

The mobile phone network: In-Building coverage

Mobile phones work by sending and receiving radiofrequency (RF) signals to and from mobile phone base stations. The radio signal generated by mobile phone base station antennas is often referred to as RF electromagnetic energy (EME).

In most instances, mobile phone coverage is provided by base stations located externally on building rooftops, towers and poles, signs and traffic light poles. Mobile phone coverage can be provided inside buildings such as multi-storey office buildings, shopping centres, apartments, and underground railway systems by installing specially designed “In-Building” systems. These systems are sometimes referred to as Distributed Antenna Systems (DAS) or In-Building Coverage (IBC). This is just like a cordless phone inside a home.

Why do we need In-Building Coverage?

Mobile phone coverage inside buildings can be reduced due to a number of factors:

- The building structure itself reduces the level of RF signal from external base stations
- It may not be physically possible to direct RF signal in to underground levels, car parks and railway stations
- The number of base stations in populated areas such as CBDs can sometimes result in overlapping RF signal (referred to as “interference”)

Also, the high number of mobile phone users inside a building or shopping centre may require a dedicated base station to handle the number of calls.

How does it work?

A dedicated In-Building system usually consists of:

- Base station equipment, often located in a Facilities room or other service area; and
- Cables which run from the base station through the building risers connecting the base station equipment to antennas; and
- Small antennas located on ceilings or walls in strategic locations

This system operates in a similar way to external base stations but at much lower power levels.

The only equipment likely to be visible to people in the building will be the occasional small antenna in the ceiling or wall similar in size to a smoke detector.



Indicative illustration only

Are In-Building Systems safe?

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).

IBC systems are all designed to provide coverage to a small geographic area and so the total power output from the antennas is very low, less than a quarter of a watt. The system operates in a similar way to external base stations but at much lower power levels – just like a cordless phone at home. The typical range of measured levels from In-Building systems is in the order of 14,000 to 1,000,000 times below the requirements of the ARPANSA Standard.

In-Building systems are designed so that the ARPANSA Standard is not exceeded in any area accessible by the public. People working in or visiting buildings where In-Building systems are installed can be confident that there are no known hazards from exposure to radio signals from these systems.

Base stations are designed, built and tested to comply with strict science-based guidelines, which are recognized by national and international health agencies as providing ample protection for all members of the community.

The international consensus of expert health bodies, such as the World Health Organisation (WHO), is that there is no substantiated scientific evidence of health effects from mobile phone base stations.

Further, because In-Building systems provide quality coverage to specific areas, the mobile phones in use are able to operate at their lowest power level – a feature known as 'adaptive power control'.

Working together

In many instances, In-Building systems are shared by a number of mobile network operators/ carriers. This means that some of the equipment can be shared reducing the amount of equipment required to be installed within the building. Carriers have worked together with other interested parties to prepare guidelines about how shared equipment can be installed in an effective manner.¹

More information

For more information about mobile phone networks and health and safety issues, please contact:

Mobile Carriers Forum

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Additional independent information may be obtained from:

Australian Radiation Protection and Nuclear Safety Agency

Ph: 03 9433 2211

www.arpansa.gov.au

Australian Communications and Media Authority (ACMA)

Ph: 03 9963 6800

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

Australian Centre for RF Bioeffects Research (ACRBR)

Ph: 03 9214 5149

www.acrbr.org.au

World Health Organisation – EMF Project

www.who.int/peh-emf