

2022/23 Property & Construction Africa Cost Guide

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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,



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Exxaro Headquarters, South Africa South African cost data

South African cost data

Building cost rate influences - inherent difficulties and pitfalls

Section

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/ m^2 .

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

100m

16m

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 $\mathsf{R800}/\mathsf{m}^2$ 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.

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.

Offices	
Offices	Plan area 600m²/floor
Offices	Construction area 3,000m ²
Offices	
Parking (600m²)	Basement

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/m ²		R 13,200

Case B

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

Offices	
Offices	Plan area 600m²/floor
Offices	Construction area 2,400m ²
Offices	Parking (600m²)

Cost of building

Offices	2,400m² @ R15,000	= R 36,000,000
Parking	600m² @ R 800	= R 480,000
Total		R 36,480,000
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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).

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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 chang structure area (architect/engineer designed):	e facilities within
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)

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

Site services to low-cost housing stand

(250-350m²)



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

		Rate per no. (excl. VAT)
Carport (shaded)	– single – double	R 5,200 R 10,500
Carport (covered)	– single – double	R 8,200 R 16,000
Swimming pool Not exceeding 50 kl Exceeding 50 kl and not exceeding 100 kl		R 103,000 R 182,000
Tennis court Standard Floodlit		R 607,000 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 Luxury	R 9,500 R 13,500
Apartment block Middle-class Luxury	R 9,900 R 15,300
Community centre Middle-class Luxury	R 13,000 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



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, so and aircraft docking systems)	eating 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 Sophisticated installation UPS, substations, standby generators	R 900 – R 1,300 R 1,300 – R 1,650
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 Sophisticated installation	R 420 – R 600 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
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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
Hotals — nublic grags	P 2 000 - P 3 100
	K 2,000 - K 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

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.



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		СРАР		ТМІ
	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.

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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



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> Department of Rural Development and Land Reform, South Africa

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