

**Draft**

# **Telecommunication Infrastructure Policy**

**(pertaining to Health, Land Use, Environmental and Heritage matters)**

REVISION OF THE CELLULAR TELECOMMUNICATION INFRASTRUCTURE POLICY APPROVED IN 2002

**CITY OF CAPE TOWN**



**STRATEGY & PLANNING**  
ENVIRONMENTAL RESOURCES MANAGEMENT

**JANUARY 2011**

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## ACRONYMS

<b>ECA</b>	means Electronic Communications Act (36 of 2005)
<b>ECO</b>	means Environmental Control Officer
<b>EIA</b>	means Environmental Impact Assessment.
<b>DEADP</b>	means the Department of Environmental Affairs and Development Planning
<b>EME</b>	means electromagnetic energy
<b>EMP</b>	means Environmental Management Plan
<b>EMR</b>	means electromagnetic radiation
<b>RF</b>	means radiofrequency
<b>ICASA</b>	means Independent Communication Association of South Africa
<b>ICNIRP</b>	means International Commission on non-ionizing Radiation Protection.
<b>LUPO</b>	means the Land Use Planning Ordinance No.15 of 1985.
<b>NBR</b>	means the National Building Regulations and Building Standards Act No.103 of 1977.
<b>NDOH</b>	means the National Department of Health, Directorate Radiation Control
<b>NEMA</b>	means the National Environmental Management Act No.107 of 1998.

## DEFINITIONS

**Antennae** means any system of wires, poles, rods or devices, used for the transmission or reception of electromagnetic waves and includes satellite dishes with a diameter exceeding 1.5m. It excludes domestic TV antennae less than 2m in diameter / height and where the associated antennae mounting structure is less than 3m in length.

**Areas of Environmental and Heritage significance** includes environmental and heritage resources, including natural and cultural sites, scenic and tourist routes, which are of special value for the City of Cape Town and that need to be protected

**Council** means the Council of the City of Cape Town and includes any body or persons empowered by it to assess and resolve on telecommunication infrastructure applications.

**Electromagnetic energy (EME)** is a term which includes electromagnetic radiation and applies to all telecommunication infrastructure that transmits or receives electronic communication signals.

**Environmental Management Plan (EMP)** is a contractually binding guideline document for use with the implementation of the construction on a site to manage and mitigate environmental impacts associated with that construction.

**Equipment room:** a structure to house communication equipment associated with telecommunication infrastructure. This can be a separate building or container used exclusively for the equipment or it can be a room within a building.

**Base telecommunication station (BTS) (Freestanding):** a site, that is not a BTS (Rooftop) site, that includes the land and access road that is designed and used for the accommodation of telecommunication infrastructure.

**Base telecommunication station (BTS) (Rooftop):** means the site that is designed and used for the accommodation on a building of telecommunication infrastructure.

**Habitable structure** means any structure where people may reside.

**Modification of telecommunication infrastructure** means the modification to the physical structure or radio frequency emissions of telecommunication infrastructure.

**Satellite dish:** any device incorporating a reflective surface that is solid, open mesh, or bar configured that is shaped as a shallow dish, cone, horn or other and is used to transmit and/or receive electromagnetic signals.

**Support structures:** means pole, monopole, guyed tower, lattice tower, freestanding tower or any other tall structure that is designed to accommodate antennae.

**Telecommunication Infrastructure (TI):** any part of the infrastructure of a telecommunication network for radio / wireless communication in the 0 to 300 GHz range, including voice, data and video telecommunications that is used in the transmission or reception of electromagnetic waves. This includes the following: base telecommunication station (BTS) (freestanding and rooftop); antennae; any support structure; equipment room (defined); radio equipment (irrespective of spectrum used); and optical communications equipment (laser and infra-red) provided by cellular network operators and any other telecommunication provider as well as all ancillary structures and the associated feeder cables between the communication equipment and the antennae, needed for the operation of TI. Optic Fibre installations and Point to Point copper (cable) installations are excluded from this Policy.

**Telecommunication Network:** means a system, or series of systems, that carries, or is capable of carrying, communications by means of guided and/or unguided electromagnetic energy.

**Telecommunication Provider (TP):** means the holder of a telecommunications licence in terms of the Electronic Communications Act (2005) (includes private, commercial, public and state parties).

**Unauthorized person:** means any person who is not employed by the operator of the infrastructure and who is not trained or conversant with the occupational exposure hazards and precautionary measures required to be taken so as to prevent exposure to Radio Frequency levels that could be harmful to health.

## **1. NEED FOR THIS POLICY REVIEW**

- 1.1 The existing *Cellular Telecommunication Infrastructure Policy* was approved by Council on 29 May 2002
- 1.2 Due to the rapid expansion of the telecommunications industry, and the increasing demand for radio telecommunication services and new technologies in the cellular phone industry, the location, siting and development of Telecommunication Infrastructure (TI) has become an issue of particular interest to both local communities and local government alike, with debate focusing on visual amenity and public health and hence the need for regulation that enables appropriate development of this kind of infrastructure.
- 1.3 The need for the revision of the existing Cellular Telecommunication Policy came about, firstly, due to the need to include **all** telecommunication infrastructure into the policy and not focus only on cellular technology and secondly, due to the need to update the provisions and guidelines on the possible impacts of this infrastructure, with special emphasis on risks of exposure to electromagnetic energy (EME). This revised Policy then, will provide updated guidelines to be utilised by decision makers within Council in assessing and responding to any application for the right to erect or modify TI.

## **2. MANDATE: RESPONSIBILITIES AND POWERS OF COUNCIL**

- 2.1 Council's has an obligation in terms of the Constitution to promote a safe and healthy environment for its citizens. The Constitution (Section 24 of the Bill of Rights) states that everyone has the right to an environment that is not harmful to their health and well-being and that everyone has the right to have the environment protected for the benefit of present and future generations through reasonable legislation, and other measures that prevent pollution and ecological degradation, promote conservation and secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.
- 2.2 The fact that control over the installation of TI falls within the ambit of municipal planning, which, in terms of the Constitution is a municipal competency. Section 36 of the Land use Planning Ordinance No. 15 of 1985 (LUPO) requires that the impact on both the natural and the developed environment be taken into account in taking decisions on development applications;
- 2.3 The fact that the Cape Town Zoning Scheme (and equivalent provisions in the 27 metro-wide zoning schemes) requires Council to take special measures with regard to permitting structures in certain areas of environmental and heritage significance, for example, S93 Scenic drives, S108 Urban Conservation Areas and S112 Bungalow Areas.
- 2.4 The fact that Council has the right to make policies and bylaws to regulate matters which is within its competency to administer;

- 2.5 Council's obligation to administer the National Building Standards and Building regulations Act 103 of 1977 and the regulations thereunder, particularly Section 7 of the Act, which states that Council must be satisfied that buildings or structures are not dangerous to life or property;
- 2.6 In terms of the Municipal Systems Act and the Constitution, the City of Cape Town must satisfy itself that it is addressing responsibly, inter alia, its duties towards its community placed upon it by such legislation- in this case its obligation to provide a safe and healthy environment and to promote the economic wellbeing of the municipal area. Seen in this context, Council has a responsibility to its community to develop and apply policy around the planning and implementation of TI.
- 2.7 In terms of the 'Duty of Care', as described in Section 28 of the National Environmental Management Act (Act 107 of 1998), the City is obliged to take measures to ensure that the environment is protected when authorising an activity that could result in degradation of the environment. When assessing an application for TI, the principles set out in the National Environmental Management Act (107/1998) must be applied, namely, Section 2, 4(a) vii, "that a risk-averse and cautious approach which takes into account the limits of current knowledge about the consequences of decisions and actions" be applied. This applies particularly in instances where the likely impact is not obvious or predictable, whether visual, biophysical, health or of any other kind. In light of this, Council is compelled to take all necessary and responsible action in order to ensure compliance with the "precautionary principle" of NEMA, if not enough is known about certain risks and effects, especially in the light of the lack of case law and guidelines delineating such obligations.

### **3. EXISTING STATUTORY FRAMEWORK AND COUNCIL APPROVALS REQUIRED**

#### **3.1 STATUTORY FRAMEWORK**

- 3.1.1 The Electronic Communications Act (36 of 2005) and ICASA regulate all forms of TI and the issue of approvals and licences. Documentation must be provided showing that transmitting power levels are in compliance with ICASA licence conditions. The design and operation of TI should be in accordance with the licensing requirements of ICASA, with physical isolation and control of public access to public exposure hazard zones and use of minimum power levels consistent with quality services.
- 3.1.2 The National Department of Health, Directorate Radiation Control (NDOH), has the mandate and the responsibility to administer the provisions of the Hazardous Substances Act (Act 15 of 1973) with respect to Group III (electronic products) and Group IV (radionuclides) hazardous substances. Devices and facilities which produce non-ionizing radiation and which are included in the Schedule of Listed Electronic Products as contained in Regulation R1302 (14 June 1991), are regarded as having been declared Group III hazardous substances, and as such all the relevant provisions of the Hazardous Substances Act apply to them, i.e the NDOH is the legally mandated national authority for the regulation of public exposure to radiation and related matters and endorses the safety standards for public exposure as set by ICNIRP.

3.1.3 National Environmental Management Act (Act 107 of 1998 as amended) and the Amended Environmental Impact Assessment Regulations, 18 June 2010 (GN543), (Listing Notice 3, GN546): The Provincial Department of Environmental Affairs and Development Planning (DEADP) is the competent authority to authorise the construction of masts or towers of any material or type used for telecommunication broadcasting or radio transmission purposes in a) estuaries b) rural areas and c) urban areas that are outside commercial and industrial areas, where the TI is to be placed on a site not previously used for this purpose, and where the TI will exceed 15 metres in height, excluding attachments to existing buildings and masts on rooftops. It is hoped that applications lodged with this department will be considered in the light of the provisions of this Policy.

3.1.4 Section 34 of the National Heritage Resources Act (Act 25 of 1999) requires a permit for any new addition to a building older than 60 years, S27 requires a permit for provincial heritage sites, including former national monuments and S38 requires a permit for development which would change the character of certain classes of sites.

## 3.2 COUNCIL APPROVALS REQUIRED

3.2.1 Land use management within the jurisdiction of the City Of Cape Town is governed by Zoning Schemes introduced in terms of the Land Use Planning Ordinance No 15 of 1985 (LUPO) and equivalent former Black Local Authority legal planning frameworks. LUPO Section 15 1a (ii) provides mechanisms whereby, in certain circumstances planning permissions in the form of consents or temporary departures must be obtained prior to building plan approval and building of a TI site. If the TI structure is on a building and exceeds 3m above the roofline of building, Council approval in the form of a permanent Regulation Departure to LUPO Section 15 1a (i) is required. Applications for TI must be considered taking into account the criteria set out in Section 36 of LUPO. Applications will be advertised in accordance with Council's current advertising policy, namely, Notification Policy for Land Use Development Applications.

3.2.2 The erection of TI is also controlled by the National Building Regulations and Building Standards Act (No 103 of 1977). In such Act, a building includes "any other structure erected or used for or in connection with the rendering of a service". Plans for TI must therefore be submitted to Council for approval (and provisions of Section 7 i.t.o this Act will be taken into account, in such approval process.

3.2.3 Other approvals or checks may be required in terms of any other relevant City Bylaws, eg, the Outdoor Advertising and Signage Bylaw.

## 4. SCOPE AND APPLICATION OF POLICY

4.1 Applications for TI must be considered i.t.o. this Policy and all information required in Annexure A to this policy must be submitted with an application for TI.

4.2 The objectives, guidelines and requirements laid down in this policy shall serve as a guideline for decision making by the City which involve the construction or modification of TI on any land within the jurisdiction of the City of Cape Town.

4.3 The Policy contains information which can assist applicants when preparing an application regarding the siting and design of TI and information required on submission. The Policy should be consulted by TP's in both the initial planning of their telecommunications networks and prior to submission of applications of TI for planning approval. Attention to the Policy will reduce the prospect of ill conceived applications being submitted to the City. It will also minimise delays involved in subsequent assessment and determination of applications.

4.4 Council must ensure that the Policy guidelines and requirements as put forward in Section 6 and summarised in Annexure B, are used in the assessment of all Land Use Management applications and building plan applications for TI. Each application for a TI will be considered on its merits and within the guidelines of this Policy.

## **5. APPROACH, PURPOSE, OBJECTIVES & OUTLINE OF THE POLICY**

### **5.1 Approach**

5.1.1 The overarching premise is to facilitate the growth of new and existing telecommunications systems and facilitate the provision of TI in an efficient, cost-effective, environmentally appropriate and sustainable way, with minimal impact on the socio-economic and physical (biophysical and built) environment of the City without negatively affecting the sense of wellbeing and health of the community.

5.1.2 The two overriding concerns of the broader public, namely, potential visual impact and possible impact on human health and wellbeing from EME emissions are addressed. The approach taken is to protect the visual character and amenity of the City of Cape Town as far as possible, and to minimise the health risks (known / potential and perceived) associated with EME, in line with the City's mandate. Regarding the former, Council encourages sensitive siting, design and co-location or sharing of TI sites so as not to negatively impact on environmental and heritage resources. Regarding possible health risks the City takes guidance from the NDOH who have adopted the International Commission on non-ionizing Radiation Protection (ICNIRP) public exposure standard (see Annexure E). Furthermore, due to the fact that research and debate on continuous long term full body exposure of EME is still ongoing, the effects of which have not yet been conclusively proved, the City has adopted a precautionary approach by the insertion of certain additional provisions and requirements (see section 6.6.2).

### **5.2 Purpose**

5.2.1 The principal purpose of this Policy is to assist local government and planning practitioners in regulating TI at the local level by providing a framework for the assessment of applications for TI within the context of the planning system of the City of Cape Town. This includes providing a uniform and comprehensive set of standards, assessment criteria, guidelines, requirements and conditions so as to minimise uncertainty associated with decision-making and result in better outcomes for the community.



### 5.3 Objectives

- 5.3.1 To promote a consistent approach in the preparation, assessment and determination of applications and the setting of conditions for planning applications TI;
- 5.3.2 To provide guidelines for land use, health and environmental and heritage issues and in so doing, in order to minimise disturbance to environmental and heritage resources of the City and protect and enhance public amenity;
- 5.3.3. To ensure compliance with public health and safety standards and where necessary, put in place additional precautionary measures.

### 5.4 Policy

- 5.4.1 The Policy as put forward in Section 6 below must be taken into account in the assessment of all applications received for TI in the City of Cape Town. The Policy addresses 5 issues, namely, 1) site selection and co-location; 2) visual impact, landscaping, public amenity and residential amenity; 3) impact on areas of environmental and heritage significance; 4) impact on existing services and utilities; 5) public health and safety. Each issue must be assessed holistically with all other issues contained in this section.
- 5.4.2 Each issue is divided into Objectives, Guidelines and specific Requirements that need to be followed for each issue respectively. Objectives clearly state what Council seeks to achieve, which leads to Guidelines which should be followed to help achieve those objectives. Requirements are prescriptive standards for achieving the desired objectives. Where an applicant requests to be exempted from any requirement, written motivation must be submitted, and, in evaluating such motivation, Council will assess if all the objectives and guidelines have been sufficiently addressed.
- 5.4.3 A summary of the Requirements flowing from this section is provided under Annexure A and B.
- 5.4.4 The following TI may be erected after approvals are granted as required under Section 3, without having to comply with the provisions of Section 6 of this Policy:-
  - 5.4.4.1 Temporary installations that provide additional telecommunications coverage at public events, such as sports events or cultural festivals (limited to a duration of 1 week).
  - 5.4.4.2 Replacement of support structures only, for purpose of co-location of TI if the replacement structure is not more than 5 metres higher than the original approved structure it replaces and the TI that it supports does not protrudes more than 0.5 metres from the face of the structure. This does not apply to structures with no previous required approvals.

## **6. POLICY: OBJECTIVES, GUIDELINES AND REQUIREMENTS**

### **6.1 SITE SELECTION AND CO-LOCATION**

#### 6.1.1 Objectives

6.1.1.1 To ensure that TI is located in the best possible location in order to maximise the coverage area that can be reached while at the same time ensuring that the siting is compatible with adjoining land uses and/or permissible land uses and that the receiving environment and heritage value (natural and built) is not adversely affected and that negative visual impacts and impacts on human health and wellbeing are avoided.

6.1.1.2 To ensure the co-location or sharing of TI wherever possible in order to minimise the proliferation of separate sites across the City, in order to effectively use existing infrastructure and minimise visual clutter.

#### 6.1.2 Guidelines

6.1.2.1 A precautionary approach is adopted with regard to the siting of TI near habitable structures and therefore no TI may be located and positioned so that a habitable structure is within a 50m zone directly in front of the antennae (at the same height as per section 6.5).

6.1.2.2 Subject to all other relevant criteria TI should be located within industrial / commercial / business areas.

6.1.2.3 TI should not be situated within or abutting an area of environmental and heritage significance (see Section 6.3 and Annexure D). Where the proposal impacts on the biophysical environment and/or an area of environmental and heritage significance, all possible site location alternatives should be explored early in the planning process in order to minimize the impact of the TI, rather than relying only on camouflage to reduce the impact.

6.1.2.4 Existing and future potential for co-location of TI needs to be considered.

6.1.2.5 Existing structures to accommodate TI is encouraged (if this does not conflict with any other legislation), for example, on tall buildings, utility poles, light masts, billboards and existing tall structures.

6.1.2.6 The design and siting of TI and ancillary facilities should be integrated with existing buildings and structures, unless it is impractical to do so, in which case they should be sited and designed so as to minimise any adverse impact on the amenity of the surrounding area.

6.1.2.7 In any application, the benefits of co-location shall be weighed up against any possible negative effects, i.e, co-location should not be adhered to at the expense of other considerations identified by Council / communities / TP's as important. The latter could include, a) a possible increase of support structure height needed to accommodate the other providers that may be visually unacceptable b) a possible increase of power output from one location c) physical and technical limits to the loads that a support structure is able to support d) the planned Radio frequency (RF) coverage may not be achieved by a particular TP at a certain location.

### 6.1.3 Requirements

- 6.1.3.1 All applications for TI must be accompanied by a Site Analysis Plan which clearly illustrates the proposal in the context of the existing landscape and receiving environment (drawn to an appropriate scale). Accompanying the Site Analysis Plan must be a Report detailing the motivation for the selected site, detailing how the siting and design of the facility has responded to the site analysis and satisfactorily demonstrating to Council that all alternatives on the site itself have been explored in order to address section 6.1.2 above (see Annexure A for detail that needs to be included in such a Site Analysis Plan).
- 6.1.3.2 A Zoning and Land Use Map to a scale of 1:2000 (A4) indicating zoning and land use must be submitted. Indicate on such map all areas of environmental and heritage significance, if applicable, and any habitable structure that is within a 50m zone directly in front of the antennae (at the same height as per section 6.6).
- 6.1.3.3 A Report and Map that demonstrates how the proposed site relates to the existing and proposed network telecommunications infrastructure and confirming that the applicant has looked at all possible existing options for co-location. A radius of 1 kilometer around the site must be shown, showing existing or proposed TI and other possible support structures. If no available alternative is possible, this fact must be motivated in this report to the satisfaction of Council. This Report must detail possible sharing opportunities with other TP's in the future. This may include making provision in the design of the TI so that it can physically cope with accommodating infrastructure of all other TP's and / or that the building that is to accommodate the equipment room should be constructed so as to be able to contain additional TP's containers in the future.
- 6.1.3.4 TI lines / cables should be located within existing underground conduits or ducts.
- 6.1.3.5 On termination of use of TI, the TP shall remove all equipment from the site including the access road (if no longer needed) and the area shall be rehabilitated to the satisfaction of Council. Council reserves the right to evaluate, monitor and approve the post-decommissioning rehabilitation of the site.

## **6.2 VISUAL IMPACT & LANDSCAPING, PUBLIC AMENITY AND RESIDENTIAL AMENITY**

### 6.2.1 Objectives

- 6.2.1.1 To retain the visual integrity, special character and amenity of the City of Cape Town, in order to protect both the natural and built landscape from visual clutter which could result from the proliferation of TI. The visual impact is especially important in natural open environments where tall artificial structures are likely to be obtrusive.
- 6.2.1.2 To improve the environmental and heritage quality of the public arena through proposing improvements to the environment in the form of 6.2.1.3 To encourage innovation in the design of TI so that the visual amenity of the City of Cape Town is not affected in a negatively way.
- 6.2.1.3 To encourage appropriate landscaping around TI and associated facilities, for example, hard / soft landscaping and/or provision of other amenities that benefit the broader public and residential amenity and to ensure that TI is sited with minimal need for tree / plant removal.
- 6.2.1.4 To provide greening and / or softening or screening of impacts through the provision of planting, landscaping and/or providing public facilities or amenities which are led by a locally driven need and context with the provision of TI.

## 6.2.2 Guidelines

- 6.2.2.1 TI should be designed and sited to minimise any potential adverse visual impact on the character and amenity of the local environment, in particular, impacts on prominent landscape features, general views in the locality and individual significant views.
- 6.2.2.2 TI must be designed and sited to minimise, mitigate or avoid adverse impacts on the visual character and amenity of residential areas.
- 6.2.2.3 Design and siting of TI should be integrated it as far as possible with the building or support structure to which it relates. TI such as antennae should not merely be hung off the side of a building in an unsightly manner, or be attached so as to protrude above the top of the roof / apex of a roof, but should form an integral part of the building as a design element. For heritage areas, buildings older than 60 years and other heritage sites, the integrity of the heritage must prevail in the design and siting of TI.
- 6.2.2.4 Techniques which may be used to minimise adverse visual impacts for rooftop BTS include: adjustment to the overall size (height and scale); colour / cladding to match adjacent walls, i.e. complementing facade treatment so as to maintain visual balance; creating an architectural feature such as a spire / column / finial / and screening to minimise visibility of the facility from adjacent areas.
- 6.2.2.5 In the case of BTS (free-standing), design measures to mitigate visual impact are in some cases the same as those referred to above, and include: adjustment to the overall size (height and dimension); colour coding to match the predominant background (e.g. sky, vegetation); designing the infrastructure as a work of urban art / as another structure (e.g. flagpole, signpost, tree); picking up on a fencing style / type of roof pitch and repeat this for the equipment room; if there are boulders on site use stone cladding for the equipment room.
- 6.2.2.6 The equipment room / container could either be walled or fenced as appropriate in the context (metal / stone / wood / brick) or could be housed in a specially designed building to match other buildings on the site.
- 6.2.2.7 In the event that a container is used as an equipment room on a rooftop, such container must be set back as far as possible from the edges of the roof so as not to be visible from street level.
- 6.2.2.8 Cables should be placed underground, unless it is impractical to do so and there would be no significant effect on visual amenity.
- 6.2.2.9 TI should not be located on ridgelines.
- 6.2.2.10 TI support structures should be located where vegetation (trees), landforms or other features of a site will adequately screen or reduce the impact of the TI from public areas and reduce the visual impact. Landscaping / tree planting can be requested by Council as a measure to reduce the visual impact of TI, even if only to screen at least the base of towers and ancillary structures, and to draw attention away from the structure. Measures such as concealment, colour / appropriate finishes and camouflage should be used, where appropriate, to minimise the visual impact. New tree group plantings and rows away from the base of the support structure may be required to protect views from more distant areas. Plant species should be chosen based on the size of the facility and in sympathy with the existing landscape theme (if any) in the locality. The position of new landscaping may be more effective in the foreground of an impacted view rather than at the BTS (freestanding) itself.
- 6.2.2.11 The obstruction of views of significant vistas, significant landmarks or elements of the cultural landscape should be avoided.

- 6.2.2.12 TP's must motivate their choice of support structure, which should, as a general rule for new BTS Freestanding site, be a slimline monopole in an urban context and a lattice mast in a rural context.
- 6.2.2.13 Newly constructed access roads or other parts of the BTS (freestanding) site, as deemed appropriate, should be landscaped with plants/trees and/or ground covers to Council's satisfaction, and may be required at areas in and around the site that is not within the BTS (freestanding) itself.
- 6.2.2.14 Where power to a base station site is required and excavation works are undertaken, no mature trees or vegetation may be affected, and the required excavation should be undertaken as required by Council.
- 6.2.2.15 Advertising signs of any type, including logos are not permitted on TI, except in accordance with a separate application for approval in terms of the City of Cape Town Outdoor Advertising and Signage Bylaw. The only signage that will be allowed on TI will be limited to small signs, if approved in terms of the relevant By-law and not larger than 0,2m<sup>2</sup>, displayed at ground storey level needed to identify the site/property/owner, as required, and those needed at ground storey level to warn of any danger, to Council's satisfaction.
- 6.2.2.16 Lighting should be energy efficient, fully shielded and tilted downwards and screens should be placed around these lights to prevent vandalism. Any such measures are required to be indicated on the TI Plan that is submitted on application.
- 6.2.2.17 All attempts must be made to ensure that for every TI site that is established, especially BTS (freestanding), that the developer makes a positive contribution that directly benefits the local community, to the satisfaction of Council. This could take the form of greening interventions (trees and/shrubs), hard and/or soft landscaping and/or the provision of public amenities (for example street furniture, lighting, benches / dustbins), needed in the local context. This is optional for the applicant / developer and can only be imposed by Council as conditional to the approval if it is in mitigation of direct impacts on the site as a result of the proposed TI.
- 6.2.3 Requirements
- 6.2.3.1 The applicant should demonstrate in the Report that all efforts available to assimilate the structure with its surrounding environment have been made.
- 6.2.3.2 If required by Council, the applicant must supply at least one alternative design option e.g. height, type (monopole / lattice / disguised) and colour and/or locality that has a lower visual impact.
- 6.2.3.3 A photo montage and/or a schedule of colours and / finishes for the proposed TI may be requested by Council.
- 6.2.3.4 A visual impact assessment prepared by a suitably qualified independent professional, to Council's satisfaction, may be requested by Council. The assessment shall include the visual sensitivity (low, medium, high, very high) at each scale of visibility (local, distant, skyline) and include recommendations on mitigation.
- 6.2.3.5 For every new or upgraded BTS (freestanding) site, Council should consider whether landscaping or the provision of public amenities is appropriate in the context to both enhance the local environment and to benefit the public amenity. If it is considered appropriate, a landscape plan with quote detailing costs must be provided by the applicant, to demonstrate to Council how landscaping will be implemented and maintained on the subject site (prior to plan approval). Council may request a financial guarantee to the cost of the landscaping to be held by Council until implementation of all approved works.

## **6.3 IMPACT ON AREAS OF ENVIRONMENTAL AND HERITAGE SIGNIFICANCE**

### 6.3.1 Objectives

6.3.1.1 To ensure that TI is not situated within an area of environmental / heritage significance and, if this is unavoidable, to ensure that the location and design of the TI is done in such a manner that the integrity of the landscape or resource is not negatively impacted on in any way. [See Annexure D for a list of areas of typical environmental and heritage significance. This includes environmental and heritage resources which are of special value for the City of Cape Town and which need to be protected and includes areas with an identifiable special character, natural and cultural sites, scenic and tourist routes)

### 6.3.2 Guidelines

6.3.2.1 No TI should be erected in an area of environmental / heritage significance such that it can be viewed to or from the site, with adverse impacts on the environmental or heritage resource. If this is unavoidable for network / technical reasons, the requirements in 6.4.3 below must be met, to the satisfaction of Council.

6.3.2.2 Environmentally sensitive construction methods must be employed in the construction of a BTS (freestanding) site so that the natural habitat is not disturbed. Any disturbance to the natural habitat must be rehabilitated as a matter of course.

6.3.2.3 Surrounding vegetation is to be retained as far as possible. Any proposed removal of trees / vegetation is to be shown on the submission of the site plans and is to be approved by Council prior to removal.

### 6.3.3 Requirements

6.3.3.1 If TI is situated within or abutting an area of environmental and / heritage significance, a Statement of Environmental Effects must be submitted to Council. This must demonstrate how the proposal meets the above objective (6.3.1) and what consideration has been given to the environmental impact of the proposal. It must also set out the measures to be taken to mitigate any likely adverse impacts of the proposal.

6.3.3.2 A Construction and/or Operational phase Environmental Management Plan (EMP) may be requested by Council, to be to Council's satisfaction, prior to plan approval. This may include the appointment of an Environmental Control Officer (ECO). This can include any associated works or access roads.

## **6.4 IMPACT ON EXISTING SERVICES AND UTILITIES**

### 6.4.1 Objectives

6.4.1.1 TI must be situated and operated in a manner so as not to interfere with any other utility functions.

## 6.4.2 Guidelines

- 6.4.2.1 Electricity supply to TI must, where practically possible, make use of underground cables. All electrical installations must be as per ESCOM or City of Cape Town Electrical Department requirements and standards. BTS (rooftop) sites should have cabling placed in a properly sealed metal channelling.
- 6.4.2.2 Power supply to TI sites must not interfere with existing radio equipment installed in the vicinity.
- 6.4.2.3 If existing electricity supply to the site is not sufficient, the use of solar energy should be considered.
- 6.4.2.4 Any interference that TI may have on satellite or television reception must be investigated by the TP, and in the event that the fault lies with the TI, the TP shall rectify the matter at own cost.
- 6.4.2.5 Public access to TI installations must be restricted in an appropriate manner (e.g., fence / wall / locked gate / door) together with warning signage to the satisfaction of Council. Care shall be exercised by the TP to ensure that such security measures do not inhibit emergency exit procedures (e.g. fire escape) for BTS (rooftop) sites.

## 6.4.3 Requirements

- 6.4.3.1 Advisory / warning signage including a pictogram may be a requirement for TI. Such signage shall identify the property and the TI and shall warn the general public as required. Such signage shall be to Council's satisfaction and may not be larger than 400mm x 500mm.
- 6.4.3.2 The TP shall indemnify Council against all claims of whatsoever nature, howsoever arising from third parties relating to the erection and operation of TI, as may be approved, as part of the application documentation. Such indemnity to be provided by the TP, to Council's satisfaction.

## 6.5 PUBLIC HEALTH AND SAFETY

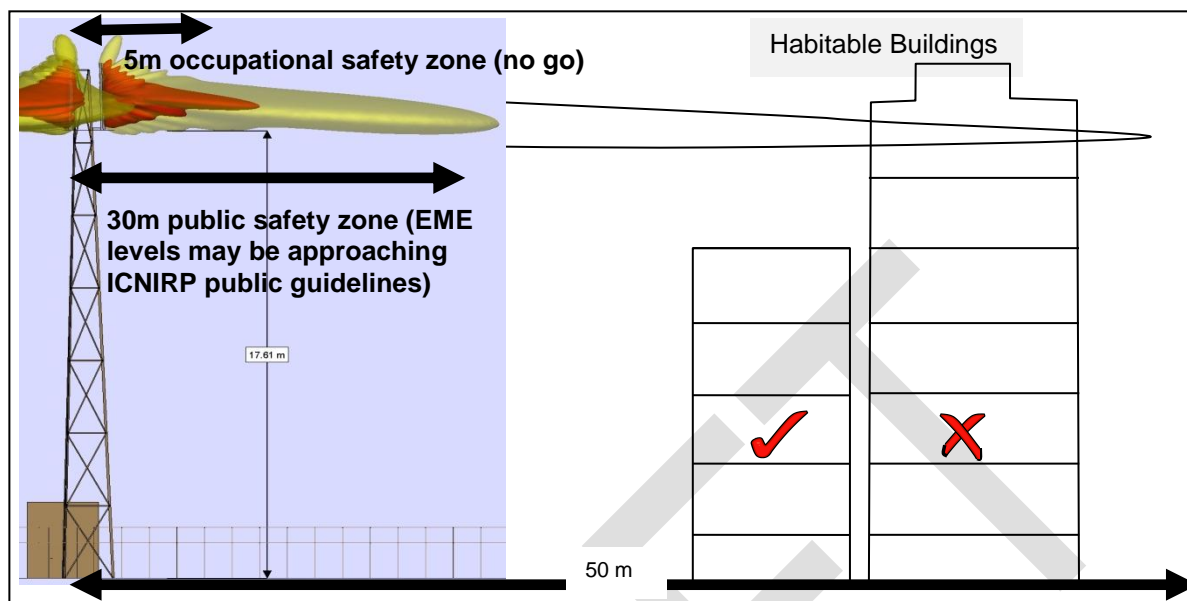
### 6.5.1 Objectives

- 6.5.1.1 To protect the health and safety and wellbeing of the inhabitants of Cape Town.

### 6.5.2 Guidelines

- 6.5.2.1 In the light of public concerns and ongoing research and debate on the effects of EME on public health, Council is adopting appropriate precautionary measures, taking preventative action and undergoing reactive investigation, as deemed necessary.
- 6.5.2.2 Antennae should be located and positioned so that no habitable structures are within a zone of 50m directly in front of the antennae (at the same height). The following diagram generally illustrates acceptable and unacceptable positioning of antennae.

**Figure 1: Zone sizes depicted here are for a typical shared cellular operator, tri-band (GSM900,DCS1800 and UMTS) site**



**50m public safety zone (EME readings must be below ICNIRP public exposure guideline)**

### 6.5.3 Requirements

- 6.5.3.1 No TI or combination of such infrastructure may at any time cause the public to be exposed to RF levels that exceed the International Commission on Non-Ionizing Radiation Protection (ICNIRP) public exposure guideline in any occupied space or location to which the public reasonably has access. This is endorsed by the NDOH.
- 6.5.3.2 No public or unauthorised person shall be able to gain access to rooftop antennae and shall not come within 5m in front of antennae.
- 6.5.3.3 If a habitable structure is within the 50m zone at the same height and in front of the antennae (this being typical panel antennae, at an approximate 60 degree angle, or any other type of installation e.g. omni directional antennae), and/or if the proposed TI elicits community / Council concern numerical simulations of predicted RF EME levels must be submitted to City Health's Senior Mechanical Engineer, for verification / assessment, prior to approval of the site. This Department may request further information or verification from the applicant, which may include numerical simulations of predicted RF EME levels done by an independent certified institution (these readings must be submitted with reference to compliance with the latest public exposure limits, ie what percentage it is of the ICNIRP guidelines).
- 6.5.3.4 Once a site is operational, Council may request a test report to be carried out by an independent certified institution providing the results of measurements showing the actual RF EME levels from that site, with necessary detail as determined at that time. The cost of carrying out such tests shall be borne by the applicant.



## **7 OPERATIONAL CONTROLS**

Council must ensure that conditions of approval are complied with (draft conditions are attached under Annexure C).

- 7.1 Council can request a Network Plan for each respective TP. This would enable one to see all existing and planned sites for the City of Cape Town and how the different networks' sites relate to each other.
- 7.2 At any time Council may request monitoring by an independent certified expert in the field, to verify any issue relating to the siting and operation of TI, as put forward by the TP, at the expense of the TP. In this way, compliance monitoring to check that RF EME levels are within standards set for public exposure limits can be verified at any time. Alternatively Council may take its own readings.
- 7.3 In the event of measurements showing that either the RF EME levels exceed the ICNIRP public exposure guidelines, the NDOH must be notified and Council / NDOH may take any appropriate action required at such time in order to further investigate and close / discontinue the TI site, if so required.
- 7.4 Any TI which is erected in contravention of either the EIA Regulations, LUPO or the NBR may be required to be rectified in terms of a notice served on the land owner and / or TP, as deemed necessary

## **8 COMMENCEMENT OF POLICY**

This Policy comes into force on the ..... in accordance with .....(approval by the Economic, Environment and Spatial Planning Portfolio Committee). This Policy rescinds and replaces the City of Cape Town Cellular Telecommunication Infrastructure Policy as adopted by Council in March 2002.

# **ANNEXURES**

to be read with the

**Draft**

## **Telecommunication Infrastructure Policy**

(pertaining to Health, Land Use, Environmental and Heritage matters)

**CITY OF CAPE TOWN**

**STRATEGY & PLANNING**  
**ENVIRONMENTAL RESOURCES MANAGEMENT**

**JANUARY 2011**

## **ANNEXURE 1**

### **INFORMATION TO BE SUBMITTED WITH APPLICATIONS FOR TELECOMMUNICATION INFRASTRUCTURE**

Applicants should ensure that all relevant information is provided with submission otherwise the application may not be accepted or the process may be delayed.

#### **1. Site Analysis Plan (scale 1:2000) with accompanying Report**

A Site Analysis must include a Map and Report that provides sufficient information relating to the site and its surroundings to assist in the assessment of TI proposals. This is to ensure that they are designed and located in the best possible manner so as to minimise visual impact and any concerns over RF EME exposure levels.

An application for a BTS (freestanding) shall include the following, to the satisfaction of Council:-

- zoning, site boundaries and dimensions
- location and height of the TI
- natural landforms and waterflow through the site
- surrounding land uses (to a radius of 200m)
- surrounding areas of environmental & heritage significance
- existing vegetation
- details of any significant environmental constraints and, where relevant, commitments stating how these constraints will be managed to prevent a negative impact on the environment
- views and vistas to and from the site
- location of areas of environmental significance (Annexure D) within the exposure area
- proximity to adjacent or nearby buildings / other tall structures
- proximity of TI to other existing TI sites (show 1km radius around application site for urban areas)
- other info as required by Council

An application for a BTS (Rooftop) shall include the following, to the satisfaction of Council:-

- site boundaries and dimensions
- location and height of the TI
- proximity to adjacent or nearby buildings and use of such buildings
- views to and from the site
- use of the building and position of such use relative to TI
- proximity of TI to other TI and other possible support structures
- photographic illustrations of the proposal within its setting
- other info as required by Council

#### **2. Telecommunication Infrastructure Plan (scale 1:1000 as well as a reduced A4)**

An application for TI may include the following, to the satisfaction of Council:-

- dimensioned plans showing detail of the TI;
- graphic illustrations (including photographs of similar facilities and/or computer generated simulations) showing the type of facility and its relationship with adjacent development;
- elevations showing the extent, height and appearance of the proposed facility as viewed from any adjacent street, public place and adjacent property;

- proposed materials and colour of the facility, and proposed arrangements for maintenance and/or future modifications in response to changes to any adjacent buildings or structure;
- any screening or fencing proposed in conjunction with the facility, including arrangements for maintenance;
- any external lighting of the proposed facility and/or the facility site; details of any existing vegetation to be removed and any proposals for landscaping and/or restoration of any disturbed land;
- details of the timing of works involved in establishing the facility and any arrangements for temporary access and/or changes to existing access facilities during the course of construction;
- how the proposed facility relates to the existing and proposed network of telecommunications infrastructure, and what (if any) additional facilities are known by the proponent to be under consideration to meet projected future increases in demand;
- how the proposed TI facility addresses Section 9 Development Control: Objectives, Guidelines and Requirements as contained in the City of Cape Town Telecommunication Infrastructure Policy.

### **3. Compliance certificate and / Lease agreement**

A statement that the site is compliant with the current public exposure guidelines as determined by the National department of Health.

If the site is leased from Council, a letter of consent / the lease agreement is required.

### **4. Information that may be required by City's Telecommunications Branch**

- Specify what radio spectrum/frequency is used.
- Specify what radio equipment is used – make and model.
- Specify the number of antennae attached to this equipment (gain in dB, polarisation, and coverage i.e. azimuth / elevation).
- Specify what power levels are to be radiated by the antennae (dBm or Watts)
- If operating in the ISM band, provide a certified copy of their ICASA license. If not operating in the ISM band, then provide a certified copy of their specific spectrum licence.
- The maximum power output of the facility and radio frequency electromagnetic energy levels in accordance with ICASA. This statement is to demonstrate that the carrier accepts full responsibility for compliance with the Telecommunications Act;
- Provide the GPS coordinates (WGS84) of this site, and of all radio sites which connect to this installation.

### **5. Environmental Management Plan (EMP)**

An Environmental Management Plan (EMP) must be included in the submission if the site is within an area of environmental & heritage significance. With the approval of such EMP, Council may request an ECO and financial guarantee to ensure compliance with the EMP. Separate guidelines on a Generic full EMP and a Site EMP are available from Environmental & Heritage Management Branch. This must be submitted to Council's satisfaction prior to final building plan approval.

### **6. Basic Assessment and Environmental Authorisation into NEMA Regulations**

If the TI is a listed activity i.t.o the NEMA Regulations as amended, the Environmental Authorisation from DEADP must be forwarded to Council before taking a decision on the application (see section 3 of Policy). Council should be included in this process from submission of the application to DEADP.

**ANNEXURE 2: ASSESSMENT CHECKLIST: To be completed by Strategy & Planning official**

Officials Name.....

PLEASE ATTACH COMPLETED CHECKLIST TO APPLICATION DOCUMENTATION

Erf ..... Address ..... APPLICATION #.....

Please consult with Environmental & Heritage Management Branch in the Relevant District Office

<b>GENERAL REQUIREMENTS</b>		
<b>Has the following been submitted? (Annexure 1)</b>	<b>YES</b>	<b>NO</b>
Telecommunication Infrastructure Plan		
Zoning Compliance certificate and / Lease agreement		
Telecommunications Branch Information, if required		
Environmental Management Plan, if required		
DEADP process documentation, if required		
<u>Monitoring:-</u>		

<b>SITE SELECTION AND COLOCATION (see 6.1)</b>	<b>YES</b>	<b>NO</b>		
Is a Site Analysis Plan & Report submitted and to Council's satisfaction?				
Is a Zoning / Land use map (1:2000) (A4) submitted?				
Is the TI on an existing structure or building?				
if yes	Is the proposal integrated with the structure / building as a design feature?			
Is the Report submitted that addresses co-location options to Council's satisfaction?				
Is the map and photographs showing other existing tall structures (TI structures / other) in a 1km radius around the site submitted to Council's satisfaction				
Are there existing / other approved TI sites within the 1km radius around the proposed site?				
if yes	Is there sufficient motivation / reason for non-location with such site(s)?		<b>Y</b>	<b>N</b>

<b>VISUAL IMPACT, LANDSCAPING AND PUBLIC AMENITY (see 6.2)</b>	<b>YES</b>	<b>NO</b>		
Will there possibly be a negative visual impact on the environmental / heritage resource / public amenity / landscape arising from this proposal?				
if yes	Is an alternative type and / or locality that has a lower visual impact required? (Council may require this)		<b>Y</b>	<b>N</b>

<input type="checkbox"/>	<input type="checkbox"/>	if yes	Is a photo montage and a schedule of colours and / finishes required? (Council may require this)	<b>Y</b>	<b>N</b>
<input type="checkbox"/>	<input type="checkbox"/>	if yes	Is a Visual Impact Assessment required? (Council may require this)	<b>Y</b>	<b>N</b>
Is the proposal for a BTS (freestanding) site (new or upgrade / modification / sharing)?					
<input type="checkbox"/>	<input type="checkbox"/>	if yes	Have landscaping / or provision of public amenities been proposed and adequately been dealt with regarding implementation?	<b>Y</b>	<b>N</b>
<b>Monitoring:</b> If landscaping or provision of public amenities is a requirement as a condition of approval.					

<b>IMPACT ON AREAS OF ENVIRONMENTAL AND HERITAGE SIGNIFICANCE (see 6.3)</b>					
			<b>YES</b>	<b>NO</b>	
Is the proposal within an area of environmental / heritage significance?					
<input type="checkbox"/>	<input type="checkbox"/>	if yes	Is there a Statement of Environmental Effects submitted to Council's satisfaction?	<b>Y</b>	<b>N</b>
<input type="checkbox"/>	<input type="checkbox"/>	if yes	Is an EMP required by Council?	<b>Y</b>	<b>N</b>
<b>Monitoring:-</b> Condition must be imposed with approval, If an EMP is a requirement.					

<b>IMPACT ON EXISTING SERVICES &amp; UTILITIES (see 6.4)</b>			
		<b>YES</b>	<b>NO</b>
Is advisory & warning signage on the TI? (see 6.4.3.1)			

<b>PUBLIC HEALTH AND SAFETY (see 6.5)</b>		<b>YES</b>	<b>NO</b>
Is there a habitable structure within a 50m zone in front of the antennae?			
<input type="checkbox"/>	if yes	Show alternative location that does not fall into this 50m zone.	
<input type="checkbox"/>	if yes	If circumstances prevail that necessitates being within the 50m zone, ensure that Section 6.5.3 of the Policy is complied with.	
Is the 5m areas in front of the antennae accessible to the general public?			
<input type="checkbox"/>	if yes	Ensure that safety measures are put in place to prevent access.	
<b>Monitoring:-</b>			

## **ANNEXURE 3: STANDARD CONDITIONS OF APPROVAL (IMPOSED IN TERMS OF SECTION 42 OF THE ORDINANCE)**

### **Standardized conditions of approval for cell masts and other telecommunication infrastructure**

With an approval of a site for telecommunication structures, the following pro forma conditions may apply. When formulating conditions of approval, any further site specific issues or conditions which are not dealt with in the general conditions must also be included as conditions of approval. [Note that if the TI is in an area of environmental significance an Environmental Management Plan (EMP) must be submitted to Council for approval prior to final approval and not as a condition of approval].

#### **1) GENERAL**

- 1.1) This approval shall be valid for maximum period of 5 years.
- 1.2) After 5 years, or if the site is decommissioned before such time, the applicant must remove all site infrastructure and the site must be rehabilitated, within one month, to its former state or to a condition that is in line with the land use and character of the area at the time, as required by Council. If the communication structures are still operational at this time, the period can only be extended by a further application to Council.
- 1.3) Ongoing maintenance of the entire installation must take place by the operator.
- 1.4) Conditions of approval must be made known to any new owner of the site and are binding on the successor in title.
- 1.5) The operator must certify that the anticipated combined / weighted RF Exposure of a person will not exceed the public exposure guideline as set by the ICNIRP, prior to the approval of the building plans.
- 1.6) The land owner / operator shall grant Council access at all reasonable times to the installation, for the purpose of monitoring inspection and compliance certification.
- 1.7) No unauthorized person shall be able to come within 5m in front of the panel antennae. Clearly marked warning signs, must define this no go zone.
- 1.8) Should any further research link electromagnetic radiation to health issues, this approval may be to be revised.
- 1.9) The finishing and colour of the panel antennae must be kept in keeping with the building to which it is attached.(Rooftop sites only)
- 1.10) That the consent use / departure be restricted to the fenced compound of the mast and equipment room as depicted on the building plan (Freestanding sites only)
- 1.11) This approval does not exempt the applicant from any other Bylaws or Regulations that may be applicable.
- 1.12) The applicant accepts the abovementioned conditions in writing within 30 days of notification thereof.
- 1.13) The mast or equipment room shall not be utilised for outdoor advertising purposes.

#### **2) SITE SELECTION AND CO-LOCATION**

#### **3) VISUAL IMPACT, LANDSCAPING, PUBLIC AMENITY AND RESIDENTIAL AMENITY**

- 3.1) Paintwork / materials / finishes used for the fencing, posts, antennae and equipment container must subscribe to the provisions of the City's Draft Guidelines and be to the satisfaction of the applicable environmental official, prior to installation or construction of the site.

- 3.2) The container / equipment room must be set back as far as possible from the edges of the roof (Rooftop sites only)
- 3.3) Any lighting of structures shall be shielded from adjacent properties (tilted downwards), and shall avoid upward light pollution.

#### **4) IMPACT ON AREAS OF ENVIRONMENTAL AND HERITAGE SIGNIFICANCE**

#### **5) SAFETY AND SECURITY**

- 4.1) If access to the rooftop is prevented, for example, by a locked door, ensure that this conforms with fire escape procedures. (Rooftops only)
- 4.2) Access to the antennae and or mast and equipment room must be strictly controlled by means of a fence / wall with locked gate and adequate warning signs in the official languages must be displayed on the gate.

#### **6) IMPACT ON EXISTING SERVICES AND UTILITIES**

- 5.1) Rooftop Installations should be situated in such a manner that they do not interfere with other utility functions.
- 5.2) In the event that interference occurs with Council's services, this shall be rectified by the cellular operator and at the cost of the operator, within the timeframe stipulated by Council.

#### **7) PUBLIC HEALTH AND SAFETY**

#### **8) LEASE**

- 8.1) This temporary departure shall become effective upon the approval of the lease application for a part of the property for the erection of cell phone communication infrastructure.
- 8.2) If for any reason any condition of the lease agreement is breached or the lease ceases to exist, the temporary departure shall expire.
- 8.3) Prior to approval of building plans, the applicant must provide Council with an indemnity form, indemnifying Council against any possible public claim arising from the erection / use of this installation.

#### **9.) SPECIAL CONDITIONS**

- 6.1) Any special conditions relevant to a particular site (e.g. mitigating factors such as landscaping required), should be added under this section.

**ABOVE STANDARD CONDITIONS WILL BE UPDATED ON THE CITY WEBSITE, AND MAY BE APPLICABLE, IN ADDITION TO ANY SPECIFIC CONDITIONS OF CONSENT WHICH MAY ALSO / ALTERNATIVELY BE IMPOSED**



#### ANNEXURE 4: TYPICAL AREAS OF ENVIRONMENTAL AND HERITAGE SIGNIFICANCE-

1. Land zoned Public Open Space
2. Large Boulders / rocky outcrops on the site
3. Site abuts Vacant / Open space / public passage
4. Site abuts or is within a conservation / nature area or place with Provincial / Local protection / status.
5. River/stream/drainage channel on or within 32m of the site
6. Wetland/dam/water body/marshy area/high water table on or within 32m of the site
7. Site that naturally stays filled with water in wintertime
8. Floodplain of a river / wetland (within 1:50 year floodline/ 1:100 year floodline)
9. Coastline / beach / or within 100m of the high water mark of the sea
10. Coastal dunes, Coastal forests / thickets on the site
11. Site outside or abutting the Urban edge or constituting the last row of properties on a mountainside, rural / smallholding edge or a horticultural area
12. Steep slopes (>1:3)
13. Site abuts / is within a scenic drive / reserve
14. Significant tourism gateways / viewing platforms / vantage points / vistas
15. Old Oaks, Stone Pines, gumtree avenues or similar Historical plantings on site (tree avenues/hedges)
16. Mature (trunk circumference of an adult's arms length ) trees on site (indigenous / alien)
17. Cultural landscapes, historic farms, historical plantings on site (tree avenues/hedges)
18. Existing Buildings / any part of a structure older than 60yrs
19. Existing building/site which is an old National monument / provincial heritage site
20. A declared / proposed Urban conservation area or heritage area / zone
21. Special Areas eg Bungalows
22. Surveyed heritage areas
23. Graves / burial grounds / cemeteries on the site
24. A place of known social / cultural significance, for example, certain places of worship, a male initiation site, a place of oral traditions/stories/legends, struggle history, slavery

# ANNEXURE 5: RADIO FREQUENCY (RF) EXPOSURE AND HUMAN HEALTH

## Electromagnetic Radiation from Mobile Phone Base Stations

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In the past century numerous devices have been designed by scientists and engineers using radio-frequency (RF) electromagnetic fields for communication. These include two-way communication transmitters (for example sea-vessel to shore-base), hand held communication transmitters (walkie-talkies), radio and television transmitters, radars, satellite communication transmitters, and lately mobile phone (or cellular phone) communication transmitters including cellphones and base stations.

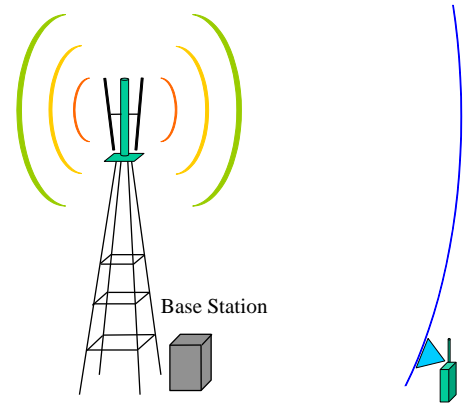
### *The nature of RF communication*

In all the cases mentioned above, one *transmitting device* transmits (or radiates) energy in the form of electromagnetic fields carrying the required information (voice, picture, digital data, etc.). A second *receiving device* receives a **very small part** of the radiated energy, enough that the required information can be processed and used.

### *RF communication in cellular phone technology*

In the case of cellular phones, two-way communication must be established between the cellphone and the base station. First, the base station acts as the source of radiation and then the cellphone. A simplistic view of RF communication when the base station acts as the radiating source is shown in Figure 1. Here it is demonstrated how the base station antennas radiate RF electromagnetic fields away from the base station in all directions --- like the waves in a pond when a stone is dropped into it. As the radiating field travels away from the base station, the energy it carries is distributed over a larger region (the semi-circles become larger). In one particular direction, energy from the radiating field is "intercepted" by a receiving device (cellphone). Only a small percentage of the transmitted energy is available for "interception".

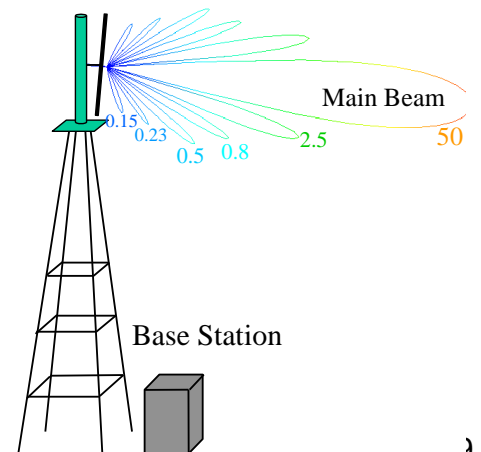
**Figure 1**



### **Radiation levels around base station antennas**

Near a base station, in regions that are accessible to the general public (for example, at the foot of a base station mast), another important factor must be taken into account: A base station antenna radiates most of its energy in a specific direction (called the main beam of the antenna). This is shown in Figure 2. The main beam typically points in the direction of the horizon (actually a few degrees downwards). The result is that only a very small percentage of the radiated energy will be present in the regions outside the main beam (that is, in the regions around the base station masts which are accessible to the general public).

**Figure 2**



## RF radiation and the environment

The consequence of numerous RF devices continuously radiating electromagnetic fields in all directions is that our environment (our suburbs, homes, offices, streets, playgrounds, etc.) is populated by RF electromagnetic fields, all carrying some amount of energy. At the frequencies these devices radiate at (i.e. radio-frequencies), the electromagnetic fields can penetrate relatively easily into our bodies. Our biological tissue material (brain, muscle, bone, fat, etc.) absorbs some of this RF energy.

## RF radiation and human health

It is very important to note that there is a significant difference between radio-frequency radiation (at which cellular technology operates) and the well know X-ray and Gamma-ray radiation that can be emitted by radioactive material. X-ray and Gamma-ray radiation are classified as **ionizing** radiation. These are known to be dangerous through the mechanism of ionization (or the direct breaking of chemical bonds in human tissue or cells). Radio-frequency radiation is classified as **non-ionizing** radiation because the energy it carries is too low to cause ionization or the breaking of chemical bonds in human tissue. However, at *sufficiently high energy levels* RF radiation **can** be harmful to humans. All scientists agree on this point and for this reason various international regulating bodies have compiled standards or guidelines for limiting human exposure to radio-frequency radiation.

## Guidelines for safe exposure to RF radiation

The guidelines for safe exposure have been compiled from the published scientific literature on the topic, and the scientists who have studied the literature agree that the research is adequate for establishing valid safety guidelines. Simplistically stated, the guidelines are established in the following way: Scientists observe that negative health effects *start* to occur in laboratory animals at a certain energy level. They then set the safety guidelines (applicable to the general public) at approximately 50 times below this energy level. In South Africa, the Department of Health (Directorate: Radiation Control) has adopted the International Commission on Non-Ionizing Radiation Protection guidelines of April 1998 (ICNIRP'98).

## Prolonged exposure

Research to date indicates that what matters most is the intensity of exposure and not the duration. This has been established through lifelong exposure of rats and mice, and epidemiological studies on military personnel who have worked close to communication antennas and radars (RF devices) for years. The guidelines have thus been set accordingly.

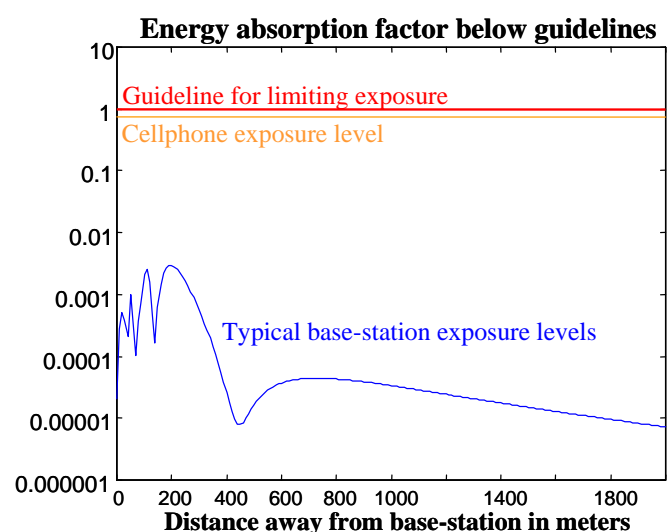


Figure 3

## Cellphones and guidelines for safe exposure

With the cellphone as radiator, RF exposure of the human operator is just below the international safety guidelines (see Figure 3). This is due to the very close proximity of the operator to the cellphone. But remember that these guidelines are 50 times below the energy levels where negative health effects have been observed.

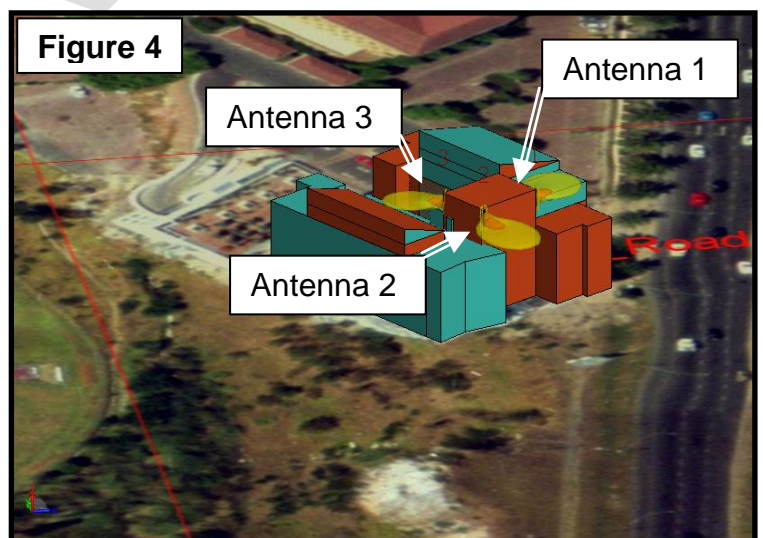
## Base stations and guidelines for safe exposure

Energy absorption in humans exposed to RF radiation from base stations is typically **hundreds to thousands** of times **below** the international safety guidelines (see Figure 3). This is also true on the ground next to base stations or at any position in the close vicinity of base stations. Only on the top of a base station mast, directly in front and within 10 to 20 meters of the antennas, would the energy absorption levels approach the safety guidelines. The public is usually denied access to these areas.

## Base stations on rooftops

Quite often in urban environments, base stations are installed on the rooftops of buildings. In some cases the antennas of the base station site might be installed against the wall of a building. The reason behind these rooftop installations is to provide cellphone coverage in the area without erecting a mast. Similar to base stations on masts, installations on rooftops lead to public exposure in the immediate vicinity of the building that are **thousands** of times **below** the international safety guidelines (see Figure 3). Exposure right below the installations (on the top floor of a building) or right behind a wall mounted installation is also well below the guidelines. The only extra precaution that should be taken in the case of rooftop installations is that access to the areas **directly in front and within 10 to 20 meters** of the antennas should be controlled, because this is the area where the exposure levels would approach the safety guidelines.

Figure 4 shows a computer representation of a typical rooftop installation. The yellow zones are the boundary area where the exposure approaches the public guideline for safe exposure. As can be seen from this representation, the only area of exposure above the guidelines is right on top of the roof, in front of antenna 1. Access control and signage would be implemented to protect members of the public against accidental entry into this area on the roof. The yellow zones of antennas 2 and 3 are in the air where no person has access. These antennas are thus inherently safe and no special access controls need to be implemented.



## Occupational Exposure (RF workers)

Most regulating bodies, including ICNIRP and the Directorate: Radiation Control (South Africa) distinguish between occupational and general public exposure levels. The following direct quotation from the ICNIRP guidelines should yield a clear understanding of what is meant by the concept **occupational** exposure:

*“ The **occupationally** exposed population consists of adults who, in the normal course of their particular employment, are exposed under generally known conditions and are trained or informed to be aware of potential risks and to take appropriate precautions.”*

Guidelines for safe **occupational** exposure are 5 times less stringent. This is still 10 times below the levels at which harmful health effects have been observed, but it can be expected from “aware” and well-trained RF workers that they take precautions to minimize exposure during the course of their work.

## The World Health Organization and continuous international research

The available guidelines for safe exposure are deemed to be an accurate health risk assessment based on the current available research data. This is the view of the World Health Organization (see the WHO factsheet on base station exposure at <http://www.who.int/mediacentre/factsheets/fs304/en/index.html>). Apart from the WHO, a number of independent international expert groups have also reviewed the scientific literature. All concluded that the balance of evidence indicates that exposure **below** the **ICNIRP guidelines** would not cause any negative health effects. Nonetheless, scientific studies on human exposure to radio-frequency fields continue world-wide. These studies are conducted to enable regulating authorities to make *better health risk assessments* as more and more people worldwide are exposed to the radio-frequency radiation from cellular phone and other communication technologies. The majority of scientists in this field concentrate their studies on possible health effects at cellphone levels of radiation and **not** base station levels, because the latter are deemed too low to justify intense investigations.

## NATIONAL DEPARTMENT OF HEALTH (LETTER FROM THIS DEPARTMENT)

### Department of Health

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Date: 14 June 2010

### To whom it may concern

### HEALTH EFFECTS OF CELLULAR BASE STATIONS

Within the national Department of Health, the Directorate: Radiation Control is the section responsible for regulating non-ionizing radiation, and this includes electromagnetic fields (EMF) at frequencies less than 300 GHz. In carrying out this responsibility, the Directorate has been utilising the World Health Organization's (WHO) International EMF Project ([www.who.int/emf](http://www.who.int/emf)) as its primary source of information and guidance with respect to the health effects of EMF. In this regard, two recent publications by the WHO are of particular relevance, i.e. (i) International EMF Project Fact Sheet **"Electromagnetic fields and public health: mobile phones"** ([www.who.int/mediacentre/factsheets/fs193/en/index.html](http://www.who.int/mediacentre/factsheets/fs193/en/index.html)) and (ii) the results of the multi-national 10-year long INTERPHONE study on mobile phone use and brain cancer risk (press release – [www.iarc.fr/en/media-centre/pr/pdfs/pr200\\_E.pdf](http://www.iarc.fr/en/media-centre/pr/pdfs/pr200_E.pdf)). The Directorate endorses the exposure guidelines published in 1998 by the International Commission on Non-Ionizing Radiation Protection (ICNIRP), based on the official endorsement of the WHO in this regard. ICNIRP states categorically that exposure to EMF at any level below that of the ICNIRP exposure guidelines will protect people against the known adverse health effects of EMF. The Department of Health is currently considering new legislation with regard to EMF and compliance with the ICNIRP exposure guidelines would in all probability form the mainstay of any such future EMF regulations. The scope of regulatory control would be another issue to consider, i.e. whether cellular and/or other low power radiofrequency technologies should be included at all, and if so, on what basis and subject to which control measures.

Measurement surveys conducted in South Africa and around the world have shown that the actual levels of public exposure, as a result of base station emissions, are invariably only fractions of a

percentage of the ICNIRP guidelines, even in instances where members of the public have been really concerned about their exposure to these emissions. The Department is therefore satisfied that the health of the general public is not being compromised by their exposure to the microwave emissions of cellular base stations, because at present no confirmed scientific evidence exists that would indicate any hazard to human health in situations that members of the public would typically find themselves in. This also means that local authorities, in considering the environmental impact of any particular base station, do not need to and should not attempt to set, from a public health point of view, any restrictions with respect to parameters such as mast heights, separation distances, and duration of exposure. In all of this, it is implicitly assumed that the normal security measures, which are routinely implemented by the cellular network providers at all base stations, will effectively prevent reasonable members of the public from gaining close access to the actual antennas situated on any mast structure.

It is important to note that although the Department of Health is currently not prescribing or enforcing any exposure limits for electromagnetic fields or measures to limit exposure to such fields, the Department does strongly advise all parties concerned, whether they be other government departments, industry, or the public, that compliance with the afore-mentioned 1998 ICNIRP guidelines is the recommended and science-based way to deal with any situation involving exposure to electromagnetic fields.

**Yours sincerely,**



**LL du Toit**  
**DEPUTY DIRECTOR: RADIATION CONTROL**

NATIONAL DEPARTMENT OF ENVIRONMENTAL AFFAIRS AND TOURISM:  
DIRECTORATE ENVIRONMENTAL IMPACT MANAGEMENT

The Department of Environmental Affairs and Tourism do not have a policy with regards to health and support the recommendations of the National Department of Health:

“While the biological effects of exposure to much higher intensity radio frequency fields have been somewhat determined, there is research presently underway to delineate what possible biological effects, if any, are linked to the low intensity exposures near cellular towers. Currently, there is no significant indication that chronic exposure to the EMFs around cellular sites has any potential to be hazardous to human health. In the absence of confirmed

scientific evidence of a health risk to humans resulting from cell phone use, the South African Department of Health has not deemed it necessary to exercise regulatory control over either the erection and operation of cell phone base stations or the sale and use of cell phones". (Provisional Background Document on Standards for Cellular Phone Base Station Antennas (Draft: 2000-08-17).

NEMA NATIONAL ENVIRONMENTAL MANAGEMENT ACT (107/1998) CHAPTER 1  
SECTION 2: PRINCIPLES

Section 2 (1): "The principles set out in this section apply throughout the Republic to the actions of all organs of state that may significantly affect the environment".

Section 2 (4) (a) (vii) "Sustainable development requires the consideration of all relevant factors including the following: - that a risk-averse and cautious approach is applied, which takes into account the limits of current knowledge about the consequences of decisions and actions."

DRAFT



## **ANNEXURE 6: REFERENCE GUIDE**

Council wishes to acknowledge that the following documents have been used or institutions consulted, in the preparation of this Policy:-

Department of Planning NSW, Australia, Draft Telecommunication Guidelines, 2002.

EMSS, Technopark, Stellenbosch

Liverpool City Council, development Control Plan No. 38: Telecommunication Towers, 23 August 2000.

Western Australian Planning Commission, Statement of Planning Policy No. 52: Telecommunications Infrastructure, and Guidelines for the Location, Siting and Design of telecommunication Infrastructure (March 2004).

South African Bureau of Standards (SABS): Draft Code of Practice: Environmental Considerations for the Planning and Management of Telecommunications Structures (prepared by Environomics for the SABS) 19 May 2000.

National Department of Health: Health Effects of cell phones and cell phone base stations. Directorate Radiation Control, September 2000.

Department of Environmental Affairs and tourism (Directorate Environmental Impact Management: Provisional Background document on standards for cellular phone base station antennas).

ICNIRP, International Commission on Non-Ionizing Radiation Protection.