

TECHNICAL AND PROCEDURAL GUIDELINES

2026

Document Title: Technical and Procedural Guidelines for Installation and Maintenance of Cable Telecommunication Infrastructure, 2026

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1. Introduction

The Communications Authority of Kenya (CA), established under the Kenya Information and Communications Act, 1998, is mandated to regulate and promote the development of the telecommunications sector within the country. In keeping with its regulatory responsibilities, the Authority recognizes the pivotal role played by reliable and robust telecommunication infrastructure, both wireless and cabled, in facilitating national digital transformation, socio-economic growth, and integration into the global digital ecosystem.

The increasing demand for high-speed broadband and digital services has necessitated the widespread deployment of robust and scalable cabled networks across the Country for the provision of fixed telephony, radio, television, as well as internet services.

The increasing rollout of digital cable infrastructure, therefore, calls on the regulator to not only standardize the installation of the various cables but also enforce compliance with the installation guidelines, as well as other regulatory constraints like infrastructure sharing requirements, the need for the right license, environmental sustainability, prevention of frequent social and communication service disruptions, and need to comply with requirements from other government departments.

2. Rationale for the Guidelines for Installation and Maintenance of Telecommunication Cables

Whereas there exist cable installation and maintenance guidelines from cable manufacturers to be adhered to, for ensuring the networks are fit for purpose, the Authority has noted the proliferation of cables not only installed with disregard to the manufacturer standards, but also poorly maintained.

Further, any licensed entity that lays cable infrastructure is expected to have company standards that set the minimum requirements and specifications as part of its quality assurance framework, to be adhered to by its staff in laying cables. Regrettably, most cable installation companies lack internal quality assurance measures, and therefore their telecommunication cables are installed with disregard to any existing installation guidelines.

It is within this context of failure in self-regulation through adherence to cable manufacturer installation guidelines and lack of internal quality assurance measures among cable infrastructure installation companies that the Authority developed these guidelines.

These guidelines aim to facilitate the effective and standardized deployment of fiber optic infrastructure, ensuring equitable access, promoting investment, and safeguarding the interests of all stakeholders.

3. Principles of the Guidelines

These guidelines are anchored on fundamental principles of:

- 3.1 Environmental and Biodiversity Conservation
- 3.2 Dig/Build Once Policy
- 3.3 Aesthetics Preservations
- 3.4 Quality of Service and Quality of Experience

4. Objectives of these guidelines

- 3.5 Establish a standard for installation and maintenance of telecommunication cable infrastructure
- 3.6 Promote efficient and coordinated telecommunication cable infrastructure deployment to reduce costs and avoid duplication.
- 3.7 Ensure the safety of both the installation team and the public during deployment, maintenance, and use of telecommunication cable infrastructures
- 3.8 Maintain the aesthetic environment of the areas where telecommunication cable infrastructure traverses to maintain visual harmony with surroundings and reduce visual pollution.
- 3.9 Actualize the provisions for telecommunication infrastructure sharing as contained in telecommunication infrastructure sharing regulatory documents.
- 3.10 Promote eco-sustainability by ensuring protection of natural habitats, prevention of soil erosion, and proper waste management throughout the installation process.

5. Scope and Applicability

The telecommunication cable infrastructure installation project covers four phases, namely, planning, procurement, installation, and maintenance.

- 5.1. These guidelines cover the planning, installation, and maintenance phases, in particular:
 - 5.1.1. Approvals needed from other government agencies and departments
 - 5.1.2. Licensing requirements from Communications Authority
 - 5.1.3. Cable Telecommunication Infrastructure Installation Guidelines
- 5.2. The guidelines pertain to
 - 5.2.1. Copper and Fiber Optic Cables
 - 5.2.2. Underground and Aerial Installation of telecommunication cables
- 5.3. The procurement phase, which involves specifying the characteristics of the cables and their associated equipment, is left at the discretion of service providers, provided the cable meets the set quality of service of the equipment are type approved by the Communications Authority.

6. Licensing Requirements for Telecommunication Cable Installation

- 6.1. The Authority has in place a technology and service-neutral licensing regime, and to his end, any service provider wishing to install and operate telecommunication infrastructure shall obtain a Network Facility Provider(NFP) License.
- 6.2. Those wishing to install and maintain on behalf of service providers shall obtain either a contractor license or an individual technical personnel license.
- 6.3. Table 1 provides a summary of the licenses required.

Table 1: Applicable License for cable telecommunication infrastructure installation

License	Span
NFP T1	Install and operate country wide
NFP T2	Install and operate country wide
NFP T3	Install and operate country wide in contiguous 3 counties
Contractor	Install and maintain on behalf of service providers
Technical Personnel	Install and maintain on behalf of service providers

7. Approvals from other Government entities

Prior commencement of installation of telecommunication cable infrastructure, service providers shall obtain all required approvals from applicable government departments and agencies.

The various government/government agencies include:

- 7.1. County Governments: the service provider shall obtain excavation permits, wayleave acquisition, and road reserve access for both underground and aerial cable installations.
- 7.2. Road Authorities: these include Kenya National Highway Authority (KeNHA), Kenya Urban Roads Authority (KURA), and Kenya Rural Roads Authority (KeRRA), who have to provide authorizations in cases where the telecommunication cable infrastructure crosses roads or road reserves.
- 7.3. Ministry of Lands & Physical Planning: For authorizations in areas where telecommunication cable infrastructure crosses public lands not overseen by road agencies.
- 7.4. National Environmental Management Authority (NEMA): Where a telecommunication cable infrastructure is deemed to require an Environmental and Social Impact Assessment (ESIA), the service provider shall be required to obtain a permit from NEMA after carrying out an ESIA.
- 7.5. Kenya Power and Lighting Company (KPLC): For telecommunication cable infrastructure that seeks to share poles with KPLC, authorization shall be sought from KPLC prior to mounting the aerial telecommunication cable infrastructure.
- 7.6. Water and Sewerage Agencies: For underground cables laid alongside or in close proximity to water and sewerage pipeline, authorization shall be sought from the respective water and sewerage agency.
- 7.7. Kenya Railways Corporation: For telecommunication cable infrastructure, both underground and aerial, that runs in close proximity, namely, horizontal clearance of 15 feet, to the railway network, or crosses the rail network, the service provider shall seek authorization from the rail service provider.

8. Preparatory Steps Prior to Installations

8.1. The service provider wishing to install telecommunication cable infrastructure shall:

8.1.1. Submit an application for Authorization to install telecommunication cable infrastructure to the Communications Authority(CA).

8.1.2. Attach all requisite authorizations from government entities

8.1.3. Submit a drawing showing the route and coordinates at key points the cable will follow during installations, comprising of the core location of equipment, transmission network, and distribution network [NFP License condition no. 3]

8.1.4. State the sharing capacity of the passive infrastructure to be installed in terms of the number of additional service providers the poles, conduits, and ducts can accommodate [NFP License condition no. 3].

8.1.5. The route shall show other telecommunication cable infrastructure traversing the same route, and justifications on why sharing is not possible.

8.1.6. Provide measures put in place to minimize disruption of both human and vehicle traffic

8.1.7. Provide safety measures for both installers and members of the public, put in place during the construction of telecommunication cable infrastructure

8.2. Upon receipt of the application for authorization to install telecommunication cable infrastructure, the Authority shall:

8.2.1. Review and inspect the proposed route to ascertain the contents of the applications

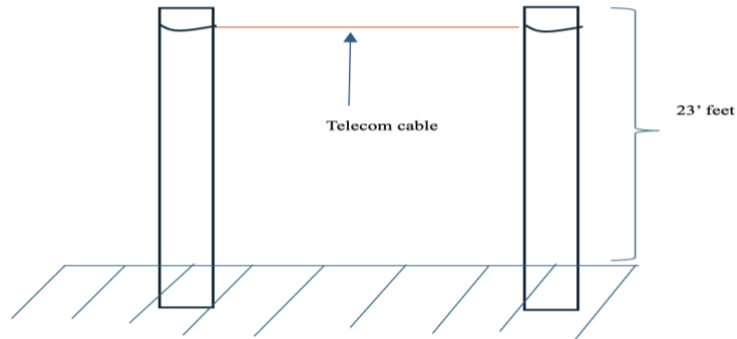
8.2.2. Respond within thirty days (30) on whether to allow the installations to proceed.

9. Guidelines for Installation of Cable Telecommunication Infrastructure

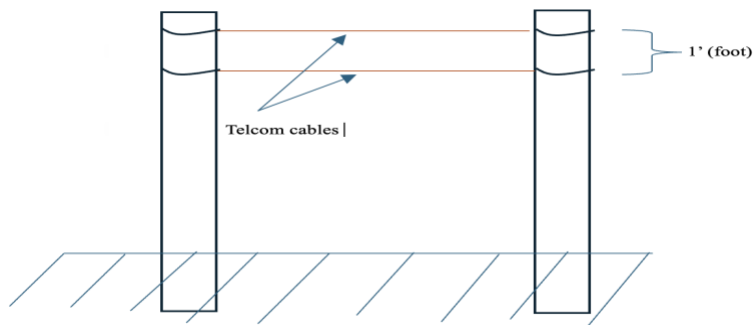
Cable telecommunication infrastructure can be installed underground or aerially on poles.

9.1. Aerial cables Installations

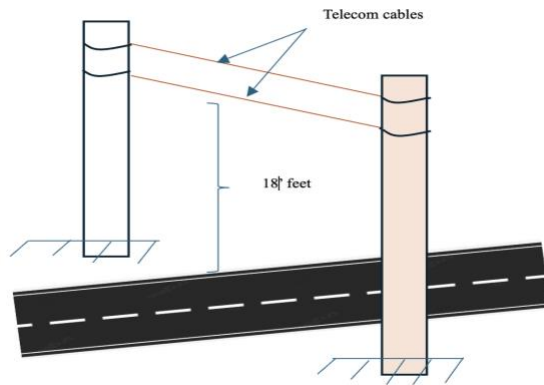
9.1.1. All poles for telecommunication infrastructure shall have a minimum vertical ground clearance height of 23 feet [EAS 322:2002].



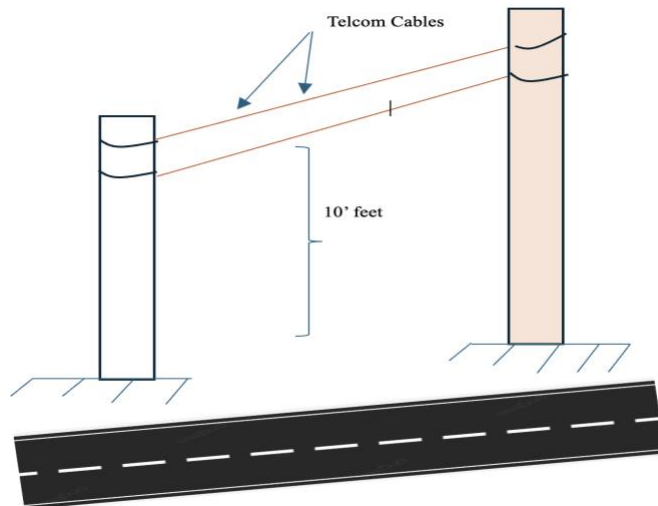
9.1.2. The minimum vertical clearance between adjacent telecommunication cables on a pole shall be one(1) foot [NESC Rule 23 5H1].



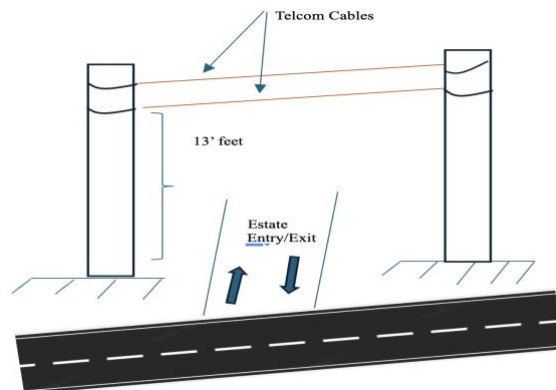
9.1.3. The lowest ground clearance for a telecommunication cable crossing roads and railway lines shall be 18 feet [NESC]



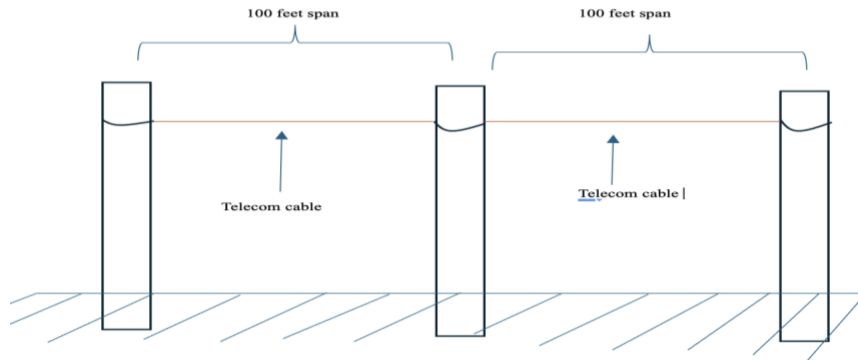
9.1.4. The lowest ground clearance for a telecommunication cable running parallel to roads, railway line and crossing footpaths shall be 10 feet



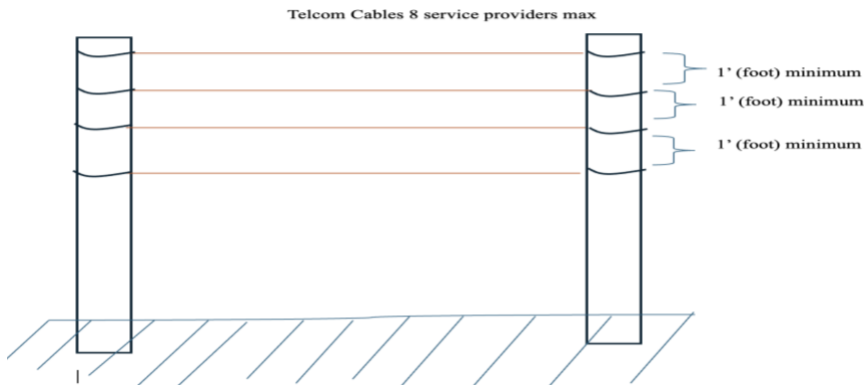
9.1.5. The lowest ground clearance for telecommunication cables crossing an entry into estate gates shall be a minimum of 13 feet.



9.1.6. The maximum distance between poles shall be 100 feet [ITU-T L.341 (05/2025)].



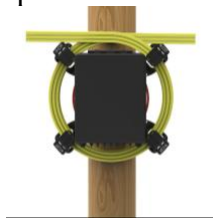
9.1.7. A maximum of ten(10) different providers of telecommunication cables shall share one pole



9.1.8. All cables shall be labelled with a permanent strip indicating the owning service provider, at intervals of 300 feet, with information in the format :

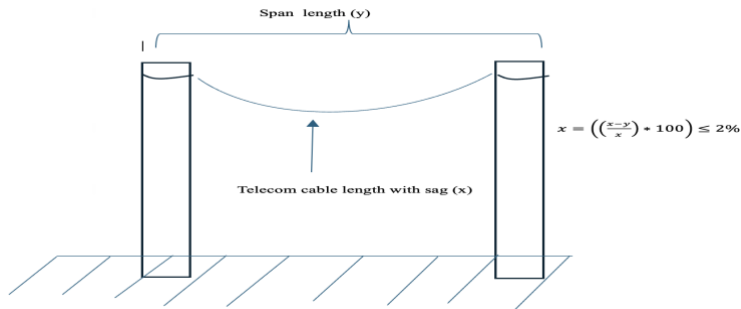
- 9.1.8.1. Service Provider Name: Printed in bold or capital letters
- 9.1.8.2. Fiber Count if fiber cable: to show how many fiber strands are inside (e.g., 24F, 48F, 96F).
- 9.1.8.3. Cable Type: to show if Singlemode (SM) or Multimode (MM)
- 9.1.8.4. Installation Date

9.1.9. All slack loops shall be fixed on poles and supported with brackets or trays

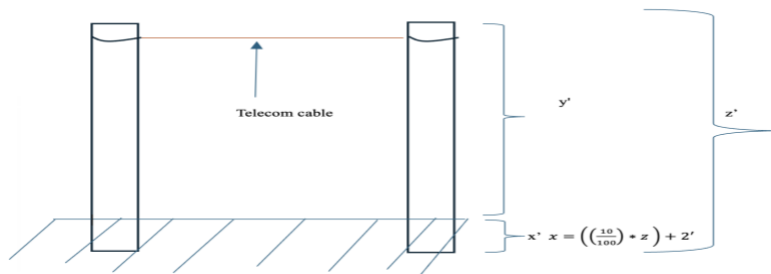


9.1.10. A pole shall have only one slack, therefore, sharing service providers shall have to alternate their slacks

9.1.11. The cable sags shall not be more than 2% of the cable span length [KS 1882-1:2008]

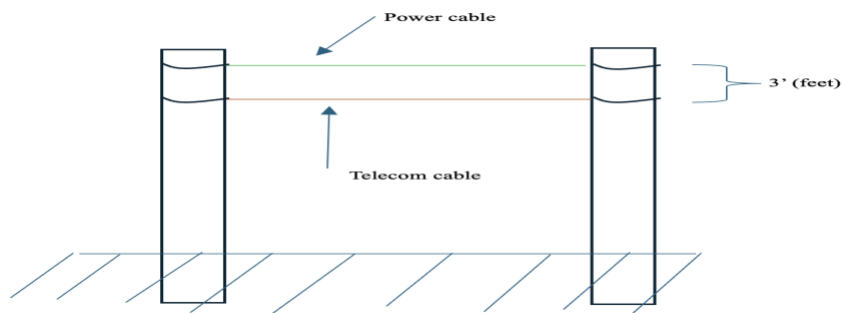


9.1.12. The depth of the poles shall follow the general rule of 10 % height of the pole, plus an additional 2 feet [EAS 322:2002 ICS 79.040].



9.1.13. The horizontal clearance distance from utilities shall be as advised by the respective utility companies

9.1.14. The minimum vertical separation between telecommunication cables and electricity cables shall be three(3) feet [IEEE: NESC Rule 235C4 & 238E].



9.1.15. The actual vertical separation between telecommunication cables and electricity cables shall be as guided by the electricity service provider and based on the electricity cable power load.

9.1.16. For fiber installations on shared electricity poles, the allowable cable type shall be All-Dielectric Self-Supporting (ADSS) cable [IEEE 1222-2019 Standard], [IEC 60794-1-1]

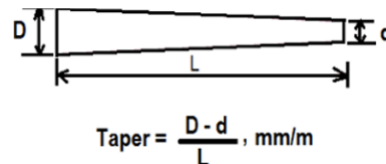
9.1.17. The poles to be used for aerial cable installations shall be :

[EAS 322:2002, KS 1933]

- 9.1.17.1. From pine, cedar, or eucalyptus trees
- 9.1.17.2. Free of cross breaks, decay, hollow butts
- 9.1.17.3. Have a safety factor of 2.5

$$FOS = \frac{F_{failure}}{F_{allowable}}$$

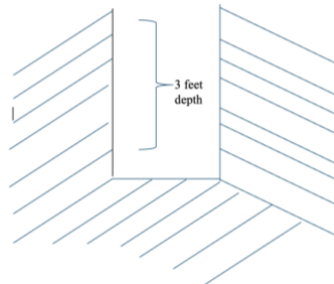
- 9.1.17.4. Taper shall not exceed 10mm per metre of the length of a pole



- 9.1.17.5. Preserved through pressure impregnation with creosote or with a copper/chromium/arsenic (CCA) mixture
- 9.1.17.6. Have an Aluminium or galvanized mild steel gouge name plate of at least 75mm long, labelled with at least: length, pole top diameter, species of the pole, taper, safety factor, type of preservative treatment and manufacturer details.

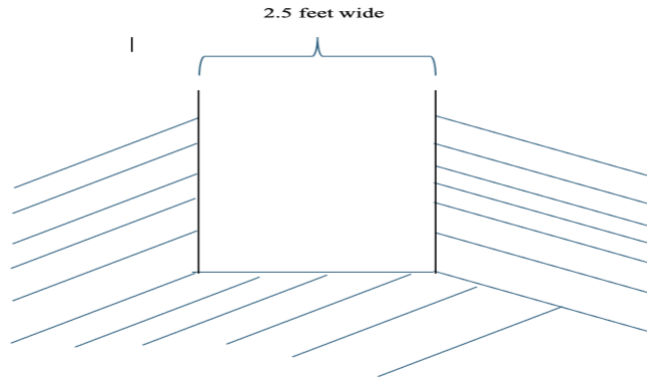
9.2. Underground cable installations

- 9.2.1. The excavation distance from utility lines shall be as guided by the respective utility company whose infrastructure is in close proximity to the area to be excavated
- 9.2.2. The depth of excavation shall be at least 3 feet [TIA-758-B]



- 9.2.3. The minimum trench width shall be two and a half (2.5) feet to enable

accommodation of at least four 100 mm diameter ducts [IEC 60794-3:]

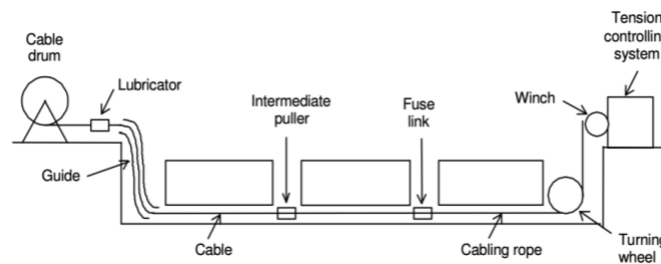


- 9.2.4. The horizontal separation between ducts in the trench shall be at least 50 mm [TIA-758-B]
- 9.2.5. Rigid spacers between cable ducts shall be placed every 2 meters to maintain consistent separation and alignment [TIA-758-B]
- 9.2.6. The marking tape, made of corrosion-proof material, shall be placed at a depth of at most 2 feet from the top of the trench [IEC 60794-3]
- 9.2.7. The entire cable route shall be marked with underground concrete or metallic cable markers which should be at least two feet (2) above the ground, spaced at a distance of one(1) kilometer, with clear labeling indicating cable route, ownership, and warning messages.



- 9.2.8. The cable markers shall also be placed at each manhole and interconnection points with any underground utility infrastructure.
- 9.2.9. The trenches shall have at least four ducts installed to facilitate infrastructure sharing.
- 9.2.10. Manholes shall be spaced at almost 1000 feet

9.2.11. A standard underground duct installation shall comprise a cable guide, lubricator, intermediate pullers, and tension control system [IEC 60794-1-1], depicted pictorially as :



9.2.12. The cable trench bottom shall be firmed with either a compacted soil base or a minimum of 150 mm high layer of sand

9.2.13. For fiber cables crossing rivers or lakes, an underwater ground continuous length cable should be used to avoid underwater joints, with the gradient of the cable route down the riverbed or lake shore made as gentle as possible. to avoid the fiber moving within the cable [IEC 60794-1-1].

9.2.14. Excavations crossing roads, railways and other underground utility infrastructure shall be done as guided by the respective utility providers.

9.3. Generic installation guidelines

9.3.1. For Quality of Service and Quality of experience, all splicing of fiber cables shall be done using fusion splicing, which minimizes signal loss.

9.3.2. All splicing joint enclosures shall be labelled with a permanent weather-resistant details of the service provider using the cable.

9.3.3. Subjection of the cables and optical fibres to unacceptable bending stresses, beyond the cable manufacturer's recommendations regarding bending diameters, should be avoided during pulling and installation [IS/IEC 60794-1-1 : 2001].

The minimum cable bending diameters, both during installation and post installation, as defined by the cable manufacturer, must be maintained, [ITU-T Recommendation L.100 (01/2024)] as :

9.3.3.1. 40* cable outer diameter during installation

9.3.3.2. 20/30 * cable outer diameter after installation

9.3.3.3. Manufacturer guidance for micro duct cables

9.4. Post Installation requirements

9.4.1. The service provider is required to notify the Authority on completion of the installation of cable telecommunication infrastructure

9.4.2. The notification shall be accompanied by service provider self-test report on the installed cable, using applicable equipment, like an optical time-domain reflectometer and loss measurements of the cable.

9.4.3. The self-inspection report shall be accompanied by photographic evidence of applicable key measurements comprising of :

9.4.3.1. Continuity tests,

9.4.3.2. Insulation resistance,

9.4.3.3. Loop resistance,

9.4.3.4. Signal quality tests like NEXT (Near-End Crosstalk), attenuation, and return loss

9.4.3.5. end-to-end optical power measurements

9.4.3.6. Signal attenuation at each connector and joint to be maintained at < 0.03 dB and < 0.06dB for 1310 nm cables, while < 0.07dB and < 0.04 dB for 1550 nm.

9.4.4. Findings from physical inspection through observations shall also accompany the report, with photographic evidence, which includes:

9.4.4.1. Labeling

9.4.4.2. Grounding.

9.4.4.3. Cable support with trays, conduits, or hangers to prevent sagging or strain.

9.4.5. The Authority shall, within 14 days of receiving the notification, carry out a certification exercise to ascertain compliance with these guidelines

9.4.6. Upon successful inspection and certification, the service provider shall be allowed to provision services on the cable telecommunication infrastructure

9.5. Transition

9.5.1. All service providers using existing cable telecommunication infrastructure that does not conform to these guidelines shall be required to regularize their infrastructure within a period of six(6) months.

9.6. Review of Guidelines

9.6.1. These guidelines will be reviewed periodically based on emerging technological advancements in telecommunications cables

Signed:

Signature: _____

Date: _____