to country. Therefore, the building costs must be seen as the normal standards prevailing in each particular region and must be used circumspectly.

Shell Head Office, Nigeria

Africa Property & Construction Cost Guide
Africa Building Cost Comparison

Costs based on 1 July 2022
Exchange Rates to US$ as at 1 May 2022

Building Type		Botswana Gaborone	Ghana Accra	Kenya Nairobi	Lesotho Maseru	Mozambique Maputo	Namibia Windhoek	Nigeria Lagos	Rwanda Kigali	South Africa Johannesburg	Tanzania Dar Es Salaam	Uganda Kampala	Zambia Lusaka
Residential	(US$ / m²)												
Average Multi Unit High Rise		1,042	2,020	815	1,206	1,271	1,206	2,737	1,307	1,049	917	961	1,718
Luxury Unit High Rise		1,481	2,383	1,209	1,487	1,625	1,487	3,798	1,744	1,293	1,222	1,539	2,371
Individual Prestige Houses		2,227	2,280	1,484	1,563	1,750	1,563	3,336	1,876	1,359	1,316	1,817	2,320
Commercial/Retail	(US$ / m²)												
Standard Offices High Rise		1,104	1,850	1,099	1,137	1,223	1,137	2,737	1,606	989	1,122	1,363	1,769
Prestige Offices High Rise		1,856	2,720	1,907	1,465	1,462	1,465	3,798	2,030	1,274	1,421	2,306	2,381
Major Shopping Centre		1,545	1,522	924	1,124	1,462	1,124	3,792	1,489	977	1,047	1,139	2,240
Industrial	(US$ / m²)												
Light Duty Factory		979	1,088	797	414	839	414	1,516	1,203	360	841	949	892
Heavy Duty Factory		1,506	1,348	1,264	469	1,271	469	2,043	2,142	408	1,503	1,528	989
Hotel	(US$ / key)												
Mid-scale (3 Star)		157,221	352,281	400,023	107,221	146,171	107,221	374,885	222,024	93,236	159,219	507,167	458,200
Luxury (5 Star)		507,558	495,006	692,348	218,078	263,588	218,078	684,573	531,203	189,633	375,664	884,593	591,528
Resort Style		566,857	629,028	824,224	Not available	522,862	Not available	831,269	710,392	Not available	496,382	1,072,717	622,137
Other	(US$ / m²)												
Multi Storey Car Park		821	881	528	348	815	348	1,956	917	303	671	660	790
District Hospital		Not available	1,762	1,110	2,276	2,900	2,276	2,734	Not available	1,979	Not available	1,516	1,639
Primary & Secondary Schools		1,420	1,140	972	632	1,136	632	Not available	Not available	550	Not available	1,203	1,148
(As at 1 May 2022)		BWP	GHS	KES	LSL	MZN	NAD	NGN	RWF	ZAR	TZS	UGX	ZMW
US$1 =		**12,11**	**7,11**	**116,50**	**15,82**	**63,70**	**15,82**	**415,12**	**1021,00**	**15,82**	**2325,00**	**3554,98**	**17,10**

Prices exclude land, site works, professional fees, tenant fitout and equipment. Rates exclude GST/VAT. Hotel & **Hospital** rates include FF&E.

International building cost comparison

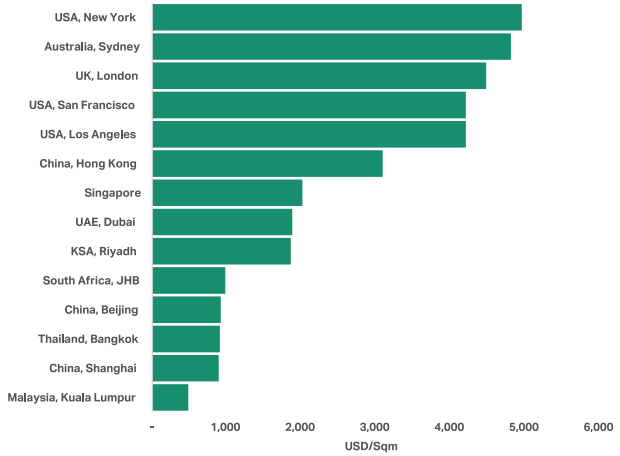
The international cost data shown is a comparison of local construction costs converted to US Dollars to enable differentiation.

The building costs, for their respective asset types, are averages based on local specifications. The actual cost of a building will depend on, among other things, unique site conditions, design attributes and applicable tariffs. In addition, the standard for each building varies from region to region, which may have a significant impact on costs.

Costs are subject to considerable variations due to factors such as:

- Local market conditions
- Complexity of project
- Commodity price movements
- Building specifications
- Exchange rates
- Contractors appetite for securing work
- Contractual risk apportionment

Average building cost for a standard residential high-rise



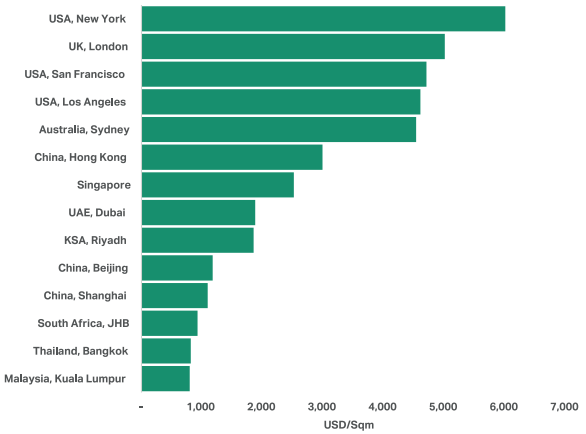
– Average building costs (USD/sqm)

Building type	Sydney Australia	Hong Kong China	Beijing China	Shanghai China	Kuala Lumpur Malaysia	Singapore Singapore	Johannesburg South Africa	Bangkok Thailand	Dubai UAE	Los Angeles USA	San Francisco USA	New York USA	London UK	Riyadh KSA
Average multi-unit high-rise	**4,805**	**3,086**	**916**	**889**	**482**	**2,011**	**976**	**903**	**1,875**	**4,200**	**4,200**	**4,950**	**4,473**	**1,855**
Luxury unit high-rise	6,589	4,281	1,711	1,644	923	3,469	1,204	1,355	2,250	5,390	5,300	6,300	6,271	2,240
Individual prestige houses	6,864	5,973	971	973	1,100	3,268	1,269	1,445	-	5,100	5,400	5,850	6,222	-
(As of Sept 2021)	**AUD**	**HKD**	**CNY**	**CNY**	**MYR**	**SGD**	**ZAR**	**THB**	**AED**	**USD**	**USD**	**USD**	**GBP**	**SAR**
US $1 =	**1.38**	**7.79**	**6.45**	**6.45**	**4.18**	**1.36**	**15.05**	**33.66**	**3.67**	**1.00**	**1.00**	**1.00**	**0.74**	**3.75**

Source: AECOM

Note: Prices exclude land, site works, professional fees, tenant fitout and equipment. Rates exclude GST/VAT. Costs based on Q3 2021. Exchange rates to USD as of Q3 2021.

Average building cost for standard high-rise offices



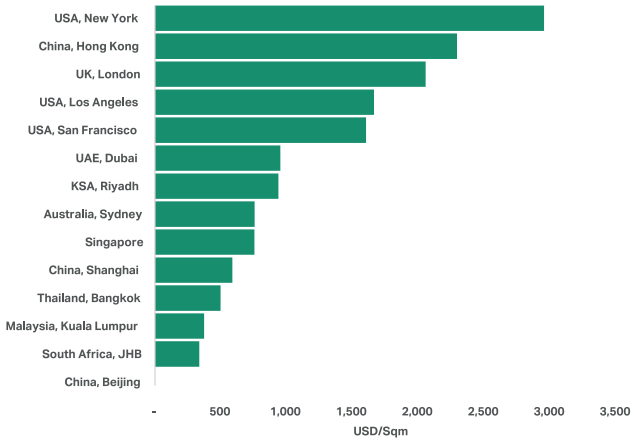
– Average building costs (USD/sqm)

Building type	Sydney Australia	Hong Kong China	Beijing China	Shanghai China	Kuala Lumpur Malaysia	Singapore Singapore	Johannesburg South Africa	Bangkok Thailand	Dubai UAE	Los Angeles USA	San Francisco USA	New York USA	London UK	Riyadh KSA
Average standard offices high-rise	**4,530**	**2,987**	**1,174**	**1,090**	**796**	**2,513**	**924**	**813**	**1,875**	**4,600**	**4,700**	**6,000**	**5,002**	**1,850**
Prestige offices high-rise	6,589	3,683	1,608	1,761	1,191	3,117	1,190	994	2,250	5,060	5,000	6,450	6,183	2,200
Major shopping center (CBD)	4,599	4,281	1,460	-	830	3,418	911	813	1,725	3,800	4,000	4,400	5,453	1,750
(As of Sept 2021)	**AUD**	**HKD**	**CNY**	**CNY**	**MYR**	**SGD**	**ZAR**	**THB**	**AED**	**USD**	**USD**	**USD**	**GBP**	**SAR**
US $1 =	**1.38**	**7.79**	**6.45**	**6.45**	**4.18**	**1.36**	**15.05**	**33.66**	**3.67**	**1.00**	**1.00**	**1.00**	**0.74**	**3.75**

Source: AECOM

Note: Prices exclude land, site works, professional fees, tenant fitout and equipment. Rates exclude GST/VAT. Costs based on Q3 2021. Exchange rates to USD as of Q3 2021.

Average building cost for a light duty factory



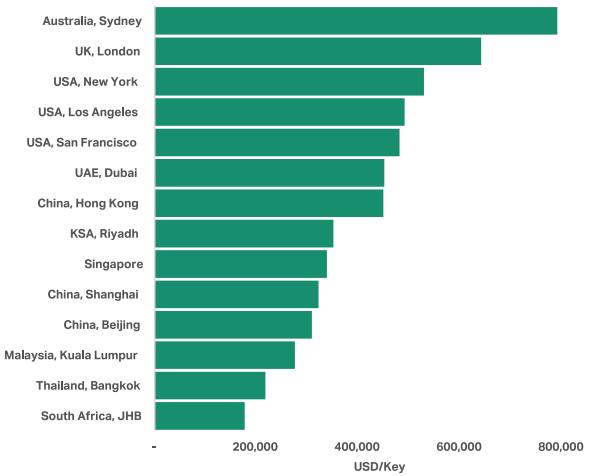
– Average building costs (USD/sqm)

Building type	Sydney Australia	Hong Kong China	Beijing China	Shanghai China	Kuala Lumpur Malaysia	Singapore Singapore	Johannesburg South Africa	Bangkok Thailand	Dubai UAE	Los Angeles USA	San Francisco USA	New York USA	London UK	Riyadh KSA
Light duty factory	**755**	**2,290**	**-**	**587**	**371**	**754**	**335**	**497**	**950**	**1,660**	**1,600**	**2,950**	**2,051**	**935**
Heavy duty factory	-	-	-	-	523	955	381	768	1,475	2,080	2,100	3,870	3,519	1,268
Multi-storey car park	1,098	1,643	-	470	286	-	280	497	700	1,680	1,600	1,550	1,005	-
District hospital	7,276	5,475	-	1,594	852	-	1,855	-	2,975	7,800	7,450	9,100	5,053	2,350
Primary and secondary schools	2,814	2,588	-	1,090	304	-	510	-	1,735	4,800	4,700	4,850	3,237	-
(As of Sept 2021)	**AUD**	**HKD**	**CNY**	**CNY**	**MYR**	**SGD**	**ZAR**	**THB**	**AED**	**USD**	**USD**	**USD**	**GBP**	**SAR**
US $1 =	**1.38**	**7.79**	**6.45**	**6.45**	**4.18**	**1.36**	**15.05**	**33.66**	**3.67**	**1.00**	**1.00**	**1.00**	**0.74**	**3.75**

Source: AECOM

Note: Prices exclude land, site works, professional fees, tenant fitout and equipment. Rates exclude GST/VAT. Costs based on Q3 2021. Exchange rates to USD as of Q3 2021.

Average building cost for a five-star luxury hotel

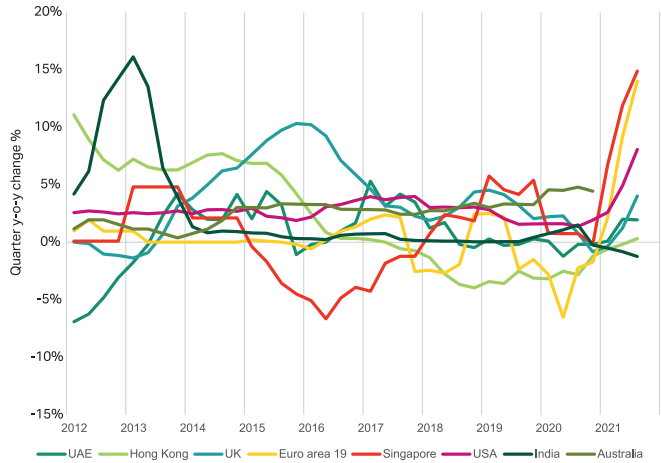


– Average building costs (USD/key)

Building type	Sydney Australia	Hong Kong China	Beijing China	Shanghai China	Kuala Lumpur Malaysia	Singapore Singapore	Johannesburg South Africa	Bangkok Thailand	Dubai UAE	Los Angeles USA	San Francisco USA	New York USA	London UK	Riyadh KSA
Three-star budget	377,510	209,057	-	-	151,245	59,821	86,223	56,451	100,000	84,000	84,000	87,000	105,564	90,000
Five-star luxury	789,340	447,979	307,926	320,746	274,383	337,309	176,024	216,773	450,000	490,000	480,000	528,000	640,125	350,000
Resort style	-	-	508,890	-	214,152	224,705	-	261,934	650,000	305,000	300,000	300,000	393,059	-
(As of Sept 2021)	AUD	HKD	CNY	CNY	MYR	SGD	ZAR	THB	AED	USD	USD	USD	GBP	SAR
US $1 =	1.38	7.79	6.45	6.45	4.18	1.36	15.05	33.66	3.67	1.00	1.00	1.00	0.74	3.75

Note: Prices exclude land, site works, professional fees, tenant fitout and equipment. Rates exclude GST/VAT. Hotel rates include FF&E. Costs based on Q3 2020. Exchange rates to USD as of Q3 2020.

International construction cost inflation



Source: Based on AECOM Indices for UK, UAE; ENR USA Construction Cost Index; Singapore Building Construction Authority, Hong Kong Architectural Services Dept (Public Sector), Euroarea Eurostat Construction Output Index, India CIDC Construction Cost Index, AIQS Building Cost Index.

International exchange rate trends

In recent years, exchange rate movements have been significant as diverging economic performance has led to many major currencies experiencing significant shifts against the US Dollar.

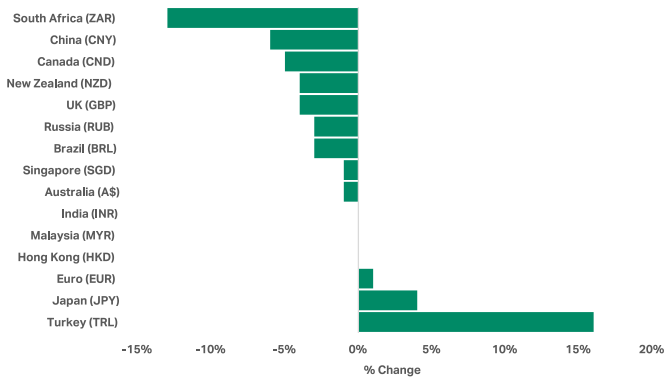
The Forex rate illustrates a country's economic stability with leading factors that can influence fluctuations and those that are constantly analysed, including:

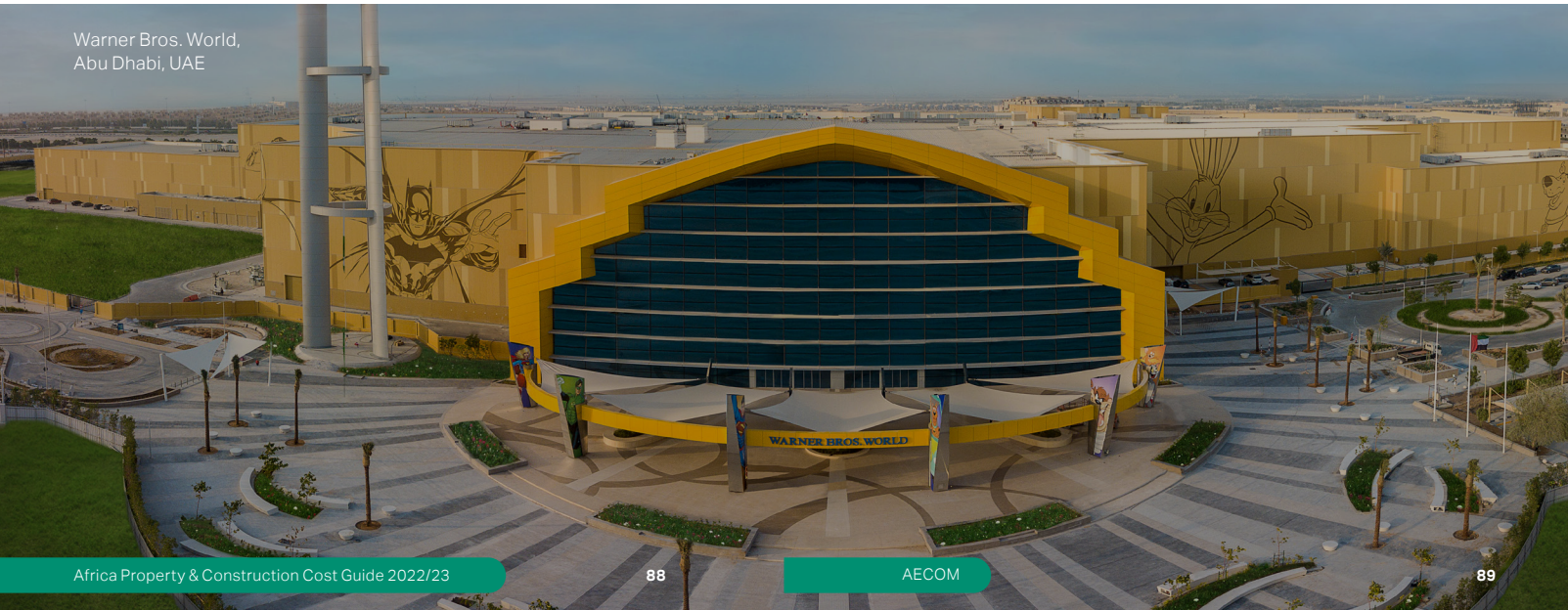
- Interest rates
- A country's current account balance
- Government debt
- Political stability (Brexit, trade uncertainty and shifts, elections)
- Recessions
- Commodity markets
- International trade

Currency depreciation against the US Dollar translates into a relative drop in building costs when expressed in US Dollars, making these locations/regions relatively cheaper in US Dollar terms.

Exchange rate trends

Currency movements of the US Dollar against major currencies Q3 2021 compared to Q3 2020:





Warner Bros. World, Abu Dhabi, UAE

Section 6

International prestigious office rental comparison

Section 06

International prestigious office rental comparison

Region	Country	City	USD/m² per annum
Africa			
	Algeria	Algiers	336
	Angola	Luanda	600
	Botswana	Gaborone	144
	Cameroon	Yaoundé	252
	Chad	N'Djamena	324
	Cote D'Ivoire	Abijan	390
	Democratic Republic of Congo	Kinshasa	420
	Egypt	Cairo	396
	Ethiopia	Addis Ababa	192
	Equatorial Guinea	Malabo	360
	Gabon	Libreville	240
	Ghana	Accra	360
	Kenya	Nairobi	156
	Madagascar	Antananarivo	132
	Malawi	Lilongwe	144
	Mali	Bamako	240
	Mauritania	Nouakchott	192
	Mauritius	Port Louis	234
	Morocco	Casablanca	264
	Mozambique	Maputo	336
	Namibia	Windhoek	162
	Nigeria	Abuja	396
		Lagos	750
	Rwanda	Kigali	192
	Senegal	Dakar	282
	South Africa	Cape Town	192
		Durban	140
		Johannesburg	180
		Port Elizabeth	108
		Pretoria	176
	Tanzania	Dar Es Salaam	180
	Tunisia	Tunis	108
	Uganda	Kampala	173
	Zambia	Lusaka	216
	Zimbabwe	Harare	84

International prestigious office rental comparison

Region	Country	City	USD/m² per annum
Asia			
	China	Beijing (CBD)	971
		Guangzhou (ZJNT	478
		Hong Kong (Central)	1,513
		Shanghai (CBD	771
	India	Bangalore (CBD)	201
		Chennai (CBD)	144
		Mumbai (SBD BKC)	459
		New Delhi (CBD)	267
	Indonesia	Jakarta (CBD)	193
	Japan	Tokyo (5 Kus)	744
		Osaka (2 Kus)	490
	Malaysia	Kuala Lumpur (City Centre)	123
	Philippines	Manila (Makati)	265
	South Korea	Seoul (CBD)	513
	Singapore	Singapore (CBD)	791
	Taiwan	Taipei (Xinyi)	632
	Thailand	Bangkok (CBD)	265
	Vietnam	Ho Chi Minh City (CBD)	572
Australasia			
	Australia	Adelaide (CBD)	125
		Brisbane (CBD)	186
		Melbourne (CBD)	257
		Perth (CBD)	197
		Sydney (CBD)	476
	New Zealand	Auckland (CBD)	304
		Christchurch (CBD)	281
		Wellington (CBD)	268
Europe			
	Austria	Vienna	344
	Belgium	Brussels	353
	Czech Republic	Prague	318
	Denmark	Copenhagen	315
	England	Birmingham	545
		Bristol	545
		Cardiff	354
		Leeds	467
		London (City)	1,026
		London (West End)	1,699
		London (Docklands)	701
		Manchester	545
		Newcastle	379
		Sheffield	379
	France	Paris	1,026
	Germany	Berlin	569

International prestigious office rental comparison

Region	Country	City	USD/m² per annum
		Frankfurt	622
		Hamburg	437
		Munich	569
	Greece	Athens	304
	Hungary	Budapest	344
	Ireland	Dublin	683
	Italy	Rome	518
		Milan	673
	Luxembourg	Luxembourg	728
	Netherlands	Amsterdam	518
	Norway	Oslo	582
	Poland	Warsaw	318
	Portugal	Lisbon	331
	Romania	Bucharest	252
	Scotland	Aberdeen	483
		Edinburgh	538
		Glasgow	495
	Spain	Barcelona	364
		Madrid	477
	Sweden	Stockholm	784
	Switzerland	Geneva	797
		Zurich	816
Middle East			
	Bahrain	Manama	167
	Lebanon	Beirut	354
	Oman	Muscat	187
	Qatar	Doha	533
	Saudi Arabia	Jeddah	227
		Riyadh	320
		Makkah	147
	Turkey	Istanbul	215
	United Arab Emirates	Dubai (Central Dubai)	501
		Dubai (New Dubai)	373
		Dubai (Old Dubai)	370
		Abu Dhabi	449

International prestigious office rental comparison

Region	Country	City	USD/m² per annum
North America			
	Canada	Montreal	478
		Toronto	892
		Vancouver	712
	USA	Atlanta	337
		Austin	551
		Baltimore	278
		Boston	503
		Chicago	383
		Houston	331
		Los Angeles	498
		Miami	519
		New York (Manhattan)	1,003
		Philadelphia	303
		Richmond	225
		Salt Lake City	281
		San Francisco	859
		Seattle	511
		Washington DC	471
South America			
	Argentina	Buenos Aires	343
	Brazil	Sao Paulo	270
		Rio de Janeiro	212
	Bolivia	Santa Cruz de la Sierra	162
	Chile	Santiago	269
	Columbia	Bogota	194
	Costa Rica	San Jose	256
	Mexico	Guadalajara	221
		Mexico City	287
	Paraguay	Asuncion	162
	Peru	Lima	190
	Puerto Rico	San Juan	280
	Uruguay	Mentevideo	349

Rates are applicable as of 1 January 2022 and exclude VAT, but include GST where applicable. Above are gross rentals and include operating cost and municipal cost, but exclude electricity and water consumption.

Section 7

Building cost escalations

Section 07

Building cost escalations

Building cost

The meaning of 'building cost' depends on the application and context. A building contractor, for example, may refer to it as the cost of labour, material, plant, fuel and supervision. In contrast, a developer may refer to either the tender price from the contractor or the ultimate cost of the project, which could include professional fees, plan approval fees, escalation, loss of interest etc.

For the purpose of this document, building cost shall be deemed to mean the tender price (or negotiated price) submitted by the building contractor.

Escalation rate

There seems to be two popular methods for calculating and expressing percentage annual increases, the average rate and the year-on-year rate. The average rate has no real use in calculating escalation and is of general interest only. The year-on-year rate should be used in escalation calculations, taking cognizance of actual project programmes.

The average rate compares the indices for each month (or quarter) of the year with those of the corresponding months (or quarters) of the preceding year. The average of these is then calculated and then quoted as the average annual increase for that year.

The year-on-year rate compares the January (or December) index with the index for the corresponding month of the previous year and reflects the increase over that year.

There may be a significant difference in the two rates in question. For example, in 2018 the year-on-year rate (January 2018 to January 2019) of the building cost inflation in South Africa was only 4.3 per cent, while the average annual rate (comparing monthly indices) was 8.0 per cent.

Calculation of estimated escalation of construction contracts

Pre-contract

Construction cost changes are on an ongoing basis for various reasons. Provision should therefore be made for changes in tender prices during the date of the estimate to the expected tender date. Adding the estimated current building cost to the total equals the anticipated tender amount.

This is calculated by multiplying the estimated current building cost by the average estimated monthly percentage increase and by the number of months from date of estimate to tender date.

Contract price adjustment

Provision is made for escalation in building costs during the contract period. The Contract Price Adjustment Provisions (CPAP) formula provides for 85 per cent of the contract amount to be subject to escalation adjustment with the remaining 15 per cent fixed. Furthermore, a factor must be introduced to take account of the cash flow payments during the construction period and 0.6 is often acceptable if a short method of calculation is employed.

The total escalation during the contract period is therefore calculated by multiplying the anticipated tender amount by 0.85 and 0.6. After this, it is then calculated by the estimated monthly percentage increase as indicated by the relevant indices in the CPAP formula, and by the contract period expressed in months.

Moses Mabhida Stadium
South Africa

Tender price escalation

The annual year-on-year increase in building costs (i.e. tender prices) are based on the indices published by the Bureau for Economic Research (BER), University of Stellenbosch (January to January of each year), and for CPAP formula (Work Group 181 Commercial/Industrial buildings). It is published by Statistics South Africa (P0151), and is as follows:

Cost indices applicable to the building industry

YEAR	BER		CPAP		TMI
	Index (Jan=100)	Year-on-Year Increase	Index (Jan=100)	Year-on-Year Increase	
2016	100.0		100.0		1.00
2017	108.3	+8.3%	108.3	+8.3%	1.00
2018	116.7	+7.8%	114.4	+5.6%	1.02
2019	121.8	+4.3%	118.7	+3.8%	1.03
2020	125.9	+3.4%	123.0	+3.6%	1.02
2021	128.9	+2.4%	130.4	+6.0%	0.99
2022	134.0	+3.9%	145.9	+11.9%	0.92
2023	142.7	+6.5%	152.3	+4.4%	0.94
2024	153.4	+7.5%	158.8	+4.3%	0.97
2025	164.3	+7.1%	166.5	+4.8%	0.99

The average annual increases indicated by the BER publications are the average of the quarterly increases for that particular year and will not correspond to the above year-on-year increase.

The difference between tender price escalation and escalation according to the indices incorporated in the CPAP formula for any one period, may be attributed to the market factor, which incorporates the contractor's mark- up, productivity, availability of materials, etc.

This forecast is based on information provided by the Bureau for Economic Research, Stellenbosch University.

Tender climate

The column marked TMI (Tender Market Indicator) gives an indication of the tender climate. The building cost index, as published by the BER, is based on tender prices and has been deflated by the index for CPAP Work Group 181, which is based on the cost of labour and materials. The result is that the movement of tender prices (excluding the influence of market costs of labour and material), gives an indication of the competitiveness of tendering. It represents a comparison, or rate of change, of BER and CPAP indices.

When the TMI (see graph on page 103) shows a downward gradient, this indicates a favourable tender market, i.e. the next point is numerically less resulting from the calculation of BER divided by CPAP. This indicates that the increase in BER (tender index) is less than the increase in the CPAP index. Therefore, there is a favourable tender market from the viewpoint of the employer.

Alternatively, if the graph has an upward gradient, the increase in BER is greater than the increase in CPAP indices. This indicates an unfavourable tender market from the viewpoint of the employer. Therefore, it would be prudent to recommend negotiation as opposed to tendering.

This tendency is also apparent on the cost indices graph (see page 103). When the two lines (CPAP and BER) converge, i.e. CPAP is decreasing and BER is increasing, you should negotiate. When the two lines diverge, i.e. CPAP is increasing and BER is decreasing, proceed to tender instead.

Base dates: To allow for the comparison of indices, a factor has been introduced resulting in an equal base for both BER and CPAP indices (i.e. January 2016 = 100).

Unique large-scale projects

Building cost estimation seems to become more complex when unique circumstances prevail. For example, when a FIFA World Cup, Olympic Games or similar events take place in a particular country, many new construction works and associated infrastructure projects are awarded.

Projects of such magnitude can only be constructed by major contractors possessing the required expertise and resources. Often the unit costs of these projects are significantly higher than originally anticipated. Contractors at this level have little competition. Based on a favourable supply and demand, they price costs accordingly, resulting in client cost overruns and severe pressure on budgets.

Value-added tax

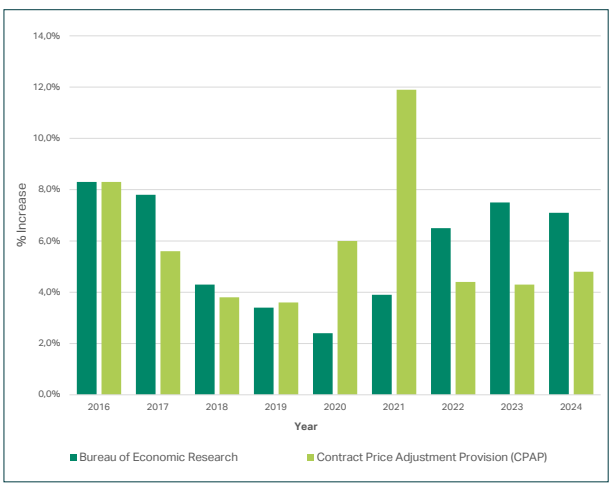
As the majority of developers are registered vendors in the property industry, any VAT on commercial property development is fully recoverable. Therefore, to reflect the net development cost, VAT should be excluded. Should the gross cost (i.e. after VAT inclusion) be required, then VAT at the ruling rate (currently 15 per cent) should be added.

> As the majority of developers are registered vendors in the property industry, any VAT on commercial property development is fully recoverable."

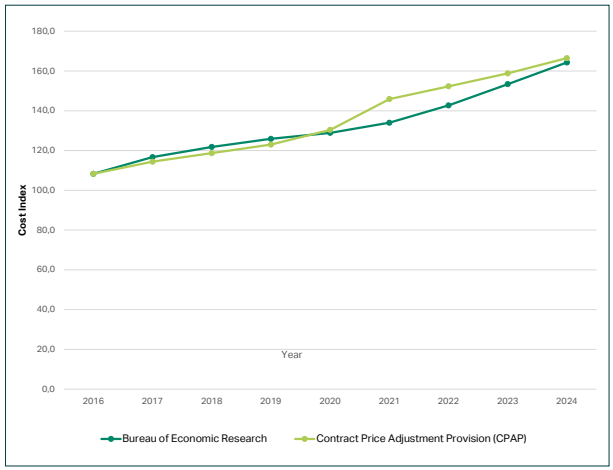
Awareness must be made of the effect that VAT has on cash flow over a period of time. This will vary according to the payment period of the individual vendor. However, in all cases, it will add to the capital cost of the project to the extent of interest on outstanding VAT for the VAT cycle of the vendor.

Graphs: BER and CPAP

January to January building cost percentage change



January building cost indices



Tender market indicator

BER deflated by CPAP

This graph gives an indication of the tender climate. It is the result of the relationship between BER and CPAP. Refer to the section on tender climate, page 101

Section 8

Method for measuring rentable areas

Section 08

Method for measuring rentable areas

SAPOA methods

In the past, many landlords and developers have derived methods for calculating the rentable areas of buildings.

The most common method is recommended by SAPOA, entitled *'Method for Measuring Floor Areas in Buildings', Second Edition* (effective from 7 November 2007). This replaces the previous SAPOA recommendation in *'Method for Measuring Floor Areas in Commercial and Industrial Buildings'* (updated August 1991). However, it must be noted that the latest edition is approved for use from 7 November 2007 and should not be applied retrospectively.

Not detracting from the above publication, and by kind permission of SAPOA, below we have abbreviated and simplified the definitions contained in the document for easier understanding, and made our own comments on the use of rentable areas.

The document provides separate methods for measuring floor areas of:

- Offices of all types.
- Retail developments, including malls, stand-alone, strip and value centres/warehouses.
- Industrial developments, including factories, warehouses, mini-units, trading warehouses, multi-storey, etc.
- Residential buildings, including houses, flats/apartments, townhouses, cluster houses, etc.

> “The most common method is recommended by SAPOA.”

For all office types, the following definitions and explanations are applicable:

The basis

The basis used in calculating the rentable area is the measurement of usable area, together with the common and supplementary area, as determined at each level. Unless otherwise indicated, the unit of measurement is square metres (m²).

Area definitions

Construction area

The construction area is the entire covered built area. This is the sum of the areas measured at each floor level over any external walls to the external finished surface.

Only the lowest levels of the atria are included, and all openings on other levels to form the atria are to be excluded.

Rentable area

The rentable area is the total area of the building enclosed by the dominant face, adjusted by deducting major vertical penetrations. No deduction is made for columns.

The intended use is determined by the revenue-producing area of a building. This comprises the rentable area, supplementary area and parking. It is also used by those analysing the economic potential of a building.

- The rentable area has a minimum floor-to-ceiling height of 1.5 metres.
- The rentable area comprises usable area, plus common area.
- The rentable area excludes the supplementary area.
- This may produce additional revenue.

Usable area

The usable area is the area capable of exclusive occupation by the tenant. This includes the total area of the building enclosed by the dominant face, adjusted by deducting all common area and major vertical penetrations. No deduction is made for columns.

It is intended to be the essential part of the rentable area, and the basis for the apportioning common area.

Common area

The common area is an area that the tenant has access to and/or use of. It is still considered part of the rentable area. The primary common area of the building is apportioned to tenancies pro-rata to the usable area of that tenancy.

The secondary common area is apportioned only to tenancies that it services.

The common area has two components:

- The primary common area comprises all rentable area on a given floor that is not usable area. Together with remote common areas that comprise entrance foyers, plant and service rooms, or any other portion of rentable area not located on the given floor.
- The secondary common area comprises areas beyond the primary common area, giving access to multiple tenancies. Accordingly, this may vary over the life of a multiple tenancy building.

Supplementary area

The supplementary area is any additional revenue-producing component that falls outside of the defined rentable area.

Supplementary areas need not be weatherproof.

For example, it comprises storerooms, balconies, terraces, patios, access/service passages, signage/advertising areas and parking areas demarcated for tenant use. Parking bays shall be given in number.

General definitions

Atrium

An atrium is a weatherproof interior space, accessible and capable of use by the tenant at the lowest level. Voids in floors above the atrium space are not included in the rentable area.

Entrance foyer

An entrance foyer is a portion of remote common area, including associated adjacent rooms and lobby. Lift area, lobby and entrance foyers that occur together with parking floors (not adjacent to office areas) comprise remote common area.

Major vertical penetrations

Major vertical penetrations, stairs and landings, lift shafts, flues, pipe shafts, vertical ducts, and their enclosing walls, exceeding 0.5m² in area, are deducted from the rentable area.

Remote service areas and plant rooms

Remote refuse rooms, electrical sub-stations, transformer rooms, central air-conditioning plant rooms and lift motor rooms are included in the primary common area.

Storage areas

Dedicated storage areas within the usable area are included as usable area.

Dedicated storage areas are listed separately as supplementary areas.

Retail, industrial, residential and other developments

Similar provisions have been made for measuring the floor areas of retail, industrial and residential buildings (referred to on page 106). For detailed information, it is suggested that the relevant sections of the said document be studied carefully.

The above method is designed to accommodate the practical measurement of most building types. However, certain building types such as hotels, leisure and sport centres, petrol stations, hospitals, law courts, and retirement villages may only utilise the underlying principles of this method.

In general

Developers and financiers are constantly attempting to either reduce building costs or increase rental levels to achieve higher returns. When these parameters are exhausted, it becomes incumbent on the architects and designers to design more efficiently. One must therefore understand the complete SAPOA *'Method for Measuring Floor Areas in Buildings', Second Edition,* and implement the various facets of the definitions to achieve higher efficiencies between the various areas.

The initial return is more sensitive to an increase in rental income (which can be affected by increasing the rental area) than the corresponding percentage reduction in construction costs.

Once again, the above has been published as a quick guideline only, and should not be used in preference to the SAPOA publication, which is far more comprehensive and detailed.

We acknowledge and thank SAPOA for permission to use extracts from this publication.

Section 9

Return on investment

Section 09

Return on investment

Criteria to be employed

There are two distinct criteria generally used for evaluating the financial viability of a property investment, namely:

- The initial return, and
- The cash flow analysis.

The initial return

The initial return is based on the net income during the first year of the development's operation. The return is expressed as a percentage per annum of the anticipated capital investment.

Escalation in both construction cost and cost of capital are both considered to incorporate the time value of money.

The major advantage of employing the initial return method is that expenses and income do not have to be escalated too far into the future. Therefore, these are relatively accurate and easily understood in today's monetary terms. The fact that the first year of operation may have a higher vacancy factor than subsequent years should be ignored when the initial return is calculated in order to reflect long-term potential more accurately.

The initial return should be qualified as follows:

- All expenses and income have been escalated to the construction completion date.
- Interim income received prior to the construction completion date has been deducted from the capital investment after adjusting for operating expenses and cost of capital.
- The returns are expressed as percentages of the escalated capital investment and do not take into account loans, loan repayments or interest charges on loans.

The calculated returns are for the first complete year of operation only and do not cater for the following:

- When the project may not reach full maturity during the first year of operation.
- Vacancies.
- Recoupment of capital during the income–bearing period of the investment or realisation value of the investment at the end of the investment period.
- Income tax.

Cash flow analysis over a predetermined period

In the cash flow method, the income and expenditure cash flow over the economic lifespan of the investment is taken into account. Usually an Internal Rate of Return (IRR) and/or a Net Present Value (NPV) is employed to evaluate the financial viability.

The NPV (discounted cash flow) method determines the sum of all cash flows (inflows, outflows and initial investment) and discount to present values at the project's cost of capital. With a positive NPV the project can be accepted and it should be rejected if the NPV is negative.

The IRR is the rate of interest that equates the present value of the expected future net income with the present value of the cost of the investment. The NPV would therefore be exactly zero if the IRR is used as the discount rate. The IRR of an investment is generally used by institutional investors, as it is a comparative indication of the profitability of alternative investment options.

A weakness of the IRR calculation is the fact that an implicit assumption is made that cash flows are reinvested at the project's own IRR. The Modified Internal Rate of Return (MIRR) overcomes this by assuming that cash flows are reinvested at the cost of capital rate (or any other given rate), and may be calculated in addition. As the cost of the capital rate is normally determined at a lower rate than the IRR, it can be assumed that the MIRR calculation will always render a lower result.

The assumptions on which the cash flow return is based upon must be listed. These should include the assumed investment period (e.g. 20 years after the construction completion date), that income has been taken into account at the beginning of each month and expenditure at the end of each month, the terminal value, and escalation in rental and operating expenses over the investment period, etc.

It is suggested that, where applicable, a comprehensive financial viability analysis should incorporate both the initial return and the cash flow method of evaluation. It is significant to note that there is a close relationship between the initial return and the IRR. However, this is to be applied with care by an experienced analyst.

Example:

Total capital expenditure (investment)		R 100,000,000
Rental in first year (net income)		R 10,500,000
Initial return in first year		10.50%
Escalation in net rental income		9.00% per annum
		Net cash flow
Year 0		-100,000,000
Year 1		10,500,000
Year 2		11,445,000
Year 3		12,475,050
Year 4		13,597,805
Year 5		14,821,607
Year 6		16,155,552
Year 7		17,609,551
Year 8		19,194,411
Year 9		20,921,908
Year 10		22,804,879
Year 11		24,857,319
Year 12		27,094,477
Year 13		29,532,980
Year 14		32,190,948
Year 15		35,088,134
Year 16		38,246,066
Year 17		41,688,212
Year 18		45,440,151
Year 19		49,529,764
Year 20 (+ terminal value)	53,987,443 560,441,075	614,428,518

The IRR with a 9.00 per cent annual escalation in rental is 19.50 per cent.

The terminal value is subjective. In this example, it has been assumed as the capitalised value of the anticipated rental in Year 21 (i.e. R53,987,443 + 9.00% = R58,846,313) capitalised at the initial yield, i.e. 10.50 per cent.

Should the terminal value be assumed to be nil (this is unlikely as the land parcel will always have a value), the IRR drops to 16.92 per cent.

As a rule of thumb, the calculation of the approximate IRR of an investment is that it is equal to the sum of the initial return plus the escalation rate (assumed to be constant over the investment period). Providing that the terminal value is calculated, as in the given example, i.e. the capitalised value of the anticipated rental in the year after disposal, assuming a capitalisation rate equal to the initial return.

In the given example, the initial return is 10.50 per cent, the escalation rate is 9.00 per cent, and the approximate IRR is the sum of the two, i.e. 19.50 per cent.

Where Green Star South Africa ratings are a requirement, cash flow analysis over longer periods of time have become essential. Capital expenses are normally higher due to investment in 'green' technology and more expensive methods employed. Therefore, the long-term effect on the operation and maintenance of buildings due to better energy efficiency should be demonstrated to building owners and tenants in order to determine the viability scientifically.

Residual land value

The formula

The calculation of the residual land value for a predetermined rate of return, i.e. what a developer can afford to pay for a parcel of land, would be given a specified return for a particular development.

The formula is determined as follows:

Return	=	Net Annual Income / Total Capital Outlay (TCO)
	=	Net Annual Income / y + x
		(Where 'y' = TCO, excluding land value and its corresponding loss of interest and 'x' = land value and its corresponding loss of interest)
Therefore x	=	Net Annual Income / Return − y
Now x	=	Land Value + Loss of Interest
	=	Future Value of Land

Therefore, to obtain the present land value, i.e. land value excluding its corresponding loss of interest, simply discount 'x' at the interest rate and period used in the previous TCO calculations.

Example:

What price should be paid for land to obtain a return of 10.00 per cent p.a. with a net annual income of R6 million and the following capital outlay?

Estimated escalated building cost	R 38,150,000
Professional fees	5,725,000
Legal and plan approval fees	45,000
Interim rates on ground during construction period	265,000
Loss of interest and/or bond interest at 10.5% p.a. compounded monthly over a 15-month construction period	3,180,000
Total capital outlay excluding land cost (y)	R 47,365,000
x = Net Annual Income / Return − y	
= R6,000,000 / 0.10 − R47,365,000	
= R12,635,000	
Therefore land value is R12,635,000 discounted at 10.5% p.a. over 15 months = R11,087,204 (say)	R 11 million

The above residual value is very sensitive to changes of the required rate of return. This is otherwise known as the capitalisation rate (CAP rate). Consideration should be given carefully, taking into account the risk profile of the proposed development.

Article 3

Celebrating a century of business excellence

Gerhard Brümmer

PhD (Pret), PrQS, PMAQS - Surveyor Cost Management , Africa

(Source: ASAQS 2009 p. ix)

The AECOM quantity surveying service line (PCC), formerly known as Farrow Laing and Partners, and later as Davis Langdon, is the South African arm of the AECOM construction cost management consultancy. For the last 100 years, this practice has played a very significant role within the construction industry in Africa.

Looking at the history of the quantity surveying (cost management) profession in South Africa, amongst the early pioneers was E.B. Farrow. An indication of his recorded activities include that in October 1909 when he prepared a schedule of quantities for the 'New Railway Station in Pretoria'.

Donald James Laing, after setting up his own quantity surveying practice in Johannesburg in the early part of 1922, linked up with E.B. Farrow to establish the firm Farrow and Laing. This is recognised as the founding of today's cost management consultancy.

The practice thrived during the period leading up to the Second World War and after a study of the archives, this indicated that major clients at that time included the Anglo-American Corporation, Barclays Bank, Standard Bank and South African Railways.

The practice continued to prosper and expand during the 1950's and 1960's, and extended its areas of influence throughout Southern Africa. Major commissions undertaken in South Africa included the Johannesburg Station, the Carlton Centre, the Johannesburg Civic Centre, Bank City and the Reserve Bank building in Pretoria.

Over the years other practices were acquired and amongst others, quantity surveying services in the mining and heavy engineering construction sectors were established. This specialised service remains a significant part of the total services provided by the practice today, and in particular, many commissions have been obtained within the gold, diamond, platinum and coal industries throughout Southern Africa.

> “This specialised service remains a significant part of the total services provided by the practice today.”

AECOM Centurion Headquarters, South Africa

The operating style of the firm was changed in the 1990's. From what was a partnership blossomed into a company. The practice consolidated its position as a leader in the field of construction cost consultancy in Southern Africa. Offices have been established in many centres in South Africa.

In 1998, the practice entered into a formalised Verein agreement with Davis Langdon and Seah International, one of the foremost multi-disciplinary cost management and project control organisations in the world.

In 2010, the firm was acquired by AECOM. Since then, the practice has become part of a global construction consultancy, having full access to extensive localised knowledge, wide-ranging experience and a significant data bank of this entity.

The firm has always been closely associated with the development of the quantity surveying profession in South Africa. AECOM has participated in, and chaired, numerous thought leadership committees. Over the years they have provided eight Presidents of what is known today as the Association of South African Quantity Surveyors.

The firm, whose roots go back to the commencement of the profession in South Africa, has maintained and improved its status as a leader in the field of construction consultancy.

The influence of the practice and its areas of operation have moved beyond Southern Africa to many parts of the African continent and beyond.

Cape Town Station, South Africa

Section 10

Africa office locations

Section 10

Africa office locations

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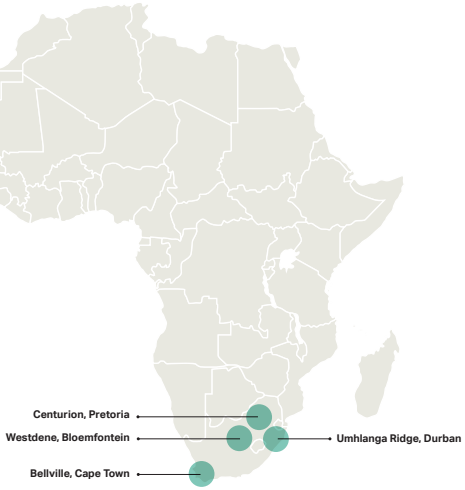

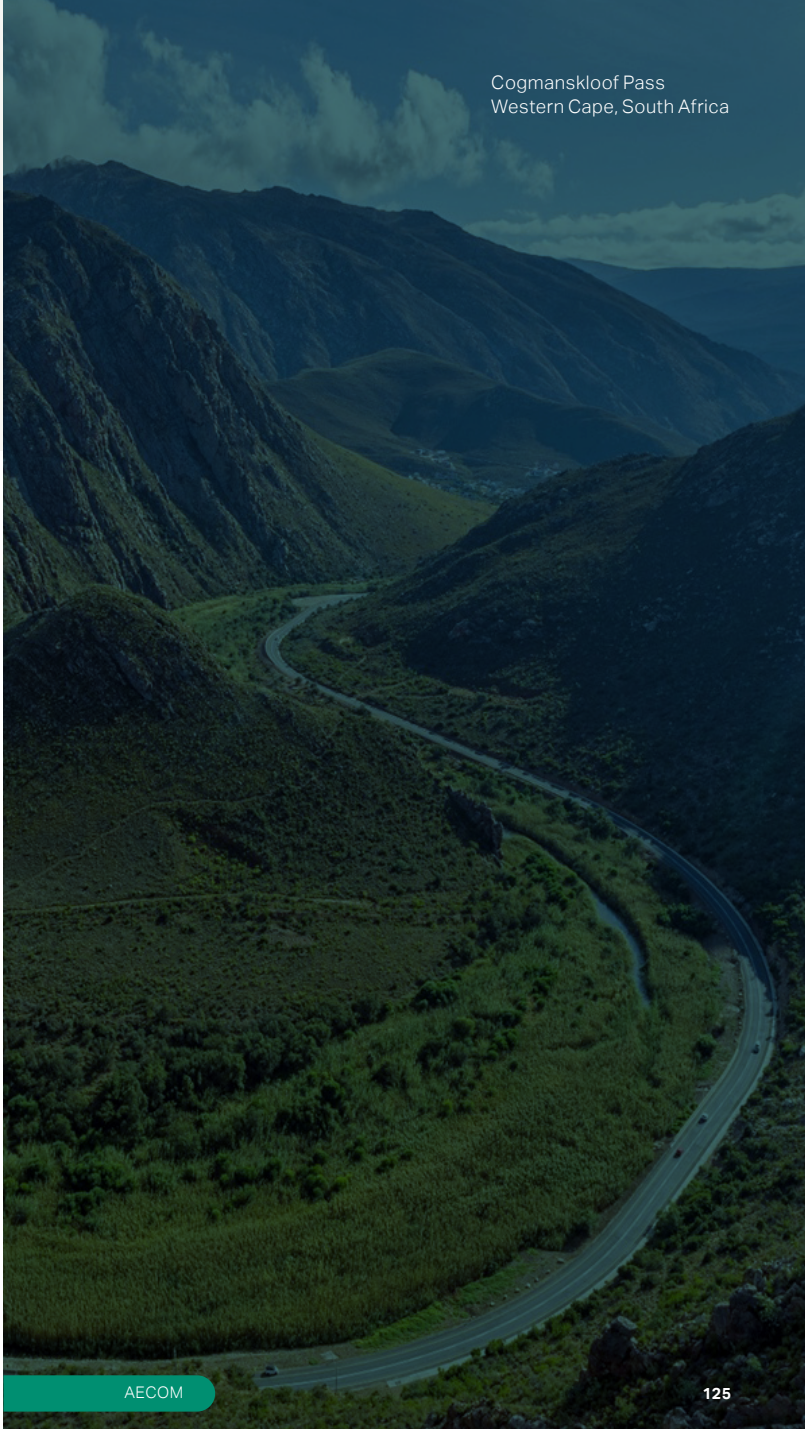

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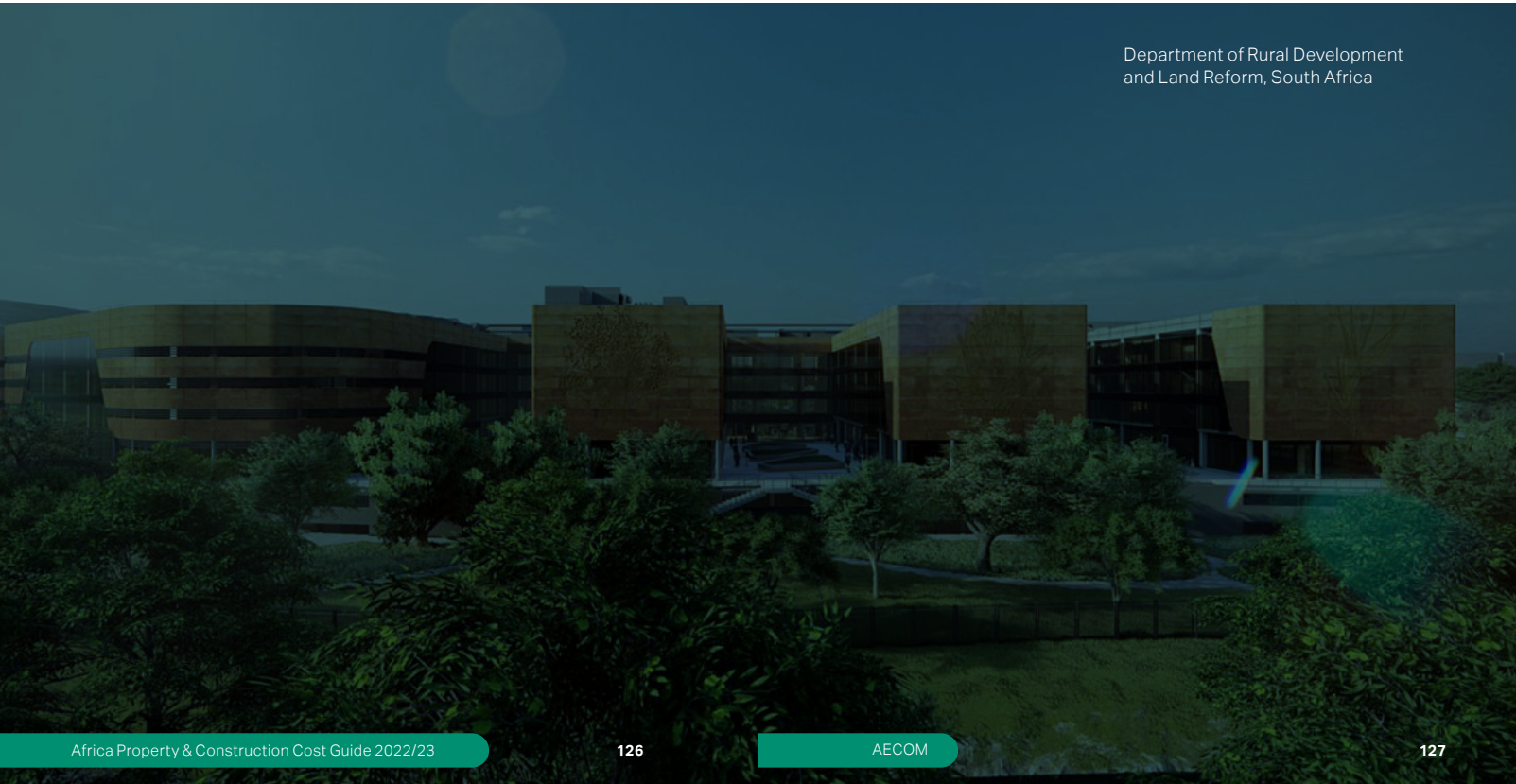

Department of Rural Development and Land Reform, South Africa

About AECOM

AECOM is the world's trusted infrastructure consulting firm, delivering professional services throughout the project lifecycle – from planning, design and engineering to program and construction management. On projects spanning transportation, buildings, water, new energy and the environment, our public- and private-sector clients trust us to solve their most complex challenges. Our teams are driven by a common purpose to deliver a better world through our unrivaled technical expertise and innovation, a culture of equity, diversity and inclusion, and a commitment to environmental, social and governance priorities. AECOM is a Fortune 500 firm and its Professional Services business had revenue of $13.3 billion in fiscal year 2021. See how we are delivering sustainable legacies for generations to come at aecom.com and @AECOM.

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