

Article Overview

A communication optical cable pipe jacking project involves trenchless installation of fiber optic cables underground using hydraulic jacks and prefabricated pipes, ensuring minimal surface disruption and high-quality signal transmission.

Overview of Pipe Jacking for Optical Cables

Pipe jacking is a trenchless construction method used to install underground pipelines, ducts, and communication cables with minimal impact on surface traffic, buildings, and the environment . In this method, a jacking machine or micro-tunneling machine pushes prefabricated pipes through the soil from a launch shaft to a reception shaft while simultaneously excavating the soil within a shield . This technique is suitable for urban areas, highways, railways, rivers, and other locations where open-cut trenching is impractical .

Technical Considerations

- o Pipe and Shaft Design: Pipes typically range from 150mm to 3000mm in diameter, and the drive length can extend several hundred meters depending on soil conditions and project requirements .
- o Excavation and Slurry Management: Drilling generates slurry composed of soil and drilling fluid. Proper solids control and mud treatment are critical to maintain jacking efficiency, prevent equipment wear, and ensure environmental compliance .
- o Ground Conditions: Soil type (clay, sand, gravel) affects the choice of jacking method, pipe diameter, and slurry system design .

Optical Cable Installation

- o Cable Type: Fiber optic cables, often used for broadband, FTTH, or long-haul networks, are installed inside the jacked pipes .
- o Connection Methods: Optical fibers are connected using fusion splicing (melting), mechanical joints, or active connectors. Fusion splicing is preferred for its low loss and high reliability, with connection loss typically controlled within 0.05 dB .
- o Cable Handling: Excess cable should be carefully coiled in trays to prevent bending or damage, and joints should be positioned to avoid water exposure .

Advantages of Pipe Jacking for Communication Projects

- o Minimal Surface Disruption: Avoids excavation of roads, sidewalks, and landscaping .
- o Safety and Environmental Compliance: Reduces risk to workers and surrounding structures, with

OSHA-certified teams often employed for telecom projects .

- o High-Quality Signal Transmission: Proper installation and splicing ensure low optical loss and reliable broadband service .

Project Planning and Execution

- o Route Survey and Design: Determine optimal path, depth, and gradient while considering existing underground utilities .

- o Shaft Construction: Build launch and reception shafts with adequate space for jacking equipment and pipe assembly .

- o Pipe Jacking and Cable Installation: Advance pipes using hydraulic jacks while monitoring alignment and slurry performance; install optical cables inside the pipes .

- o Splicing and Testing: Perform fusion splicing or mechanical connections, test optical loss, and secure cable trays .

- o Completion and Documentation: Record as-built drawings, test results, and maintenance plans for future reference . Pipe jacking provides a reliable, efficient, and low-impact solution for installing communication optical cables in complex urban or highway environments, ensuring both structural integrity and high-quality signal transmission.

Pipe jacking is a specialist tunnelling method for installing underground pipelines with the minimum surface

The old story about the most likely fiber optic communications system failure being caused by "backhoe fade" is not a joke - it

The pipe-jacking type cable sleeve passage construction method is generally applicable to cable pipeline laying projects with ground

Pipe jacking, also known as microtunneling, is a tunneling method used to install underground pipelines with minimal surface

Our pipe jacking solution requires only small entry and exit shafts, dramatically reducing material waste, labor requirements, and post

Pipe jacking is linked in practice with several fields of application: Rock excavation and tunnel construction:

Abstract Pipe Jacking is one of the most popular method to construct new pipelines below the ground surface in the

This study of construction technologies and mechanical effects will help provide theoretical guidance for the

Indicative jacking lengths achievable between shafts for mechanised drives, based on PJA members' experience and lengths being

The purpose of this paper is to provide a thorough review of learnings from instrumented pipe-jacking case studies and

Pipe jacking is a trenchless construction method used to install underground pipelines

Pipe jacking and tunneling applications are suitable in sand, medium to stiff clay and silt with strong cohesion values, dry or

Jacking lengths achievable can be considerably in excess of 1km depending on pipe diameters, ground conditions and excavation

The pipe jacking method, a common trenchless pipeline installation technique, is widely used in urban pipeline

The pipejacking Technique The major applications for pipejacking and microtunnelling include new sewerage and drainage

In several articles, I mentioned optical fibre in the context of substation automation,

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