



EMTELLE

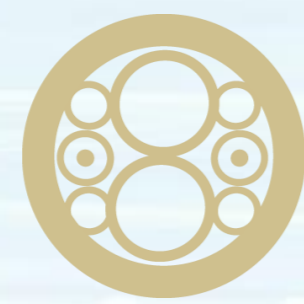


Dr. Hans W. Wilk
Emtelle Europe



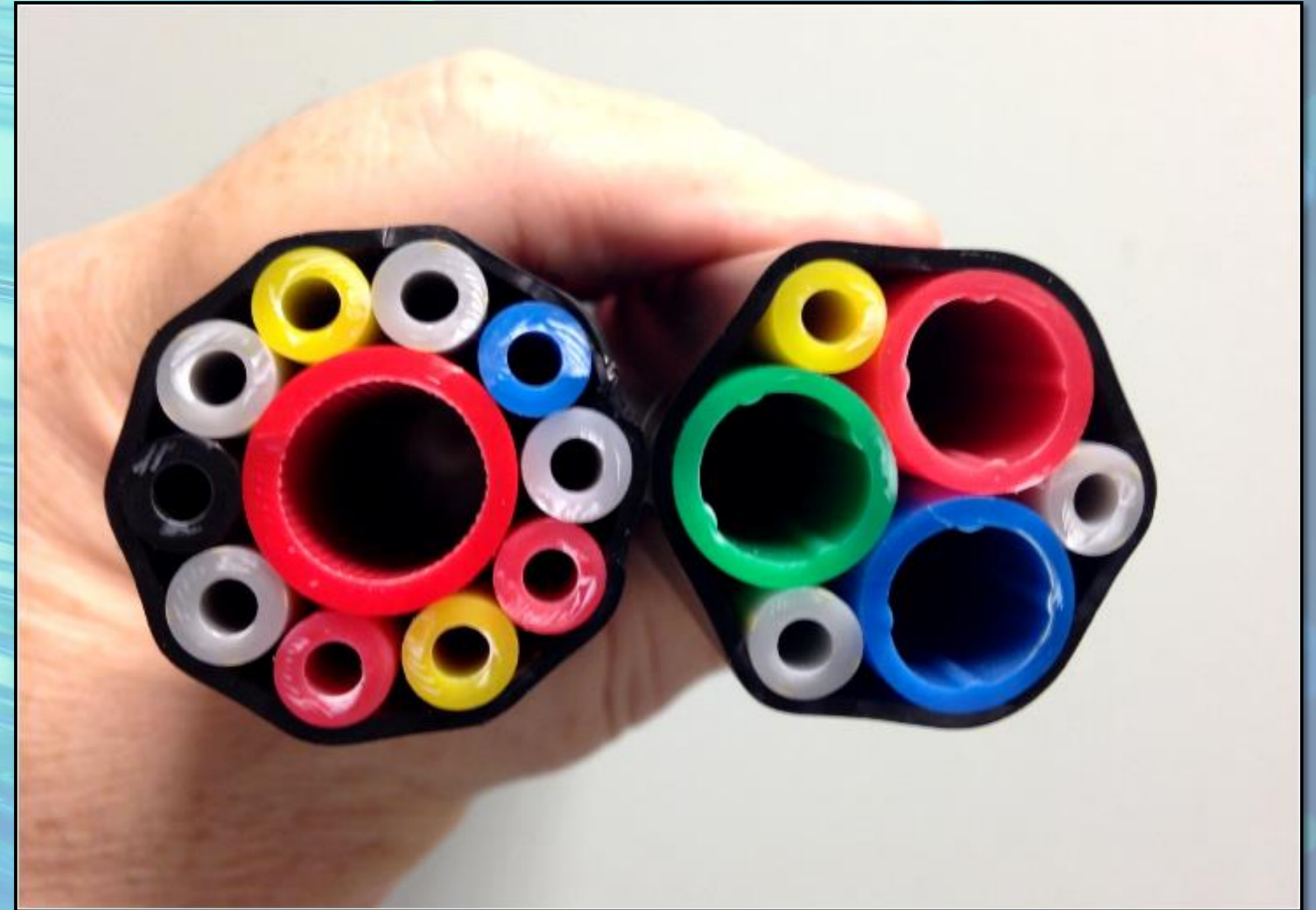
Overcoming the Technical & Cost Challenges of FTTH

ENGAGE. LISTEN. INNOVATE. DELIVER.



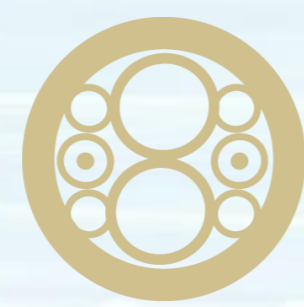
Rule 1 – Maximise the Use of Existing Infrastructure

- Subdivision of Existing Main Duct Network
- Replacement of 40 or 32mm subducts with a tube bundle for New Build
- These products can also be Directly Buried, installed inside another duct or on the side of buildings
- Maximise value from lease of existing space



1 x 16/12 (192f)
10 x 7/4 (12f)

3 x 14/10 (144f)
3 x 7/4 (12f)

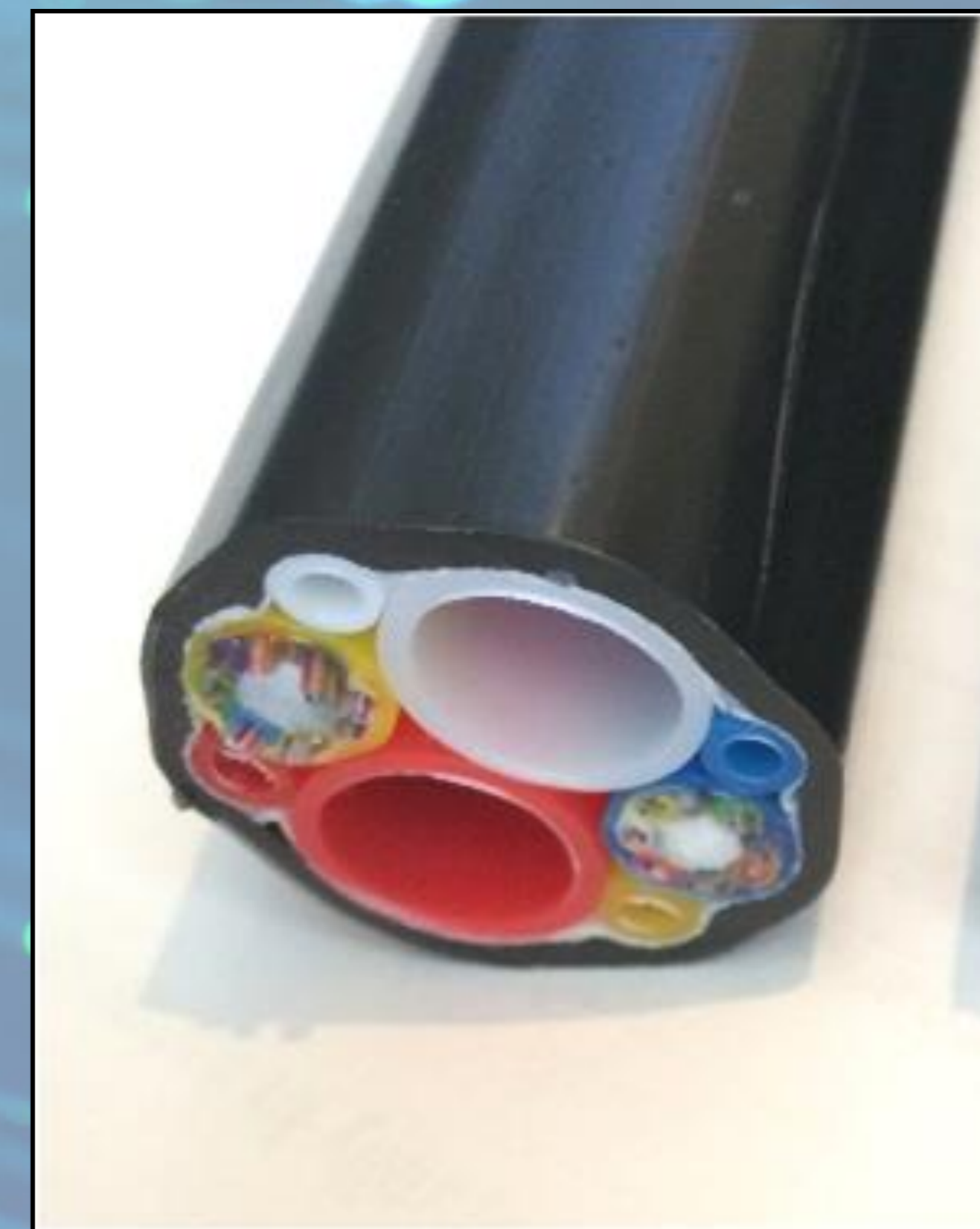


Rule 2 – Eliminate Installation Processes and Costs through Product Design

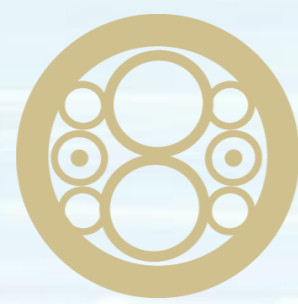
- Subdivision of Existing 40mm cable ducts
- ‘Fusion’ of microduct and fibre optic cable technology in one ‘Cable’
- Elimination of installation processes
- Customer Connection
- Future Proofing



Fibre Cable &
Microduct
Hybrid



2 x 12/10 (144f)
2 x 96f / 144f
4 x 4/2.7 (6f)



Rule 3 – Build Flexibility and Maximise Capability

96f, 48f, Trunk duct and 2 x customer drops in 1 x 40mm

40mm Duct Solution

Fibre-Microduct Fusion

- 240f on Install
- 152f in future

(Metal free)

1x 14/10mm (12-144f)

2 x 4/2.1mm (2 & 4f)

2 x 96F, 1 x 48F

Ø 24.5mm



Rule 4 – Adopt Construction Techniques appropriate to the As-Built Environment



100mm
Narrow
Trenching



75mm
Narrow
Trenching



25mm
Micro
Trenching

Directional
Drilling



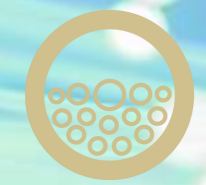
Mole
Ploughing



- Rapid Reinstatement
- Cost effective
- Widely Used

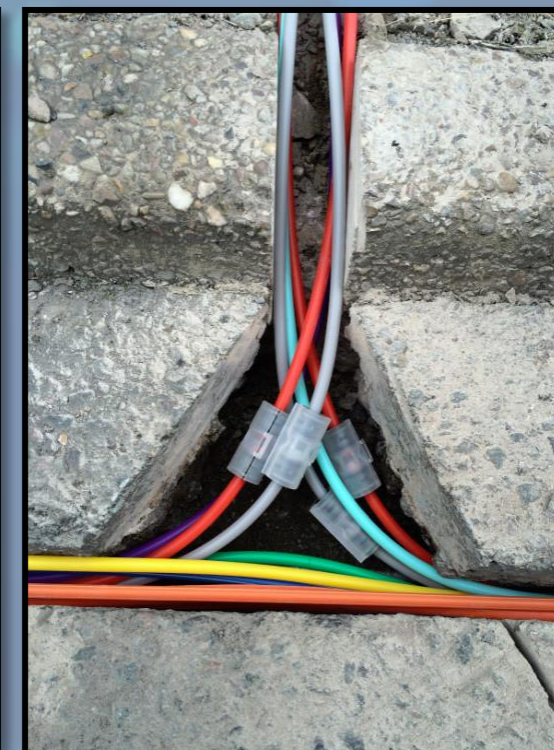
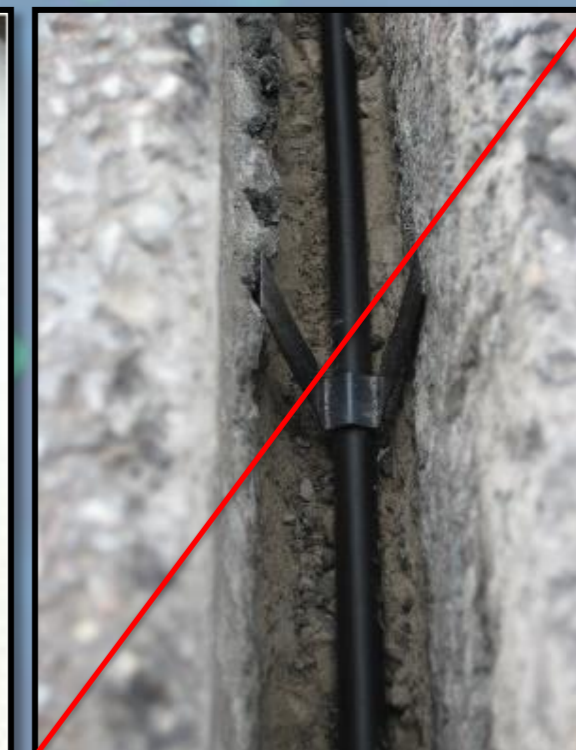
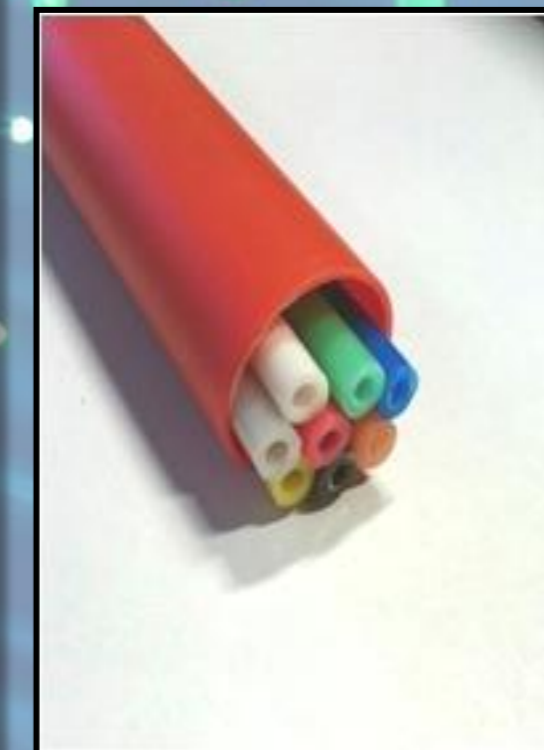
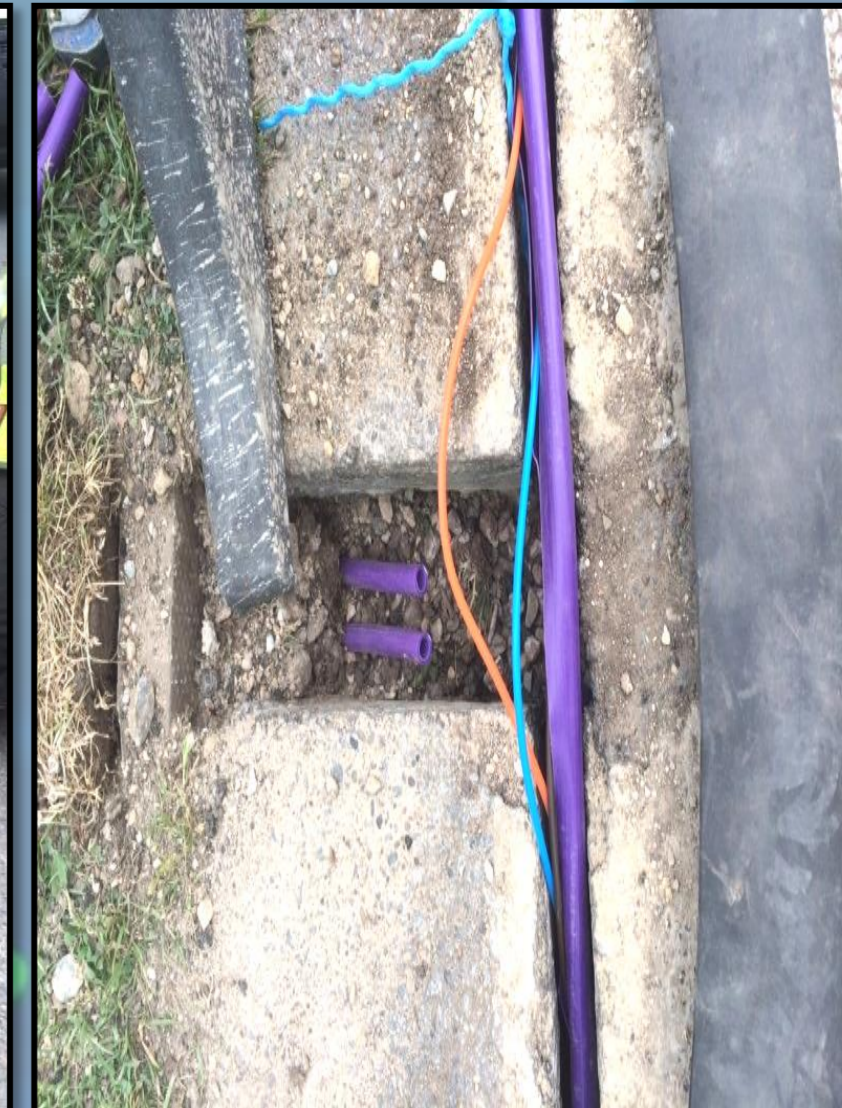
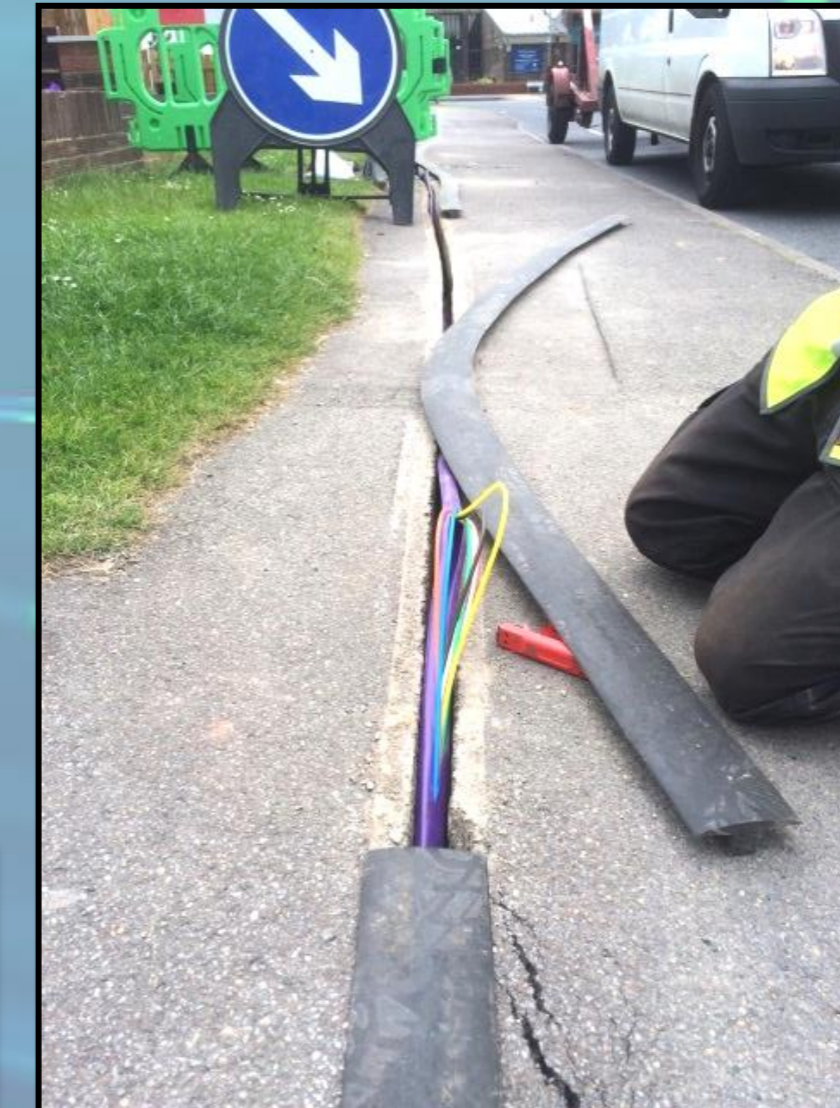
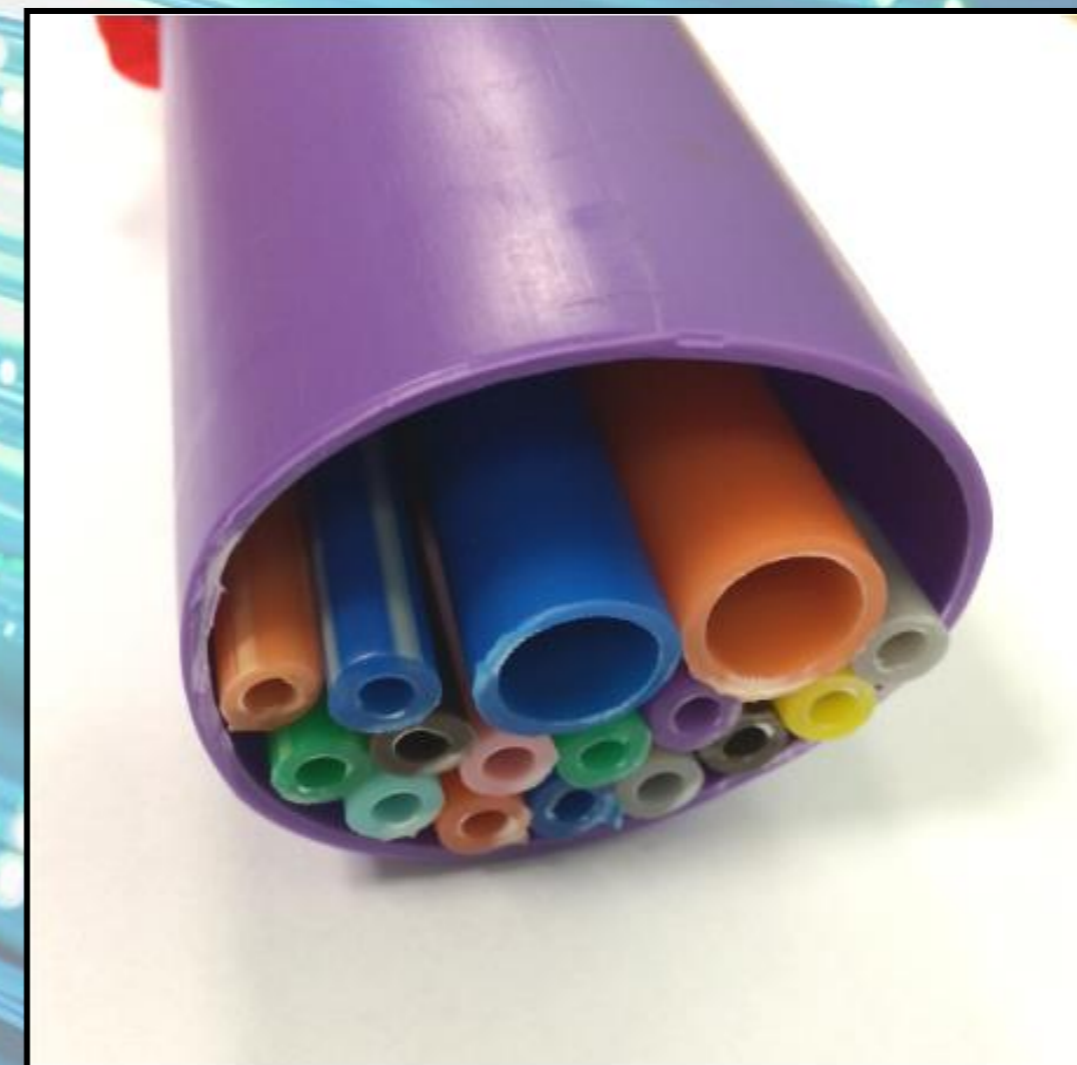


Rule 5 – Optimise Products for Construction Techniques



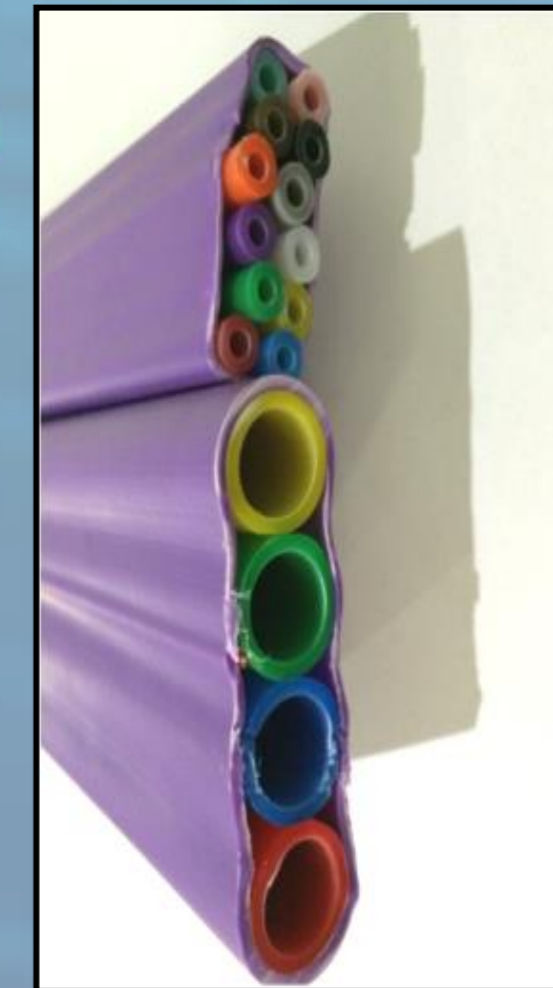
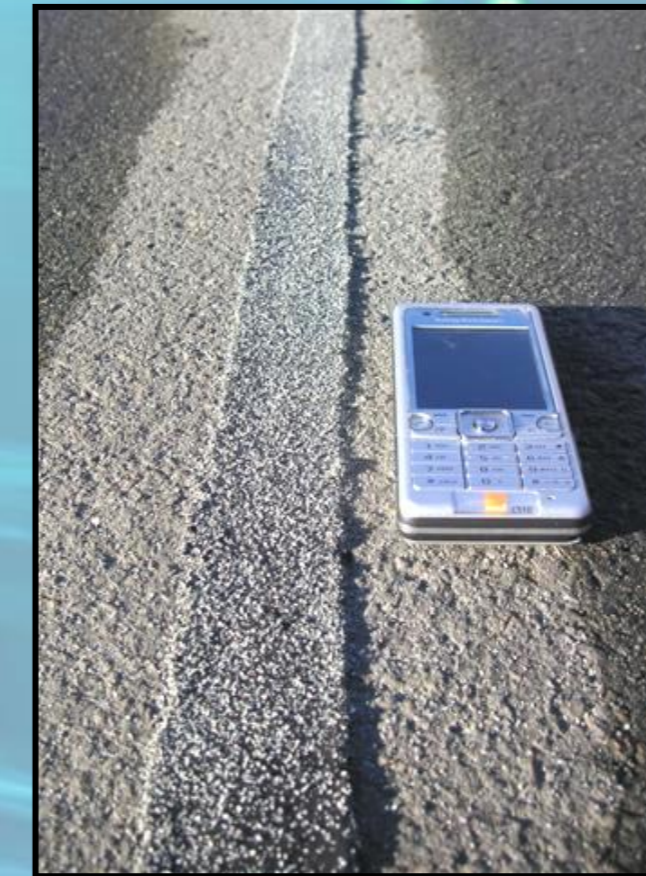
FibreFlowFlexformTM for Narrow Trenching

- Combinations of Microduct Dimensions Not Constrained by Geometry
- It holds itself into position - no clips required
- Very Flexible, small bend radius
- Easy access and identification





Rule 6 – Speed of Deployment



Micro trenching / Narrow trenching

- Country Specific Standards are being written
- Seen as a 'Cost Optimised' solution for Rural and Urban FTTX
- The smallest Micro trench isn't always the cheapest
- Product Choice is 'Key' for Initial demand, Day 2 demand and all future demand. Easy & Fast Maintenance and restoration is essential for a successful network

Rule 7a – Simplify Installation



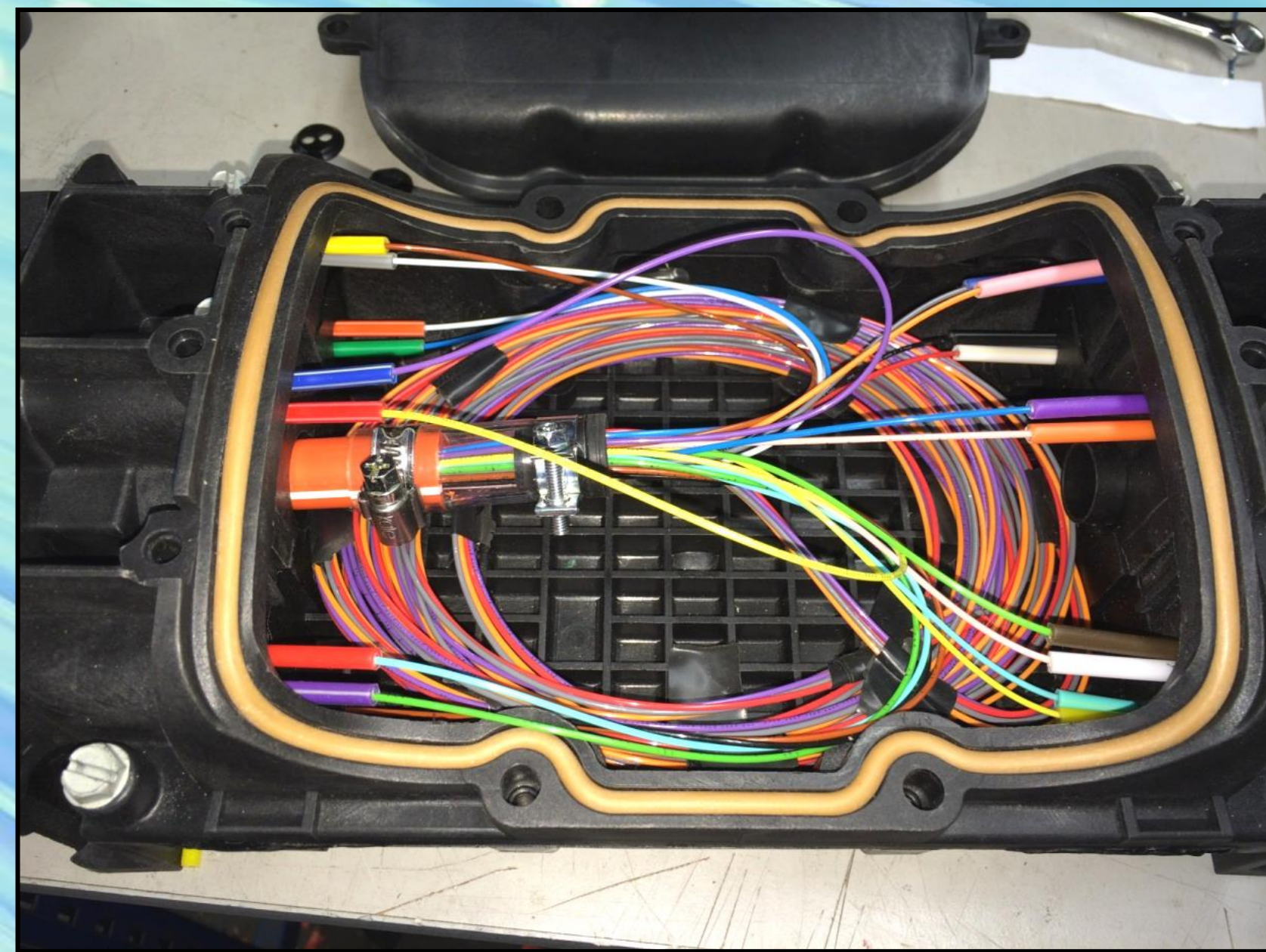
Tube Bundles with 7,12, 19 or 24 x 4/2.1mm Microducts

- 1- 4 Fibres Pre-installed (G652d, G657A1 & G657A2 Fibre)
- Fibre is retracted when a subscriber requires a connection
- Minimal tools – no blowing equipment
- Easy to train installers

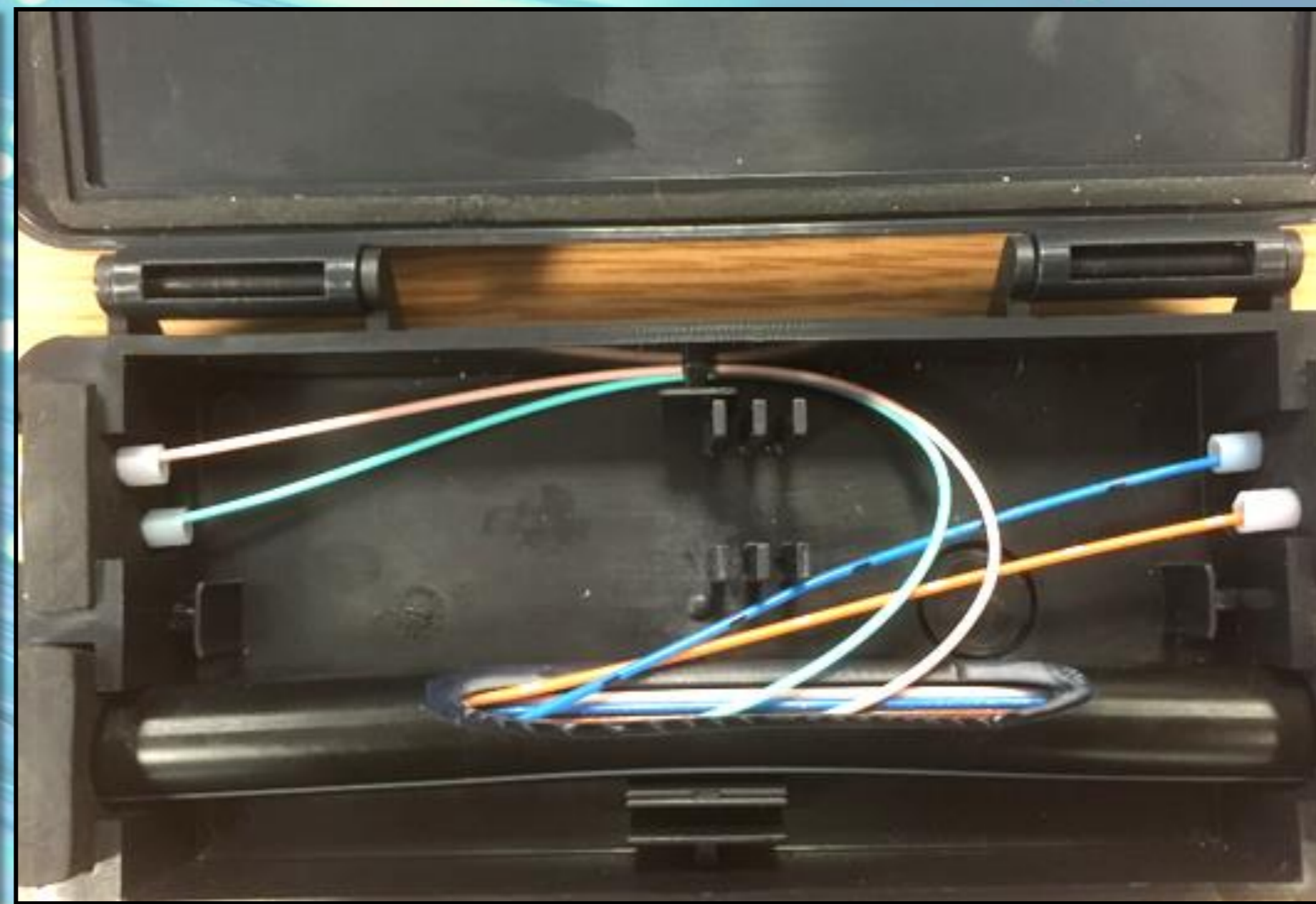
Rule 7b – Simplify Installation

Strong Subduct with loose Tube Fibre Elements Pre- Installed for Retraction

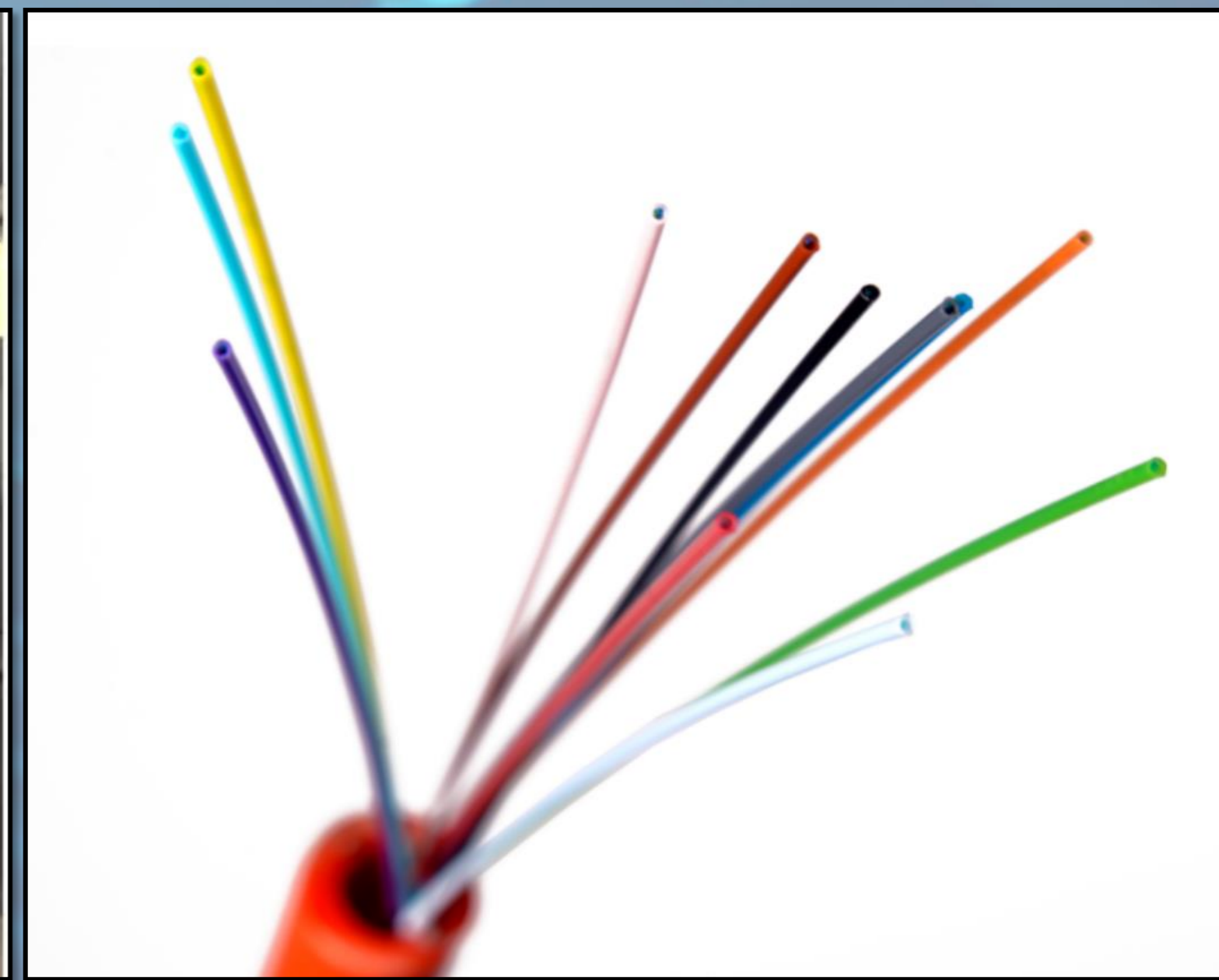
- 8, 15 & 16mm Outside diameters – Internal and External Grade Available
- Pull Out & Push in - Simple



24 way branch



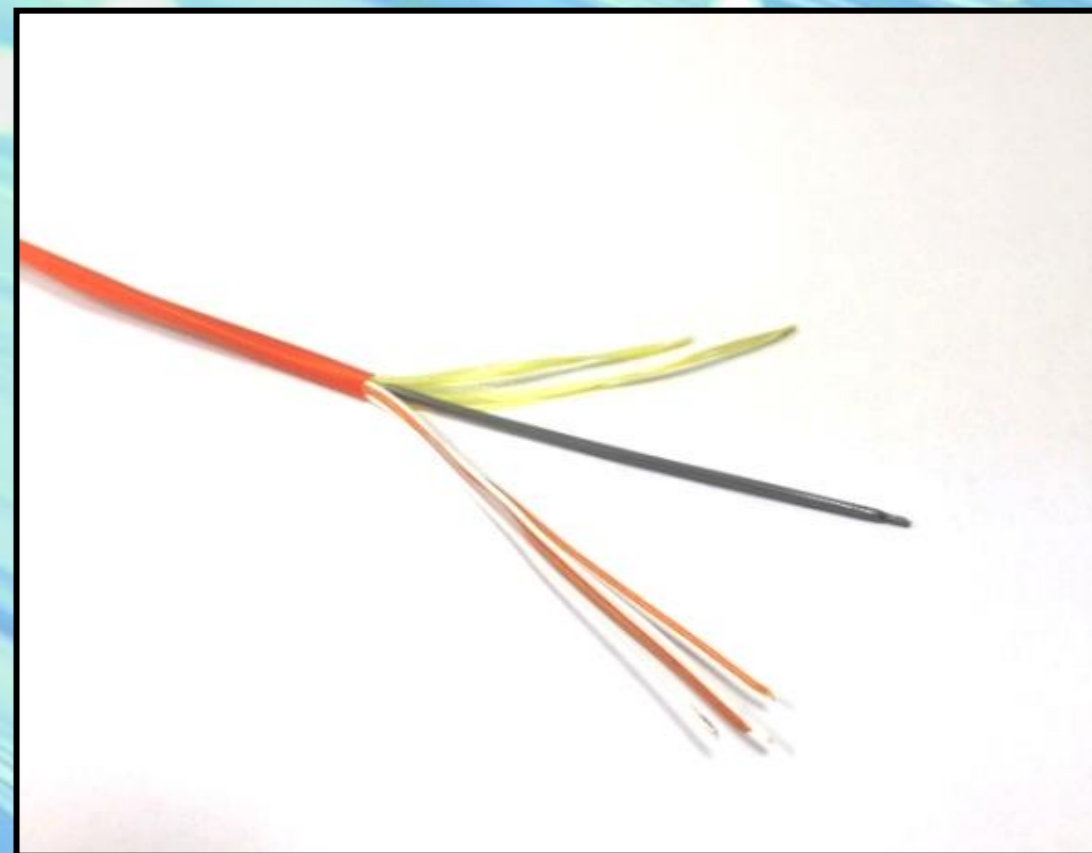
4 way branch



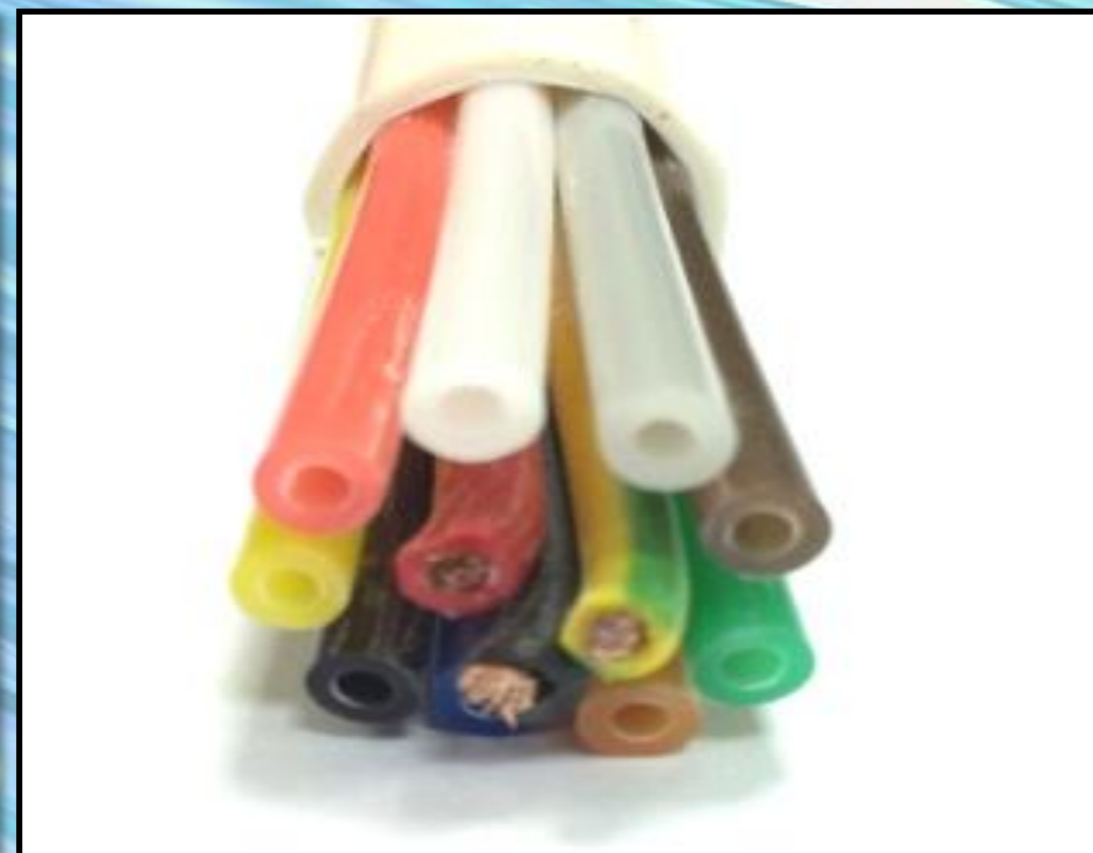
Rule 8 – Flexible Product Design for Drop Ducts

Drop Ducts can have :-

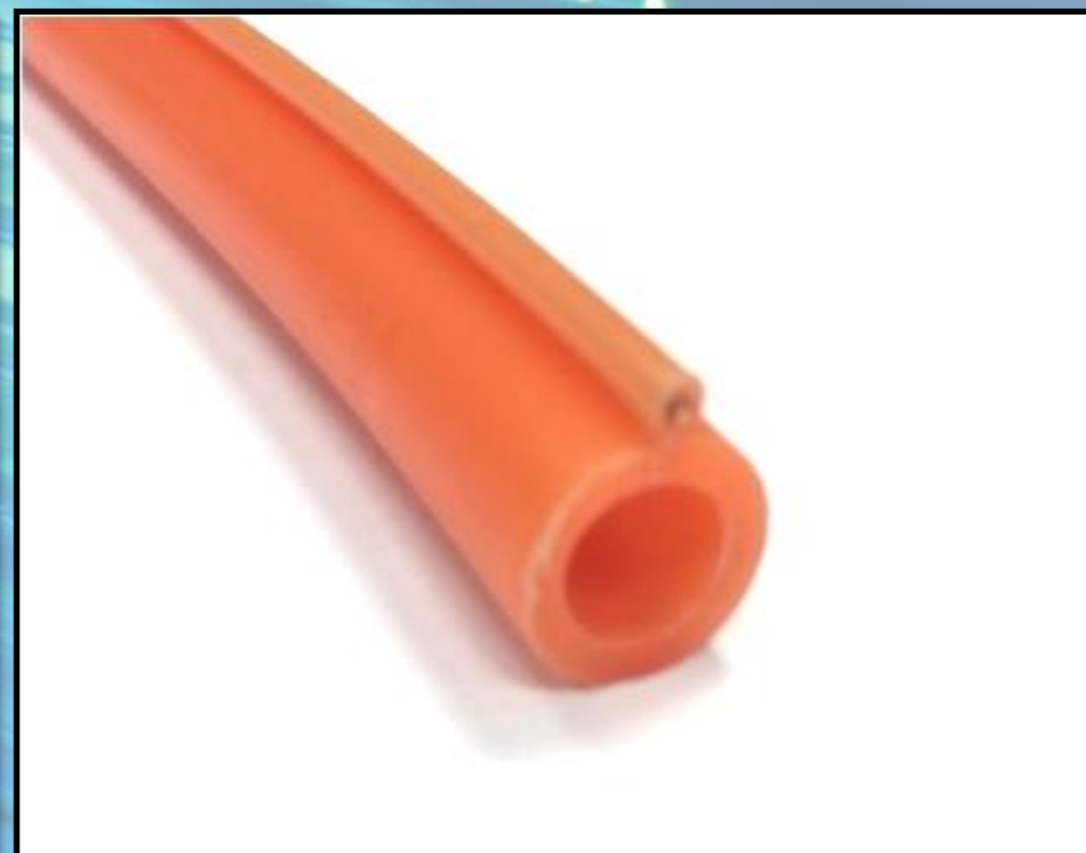
- Copper / Fibre Hybrid (for phone back up)
- Tracer wire (for finding at a later date)
- Power Elements (for Remote Powering)
- Fibre Pre-installed (easy to repair or upgrade)
- Crush Resistant and Rodent Resistant



Hybrid twisted pair /
fiber drop



Hybrid MDU
copper fiber drop



Traceable drop



Pre-installed fiber unit
PIFU

Rule 9 – Protect the Network where it is Most Vulnerable

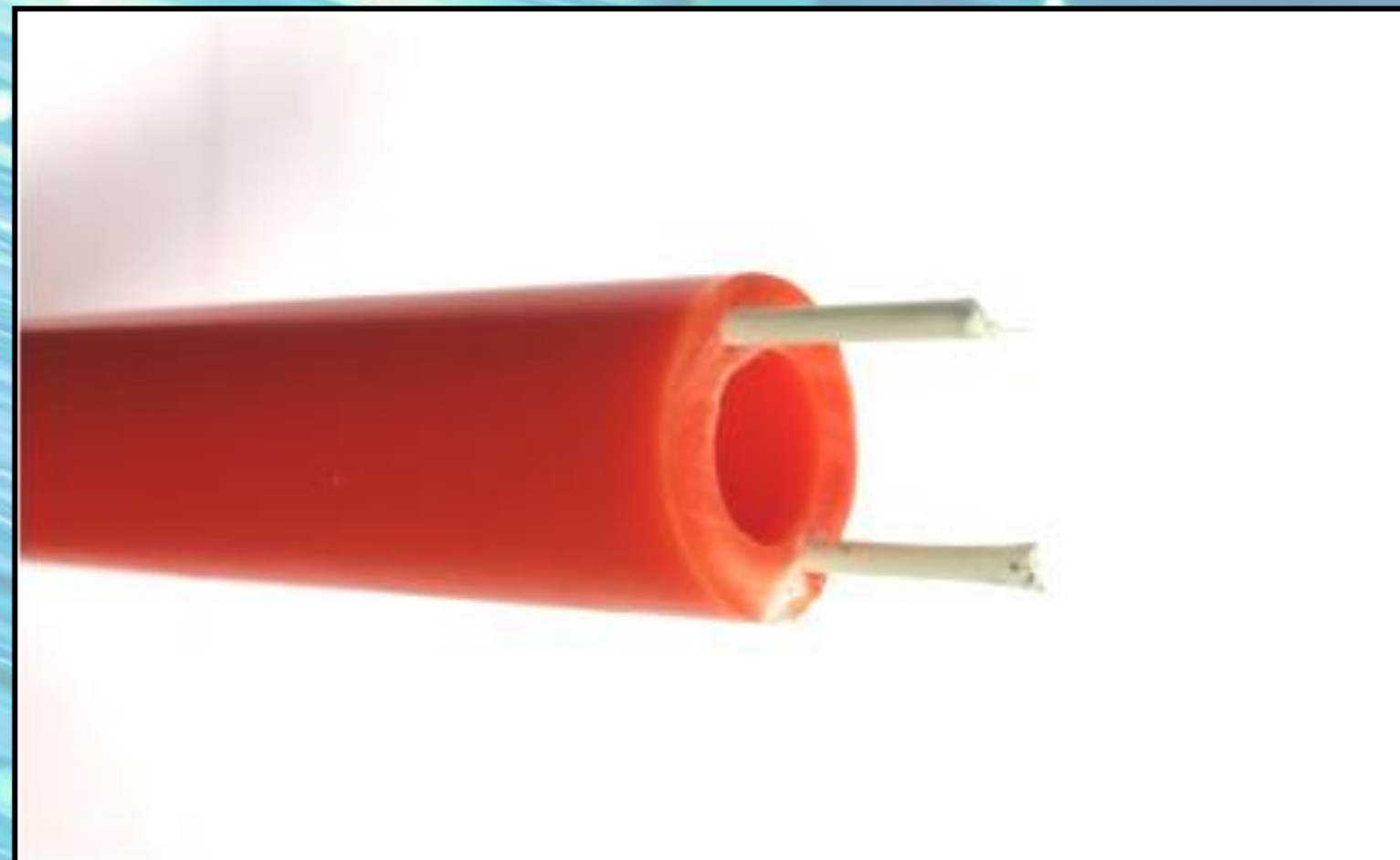
Universal Drop Tube -

The drop on the property is probably the shallowest area for a Telecoms network

7mm x 3.7mm

Can be installed:-

- Direct Burial
- Direct Install
- Overhead
- On Walls
- Spade Resistant
- Temperature Stable - 40° to + 60°

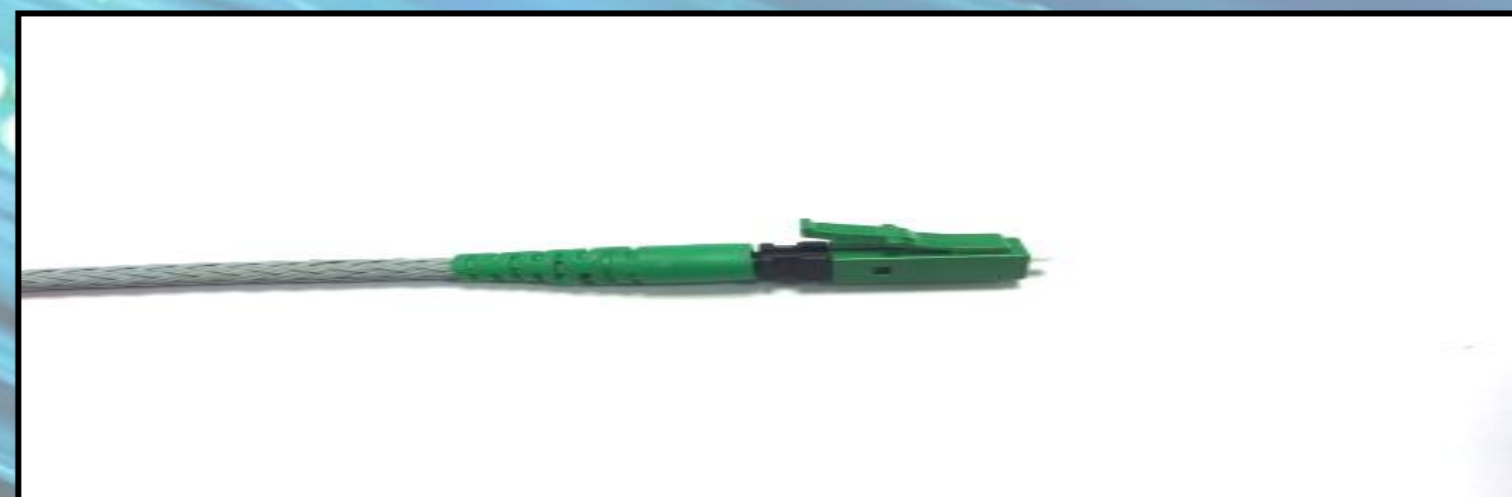


Rule 10 – Make the Customer Link Quick & Easy

Pre-Connectorised, pre-ferruled - Fibre Drop Cable



- Quick & Easy customer connections
- Eliminates the splicing process
- Pre-connectorised at both ends
- Blowable Ferrule, easy to assemble connector
- Minimum Equipment
- Much easier storage of excess cable due to miniaturised system





With

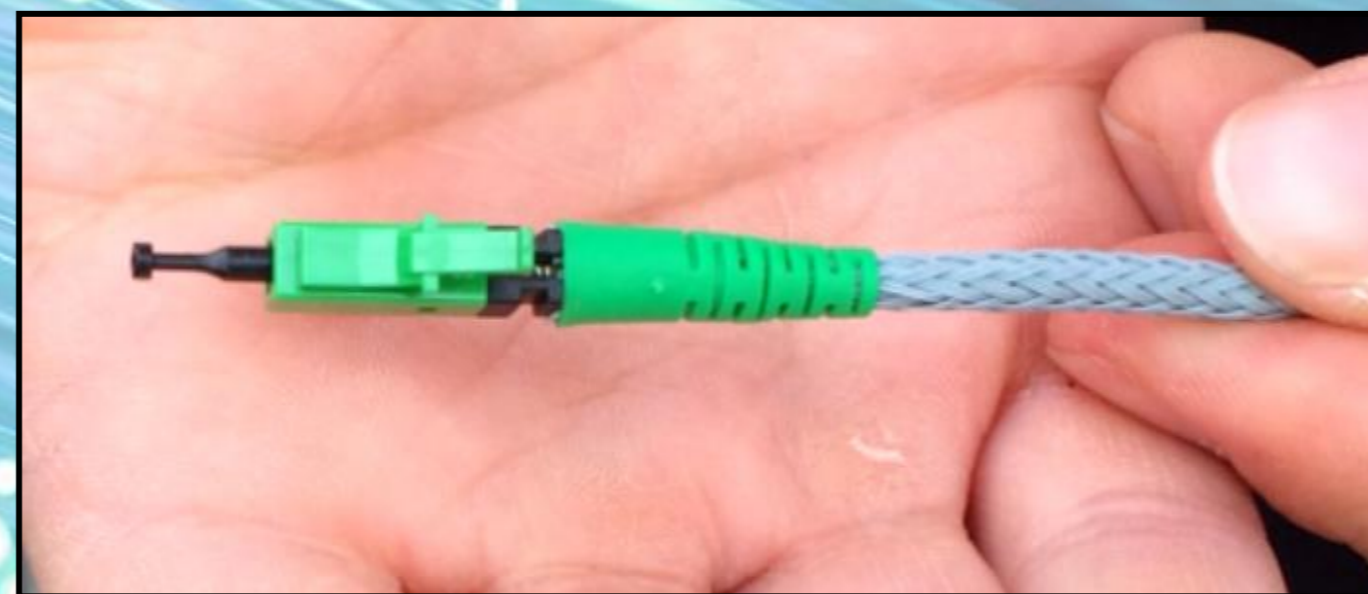
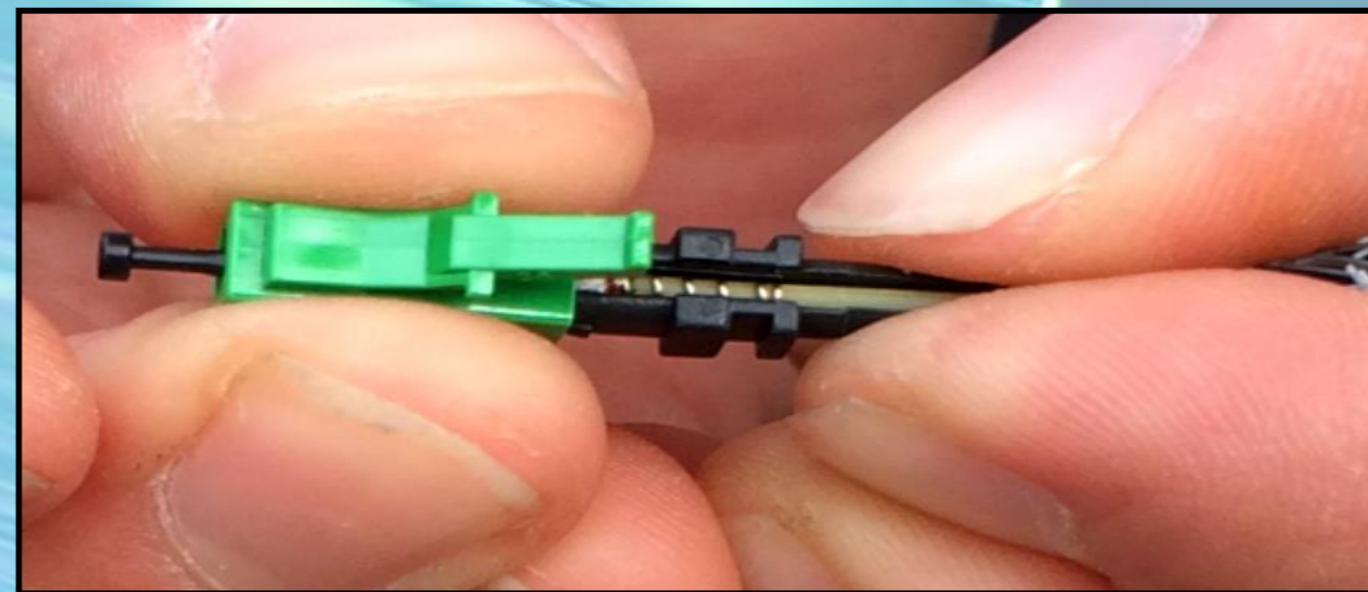


Rule 11 – Buy a Fully Compatible Network System

- Certified and Warranted by the Manufacturer  EMTELLE



QWKdrop Microducts



QWKlink Blowable Ferrule



QWKlink in Cabinet / Closure

ENGAGE. LISTEN. INNOVATE. DELIVER.

Training

Rule 12 – Continuously Train the Planners and Installers



Emtelle fibreFlow™ Installation & Maintenance Training Course

Installation of fibreFlow™ Tube bundles, fibre bundles and use of the Installation Equipment

Learn the key skills and processes involved with installing fibreFlow™ into a network.

Introduction

Duration : 2 days

Objectives

At the end of this programme you will be able to :

- fibreFlow™ Tube bundles - different types of tube bundles and identification of primary tubes
- Handling, deployment and testing of the tube bundles
- Health and safety procedures
- Tube connectors and jointing enclosures
- fibreFlow™ Fibre bundles stripping & handling techniques
- Blowing equipment & operation
- Blowing techniques including point to point blows, centre blowing and onward blowing
- Maintenance of the blowing equipment and changing blowing head to accommodate different fibre sizes
- Choosing maximum blowing distances for certain tube and fibre combinations
- Installation Use of Emtelle approved closures

Trainees

This course is designed for new customers and installers who shall be using fibreFlow™. It is assumed that all delegates will already be competent in conventional fibre cable installations and have a general background on cable installation techniques and fibre cables. Where appropriate, it is assumed that all trainees are knowledgeable in their local rules and regulations which are appropriate when installing fibre optic cabling and ducting including local health and Safety rules

Key Benefits

- Gain accreditation from Emtelle as an 'Emtelle registered Installer'
- Ensure that you know how to do the installation correctly without causing defects in the network
- Practical hands-on training
- Course training manual for reference



Why does it exist?

Emtelle run this training course to enable installers to become familiarised with the use of the fibreFlow™ system before installation begins. This also gives the network owner the assurance that all products shall be installed in the correct manner giving piece of mind. The course can be run for up to 6 delegates over 2 days.

©Emtelle UK Ltd, Haughhead, Hawick, Roxburghshire, Scotland, TD9 8LF - Tel +44 (0)1450 364000 www.emtelle.com



The fibreFlow™ Mini-Cable, Registered Installers Training Manual

Installation of fibreFlow™ Tube bundles, mini-cable and use of the Installation Equipment

Learn the key skills and processes involved with installing fibreFlow™ mini-cable into a network.

Introduction

Duration : 2 days

Objectives

At the end of this programme you will be able to :

- Prepare different fibreFlow™ tube bundles and identification of primary tubes
- Handle, deploy and test tube bundles
- Apply health and safety procedures
- Understand the importance of tensile and thermal tube assembly relaxation
- Use tube connectors and jointing enclosures
- Operate blowing equipment including the fleeting machine
- Understand and apply blowing techniques; including point to point blows, centre blowing and series blowing
- Maintain the blowing equipment and change out blowing head parts to accommodate different mini-cable sizes

Trainees

This course is designed for new customers and installers who shall be using fibreFlow™ mini-cable. It is assumed that all delegates will already be competent in conventional fibre cable installations and have a general background on cable installation techniques and fibre cables. Where appropriate, it is assumed that all trainees are knowledgeable in their local rules and regulations which are appropriate when installing fibre optic cabling and ducting including local health and safety rules

Key Benefits

- Gain accreditation from Emtelle as an 'Emtelle Registered Mini-Cable Installer'
- Know how to install correctly without causing defects in the network
- Practical hands-on training
- Course training manual for reference



Why does it exist?

Emtelle run this training course to enable installers to become familiarised with the use of the fibreFlow™ mini-cable system before installation begins. This also gives the network owner the assurance that all products shall be installed in the correct manner giving piece of mind. The course can be run for up to 6 delegates over two days.



©Emtelle UK Ltd, Haughhead, Hawick, Roxburghshire, Scotland, TD9 8LF - Tel +44 (0)1450 364000 www.emtelle.com



Engage. Listen. Innovate. Deliver.

Our core values, our philosophy, our approach to business, and how we build customer relationship defines who we are as a company. We have an on-going commitment to ensuring we maintain outstanding levels of quality. That we are at the leading edge of our industry, and that customer satisfaction never falls below our high expectations.

ENGAGE. LISTEN. INNOVATE. DELIVER.