

**TELECOMMUNICATION MAST  
INFRASTRUCTURE POLICY**

**DRAFT**

**2016/17**

# GLOSSARY, DEFINITIONS AND TERMINOLOGY

## Abbreviations

SMIZS	Stellenbosch Municipality Integrated Zoning Scheme
DAS	Distributed Antenna Systems
DEADP	Provincial Department of Environmental Affairs and Development Planning
ECA	Electronic Communications Act 2005 (Act 36 of 2005)
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
EME	Electromagnetic energy
EMP	Environmental Management Plan
EMR	Electromagnetic radiation
FBTS	Freestanding Base Telecommunication Station
ICASA	Independent Communication Association of South Africa
ICNIRP	International Commission on non-ionizing Radiation Protection.
LUPA	Land Use Planning ACT No.3 of 2014.
MFBS	Minor Freestanding Base Telecommunication Station
NBR	National Building Regulations and Building Standards Act No.103 of 1977.
NDOH	National Department of Health, Directorate Radiation Control
NEMA	National Environmental Management Act No.107 of 1998
PED	Planning and Economic Development Department
RBTS	Rooftop Base Telecommunication Station RF radiofrequency
TMI	Telecommunication Mast Infrastructure
TP	Telecommunication Provider

## Definitions

**Antennas** 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 antennas less than 2m in diameter/ height and where the associated antennas 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 benefit of all, and need to be protected.

**Stellenbosch SDF** means the Spatial Development Framework approved by Council.

**Stellenbosch Municipality** means the administrative jurisdiction of Council.

**Municipality** means the Stellenbosch Municipality.

**Council** means the Municipal Council of the Stellenbosch Municipality and includes anybody or persons empowered by it to assess and resolve on Telecommunication Mast Infrastructure applications.

**Distributed Antenna System (DAS)** means a network of spatially separated antenna nodes connected to a common source via a transport medium that provides wireless service within a geographic area or structure. A distributed antenna system may be deployed indoors (an iDAS) or outdoors (an oDAS).

**Electromagnetic Energy (EME)** is a term which includes electromagnetic radiation and applies to all Telecommunication Mast 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** means a structure to house communication equipment associated with Telecommunication Mast Infrastructure. This can be a separate building or container used exclusively for the equipment or it can be a room within a building.

**Freestanding Base Telecommunication Station (FBTS)** means a freestanding support structure on land



or anchored to land and used to accommodate Telecommunication Mast Infrastructure for the transmitting or receiving of electronic communication signals, and may include an access road to such facility.

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

**MSA** means Local Government Municipal Systems Act 2000 (Act 32 of 2000)

**Minor freestanding base telecommunication station (MFBTS)** means a freestanding support structure on land or anchored to land and used to accommodate telecommunication infrastructure for the transmitting or receiving of electronic communication signals. The telecommunication infrastructure will form part of the base station that may be attached to street lamps, traffic lights, road directional signage, camera poles and flag poles or similar support structure which may not exceed:

- 15m in height measured from existing ground level, or
- 300mm diameter for the post or support structure to which the antenna is to be attached.

A screened container for antennas attached to, or included in the mast may not exceed:

- 500mm diameter
- 2m height

An equipment container may not exceed:

- 1m x 1m x 1m cube above existing ground level.

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

**NBR** means the National Building Standards and Building Regulations Act 1977 (Act 103 of 1977)

**Rooftop Base Telecommunication Station (RBTS)** means a support structure attached to a roof, side or any other part of a building and used to accommodate Telecommunication Mast Infrastructure for the transmitting or receiving of electronic communication signals.

**Satellite dish** means 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.

**Scenic Drive Network Plan** means as applied to an existing Council approved plan.

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

**Telecommunication Mast Infrastructure (TMI)** means any part of the infrastructure of a telecommunication network for radio/wireless communication, including voice, data and video telecommunications that are used in the transmission or reception of electromagnetic waves. This includes the following: Freestanding base telecommunication station (FBTS); Rooftop base telecommunication station (RBST); antennas; 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 antennas, needed for the operation of TMI.

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

**Telecommunication Provider (TP)** means the holder of a telecommunications licence in terms of the Electronic Communications Act (2005).

**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.

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# 1 PROBLEM STATEMENT

## 1.1 Need for this policy review

- 1.1.1. There is increasing importance of telecommunication to the growth of the economy. This is especially the case in Stellenbosch that has a strong emphasis on business services and information communication technology.
- 1.1.2. Rapid expansion of the telecommunications industry in recent years has resulted in an increasing demand for radio telecommunication services, and new technologies in the cellular phone industry. The location, siting and development of TMI continues to be an issue of particular interest to both local communities and local government alike, with debate focusing on adequate availability of connectivity, visual amenity and public health.
- 1.1.3. With the nature of technology it must be accepted that the future need for TMI sites will increase in the short to medium term.
- 1.1.4. Investment in telecommunications networks not only facilitates economic trade in goods, by bringing together buyers and sellers, but more importantly, also promotes trade in services upon which modern economies are built.
- 1.1.5. There are significant economic benefits of good Telecommunication Mast Infrastructure, but this must be balanced with the fact that Stellenbosch depends on its scenic resources for tourism. The resources therefore also have an economic value, which could be negatively affected by unsightly or inappropriate structures.
- 1.1.6. The need for the preparation of a Cellular Telecommunication Policy came about, firstly, due to the need to include all TMI into the policy and not focus only on cellular technology and secondly, due to the need to introduce provisions and guidelines on mitigating impacts of this infrastructure.
- 1.1.7. Many existing installations have been approved on a temporary basis. Their continued operation will at some point require re-consideration of approval. This Policy will provide updated guidelines to be utilized by decision makers within the Municipality in assessing and responding to any application for the right to erect or modify TMI.



## 1.2 Problem Statements

- 1.2.1. Most of the original infrastructure was approved as temporary departures.
- 1.2.2. Masts provide a radio signal which is dependent on line of sight for good reception. The signal becomes weaker with distance or obstructions.
- 1.2.3. Landlords, topography and demand tend to dictate the location of masts. For example, mountainous areas often require high masts due to the topography.
- 1.2.4. Due to improvements in mobile devices (smart phones), the coverage that each mast is able to provide has shrunk. Thus there is continual need to provide more masts as coverage is lost - the distance between the masts is reducing.
- 1.2.5. Cell phone providers are having difficulty accessing suitable land, and there have been problems accessing municipal owned land, even when it is the most suitable location for TMI.
- 1.2.6. Parastatals such as Telkom, ESKOM and the SABC, who also make use of masts, have traditionally not been subject to approval regulations or the same stringent requirements as private industry.

## 2 DESIRED OUTCOMES

The overarching premise is to facilitate the growth of new and existing telecommunications systems and facilitate the provision of TMI in an efficient, cost-effective, environmentally appropriate and sustainable way.

The policy aims to:

- Promote economic business activity in the Municipality;
- Give clarity and certainty to the industry and to the general public with regards to acceptable locations and positioning of TMI;
- Provide a comprehensive set of policy guide- lines;
- Improve the quality and efficiency of decision making;
- Improve consistency of decision making though- out all Municipal Districts and Departments and in the setting of conditions for planning applications; and
- Improve awareness and a quicker response to changes in TMI and its related industry.



### 3 STRATEGIC INTENT

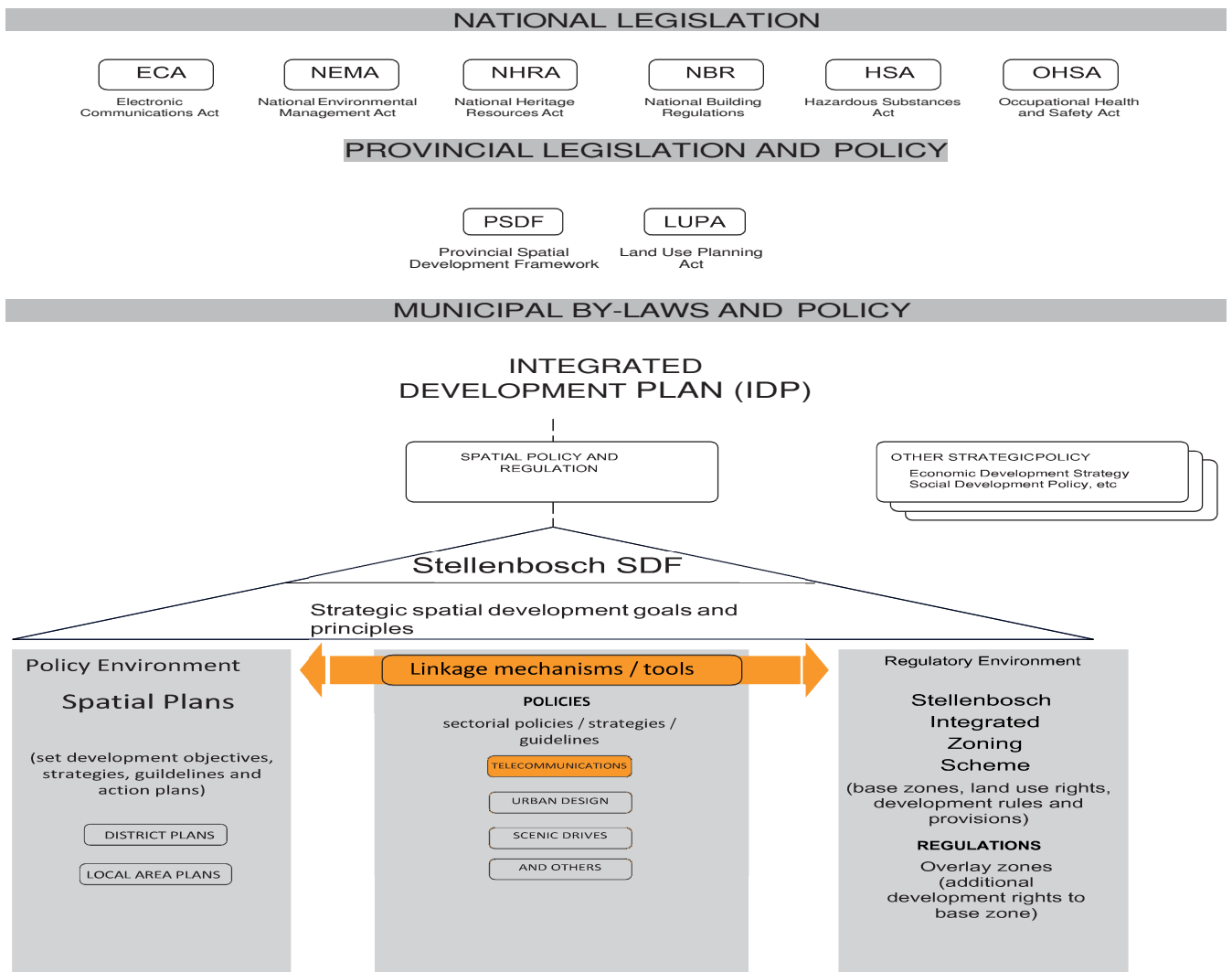
Control over the installation of TMI falls within the ambit of municipal planning, which, in terms of the Constitution is a municipal competency.

In terms of the MSA and the Constitution, Council must satisfy itself that it is addressing its 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 TMI.

The policy falls within Strategic Focus Area 1: The opportunity Municipality: Programme 1.1(e): Planning and regulation programme: Supportive legal frameworks. It serves to support other policies while dealing with TMI in detail.

Optic Fibre installations, Point to Point copper (cable) installations, and undersea cables are excluded from this Policy.

The implementation of the Policy will aid the development of a Municipality with **opportunities** which are **well run, safe** and **inclusive**.



## 4 POLICY PARAMETERS

The policy applies across the Stellenbosch Municipality.

The Policy contains information which can assist applicants when preparing an application regarding the siting and design of TMI 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 TMI for planning approval. Attention to the Policy will reduce the prospect of ill-conceived applications being submitted to the Municipality. It will also minimize delays involved in subsequent assessment and determination of applications.

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 Stellenbosch Municipality as far as possible, and to minimize the health risks (known / potential and perceived) associated with EME, in line with the Municipality's mandate.

The responsibility for regulation and control of EME lies with the National Department of Health (see "Annexure 7: Letter from the National Department of Health" on page 46).

This policy will not affect TMI that has been lawfully approved, unless the approval lapses and a new application is to be made.

### 4.1 Visual Impact

Council encourages sensitive siting, design and co-location or sharing of TMI so as to minimize impact on its surroundings.

The Policy seeks to strike a balance between erection of necessary TMI development on the one hand, and the conservation of visual, tourist, traffic safety, environmental and heritage characteristics on the other hand. The objective of this Policy is to ensure that placement of the TMI respects the

integrity of any site on which it is erected and that it does not detrimentally affect the character of the locality in which it is displayed. TI should be placed where they are most compatible with the surrounding locality and where they impact as little as possible on visual corridors or scenic drives.

### 4.2 Health Impact

The Municipality takes guidance from the NDOH who have adopted the ICNIRP public exposure standard (See Annexures "A6.4 Guidelines for safe exposure to RF radiation" on page 43 and "Annexure 7: Letter from the National Department of Health" on page 46). This policy, must adopt a precautionary approach by the insertion of certain additional provisions and requirements (see "Objective 10. To protect the health, safety and wellbeing of the inhabitants of Stellenbosch" on page 24).

The cellular network provider or network provider shall at all times be required to comply with the requirements of the NDOH and the ICNIRP on nonionizing radiation protection with respect to safety standards.

### 4.3 Services Impact

Most underground infrastructural services are located within Councils road reserves. Historically some service providers, and particularly Telkom, installed services in an ad hoc manner. Many of the Municipality's road reserves do not have an accurate record of the type and location of these services.

Any proposals to consider additional infrastructure (including the base plinth) for TMI need to take cognisance of the logistical difficulties that may arise as a result of this uncertainty of services location.





## 5 ROLEPLAYERS AND STAKEHOLDERS

The Telecommunication Mast Infrastructure Policy has been written for TPs, built environment professionals and municipal officials involved in the design, assessment and implementation of development proposals. It will be used primarily by the Stellenbosch Municipality's Planning and Building Development Management Department (PBDM) to facilitate their statutory development control functions. The powers and functions of these departments are captured in the system of delegations granted by Council to act on its behalf.

All applicable Municipal Departments will use the policy to comment on applications in support of the functions of the regulatory departments.

The TMI industry is a key role player and they not only need to continue developing new technology, but also need the legislative framework in which to operate within the law.



## 6 REGULATORY CONTEXT

### 6.1 Statutory Framework

**6.1.1.** Compliance with the Electronic Communications Act (36 of 2005). ICASA regulates all forms of TMI and the issue of approvals and licenses. Documentation may be required showing that transmitting power levels are in compliance with ICASA licence conditions. The 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 IC-NIRP.

**6.1.2.** 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 DEADP is the competent authority to authorize 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 TMI is to be placed on a site not previously used for this purpose, and where the TMI will exceed 15 metres in height, excluding attachments to existing buildings and masts on rooftops. Construction activities that may be required for TMI installation may also trigger other listed activities in terms of this Act.

**6.1.3.** The NBR and the regulations thereunder, particularly Section 7 of the Act, requires Council to be satisfied that buildings or structures are not dangerous to life or property. Other provisions in the Act are that the buildings / structures must not disfigure the area, that they must not be unsightly or objectionable, and that they must not derogate from the value of adjoining or neighbouring properties. TMI such as FBTS is considered to be a structure as defined in the NBR and will therefore

**Table 1: Zones that allow TMI as primary use, additional use or with the consent of Council**

Zone	Primary Use	Additional Use (SDP)	Consent use
Multi-Unit Residential Zone			Rooftop
Local Business Zone			Rooftop
Industrial Zone	Rooftop		Freestanding
Education Zone			Freestanding and Rooftop
Community Zone			Freestanding and Rooftop
Utility Services Zone	Rooftop		Freestanding
Transport Facilities Zone		Rooftop	Freestanding
Public Roads and Parking Zone		Rooftop	Freestanding
Public Open Space Zone			Freestanding and rooftop
Private Open Space Zone			Freestanding and rooftop
Agriculture and Rural Zone		Rooftop	Freestanding
Natural Environment Zone			Freestanding and rooftop

*Note that the content of this table is subject to change should the bylaw be amended*



require approval in terms of such Act by Council.

**6.1.4.** Section 34 of the National Heritage Resources Act (Act 25 of 1999) requires a permit for any alteration or 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.

**6.1.5.** The Stellenbosch Municipality Integrated Zoning Scheme permits FBTS and RBTS as a primary or additional use in certain use zones. The scheme also permits with Councils consent both the above in certain zones (see Table 1). Council must also have regard to permitting these base stations in terms of various overlays in the Zoning Scheme Regulations, present and future.

## **6.2 Council approvals required**

**6.2.1.** Land use management within the jurisdiction of the Stellenbosch Municipality is governed by its Zoning Scheme approved in terms of the LUPA. The Stellenbosch Municipality Integrated Zoning Scheme permits RBTS and FBTS as a primary or additional use in certain zones. The scheme also permits with Councils consent BST's in certain zones.

**6.2.2.** Where the permitted use is silent in the scheme, a temporary land use departure can be applied for, for a limited period of time.

**6.2.3.** Applications will be advertised in accordance with legislative requirements together with Council's Notification Policy for Land Use Development Applications.

**6.2.4.** The erection of TMI is also controlled by the NBR. In this Act, a building includes "any other structure erected or used for or in connection with the rendering of a service". Plans for TMI must therefore be submitted to Council for approval.

**6.2.5.** Other approvals or checks may be required in terms of any other relevant municipal Bylaws.

## **6.3 Accommodation of MFBTS in the SMIZS**

In terms of section 3.2.8 of the SMIZS a special use is a use that is not defined or provided for in the zoning scheme regulations, and may be so classified and permitted in any zone with the approval of Council.

It is proposed that MFBTS be included in the SMIZS as a consent use and permitted in the following zones:

- Multi-Unit Residential Zone
- Local Business Zone
- Industrial Zone
- Education Zone
- Community Zone
- Utility Services Zone
- Transport Facilities Zone
- Public Roads and Parking Zone
- Public Open Space Zone
- Private Open Space Zone
- Agriculture and Rural Zone
- Natural Environment Zone

- Stellenbosch Municipality Integrated Zoning Scheme
- National Building Standards and Building Regulations Act 103 of 1977
- Electronic Communications Act (36 of 2005)
- Hazardous Substances Act (Act 15 of 1973)
- National Environmental Management Act (Act 107 of 1998 as amended)
- National Heritage Resources Act (Act 25 of 1999)

## 7 POLICY OBJECTIVES AND GUIDELINES

The objectives and guidelines of the policy as presented in the next pages must be taken into account in the assessment of all applications received for TMI in the Stellenbosch Municipality.

The Policy addresses 6 issues, namely,

- Economic considerations;
- Site selection and co-location;
- Visual impact, landscaping, public amenity;
- Impact on areas of environmental and heritage significance;
- Impact on existing services and utilities; and
- Public health and safety.

Municipalities are authorized to make policies and bylaws to regulate matters which are within its competency to administer.

The following TMI may be erected after approvals are granted without having to comply with the provisions of this Policy:-

- Temporary installations that provide additional telecommunications coverage at public events, such as sports events or cultural festivals (limited to the duration of the event).
- Replacement of support structures only, for purpose of co-location of TMI if the replacement structure is not more than 5 metres higher than the original approved structure it replaces and the TMI that it supports does not protrude more than 0.5 metres from the face of the structure. This does not apply to structures with no previous required approvals, nor to the replacement of outdated/faulty equipment.

Each issue gives rise to a number of objectives which strive to address the issue. Each objective includes guidelines on how this should be done.

**THE OBJECTIVES MUST BE READ HOLISTICALLY WITH EACH OTHER AND WILL BE ASSESSED AS A WHOLE.**

### Application of the Policy

- Applications for TMI must be considered i.t.o. this Policy and all information required in “Annexure 2: Requirements for submission” on page 34 and “Annexure 3: Information to be submitted with applications” on page 36 to this policy must be submitted with an application for TMI.
- The objectives, guidelines and requirements laid down in this policy shall serve as a guide-line for decision making by the municipality which involve the construction or modification of TMI on any land within the jurisdiction of the Stellenbosch Municipality
- Each application for a TMI will be considered on its own merits and within the guidelines of this Policy.



## OBJECTIVE 1: TO IMPROVE AND MAINTAIN COMMUNICATION

*Telecommunication networks not only facilitate economic trade in goods, by bringing together buyers and sellers, but more importantly, also promote trade in services upon which modern economies are built. It can thus be seen how important communication can be for economic growth. Communication is the root of all events, daily interaction, social affairs and anything that requires the purpose of human dealings.*

**OB.1.1.** The telecommunications network should be as comprehensive and accessible as possible.

**OB.1.2.** Use TMI to enhance people's experience of the municipality (both residents and tourists), and allow them to remain connected.

**OB.1.3.** Use the TMI to increasingly become a:

- Valley of Possibility
- Green and Sustainable valley
- Safe valley
- Dignified Living
- Good Governance and Compliance



## OBJECTIVE 2: TO INSURE THAT THE TMI IS PLACED IN THE BEST POSSIBLE LOCATION

The coverage area that TMI can reach needs to be maximized while at the same time it must be ensured that the siting is compatible with adjoining land uses and permissible land uses, 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 minimized. Well sited TMI will reduce the mitigation measures that are needed.

**OB.2.1.** Subject to all other relevant criteria TMI should preferably be located within areas where they have the least visual impact.

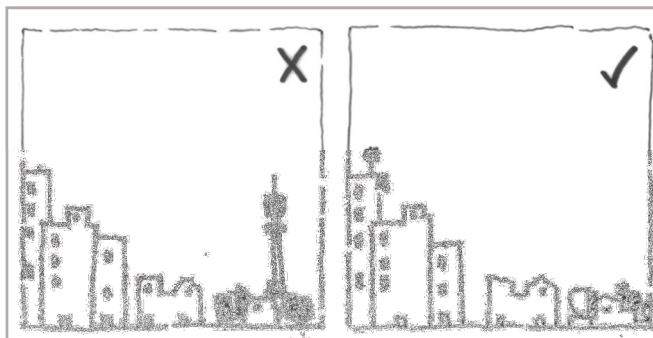
**OB.2.2.** TMI should when developed within or abutting an area of environmental or heritage significance be located and positioned on the property where it will have the least impact on the surroundings.

**OB.2.3.** All possible site location alternatives should be explored early in the planning process in order to minimize the impact of the TMI, rather than relying only on mitigation measures to reduce the impact.

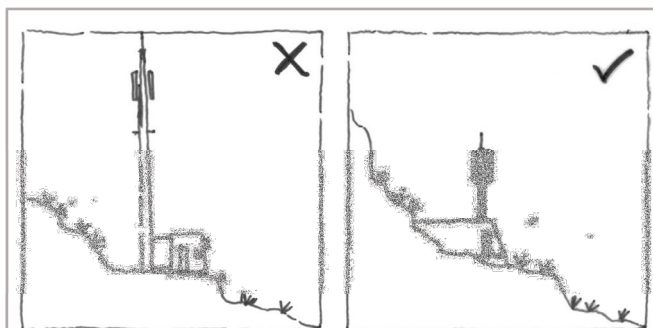
**OB.2.4.** In open areas, avoid placing TMI in visually sensitive zones see "Factors affecting visual sensitivity" on page 15, such as:

- On highly visible skyline locations, such as ridges and coastal promontories;
- In stark open fields, particularly on hill crests – rather relate the mast to other structures or clumps of trees in the area.

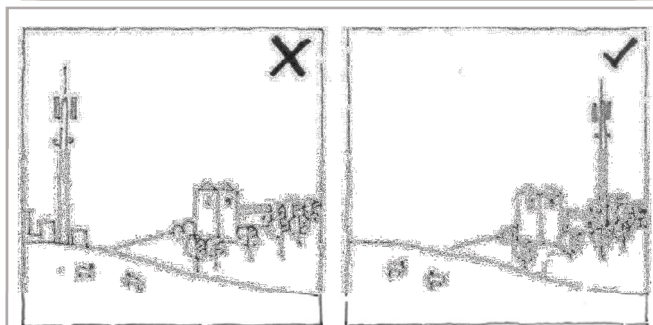
**OB.2.5.** Using existing structures to accommodate TMI is encouraged (if this does not conflict with any other legislation), for example, on tall buildings, utility poles, light masts, billboards and existing tall structures. (See "Objective 9. Where possible TMI should be placed on other structures such as light posts, road signs etc." on page 23)



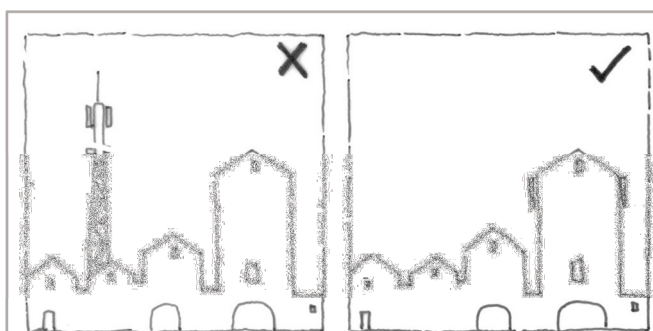
Locate TMI within industrial, commercial or business areas where possible



Avoid masts and structures on the skyline

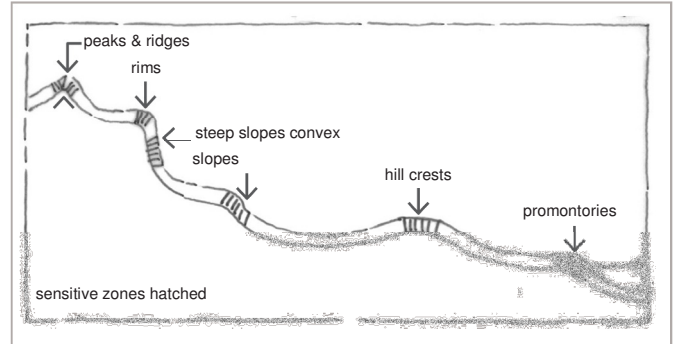


Relate masts to other structures and/or tree clumps

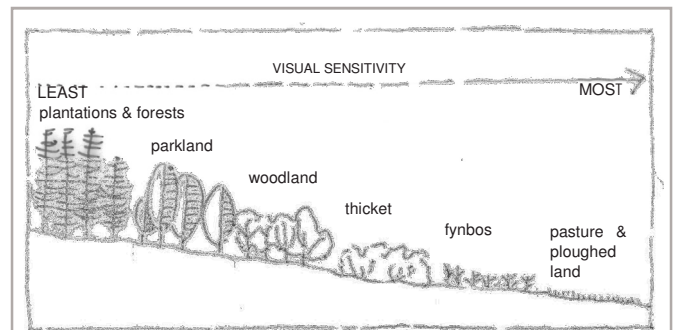


Use existing structures to accommodate TMI wherever possible

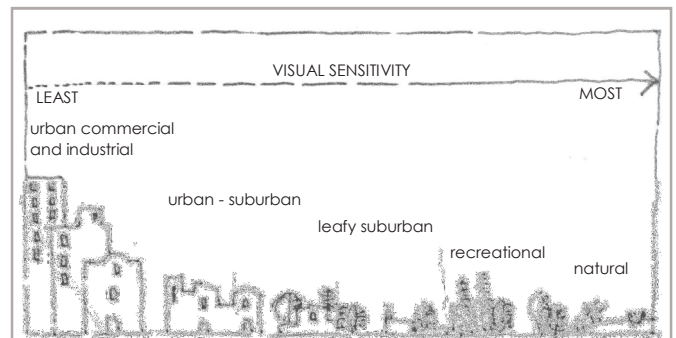
- The landscape or townscape can be seen to have varying levels of visual absorption capacity. This existing visual impact is largely dependent on landforms, land cover (vegetation), and land uses.
- Landforms such as peaks, ridges, spurs, promontories, rims, convex slopes and steep gradients, for example, tend to be more visible and therefore more visually sensitive.
- Land with low cover, such as ploughed fields or low fynbos vegetation provide less visual absorption than thickets or woodland. Plantations, shelter belts and parkland tend to have the tallest canopy, although plantations may be temporary, if harvested.
- Land uses such as open playing fields or low density residential areas tend to be more visually exposed than commercial or industrial areas with large buildings.
- Visual sensitivity is related to the degree of naturalness of an area. For example, pristine areas are more scenically valuable than disturbed or urbanized sites. Generally the sensitivity scale ranges according to the wilderness, rural or urban character of the landscape.
- The uniqueness of an area, or the protection it is afforded must also be considered. Nature reserves, scenic drives, national monuments, heritage sites and historical areas would all heighten the sensitivity of an area.
- Special features, view sites and places of interest further influence visual sensitivity at a micro scale.



Visually sensitive landforms



Land cover and visual absorption capacity



Land use and visual absorption capacity

## OBJECTIVE 3. TO ENSURE THE CO-LOCATION OR SHARING OF TMI WHEREVER POSSIBLE

*It is necessary to effectively and efficiently use existing infrastructure and minimize visual clutter. Competing TMI sites across the municipality will therefore be discouraged.*

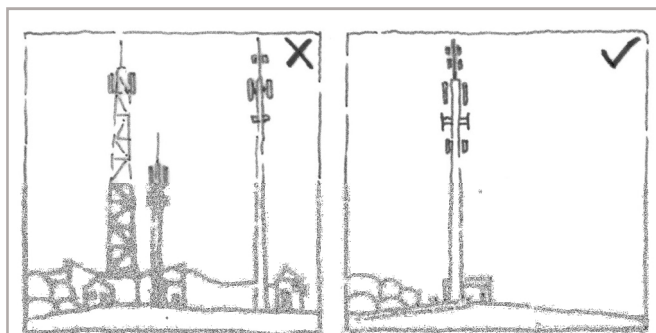
**OB.3.1.** Existing and future potential for co-location of TMI needs to be considered.

**OB.3.2.** 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 all other considerations. These could include:

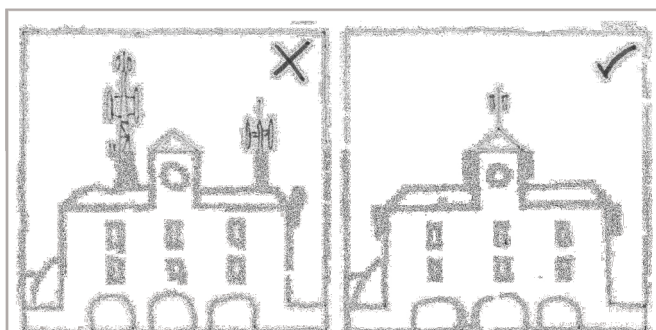
- a possible increase of support structure height needed to accommodate the other providers that may be visually unacceptable;
- a possible increase of power output from one location;
- physical and technical limits to the loads that a support structure is able to support; or
- planned Radio frequency (RF) coverage may not be achieved by a particular TP at a certain location.

**OB.3.3.** The siting and design of TMI 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 minimize any adverse impact on the amenity of the surrounding area.

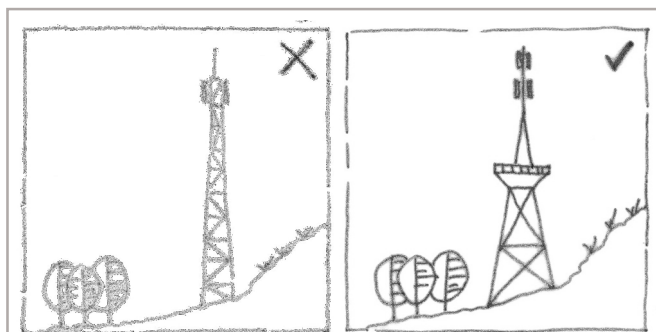
**OB.3.4.** Consider the possible multiple use of masts for landmark structures etc. Take the particular needs and character of the area into account.



Design masts for sharing



Integrate the TMI with the existing structure or building wherever possible



Masts could become viewing towers



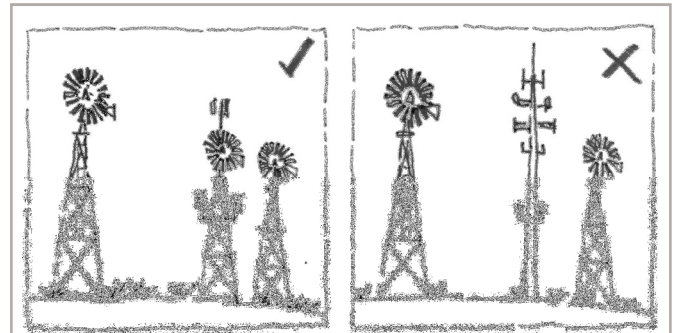
## OBJECTIVE 4. TO RETAIN THE VISUAL INTEGRITY, SPECIAL CHARACTER AND AMENITY OF THE STELLENBOSCH MUNICIPALITY

*Proliferation of TMI could result in visual clutter which would be detrimental to Stellenbosch's built and natural environment. The visual impact is especially important in natural open environments or on ridge lines. TMI should be integrated into the landscape (whether rural or urban) to be as visually unobtrusive as possible.*

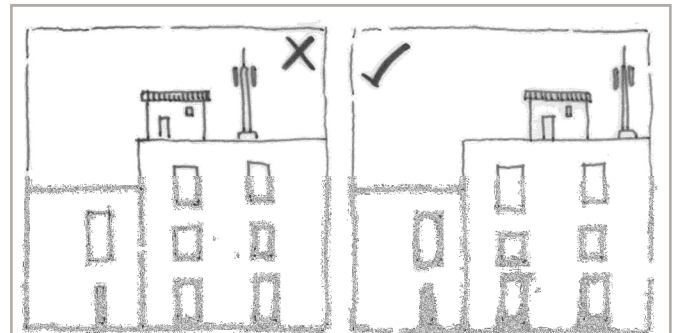
- OB.4.1.** TMI should be designed, sited and integrated with existing infrastructure to minimize any potential adverse visual impact on the character and amenity of the local environment, in particular, impacts on prominent landscape features, buildings, general views in the locality and individual significant views.
- OB.4.2.** Attention must not only be paid to the design of masts, but also to the treatment of ancillary structures and mechanical equipment. Access roads, power lines and fencing will all be assessed.
- OB.4.3.** TMI must be designed to minimize, mitigate or avoid adverse impacts on the visual character and amenity of residential areas.
- OB.4.4.** The obstruction of or detracting from views of significant vistas, significant landmarks or elements of the cultural landscape should be avoided.
- OB.4.5.** TP's must motivate their choice of support structure, which should blend into the surrounding environment as far as possible.
- OB.4.6.** 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.
- OB.4.7.** Cables should be placed underground, unless it is impractical to do so and there would be no significant effect on visual amenity.
- OB.4.8.** Newly constructed access roads or other parts of the TMI site, as deemed appropriate, should be landscaped to Council's satisfaction.
- OB.4.9.** Advertising signs of any type require approval in terms of the Stellenbosch Municipality Outdoor Advertising and Signage Bylaw. Signage should 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.

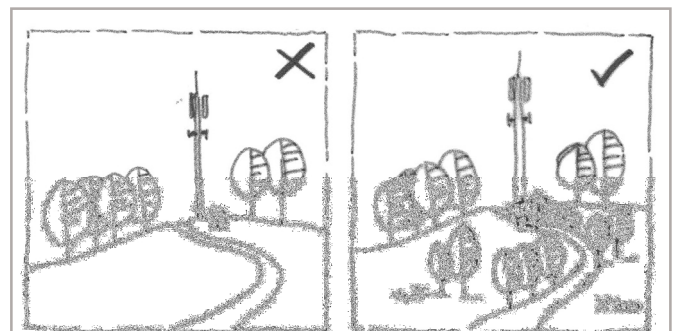
- OB.4.10.** Lighting should be energy efficient, fully shielded and tilted downwards and screens should be placed around these lights to prevent vandalism. Any such measures are required to be indicated on the TMI Plan that is submitted on application.



Site to minimize adverse visual impacts



Set the equipment room as far back as possible on a rooftop



Access roads should be landscaped

## OBJECTIVE 5. TO DESIGN WITH THE LANDSCAPE AND USE MODERN MITIGATION MEASURES TO REDUCE IMPACT

*The TMI should be placed and designed to respond appropriately to the surrounding landscape. Mitigation measures should be appropriate to each particular landscape and incorporated into the design.*

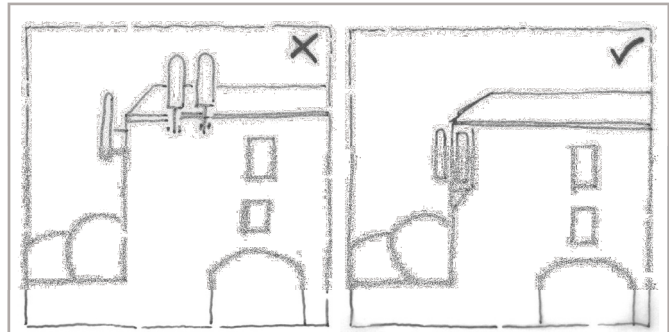
**OB.5.1.** Design and siting of TMI should be integrated as far as possible with the building or support structure to which it relates. TMI such as antennas should not merely be hung off the side of a building, or be attached so as to protrude above the top of the roof/apex of a roof, but should form 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 TMI.

**OB.5.2.** Techniques which may be used to minimize adverse visual impacts for RBTS 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 and finial and screening to minimize visibility of the facility from adjacent areas.

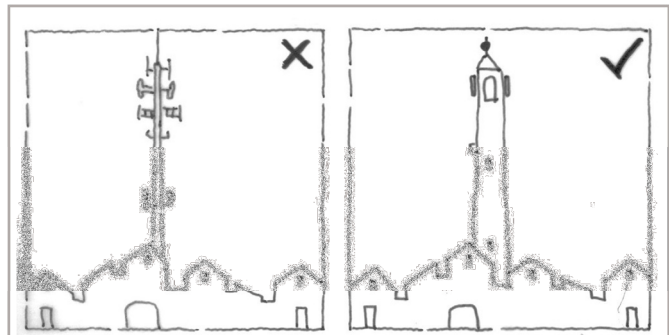
**OB.5.3.** In the case of FBTS, design measures to mitigate visual impact are in some cases the same as those referred to above, and include: adjustment to the overall size (height and dimension); colour coding to match the predominant background (e.g. sky, vegetation); designing the infrastructure 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.

**OB.5.4.** The equipment room should be walled or fenced as appropriate in the context (metal, stone, wood or brick) or housed in a specially designed building to match other buildings on the site.

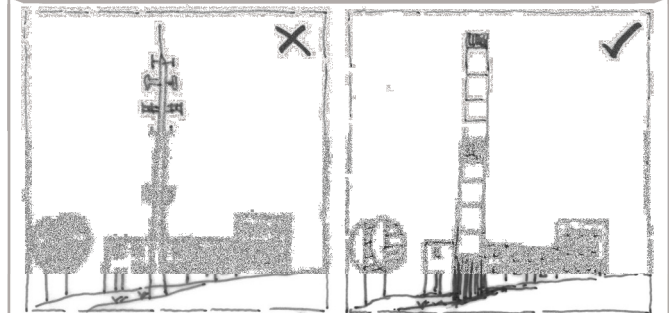
**OB.5.5.** TMI support structures should preferably be located where vegetation (trees), landforms or other features of a site will adequately screen or reduce the impact of the TMI from public



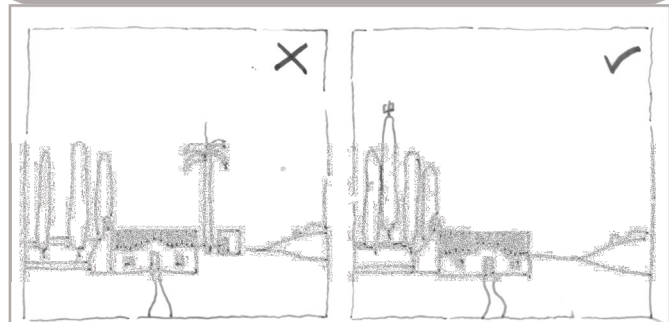
Integrate TMI with the building or support structure to which it relates



An architectural feature can be created on the building or in the landscape



The TMI can be designed as a work of urban art/furniture

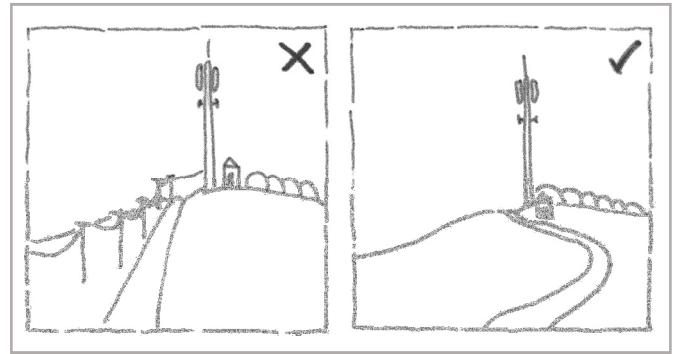


Avoid inappropriately disguised masts

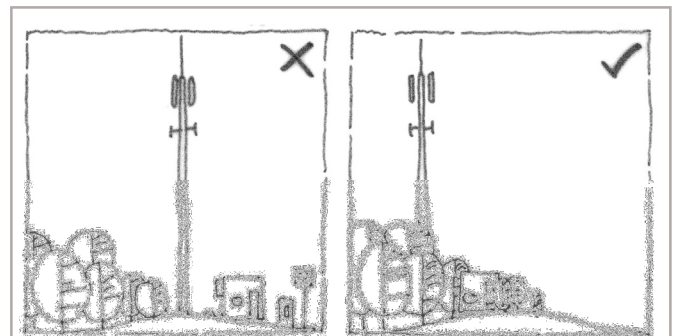
areas and reduce the visual impact. Landscaping/tree planting and maintenance thereof can be requested by Council as a measure to reduce the visual impact of TMI, even if only to screen the base of any towers and ancillary structures, and to draw attention away from the structure.

**OB.5.6.** Measures such as concealment, colour and appropriate finishes and camouflage should be used, where appropriate, to minimize the visual impact.

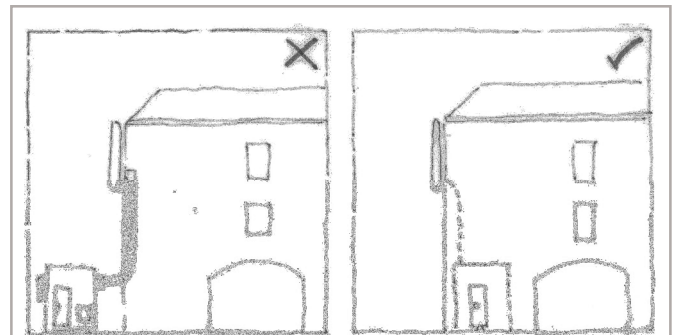
Mitigation guidelines	Site or property characteristics	Mitigation guidelines
	Existing fences with a common style or predominant colour that are a positive feature in the landscape.	The fence around the base station site must match the style and colour of the other fences in the landscape.
	Walls as a positive feature in the environment.	The wall around the base station site must match the style and colour of the surrounding walls.
	Existing buildings have an architectural theme.	Any structures built must respond to this theme.
	Open or exposed locations where the background is mostly sky.	Any structures should be left unpainted in a galvanized finish.
	Existing buildings with one or two predominant colours or design elements. e.g. a brick building with a pitched roof.	Any structures should be painted from the same palette of colours. If the equipment room cannot be housed within an existing building, then its architecture must respond to the predominant design elements.
	An open space or natural area	If possible equipment container and mast must be camouflaged physically within the environment - camouflage structures (trees, rocks) or painted a suitable natural colour.
	Residential areas where trees are an important landscape feature	Camouflage support structures as trees that are appropriately part of the local landscape.
	Residential areas with few trees	Place TMI on existing street features such as
	Urban areas	Incorporate TMI into existing buildings wherever possible.



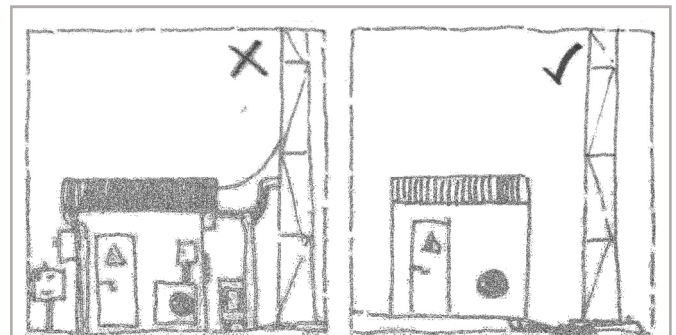
Site new road appropriately in the landscape



Locate TMI where trees or other landforms will mitigate the impact



Avoid external containers and ducts



Accommodate mechanical equipment in container

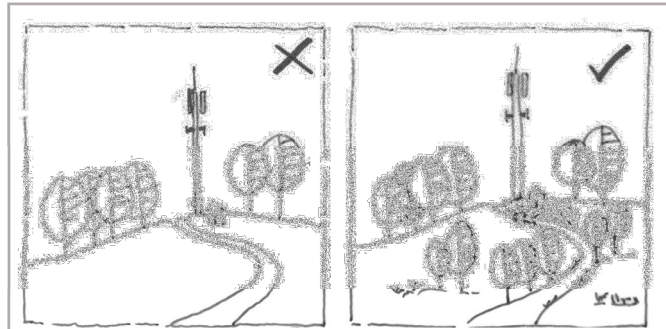
## OBJECTIVE 6. TO RETAIN AND IMPROVE THE ENVIRONMENTAL AND HERITAGE QUALITY OF THE PUBLIC ARENA

*Appropriate landscaping around TMI and associated facilities should be implemented, for example, greening or softening or screening of impacts through the provision of planting, landscaping or providing public facilities or amenities. It should be ensured that TMI is sited with minimal need for tree and plant removal.*

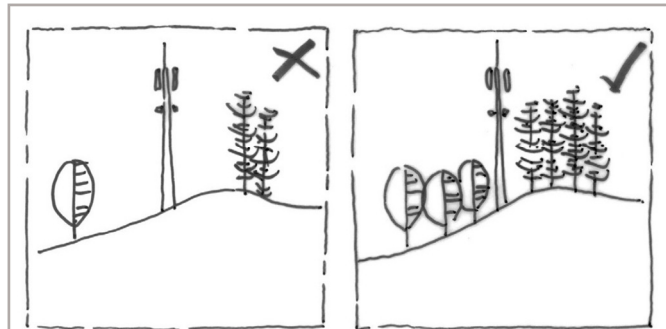
**OB.6.1.** Newly constructed access roads or other parts of the TMI site, as deemed appropriate, should be landscaped with plants, trees and ground covers to minimize visual impacts.

**OB.6.2.** Where power to a base station site is required and excavation works are undertaken, the removal of mature trees or vegetation should be avoided as far as possible.

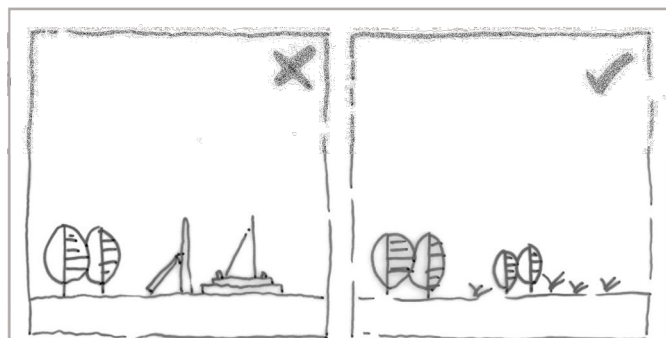
**OB.6.3.** On termination of use of TMI, the TP will be requested to remove all equipment from the site including the access road (if no longer needed) and the area should be rehabilitated to the satisfaction of Council. Council may impose conditions regarding post-decommissioning rehabilitation of the site.



Landscape new TMI sites appropriately



The removal of mature trees or vegetation should be avoided as far as possible



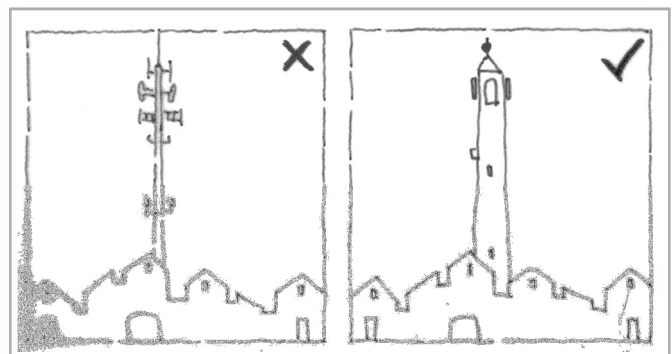
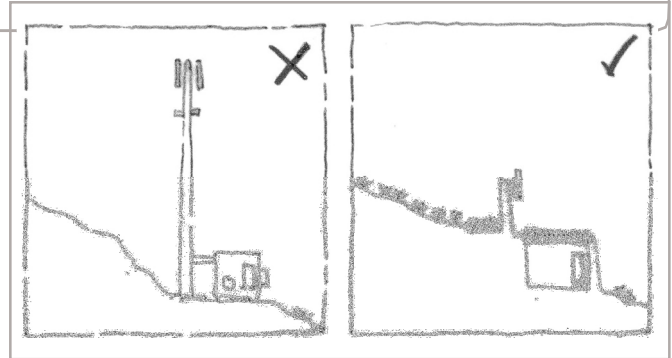
All equipment to be removed from site on the termination of TMI



## OBJECTIVE 7. TO PRESERVE AREAS OF ENVIRONMENTAL OR HERITAGE SIGNIFICANCE

*Environmental and heritage areas are of great importance to Stellenbosch and need to be sensitively treated. The visual impacts tend to be much higher in these areas, and if siting in this kind of area is unavoidable, then it must be ensured that the location and design of the TMI is done in such a manner that the integrity of the landscape or resource is retained by the appropriate mitigative measures to minimize negative impact.*

- OB.7.1.** The erecting of TMI in areas of environmental or heritage significance where it can be viewed to or from the site, with adverse impacts on the environmental or heritage resource should be avoided as far as possible. If this is unavoidable for network and technical reasons, the requirements in "Annexure 2: Requirements for submission" on page 34 must be satisfied.
- OB.7.2.** Environmentally sensitive construction methods must be employed in the construction of a TMI site so that the natural habitat is not disturbed. Any disturbance to the natural habitat must be rehabilitated.
- OB.7.3.** Surrounding vegetation is to be retained as far as possible. Any proposed removal of trees and vegetation is to be shown on the submission of the site plans and is to be approved by Council prior to removal.
- OB.7.4.** In heritage areas, masts, structures, fences, etc. should be in keeping with the character of the area.



In heritage areas, all structures should be in keeping

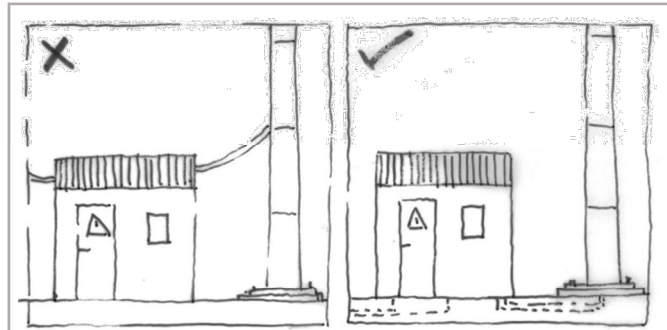
Typical areas of significance

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 National/Provincial/Local protection status.
5. River/stream/watercourse/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/horticultural area.
12. Steep slopes greater than 1 in 3.
13. Site abuts/is within a scenic drive/reserve.
14. Significant tourism gateways/viewing platforms/vantage points/vistas.
15. Old Oaks, Stone Pines, gum tree avenues or similar Historical plantings on site (tree avenues/hedges).
16. Mature (trunk circumference of an adult's arm's length) trees on site (indigenous or 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 a National monument/provincial heritage site.
20. A declared/proposed Urban conservation area or heritage area/zone.
21. Special Areas eg Nature Reserves.
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.

## OBJECTIVE 8. TMI MUST BE SITUATED AND OPERATED IN A MANNER SO AS NOT TO INTERFERE WITH ANY OTHER UTILITY FUNCTIONS

*It is important that the existing and future planned utility services are not affected by additional infrastructure*

- OB.8.1.** Electricity supply to TMI must, where practically possible, make use of underground cables. All electrical installations must be as per Eskom or Stellenbosch Municipality Electrical Department requirements and standards. RBTS sites should have cabling placed in a properly sealed metal channeling.
- OB.8.2.** Power supply to TMI sites must not interfere with existing radio equipment installed in the vicinity.
- OB.8.3.** If existing electricity supply to the site is not sufficient, the use of solar energy should be considered.
- OB.8.4.** Any interference that TMI may have on satellite or television reception must be investigated by the TP, and in the event that the fault lies with the TMI, the TP shall rectify the matter at own cost.

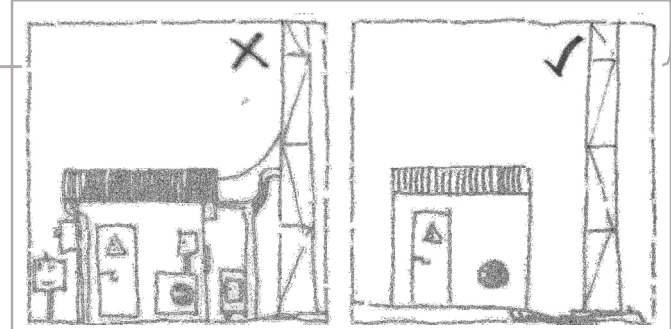


Electricity supply must, wherever possible make use of underground cables

## OBJECTIVE 9. WHERE POSSIBLE TMI SHOULD BE PLACED ON OTHER STRUCTURES SUCH AS LIGHT POSTS, ROAD SIGNS ETC.

*New technology has allowed small panels to be placed on normal street utility poles; this is called Distributed Antenna Systems. Although they need to be placed on a number of poles, there is no additional visual impact.*

*Before the responsible Road Department can consider new cabling and base plinths in road reserves, it will be necessary for the identification of all existing services in the vicinity of the proposed new location. Thereafter it will be dependent upon the service departments being able to accommodate the infrastructure and supporting network in the road reserve without compromising service delivery in respect of other services.*



All mechanical equipment should be placed within the structure

- OB.9.1.** TMI lines and cables should be located within existing underground conduits or ducts.
- OB.9.2.** If a base station is needed; it should be sensitively sited with little impact on its surroundings.
- OB.9.3.** All mechanical equipment should be placed within the base station.
- OB.9.4.** Distributed Antenna Systems, when placed on normal street utility poles, will not be considered a land use activity.

***For examples see “A1.3 TMI placed on other structures including utility structures” on page 32***

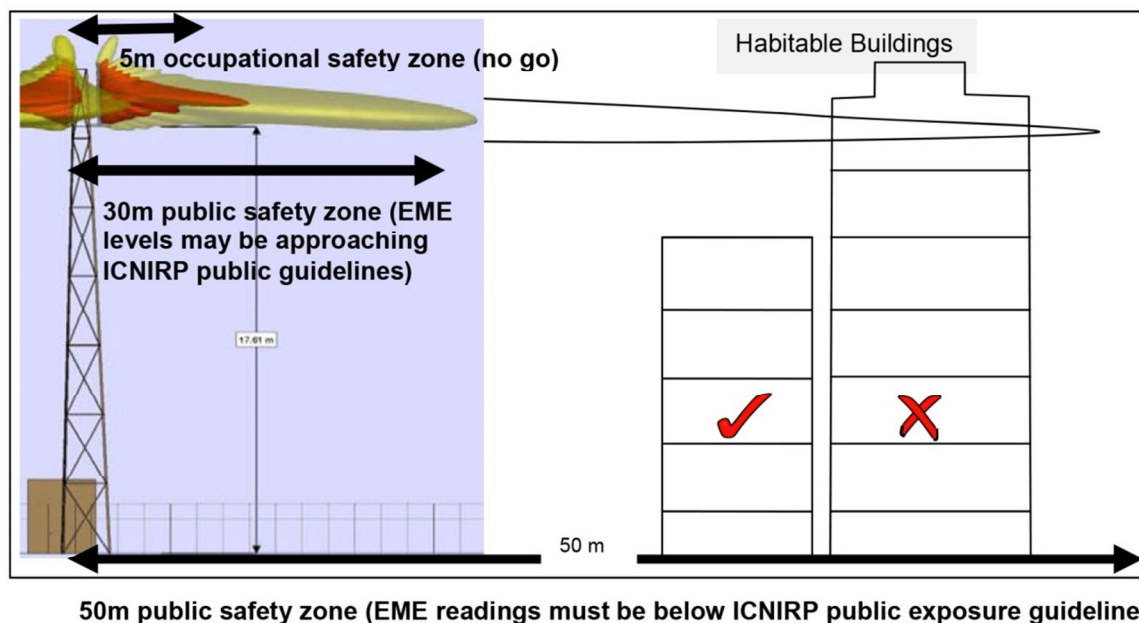
## OBJECTIVE 10. TO PROTECT THE HEALTH, SAFETY AND WELLBEING OF THE INHABITANTS OF STELLENBOSCH

*The safety of the population has to be protected with regard to permissible EME levels as well as making sure that the security is sufficient so that no unauthorized entries that could lead to people being injured can occur.*

- OB.10.1.** Public access to TMI installations must be restricted in an appropriate manner (e.g. fence, wall, locked gate or door) together with warning signage to the satisfaction of the Municipality. Care shall be exercised by the TP to ensure that such security measures do not inhibit emergency exit procedures (e.g. fire escape) for RBTS sites.
- OB.10.2.** 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.
- OB.10.3.** With the exemption of Minor Freestanding Base Telecommunication Stations, antennas should be located and positioned so that no habitable structures are within a zone of

50m directly in front of the antennas at the same height. The following diagram generally illustrates acceptable and unacceptable positioning of antennas.

- OB.10.4.** No TMI or combination of such infrastructure may at any time cause the public to be exposed to RF levels that exceed the ICNIRP public exposure guideline in any occupied space or location to which the public reasonably has access. This is endorsed by the NDOH.
- OB.10.5.** No public or unauthorized person shall be able to gain access to rooftop antennas and should not come within 5m in front of antennas.



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

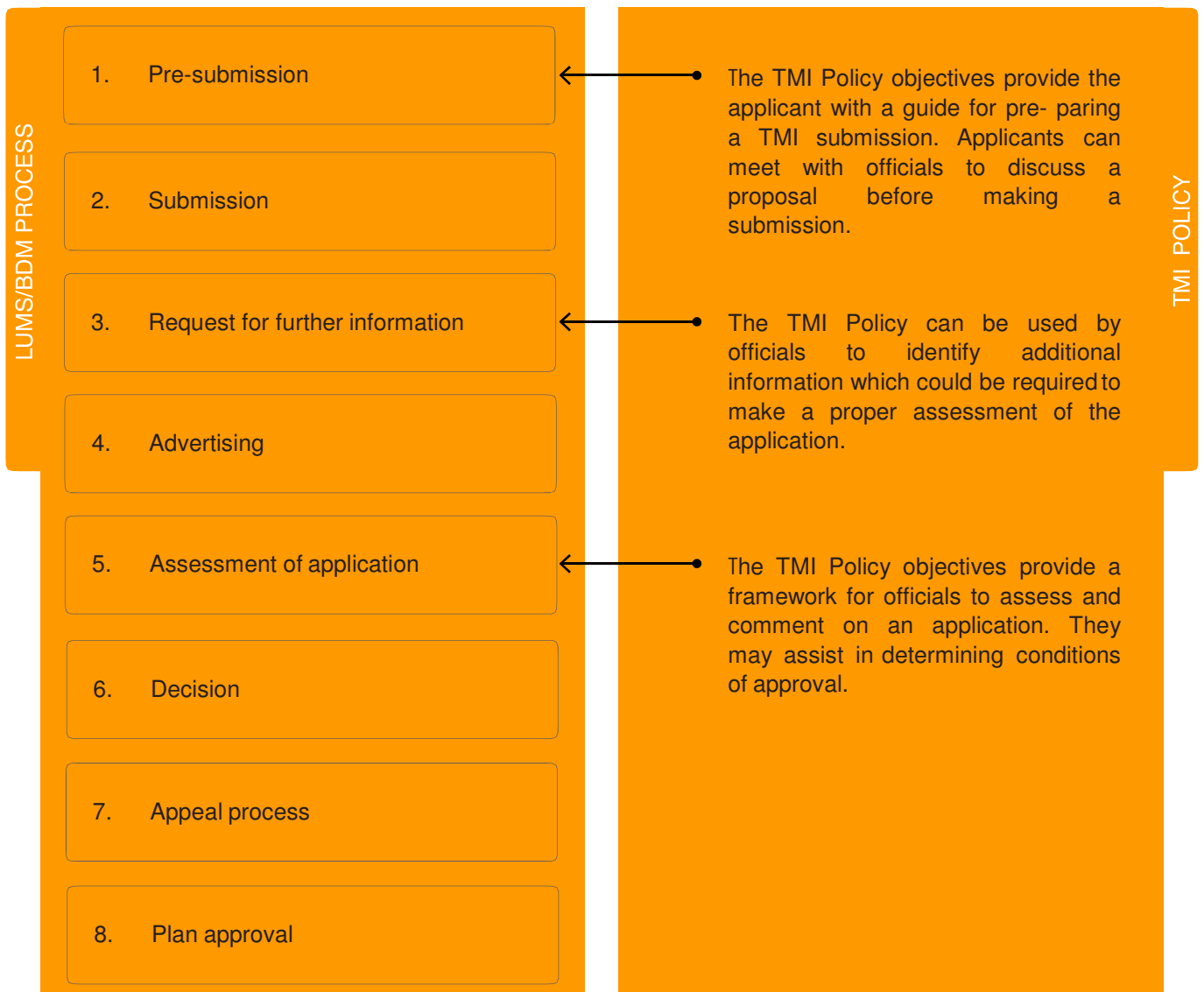


## 8 IMPLEMENTATION

The Telecommunication Mast Infrastructure Policy will be effective from the date it is approved by Council and will not be retrospectively applied to applications that are already in the system. The Policy will be applied within the Municipality's existing development application process and will need to be considered by officials in the assessment of development applications.

It is the applicant's responsibility to ensure that where parallel processes are required, in terms of other legislation, that these are integrated as far as possible and to ensure that design considerations are considered in order to streamline all levels of approvals and minimize risk.

Prospective applicants who are considering projects to which the policy would apply are welcome to engage the Municipality in pre-submission consultation.



## 9 MONITORING, EVALUATION AND REVIEW

Council must ensure that conditions of approval are complied with (model conditions are attached under “Annexure 5: Model Conditions of approval” on page 40).

### 9.1 Monitoring

9.1.1. Council can request a Network Plan from each respective TP. This would enable one to see all existing and planned sites for the Stellenbosch Municipality and how the different networks’ sites relate to each other.

9.1.2. 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 TMI, 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 the Municipality may take its own readings.

The cellular network provider or network provider should at all times comply with the requirements of the NDOH and the ICNIRP on non-ionizing radiation protection with respect to safety standards.

### 9.2 Evaluation

9.2.1. Any TMI which is erected in contravention of an approval given by council may be required to be rectified in terms of a notice served on the land owner or TP, as deemed necessary.

### 9.3 Review

9.3.1. The TMI policy will be reviewed every five years.

9.3.2. The TMI industry as a primary stakeholder must play an active role in the monitoring and evaluation of this policy.

9.3.3. The effectiveness of the policy in facilitating decision making process will be ongoing.



## 10 REFERENCES

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.

**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.**

# ANNEXURES



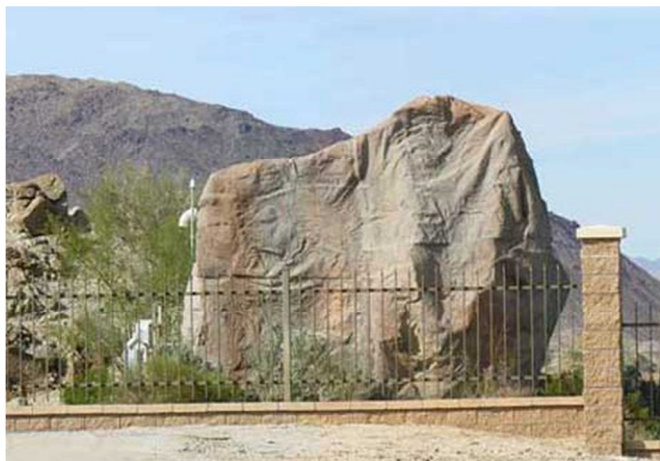
## ANNEXURE 1: REFERENCE GUIDE TO GOOD PRACTICE

### A1.1 Disguised TMI

One way to reduce the impact of TMI on its surroundings is to disguise them. One of the most popular methods is to construct a false tree - these tend only to be successful if they are at roughly the same height as other trees (as in the palms shown here) or in a forested area. They also need to be very well designed and constructed to be effective.

Sculptures and towers can be built to be TMI, and these tend to be more successful in urban and sub-urban settings.

The false rock below is a good example of an unobtrusive TMI, with good landscaping around it.



## A1.2 TMI designed as an architectural feature

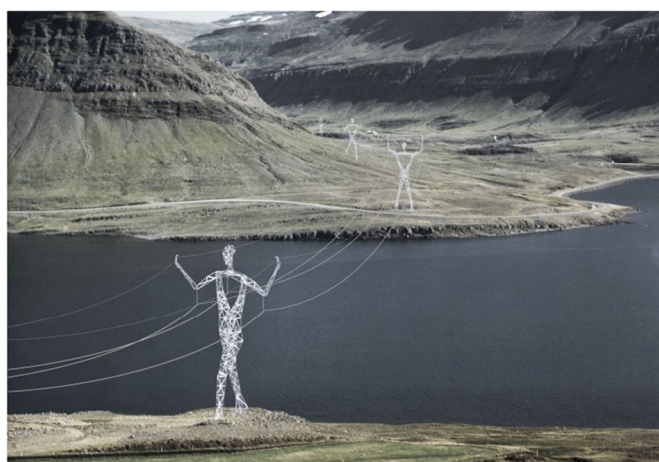
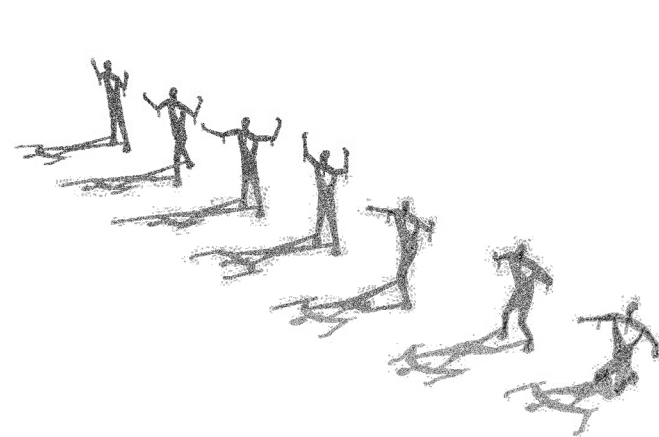
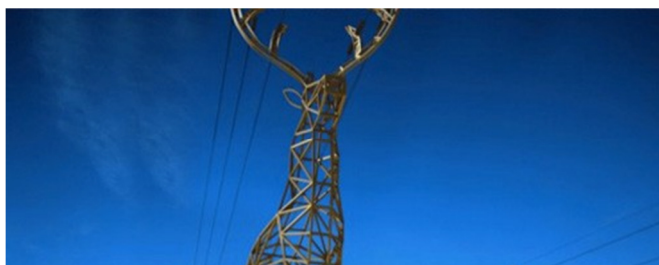
A preferred reaction rather than disguising the TMI as something else is to design something unique that is attractive in its own right.

The pylons shown below are an example of this innovative thinking. The human figures were a competition entry to the Iceland national power transmission company.

The Architects (Choi+Shine) write: "Seeing the pylon-figures will become an unforgettable

experience, elevating the towers to something more than merely a functional design of necessity."

The Deer Power lines are also conceptual by Design Depo, Moscow.



## Mosaic Tower

For a more urban setting, Mosaic tower is a beautiful landmark. TMI, nowadays hugely interacting with urban landscape, can no longer be considered as a simple technological element. They are becoming a contemporary symbol, connected and inter-twining with material and immaterial networks.

## Montjuic Communications Tower

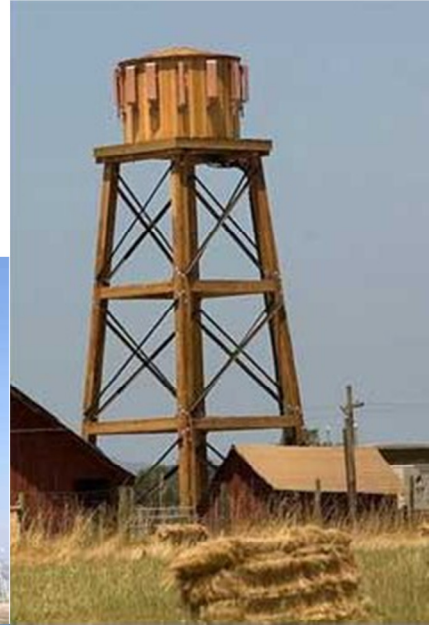
Calatrava's beautiful and original communications tower was built for Telefónica in the heart of the 1992 Olympic site, to carry coverage of the Games. Aside from its distinctive structural form, the tower is innovative in enclosing the circular platform of microwave dishes, replacing the normal clutter with a serene white arc. As a result the 130 meter structure becomes a welcome feature in the Olympic park.



### A1.3 TMI placed on other structures including utility structures

As long as it's not too obtrusive, it is ideal to place TMI on existing structures.

It is far better to use light poles, flagpoles etc. to carry the transmitters than to build obtrusive towers, even if more transmitters are needed.





#### A1.4 TMI placed on domestic structures

As TMI gets smaller, it is becoming easier to place it on domestic structures unobtrusively. TMI is often placed on or next to a chimney and generally has less visual impact than a satellite dish.



## ANNEXURE 2: REQUIREMENTS FOR SUBMISSION

### A2.1 Site selection and co-location

**2.1.1.** All applications for TMI must be accompanied by a Site Analysis Plan which clearly illustrates the proposal in the context of the existing landscape and receiving environment and 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).

**2.1.2.** 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 antennas at the same height as per "Public health and safety" on page 35 below. 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 TMI and other possible support structures. If no available alternative is possible, this fact must be motivated in this report to the satisfaction of the Municipality. This Report must detail possible sharing opportunities with other TP's in the future. This may include making provision in the design of the TMI so that it can physically cope with accommodating infrastructure of all other TP's 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.

**2.1.3.** Where TMI can be placed on other structures such as lamp posts, traffic lights, road direction signage, camera poles and flag poles, co-location must be encouraged.

Technical advances in the industry must also look to minimizing the size/scale and impact of infrastructure, which can also make co-location more practical.

### A2.2 Visual impact, landscaping and public amenity

**2.2.1.** The applicant should demonstrate in the Report that all efforts available to assimilate the structure with its surrounding environment have been made.

**2.2.2.** If required by Council, the applicant must supply at least one alternative design option e.g. height, type (monopole, lattice or disguised) and colour or locality that has a lower visual impact.

**2.2.3.** A photo montage and a schedule of colours and finishes for the proposed TMI may be requested by the Municipality.

**2.2.4.** A visual impact assessment prepared by a suitably qualified independent professional, to the Municipality's satisfaction, may be requested by the Municipality. The assessment shall include the visual sensitivity indicating low, medium, high, very high at each scale of visibility including local, distant and skyline, and include recommendations on mitigation.

**2.2.5.** For every new or upgraded FBTS site, the Municipality 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 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.

## **A2.3 Utilities**

- 2.3.1.** Advisory or warning signage including a pictogram may be a requirement for TMI. Such signage shall identify the property and the TMI and shall warn the general public as required. Such signage shall be to the Municipality's satisfaction and may not be larger than 400mm x 500mm.

## **A2.4 Public health and safety**

- 2.4.1.** If a habitable structure is within the 50m zone at the same height and in front of the antennas; this being typical panel antennas, at an approximate 60 degree angle, or any other type of installation e.g. omni-directional antennas, or if the proposed TMI elicits Council concern numerical simulations of predicted RF EME levels must be submitted to Municipality for verification and 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, i.e. what percentage it is of the ICNIRP guidelines.
- 2.4.2.** Once a site is operational, the Municipality 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.

## ANNEXURE 3: INFORMATION TO BE SUBMITTED WITH APPLICATIONS

The following plans or documents may be required when applying for the construction of TMI:-

### A3.1 Site Analysis Plan

*(Scale 1:2000) with accompanying Report*

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

When applying for a FBTS Council may require the following information to be included in the submission:-

- zoning, site boundaries and dimensions
- location and height of the TMI
- 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 ("Typical areas of significance" on page 21) within the exposure area
- proximity to adjacent or nearby buildings or other tall structures
- proximity of TMI to other existing TMI sites. Show km radius around application site for urban areas.
- other info as required by the Municipality

When applying for a RBTS, the Municipality may require the following information to be included in the submission:-

- site boundaries and dimensions
- location and height of the TMI
- 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 TMI
- proximity of TMI to other TMI and other possible support structures
- photographic illustrations of the proposal within its setting
- other info as required by the Municipality

### A3.2 Telecommunication Mast Infrastructure Plan

*(scale 1:1000 as well as a reduced A4)*

The following information is required with an application for TMI:-

- dimensioned plans showing detail of the TMI;
- graphic illustrations including photographs of similar facilities 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 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 or the facility site; details of any existing vegetation to be removed and any proposals for landscaping or restoration of any disturbed land;
- details of the timing of works involved in establishing the facility and any arrangements for temporary access 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 TMI facility addresses Section 9 Development Control: Objectives, Guidelines and Requirements as contained in the Stellenbosch Municipality Telecommunication Mast Infrastructure Policy.

### **A3.3 Compliance certificate and Lease agreement**

- The Municipality may require a statement that the site will be compliant with the current public exposure guidelines prepared by ICNIRP.
- If the site is leased from the Municipality, a letter of consent or the lease agreement is required.

### **A3.4 Information that may be required by the Stellenbosch Municipality's Building Management Branch**

- Specify what radio spectrum or frequency is used.
- Specify what radio equipment is used – make and model.
- Specify the number of antennas attached to this equipment and the gain in dB, polarization, and coverage i.e. azimuth and elevation.
- Specify what power levels are to be radiated by

the antennas in 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.

### **A3.5 Environmental Management Plan (EMP)**

- An EMP must be included in the submission if the site is within an area of environmental & heritage significance and no EIA is triggered in terms of NEMA.
- Separate guidelines on a Generic full EMP and a Site EMP are available from Environmental & Heritage Management Branch, where an EMP is required. This must be submitted to Council's satisfaction prior to final building plan approval.



## ANNEXURE 4: PRELIMINARY ASSESSMENT CHECKLIST FOR PLANNING CASE OFFICIAL

Officials Name.....

PLEASE ATTACH COMPLETED CHECKLIST TO APPLICATION DOCUMENTATION

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

GENERAL REQUIREMENTS				
Has the following been submitted? (Annexure 3)	YES	NO		
Telecommunication Mast Infrastructure Plan				
Zoning Compliance certificate and / Lease agreement				
Telecommunications Branch Information, if required				
Environmental Management Plan, if required				
Other, specify				
<b>Monitoring:</b>				

SITE SELECTION AND COLOCATION (OB1 & OB2)	YES	NO		
Is a Site Analysis Plan & Report submitted and to Council's satisfaction?				
Is a Zoning / Land use map (1:2000) (A4) submitted?				
Is the TMI on an existing structure or building?				
<b>IF YES</b>	Is the proposal integrated with the structure / building as a design feature?		<b>Y</b>	<b>N</b>
Is the Report submitted that addresses co-location options to Council's satisfaction?				
Is the map and photographs showing other existing tall structures (TMI structures / other) in a 1km radius around the site submitted to Council's satisfaction?				
Are there existing / other approved TMI sites within the 1km radius around the proposed site?				
<b>IF YES</b>	Is there sufficient motivation / reason for non-location with such site(s)?		<b>Y</b>	<b>N</b>

VISUA IMPACT, LANDSCAPE AND PUBLIC AMENITY (OB 3 & 4)	YES	NO		
Will there possibly be a negative visual impact on the environmental / heritage resource / public amenity / landscape arising from this proposal?				
<b>IF YES</b>	Is an alternative type and / or locality that has a lower visual impact required? (Council may require this)		<b>Y</b>	<b>N</b>
<b>IF YES</b>	Is a photo montage and a schedule of colours and / finishes required? (Council may require this)		<b>Y</b>	<b>N</b>
<b>IF YES</b>	Is a Visual Impact Assessment required? (Council may require this)		<b>Y</b>	<b>N</b>



Is the proposal for a FBTS site (new or upgrade / modification / sharing)?				
<b>IF YES</b>	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 (OB 5 &amp; 6)</b>	<b>YES</b>	<b>NO</b>		
Is the proposal within an area of environmental / heritage significance?				

<b>IMPACT ON EXISTING SERVICES &amp; UTILITIES (OB 7)</b>	<b>YES</b>	<b>NO</b>		
Is advisory & warning signage on the TMI?				

<b>PUBLIC HEALTH AND SAFETY (OB 9)</b>	<b>YES</b>	<b>NO</b>		
Is there a habitable structure within a 50m zone in front of the antennas?				
<b>IF YES</b>	Show alternative location that does not fall into this 50m zone.			
<b>IF YES</b>	If circumstances prevail that necessitates being within the 50m zone, ensure that "Objective 10. To protect the health, safety and wellbeing of the inhabitants of Cape Town" on page 24 of the Policy is complied with.)			
Is the 5m areas in front of the antennas accessible to the general public?				
<b>IF YES</b>	Ensure that safety measures are put in place to prevent access.			



## ANNEXURE 5: MODEL CONDITIONS OF APPROVAL

### Standardized conditions of approval for cell masts and other Telecommunication Mast 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 TMI is in an area of environmental significance an EMP must be submitted to Council for approval prior to final approval and not as a condition of approval].

#### A5.1 General

- 5.1.1. This approval shall be valid for maximum period of 5 years for temporary departures or extended period.
- 5.1.2. 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 the Municipality. If the TMI are still operational at this time, the period can only be extended by a further application to the Municipality.
- 5.1.3. Ongoing maintenance of the entire installation must take place by the applicant.
- 5.1.4. Conditions of approval must be made known to any new owner of the site and are binding on the successor in title.
- 5.1.5. The combined or weighted RF exposure of a person may not exceed the public exposure guideline as set by the ICNIRP.
- 5.1.6. The applicant shall grant the Municipality access at all reasonable times to the installation, for the purpose of monitoring inspection and compliance certification.
- 5.1.7. No unauthorized person should be able to come within 5m in front of the panel antennas. Clearly marked warning signs, must define this no go zone.
- 5.1.8. Should any further research link electromagnetic

radiation to health issues, the Municipality may impose further conditions to keep it in line with CNIRP.

- 5.1.9. The finishing and colour of the panel antennas for rooftop sites must be in keeping with the building to which it is attached.
- 5.1.10. That for freestand sites the consent use or departure be restricted to the fenced compound of the mast and equipment room as depicted on the building plan.
- 5.1.11. This approval does not exempt the applicant from any other Bylaws or Regulations that may be applicable including any lease/wayleave approval that may be required for location in a Council road reserve or on other Council owned property.
- 5.1.12. The mast or equipment room should not be utilised for outdoor advertising purposes.

#### A5.2 Visual impact, landscaping and public amenities

- 5.2.1. Paintwork, materials and finishes used for the fencing, posts, antennas and equipment container must be in accordance with the specifications on the approved plans, and also maintained as such.
- 5.2.2. The equipment room for rooftop sites must be set back as far as possible from the edges of the roof.
- 5.2.3. Any lighting of structures shall be shielded from adjacent properties (tilted downwards), and should avoid upward light pollution.



### **A5.3 Impact on existing services and utilities**

- 5.3.1. Rooftop Installations should be situated in such a manner that they do not interfere with other utility functions.
- 5.3.2. 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.

### **A5.4 Public health, safety and security**

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

### **A5.5 Lease**

- 5.5.1. 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.
- 5.5.2. If for any reason any condition of the lease agreement is breached or the lease ceases to exist, the temporary departure shall expire.
- 5.5.3. Prior to approval of building plans, the applicant must provide the Municipality with an indemnity form, indemnifying the Municipality against any possible public claim arising from the erection or use of this installation.

### **A5.6 Special conditions**

- 5.6.1. Any special conditions relevant to a particular site (e.g. mitigating factors such as landscaping required), should be added under this section.
- 5.6.2. Council may require a master plan to be approved that indicates the grid network of existing and proposed TMI for each service provider to manage the integration of MFBTS into existing services within Councils road reserves.

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



# ANNEXURE 6: RADIO FREQUENCY (RF) EXPOSURE AND HUMAN HEALTH

## Electromagnetic Radiation from mobile phone base stations

Information Document Prepared by

### EMSS Consulting

Technopark, Stellenbosch, 7600, South Africa

Tel: (+27) 21 8801880

Fax: (+27) 21 8801936

compliance@emss.co.za

www.emss.co.za

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".

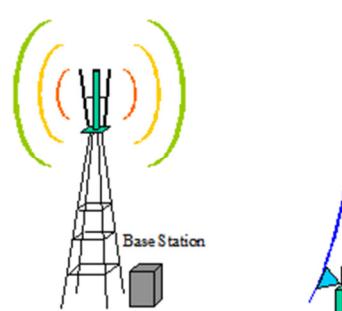


Figure 1: RF communication when the base station acts as the radiating source



## A6.1 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).

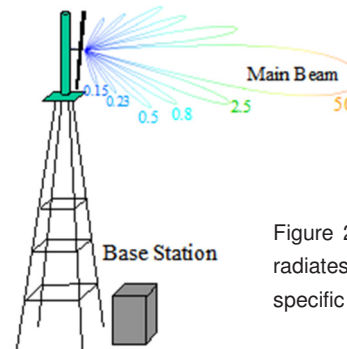


Figure 2: A base station antenna radiates most of its energy in a specific direction

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.

## A6.2 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.

## A6.3 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). Radiofrequency radiation is classified as **non-ionizing** radiation because the energy it carries is too low to cause ionization or the breaking of chemical bonds

## A6.4 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).

## A6.5 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.

## A6.6 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.

## A6.7 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.

## A6.8 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.

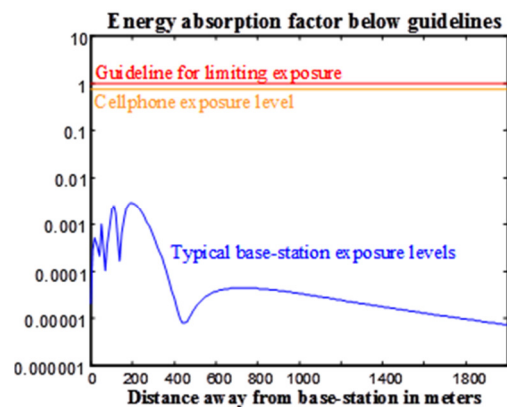


Figure 3: Typical base station exposure levels

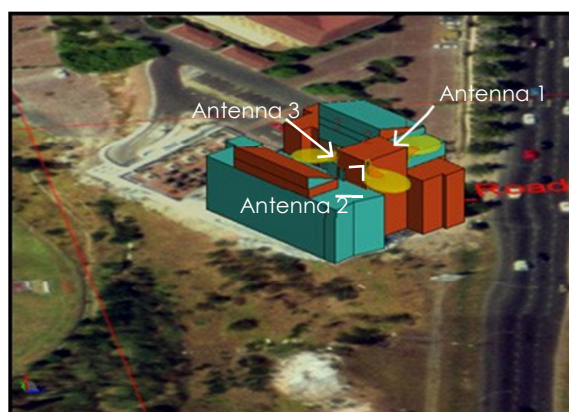


Figure 4: A computer representation of a typical rooftop installation

## A6.9 Occupational Exposure (RF workers)

Most regulating bodies, including ICNIRP and the Directorate: Radiation Control (South Africa) distinguishes 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.

## A6.10 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.

## ANNEXURE 7: LETTER FROM THE NATIONAL DEPARTMENT OF HEALTH

Department of Health

Directorate: Radiation Control  
Private Bag X62  
BELLVILLE  
7535

Tel: 021 957 7483  
Fax: 021 946 1589  
E-mail: [Dutoil@health.gov.za](mailto:Dutoil@health.gov.za)

Web: <http://www.doh.gov.za/department/radiation/01.html>

Enquiries: LL du Toit  
Date: 26 June 20104

To whom it may concern

### HEALTH EFFECTS OF CELLULAR BASE STATIONS AND HANDSETS

The Directorate: Radiation Control is the section within the National Department of Health that is responsible, from the viewpoint of human health, for regulating electronic products producing non-ionizing electromagnetic fields (EMF), i.e. where the frequency of such EMF is less than 300 GHz. In carrying out this responsibility, the Directorate has been utilizing 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. The International EMF Project was established by the WHO in 1996 to (i) assess the scientific evidence for possible adverse health effects of non-ionizing electromagnetic fields on an on-going basis, (ii) initiate and coordinate new research in this regard, and (iii) compile health risk assessments for different parts of the electromagnetic spectrum. The Department of Health has been a member of the International Advisory Committee of the International EMF Project since 1998.

In June 2005 the International EMF Project hosted a workshop that was specifically aimed at considering the possible health consequences of the emissions from cellular base stations and wireless networks. The findings of this workshop were summarised in a 2-page Fact Sheet ([www.who.int/mediacentre/factsheets/fs193/en/index.html](http://www.who.int/mediacentre/factsheets/fs193/en/index.html)). The following extract from this Fact Sheet provides a clear-cut summary of the findings to date, i.e. ***“Considering the very low exposure levels and research results collected to date, there is no convincing scientific evidence that the weak RF signals from base stations and wireless networks cause adverse health effects.”***

The following quote is taken from another WHO Fact Sheet (Electromagnetic fields and public health: mobile phones) that was published in June 2011: ***“To date, no adverse health effects have been established as being caused by mobile phone use.”***



The WHO recommends utilizing internationally recognized exposure guidelines such as those that were published in 1998 by the International Commission on Non-Ionizing Radiation Protection (ICNIRP) and that were reconfirmed in 2009 for the frequency range 100 kHz – 300 GHz (i.e. including all the frequencies employed by the cellular industry). The Department of Health likewise recommends the use of these ICNIRP guidelines to protect people against the known adverse health effects of EMF.

Numerous measurement surveys, which have been conducted around the world (and in South Africa), have shown that the actual levels of public exposure as a result of base station emissions invariably are only a fraction of the ICNIRP guidelines, even in instances where members of the public have been really concerned about their exposure to these emissions.

At present there is no confirmed scientific evidence that points to any health hazard associated with the very low levels of exposure that the general public would typically experience in the vicinity of a cellular base station. 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. This also means that local and other authorities, in considering the environmental impact of any particular base station, do not need to and should not attempt, from a public health point of view, to set any restrictions with respect to parameters such as distance to the mast, duration of exposure, height of the mast, etc.

The Department of Health is obviously not able to make any pronouncements about the specific levels of EMF that a member of the public would experience at any particular base station site when it is in operation. However, generally-speaking unless a person would climb to the top of a mast (or other structure supporting an antenna) and position him/herself right in front of the active antenna not more than a few meters away, such a person would have no real possibility of being exposed to anywhere near the aforementioned ICNIRP guideline limits. Since these base stations are, as a rule, cordoned off with barbed wire fencing and locked gates/doors to protect the sensitive and expensive technology, such actions would in all probability not constitute responsible behaviour. Even then the risk of falling off the structure in question would be an immeasurably greater threat to the health of the person involved. Based on the results of numerous global and local surveys, the experience has been that the exposure to base station EMF at ground level is typically in the range of between 0.001 – 1.0 % of the aforementioned ICNIRP guideline limits. Against this background of available data, there would be no scientific grounds to support any allegation that adverse health effects might be suffered by a responsible member of the public due to the EMF emitted by a base station.

Although the Department of Health currently neither prescribes nor enforces any compulsory exposure limits for electromagnetic fields, the Department does advise all concerned (whether they be a government department, the industry or the public) that voluntary compliance with the aforementioned ICNIRP exposure guidelines is the recommended and science-based way to deal with any situation involving human exposure to the non-ionizing electromagnetic fields emitted by cellular base stations and handsets.

**Yours sincerely,**



**LL du Toit**

**DEPUTY DIRECTOR: RADIATION CONTROL**

