# Cairo University –Faculty of Engineering

## Electronics & Electrical Communication Engineering Department


# ELC405B

# Activity#2

## Group 3

### Team Members

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## Presented to:

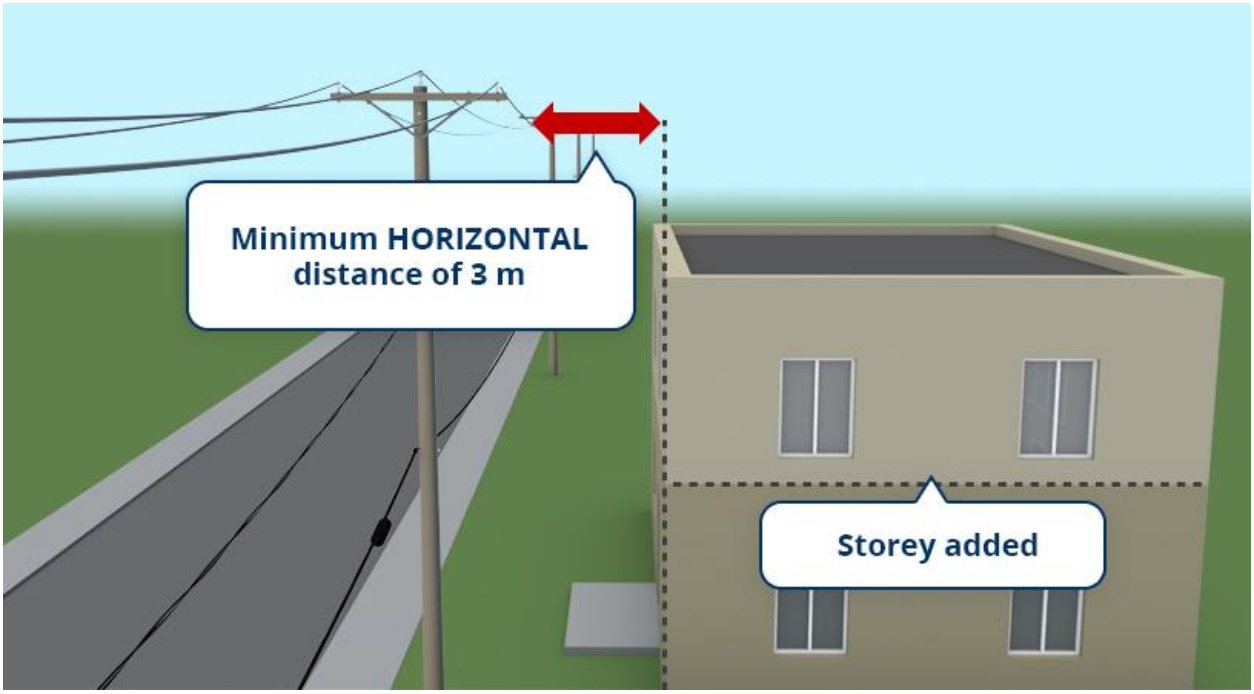
## Dr. Mohammed Alaa

1. The purpose of this document is to keep the protocols protecting the health of the Egyptian citizen up to date with the developments in the field of ICT and all the studies, experiments and researches in the field of health, environment and electrical, electronic and electro-magnetic rays. This is a modified version of the Protocol for Macro Cells Rollout and it was written while taking into consideration with safety standards and researches developed by well-known and credentialed international organizations and scientific institutes such as WHO, American National Standards Institute (ANSI), International Electro-technical Commission (IEC), International Commission on Non-ionizing Radiation Protection and Institute of Electrical and Electronics Engineers (IEEE).

2. NTRA stands for the National Telecommunication Regulatory Authority.
3. NTRA, the National Telecommunications and Information institute (NTI), the Ministry of Health and the Ministry of Environmental affairs collaborated to issue this document.
4. Both are metallic towers fixed on top of a building for purpose of loading antennas with difference that Mast loads 1 antenna only while Pylon carries more than one antenna.

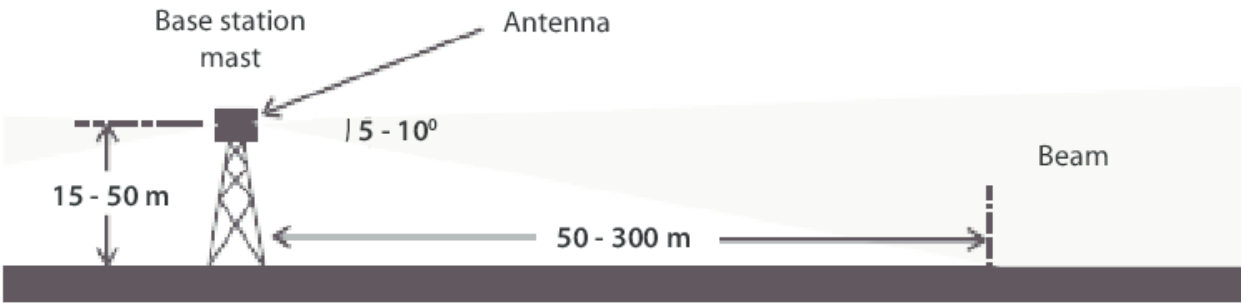
5. The recommended high range for building to mount antennas on is between 15 to 50 meters. If no building is high enough (its length is less than 15m) than the antenna should be fixed on a metal pylon of mast, and in the case of building exceeding 50 m the operators willing to fix antennas on top of them should seek the approval of the Egyptian Environmental Affairs Agency (EEAA) by filling the Environmental Assessment Form (B) and sending it to EEAA via competent administrative authority.
6. A Macro cell must exceed in height all surrounding building within 10-meter-radius circle.
7. No, the roof must be made out of reinforced concrete.

8. In case of using a Mast than only 1 transmitting antenna can be installed per Mast. In case of pylon, no more than 3 transmitting antennas and 3 receiving antennas can be mounted on the same level and in case integrated antennas only 3 integrated antennas can be used, this number may be increased if we mounted the antennas on different levels on the same pylon, with the condition that there should be no less than meters between each two consecutive levels
9. The horizontal distance between them must not be less than 12 m




10. The minimum front-to-back ratio of the used antennas is 20 dB.

11. There must be at least a distance of 6 m between the antennas and human beings in the direction of the main beam. I think this is to avoid over exposure to EMF that may cause heat induction at such close distance and thus have many unwanted effects. A 6 m distance will allow the power density to decrease greatly since in case of directive antennas the beam have a pencil shape and generally in mobile communications it covers around 120 degrees, thus as the distance increases the spreading of the power increases.
12. No, it cannot be installed on building utilized as hospitals to avoid any interference with the medical devices used.
13. The roof holding the antennas should be completely closed or else a non-metal fence should surround the pylon of a distance if 6 m from its center, also warning signs should be fixed.




14. The operators must abide by the following standards:
    - International standards of the permissible electromagnetic power density emitting from the antennas
    - Standards issued by the World Health Organization (WHO)
    - Standards issued by the American National Standards Institute (ANSI)
    - Standards issued by the International Electro-technical Committee (IEC),
    - Standards issued by the International Commission on Non-ionizing Radiation Protection (ICNIRP)
    - Standards issued by the Institute of Electrical and Electronic Engineering (IEEE)

    I must be noted that the maximum permissible power density a human being can be safely exposed to must not exceed 0.4 mW/cm2 (CDMA-GSM 900 MHZ- GSM 1800 MHZ).
15. They must be placed at minimum distance of 20 meters since children are more susceptible to effects of EMF due to their lower mass compared to adults among other reasons.
16. It was signed on 17/2/2005 by the Ministry of Health, the Ministry of Environmental affairs and the Ministry of Telecommunications and Information Technology.