

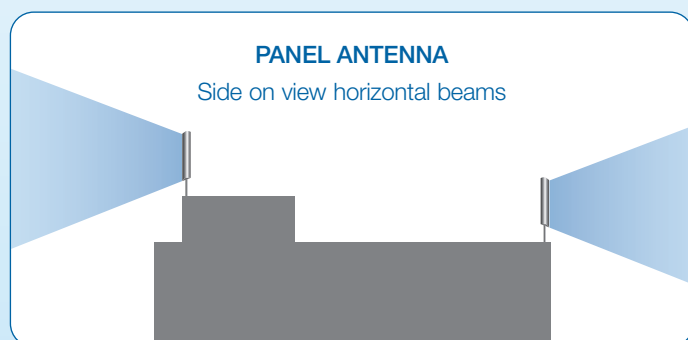
## Antennas on roof tops

Mobile phone base station antennas are often located on existing structures and on the roof tops of buildings to minimise the visual impact of the facility and to use the available height to achieve coverage objectives and to minimise mobile phone coverage 'black spots'.

The antennas work by sending a radio signal to provide coverage to a particular area. "Panel" antennas are most commonly used on roof tops. These are rectangular shaped antennas which direct the radio signal in a broad horizontal direction and a limited vertical direction.

These antennas direct their power outward, in a beam that is typically very narrow in the vertical direction but quite broad in the horizontal direction.

The radio signal generated by mobile phone base station antennas is often referred to as radiofrequency Electromagnetic Energy (EME).



*Indicative illustration only*

The other type of antenna which is less commonly used on a rooftop is an Omni directional antenna ("omni"). Omnis are long cylindrical rods which look like broomstick handles. They send out a radio signal in a 360 degree horizontal direction.

### Safety

All mobile phone networks must comply with strict regulations set by the Federal Government in relation to exposure to EME, known as the ARPANSA Radiation Protection Standard (RPS3). In addition, mobile phone base stations must be designed to minimise EME exposure to the public.<sup>1</sup>

### Safety - in the building

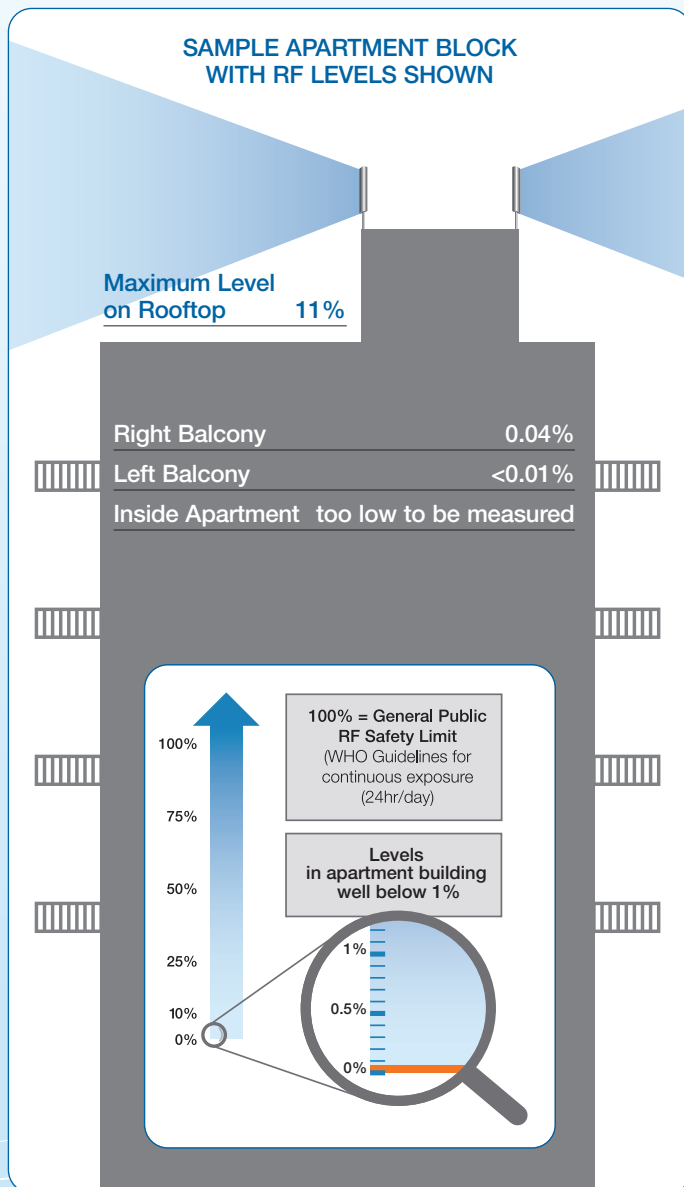
Public exposure levels of EME from mobile base stations are well below the mandated limits. In fact a nationwide study published in 2004 by the Department of Health's Australian Radiation Protection and Nuclear Safety Agency (ARPANSA) found that the typical exposure level from mobile phone base stations is hundreds and sometimes thousands of times below the regulated limit. To put this in to perspective, it should be noted that the standard itself already has a fifty-fold safety margin built in to it.

ARPANSA has published a fact sheet "About mobile phone networks" in which they state:

***"Since antennas direct their power outward, and do not radiate significant amounts of energy from their back surfaces or towards the top or bottom of the antenna, the levels of RF energy inside or to the sides of the building are normally very low".***

The rooftop of the building also absorbs some of the energy of the radio signal. Roofing materials such as timber, steel and concrete attenuate the power of the signal as it passes through. This means that actual levels of EME in the top floor of a building with antennas mounted on the roof are significantly lower than on the roof itself and are well within the mandatory exposure limits.

For example, a survey recently conducted by an independent accredited RF assessor showed that EME levels in the top floor of a building with antennas on the rooftop were so low that they were not able to be measured. EME levels on two balconies of the top floor apartment in this example were measured at 0.04% of the regulations for one of the balconies and “too low to be measured” on the second balcony. It might sound strange at first that the EME levels are “too low to be measured”, however it’s like trying to measure the light intensity of a torch beam when you are directly below the torch – you can not see the light beam and most instruments would not detect the light. Radio signals work in a similar manner.



*Indicative illustration only*

## Safety – on the rooftop

Levels of radiofrequency EME vary according to the distance from the antenna. Levels immediately in front of the antenna may exceed the exposure limits. Access to antennas situated on rooftops is restricted in order to keep the public away from these areas. This may include securing or barricading access to certain areas. Signage will also be positioned in locations leading to the rooftop site, such as on perimeter fencing, doors, the base of structures or other suitable positions to indicate the presence of RF hazards and safe areas. A Radiocommunications Site Management Book (RCSMB) is produced for every rooftop facility managed by a mobile network carrier. The RCSMB contains site contact details, information on the emission patterns from the antennas (known as RADHAZ drawings), site access control, equipment installed at the site and Safe Working Procedures.

A series of fact sheets “Working Safely Around Radiofrequency (RF) Transmitters” has been produced by the Mobile Carriers Forum and is available at <http://www.mcf.amta.org.au>

## Safety - Summary

The safety of the community is of fundamental importance to the mobile telecommunications industry. On the basis of the most recent scientific evidence sourced from reputable bodies such as the World Health Organisation (WHO), there are no adverse health risks linked to using mobile phones or living near mobile phone base stations.

The WHO’s current advice is:

**“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.”<sup>2</sup>**

## More information

### Mobile Carriers Forum

Email us at [contact@mcf.amta.org.au](mailto:contact@mcf.amta.org.au)

MCF Contact Details: [www.mcf.amta.org.au/pages/Contact.Us](http://www.mcf.amta.org.au/pages/Contact.Us)  
[www.mcf.amta.org.au](http://www.mcf.amta.org.au)

*Additional independent information may be obtained from:*

### Australian Radiation Protection and Nuclear Safety Agency

Ph: 03 9433 2211

[www.arpansa.gov.au](http://www.arpansa.gov.au)

### Australian Communications and Media Authority (ACMA)

Ph: 03 9963 6800

<http://emr.acma.gov.au/>

### World Health Organisation – EMF Project

[www.who.int/peh-emf](http://www.who.int/peh-emf)