

LOCAL AUTHORITY NOTICE 328

CITY OF TSHWANE

GREEN BUILDING DEVELOPMENT BY-LAW

The City Manager of the City of Tshwane hereby publishes in terms of Section 7 of the Rationalisation of Local Government Affairs Act, 1998 (Act 10 of 1998), read with Section 13 of the Local Government: Municipal System Act, 2000 (Act 32 of 2000), and Section 162 of The Constitution of the Republic of South Africa, 1996 (Act 108 of 1996), the CITY OF TSHWANE GREEN BUILDING DEVELOPMENT BY-LAW, 2013, as contemplated hereunder and approved by Council on 25 October 2012.

The purpose of the said By-laws is to provide the City of Tshwane Metropolitan Municipality with legislative measures to ensure that a more sustainable built environment is developed.

These By-laws takes effect on **1 July 2013**.

MR JASON NGOBENI
CITY MANAGER

(Notice No 250 of 2013)
27 March 2013

CITY OF TSHWANE

GREEN BUILDING DEVELOPMENT BY-LAW

To provide the City of Tshwane Metropolitan Municipality with legislative measures to ensure that a more sustainable built environment is developed.

PREAMBLE

Whereas the South African Constitution read together with the Local Government Municipal Systems Act as well as other various legislation states that everyone has a right to an environment that is not harmful to their health and well-being;

and whereas the Constitution requires the environment to be protected for the benefit of present and future generations, through reasonable legislative measures that –

- prevent pollution and ecological degradation;
- promote conservation; and
- ensure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development;

and whereas the Municipal Systems Act enjoins local government to ensure that municipal services are provided to communities in a financially and environmentally sustainable manner and promote safe and healthy environments;

be it therefore enacted by the City of Tshwane Metropolitan Municipality as follows:

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1. DEFINITIONS

In the By-law all words and phrases, except the words and phrases defined in the By-law, have the same meaning as in the National Building Regulations and Building Standards Act, 1977 (Act 103 of 1977), the National Building Regulations made under the Act and the user's code of practice for the application of the National Building Regulations, namely SANS 10400/SABS 0400:1990. Thus, unless the context indicates otherwise –

"Approved" means approved in writing by the Municipality or an authorised agent;

"Building Regulations" means the National Building Regulations made in terms of the National Building Regulations and Building Standards Act, 1977 (Act 103 of 1977);

"Constitution" means the Constitution of the Republic of South Africa, 1996;

"Green Building Development Policy" means a policy developed by the City of Tshwane Metropolitan Municipality in order to support the development of a more sustainable built environment, which policy contains both mandatory standards (which have to be complied with) and promoted standards (which do not have to be complied with but are supported by the Municipality);

"Incentives" means inducements and support, financial or otherwise, that may be offered to encourage the development of a more sustainable built environment;

"Mandatory standards" means standards that the City of Tshwane has made compulsory and which must be achieved for approval of a building as a green building;

"Municipality" means –

- (a) the City of Tshwane Metropolitan Municipality or its successors-in-title; or
- (b) the Municipal Manager in respect of the performance of any action, or exercise of any right, duty, obligation or function in terms of the By-law; or
- (c) an authorised agent;

"Owner" means –

- (a) the person in whom from time to time is vested the legal title to the premises;
- (b) where the person in whom the legal title to the premises is vested is insolvent or deceased, or is under any form of legal disability whatsoever, the person in whom the administration and control of the premises are vested as curator, trustee, executor, administrator, judicial manager, liquidator or other legal representative;
- (c) where the Municipality is unable to determine the identity of the person in whom the legal title to the premises is vested, the person who has a legal right in or to the benefit of the use of the premises or a building or buildings on the premises;
- (d) in the case of premises for which a lease agreement of 30 years or more has been entered into, the lessee of the premises;
- (e) in relation to –
 - i. a piece of land delineated on a sectional plan registered in terms of the Sectional Titles Act, 1986 (Act 95 of 1986), the developer or the body corporate in respect of the common property; or
 - ii. a section as defined in the Sectional Titles Act, 1986, the person in whose name the section is registered under a sectional title deed, and includes the lawfully appointed agent of such a person; or
- (f) a person occupying land under a register held by a tribal authority or in accordance with a sworn affidavit made by a tribal authority;

"Person" means a natural person, a local government body, a company or close corporation incorporated under any law, a body of persons, whether incorporated or not, a statutory body, a public utility body, a voluntary association or a trust;

"Premises" means any piece of land, the external surface boundaries of which are delineated on –

- (a) a general plan or diagram registered in terms of the Land Survey Act, 1997 (Act 8 of 1997), or in terms of the Deeds Registries Act, 1937 (Act 47 of 1937); or
- (b) a sectional plan registered in terms of the Sectional Titles Act, 1986; or
- (c) a register held by a tribal authority or in accordance with a sworn affidavit made by a tribal authority;

"Promoted standards" means standards that the City of Tshwane encourages and supports in order to improve the sustainable performance of the built environment.

2. SCOPE OF THE BY-LAW

- (1) The By-law is supplementary to the National Building Regulations and applies to all development requiring City of Tshwane approval as defined in the National Building Regulations.
- (2) The By-law is also supplementary to existing City of Tshwane by-laws on solid waste, sanitation, electricity and water supply, i.e. it is not designed to supersede or amend these in any way.

3. GENERAL PROVISIONS

- (1) All development requiring City of Tshwane approval as defined in the National Building Regulations must comply with the mandatory standards of the current version of the City of Tshwane Green Building Development Policy, as contemplated in Schedule 1 of the By-Law as amended from time to time.
- (2) The development may also comply with promoted standards of the current version of the City of Tshwane Green Building Development Policy.
- (3) Compliance with the mandatory standards must be demonstrated to achieve City of Tshwane approval for development.
- (4) Demonstrated compliance with the promoted standards in the Policy may be used to apply for incentives managed, or promoted by, the City of Tshwane, which incentives are further detailed in the City of Tshwane Green Building Development Policy.
- (5) Compliance with both the mandatory and promoted standards must be demonstrated through appropriate documentation. Requirements for demonstrating compliance with the policy are outlined in the City of Tshwane Green Building Development Policy.
- (6) The City of Tshwane confirms compliance with both mandatory and promoted standards outlined in the City of Tshwane Green Building Development Policy.

4. NON-COMPLIANCE

- (1) Should there be non-compliance with mandatory standards of the City of Tshwane Green Building Development Policy and the City of Tshwane has not approved the development, this may be addressed and remedied through the same instruments and powers vested in local authorities as for ensuring compliance with the National Building Regulations.
- (2) Any person convicted of a contravention of the City of Tshwane Green Building Development Policy and By-law or any person who fails to comply with these documents is liable to a penalty as determined by the City of Tshwane. The penalty may be imprisonment or a fine.

5. COMMENCEMENT AND TITLE

- (1) The By-law is effective as from the date of promulgation in the Provincial Gazette.
- (2) The By-law is called the City of Tshwane Green Building Development By-law.

SCHEDULE 1

CITY OF TSHWANE

GREEN BUILDING DEVELOPMENT POLICY

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DEFINITIONS

Air conditioning: A mechanical system installed in a building to control the temperature and humidity of the air by heating or cooling.

By-law: By-laws promulgated by the City of Tshwane on subjects such as solid waste, water and sanitation, etc.

Envelope: The external elements of a building such as the walls, windows and roof.

Glazing: Windows, glazed doors or other transparent and translucent elements, including their frames (such as glass bricks, glazed doors, etc), that are located in the fabric of the building.

Gross floor area: The total floor area of the building that is protected from the elements but which excludes parking.

Lighting power density: The total amount that will be consumed by the lighting systems in a space. It includes lamps, ballast, current regulators and control devices. The total is calculated by adding the energy used and dividing it by the floor area of the room.

Renewable energy: Sun, wind, biomass, water (hydro), waves, tides, ocean currents, geothermal energy, and any other natural phenomena which are cyclical and non-depletable.

Renewable technology: Technology that converts a primary renewable energy source or resource to the desired form of energy service.

SANS 204: The South African National Standard on Energy Efficiency in Buildings, published by the South African Bureau of Standards.

Useable area: The floor area in a building that can be occupied. It excludes areas such as toilets, bathrooms, storage, ducts and vertical circulation.

Watt (W): The determined metric or international system of units (SI) value for energy loads. It is used to rate electrical motors, appliances and lights as well as to express energy loads and consumption.

CITY OF TSHWANE

GREEN BUILDING DEVELOPMENT POLICY

1. Introduction

The Green Building Development Policy developed by the City of Tshwane aims to improve the performance of built environments in order to reduce negative or adverse environmental impacts, to improve the quality of the environment and to enhance the quality of life in the city.

The Green Building Development Policy is one of three related instruments by the City of Tshwane to encourage the development of a more sustainable built environment. These instruments are the following:

- **Green Building Development By-law:** This by-law sets out the legislative status of the Green Building Development Policy and the Green Building Development Incentive Scheme
- **Green Building Development Policy:** This policy sets out green building development standards that are either mandatory (must be complied with) or promoted (may be complied with)
- **Green Building Development Incentive Scheme:** Once finalised, this scheme will encourage new buildings to surpass mandatory green building development standards and to adopt promoted standards

This document sets out the Green Building Development Policy and includes both mandatory and promoted green building development standards.

2. Application of the Green Building Development Policy

The Green Building Development Policy only applies to developments that require building control approval. The policy sets out standards that are either **mandatory** or **promoted** by the City of Tshwane. Mandatory standards must be complied with. Promoted standards are voluntary, but demonstrating compliance with them may be used to ensure that developments are eligible for incentive schemes.

Submissions to the City of Tshwane for approval of building plans must demonstrate that the proposed development or refurbishment will comply with all the mandatory standards outlined in this Green Building Development Policy.

This policy will be implemented and enforced by the office of the City of Tshwane Chief Building Control Officer in terms of an approved implementation plan.

Submission requirements may be amended from time to time by the City of Tshwane in order to support ongoing performance improvement in the built environment.

3. Green Building Development Incentive Scheme

The City of Tshwane may, from time to time, provide incentives to submissions that comply not only with mandatory standards but also with promoted standards as outlined in this policy. Incentives may include the following:

- Fast-tracked application procedures.
- Reduced application costs.
- Reduced bulk services contribution.
- Relaxation of specific planning requirements such as parking provision.
- Access to reduced cost or free green building technical training and seminars.
- Access to municipal negotiated discounts for energy-efficient/sustainable technologies.
- Access to municipal negotiated interest rate reductions from financial institutions.
- Assistance in applying for grants or tax incentives for investments in energy-efficient/sustainable technologies.
- Formal recognition of performance through certification.

Eligibility for these incentives will be determined by the City of Tshwane through reviewing submitted promoted standards documentation as outlined in the implementation plan referred to in Section 2 of this policy. Formal recognition of eligibility will be provided through a Green Building Development Certificate issued by the City of Tshwane.

4. Green Building Development Certificate

The Green Building Development Certificate is a valuable tool that can be used by developers, building owners and professional teams to demonstrate a commitment to improved environmental performance and the achievement of specific environmental performance standards within a development.

Therefore, even where incentives are not in place, projects should consider achieving the promoted standards and submitting the relevant documentation in order to benefit from these initiatives as well as from the valuable associated publicity and recognition in terms of a Green Building Development Certificate.

5. Green Building Development Mandatory and Promoted Standards

This section outlines the mandatory and promoted standards for green building development. Mandatory standards are marked with an asterisk (*). Promoted standards are not distinguished in any way.

EN: Energy

EN 1: Urban heat island*

All external flat hard surfaces, including car parking areas and roofing of more than 500m², must be constructed of a material with an absorptance value lower than 0,6. Where material with a solar reflectance value of more than 0,6 is used for car parking, a minimum of 30% of the surface area must be shaded.

Table 1: Absorptance values. (SANS 204)

Colour	Value
Slate (dark grey)	0,9
Red, green	0,75
Yellow, buff	0,6
Zinc aluminium – dull	0,55
Galvanised steel – dull	0,55
Light grey	0,45
Off-white	0,35
Light cream	0,3

Submission requirements

1. Provide a site plan that indicates the external hard surface areas, including roofs. Annotate this plan to indicate the type of surface, the area and the absorptance value. Shading type and area should also be included.
2. Provide a table that refers to the site plan. An example of such a table is given below.

Plan reference	Area (m ²)	Colour	Absorptance value	Is the surface shaded?	Shading source	Shaded area (m ²)	% shaded
Office roofing	3 500	Light grey	0,45	No	Not applicable	Not applicable	Not applicable
Office parking	600	Buff	0,6	Yes	Indigenous trees	300	50%

EN 2: Internal lighting power density*

Internal lighting power densities should comply with SANS 204. These are provided in Table 2.

Submission requirements

1. Provide a table of internal spaces that indicates the number of light fittings and respective power ratings. The sum of the total lighting power divided by the total area of internal spaces should be provided. An example of such a table is given below.

Internal space	Area (m ²)	Type of light fitting	Light fitting power rating	Number of fittings	Total lighting power (W)	Lighting power density
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			(W)			(W/m ²)
Office	30	Fluorescent tube	58	4	232	7,7
Bathroom	12	Compact fluorescent	12	2	24	2,0
Total lighting power (W)						256
Total area (m ²)						42
Lighting power density (W/m ²)						6

EN 3: Lighting zoning*

The maximum internal area that can be controlled with a single switch should not exceed the area indicated in Table 2.

Table 2: Internal lighting power density and zoning

Class of occupancy or building	Occupancy	Internal lighting power density in watt per m ² (from SANS 204)	Maximum area that can be controlled by a single switch (m ²)
A1	Entertainment and public assembly	10	300
A2	Theatrical and indoor sport	10	300
A3	Places of instruction	10	100
A4	Worship	10	200
A5	Viewing of outdoor sport	10	200
B1	High-risk commercial	10	200
B2	Moderate risk commercial	24	200
B3	Low-risk commercial	20	200
C1	Exhibition halls	15	300
C2	Museums	15	200
D1	High-risk industrial	5	200
D2	Moderate risk industrial	20	200
D3	Low-risk industrial	20	200
D4	Plant rooms	15	200
E1	Places of detention	5	200
E2	Hospitals	15	100
E3	Other institutional residences	10	100
F1	Large shops	10	200
F2	Small shops	24	100
F3	Wholesalers' stores	20	200
G1	Offices	15	100
H1	Hotels	17	100
H2	Dormitories	10	100
H3	Domestic residences	5	Not applicable
H4	Dwelling houses	5	Not applicable
J1	High-risk storage	5	200
J2	Moderate risk storage	17	200
J3	Low-risk storage	15	200
J4	Covered parking areas	7	200

Submission requirements

1. Provide a table of internal spaces that indicates the number of switches and the maximum area per switch. An example of such a table is given below.

Space	Area (m ²)	Number of switches	Maximum area per switch (m ²)
Offices	400	5	80
Kitchenette	20	1	20

EN 4: Internal lighting controls

Lighting controls should be selected to ensure that lights are only on when required and are not left on by accident. The following requirements should be met:

Table 3: Internal lighting controls

Area	Examples	Lighting controls
Intermittently used areas larger than 20m ²	Storage areas, bathrooms, meeting spaces and underground parking	Motion sensor

Useable areas larger than 200m ² that are well lit by day	Open-plan office space within 6 m of external glazing	Photo sensor which switches off lighting when there is adequate day lighting within the space
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Emergency lighting and lighting in hazardous environments (for instance where machine tools are being used) is exempt from this requirement.

Submission requirements

1. Provide a table of internal spaces with associated lighting controls. An example of such a table is given below.

Space	Area (m ²)	Type of switch
Office	240	Photo sensor
Bathroom	28	Motion sensor

EN 5: External lighting controls*

External lighting (including signage, façade and feature lighting) should be linked to a light sensor to ensure that it is switched off when there is adequate daylight. In addition, external lighting can be switched on using motion sensors to ensure that lighting is only on when required. All signage, façade and feature lighting must be on a timer that ensures that it is switched off at 1:00 in the morning at the latest. Occupancies that are exempted from the timer switch-off requirement are listed in Table 4.

Submission requirements

1. Provide a table that contains all external light fittings and type of controls. An example of such a table is given below.

Area	Type of light fitting	Type of control	Lighting fitting power rating	Number of fittings	Total lighting power
Parking area	Compact fluorescent	Movement and light sensor	12	2	24
Signage	Compact fluorescent	Timer and light sensor	12	2	24
Total power requirements					48
Gross floor area (m ²)					300
External lighting power ratio (W/m ²)					0.16

EN 6: External lighting power ratio*

The amount of external lighting in buildings should be restricted to a maximum external lighting power ratio, as indicated in Table 4.

Table 4: External lighting power density and timer switch-off requirements

Class of occupancy or building	Occupancy	Maximum external lighting power ratio (W/m ²)	Timer switch-off
A1	Entertainment and public assembly	1	No
A2	Theatrical and indoor sport	2	No
A3	Places of instruction	1	Yes
A4	Worship	1	Yes
A5	Viewing of outdoor sport	2	No
B1	High-risk commercial	1	No
B2	Moderate risk commercial	1	Yes
B3	Low-risk commercial	1	Yes
C1	Exhibition halls	2	No
C2	Museums	2	Yes
D1	High-risk industrial	2	Yes
D2	Moderate risk industrial	1	Yes
D3	Low-risk industrial	1	Yes
D4	Plant rooms	Not applicable	Yes
E1	Places of detention	Not applicable	No
E2	Hospitals	Not applicable	No
E3	Other institutional residences	1	Yes
F1	Large shops	1	Yes

Class of occupancy or building	Occupancy	Maximum external lighting power ratio (W/m ²)	Timer switch-off
F2	Small shops	2	Yes
F3	Wholesalers' stores	1	Yes
G1	Offices	2	Yes
H1	Hotels	2	No
H2	Dormitories	1	Yes
H3	Domestic residences	1	Yes
H4	Dwelling houses	1	Yes
J1	High-risk storage	Not applicable	No
J2	Moderate risk storage	1	Yes
J3	Low-risk storage	1	Yes
J4	Covered parking areas	1	No

Submission requirements

1. Provide a table that contains the area, the number and type of external light fittings, the type of switching, the power rating of the light fittings and the total lighting power. The sum of the total lighting power divided by the gross floor area should be also provided. An example of such a table is given below.

Area	Type of light fitting	Type of switching	Light fitting power rating (W)	Number of fittings	Total lighting power (W)
Parking area	Compact fluorescent	Movement and light sensor	12	2	24
Signage	Compact fluorescent	Timer and light sensor	12	2	24
Total lighting power (W)					48
Gross floor area (m ²)					300
External lighting power ratio (W/m ²)					0.16

EN 7: Energy sub-metering

All buildings with a gross floor area of more than 5 000 m² should have energy sub-metering in order to monitor and control energy use in the building. Sub-metering should measure all substantial energy consumption areas and include, as a minimum, lighting and heating, ventilation and air conditioning (HVAC) systems. Sub-metering systems should enable data to be captured and presented over time and enable energy profiles to be generated. Data from these meters should be readily accessible to the managers of buildings or facilities.

Submission requirements

1. Provide a table that indicates the metered energy consumption areas and means of monitoring. An example of such a table is given below.

Energy consumption area	Means of monitoring
Ground floor lighting	Monitor in facilities manager's office
First floor lighting	Monitor in facilities manager's office
Air conditioning	Monitor in facilities manager's office

EN 8: Renewable energy

All new buildings, refurbishments and major retrofits should ensure that at least 10% of energy consumption is generated from renewable energy systems. This requirement can be met by installing renewable energy systems such as photovoltaic and solar water heating systems in buildings or on-site.

Submission requirements

1. A renewable energy generation report that indicates the building's predicted renewable energy generation in kWh/annum, the building's total predicted annual energy consumption in kWh/annum, and the percentage of energy consumption sourced from renewable sources, as indicated in the table below. This table should be supported by detailed and comprehensive calculations and all data – including weather data, schedules, occupancy and others – used as a basis for predicted energy generation figures should be included. Assumptions used in calculations should be accurate or conservative. Methodology and calculations must be in line with generally accepted good practice standards.

Renewable energy system	Energy consumption
Renewable energy generated by photovoltaic panels on the building (kWh/annum)	4 000
Renewable energy generated by solar water system in the building (equivalent kWh/annum)	4 000
Total renewable energy generated (kWh/annum)	8 000
Annual predicted energy consumption for the building (kWh/annum)	40 000
Percentage of energy consumption sourced from renewable sources	20%

2. The report must be compiled by a registered mechanical or electrical engineer. This should be confirmed in the report by the following statement:

"This report has been compiled to provide a realistic prediction of renewable energy generation in the proposed building. The report is aligned with current best engineering and modelling practice and all assumptions and data used are accurate or conservative in nature."

Signed: Name: Registration: Registration number:

WA: Water
WA 1: Toilet flush*

Where flush toilets are installed, they must have a dual-flush capability. Flush rates must not exceed 4,5 ℓ (half flush) and 9 ℓ (full flush).

Submission requirements

1. Provide a table that indicates all the flush toilets in the building. This should include the manufacturer and product type, the flush volumes and the respective numbers. An example of such a table is given below.

Manufacturer and product	Flush volume (full flush)	Flush volume (half flush)	Number

WA 2: Hand wash basin taps*

The flow rate in hand wash basin taps should not exceed six litres per minute.

Submission requirements

1. Provide a table that indicates all hand wash basin taps in the building. This should include the manufacturer and product type, the flow rate and the respective numbers. An example of such a table is given below.

Manufacturer and product	Flow rate	Number

WA 3: Baths*

Where baths are installed, a shower fitting should also be provided.

Submission requirements

1. Drawing(s) of all bathrooms with baths (or representative bathroom, if similar) and which also indicate showers.

WA 4: Showers*

Flow rates of shower heads must not exceed 10 litres per minute.

Submission requirements

1. Provide a table that indicates all the showers in the building. This should include the manufacturer and product type, the flow rate and the respective numbers. An example of such a table is given below.

Manufacturer and product	Flow rate	Number

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WA 5: Hot water pipes

Hot water pipe runs from the point of hot water generation to the delivery device should not exceed 10 metres.

Submission requirements

1. Provide a plan drawing that indicates hot water pipe runs from the generating device to the consumption point(s). Annotate the drawing with the length of pipe runs in metres, including both horizontal and vertical runs.

WA 6: Rainwater harvesting

In all buildings with a useable area of more than 200m², provision must be made for rainwater harvesting. On-site rainwater harvesting systems must be installed with at least the capacity indicated in Table 5. The rainwater harvesting system should be linked to flush toilets, irrigation systems or other water consumption areas.

Table 5: Rainwater harvesting capacity

Class of occupancy or building	Occupancy	Rainwater harvesting system capacity to useable area ratio (ℓ/m ²)
A1	Entertainment and public assembly	5
A2	Theatrical and indoor sport	5
A3	Places of instruction	10
A4	Worship	5
A5	Viewing of outdoor sport	5
B1	High-risk commercial	5
B2	Moderate risk commercial	5
B3	Low-risk commercial	5
C1	Exhibition halls	5
C2	Museums	5
D1	High-risk industrial	5
D2	Moderate risk industrial	5
D3	Low-risk industrial	5
D4	Plant rooms	n/a
E1	Places of detention	5
E2	Hospitals	5
E3	Other institutional residences	5
F1	Large shops	5
F2	Small shops	5
F3	Wholesalers' stores	5
G1	Offices	5
H1	Hotels	5
H2	Dormitories	5
H3	Domestic residences	10
H4	Dwelling houses	10
J1	High-risk storage	5
J2	Moderate risk storage	5
J3	Low-risk storage	5
J4	Covered parking areas	2

Submission requirements

1. Provide a plan drawing that indicates the rainwater harvesting tank and the linked water consumption areas.
2. Provide a table that indicates the useable area, rainwater harvesting system capacity and the ratio of rainwater harvesting capacity to useable area. An example of such a table is given below.

Useable area of building (m ²)	Rainwater harvesting tank volume (ℓ)	Rainwater harvesting system capacity to useable area ratio (ℓ/m ²)
500	5 000	10

WA 7: On-site storm water retention

Sites which have over 500m² of hard surface (for instance surface car parking) should demonstrate how 80% of run-off water volume will be retained on-site. Retention strategies can include appropriately designed rainwater harvesting systems or sustainable urban drainage systems (SUDs) including swales.

Submission requirements

1. An on-site storm water retention report that indicates the predicted on-site storm water retention performance of the project should be provided. This should show that at least 80% of run-off volume is retained on-site. The report should be supported by detailed and comprehensive calculations. Data – including weather data, soil type, permeability and others – used as a basis for predicted on-site storm water retention should be included. Assumptions used in calculations should be accurate or conservative. Methodology and calculations must be in line with generally accepted good practice standards.

The report must be compiled by a registered civil or wet services engineer. This should be confirmed in the report by the following statement:

"This report has been compiled to provide a realistic prediction of on-site storm water retention in the proposed project. The report is aligned with current best engineering and modelling practice and all assumptions and data used are accurate or conservative in nature."

Signed: Name: Registration: Registration number:

WA 8: Swimming and ornamental pools

Water to top up swimming pools and ornamental ponds with a volume of 2 m³ or more must be sourced from rainwater harvesting tanks. Municipal supplies should not be used for this purpose. Applications to develop pools of 2 m³ or more must include a rainwater harvesting system of adequate capacity.

This requirement does not apply where the pool will have a pool cover installed for at least six months of the year and has a filtration system that does not result in waste water from backwashing.

To calculate the required minimum rainwater harvesting capacity, the surface area of the pool in square metres should be multiplied by 1,0 to obtain a volume. Thus, if the surface area of a pool is 5 m², the volume required would be 5,0 x 1,0 = 5,0 m³ or 5 000 ℓ. This is the minimum required capacity of the rainwater harvesting system.

Submission requirements

1. Provide a site plan that indicates the pools and rainwater harvesting system.
2. Provide a table that contains the type of pool, surface area, minimum rainwater harvesting requirements and actual rainwater harvesting capacity provided. An example of such a table is given below.

Type of pool	Surface area (m ²)	Minimum rainwater harvesting capacity required (ℓ)	Actual rainwater harvesting capacity provided (ℓ)
Swimming pool	5	5 000	10 000

Alternatively:

1. Provide written and signed confirmation by the building owner that a pool cover will be installed for at least six months of the year and that a filtration system will be used that does not result in waste water from backwashing.

WA 9: Irrigation

All water used to irrigate landscapes and planting must be sourced from rainwater harvesting. Municipal supplies should not be used for this purpose. All applications for development that include irrigation schemes must indicate that a rainwater harvesting system of adequate capacity to meet the irrigation requirements of planting throughout the year has also been provided. Irrigation for food gardens is exempt from this requirement.

To calculate the minimum rainwater harvesting capacity required, the surface area of the landscape requiring irrigation should be multiplied by the irrigation requirements in millimetre per week multiplied by 16 to get the minimum rainwater harvesting capacity volume. Thus, if the landscaped area is 50 m² and the irrigation requirements are 20mm per week, irrigation water requirements per week would be 50,0 x 0,02 = 1,0 kℓ or 1 000 ℓ. This would then be multiplied by 16 to get the minimum

rainwater harvesting capacity required (16 000 ℓ). This is the minimum required capacity of the rainwater harvesting system.

Submission requirements

1. Provide a site plan that indicates the irrigated area and rainwater harvesting system.
2. Provide a table that indicates the type of vegetation requiring irrigation, the area of the vegetation, the irrigation requirements per week and the minimum actual rainwater harvesting capacity provided. An example of such a table is given below.

Type of vegetation requiring irrigation	Area (m ²)	Irrigation requirements (mm / week)	Weekly water requirements (ℓ)	Factor	Minimum rainwater harvesting capacity required (ℓ)	Actual rainwater harvesting capacity provided (ℓ)
Front lawn	50	20	1 000	16	16 000	20 000

WE: Waste
WE 1: Solid waste*

Recycling storage areas should be provided for all buildings with a gross floor area of more than 500m² or for sites where the total cumulative gross floor area is more than 500m² (such as townhouse developments). Recycling storage areas must be covered and located within 50m (road distance) of a public highway. Where there are a number of units on one site, such as a townhouse development, a single recycling area can be provided, as long as this has adequate capacity (that means that the total recycling area should not be less than what would be required for individual units). The area for recycling storage should at least meet the requirements listed in Table 6.

Table 6: Requirements for cycling storage area

Gross floor area of building(s) (m ²)	Minimum area of recycling storage required per gross floor area (m ²)
501 to 1 000	0,005
1 001 to 5 000	0,0035
5 001 +	0,0025

Projects should perform their own calculations and modelling for the size of the recycled waste storage areas. This should be based on expected waste streams. In general, space allocation should ensure that at least seven days of recycling waste can be stored. The stockpiling of recycling waste helps to improve the efficiency and economic viability of recycling operations.

Submission requirements

1. Provide a site plan that indicates recycling storage area and distance (in metres) to the nearest public highway.
2. Provide a table that indicates the gross floor area of buildings, the minimum recycling storage areas per gross floor area, the minimum recycling storage area required and the actual recycled storage area provided. An example of such a table is given below.

Gross floor area of building(s) (m ²)	Minimum area of recycling storage required per gross floor area (m ²)	Minimum recycling storage area required (m ²)	Actual recycling storage area provided (m ²)
2 000	0,0035	7	15

TR: Transport
TR 1: Cycling provision*

Secure cycling storage should meet the requirements indicated in Table 6. This does not apply to buildings with a gross floor area of less than 1 000m².

Submission requirements

1. Provide a site plan that indicates bicycle parking.
2. Provide a table that indicates the size of the building and the required and actual bicycle parking. An example of such a table is given below.

Gross floor area of building / number of seats / number of beds (refer to Table 7)	Required bicycle parking (refer to Table 7) (number of spaces)	Actual bicycle parking (number of spaces)

TR 2: Cycle routes*

Cycle routes are clearly designated on roads and provision is made for safe passage at road crossings and junctions and also for storage. The provision of cycling routes does not apply to buildings with a gross floor area of less than 1 000 m².

Submission requirements

1. Provide a site plan that indicates cycle routes.
2. Provide representative drawings of cycle paths, cycle lanes, crossing points and junctions.

TR 3: Car parking

Car parking provision may not exceed the minimum requirements of the City of Tshwane by more than 10%.

Submission requirements

1. Provide a table that indicates municipal parking requirements and the actual provision on-site. An example of such a table is given below.

Gross floor area of building	Municipal parking requirements (number of spaces)	Actual parking provision (number of spaces)

TR 4: Pedestrian routes*

All buildings should have dedicated pedestrian routes from public highways and public transport nodes to the main entrances of buildings, and safe road crossing points should be provided.

Submission requirements

1. Provide a site plan that indicates pedestrian routes.
2. Provide representative drawings of pedestrian paths/routes, including flat sections, ramps and stairs, crossing points and access control arrangements.

TR 5: Local facilities

Work environments

Access to the following facilities should be provided within 400 m from the building entrance: bank/ATM, restaurant/food retailer, train station/bus stop/regularly used taxi stop.

Table 7: Provision of cycling and local facilities

Class of occupancy or building	Occupancy	Cycling provision	Local facilities provision requirement
A1	Entertainment and public assembly	5 per 100 seats	Work environments
A2	Theatrical and indoor sport	5 per 100 seats	Work environments
A3	Places of instruction	30 per 100 learners	Work environments
A4	Worship	5 per 100 seats	Work environments
A5	Viewing of outdoor sport	5 per 100 seats	Work environments
B1	High-risk commercial	Minimum 1 space, plus 1 space per 1 000m ²	Work environments.
B2	Moderate risk commercial	Minimum 1 space, plus 1 space per 1 000m ²	Work environments
B3	Low-risk commercial	Minimum 1 space, plus 1 space per 1 000m ²	Work environments
C1	Exhibition halls	Minimum 1 space, plus 2 spaces per 1 000m ²	Work environments
C2	Museums	Minimum 1 space, plus 2 spaces per 1 000m ²	Work environments
D1	High-risk industrial	Minimum 1 space, plus 1 space per 1 000m ²	Work environments
D2	Moderate risk industrial	Minimum 1 space, plus 1 space per 1 000m ²	Work environments
D3	Low-risk industrial	Minimum 1 space, plus 1 space per 1 000m ²	Work environments
D4	Plant rooms	Not applicable	Not applicable

Class of occupancy or building	Occupancy	Cycling provision	Local facilities provision requirement
E1	Places of detention	Minimum 1 space, plus 1 space per 50 beds	Work environments
E2	Hospitals	Minimum 1 space, plus 1 space per 50 beds	Work environments
E3	Other institutional residences	Minimum 1 space, plus 1 space per 50 beds	Work environments
F1	Large shops	Minimum 1 space, plus 2 spaces per 100m ²	Work environments
F2	Small shops	Minimum 1 space, plus 2 spaces per 100m ²	Work environments
F3	Wholesalers' stores	Minimum 1 space, plus 1 space per 1 000m ²	Work environments
G1	Offices	Minimum 1 space, plus 1 space per 100m ²	Work environments
H1	Hotels	Minimum 1 space, plus 1 space per 50 beds	Work environments
H2	Dormitories	Minimum 1 space, plus 1 space per 50 beds	Work environments
H3	Domestic residences	Not applicable	Residential environments
H4	Dwelling houses	Not applicable	Residential environments
J1	High-risk storage	1 space per 1 000m ²	Work environments
J2	Moderate risk storage	1 space per 1 000m ²	Work environments
J3	Low-risk storage	1 space per 1 000m ²	Work environments
J4	Covered parking areas	1 space per 20 cars	Not applicable

Submission requirements

1. Provide a location plan that indicates the building entrance(s) and routes to banks/ATMs, restaurants/food retailers, train stations/bus stops/regularly used taxi stops. Annotate routes with the distance of the route in metres.

Residential environments

Access to the facilities outlined in Table 7 should be provided within 1 000m² from residential units: crèches, primary schools, parks, grocery retailers, post offices, train stations/bus stops/regularly used taxi stops.

Submission requirements

1. Provide a location plan that indicates the residential unit(s) and routes to crèches, primary schools, parks, grocery retailers, post offices, train stations/bus stops/regularly used taxi stops. Annotate the routes with the distance of the route in metres.