JOHANNESBURG BUILT ENVIRONMENT GUIDELINES AND STANDARDS

(JBEGS)

November 2014

Development Planning
City Transformation & Spatial Planning

a world class African city

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1. Introduction

The City of Johannesburg has identified a need to provide its citizens, prospective developers, Municipal Owned Entities, Internal City Departments and any other interested parties with a reference manual for City specific guidelines and standards relating to the built environment.

As such, this reference manual has been developed with the end user, especially the developer or prospective developer in mind. It has been formulated with ease of use in mind as well as the fact that the built environment changes over time with different development dynamics and trends. Therefore it has also been developed in such a manner that it is easy to update and/or add any additional standards and/or guidelines which may be developed in future.

Important to note is the fact that this reference manual contains and promotes only the uniquely developed standards and/or guidelines for the City of Joburg. It is not the intension of this reference manual to replicate or duplicate any national standards and guidelines or any other standards and/or guidelines prepared and accepted by any of the built environment disciplines (i.e. Engineering Standards). Any uniquely developed standards and/or guidelines contained in this reference manual have been developed for whatever reason might have been identified, which may include but is not limited to:

- Unique situations that a City department or Municipal Owned Entity may have identified which may not be covered by any other recognised and approved national standard and or guideline;
- Standards and/or guidelines may have been drafted to supplement existing national and or any other recognised standards and/or guidelines;
- Standards and/or guidelines may have been drafted for specific areas (i.e. precinct) which will provide that area with a unique character/ambience – these are contained in Annexure B and must be referred to prior to the use of generic standards / guidelines ;

Below is how standards and guidelines are understood in this reference manual and the user is encouraged to use it with this understanding.

Guidelines vs Standards

Guidelines are perceived as policy that is 'flexible', within reason, depending on the context in which the policy is applied. Standards by comparison are set and apply in situations where there are no alternatives (e.g. the expansion of existing water pipe network)

2. Guide to using JBEGS

a) Updating JBEGS

The updating of information in the reference manual has been set in in such a manner that the entity or department formulating any standards and/or guidelines will be able to update the JBEGS themselves. A particular format has been drawn up, which is merely a guideline, but should be adhered to as far as possible. In instances where the format must be altered to accommodate the new or additional information, this may be done but will be subjected to clearance from the "publishers/custodians" of the book. This is explained in due course.

Role of "Publishers / Custodians":

The publishers/custodians of the JBEGS is the Department of Development Planning. This unit interfaces with both the technical departments of the Municipal Owned Entities and City Departments as well as with developers through development applications.

For this reason this department has been chosen as the custodians as they are best placed and suited to ensure that these standards and/or guidelines are adhered to and implemented accordingly.

Further to this, this Unit will approve the submissions made to the JBEGS to ensure that the submissions are user friendly and appropriate for the JBEGS and will also ensure that the submissions made are of a high quality in line with the rest of the document.

It is not the responsibility of the custodians to extract and submit any new information from formulated policies/standards/guidelines for insertion into this reference manual, but merely an oversight role to ensure the quality of submissions prior to its final inclusion.

Steps to be followed when updating/adding information:

The following outlines the process to follow to update and make submissions into the JBEGS.

1) Extrapolate the relevant, most crucial information from your APPROVED[1] standards and/or guidelines;
2) Place the extrapolated information in the preferred format for inclusion in electronic format (MS Word) (see Annexure A);
3) Place the formatted information under the relevant section in JBEGS – in the event that the new standards and/or guidelines will require a new section, add the section but provide motivation for why it requires a new section and cannot be accommodated under any of the other sections;
4) Submit the replacement and / or additions both in electronic format and one hard copy to the "Custodians/Publishers" for consideration together with an electronic and hard copy of the approved standards and/or guidelines for record keeping purposes. Where a standards / guidelines are being replaced, please indicate clearly what needs to be removed / rescinded in such instances.
5) Once the "Custodians/Publishers" are satisfied with the submission, the document will be published with the new additions.

When updating/adding and publishing should take place:

Updating/Adding Information:
The updating and adding of information to the JBEGS should not be sporadic but structured to ensure that all submissions are dealt with once on an annual basis. As such, due to the fact that the City of Joburg relates its work streams to its financial year, all submissions must be made by the end of the first quarter of each financial year – therefore no later than 30 September of each year. It would be assumed that all approvals have been granted by this time. During the month of October, the custodians will evaluate the submissions made and liaise with the relevant department / entity should changes be required. The document must be finalised for publication no later than 31 October.

Publishing Procedure:
As stated above, the JBEGS must be finalised by the end of October each year after submissions. During the first two weeks of November, the finalised document must be converted into a PDF format and provided to the City's web administrators for publication on www.joburg.org.za. The document should be placed on the website's Site Guide page as JOHANNESBURG BUILT ENVIRONMENT GUIDELINES AND STANDARDS which should be placed on the DEVELOPMENT PLANNING page.

b) Using JBEGS

The use of JBEGS is to provide the user with a quick reference document in terms of development of the built environment, in particular public environment upgrades. As such, it is imperative for the users to familiarise themselves with the content of the book in order to ensure that they adhere to all required standards and/or guidelines prior to any development.

Some of the content will be of a generic nature which should be applied as far as possible across the entire City, no matter where a development is taking place. The JBEGS are to complement existing engineering and design standards and guidelines where they are of a generic nature and should be applied at the local context on a site specific basis.

However, certain precincts will have additional standards and or guidelines which might not fall in the ambit of the generic clauses. As such, the user is urged to consult the 'Area Based Planning' section of the manual / Annexure B of the manual to determine whether they fall in a targeted area where detailed planning and design has occurred. Where precinct level design has occurred, these standards and/or guidelines will prevail.

[1] As part of your submission, provide proof that the standards and/or guidelines submitted for JBEGS inclusion have been adopted by Council.

3. Standards & Guidelines for the Elements of the Built Environment

c) Commercial Development

i. Industrial

ii. Office

iii. Retail

iv. Home Office

v. Mixed Use

vi. Informal Economic Activity (e.g. Spazas, Shebeens,)

vii. Nodes

d) Housing

i. Typologies

ii. Formal

iii. Informal (backyard shacks & informal settlements)

iv. Tenure

v. Building Control (minimum building standards)

vi. Density

e) Complete Streets

i. Non-Motorised Transportation

ii. Road Design (traffic circles, traffic lights, road reserve considerations, street cross section)

iii. Street Furniture

iv. Security by Design

v. Transport Oriented Development

vi. Open spaces

vii. Activity Streets

f) Resource Management

i. Energy Efficiency

ii. Stormwater Management

iii. Waste Management

City of Johannesburg Metropolitan Municipality: Waste Management By-laws, section 12	ENVIRONMENT AND INFRASTRUCTURE SERVICES DEPARTMENT				
	Waste By-laws published in Provincial Gazette Extraordinary No. 216 dated July 2013 Under Notice 1012				
	PLEASE MARK CLEARLY	**NEW GUIDELINES**	**x**	**Additional** standards / guidelines	

THE PURPOSE OF THE APPROVED STANDARDS AND / OR GUIDELINES		
The purpose of the waste management guidelines is to advise developers on waste management requirements in relation to site development. The guidelines must be read in conjunction with the City of Johannesburg Waste Management By-laws.		
STANDARD / GUIDELINE	**SPECIFICATION**	**ACTOR(S)/ROLEPLAYERS**
Requirement for the submission of an integrated waste management plan	The following information must be included in the plan: • The exact location of the development e.g. ERF 406 INDUSTRIA; • The type of building planned e.g. FACTORY; • An indication of existing, planned and / or alterations and / or additions to existing structures e.g. (i) ALTERATIONS (ii) ADDITIONS (ii) NEW BUILDING • Street names, kerb lines, entrances, and neighbouring property erf, numbers should also be included; • Indication of the zoning of the stand/s; • The number of living units that the complex consists of (in the case of a residential complex); • The name and contact numbers of the architect (company); • Waste management calculations equivalent to the type and size development. • Volumes and type of waste that will be generated during the construction phase and thereafter on how this waste will be disposed of.	PIKITUP, DEVELOPERS, LAND OWNERS, CITY DEPTs AND MEs
Size requirements for the refuse area	It takes roughly four 240 litre bins to store 1m³ of uncompact refuse, and about one square metre of floor area to store a 240 litre bin. *Example* 8.91m³/week × 4 bins/m³ = 35.63 bins say 36 bins. This would require a 36m² refuse room	PIKITUP, DEVELOPERS, LAND OWNERS, CITY DEPTs AND MEs
The refuse storage area requirements	The following are the requirements for the refuse area: • must be walled in by a 1.8m high wall; • must have a 1.2m wide door; • the door must be solid so that the refuse is not visible; • must have a tap and floor level drainage gully (wash-down gully); • the gully must drain to the sewer and not to the storm-water system or to the road; Storm-water from outside the refuse area must not enter the gully. If the storage area is roofed or if the storage area is in a room or basement within the building, adequate ventilation must be provided.	PIKITUP, DEVELOPERS, LAND OWNERS, CITY DEPTs AND MEs

<table>
<tr><td></td><td>• the gulley is likely to be subject to blockage by spilt refuse. It is recommended that a litter basket/catcher be installed to prevent blockages.</td><td></td></tr>
<tr><td>Requirement for the calculation for the volume of waste to generated</td><td>The following is the formula for the calculation of the volume of waste generated per week:
f(g) × FA / 100 = volume (m³)/week
Where:
f(g) = generation factor
GFA = Gross floor area

The table below is typified building area estimates used by Pikitup:

f(g) Generation factor (m³/100m²/week)

Type of building
Factory 0.472707
Warehouse 0.379058
Residential 0.1425
Offices 0.2258
Shops 0.92353</td><td>PIKITUP, DEVELOPERS,
LAND OWNERS, CITY DEPTs AND MEs</td></tr>
<tr><td>Special requirements for skip container services</td><td>Servicing trucks are approximately 10.7m long and loading takes place from the back of the vehicle for Rear-end-loaders (REL) and from the front for Front-end-loaders (FEL).
The following are the requirements:
• for REL compactors a clear headroom height of 5.0m is required;
• for FEL compactors a clear headroom height of 7.7m is required, (be careful of overhead electrical conductors).
• Sufficient maneuvering space in front of the containers must be provided. Ask your traffic engineer to put some vehicle tracking curves on to see if a vehicle can turn around in the available space. The vehicle tracking must be illustrated on the site development plan (SDP);
• The minimum size of 4 m x 6 m = 24 m² for a waste area is required. This area will cater the maximum skip size of 2m x 4m, made to cater for 6 m³ of waste and will allow a 1 m allowance around the skip.</td><td>PIKITUP, DEVELOPERS,
LAND OWNERS, CITY DEPTs AND MEs</td></tr>
<tr><td>Requirements for the submission of a building waste management plan.
(Section 12 of the waste management by-laws)</td><td>A building waste management plan setting out the manner in which all building waste and other waste to be generated in the course of construction will be managed, treated, collected, transported and disposed of must be submitted to Pikitup for approval. The plan will detail the following:
• Proof that all necessary waste management services for the construction activities will be provided by an accredited service provider.
The following must be adhered to:
• No SDP may be approved before the building waste management plan has been approved by Pikitup.</td><td>PIKITUP, DEVELOPERS,
LAND OWNERS, CITY DEPTs AND MEs</td></tr>
</table>

	• A refundable deposit must be paid by the landowner or developer before approval of SDP. • Deposit will be refunded by Pikitup, once the building management plan has been complied with by the developer or landowner.	

iv. Environment / Green Guidelines

a) Open spaces

COJ OPEN SPACE FRAMEWORK	ENVIRONMENT AND INFRASTRUCTURE SERVICES DEPARTMENT				
	COJ Mayoral Committee Resolution 2009-03-05 Item 89				
	PLEASE MARK CLEARLY	Replacement of previous standards / guidelines	**Builds on JMOSS 1,11 and 111, and incorporates substantive aspects**	Additional standards / guidelines	

THE PURPOSE OF THE APPROVED STANDARDS AND / OR GUIDELINES

The open space framework was formulated in response to concerns about the rapid loss and fragmentation of open space resources, the loss of protective vegetation cover and associated ecosystem goods and services, and open space provisioning in relation to new development. It seeks to update open space provisioning in line with sustainability principles and the promote more equitable open space provisioning for better allocation of scarce resources.
The following open space typologies are recognised in the open space framework:

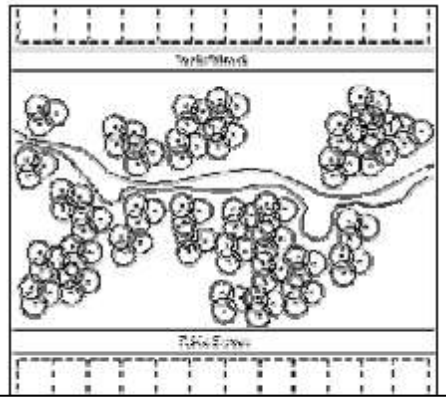
Ecological Open Space		Social Open Spaces
• Nature reserves • Botanic gardens • Water bodies and buffers • Undeveloped ridges • Bird sanctuaries	• Nature trails, areas of high conservation value • Areas with high habitat diversity • Areas with low disturbance • Red data fauna and flora • Natural land cover categories	• Parks (local and regional) • Play areas (local and regional) • Sports and recreational facilities (green areas – local and regional

STANDARD / GUIDELINE	SPECIFICATION	RESPONSIBILITY
1. Quantitative Guidelines for Social Open Spaces	• Provision shall be made within the development for recreational parks in compliance with the COJ Open Space Framework standards and requirements to the satisfaction of EISD. The required standard for the provision of socio-economic open space is 2,4 ha per 1000 population. This includes parks, sports fields, and open spaces such as urban squares but excludes traffic islands and parking areas, ecological open spaces and protected areas which are conserved for their intrinsic value. • In areas where the Open Space Framework has identified a shortage of open space and in high density developments, no financial contributions *in lieu* of parkland will be accepted. Developers are required to set aside sufficient portion of land for open space, parkland within their development(s). • In line with the open space framework, a minimum of 6-8 ha per 1000 population 'breathing space' is required. All households should on average be located within a 30 minute drive of a natural open space.	Developer/City Dept/ME, including other government departments and agencies

2. Quantitative Guidelines for Ecological Open Space	• Ecological open spaces are based on a specific resource, such as a river system or a sensitive habitat area, or on the need to complete the open space network, and thus independent of population requirements. There is no quantitative guideline for ecological open space as protection of these areas is important irrespective of its size. • Ecological open space needs protection simply based on their intrinsic value and the related irreplaceable ecological services rendered.	Developer/City Dept/ME, including other government departments and agencies
3. Qualitative Guidelines for identified development types and environments	Policy guidelines for design and landscaping are detailed in the COJ Open Space Framework document. Key requirements are highlighted below:	
3.1 Qualitative Guidelines for Social Open Space	*Social Open Spaces (Manicured Parks And Sports Fields)* ***a.*** ***Social open spaces should be linked as far as possible*** *so as to effectively increase the capacity of the system. Provision of open spaces within layouts shall optimise linkages:* • *To adjoining open spaces;* • *To schools, libraries, sport stadium and other social/ recreational facilities;* • *To linear spaces and open space corridors;* • *To continuous bicycle- and/or pedestrian routes; and* • *Must as a minimum, create a visual linkage.* ***b.*** ***Social open spaces must be accessible to all segments of the population****, including the disabled to enhance as wide usage as possible. This implies social open spaces:* • *Must be centrally located;* • *Must be visible from public roads;* • *Must have safe pedestrian crossings leading to and from the open space; and* • *Must have entrances that will be easily identifiable and accessible.* ***c.*** ***Existing natural landscape features must be retained wherever possible*** *to help create local identity and an environment of visual interest and scenic value e.g. sites which are pleasant to be on and have unique features such as a clump of trees, a river, rock outcroppings or significant views.* ***d.*** ***Social open spaces must be landscaped in such a way as to minimize maintenance and the need for irrigation****. These implies:* • *Minimising irrigation-intensive plantings, especially lawns, and maximising drought-tolerant species and retention of pre-existing vegetation;* • *If lawns are used, grass species which require less water and are drought tolerant should be used;* • *Separating drought-tolerant and non-drought tolerant species to allow for irrigation by zones;* • *Design should be thematic and complement and enhance the endemic vegetation within the area;* • *Mowing of lawns should be limited to necessary corridors and playing fields to protect indigenous plants and grasses;* • *Landscape design should be appropriate to the level of maintenance envisaged. For example, in low maintenance areas, indigenous plants in mulched soil with crushed rock paths may be more appropriate than a formal arrangement of plants with lawn areas.*	*Developer/City Depts/ME*

	e. Social open spaces must be safe**. Measures to be used can include:* • *Visibility from public roads and adjacent land uses to allow for surveillance;* • *Design of parks should discourage anti-social behaviors;* • *Lighting should include pedestrian-oriented lights. Lighting of trees and other site features is encouraged. Adequate security lighting should be utilised to deter vandals whilst also having regard to the impact of such lighting on adjacent residential areas;* • *Landscaping should not offer hiding places for criminals.* ***f. Social open spaces must be located away from polluting land uses which produce adverse environmental qualities** e.g. main streets and heavy industries. If this is inevitable, buffers consisting of planting should be combined with earth-mounding to act as a buffer to polluting sources. Greater buffer distances are necessary for active facilities and children's playgrounds.* ***g. Social open spaces should be usable for their intended purpose e.g. relatively flat for sports fields. ***h. Social open spaces must be made accessible, with the following attributes**:* • *Good pedestrian access;* • *Must be located within short walking distance from the residents it intends to serve, preferably within a radius of not more than about 500m; and* • *Residents should not have to cross any major arterials or barriers to reach the park.* *<u>Types of facilities:</u>* • *Combination of a variety of activities for both active and passive recreation;* • *Public convenience; and* • *Off-street parking* *<u>Linkages:</u>* • *In new areas, should be linked with secondary or tertiary education facilities or higher order social facilities;* • *Combined with parkways, greenways and greenbelts; and* • *Could link with ecological spaces to allow for environmental education programmes.* *<u>Size:</u>* • *Generally large: should be of a size and physical nature capable of supporting active and/or passive recreational facilities (2ha+)* ***i . Local Social Open Spaces*** *<u>Type of facilities:</u>* • *Space and facilities provided for all groups but with an emphasis on the activities enjoyed by the young and the elderly because these groups are less mobile and have more leisure time than other age groups; and* • *No need for parking.* *<u>Linkages:</u>* • *In new areas could be linked with primary education or lower order social facilities; and* • *Could be shared with street space.*	

	Design: • *Could take different forms e.g. 'green' or 'brown' or a combination;* • *Should provide sunny and shaded play areas for children as well as open shelter with benches for parents;* • *Playing surfaces may be covered in sand, wood chips, rubberized surfaces, synthetic grass or other equivalent material;* • *Paths and walkways may be paved in concrete, crushed gravel, brick pavers, or similar material, or partially paved;* • *Should be overlooked by adjacent properties; and* • *Should be planted with similar trees on the periphery.*	
3.2 Qualitative Guidelines for Green Linkages	*Green Linkages include Parkways and Greenways* *The system of open spaces and recreation facilities is incomplete without an equally important system of linkages that provide ready access to all parts of the system. Every opportunity to facilitate movement from one facility to another should be utilised.* • *All watercourses, linear or ribbon open spaces, utility corridors, buffer zones, abandoned right-of-ways and conservation areas must be used to link the component parts of the system and thus facilitate such activities as cycling and walking. The objective becomes the safe pedestrian flow to schools and shopping areas as well as public access, without a car, to recreational facilities and the exploration of the city.* • *All households must be within 1km of a linear open space (such as a walking or cycling route) that connects the different open spaces.* • *Parkways and greenways are linear corridors of open space incorporating natural features such as streams and rivers within neighbourhoods for conservation and recreation purposes. They separate walkers, joggers, and cyclists from vehicular traffic and provide a safe transportation corridor linking neighbourhoods with parks, schools, cultural & historic sites, and other developed areas.* • *Parkways are entirely bounded by streets, while greenways may or may not be.* • *Interior areas within parkways and greenways should remain natural, and any new plantings should be indigenous species arranged informally. The green space should be designed in line with storm water reticulation and management.*	*Developer/City Dept/ME*

	 **Figure: Parkways and Greenways**	
3.3 Qualitative Guidelines for Streetscapes	***a. Tree Selection Criteria*** *The planting of trees adjacent to streets can serve several other functions as well as:* • *To create a regional landscape imagery;* • *To improve the microclimate of the street.* • *To act as a buffer between pollution created by cars and adjacent land uses; and* • *To protect pedestrians from vehicular traffic.* *Trees must be selected with reference to the following:* • *Suitability for the region, based on climate, endemic vegetation and habitat type, and cultural elements;* • *Hierarchy and character of street;* • *Function and desired impact;* • *Tree structure and growth pattern.* *The surrounding context and its* ***natural, cultivated or built-up character*** *must be taken into consideration as well as the surrounding tree species to ensure that the trees blend into and enhance the surrounding environment when mature.* ***b. Tree planting criteria*** • *Due to the ecological and place making value of trees, trees and engineering services must be regarded as service delivery imperatives of equal importance and status within the road reserve;* • *The planting of trees within the total compliment of road reserve hierarchies must be pursued at all times in roads with of metropolitan and regional significance. In lower order streets, 13 and*	*Developer/City Dept/ME, including other government departments and agencies*

	10 meter the planting of at least one row of trees must be pursued; • *Priority must be given to the "densification corridors" and streets that contribute to the legibility of the city (ceremonial routes and boulevards). Thereafter attention should be given to linkages and residential streets;* • *Sufficient planting space must be secured within the road reserves of densification corridors;* • *Trees must be selected on the basis of the proposed tree selection criteria and should seek to prioritise place making;* • *An aesthetic balance should be sought along all streetscapes: gaps must be planted up and trees must be planted to attain similar proportions and spacing on either side of a road.* • *Trees should be spaced to facilitate maximum definition and overall structure and spacing in excess of 10 -15 meters should be implemented.* • *Big trees should be planted approximately 20 or 40m apart, depending on the situation and the amount of houses in a street.* • *Small trees should be planted approximately 10 or 20m apart, depending on the situation and the amount of houses in a street.* • *Trees are to be planted so that they allow for an unobstructed pedestrian flow.* • *No planting of trees must be undertaken within 20meters from a traffic intersection.* • *No planting to be undertaken within 2 meters of an existing vehicle entrance or an electrical stay-wire support.* • *Planting may not be undertaken within 10 meters of an existing electrical or street light pole.* • *Plants used should not reduce visibility or obscure signs.* • *Planning during road upgrading projects must integrate existing trees from the earliest possible stages of the planning process. Every effort must be made to retain and incorporate such trees within the end result, and negotiation around reduced lane widths and turning radii, must be considered where possible;* • *Planning of new developments must integrate and respond to existing trees in this regard* ✓ *level changes, trenching and compaction must be avoided, or where not possible, minimised around the tree root zone as this severs tree roots;* ✓ *drainage levels must be maintained to prevent drought or water logging of the root zone.* *The planting of trees within the road reserve shall take cognisance of not only the location of the proposed intervention, but also the intended typology to be created.* *With regard to **LOCATION** the following criteria is relevant:* **i. <u>Inner City</u>** • *A formal, dignified and ceremonial planting approach must be followed;* • *Highly structured and large trees must be selected for planting in ceremonial streets and boulevards* • *Trees must be planted within elongated planting wells, as opposed to small round wells with grates, to enable root space.*	

ii. Cores

- *A tree palette must be developed for each core;*
- *A Boulevard planting approach must be followed focusing on place making;*
- *High - Moderately structured and medium to large trees must be selected for planting.*

iii. Densification Corridors

Priority should be given to densification corridors for tree planting and the following is the planting protocol:

- *An Avenue planting approach must be followed;*
- *High - Moderately structured and medium to large trees must be selected for planting.*
- *The proposed tree planting intervention should be dictated by the regional character and site-specific context.*

*With regard to **TYPOLOGY** the following criteria is relevant:*

i. Ceremonial Route:

A road for stately occasions, processions and celebrations that:

- *is as wide as possible;*
- *is an intensively developed open space;*
- *contains at least two rows of trees on either side of the road as well as one row within the median island, if relevant;*
- *contains trees responding to ceremonial, place-making, legibility, structuring functioning;*
- *provides wide pedestrian sidewalks on either side of the road;*
- *Does not contain overhead utilities;*
- *Contains public art and street furniture.*

ii. Boulevard:

A road within a core or linking place making nodes that:

- *is as wide as possible;*
- *is a highly developed open space;*
- *contains at least two rows of trees on either side of the road as well as one row within the median, if relevant;*
- *contains trees responding to place-making, legibility, structuring, recreation and social interaction functioning;*
- *provides for wide pedestrian sidewalks, linking to squares and activity nodes;*
- *does not contain overhead utilities;*
- *contains public art and street furniture.*

*<u>Requirements for Ceremonial routes and Boulevards**:**</u>*

- *Indigenous plants should be used;*

	• *Planting should be used to provide focal points, character, screening, softening and shade;* • *Paved areas should be minimised, while planting opportunities maximised;* • *Evergreen trees should be used to provide shade while deciduous trees should be provided for seasonal change;* • *Shrubs and trees should be placed in such a manner that they do not provide hiding places for criminal elements or visual obstruction;* • *In smaller and isolated areas groundcovers should be used instead of Kikuyu grass;* • *Scrambler shrubs (e.g. Plumbago capensis or Teocomaria capensis) should be used as groundcover for large areas;* • *Bare walls (e.g. privatised garden walls in group housing schemes) must be softened with planting;* • *One tree should be provided per 3 parking bays;* • *Where hard urban spaces cannot be spatially defined by means of surrounding buildings, landscaping elements should provide the desired spatial definition* • *Landscaping of sites adjacent to boulevards and civic squares must contribute to the stately character of these spaces.* **iii. Activity Streets:** *A highly used road with many activities abutting it that:* • *adjoins land uses including a mix of residential, office and commercial uses, including a vertical mix of those uses within a building.* • *is a moderately developed open space* • *contains at least one row of trees on either side of the road, as well as one row within the median island, if relevant* • *contains trees responding to place-making, legibility, beautification and structuring functioning* • *accommodates a high level of pedestrian activity.* • *accommodates high levels of public transport.* • *Contains public art and street furniture.* *<u>Requirements of Activity Streets</u>**:** • *Trees should be planted along streets and around squares to provide shade for people walking between public transport facilities and their work places, to enhance the environment, as well as to soften the potentially harsh impact of industrial and semi-industrial structures;* • *Specialised activity squares should be suitably landscaped for use by employees from surrounding offices, workshops, factories etc. for relaxation e.g. during lunch times;* • *The use of planters and hanging flower baskets should be considered along activity streets.* **iv. Linkage Routes:** *A road linking important metropolitan and regional open space resources that:* • *is a moderately developed open space*	

	• *contains at least one row of trees on either side of the road;* • *contains trees responding to structuring, ecological, recreational and social interaction functioning* **v. Highways:** *The highest and second highest order roads that typically does not allow for tree planting.* • *All buildings next to freeways and other higher order mobility routes should preferably be set in a park-like environment.* • *Landscaping of sites adjacent to these roads should therefore be well designed and of the highest quality.* **vi. Residential Street:** *A road internal to a neighbourhood or linking various neighbourhoods that:* • *is a minimal developed open space* • *contains at least one row of trees* • *contains trees responding to structuring, ecological, recreational and social interaction functioning.* • *avoids obstructing northern and eastern solar access to residential properties.* *<u>Requirements for linkage routes, highways and residential streets:</u>* • *Sufficient space should be provided between driveways and garden walls to allow for growth of trunks of trees (minimum 1.5m)* • *When curvilinear, can be planted with a diversity of species in informal patterns to mimic nature, whereas when in grid pattern, is planted in a more formal manner.* **vii. Markets:** • *Trees must be planted abundantly to provide shade for vendors and buyers. Even if shade is provided by means of canopies or other types of shelters, trees are still needed to soften the visual impact of the structures;* • *Metal, concrete or other tree grids should be avoided as they are easily vandalised and tend to collect rubbish and cigarette buts. Instead the area around the tree should be appropriately edged (e.g. kerbs or bricks) and possibly filled with gravel.* **viii. Roads and Traffic Circles:** • *All unpaved or non-tarred surfaces must be appropriately landscaped or at least planted with low maintenance ground covers;* • *Central parts of bigger traffic circles, unless designed as civic squares, markets or other types of squares, must be landscaped.* **ix. Parking areas:** • *Trees preferably evergreen must be planted along all streets where provision is made for*	

parallel, diagonal or perpendicular parking in order to provide shade for the parked vehicles, as well as to soften the visual impact of parked cars.

x. Public Transport Routes:

- *Trees should be planted in suitable locations within and around bus stations and taxi ranks in order to soften the potentially harsh visual impact of the structures.*
- *A landscaped setback from the street should be provided for all taxi ranks and stations.*

*With regard to **ENGINEERING INFRASTRUCTURE:***

*There is a potential for conflict between trees, above ground infrastructure (such as **powerlines**, **street lighting, signage, paving, kerbing and road surfaces)** and underground infrastructure **(**such **as water pipes, sewerage pipes, telecommunication cables)**. The design and location of such services must be coordinated on an **equal basis** during the earliest possible stages of the design process in accordance with the way-leave policy, to minimise conflict which may result in loss of trees, increased maintenance costs or reduced public safety.*

i. Street lighting:

- *trees must be adequately spaced between street lights to avoid illumination problems;*
- *such lighting must be carefully selected within special precincts/districts or red nodes to recognize the identity and place making function of the specific environment.*

ii. Traffic signage:

- *trees must be planted and signage located such that clear sightlines are ensured.*
- *trees must be maintained and pruned regularly to minimize low branches that impede desired sightlines.*

iii. Paving, kerbing and road surfaces:

- *trees should be afforded the maximum possible space and be planted as far as possible away from kerbing and paved surfaces to minimize potential conflicts*
- *suitable trees must be selected in terms of identified maintenance criteria.*

iv. Water pipes, sewerage pipes and telecommunication cables, all possible effort must be made to:

- *negotiate reduced requirements on distance and space for such services within the road reserve to facilitate the planting of trees;*
- *place such services in combined service trenches, under pedestrian walk ways and road surfaces;*
- *minimize maintenance risks to such infrastructure due to tree root damage, through the use of appropriate pipe materials, regular maintenance actions and the use products such as "bio-barrier";*

	• *select suitable trees in terms of identified maintenance criteria*.	
3.4 Qualitative Guidelines For New Developments	***a. General*** Respect for nature and ecological processes: • *Environmental aspects on any development site must be fully understood and must suitably inform all decisions and the development must respond to existing site features (i.e. rocky outcrops, existing trees, natural ground level) and trees.* • *Landscape designs must be submitted for approval and must include at least 50% indigenous species.* • *New development must recognise the subtle topological features and native vegetation and develop new landscape, pathways, activities, and civic places that protect and enhance these features.* • *The design of new buildings, walkways, and landscape elements should enhance and develop existing parks, viewpoints, rivers and other open space elements, and foster access to these natural areas.* • *The relationship between the built and natural environments should be reinforced through view corridors, pedestrian links, viewpoints and other features, that adds to the design quality of the city and helps to define and protect the character.* • *Where an application site contains ecologically sensitive areas, the development application must include these as protected open space.* • *Storm water attenuation must be addressed on site.* • *Existing indigenous trees must be retained as far as possible.* ***b. Open Space Provisioning*** Open space shall be provided on site: • *Cash contributions will not be accepted in lieu of Open Space provisioning unless a suitable site for alternative open space has already been identified, is obtainable, agreed to with EISD (Water and Biodiversity) and developed accordingly.* • *Land provided in terms of Open Space Provisioning will be evaluated not only according to quantitative guidelines, but also in accordance to the qualitative guidelines as set out in this document.* • *Both hard and soft landscapes should be considered.* *Refer to open space management guideline for specific requirements.* ***c. Development adjacent to existing Ecological and Social Open Spaces*** • *Any development adjacent to open space, whether social or ecological, must be compatible with the function and aesthetics of the open space in terms of land use, scale, massing, spatial interaction, appearance and landscaping.*	*Developer/City Dept/ME, including other government departments and agencies*

	• *Any development adjacent to existing open space must actively contribute to the protection and enhancement of the open space and compliment to the Open Space i.e. the development may not turn its back or storage areas onto the Open Space.* • *An SDP and LDP for the proposed development demonstrating its interface treatment with the Open Space must be submitted to the EISD for approval.* • *The developer must landscape the boundary interface with the Open Space with endemic (local to the area) vegetation.* • *No solid fencing will be allowed on the communal boundary with Open Spaces. At least 50% of the fencing should be transparent/permeable allowing for the screening of backyards, where approved, and the movement of species.* *The development may not extend its activities onto the Open Space (parking, storage, dumping, earthworks, cooking ablution, accommodation, littering).* • *All disturbed open spaces along water bodies, especially the areas below the 1:50 and 1:100 year flood line must be rehabilitated with vlei complimentary riparian vegetation where possible.* **i. Landscaping** • *Landscaping and materials should be based on endemic species.* • *All Classified Invader Species must be eradicated and controlled on the development site.* • *No tree on the road reserve may be removed to accommodate entrances to the development.* • *One indigenous 50-litre tree for every three (3) parking bays must be provided to minimise the impact of extensive paved surfaces, i.e. increased heat generation, increased stormwater run-off, reduced potential for groundwater penetration; etc.* • *Should parking bays be developed head-to-head, one (1) tree must be planted for every four (4) parking bays in conjunction with landscaped islands. The landscaped islands must serve to break the expanse of paved surface, must serve to reduce the environmental impact of the paved surface and must be planned with due consideration of pedestrian circulation and plant maintenance requirements. (Trees often perform poorly when planted in areas with impermeable surfaces, suffering from stress due to lack of water and air. Providing more space around the tree is imperative, also to prevent the girdling of the tree. In this regard a minimum of 1,5 x 1,5 meter openings will be required.)* • *Where possible, developers must be encouraged to upgrade their adjoining road reserve, with specific reference to the planting of trees and formalisation of pedestrian walkways.* • *Bare walls (e.g. privatised garden walls in group housing schemes) must be softened with planting.* • *All new development must provide trees along streets and pathways chosen according to the regional tree-planting palette.* • *Full co-ordination of laying underground utilities and planting should be carried out at the early planning stage to ensure sufficient paving space is reserved for tree planting and to avoid problems of conflict during construction.* ***ii. Stormwater Treatment*** • *Approval of on-site stormwater management and retention must be obtained from EISD (Water & Biodiversity) and the JRA.* • *Site design must minimize imperviousness and maximise permeability.*	

- *Development should be clustered to maximise unpaved areas.*
- *Direct runoff from pavement and buildings must be directed into vegetation-lined channels.*
- *Water holding areas such as recessed athletic fields, ponds, cisterns, and other features that serve to recharge groundwater, reduce runoff, improve water quality and decrease flooding should be incorporated into the layout or site design.*
- *All aspects of landscaping from the selection of plants to soil preparation and the installation of irrigation systems must be designed to reduce water demand, retain runoff, decrease flooding, and recharge groundwater.*
- *Permeable surfaces should be used for hardscape.*
- *Impervious surfaces such as driveways, streets, and parking areas must be minimised so that land is available to absorb stormwater, reduce polluted urban runoff, recharge groundwater and reduce flooding.*

d. Residential Development on land parcels larger than 5ha (including Golf Estates, Lifestyle Estates, Mixed Residential Areas and Subsidised Housing)

i. General:

- *Open space shall be provided as per the quantitative guidelines.*
- *The open space shall be linked to cycling and walking routes and adjacent open spaces.*
- *Ecological corridors shall be provided that link different ecological spaces.*
- *These corridors and spaces must not be walled but accessible to people of the estate and allow for wildlife migration.*

ii. Design Guidelines:

- *Developers are encouraged to explore new technologies and design approaches that are founded on sustainable development principles, sometimes referred to as "environmentally friendly technologies" or "green building or green technologies".*
- *The use of fencing must take account of ecological corridors. Accordingly fencing must not be placed in a manner that disrupts the functioning of such corridors. Neither the movement of small nor large animals must be negatively impacted.*
- *The design layout of a proposed development must not compromise ecosystem functioning.*
- *Indigenous grasses (e.g. Paspalum vaginatum or Cynodon dactylon or any other species that has been tested and found to be suitable by the municipality must be used for fairways and greens (and gardens of related development) to minimise the need for the application of herbicides, pesticides and fertilisers and to reduce water demand (i.e. irrigation requirements), unless otherwise agreed with the municipality and the JCP.*
- *The use of indigenous water-wise species, for landscaping of estate gardens, including the gardens at individual residences must be specified in a design plan.*

iii. Visual and environmental guidelines:

- *The scale and design of the development must not be disruptive to the sense of place of an area or neighbourhood.*
- *The visual impact of development will require careful attention. Care must be taken to ensure that the visual impact from all public places or intended public places (e.g. roads, beaches) is assessed and mitigated.*

	• *Walling, security features and entrances require particular attention. As a rule visually permeable fencing and walling must be used and entrances must include soft landscaping to prevent them from being hard and visually intrusive features (i.e. entrances should not stand out against their surroundings).* • *An open form of development should be considered as a first option, that is, before that of a completely fenced development or "gated community" is considered.* • *The development must be designed such that it blends into neighbouring areas, if the entire development is to be fenced.* **iv. Stormwater and water use guidelines:** • *Consideration should be given to the creation of artificial wetlands for the treatment of stormwater run-off, particularly from areas where fertilisers, herbicides and pesticides are used.* • *Measures such as swales and cut-off drains must be provided for to divert poor quality stormwater runoff to effluent treatment facilities or to artificial wetlands, if created on the site.* • *The design of swales and cut-off drains should provide for runoff of acceptable quality to enter the natural drainage system so as to minimise changes to the natural hydrological regime of the system.* • *Stormwater infiltration must be promoted through minimising hard paved areas and the use of porous paving surfaces, where paving is required.* • *Designing with water conservation in mind: the principles can be applied to homes, clubhouses and hotels. Rainwater and grey water can be directed for use in irrigation of landscaped areas as well as golf courses and polo fields.* **v. Landscaping Guidelines:** • *A list of approved plant material must be provided as part of the landscape design proposals* • *Existing indigenous trees should be retained wherever possible. Existing trees with a diameter larger than 100mm may not be cut down without the written consent of the municipality. If any such indigenous trees are removed without approval, they will have to be replaced with the same size tree at the developers cost.* • *All vacant erven are to be kept clear of alien invasive plants at all times.* • *Homeowners shall not add or remove any vegetation to or from the golf course or private open space areas.* • *No alien invasive plants are permitted within in residential areas.* • *The development of an estate is subject to an EMP and Landscaping Management Plan approved by EISD.* • *The Landscaping Management Plan submitted to the EISD (Water & Biodiversity) shall indicate the following:* ✓ *The treatment of the interface between the estate and surrounding properties* ▪ *Communal walkways and any other linkage structural between urbanised areas and open spaces;* ▪ *Storm water control.*	
4. Specific Guidelines For Development Along	Ridges play an important role in ecosystem sustenance and biological biodiversity as they provide	Developer/City Dept/ME, including other

Ridges	habitats for fauna and flora. Ridges must be seen as part of the wider ecological continuum and a part of the Ecological Open Space Network that must be preserved as a migratory corridor for faunal movement, as well as a habitat and roosting site**. Please refer to Ridges Guideline for more information and control measures for developments on or abutting ridges.**	government departments and agencies
5. Specific Guidelines for Development next to rivers and wetlands	*Development adjacent to wetlands is subject to the following conditions:* • No fences, parking access, parking space(s), paved areas or swimming pools should be constructed within buffer strips. • No grading or filling, planting of exotic/non-native or non-riparian plant species, or the removal of native vegetation, within the buffer strip should be allowed. • No edge vegetation should be removed when developing along rivers and streams. Developments should rather incorporate the edge vegetation as part of the development and conservation lines should be erected before construction commences to protect the vegetation from damage. • Existing undisturbed grass and shrub coverage should be retained. • In areas where vlei vegetation is already disturbed and disturbed by construction works, the vlei vegetation is to be rehabilitated by a suitably qualified contractor as soon as the construction works are completed. • Where constructed drainage devices and improvements are required, they should be placed in the least visible locations and naturalised through the use of river rock, earth tone concrete and native landscaping. • Storm water should be managed on-site before entering the storm water system. The post-development storm water run-off should not significantly exceed the pre-development values in peak charge for any given storm. The same principle applies to pollutant and debris concentrations reaching the watercourses • To reduce run-off, impervious surfaces should be limited to the minimum possible and the development planned to utilise permeable surfaces wherever feasible. • Walkways should form a buffer between natural and manicured vegetation.	Developer/City Dept/ME, including other government departments and agencies

b) Rivers, Wetlands and streams

COJ CATCHMENT MANAGEMENT POLICY	ENVIRONMENT AND INFRASTRUCTURE SERVICES DEPARTMENT				
	CoJ Mayoral Committee Resolution of 15 June 2008, Item 5				
	PLEASE MARK CLEARLY	Replacement of previous standards / guidelines	**No - New**	Additional standards / guidelines	See also Stormwater By Laws and Manual

THE PURPOSE OF THE APPROVED STANDARDS AND / OR GUIDELINES

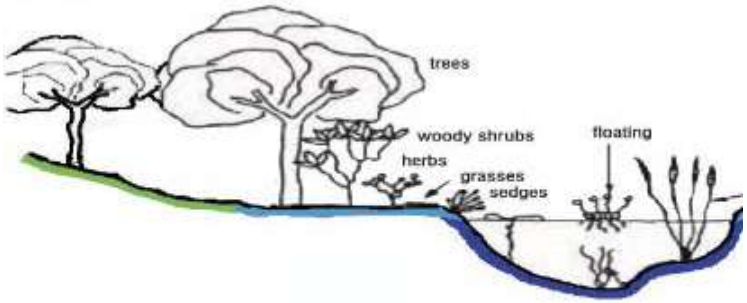
To manage development adjacent to, and within floodplains and wetlands, together with the management of stormwater, in order to promote the following:

- Protection of water resources, maintenance of water balance, and promotion of river health
- Development certainty in respect of river encroachment and stormwater management requirements
- Protection of ecology and morphology of rivers and wetlands
- Protection of human health and safety and reduced vulnerability to climate change
- Prevention of flooding (and damage to people or property)
- Prevention of pollution of water resources, both surface and groundwater
- Maintenance of healthy aquatic and riparian ecosystems (lakes, dams, streams, wetlands, floodplains)
- Maintenance of morphological stability of watercourses
- Restoration of social amenity of watercourses and riparian zones

The Catchment Management Policy has a strong land use and stormwater management bias as it recognises that environmental components cannot be divorced from engineering component and urban development patterns and stormwater runoff are significant contributors to the degradation of riverine environments. The policy seeks to implement source-based controls to contro and minimise impacts, and also to implement the principles of "polluter pays" and "beneficiary bears the costs".

The most important aspects which the policy addresses relate to the management of development adjacent to, and within floodplains and wetlands, as well as development control issues relating to this. The policy also addresses the management of stormwater.

STANDARD / GUIDELINE	SPECIFICATION	RESPONSIBILITY
Floodline Information	Any proposal for development in the proximity of a watercourse or wetland must contain an accurate floodline plan and technical report reflecting: • The boundaries of all wetlands, the edges of all watercourses and riparian areas, • Existing and original floodlines for the following recurrence intervals, 5, 10, 20, 50, 100 years and Regional Maximum Flood (REF), • Information concerning how the floodline was determined, what methods were used and what assumptions were made about development in the catchment. • The name and technical competency of the certifying Engineer • Where floodlines have not previously been determined by the Council for a particular watercourse the developer shall determine these lines at own cost and in accordance with the Council's standards and requirements. Once approved and accepted the submitted information will become the property of the Council to use and disseminate as it sees fit. Floodplains must be defined, and floodlines computed for all streams. Floodlines should include the RMF, 100, 50, 20 and 10 year lines.	Developer/City Dept/ME including other Government Departments and Agencies

	Where the catchment area of a particular stream is less than 0.5 km^2 the requirement to define the floodline may be waived by the Council at its sole discretion. Where floodlines are not shown, the plans shall contain a description and explanation as to how floodwater in the stream will be managed. Flood risk zones must be defined and shown on plans, and relevant information on the floodline and flood risk plans as detailed in Appendix G of the Catchment Management Plan (CMP) must be provided.	
Delineation of the Riparian Zone	Riparian areas should be delineated by marking the outer edge of the macro channel bank and associated vegetation, in terms of a delineation procedure described in the DWA document entitled "*A practical field Procedure for identification and delineation of wetlands and riparian areas*" The National Water Act (NWA) defines a riparian habitat as follows: "Riparian habitat includes the physical structure and associated vegetation of the areas associated with a watercourse which are commonly characterised by alluvial soils, and which are inundated or flooded to an extent and with a frequency sufficient to support vegetation of species with a composition and physical structure distinct from those of adjacent land areas." Riparian area delineation comprises the determination and marking of the boundary of a riparian area, or the outer edge of the macro channel bank and associated vegetation. A good rough indicator of the outer edge of the riparian areas is the edge of the macro channel bank. This is defined as the outer bank of a compound channel and should not be confused with the active river or stream channel bank. Flood benches may exist between the active channel and the macro channel bank, and are often covered by alluvial deposits and may have riparian vegetation on them. The macro channel bank often represents a dramatic change in the frequency, duration and depth of flooding experienced, leading to a corresponding change in vegetation structure and composition.  Terrestrial area Riparian area Submerged aquatic area **Fig 1: Typical Cross Section of a River Channel**	

Floodplain land use	• No reclamation of land or construction of permanent structures (including parking, paving or fencing) is permitted within the riparian zone or within a buffer of 30 m from edge of riparian zone or the river bank where this is clearly identifiable. • A buffer of a minimum of 30 m on each side of the riparian area (or greater as is necessary to maintain ecological functioning) must be provided adjacent to all riparian areas and adjacent to all wetlands. For areas outside of the urban edge, a buffer of 50 m must be provided. • No development of any type will be permitted within the 1:100 year floodline or within the riparian zone and a buffer area of 30 m from the edge of the riparian zone or river bank where this is clearly identifiable (outside the urban edge, buffer is increased to 50 m) must be provided. • Relaxation of these restrictions will only be considered where: ✓ Structural modifications to watercourses are required to protect infrastructure belonging to the City of Johannesburg; ✓ Structural modifications to the channel or floodplain are required to protect existing developments from flooding; ✓ Modifications to the water course or riparian zone will result in an improvement of its class in terms of the River Health Programme; and ✓ Modifications to the riparian zone are required to address stormwater attenuation requirements to the satisfaction of the JRA and EISD.	Developer/City Dept/ME including other Government Departments and Agencies
Zoning of riparian zones	All areas below 50 yr floodline (or 32 m from centre of river whichever the greater) are to be zoned "open space". The preferred zoning is "Public Open Space" to provide for continuity of the open space corridor for recreational and ecological functionality. A zoning of 'Private Open Space" will only be permitted at the discretion of EISD (Water and Biodiversity) subject to conditions which ensure the management and protection of the ecological and hydrological functionality of the riparian zone and associated buffers.	Developer/City Dept/ME including other Government Departments and Agencies
Developments within floodlines	a. <u>Buffer zone for riparian area</u> Only permeable perimeter fencing to the satisfaction of the COJ EISD. Such permeable fencing will only be permitted across the riparian zone / wetland area on outer road crossings, will be designed in a manner which does require foundations to be constructed within the riparian zone / wetland area or associated buffer areas. The fencing shall also provide for eco underpasses and the maintenance of ecological linkages, including aquatic ecosystems, and should still allow for the free movement of small mammals, and shall not be a barrier to the movement of such mammals. b. <u>50 year to 100 year floodlines</u> • No structure that results in a loss of flood storage capacity from the system; • No fill, dykes or berms intended to restrict the inundated floodplain area (including fill for sports fields); • No structure that has not been designed by a structural engineer to withstand the floodwater load will be allowed; • No ground floor in which people sleep at night; • No impermeable roads or parking areas; • No facility that poses a risk to water quality; • No agricultural activity, which may result in the destabilisation of the groundcover or poses a risk to water quality through the use of harmful pesticides and fertilisers. c. <u>20 year to 50 year floodline</u> • No permanent structures, except bridge supports (this includes swimming pools, tennis courts, brickwork gazebos, etc.) designed so as not to interfere with the integrity of the floodline area; • No roads or parking areas;	Developer/City Dept/ME including other Government Departments and Agencies

	• Only temporary structures that do not interfere with the function of the floodplain as an ecological corridor. d. <u>10 year to 20 year floodline</u> • Only ground level modifications that do not reduce the permeability of the floodplain soils or interfere with the ecological corridor alongside the watercourse; • No developments below the 10 year floodline; • Only approved water abstraction facilities; • Landscaping allowed with very minor earthworks and planting with locally indigenous riparian vegetation only; and • Approved structures to control bank erosion. Notwithstanding the provisions above, uses that have been proved to be non-destructive to natural river systems and their surroundings may be permitted within the riparian zone, subject to the following i. Consideration of the specific characteristics of the watercourse or wetland ii. The issuance of a Water Use License (WUL) by DWA. Permitted uses may include water supply, fisheries, wetland edge gardens (with indigenous vegetation) but specifically exclude permanent structures or canalisation. Land development at all scales must provide sufficient space for the implementation of the runoff control measures, and layouts must not be given final approval without adequate spatial provision having been made for drainage and attenuation requirements.	
Watercourse crossings	• Roads which traverse watercourses are to be constructed as span bridges with side supports outside of the riparian zone and associated buffer areas, with minimal additional support pillars permitted as required to support the span, and subject to the detailed design being approved by both JRA and EISD (Water and Biodiversity Unit). • Roads which traverse wetlands at grade are to be constructed in a manner which provides for the engineering of the substrate such that the hydrological linkages are maintained across the full span of the affected wetland area. • Where road crossings are permitted to serve as part of attenuation structures, provision must still be made for underpasses to ensure the maintenance of ecological linkages, including the sustenance of existing aquatic ecosystems, and to facilitate the free movement of small mammals.	Developer/City Dept/ME including other Government Departments and Agencies
Protection of Wetlands	• The City may define wetland areas within a proposed development and require special treatment of these wetland areas during design, construction, and operational phases of the development.	CoJ
Management of Stormwater and Water Quality	• Provision for attenuation of storm water will need to be made within the site and attenuation facilities or infrastructure will not be permitted within the 1:100 floodline or within the delineated wetland or riparian zone or associated buffers. Relaxation of this requirement may be permitted at the discretion of EISD (Water and Biodiversity) under the following circumstances: ✓ Where such dam would enhance the habitat and allow for the creation of an aquatic habitat within the buffer area; ✓ Where such dam already exists due to historic development patterns; ✓ With due reference to the vegetation – the construction of dams should not result in or necessitate clearance of riparian habitat or natural vegetation. • A stormwater management plan must be submitted for the approval by both the JRA and EISD (Water and Biodiversity) prior to the approval of the final SDP. Such plan will be required to meet the following criteria/standards: ✓ Peak discharge - no increase in discharge for any event of any duration up to the 25 year RI event ✓ Volume of runoff - no increase up to the annual 10 year rainfall ✓ Runoff frequency - no surface runoff for the 1 yr RI event of any duration	Developer/City Dept/ME including other Government Departments and Agencies

	✓ Water Quality - no deterioration and should meet the following objectives: - reproduce as nearly as possible the hydrological conditions at point of discharge that existed prior to development; - provide for removal of most urban pollutants; and - have a neutral to positive impact on the natural and human environment. • The storm water management plan should also minimize the generation of surface runoff and stormwater through adopting the principles of Water Sensitive Urban Design (WSUDS) and Sustainable Urban Drainage Systems (SUDS). The WSUDS and SUDS can be used to manage the impacts of urban development on the water cycle as an alternative or supplement to traditional 'end of pipe' techniques, and typically include techniques relating to stormwater conveyance, receiving water protection, and water usage and recycling, in order to reduce the negative impacts or urban development on the water cycle. • To minimize surface runoff and to maintain water quality, consideration should be given to:- ✓ the use of bio-retention ponds, ✓ enhanced swales and grass lined channels, ✓ stone filled infiltration ditches, and ✓ permeable paving. • The layout and associated stormwater management plan should optimise opportunities for linking the water cycle and integrating engineering, water conservation and greening, through:_ ✓ capturing of runoff for re-use, ✓ natural irrigation and links to landscaping, and ✓ the use of natural plant filters. • Stormwater management must seek to recharge natural underground water systems and the discharge of runoff must take place as cl to the point of interception as possible. In addition, single discharge points must be avoided in favour of multiple discharge systems to achieve a more natural flow. • Underground tanks are not permitted except in exceptional circumstances at the discretion of COJ. • The quality of stormwater runoff from proposed land developments shall be at least as good as runoff from the property before development. A range of stormwater quality improvement devices is detailed in Appendix G of the City's Stormwater Management By-laws. Kindly refer to the detailed Stormwater Management By-Laws for more information. • The City may at its discretion request the implementation of additional WSUDS measures (e.g. permeable paving, swales, infiltration trenches, vegetated buffer zones etc.) in respect of future land development projects within sensitive or stressed sub-catchments.	

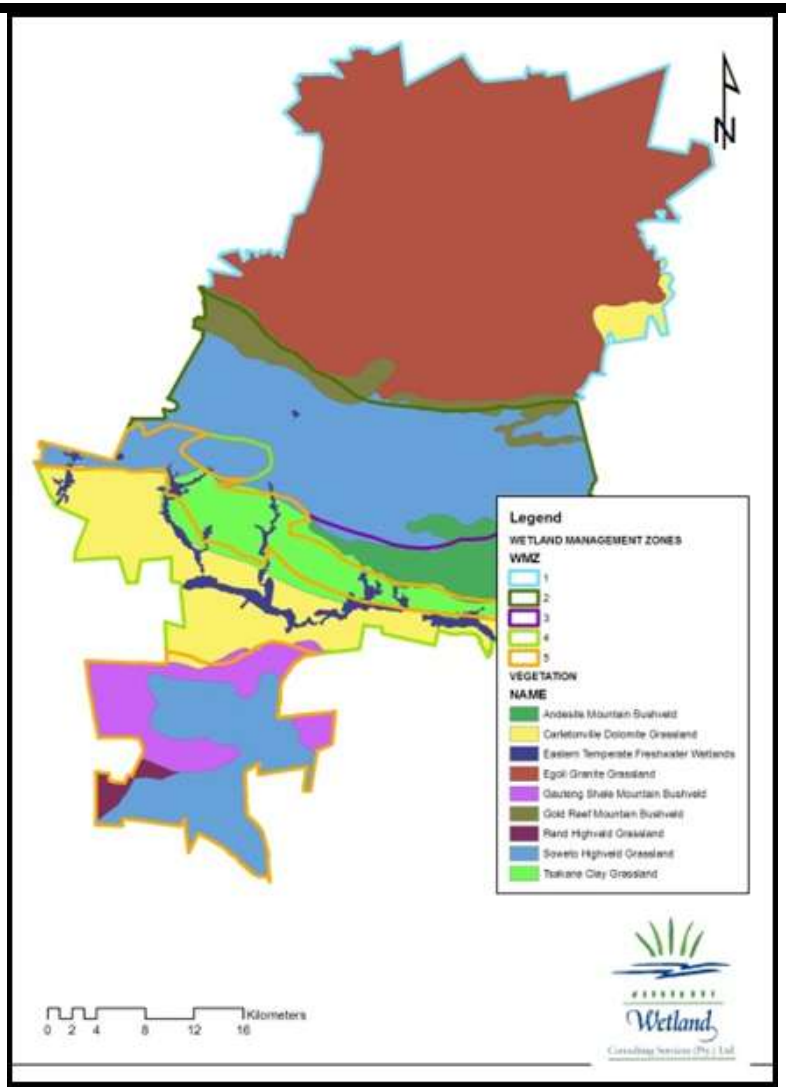
COJ WETLAND PROTECTION AND MANAGEMENT PLAN	ENVIRONMENT AND INFRASTRUCTURE SERVICES DEPARTMENT				
	CoJ Mayoral Committee Resolution 25 November 2008, Item 40				
	PLEASE MARK CLEARLY	Replacement of previous standards / guidelines	**No - new**	Additional standards / guidelines	See also Stormwater Bylaws and associated Manual, and Catchment Management Policy

THE PURPOSE OF THE APPROVED STANDARDS AND / OR GUIDELINES

To promote the protection and sustainability of wetlands, associated water resources, and hydrological systems, and to restore functionality to degraded wetlands, so that they can continue to provide environmental goods and services even under circumstances of modified runoff, contaminant load and loss of recharge areas.

Fundamental to the conservation and management of wetlands is the recognition that:

- Changes in land use influence the behaviour of the water, and that the extent of the changes is influenced by the nature of the changes as well as the geomorphological and soil characteristics
- Changes in land use influences water quality
- Wetlands reflect the hydrology of the system.



Map1: The relationship between the proposed wetland management zones and broad vegetation types in the City

In recognition of the underlying geo-hydrological influences, the nature and extent of wetlands within particular areas, different Wetland Management Zones have been identified in line with the Wetland Management Plan. Consequently, unique management objectives and priority protection and management actions and interventions have been developed for the different management zones.

Based on the above understanding, there are two issues required to be addressed:

- The conservation of biodiversity, and
- The management of water from both a hydrological as well as from a quality perspective.

- Management measures such as requirements for attenuation, development restrictions within floodlines, buffer zones and regulatory licensing for developments encroaching on wetlands, do not alone afford the necessary degree of hydrological control required to protect wetlands (refer to the Wetland Management Plan). Additional management options including a restriction on changes in land use in watersheds that are deemed to have environmental/conservation value, and retention of sufficient space along the drainage lines to permit the natural accommodation of changed flows without posing a threat to adjacent properties must be instituted. These will allow for the re-engineering of the system once the hydrology has stabilized, in a manner that meets the overall objectives for hydrological functioning, water quality protection, and biodiversity support.
- Changes in hydrology resulting from the change of land use must be anticipated and managed through design and development of appropriate engineering responses, and
- The management of wetlands must not be considered separately from the management of other water resources, in particular stormwater.

<table>
<tr><th>STANDARD / GUIDELINE</th><th>SPECIFICATION</th><th>RESPONSIBILITY</th></tr>
<tr><td>Delineation Of Wetlands</td><td>Where the COJ audit or other scoping process indicate the likely presence of wetlands on site, all wetlands on site must be delineated by an accredited specialist. Provision must be made within the layout for the protection of the full wetland area and a 30 metre buffer from the outer edge of the wetland temporary zone, and such area must be designated as sensitive and should be conserved and incorporated into an open space system. A 50 metre buffer is required for developments outside the urban edge.</td><td>Developer/City Dept/ME including other Government Departments and Agencies</td></tr>
<tr><td>All Wetland Management Zones

Management of peak flows:
Ensure that peak flow of streams within and leaving the COJ area should mimic pre development flows.

Management of Water Quality:
Ensure that the water quality in streams within and leaving the COJ complies with generally acceptable standards.

Biodiversity support:
Ensure capacity of wetlands to support biodiversity.</td><td>Objectives for Hydrology, Water Quality and Biodiversity Support

Table 1: An example of objectives that could be applied to evaluate the efficacy of wetland management strategies which are common to all zones
<table>
<tr><th>Hydrology</th><th>Suggested target values</th><th>Requirement</th></tr>
<tr><td>Flood attenuation</td><td>Flood peaks should not be greater than pre- development 2 year return event storms</td><td>Flows should be modelled and gauged to establish baseline data</td></tr>
<tr><td>Storage</td><td>Volumes of water leaving the catchment under same conditions must remain the same as pre-development conditions</td><td>As above</td></tr>
<tr><td>Water Quality</td><td></td><td></td></tr>
<tr><td>Sediment</td><td>Suspended solids concentration in the 1:2 year return storm event will not exceed 50 mg/l (clastic sediments)</td><td>An on line monitoring system should be installed together with a flow gauging station</td></tr>
<tr><td>Microbial content</td><td>Faecal coliform concentrations will not exceed at any flow >1000 cfu/100ml</td><td>Reporting system for discharging sewers</td></tr>
<tr><td>Biodiversity support</td><td></td><td></td></tr>
<tr><td>Species diversity</td><td>There is no change in Species diversity</td><td>Document species diversity</td></tr>
<tr><td>Sense of place</td><td>No litter</td><td>Through observation</td></tr>
<tr><td>Direct use</td><td>At least 2% of the residents visit the wetlands 10 times a year.</td><td>Suitable survey</td></tr>
<tr><td>Intrinsic value</td><td>Maintenance and management burden will be not more than xc/m3/water discharged</td><td>By calculation</td></tr>
</table>
General measures to be applied.

a. Existing wetlands:
Construction of erosion control systems where incision has occurred :
• Retaining walls to create localized impounding to “rewet” the upstream wetland,
• reprofiling/reshaping of the wetland banks to widen the cross sectional area and in so doing cause a reduction in velocities across the affected reaches,
• barriers placed between he stream and the water, such as armouflex or other retaining wall systems
• attenuation ponds with controlled release to reduce the velocity and hence reduce the erosion risk</td><td>Developer/City Dept/ME including other Government Departments and Agencies</td></tr>
</table>

	• other forms of bank stabilization using bioengineering techniques, or • a combination of the above. ***b. Wetlands in undeveloped catchments*:** • Consider additional and/or alternative management approaches to traditional management approaches (i.e. detention ponds, floodline exclusion zones, buffer zones, water use licence regulations) • Additional / alternative management opportunities may include: ✓ Restriction of changes in land use in watersheds that are deemed to have environmental/conservation value, ideally, but not necessarily linked, to more than just the value of the wetlands (particularly applicable to management of hillslope seepage wetlands, the conservation of biodiversity or a species) ✓ Sufficient space along the drainage lines must be left to permit the natural flow changes without posing a threat to adjacent properties. • Recognising that the changes in land use will affect the hydrology and water quality leaving the development, developments must be designed and constructed based on sound engineering practice, that: ✓ anticipates the changes in the hydrology; ✓ which will contribute to meeting the objectives and/or functions associated with wetlands, and ✓ protect the receiving environment from damage (including leaving sufficient space to accommodate changes in future)	
Wetland Management Zone 1 (Refer to Map 1 showing the different zones)		
Attenuation of Flows: • Manage sediment • Reduce erosion of banks	• Construct a weir or other impounding structure that will trap sediment which will over time be colonised by aquatic plants. • For reaches where further expansion of wetlands is not desired, control sediment transport into the reach. • Protect banks for erosive forces by using form of bank stabilization such as gabions, armourflex, grass blocks; • Change the profile of eroding reach to increase the cross sectional area which will cause a reduction in flow velocities through the reach; • Reduce sediment movement off the landscape by limiting areas of exposed soils, by re-vegetating areas as soon as possible following clearing, • Cover exposed soils with hessian or other forms of protections, • Create contour berms to intercept and reduce runoff.	Developer/City Dept/ME including other Government Departments and Agencies
Water Quality Enhancement: • Managing wetlands to improve their capacity to improve water quality requires that current channelled flows be diffused and directed through vegetation or subjected to extended residence (> 48 hours) in impoundments.	• Construct small structures that impede flow, cause deposition and facilitates the establishment of vegetation (generally only effective and possible under base flow conditions in sub catchments with low flows) • Incorporate in the design of open water systems a facility for removing sediment out of watercourse (if small dams or impoundments, have to manage sedimentation, otherwise function will be compromised and possible dam wall breaches may occur)	Developer/City Dept/ME including other Government Departments and Agencies

Biodiversity support: • Managing wetlands for enhanced biodiversity support requires the maintenance of a mosaic of wetland types, e.g. peripheral seasonal wetlands maintained by seepages off the side slopes, as well as marginal wetlands inundated during high flow events, together with in-stream wetlands and open water habitats.	Enhance species richness through: • The creation of open water sections; • creation of zones outside of the channels that intercept seasonal runoff from side slopes.	Developer/City Dept/ME including other Government Departments and Agencies
Wetland Management Zone 2 (Refer to Map 1 showing the different zones)		
Identify risks associated with loss of these wetlands in order to identify necessary actions to ensure that wetlands and their sediments remain intact: • Potential risks from reworked tailings dams (refer to Wetland Management plan details on risk associated with tailings dams)	• Undertake comprehensive investigation into risks associated with the loss of the wetlands in this zone. • If results indicate that the risks are serious, then steps should be taken to ensure that the wetlands and their sediments remain intact.	CoJ/Developer/City Dept/ME including other Government Departments and Agencies
Wetland Management Zone 3 (Refer to Map 1 showing the different zones)		
Attenuation of flows: • Soils in this management zone play a more significant role in attenuation of flows than the wetlands themselves. • Physical disturbance to soils can introduce eroding face, resulting in rapid channel incision with significant losses in wetland functionality.	• Post development stormwater attenuation should form an important component of the stormwater management system to replace the storativity of the soils. • Prevent erosion - minimise constriction to water flow and physical disturbance of the soil. • Manage volume and velocity of rainwater runoff to ensure that the ability of well-drained clay soils can maintain their high degree of storativity.	Developer/City Dept/ME including other Government Departments and Agencies
Water quality enhancement: • Water quality impairment from developments are likely to be derived from sewer overflows and low inputs of diffuse sources of nitrogen and phosphates from gardens.	• A system of ponds and broad based grass swales should be considered to encourage diffuse flows, rather than confined channelled systems.	Developer/City Dept/ME including other Government Departments and Agencies
Biodiversity Support: • High probability that the wetlands support endangered plant species, such as, *Kniphofia typhhoides* as well as *Trachyandra erythromhiza*.	• Ensure that the hydrological processes supporting the wetlands in which these species occur is not interrupted. • Ensure that flows derived from developments in this zone are effectively dissipated before contact with the perimeter of the Klipriver wetland. • Adopt a watershed protection approach to afford protection to both wetlands and the species they support – control landuse in this catchment in order to afford protection to the grasslands as well as wetlands.	Developer/City Dept/ME including other Government Departments and Agencies
Wetland Management Zone 4 (Refer to Map 1 showing the different zones)		
Attenuation of Flows: • Existing changes in the hydrology to lower reaches of the Klipriver wetlands. • Risk of stormwater being directed off side slopes into the lower reaches of the wetland system (risk	• Manage upstream Wetlands in Management Zone 2, to prevent increased input of sediments with high metal contents and higher peak flows associated with the transformation of the tailings dominated landscape with high storativity to the one with a reduced capacity to store runoff. • Create a preferential flow path that will concentrate flows in view of dolomite formations and risk of sinkhole formation.	Developer/City Dept/ME including other Government Departments and Agencies

of erosion, due to the head difference between the edge of the wetland and the channel bottom (approx 4 m). • Manage sediment		
Water quality enhancement:	• Upper reach - The capacity of the system to transform contaminants can be enhanced by creating a mosaic of open and vegetated cells within the wetland complex. Open water areas will facilitate oxygen transfer through diffusion and algal photosynthesis that will aid the oxidation of ammonia nitrates as well as organic compounds, while vegetated sections will facilitate de-nitrification. The open water areas will also help to disrupt preferential flow paths that undoubtedly exist. • Lower reach – An option exists to divert some of the flow water out of the existing channel to create a series of wetlands on the now dry portions of the lower wetland reaches.	Developer/City Dept/ME including other Government Departments and Agencies
Biodiversity support:	• The biodiversity support capacity of the wetlands associated with the Klipriver and Klipspruit catchments can be improved by creating structural diversity. This can be achieved through: ✓ for example, the creation of open water areas interlinked with vegetated areas in order to improve the capacity of the upper reaches and transform nutrients.	Developer/City Dept/ME including other Government Departments and Agencies
Wetland Management Zone 5 (Refer to Map 1 showing the different zones)		
Attenuation of flows: • Improve conditions for nutrient transformation. • Reduce the risk of channel formation.	• Flow regulation should be a requirement so as to reduce the risk of erosion. This could be facilitated by:- ✓ including in the design of the stormwater system, a number of discharge points as opposed to concentrating stormwater, ✓ with attenuation facilities that could include, for example, sports fields that intercept stormwater before the water is discharged into the natural drainage lines.	Developer/City Dept/ME including other Government Departments and Agencies
Water quality enhancement:	• In order to improve the capacity of valley bottom wetlands in the water management zone, and to transform nutrients and reduce levels of faecal coliforms (both associated with occasional sewer discharges), the wetland should be profiled into broad grass swale type systems, with open water sections to facilitate the oxidation of ammonia.	Developer/City Dept/ME including other Government Departments and Agencies
Biodiversity support: • Ensure that the biodiversity and in particular, the future existence of the threatened species is not compromised	• Additional protection measures and land use controls may be required for priority watersheds in this Wetland Management Zone.	Developer/City Dept/ME including other Government Departments and Agencies
Priority Wetland Conservation Zones	For management objectives and applicable measures for particular priority wetland conservation zones, see regional guidelines and associated management requirements in the Wetland Management Plan	Developer/City Dept/ME including other Government Departments and Agencies

c) Ridges

RIDGE PROTECTION GUIDELINES	ENVIRONMENT AND INFRASTRUCTURE SERVICES DEPARTMENT				
	Development Policy for the Main Ridges within the WMLC Area (Council Resolution) **Johannesburg Ridges and Rivers Policy (Council Resolution 1986-09-30, Item 23)** **JMOSS 1 (Council Resolution)** **COJ Open Space Framework (COJ Mayoral Committee Resolution 2009-03-05 Item 89)** **GDARD Ridges Policy (2009)**				
	PLEASE MARK CLEARLY	**Replacement** of previous standards / guidelines	No – Consolidation of previous and current policies and guidelines.	**Additional** standards / guidelines	

THE PURPOSE OF THE APPROVED STANDARDS AND / OR GUIDELINES

Recognising the importance of Johannesburg's ridge systems as valuable natural resource assets and as a major structuring element of a potential metropolitan open space system, various policies have been developed to promote the conservation of these importance natural assets within the City. These policies seek to integrate different components of the open space system, with the ridges playing a key role, both as an ecological and recreational resource. Apart from retaining the scenic value of ridges within the City, the policies and guidelines also aim to conserve the rich biodiversity and habitat of ridge systems, and to secure these primary watersheds and the associated hydrological functions such as erosion and flood control.

The various ridge policies are based on ecological principles and biodiversity considerations and seek to optimise the natural resources offered by ridges in terms of recreational, educational, conservation, and engineering aspects. Issues of access and continuity have also informed the ridge guidelines.

STANDARD / GUIDELINE	SPECIFICATION	RESPONSIBILITY
GENERAL – ALL RIDGES	• No development that results in the destruction or removal of the 1:3 slope or steeper will be permitted. • Where development on ridges is permitted, this may be subject to conditions including inter alia an ecological audit or an environmental impact study. Furthermore, a 200-metre buffer should be reserved between the foot of the ridge and the proposed development. **Where development is allowed to take place along ridges, the following principles should be followed:** • Structures should be designed to minimise cut and fill. Where possible, on sloping sites, buildings should utilise footings, which allow the natural slope to be maintained, e.g. pole structures. • Regular slopes with a sharp cut are not acceptable. Slopes should be varied with a smooth cut. • Natural vegetation should be retained and graded slopes should be replaced with native or naturalised plant materials. • Significant natural features including watercourses, rocky outcrops and indigenous vegetation must be incorporated into the development and indicated on the SDP • Unnatural edge conditions, knobs remaining from roadway cut and mass grading to accommodate roads and buildings are not acceptable. The ridge should retain its natural appearance. • Single retaining walls are not acceptable. Terraced retaining walls, which break up mass and are easier to screen should be used. • The elevational treatment of all new buildings shall be such that there shall not be any invasion of privacy or	Developer/City Dept/ME including other Government Departments and Agencies

	potential for overlooking in respect of adjoining properties. Cross measures to illustrate these measures shall be indicated on the SDP.	
REQUIREMENTS FOR VARIOUS CLASSES OF RIDGES	In addition, the GDARD policy on Ridges "Developmental Guidelines for Ridges" is applicable to all ridge systems within Johannesburg detailing the following specifications: ***Class One Ridges:*** • No further development allowed (including residential) • No further sub-divisions permitted. • Any deviations are subject to a full EIA and associated specialist reports. • A 200m impact buffer of low impact development is required around Class 1 ridges. ***Class Two Ridges (includes Klipriviersberg):*** • No further sub-divisions permitted. • In general, a 'no development' policy is applicable. • Only low impact development will be considered, and only subject to a full EIA and associated specialist reports. • Where development is permitted subject to the above, Ecological Footprint to convert no more than 5% of site. • All impacts to be appropriately mitigated. • An Environmental Management Plan to maintain the ecological integrity of the remaining property is required to be developed and implemented by the developer. • A 200m buffer zone of low impact development is required around Class 2 ridges. ***Class Three Ridges (includes Northcliff and Roodepoort):*** • All ridges considered as low impact development areas. • Development to be contained within areas that are already transformed. • No further subdivisions will be allowed. • Only low impact development will be considered, and only subject to a full EIA and associated specialist reports. • Where development is permitted subject to the above, Ecological Footprint to convert no more than 5% of site. • All impacts to be appropriately mitigated. • An Environmental Management Plan to maintain the ecological integrity of the remaining property is required to be developed and implemented by the developer. • A 200m buffer zone of low impact development is required around Class 2 ridges. ***Class Four Ridges (includes Melville Koppies and Linksfield Ridge):*** • Exempt from EIA process unless: ✓ A Red Data species is recorded for the ridge ✓ The open space is 4ha or larger. • No further subdivisions will be allowed. • Ecological footprint of development to cover no more than 5% of a property. • All impacts to be appropriately mitigated.	Developer/City Dept/ME including other Government Departments and Agencies

	• An EMP to maintain the ecological integrity of the remaining property is required to be developed and implemented by the developer.	
ROCKY OUTCROPS	• Rocky outcrops are regarded as sensitive areas characterized by high biodiversity and as such a no-go development policy will generally be applied and SDPs should make provision for conservation of such rocky outcrops and important linkages to adjacent open space areas.	Developer/City Dept/ME including other Government Departments and Agencies
WESTERN RIDGE SYSTEM	**Section 1 - Main Ridge Area:** No further development permitted. (For areas designated as part of the western ridge system – refer to the "Development Policy for the Main Ridges within the WMLC Area."). No structures, buildings or temporary building to be permitted above the 1600 contour line. **Sections 2 to 4 of Ridge Area:** *Development Criteria:* • No development to be permitted on a 1:4 or steeper slope. • No additional or foreign material to be imported for the purposes of cut and fill – only materials originating from the site to be used for such purposes. • Appropriate measures to address drainage are to be implemented to the satisfaction of the Council in order to protect the downstream catchment. *Site boundaries:* • The boundary structure should not be visible from a distance; • All materials used for construction of such wall are to blend in with the natural environment. The boundary structure to follow the alignment of the natural contour line; • Site boundary walls are not to exceed 2 metres above natural ground level and to be face brick, natural rock or palisade fencing painted in natural veld colours. *Roof specifications:* • Cement tile roofing in natural veld colours to be used • The roof structure to follow the alignment of the natural contour line and no design that forms a straight line to be considered. • The development to be visually buffered by indigenous vegetation that supports the aesthetic and natural environment. *Landscaping:* • Existing indigenous plant material and natural rock face on site to be retained as far as possible. • Sufficient indigenous landscaping to be used to soften the visual impact of the development and enhance the natural environment and biodiversity of the area. *Mitigation measures:* • Topsoil from all excavations to be stock piled and used to cover any permanent excavations or damage to the ridge caused by construction. • Construction materials, excavated soil and rock, or any materials stockpiled outside the boundary of the	Developer/City Dept/ME including other Government Departments and Agencies

	property shall be removed after construction has been completed and the area rehabilitated to the satisfaction of the Council.	
CENTRAL JOHANNESBURG RIDGE SYSTEM (PARKTOWN and NORTHCLIFF)	For details refer to the Johannesburg Ridges Policy and to the Environmental Control Zones as designated Johannesburg Town Planning Scheme Map A and B series.	Developer/City Dept/ME including other Government Departments and Agencies
REGIONAL SPECIFIC RIDGE REQUIREMENTS	For regional specific ridge requirements and schematic ridge plans refer to region specific guidelines.	Developer/City Dept/ME including other Government Departments and Agencies

d) Biodiversity

g) Social Amenity

i. Social Infrastructure Provision

ii. Schools

iii. Clinics

iv. Libraries

v. Community Centres

vi. Places of Safety

vii. Places of Religion

viii. Police Stations

ix. Fire Stations and Emergency Services

h) Other Urban Elements

i. Trading Facilities

ii. Outdoor Advertising

4. ANNEXURE A - Template

<table>
<tr><td rowspan="3">THE NAME OF THE APPROVED STANDARDS AND / OR GUIDELINES FOR CROSS REFERENCING PURPOSES</td><td colspan="5">DEPARTMENT ACTING AS CUSTODIANS FOR APPROVED STANDARDS AND / OR GUIDELINES</td></tr>
<tr><td colspan="5">Council Resolution – Approval Date & Item Number</td></tr>
<tr><td>PLEASE MARK CLEARLY</td><td>Replacement of previous standards / guidelines</td><td></td><td>Additional standards / guidelines</td><td></td></tr>
<tr><td colspan="6">THE PURPOSE OF THE APPROVED STANDARDS AND / OR GUIDELINES</td></tr>
<tr><td colspan="6"></td></tr>
<tr><td>STANDARD / GUIDELINE</td><td colspan="5">SPECIFICATION</td></tr>
<tr><td>This should explain what the standard / guidelines is being included in the JBEGS</td><td colspan="5">This should add detail on what should be done / installed etc to achieve the standard / guideline</td></tr>
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5. ANNEXURE B – Area Based Planning

List of area based plans for cross referencing purposes with a map where areas are located …

Name of Area Based Plan	**Empire – Perth Strategic Area Framework (Corridors of Freedom)**	
Custodian Department / Where Document can be obtained:	**Development Planning – City Transformation & Spatial Planning**	**Council Resolution – Approval Date & Item Number** **30 October 2014, Item 8**
Implementing Agent(s)	**City Transformation and all other department and MOE's as per implementation plan.**	
Purpose/Objective of Plan	*The Strategic Area Framework includes the Following Areas:* • *Braampark, Parktown, Sunnyside, Braamfontein Werf, Cottesloe, Jan Hofmeyer, Vrededorp, Pageview, Mayfair, Brixton, Auckland Park, Melville, Mayfair West, Uitsaaisentrum, Triomf, Westdene, Rossmore, Hursthill, Crosby, Langlaagte North, Martindale, Westbury, Coronationville, Newclare, Industria West, Croesus, Industria, Longdale, Bosmont, Pennyville & Putcoton* *To Improve Urban Efficiencies by Promoting:* • Viable public transport service • Reduced car dependency and shorter trip lengths • More people closer to work, shopping and leisure opportunities • Lower per capita infrastructure cost • Efficient service provision • Accessibility to economic and social opportunities *To Stimulate Economic, Social And Environmental Sustainability by:* • Reducing energy consumption and carbon emissions • Supporting neighbourhoods with a full range of social amenities • Offering residents with wider choice of housing – more rental in well located areas • Promoting residential and economic activities in areas where public transport is present • Providing a solid basis and support for long-term investment • Increasing land values and social values in critical areas of the city • Enhancing the liveability of neighbourhoods with improved public spaces *To Stimulate Spatial and Social Transformation by:* • Providing housing options for a range of income group • Connecting neighbourhoods • Curtailing urban sprawl, with densification and infill development • Restructuring (Spatially and economically) the apartheid city toward a more integrated city form, which seeks to make the city more accessible to disadvantaged groups • Providing a more efficient relationship between low-income housing, informal economies and public transport • Integrating development that can benefit areas beyond the limit of the study area *More Detailed Plans to be formulated in the following areas:* • *The Knowledge Precinct* • *Milpark* • *Brixton* • *Westbury* • *Pennyville*	

Name of Area Based Plan	**Louis Botha Strategic Area Framework (Corridors of Freedom)**	
Custodian Department / Where Document can be obtained:	**Development Planning – City Transformation & Spatial Planning**	**Council Resolution – Approval Date & Item Number 30 October 2014, Item 9**
Implementing Agent	**City Transformation and all other department and MOE's as per implementation plan.**	
Purpose/Objective of Plan	*The Strategic Area Framework includes the Following Areas:* • *Hillbrow, Parktown, Berea, Fellside, Marlboro, Alexandra, Kew, Waverly, Highlands North, Bramley Park, Bramley, Bellevue, Houghton Estates, Raedene Estates, Braam Park, Randjieslaagte, Orange Groove, Balfour, Wynberg.* ***Improve Urban Efficiencies by Promoting:*** • Viable public transport service • Reduced car dependency and shorter trip lengths • More people closer to work, shopping and leisure opportunities • Lower per capita infrastructure cost • Efficient service provision • Accessibility to economic and social opportunities ***Economic, Social And Environmental Sustainability by:*** • Reducing energy consumption and carbon emissions • Supporting neighbourhoods with a full range of social amenities • Offering residents with wider choice of housing – more rental in well located areas • Promoting residential and economic activities in areas where public transport is present • Providing a solid basis and support for long-term investment • Increasing land values and social values in critical areas of the city • Enhancing the liveability of neighbourhoods with improved public spaces ***Spatial and Social Transformation by:*** • Providing housing options for a range of income group • Connecting neighbourhoods • Curtailing urban sprawl, with densification and infill development • Restructuring (Spatially and economically) the apartheid city toward a more integrated city form, which seeks to make the city more accessible to disadvantaged groups • Providing a more efficient relationship between low-income housing, informal economies and public transport • Integrating development that can benefit areas beyond the limit of the study area *More Detailed Plans to be formulated in the following areas:* • *Parktown/Hillbrow* • *Yeoville/Berea/Upper Houghton* • *Orange Groove* • *Highlands North* • *Balfour* • *Bramley* • *Wynberg/ Alexandra*

Name of Area Based Plan	**Turffontein Strategic Area Framework (Corridors of Freedom)**	
Custodian Department / Where Document can be obtained:	**Development Planning – City Transformation & Spatial Planning**	**Council Resolution – Approval Date & Item Number 30 October 2014, Item 10**
Implementing Agent	**City Transformation and all other department and MOE's as per implementation plan.**	
Purpose/Objective of Plan	***The Strategic Area Framework includes the following Areas:*** • Hector Norris Park, La Rochelle edge, Rosettenville, Hospital Precinct, Turffontein Race Course, George Goch Staduim, De Villiers (Linear Park) ***To Improve Urban Efficiencies by Promoting:*** • Viable public transport service • Reduce car dependency and shorter trip lengths • More people closer to work, shopping and leisure opportunities • Lower per capita infrastructure • Efficient service provision • Accessibility to economic and social opportunities ***To Stimulate Economic, Social And Environmental Sustainability by:*** • Reduced energy consumption and carbon emissions- environmental benefit and improved health and quality of life • Neighbourhoods supported with full range of social amenities • Higher land productivity • Residents will have a wider range of choices of housing – more rental in well located areas • Residential and economic activities in areas where public transport is present • Solid basis and support for long-term investment • Increased land value and social value in critical areas of the city • Enhanced liveability of neighbourhoods and improved public spaces ***To Stimulate Spatial and Social Transformation*** • Housing options for range income group • Connected neighbourhoods • Curtailed urban sprawl, with densification and infill development overcoming the burden of fragmentation of urban areas • Restructuring (spatially and economically) the apartheid city form, which seeks to make the city more accessible to disadvantaged groups • More efficient relationship between low-income housing, informal economies and public transport • Integrative development that can benefit areas beyond the limit of the study area ***More Detailed Plans to be formulated in the following areas:*** • Wemmer Pan • Rotanda Park/ De Villiers • Stafford (Booysens Precinct)	