

Method Statement For Fiber Optic Cable Installation

Method Statement For Fiber Optic Cable Installation Method statement for fiber optic cable installation Fiber optic cable installation is a critical component of modern telecommunications infrastructure, providing high-speed data transmission essential for businesses, residential complexes, and government facilities. A comprehensive method statement ensures that the installation process is carried out efficiently, safely, and in compliance with industry standards. This article provides an in-depth guide on preparing, executing, and managing fiber optic cable installation projects, emphasizing best practices, safety measures, and quality assurance.

Introduction to Fiber Optic Cable Installation Fiber optic technology has revolutionized communication systems by enabling faster, more reliable, and higher-capacity data transfer compared to traditional copper cables. Proper installation of fiber optic cables is vital to maximize performance and longevity. A method statement serves as a detailed blueprint that outlines the procedures, safety protocols, materials, tools, and responsibilities involved in the installation process.

Objectives of the Method Statement The primary goals of a fiber optic cable installation method statement include:

- Ensuring safety for personnel and equipment
- Achieving compliance with industry standards (e.g., IEC, TIA/EIA)
- Guaranteeing the integrity and performance of the installed cables
- Minimizing disruptions to existing systems and surroundings
- Providing a clear framework for project management and quality control

Preparation Phase Site Survey and Planning Before commencing installation, conduct a comprehensive site survey to gather vital information:

- Identify existing infrastructure, obstacles, and potential hazards
- Map out the cable routes, including underground, aerial, or ducted paths
- Determine access points and entry/exit locations
- Assess environmental conditions such as weather, soil type, and vibration sources
- Plan for necessary permits and approvals

Design and Documentation Develop detailed design drawings and documentation covering:

- Cable route plan
- Cable types and specifications
- Termination and splicing points
- Equipment layout and rack locations
- Access points and handholes
- Safety zones and signage

Material and Equipment Procurement Ensure all necessary materials and tools are procured and inspected:

- Fiber optic cables (single-mode or multi-mode)
- Connectors, adapters, and splice enclosures
- Cable trays, conduits, and ducting
- Pulling grips, fish tape, and cable rollers
- Splicing and fusion machines
- Testing equipment such as OTDRs and power meters
- Personal protective equipment (PPE)

Installation Procedures

Preparation of the Route

- Clear the pathway of any obstructions or debris
- Mark the cable route with appropriate signage
- Install protective conduits or ducting if required
- Prepare handholes, manholes, or junction boxes at designated points

Cable Pulling and Laying

1. **Pre-Installation Checks** - Verify cable specifications and documentation - Inspect the cable for damages or defects - Ensure all tools and PPE are ready
2. **Cable Handling** - Handle cables carefully to prevent bending beyond minimum bend radius - Use appropriate lifting equipment and techniques
3. **Pulling Techniques** - Use cable pulling grips and lubricants to reduce friction - Employ cable rollers or pulleys to facilitate smooth pulling - Avoid excessive pulling tension as per manufacturer specifications - Maintain slack at pull points for future maintenance or splicing
4. **Installing in Conduits or Ducts** - Insert cables gently into conduits - Use fish tape or guiding rods to navigate tight bends - Secure cables at designated points to prevent movement

Termination and Splicing

- Prepare fiber ends according to standard procedures, including cleaving and cleaning
- Use precision fusion splicing machines for jointing fibers
- Protect splices with suitable enclosures
- Install connectors at designated points, ensuring proper alignment and cleanliness
- Label all cables and connectors for identification

Protection and Routing

- Secure cables with cable ties or clamps, avoiding excessive compression
- Install protective covers or conduits over vulnerable sections
- Maintain proper bend radius as specified (usually 10 times the cable diameter)
- Ensure cables are routed away from sources of heat, moisture, or mechanical stress

- 3. **Testing and Verification**
- Pre-Testing Checks** - Confirm all splices and connectors are properly installed - Check for physical damages or defects
- Performance Testing** - Use Optical Time Domain Reflectometer (OTDR) to check for faults, losses, and reflectance - Conduct insertion loss tests to verify signal integrity - Measure return loss and continuity - Document all test results for future reference
- Acceptance Criteria** - Loss levels within manufacturer's specified limits - No significant reflections or faults detected - Proper labeling and documentation
- Commissioning and Documentation** - Record all test results and configurations - Update as-built drawings with actual cable routes and installations - Assign identification labels to cables and connectors - Provide training to end-users or maintenance personnel

Safety Measures and Best Practices

Personal Protective Equipment (PPE) - Wear safety helmets, gloves, eye protection, and reflective vests - Use PPE suitable for specific tasks (e.g., eye protection during splicing)

Worksite Safety - Establish safety zones and barriers - Ensure proper signage and lighting - Avoid working in adverse weather conditions - Follow electrical safety protocols when working near power sources

Handling and Storage of Materials - Store fiber optic cables in a clean, dry, and vibration-free environment - Avoid sharp bends, kinks, or crushing during storage - Use proper lifting techniques to prevent damage

Quality Assurance and Control - Conduct regular inspections during installation - Verify adherence to design specifications and standards - Document deviations and corrective actions

- Perform final testing and validation before commissioning
- Maintenance and Future Expansion** - Implement routine inspection schedules - Keep detailed records of installed cables and splices - Plan for future upgrades, ensuring compatibility and scalability - Train maintenance personnel on handling fiber optic systems

Conclusion A well-documented method statement for fiber optic cable installation is fundamental to ensuring a successful project. It promotes safety, quality, and efficiency throughout the installation process. By meticulously planning, executing, testing, and documenting each phase, organizations can achieve reliable, high-performance fiber optic networks that meet current demands and future growth. Adherence to industry standards and best practices also minimizes risks and ensures compliance, ultimately delivering long-term value and service excellence.

Question/Answer What are the key components of a method statement for fiber optic cable installation? A comprehensive method statement for fiber optic cable installation typically includes project scope, materials and tools required, installation procedures, safety precautions, quality control measures, environmental considerations, and inspection and testing protocols. Why is a detailed method statement important for fiber optic cable installation? A detailed method statement ensures the installation is carried out safely, efficiently, and in accordance with standards, minimizing risks, ensuring quality, and providing clear guidance to the installation team. What safety precautions should be included in the fiber optic cable installation method statement? Safety precautions should include proper handling and disposal of fibers, use of personal protective

equipment (PPE), safe working at heights, electrical safety, and measures to prevent damage to existing infrastructure or environment. How does the method statement address handling and storage of fiber optic cables? The method statement outlines procedures for proper handling to avoid bending or stressing fibers, storage conditions to prevent damage, and transportation methods ensuring cable integrity during installation. What testing and quality assurance measures are typically included in the method statement? It includes procedures for optical testing such as OTDR (Optical Time Domain Reflectometer) testing, continuity checks, insertion loss measurements, and documentation to verify cable integrity and performance.

5 How does the method statement ensure minimal disruption during fiber optic cable installation? The method statement details planning, scheduling, and execution strategies such as trenchless methods or phased installation to minimize impact on existing operations and surroundings. What environmental considerations are incorporated into the fiber optic cable installation method statement? Environmental considerations include measures to prevent soil erosion, protect existing vegetation, minimize dust and noise, and properly manage waste and accidental spills during installation.

Method Statement for Fiber Optic Cable Installation

Fiber optic cable installation is a critical process in the deployment of modern telecommunications and data transfer networks. It involves a series of carefully planned and executed steps to ensure that the fiber optic cables are installed efficiently, safely, and in accordance with industry standards. A comprehensive method statement for fiber optic cable installation provides a structured approach to guide the entire process, ensuring quality, safety, and reliability. This document serves as a blueprint for engineers, technicians, and project managers to collaborate effectively, minimizing risks and optimizing performance throughout the project lifecycle.

--- **Introduction to Fiber Optic Cable Installation**

Fiber optic technology has revolutionized telecommunications by enabling high-speed, high-capacity data transmission over long distances with minimal signal loss. Because of its sensitivity and the delicate nature of the glass or plastic fibers, proper installation is paramount. The method statement outlines the procedures, safety measures, tools, and materials required to carry out the installation efficiently. The primary objectives of the method statement are to:

- Ensure compliance with industry standards and specifications.
- Minimize damage to fibers during handling and installation.
- Maintain safety for all personnel involved.
- Optimize the lifespan and performance of the fiber optic network.

--- **Preparation Phase**

Site Survey and Planning

Before commencing installation, a detailed site survey is essential. This includes:

- Mapping the route for cable installation.
- Identifying existing infrastructure, obstacles, and potential hazards.
- Assessing environmental conditions such as temperature, moisture, and vibration.
- Planning access points, handholes, and termination locations.

Key considerations:

- Avoiding areas prone to physical damage or excessive movement.
- Ensuring sufficient space for cable trays and conduits.
- Planning for future expansion or modifications.

Features:

- Enhances efficiency and reduces rework.
- Provides detailed documentation for future maintenance.

Pros/Cons:

- Pros: Prevents unforeseen issues; Method Statement For Fiber Optic Cable Installation 6 saves time and costs.
- Cons: Time-consuming; requires thorough site knowledge.

Material and Equipment Procurement

Ensure all necessary materials and tools are available, including:

- Fiber optic cables (single-mode or multimode).
- Connectors, splice trays, and adapters.
- Conduits, trays, and supports.
- Fusion splicers, cleavers, and testers.
- Personal protective equipment (PPE).

Features:

- Proper procurement reduces delays.
- Quality materials ensure durability and performance.

Pros/Cons:

- Pros: Ensures compatibility; reduces installation errors.
- Cons: Inventory management can be complex.

--- **Installation Procedures**

Routing and Conduit Laying

The initial step involves laying conduits, trays, or ducts along the planned route:

- Confirm route accuracy with site drawings.
- Install conduits in accordance with manufacturer specifications.
- Secure conduits to supports, ensuring no undue stress or bending.
- Use appropriate fittings and junction boxes at transition points.

Features:

- Protects fiber cables from physical damage.
- Facilitates future upgrades or repairs.

Pros/Cons:

- Pros: Provides organized pathways; easy to access fibers.
- Cons: Can be labor-intensive; requires precise alignment.

Pulling Fiber Optic Cables

When pulling cables:

- Use appropriate pulling methods to prevent excessive tension.
- Employ pulling grips and lubricants where necessary.
- Avoid sharp bends; adhere to minimum bend radius specifications.
- Use cable rollers or guides to reduce friction.

Features:

- Maintains cable integrity.
- Prevents microbends and macrobends that impair signal quality.

Pros/Cons:

- Pros: Ensures long-term performance.
- Cons: Mishandling can cause fiber breakage.

Splicing and Termination

Splicing involves joining fiber ends, either through fusion or mechanical methods:

- Prepare fiber ends meticulously, cleaning with proper solvents.
- Use fusion splicing for low-loss, permanent joints.
- Mechanical splicing may be used for temporary or field repairs.
- Install connectors at designated points for easy access.

Features:

- Fusion splicing provides minimal insertion loss.
- Proper termination ensures optimal signal quality.

Pros/Cons:

- Pros: High-quality, low-loss joints; durable.
- Cons: Requires skilled technicians; equipment is costly.

--- **Method Statement For Fiber Optic Cable Installation 7 Testing and Verification**

Optical Power and Loss Testing

After installation:

- Perform Optical Time Domain Reflectometer (OTDR) testing to verify splice quality and identify faults.
- Measure insertion loss and return loss at each connector.
- Ensure the link meets project specifications.

Features:

- Detects issues early.
- Validates installation quality.

Pros/Cons:

- Pros: Ensures network reliability.
- Cons: Requires specialized equipment and expertise.

Certification and Documentation

Complete all necessary documentation:

- Record test results.
- Label fibers and connectors clearly.
- Update as-built drawings.
- Prepare handover documentation for client or maintenance teams.

Features:

- Facilitates future troubleshooting.
- Ensures compliance with standards.

Pros/Cons:

- Pros: Maintains traceability.
- Cons: Time-consuming process.

--- **Safety Considerations**

Safety is paramount in fiber optic installation:

- Wear protective eyewear to prevent eye injury from laser or fiber shards.
- Handle fibers carefully to avoid cuts or splinters.
- Use PPE such as gloves, helmets, and safety boots.
- Ensure proper electrical grounding of equipment.
- Be aware of environmental hazards like electrical hazards or confined spaces.

Features:

- Protects personnel.
- Reduces risk of accidents.

Pros/Cons:

- Pros: Maintains a safe working environment.
- Cons: May slow down operations if over-cautious.

--- **Maintenance and Future Expansion**

Post-installation:

- Schedule regular inspections for physical damage or degradation.
- Clean connectors and splices periodically.
- Plan for future upgrades by leaving slack and accessible pathways.

Features:

- Extends lifespan.
- Simplifies upgrades.

Pros/Cons:

- Pros: Ensures sustained performance.
- Cons: Additional ongoing costs.

--- **Conclusion**

Implementing a method statement for fiber optic cable installation is vital for ensuring a high-quality, reliable, and safe network deployment. By following systematic procedures—from preparation and routing to splicing, testing, and documentation—companies can significantly reduce risks, optimize performance, and facilitate future maintenance. While the process requires meticulous planning and skilled labor, the benefits of a well-executed fiber optic installation—such as high data rates, Method Statement For Fiber Optic Cable Installation 8 minimal signal loss, and long-term durability—far outweigh the initial investment. Emphasizing safety, quality control, and thorough documentation throughout the project guarantees a successful deployment aligned

with industry standards and client expectations. As fiber optic technology continues to evolve, maintaining rigorous standards in installation practices ensures that networks remain robust, scalable, and capable of supporting the data demands of the future. fiber optic installation, installation procedures, safety guidelines, site preparation, equipment setup, cable laying, splicing techniques, testing and inspection, project documentation, quality assurance

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this book provides a step by step discussion through each topic of fiber optics each chapter explores theoretical concepts of principles and then applies them by using experimental cases with numerous illustrations the book works systematically through fiber optic cables advanced fiber optic cables light attenuation in optical components fiber optic cable types and installations fiber optic connectors passive fiber optic devices wavelength division multiplexing optical amplifiers optical receivers opto mechanical switches and optical fiber communications it includes important chapters in fiber optic lighting fiber optics testing and laboratory safety

a special e book edition for network admins and technicians dealing with fiber optics cabling is crucial to network performance and incorrect use of cables can result in outages and constant troubleshooting specific standards and processes must be employed when working with fiber optics this convenient e book comprises part 2 of the popular and fully updated cabling the complete guide to network wiring 5th edition with extensive coverage of fiber optics for large scale communications networks and telecommunications standards you will learn principles and practices essential to successfully installing and maintaining a fiber optic network convenient e book format is accessible on tablets and mobile devices examines the principles of fiber optic transmission optical fiber characteristics and construction and basic principles of light includes coverage of fiber optic cables light sources detectors and receivers passive optical networks components and multiplexers and system design considerations explains splicing connectors safety considerations link cable testing troubleshooting and restoration covers the objectives for popular data cabling installer certification dcic certified fiber optics installer cfoi and fiber optic technician fot exams cabling part 2 fiber optic cabling and components 5th edition has the information you need to master every aspect of setting up and managing a fiber optic network

since the invention of the laser our fascination with the photon has led to one of the most dynamic and rapidly growing fields of technology new advances in fiber optic devices components and materials make it more important than ever to stay current comprising chapters drawn from the author s highly anticipated book photonics principles and practices fiber optics principles and practices offers a detailed and focused treatment for anyone in need of authoritative information on this critical area underlying photonics using a consistent approach the author leads you step by step through each topic each skillfully crafted chapter first explores the theoretical concepts of each topic and then demonstrates how these principles apply to real world applications by guiding you through experimental cases illuminated with numerous illustrations the book works systematically through fiber optic cables advanced fiber optic cables light attenuation in optical components fiber optic cable types and installations fiber optic connectors passive fiber optic devices wavelength division multiplexing optical amplifiers optical receivers opto mechanical switches and optical fiber communications it also includes important chapters in fiber optic lighting fiber optics testing and laboratory safety containing several topics presented for the first time in book form fiber optics principles and practices is simply the most modern detailed and hands on text in the field

for years fiber optics was the future now it s the present and the time has come to act if you want to make a career in this fast growing field the fiber optics installer and technician guide is a comprehensive resource designed to prepare you for the two leading fiber optics certifications fiber optics installer foi and fiber optics technician fot this book s practical objective focused coverage includes the history of fiber optics principles of fiber optic transmission optical fiber characteristics construction and theory safety considerations cables connectors and splicing fiber optic light sources and transmitters fiber optic detectors and receivers passive components and multiplexers fiber optic links testing equipment techniques for testing links and cables troubleshooting and restoration techniques note cd rom dvd and other supplementary materials are not included as part of ebook file

the fiber optic reference guide offers readers a solid understanding of the principles of fiber optic technology especially as it relates to telecommunications from its early days to developing future trends using a minimum of jargon and a wealth of illustrations this book provides the underlying principles of fiber optics as well as essential practical applications the third edition is updated to include expanded sections on light emitters semiconductor optical amplifiers bragg gratings and more systems design considerations fiber optics plays a key role in communications as well as in broadcast and cable systems engineers working with fiber optics as well as newcomers to the industry will find the third edition of this reference guide invaluable it will help the reader develop a solid understanding of the underlying principles of this rapidly changing technology as well as its essential practical applications the text is thoroughly indexed and

illustrated

this book delves into the fascinating world of fiber optic cables the unsung heroes of today's information age it takes you on a comprehensive journey exploring the intricate characteristics of these cables and their transformative role in communication networks particularly within data centers and mobile technologies the book provides a comprehensive exploration of fiber optic cables with a focus on their design operation and impact on communication networks it delves into the fundamental principles of light propagation in optical fibers and covers a range of topics from the physics of light to the advantages of optical fibers in communication networks it also addresses the challenges and opportunities presented by different types of optical fibers and their applications in modern technologies chapter 1 delves into the comprehensive exploration of optical fiber technology it covers the foundational principles of optical fiber structures and light guiding principles the evolution of the technology the superiority of fiber optic communication systems over traditional copper based systems specialty optical fibers and their unique applications and the transformative impact of optical fiber technologies on communication networks chapter 2 delves into the physics of light propagation in optical fibers it explores the concept of light from both wave and ray perspectives gaining a deeper understanding of its behavior the chapter also covers the crucial role of the refractive index and reflection coefficient in guiding light through the fiber core as well as the intricacies of light propagation as it interacts with varying refractive indices within the fiber chapter 3 focuses on the challenges encountered during light propagation in optical fibers it includes a comprehensive examination of the fiber optic cable structure exploring its various components the chapter also explores the intricacies of a fiber optic communication system with a particular focus on the crucial role of total internal reflection in guiding light along the desired path and the concept of attenuation a primary challenge in fiber optic communication and how it affects signal strength chapter 4 takes a closer look at the design protection and environment specific solutions employed in fiber optic cables it offers a scientific exploration of fiber optic cable design analyzing the different components and their contributions to overall functionality the chapter also provides a detailed focus on outdoor cables fiber optic connectors the intricate details of fiber optic connectors highlighting the importance of precision engineering durable materials tools and splicing equipment for fiber optic network installation and maintenance chapter 5 introduces the essential elements of a fiber optic communication system the light sources and detectors the chapter provides a foundational overview of different fiber optic cable categories and dives into the concept of refractive index profiles and its crucial role in determining light propagation characteristics it also explores the underlying principles of light emission the role of energy bands and the fundamental differences between LEDs and lasers as well as an in depth analysis of edge emitting including their quantum efficiency and light generation mechanisms and scientific breakdown of laser diodes and avalanche photodiodes chapter 6 delves into the realm of dense wave division multiplexing DWDM a revolutionary technology that has significantly increased the capacity of fiber optic communication networks the chapter offers a clear introduction to the concept of WDM and its relationship with the structure of optical fibers it also explores various passive and active optical components the science behind active optical components fiber optic transmission systems and microwave over fiber optics links and the key technologies driving DWDM advancements

this publication is directed towards all who deal with design construction and maintenance of fiber optic cable plants furthermore it provides basic information as an introduction to specialized technical literature in order to make it easier to study the many specialized publications the book contains a detailed glossary of technical terms for this edition the section on optical nonlinear effects has been enlarged and information on nonzero dispersion shifted fibers has been added the chapter fiber optic modules and components has been rewritten and considerably enlarged

essential reading for anyone involved in fiber optic cable applications from installation engineers to IT professionals fiber optic cabling is a practical guide to all aspects of designing specifying and installing systems for LANs and other data communications applications the second edition has been completely revised and updated by Barry Elliott taking into account the major developments in LAN and transmission technology over the past 10 years the latest legislation is also dealt with including standards relating to flammability cutting edge topics such as photonic switching wavelength division multiplexing and plastic fiber and their implications for the future are also explored an international perspective of the subject is taken with the author looking at all the practical implementations for fiber optic cabling using American European and international ISO standards Barry Elliott has twenty years experience in the telecommunications business and became one of the first BICSI registered cabling distribution designers in Europe in 1999 he currently specializes in optical fiber and structured cabling with Brand Rex Ltd in 1991 Mike Gilmore established the cabling partnership a leading cabling design consulting and training organization Mike is chairman of the UK BSI Premises Cabling Experts Panels and convenor of the equivalent CENELEC working group Mike also acts as both the technical and standards director of the UK Fibreoptic Industry Association a practical guide to design and installation of fiber optic cabling provides key information on international standards up to date discussion of hot topics in fiber optic cabling MVD and new termination technologies

describes the mechanisms of major components such as fibers cables emission sources detectors modulators repeaters system network designs includes a section on industrial automation process control systems

fiber optics vocabulary development in 1979 the national communications system published technical information bulletin TB 79-1 vocabulary for fiber optics and lightwave communications written by this author based on a draft prepared by this author the national communications system published federal standard FED-STD-1037 glossary of telecommunications terms in 1980 with no fiber optics terms in 1981 the first edition of this dictionary was published under the title fiber optics and lightwave communications standard dictionary in 1982 the then national bureau of standards now the national institute of standards and technology published NBS Handbook 140 optical waveguide communications glossary which was also published by the general services administration as PB82-166257 under the same title also in 1982 dynamic systems inc fiber optic sensor technology handbook co authored and edited by this author with an extensive fiber optic sensors glossary in 1989 the handbook was republished by optical technologies inc it contained the same glossary in 1984 the institute of electrical and electronic engineers published IEEE Standard 812-1984 definitions of terms relating to fiber

optics in 1986 with the assistance of this author the national communications system published fed std 1037a glossary of telecommunications terms with a few fiber optics tenns in 1988 the electronics industries association issued eia 440a fiber optic terminology based primarily on pb82 166257 the international electrotechnical commission then pub lished iec 731 optical communications terms and definitions in 1989 the second edition of this dictionary was published

city of light tells the story of fiber optics tracing its transformation from 19th century parlor trick into the foundation of our global communications network written for a broad audience by a journalist who has covered the field for twenty years the book is a lively account of both the people and the ideas behind this revolutionary technology the basic concept underlying fiber optics was first explored in the 1840s when researchers used jets of water to guide light in laboratory demonstrations the idea caught the public eye decades later when it was used to create stunning illuminated fountains at many of the great victorian exhibitions the modern version of fiber optics using flexible glass fibers to transmit light was discovered independently five times through the first half of the century and one of its first key applications was the endoscope which for the first time allowed physicians to look inside the body without surgery endoscopes became practical in 1956 when a college undergraduate discovered how to make solid glass fibers with a glass cladding with the invention of the laser researchers grew interested in optical communications while bell labs and others tried to send laser beams through the atmosphere or hollow light pipes a small group at standard telecommunication laboratories looked at guiding light by transparent fibers led by charles k kao they proposed the idea of fiber optic communications and demonstrated that contrary to what many researchers thought glass could be made clear enough to transmit light over great distances following these ideas corning glass works developed the first low loss glass fibers in 1970 from this point fiber optic communications developed rapidly the first experimental phone links were tested on live telephone traffic in 1977 and within half a dozen years long distance companies were laying fiber cables for their national backbone systems in 1988 the first transatlantic fiber optic cable connected europe with north america and now fiber optics are the key element in global communications the story continues today as fiber optics spread through the communication grid that connects homes and offices creating huge information pipelines and replacing copper wires the book concludes with a look at some of the exciting potential developments of this technology

fiber optics play a key role in telecommunications as well as broadcast and cable systems engineers working with fiber optics as well as newcomers to the industry will find this comprehensive practical guide extremely useful it will help the reader develop a solid understanding of the underlying principles of the technology as well as essential practical applications it is presented clearly and with a minimum of jargon and the text is thoroughly illustrated and indexed the second edition is updated throughout and features sections on digital video coverage of narrowcasting applications in cable tv and dwdm and the internet it includes new coverage of fiber nonlinearities

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