

TOWER MAINTENANCE

Prescriptions

Towers are important parts of telecommunication networks. To that extend, they require a regular maintenance like many other components and elements of such network.

Introduction

For self supporting towers, maintenance is an important issue regarding lasting quality and safety. Maintenance impact is even greater for guyed masts.
Lack of maintenance leads to invalidity of the warranty clause.

Principe

To check regularly the tower (external) condition.
If necessary, to carry out maintenance works and interventions.

Periodicity of checking visits

The inspection of the structure must by done:

- Regularly during the life period of the structure,
- For each installation of an additional loading,
- After each important climatic events: tempest, hurricane, ...

In that context, our advises are as follow:

- The first checking visit of each tower should be done at the latest 6 months after its installation and erection,
- The following maintenance visit should be done each year.

Employees qualification

All checking visits and maintenance interventions have to be done by employees with special qualification in telecom tower manufacture or maintenance.

CGTI Pylônes will not guarantee its tower structures if they are not maintained by their own teams.

TOWER MAINTENANCE

Detailed content of checking visits

Maintenance interventions will be carried out in the shortest delay according to discrepancies that have been found.

If discrepancies involve safety problems for employees or for the structure itself, maintenance interventions will be immediately carried out in cooperation with the tower manufacturer

Main structure:

- To check that there are no structure components missing,
- To check that bars are neither warped nor holed nor splitted. In that case, defective part(s) shall be replaced.
- To check that structure components are not oxidised.
- To check that draining holes (pipe leg members, pipe lattice parts, ...) are not blocked.

Guy wires

- To check guy wires –and accessories- aspect.
- To check that each cable that is part of the guy wire is neither broken nor wrapped.
- To measure the tension of each guy wires by a strand dynamometer and to compare the result with the value stated in the manufacturer's files. Tension should be measured when wind is relatively still. Wind velocity above 25 m/s (90km/h) is likely to lead to misleading measurements. Tension can be considered satisfactory within a difference of 15% with the tension value stated by the manufacturer. Guy wires must not be over tightened. Excessive tension may cause alignment problems and even a cable rupture. It may even cause permanent wrapping of tower structural parts.

In any case, we advise to simultaneously tighten diametrically opposed guy wires. Extreme precaution must be taken while tightening: 3 turns of a tightening device would increase the tension of a 45m long guy wire by about 250kg. The value of initial tension must be about 10% of the value of the guy wire breaking load.

- To check guy wires corrosion.
- To check that the guy wire tightening system is properly greased.

Bolting parts

- To check that there are neither bolts and nuts nor other bolting parts (washers, pins ...) missing. In that case, immediate corrective action is required.
- To check bolts tightening.
- To check that bolts are not oxidised.
- To check anchorage rod in the concrete.

Verticality

- To check structure verticality with the appropriate devices (such as theodolite). Measurements should be made in two different planes with a 90° angle difference.

Antennas and accessories

- To check antennas and antenna supports good condition,
- To check coaxial cables good condition,
- To check fixing clamps good condition.

Safety components

- To check access ladder good condition,
- To check that all safety components are existing and complete,
- To check the well functioning of the fall arrestor system,
- For a fall arrestor system with cable, check that the cable has not been overtightened (due to a fall for instance)
- To check the well functioning of the anti climbing door.

Lightning and earthing system

- To check that all lightning and earthing components are existing and complete including lightning arrestor, copper strip, connection plate, ...
- To check the earthing connection of coaxial cables,
- To measure the resistivity of the earthing system.

Night beaconing

- To check that all beaconing components are existing,
- To check condition and well functioning of beaconing components (Light bulb, energy cables, fixing parts, photoelectric cell, connections ...),
- To check earthing of the night beaconing.

Anti corrosion protection

- To check galvanisation condition,
- To check paint condition.
- To check oxidisation of the structure, of the bolting parts and of accessories.
- For guyed masts, check oxidisation of guys.

Towers in salty environments

- To check the good condition of the tower structure when located in a salty environment. If rains are not sufficient to clean the tower out of salt settlements, a regular wash of the tower structure shall be carried out.

Concrete blocks

- To check the good condition of above ground concrete blocks parts. There must not be any water stagnancy.
- To check the good condition of anchor setting in the concrete block.

Tower loading

- To report types, numbers and heights of antennas currently installed on the tower,
- To compare the result with the initial loading that has been considered in the structure design.

MAINTENANCE PLANNING FOR STEEL TOWERS

The first checking of the above described points shall be done 6 months after the tower installation and erection.

The checking of the above described points shall be done after each tempest, hurricane ... or after each change in the tower loading.

List of checking to be done every year:

STRUCTURE

- Guy wires tension for guyed masts
- Structure verticality checked with appropriate device for guyed masts
- Structure verticality for self supporting towers
- Tightening of the main structure bolting parts (10%)
- Tightening of the accessories bolting parts
- Bars geometry
- Antennas and accessories. Steadiness

SAFETY

- Opening/closing of the anti climbing door
- Opening/closing of the working platform's trap
- Fixing of the fall arrestor system
- Right placing and right installation of safety components
- Use test of the fall arrestor system with individual equipment

EARTHING

- Condition of the lightning rod
- Condition of the lightning arrestor
- Condition and fixing of the copper strip
- Connection of the concrete block copper belting onto the copper strip
- Connection of coaxial cables earthing onto the copper strip
- Connection between the bottom coaxial cable earthing and the collection copper bar fixed on the concrete block
- Resistivity measure of the lightning protection electrodes
- Tightening of the brass bolts of the lightning protection electrodes

NIGHT BEACONING

- Night beaconing functioning
- Condition of electrical connectors and earthing
- Condition and fixing of energy cables

COATING

- Localisation of galvanisation discrepancies
- Localisation of paint coating

CIVIL WORK

- Checking of the horizontality of concrete blocks
- Checking of the above ground concrete blocks parts, horizontal cable tray ...

MISCELLANEOUS

- Reporting of antennas types, numbers and heights
- In salty environment, to wash the tower structure