Underground Optical Cable Splicing Process



Overview

Proper splicing and termination are critical for maintaining the integrity and performance of the fiber optic cable.

Key Takeaways

Underground optical cable splicing involves carefully joining fiber optic cables using fusion or mechanical splicing, protected within splice closures to ensure long-term performance and minimal signal loss.

Preparation and Planning

Before splicing, thorough planning is essential. Conduct a site survey to assess the route, identify obstacles, and plan conduit placement. Obtain all necessary permits and permissions from local authorities and property owners.

Ensure the fiber optic cable is prepared by stripping the jacket, cleaning the fibers, and performing preliminary tests to confirm integrity. Conduits and ducts should be cleared of obstructions to allow smooth cable placement.

Splicing Techniques

There are two primary splicing methods: Fusion Splicing: Fibers are aligned and welded using controlled heat, creating a permanent, low-loss connection. This is the most common method for underground installations due to its reliability. Mechanical Splicing: Fibers are aligned and held together mechanically.

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This method is faster but generally has higher insertion loss and is less durable than fusion splicing.

Splice Protection

After splicing, fibers must be protected from environmental and mechanical damage. Splices are placed in splice trays and then enclosed in splice closures, which can be dome-shaped or inline depending on the application. Dome closures are preferred for underground installations because they provide easier fiber management and reliable sealing against moisture and soil pressure.

Closures can be buried, wall-mounted, or pole-mounted depending on the network design.

Termination and Testing

Once spliced, cables are terminated by connecting them to connectors or distribution frames. Proper termination ensures minimal signal reflection and consistent transmission quality. Testing is critical: use an Optical Time-Domain Reflectometer (OTDR) to measure optical loss and detect faults, and a power meter to verify signal levels along the cable.

Installation Considerations

Maintain the minimum bending radius of the cable to prevent fiber breakage (typically 15–20 times the cable diameter). Avoid exceeding the maximum tensile strength during cable pulling to prevent long-term damage. Include slack storage at splice points for maintenance and future upgrades.

Use armored cables or additional conduit layers in areas with rocky terrain or high groundwater.

Documentation and Maintenance

Document all splice locations, cable routes, and test results for future reference. Develop a maintenance plan that includes regular inspections, cleaning, and repairs to ensure the long-term reliability of the underground fiber network. By following these steps—careful planning, precise splicing, protective enclosures, rigorous testing, and proper documentation—you can achieve a reliable and high-performance underground fiber optic installation.

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Choosing a connector type for any installation should consider if the connector is compatible with the systems planned to utilize the fiber optic cable plant, if the termination process is familiar to the

IK10 100N IP68 288 Cable Fiber Optic Splice Closure

Product Details The Clos-8A-192 fiber optic splice closure can accommodate up to 192 splicing points as an outdoor closure. It serves as a

Fiber Optic Splicer 1 (Remote) at SOLV Energy

SOLV Energy is a leading provider of infrastructure services to the power industry, designing, building and maintaining utility scale solar, battery storage and high voltage substation projects

Guidelines for Underground Fiber Optic Installation

These guidelines provide specifications for the installation of fiber optic cables underground in Rwanda. They aim to avoid damage to existing infrastructure and ensure installation follows

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