6.2 Types of communication towers

The different types of communication towers are based upon their structural action, their cross-section, the type of sections used and on the placement of tower.

A brief description is as given below:

6.2.1 Based on structural action.

Towers are classified into three major groups based on the structural action. They are:

- Self supporting towers
- Guyed towers
- Monopole.

6.2.1.1. Self supporting towers.

The towers that are supported on ground or on buildings are called as self-supporting towers. Though the weight of these towers is more they require less base area and are suitable in many situations. Most of the TV, MW, Power transmission, and flood light towers are self-supporting towers.

6.2.1.2. Guyed towers.

Guyed towers provide height at a much lower material cost than self-supporting towers due to the efficient use of high-strength steel in the guys. Guyed towers are normally guyed in three directions over an anchor radius of typically 2/3 of the tower height and have a triangular lattice section for the central mast. Tubular masts are also used, especially where icing is very heavy and lattice sections would ice up fully. These towers are much lighter than self-

supporting type but require a large free space to anchor guy wires. Whenever large open space is available, guyed towers can be provided. There are other restrictions to mount dish antennae on these towers and require large anchor blocks to hold the ropes.

6.2.1.3 Monopole.

It is single self-supporting pole, and is generally placed over roofs of high raised buildings, when number of antennae required is less or height of tower required is less than 9m.

6.2.2. Based on cross section of tower.

Towers can be classified, based on their cross section, into square, rectangular, triangular, delta, hexagonal and polygonal towers.

Open steel lattice towers make the most efficient use of material and enables the construction of extremely light-weight and stiff structures by offering less exposed area to wind loads. Most of the power transmission, telecommunication and broadcasting towers are lattice towers.

Triangular Lattice Towers have less weight but offer less stiffness in torsion. With the increase in number of faces, it is observed that weight of tower increases. The increase is 10% and 20% for square and hexagonal cross sections respectively. If the supporting action of adjacent beams is considered, the expenditure incurred for hexagonal towers is somewhat less.

6.2.3 Based on the type of material sections.

Based on the sections used for fabrication, towers are classified into angular and hybrid towers (with tubular and angle bracings).

Lattice towers are usually made of bolted angles. Tubular legs and bracings can be economic, especially when the stresses are low enough to allow relatively simple connections. Towers with tubular members may be less than half the weight of angle towers because of the reduced wind load on circular sections. However the extra cost of the tube and the more complicated connection details can exceed the saving of steel weight and foundations.

6.2.4 Based on the placement of tower.

Based on this placement, Communication towers are classified as follows:

	Green Field Tower	**Roof Top Tower**
Erection	Erected on natural ground with suitable foundation.	Erected on existing building with raised columns and tie beams.
Height	30 – 200 m	9 – 30 m
Usual Location	Rural Areas	Urban Areas
Economy	Less	More

6.2.5 Based on the number of segments.

The towers are classified based on the number of segments as Three slope tower; Two slope tower; Single slope tower; Straight tower.