

Energy Efficiency Indicators and Target Setting in South Africa

Energy Efficiency Target Setting – Buildings – the incomplete picture

Legislative: SANS 10400 XA – what can be enforced

Table 2 gives the Maximum energy demand per building classification of each climate zone

and

Table 3 gives the Maximum annual consumption per building classification for each climate zone

Table 2 — Maximum energy demand per building classification for each climatic zone

1	2	3	4	5	6	7	8
Classification of occupancy of building	Description of building	Maximum energy demand ^a					
		VA/m ²					
		Climatic zone ^b					
		1	2	3	4	5	6
A1	Entertainment and public assembly	85	80	90	80	80	85
A2	Theatrical and indoor sport	85	80	90	80	80	85
A3	Places of instruction	80	75	85	75	75	80
A4	Worship	80	75	85	75	75	80
F1	Large shop	90	85	95	85	85	90
G1	Offices	80	75	85	75	75	80
H1	Hotel	90	85	95	85	85	90

^a The maximum demand shall be based on the sum of 12 consecutive monthly maximum demand values per area divided by 12/m², which refers to the nett floor area.

^b The climatic zones shall be as given in annex A.



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Table 3 — Maximum annual consumption per building classification for each climatic zone

1	2	3	4	5	6	7	8
Classification of occupancy of building	Description of building	Maximum energy consumption kWh/m ²					
		Climatic zone ^a					
		1	2	3	4	5	6
A1	Entertainment and public assembly	420	400	440	390	400	420
A2	Theatrical and indoor sport	420	400	440	390	400	420
A3	Places of instruction	420	400	440	390	400	420
A4	Worship	120	115	125	110	115	120
F1	Large shop	240	245	260	240	260	255
G1	Offices	200	190	210	185	190	200
H1	Hotel	650	600	585	600	620	630

NOTE 1 The annual consumption per square metre shall be based on the sum of the monthly consumption of 12 consecutive months.

NOTE 2 Non-electrical consumption, such as fossil fuels, shall be accounted for on a non-renewable primary energy thermal equivalence basis by converting megajoules to kilowatt hours.

^a The climatic zones shall be as given in annex A.

There are therefore only 7 building types that have enforceable energy consumption and demand figures

In terms of the standard (SANS 1544:2015) the Energy Performance Certificates (EPCs) are aligned to SANS 10400 XA

Currently only these 7 occupancies can receive EPCs and data will be gathered for these only

However the national building regulations define (also included in SANS 10400XA)

9 major groupings and

31 individual occupancies

Problem: a single occupancy covers too broad a spectrum of building sizes and applications

These are

- A Places of public assembly
- B Non industrial commercial service
- C Exhibitions and halls
- D Industrial
- E Places of detention, hospitals and health care
- F Shops
- G Offices
- H Housing, hotels, domestic etc.
- J Storage and parking

Table 1 — Occupancy or Building Classification

1	2
Class of occupancy of building	Occupancy
A1	Entertainment and public assembly Occupancy where persons gather to eat, drink, dance or participate in other recreation.
A2	Theatrical and indoor sport Occupancy where persons gather for the viewing of theatrical, operatic, orchestral, choral, cinematographical or sport performances.
A3	Places of instruction Occupancy where school children, students or other persons assemble for the purpose of tuition or learning.
A4	Worship Occupancy where persons assemble for the purpose of worshipping.
A5	Outdoor sport Occupancy where persons view outdoor sports events.
B1	High risk commercial service Occupancy where a non-industrial process is carried out and where either the material handled or the process carried out is liable, in the event of fire, to cause combustion with extreme rapidity or give rise to poisonous fumes, or cause explosions.
B2	Moderate risk commercial service Occupancy where a non-industrial process is carried out and where either the material handled or the process carried out is liable, in the event of fire, to cause combustion with moderate rapidity but is not likely to give rise to poisonous fumes, or cause explosions.
B3	Low risk commercial service Occupancy where a non-industrial process is carried out and where neither the material handled nor the process carried out falls into the high or moderate risk category.
C1	Exhibition hall



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	handled nor the process carried out falls into the high or moderate risk category.
C1	Exhibition hall Occupancy where goods are displayed primarily for viewing by the public.
C2	Museum Occupancy comprising a museum, art gallery or library.
D1	High risk industrial Occupancy where an industrial process is carried out and where either the material handled or the process carried out is liable, in the event of fire, to cause combustion with extreme rapidity or give rise to poisonous fumes, or cause explosions.
D2	Moderate risk industrial Occupancy where an industrial process is carried out and where either the material handled or the process carried out is liable, in the event of fire, to cause combustion with moderate rapidity but is not likely to give rise to poisonous fumes, or cause explosions.
D3	Low risk industrial Occupancy where an industrial process is carried out and where neither the material handled nor the process carried out falls into the high or moderate risk category.
D4	Plant room Occupancy comprising usually unattended mechanical or electrical services necessary for the running of a building.
E1	Place of detention Occupancy where people are detained for punitive or corrective reasons or because of their mental condition.
E2	Hospital Occupancy where people are cared for or treated because of physical or mental disabilities and where they are generally bedridden.
E3	Other institutional (residential) Occupancy where groups of people who either are not fully fit, or who are restricted in their movements or their ability to make decisions, reside and are cared for.



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	Occupancy comprising offices, banks, consulting rooms and other similar usage.
H1	Hotel Occupancy where persons rent furnished rooms, not being dwelling units.
H2	Dormitory Occupancy where groups of people are accommodated in one room.
H3	Domestic residence Occupancy consisting of two or more dwelling units on a single site.
H4	Dwelling house Occupancy consisting of a dwelling unit on its own site, including a garage and other domestic outbuildings, if any.
H5	Hospitality Occupancy where unrelated persons rent furnished rooms on a transient basis within a dwelling house or domestic residence with sleeping accommodation for not more than 16 persons within a dwelling unit.
J1	High risk storage Occupancy where material is stored and where the stored material is liable, in the event of fire, to cause combustion with extreme rapidity or give rise to poisonous fumes, or cause explosions.
J2	Moderate risk storage Occupancy where material is stored and where the stored material is liable, in the event of fire, to cause combustion with moderate rapidity but is not likely to give rise to poisonous fumes, or cause explosions.
J3	Low risk storage Occupancy where the material stored does not fall into the high or moderate risk category.
J4	Parking garage Occupancy used for storing or parking of more than 10 motor vehicles.



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A proposal

Include finer subdivisions of occupancies

e.g.

A3 **Places of instruction**

Occupancy where children, students or other persons assemble for the purpose of tuition or learning

Could for example become

A3.1 **Places of instruction**

Large auditoria (>200m²) with audio visual services at tertiary level education

A3.2 **Places of instruction**

Conventional naturally ventilated classrooms for primary, secondary and other levels of basic education

A3.3 **Places of instruction**

Conference facilities, meeting rooms and other places of instruction

1	2
Class of occupancy of building	Occupancy
E4	Health care Occupancy which is a common place of long term or transient living for a number of unrelated persons consisting of a single unit on its own site who, due to varying degrees of incapacity, are provided with personal care services or are undergoing medical treatment.
F1	Large shop Occupancy where merchandise is displayed and offered for sale to the public and the floor area exceeds 250 m ² .
F2	Small shop Occupancy where merchandise is displayed and offered for sale to the public and the floor area does not exceed 250 m ² .
F3	Wholesalers' store Occupancy where goods are displayed and stored and where only a limited selected group of persons is present at any one time.
G1	Offices Occupancy comprising offices, banks, consulting rooms and other similar usage.
H1	Hotel

What about the difference in shop typology
Malls – large anchors vs small line shops
Supermarkets vs clothing, motor sales, etc.?



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