



Standard for the establishment of the Telecommunications Towers

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Royal Government of Bhutan
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Preliminary

1.1 Legal basis

In accordance with Section 51(2) of the Information, Communications and Media Act of Bhutan 2018 (“the Act”), the Bhutan InfoComm and Media Authority (“the Authority”) hereby issues this Standard for the establishment of the Telecommunications Towers.

1.2. Title and Commencement

This standard shall be called as the Standard for the establishment of the Telecommunications Towers and shall come into force on the 02nd of July, 2018 corresponding to the 19th of the fifth month of the Bhutanese Earth Male Dog Year.

1.3. Scope of Application

This Standard shall apply to all licensed ICT Facility Providers who plans to build new telecommunications towers. This standard shall not be applied to the existing sites.

1.4. Amendment

Amendment to this Standard shall be made according to the change in technologies, national priorities, policies and industry trends.

1.5. Definitions

Unless the context otherwise requires, the following words and terms used in this Standard shall have the following meanings assigned to them:

“Antenna” means any structure or device used to receive or radiate electromagnetic waves for transmitting or receiving radio or television waves. Antennas may consist of metal, carbon fibre, or other electronically conductive rods or elements. It includes, but is not limited to personal wireless service, microwave, radio and television broadcasting and transmitting and receiving and short wave radio equipment.

“Camouflaged Tower” means a tower constructed to simulate a natural feature, such as a tree, thereby reducing the aesthetic impact to the surrounding area.

“Co-Location” means locating one or more cellular antennas for more than one provider on a single cellular antenna tower or alternative cellular antenna tower structure on a single lot.

“Electromagnetic Waves” refers to the waves (or their quanta, photons) of the electromagnetic field, propagating (radiating) through space-time, carrying electromagnetic radiant energy. It includes radio waves, microwaves, infrared, (visible) light, ultraviolet, X-rays, and gamma rays

“Residential area” means a land use in which housing predominates, as opposed to industrial and commercial areas.

“Tower” means a structure intended to support wireless communications equipment used to receive and/or transmit electromagnetic waves.

“Tower Accessory Structure” means a structure located at the base of the tower housing base receiving/transmitting equipment.

General Requirements for installation or construction of Telecommunications Tower

- 2.1 The installation or construction of the telecommunications tower shall only be carried out after obtaining prior approval from the respective Dzongkhag or Thromde Administration.
- 2.2 Any proposed telecommunications tower near the airport shall be installed or constructed after obtaining prior approval from Bhutan Civil Aviation Authority.
- 2.3 In commercial areas, the installation of telecommunications towers shall be encouraged to be carried out on the rooftop of the existing buildings, rather than creating new installations/ sites.
- 2.4 The telecommunications towers shall not be installed in close proximity to the High Voltage (11KV and above) of electrical power transmission line. The nearest distance of the tower to a high voltage transmission line shall not be less than 120% of the height of the tower.
- 2.5 An appropriate demarcation of indelible or refectories marking line on the floor for rooftop installation or fencing of the telecommunications stations shall be provided within the maximum safe distance (MSD) to avoid entry of unauthorized personnel.
- 2.6 While installation of telecommunications base stations, measurement of EMF shall be carried out at a radial distance of 50 meters increment up to 300 meters from each site to determine the actual EMF level during normal operation.
- 2.7 In keeping with the international recognition of public perception concerns, no telecommunication tower shall be installed or constructed in public-sensitive areas such as children's park, schools, nurseries and hospitals. The minimum distance between such places and the telecommunication tower shall not be less than 20 meters.
- 2.8 To preserve the aesthetic value or beautification of the place, the visibility of the telecommunications equipment shall be minimized to the extent possible.
- 2.9 If the telecommunications equipments are installed on a roadside or rooftop, then such equipments shall be, either by painted or camouflaged from public view.

Design Standards for the Telecommunication Tower

- 3.1 While designing the telecommunication tower, the service providers shall ensure to follow the following general principles:
- a) Define high level technical criteria for construction of cellular towers, sites and associated infrastructures that could be shared with other service providers;
 - b) Healthy and safety criteria including limiting human exposure to radio frequency and electromagnetic fields as per the recommendation of International Commission on Non-Ionizing Radiation Protection (ICNIRP);
 - c) Environment criteria including preservation of aesthetic;
 - d) Tower loading based on wind, soil and seismic conditions. The wind load rating shall be based on the height of the tower, its location and any relevant local conditions; and
 - e) Adequate power supply to meet its full operational capacity requirements including provision for power sharing with other service providers wanting to share the tower.
- 3.2 The local pattern of streets and spaces, buildings' traditional aesthetic and ecology shall be taken into consideration while planning, designing and installation of the telecommunication tower.
- 3.3 The structural design, mounting, and installation of telecommunication towers including mounting of any antenna and support structure shall be in compliance with the manufacturer's specifications. The construction plans and design of any antenna shall be approved and certified by a professional engineer.
- 3.4 All telecommunications towers shall be designed to ensure that protection against unauthorized climbing and enclosed by fence with strands of barbed wire at the top with a locked gate.
- 3.5 The telecommunication towers shall be equipped with appropriate warning lights in compliance with the Civil Aviation Regulation to facilitate identification to flying aircraft.

3.6 The telecommunications towers shall be designed with sufficient space and loading capacity for co-location (infrastructure sharing) of at least one or two additional carriers of other service providers, depending on the height of the tower as follows:

- a) Structures of 50 feet: with provision to share with one service provider; and
- b) Structures of 100 feet: with provision to be share with two service providers

3.7 The minimum height of the telecommunication tower shall be:

- a) 100 feet in urban and commercial areas; and
- b) 50 feet in rural area.

In the event of construction of telecommunications tower in the residential area, a minimum distance of 70 feet shall be maintained from the residential site if the height of the tower is more than 50 feet.

3.8 The design of the telecommunication tower shall ensure to keep a provision of minimum setback requirement for the area in which it is located. If the tower is located in a Heavy Industrial, Industrial or Commercial zone, then the tower shall have to meet a minimum setback equal to the height of the tower plus an additional 20 feet from the property line abutting that area.

Prohibited Uses

4.1 The telecommunications towers shall not be installed or constructed in any public or private drainage easements.

4.2 The height of the telecommunications tower shall not be equivalent to the height of the buildings located in the proximity areas; the tower height to exceed the heights of the surrounding buildings.

4.3 No temporary mobile cell sites are permitted except in the case of equipment failure, equipment testing, or in the case of emergency situation as authorized by the Authority.

4.4 In the event, if temporary mobile cell sites are to used for testing purposes then use of such sites shall be limited to a duration of twenty-four (24) hours. However the use of temporary mobile cell sites shall be permissible in the event of equipment failure or in the case of emergency situations for a period of thirty (30) days.

Tower Reporting and certification by the Authority

- 5.1 The service provider shall ensure to provide the Authority with a database of the mobile cellular base stations including the power radiation and cell capacity and towers bi-annually in GIS or Excel sheet format, or both.
- 5.2 All telecommunication towers shall be inspected, verified and certified for the EMF radiation by the Authority.