Selection of Overhead Optical Cable Routes



Overview

In the communications industry, how to construct overhead optical cable is a problem that many front-line communications construction workers will encounter.

Key Takeaways

Overhead optical cable routes are selected based on terrain, existing infrastructure, environmental conditions, and mechanical requirements to ensure reliable, cost-effective, and safe fiber deployment. Key Considerations for Route Selection1.

Existing Infrastructure and Right-of-

Way Overhead fiber often leverages existing utility poles or power line routes to minimize construction costs and simplify permitting. Using aerial routes along power lines or dedicated poles reduces the need for trenching and allows rapid deployment, especially in rural or suburban areas. Permissions, easements, and regulatory approvals must be obtained before installation.

2. Terrain and Environmental Factors Route selection must account for terrain variations, wind exposure, ice loading, and temperature extremes. Overhead cables must withstand environmental stresses such as wind speeds up to 320 km/h, ice accumulation up to 50 mm, and temperature ranges from -40°C to +80°C.

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Extreme environments may require reinforced poles or lattice structures with increased spacing. 3. Pole Spacing and Mechanical Design Pole spacing depends on the type of area and cable design: Urban areas: 25–40 m spacing with concrete poles (10–12 m height)Suburban/rural areas: 40–50 m spacing with wooden poles (12–15 m height)Extreme environments: up to 67 m spacing with reinforced poles Mechanical considerations include cable tensile strength (1,500–12,000 N depending on span), sag control (1–2% of span length), and proper anchoring using guy wires at dead-end poles.

Pulling tension should not exceed 0. 5% of the cable's breaking strength. 4.

Cable Type Selection Two primary overhead fiber cable types are commonly used: Dielectric cables: Non-metallic, suitable for high-voltage crossings and areas requiring electrical isolation.

OPG

W (Optical Ground Wire): Combines grounding and fiber transmission, often used to replace or supplement earth wires on power lines. Cable selection should consider fiber count, environmental durability, and compatibility with existing infrastructure. 5.

Installation and Maintenance Proper installation techniques, such as self-lashing or messenger lashing with UV-protected materials, ensure long-term reliability. Splice enclosures should be IP65-rated and sun-resistant. Documentation of routes, pole locations, and cable specifications is essential for future maintenance and network expansion.

6. Cost and Deployment Efficiency Overhead routes reduce excavation and conduit costs by 30–50% and allow installation 2–3 times faster than buried methods. Route planning should balance cost, reliability, and ease of maintenance.

Summary

Selecting overhead optical cable routes requires a holistic approach that integrates existing infrastructure, environmental conditions, mechanical design, cable type, and regulatory compliance. Proper planning ensures efficient deployment, long-term reliability, and minimal operational risk for fiber optic networks.

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Article Content

Overhead Optical Cable Construction Guidelines

In the communications industry, how to construct overhead optical cable is a problem that many front-line communications construction workers will encounter. If we can reduce failures

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This document provides guidelines for laying optical fibre cables, including detailed surveying the cable route, soil categorization, recommended pipe types for cable protection,

Planning and route survey | PDF

This document discusses planning and surveying for fiber optic network routes. It outlines the importance of performing a preliminary survey to identify the optimal cable route and key

Overhead Optical Cable Construction Guidelines

If you need to lay an aerial optical cable for long-distance network communication, please contact us to design and produce the most suitable optical cable for you according to the use

Planning Fiber Optic Cable Routes for Telecommunications

Expert strategies for planning fiber optic cable routes in telecommunications carriers using advanced data analytics.

Handbook – Optical fibres, cables and systems

With this evolution it is possible to foresee that all optical networks (AONs) could extend to all potential routes of the backbone network of a medium size country with optical paths up to around 2 000 km.

Fiber Network Planning and Design (FTTH/FTTP /FTTx)

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OSP Civil Works Guide-FOA

Cable jackets shall be marked with manufacturer''s name, month and year of manufacture, sequential meter markings, fibre type, the number of fibres, along with a telecommunications handset symbol.

ITU-T Rec. L.163 (11/2018) Criteria for optical fibre cable ...

To cope with such difficulties, robust cable structure, safe cable routes, an appropriate cable installation scheme and physical safe guarding measures of the cable should be properly selected and applied

Route Design/Cable Laying Technologies for Optical The geotechnical ...

3. Route Design Based on the results of marine route surveys and informa-tion regarding existing structures (such as fish nets etc.), the cable route is designed by taking into consideration the ease

How To Set Up Overhead Fiber Optic Cable? — ZMS

Fiber optic cable construction is roughly divided into the following steps: preparation → routing project → fiber optic cable laying → fiber optic cable splicing → project

Chapter 16: Overhead Line Routing

16.2 ROUTING OBJECTIVES The preliminary routing work determines the physical constraints involved and allows the establishment of the least-cost solution for the overhead line. Estimated quantities for

Overhead Fiber Optic Cable Installation Requirements And 2 Cable

Overhead fiber optic cable is an optical cable installed on poles. One of the most advantage is that it can save costs and shorten the construction period.

Understanding and Selecting Optical Fibre and Cable

OPTICAL FIBRE AND CABLE This document will provide an understanding of optical fibre, optical fibre cable (OFC), application standards, and key considerations that one should make before selecting

Overhead Fiber Optic Cable: Installation Method and

Overhead fiber optic cable is suitable for long-distance lines and dedicated network optical cable lines or some local special sections. It provides

Overhead/Aerial

Overhead installation involves a series of steps. First, the route for the fiber optic cables is determined, considering factors such as distance,

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A Guide to Fiber Optic Network Planning and Design

Step 4: Fiber optic cable routing Step 5: Equipment selection Step 6: Capacity and bandwidth planning Step 7: Power and infrastructure planning Step 8: Network documentation and

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