

Recommendation

ITU-T L.341 (05/2025)

SERIES L: Environment and ICTs, climate change, e-waste, energy efficiency; construction, installation and protection of cables and other elements of outside plant

Maintenance and operation – Infrastructure maintenance

Maintenance of telecommunication poles and overhead facilities

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Recommendation ITU-T L.341

Maintenance of telecommunication poles and overhead facilities

Summary

Telecommunication poles and overhead facilities such as closures, wires, cables, and accessories are deteriorating. For example, breakage and cracks occur and these phenomena degrade the safety and serviceability of poles and overhead facilities. If the deterioration is unnoticed, large-scale repair and reinforcement measures will probably be required, which will further increase the cost in the future. Therefore, it is highly recommended that periodic inspection and timely maintenance should be performed.

Safety management of telecommunication infrastructure facilities is generally described in Recommendation ITU-T L.330. This Recommendation describes the inspection procedures, technologies and countermeasures for maintenance of poles and overhead facilities as defined in Recommendation ITU-T L.330. Previous editions dealt with inspection methods for wooden poles. In this revision, the inspection method and the appropriate countermeasures for the inspection result have described including poles made of concrete, steel, and GRP, which are mainly used at present.

History*

Edition	Recommendation	Approval	Study Group	Unique ID
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Keywords

Non-destructive testing (NDT), overhead facilities, telecommunication poles.

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The World Telecommunication Standardization Assembly (WTSA), which meets every four years, establishes the topics for study by the ITU-T study groups which, in turn, produce Recommendations on these topics.

The approval of ITU-T Recommendations is covered by the procedure laid down in WTSA Resolution 1.

In some areas of information technology which fall within ITU-T's purview, the necessary standards are prepared on a collaborative basis with ISO and IEC.

NOTE

In this Recommendation, the expression "Administration" is used for conciseness to indicate both a telecommunication administration and a recognized operating agency.

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Maintenance of telecommunication poles and overhead facilities

1 Scope

This Recommendation describes detailed inspection technologies and countermeasures to the deterioration of telecommunication poles and overhead facilities such as closures, wires, cables, and accessories. These inspection and countermeasures are conducted when certain problems are observed during the periodic inspections described in [ITU-T L.330].

This Recommendation covers:

- inspection technologies for poles, closures, wires, cables, and accessories,
- countermeasures based on inspection results to prolong the lifetimes of telecommunication poles and overhead facilities,
- maintenance procedures to realize effective facility management.

Appendices provide the effective and quantified maintenance technologies.

2 References

The following ITU-T Recommendations and other references contain provisions which, through reference in this text, constitute provisions of this Recommendation. At the time of publication, the editions indicated were valid. All Recommendations and other references are subject to revision; users of this Recommendation are therefore encouraged to investigate the possibility of applying the most recent edition of the Recommendations and other references listed below. A list of the currently valid ITU-T Recommendations is regularly published. The reference to a document within this Recommendation does not give it, as a stand-alone document, the status of a Recommendation.

[[ITU-T L.330](#)] Recommendation ITU-T L.330 (2020), *Telecommunication infrastructure facility management*.

3 Definitions

3.1 Terms defined in this Recommendation

This Recommendation defines the following terms:

3.1.1 concrete: An artificial, stone like material used for various structural purposes, made by mixing cement with various aggregates, such as sand, pebbles, gravel, or shale, with water and allowing the mixture to harden.

3.1.2 creosote: Wood creosote is a colourless to yellowish greasy liquid with a smoky odour and burned taste. Wood creosote is used as a wood preservative and has also been used as a disinfectant, a laxative, and a cough treatment.

3.1.3 non-destructive testing (NDT): This method detects defects such as cracking and corrosion, without destroying the test object. There are different methods of testing available, such as the ultrasonic pulse velocity method and the stress wave propagation method.

3.1.4 resonance frequency: Resonance is the tendency of a system to oscillate at maximum amplitude at certain frequencies. When damping is small, the resonance frequency is approximately equal to the natural frequency of the system, which is the frequency of free vibrations.

3.1.5 unearthing: Action of removing a covering layer of earth.

4 Abbreviations and acronyms

This Recommendation uses the following abbreviations and acronyms:

BHU	Barcol Hardness Unit
FFT	Fast Fourier Transform
GRP	Glass-Reinforced Plastic
NDT	Non-Destructive Testing
OD	Outer Diameter
UV	Ultraviolet

5 Conventions

None.

6 Maintenance of telecommunication poles and overhead facilities

Like other public infrastructures such as bridges, roads and buildings, telecommunication poles and overhead facilities also experience problems caused by aging degradation. If such problems are left unrepaired, the deterioration of facilities may cause serious accidents, or the need for additional replacement projects, which will further increase the cost. The purpose of maintenance is to detect the defects in poles and overhead facilities at an early stage and to take appropriate actions in order to enhance the facility's durability and serviceability.

6.1 Inspection

6.1.1 Periodic inspection

Telecommunication poles are visually inspected once every 5 to 10 years, depending on the material. In the case of wooden poles, inspection should be conducted once in less than 5 years. The overhead facilities (wires and accessories) attached to the poles are usually inspected visually at the same time as the poles. In addition, for areas of harsh environmental conditions, such as ultra-high/low temperature, ultra-high humidity, strong wind or heavy frequent rain, the period should be decreased.

During periodic inspections, deformation or deterioration of poles and overhead facilities is detected and evaluated as whether precise inspections and/or temporary countermeasures are needed.

NOTE – Cables and closures are inspected visually during daily operations.

It is recommended that procedures be established that guide the manager of the poles and overhead facilities to schedule/undertake periodic inspections. These inspections are mainly done by observing the surface of the poles and overhead facilities and detecting crack width, deflection/bending, and surface damage. The inspections are carried out using comprehensive identification sheets on which observations and measurements can be conveniently recorded.

6.1.2 Precise inspection

Precise inspections are carried out when the defects and/or deformations are deemed critical to the safety of the poles and/or overhead facilities. Quantitative measurements are also carried out when there is degradation that cannot be identified by visual inspection or when the cause of degradation must be clarified to judge whether countermeasures are needed and to select the optimum method. During precise inspections, a detailed investigation of the measurements and deformation gathered in the periodic inspections is conducted by a specialist.