

KARONA OVERBLOW SYSTEM

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Prysmian
Group

Introduction

Now more than ever, data transmission is an essential part of modern life, that means it is vital that sound digital infrastructure is in place. Existing networks are already congested with legacy cable, but installing more ducts can be expensive and time consuming. Prysmian developed a solution to this problem offering a new way to install additional amounts of fibre cable using the existing sub-duct network.

Openreach, Britains' digital network business, is benefitting from this system to help install its 'Single Fibre Network' in both major cities and remote rural areas, where installation is usually harder and less efficient. Prysmian developed the Karonna overblow system specifically to allow Openreach to add small diameter cables into a range of low diameter sub-ducts where legacy cables already exist.



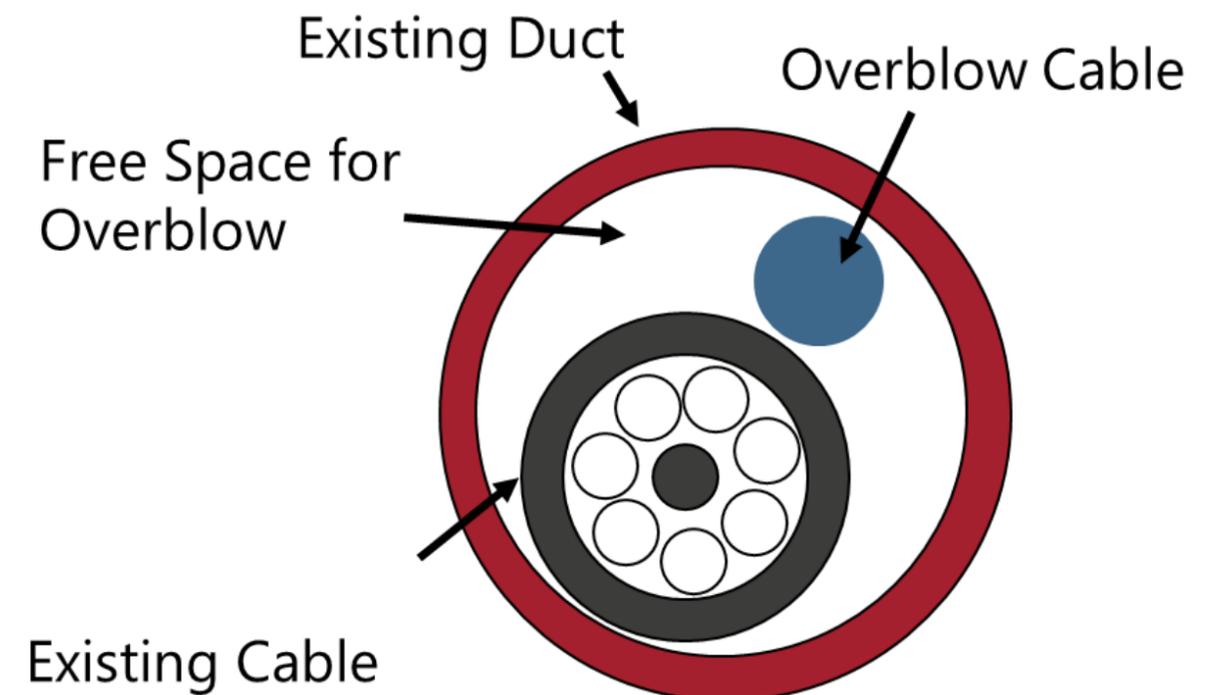
Karona Overblow System

The Karona Overblow System enables the installation of high density optical fibre cable into pre-existing sub-ducted routes already containing existing legacy cable.

The system comprises overblow cables, installation equipment and Connectivity.

This presentation includes:

- Solution Overview
- Case Studies
- Sub-duct configuration and cable selection
- Starter and Consumable Kits
- Training and Complimentary services



Solution Overview



Benefits

The key benefits of the Karon Overblow System compared to conventional cable installation are:

- **Cost:** civil's cost typically make up ~70% of the cost of a new installation; this cost is eliminated
- **Lead Time:** generally there is no need to apply for licences for an installation into an existing sub-duct network
- **Speed:** when building a new duct network a speed of 100m per day is considered fast; overblowing is conducted at 40m/min
- **Environmental Impact:** huge reduction in energy/greenhouse/ozone affects; no waste products created or to be removed
- **End User Satisfaction:** installation speed, significantly reduced lead times as well as eliminated civil work drastically reduces end-user disruption

Karona Overblow System Installation Vs Traditional Cable Installation



Karona Overblow System – Solution Overview

The Karona Overblow System consists of the following 4 elements. Technical Support and Warranty is also offered.



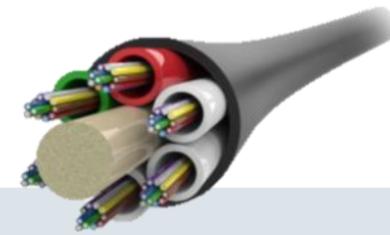
1. Services

Support services including Field Demos, Installer Training, Qualification etc.



2. Starter Kits

Items required for installation teams to undertake Overblowing



3. Overblow Cables

Approved Overblow Cable



4. Consumable Kits

Consumables required for each Overblow installation

Karona Overblow Installation Overview

The following overview describes a Karona Overblow Installation:

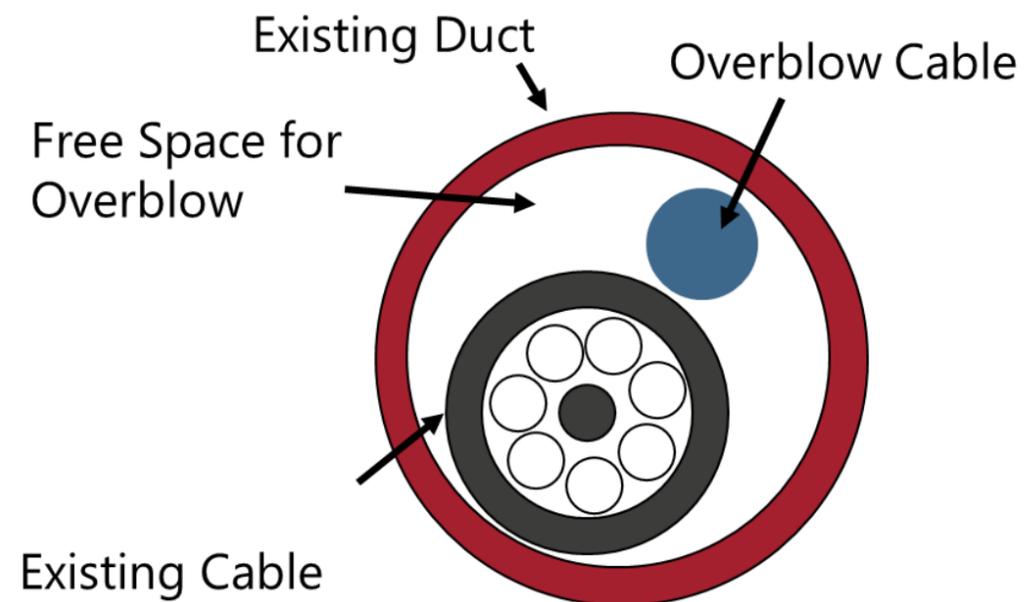
- Approved Installers survey the route.
- Approved Installers arrive on site with Karona installation equipment including:
 - A Karona Overblow Starter Kit
 - A Karona Overblow Consumable kit suitable for the sub-duct
 - Karona Overblow Optical Fibre Cable
- Approved Installers utilise equipment in the Starter Kit to prepare the installation including:
 - Installing the 'Y' Coupler
 - Installing the Deflector at the end of the sub-duct route
 - Installing the Air Guard at the end of the Deflector
- Once the equipment is installed as required, installers then prepare and complete the installation of Overblow cable into the occupied duct.



Karona Overblow Installation Overview

Once the cable is installed:

- The Deflector and Airguard are removed
- The Deflector and Y Connector are replaced with either a Universal Swept 'T' closure or 25mm sealed closure
- Additional Overblow installs can then take place following the same process



Case Studies



Case Studies

1. A.40 Road Crossing Installation (2016)

Installation across major road, approx. 100m route. Minimal traffic management required. Completed in less than 1 hour. cost saving £50k.



2. Quedgley Bridge Crossing Installation (2016)

Installation crossing bridge over major road for new housing development, approx. 100m install. Completed in less than 2 hours. Estimated cost saving £35k.



3. Stoke Lacey Installation (2016)

Overblowing 550m sub-duct route along a minor road. Centre blowing completed due to access, including 1/10 hill climb. Completed in less than 3 hours. Estimated cost saving £25k.



Sub-duct Configuration & Cable Selection



Selecting Approved Overblow Cable Based On Sub-duct Network

Overblow cables are designed and approved for use in the Karona Overblowing System

Cable selection may be based on:

- Sub-duct internal diameter
- Incumbent cable diameter and route conditions
- Fibre count installation requirement
- Connectivity requirements (12/24f per tube designs)

The internal diameter of sub-ducts can be identified by the duct designation as below:

Designation	OD	ID
40mm	40mm	32mm
32mm	32mm	26mm
25mm	25mm	20mm

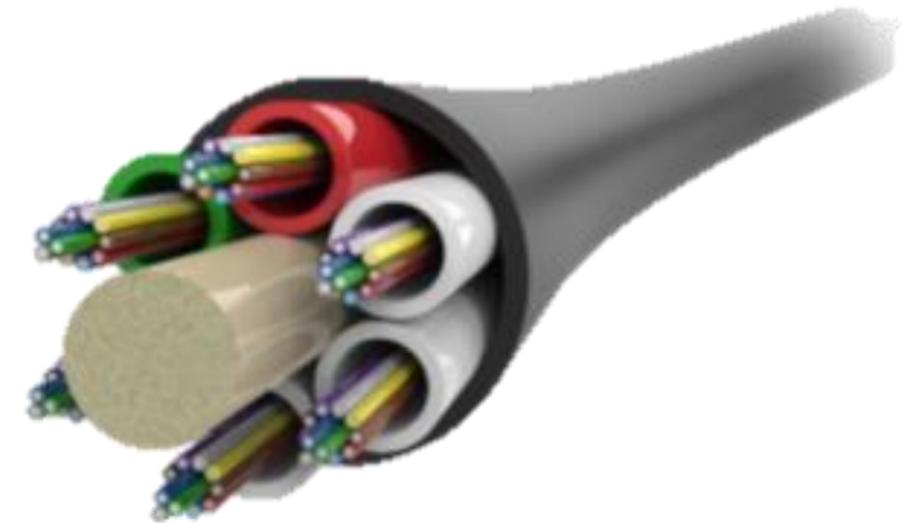
Approved Karona Overblow Cables – NEWT Cable Range 12f And 24f Per Tube, 12 - 432 Fibre Cables

Cables approved for the Karona Overblow systems are designed for installation into occupied sub-duct networks through overblow blowing techniques.

Overblow cables are designed and approved for use in the Karona Overblowing System:

Cable selection is based upon:

- Sub-duct internal diameter
- Incumbent cable diameter and route conditions
- Fibre count installation requirement
 - **12 - 432 fibre per cable available**
 - Multi-cable install available
- Connectivity requirements (12/24f per tube designs)



Cable Selection

Cable selection is based on a number of factors including the sub-duct dimension, the incumbent cable dimension and the fibre requirements.

See the below guide examples of proven network installations based on these factors. In addition 24f per tubes cables are available. Multiple overblow cables can be installed.

Sub-Duct OD (mm)	Incumbent Cable OD (mm)	Cable Maximum Fibre Count (12f per tube) (f)
40	13 - 17	432
40	18 - 19	144
40	20	144
32	13	144
32	14 - 16	144
32	17 - 18	96
32	19	72
25	13	72

Starter Kits



Karona Overblow System – Starter Kits

Starter Kits contain the supplementary equipment required for installation teams to undertake Overblowing.

These items are not consumed during the completion of each installation.

A Starter Kit enables a trained Overblow installation team to conduct the installation of optical fibre cable into an occupied sub-duct network.

The kit contains equipment supplementary to that used in the traditional cable blowing installation practice.



Consumable Kits



Karona Overblow System – Consumable Kits

Consumable Kits contain single use items which are consumed with each Overblow installation.

Consumable kits are utilised by trained Overblow installation teams with every installation of optical fibre cable into an occupied sub-duct network.

They include the necessary equipment to seal the existing and additional sub-ducts required.

Each kit contains single use items for 5 Point to Point installations specific to the sub-duct dimension required.



Training and Complimentary Services



Installer Training

Prysmian Group provide approved installation training for the Karona Overblow System.

Training is designed for experienced installers.

In Summary:

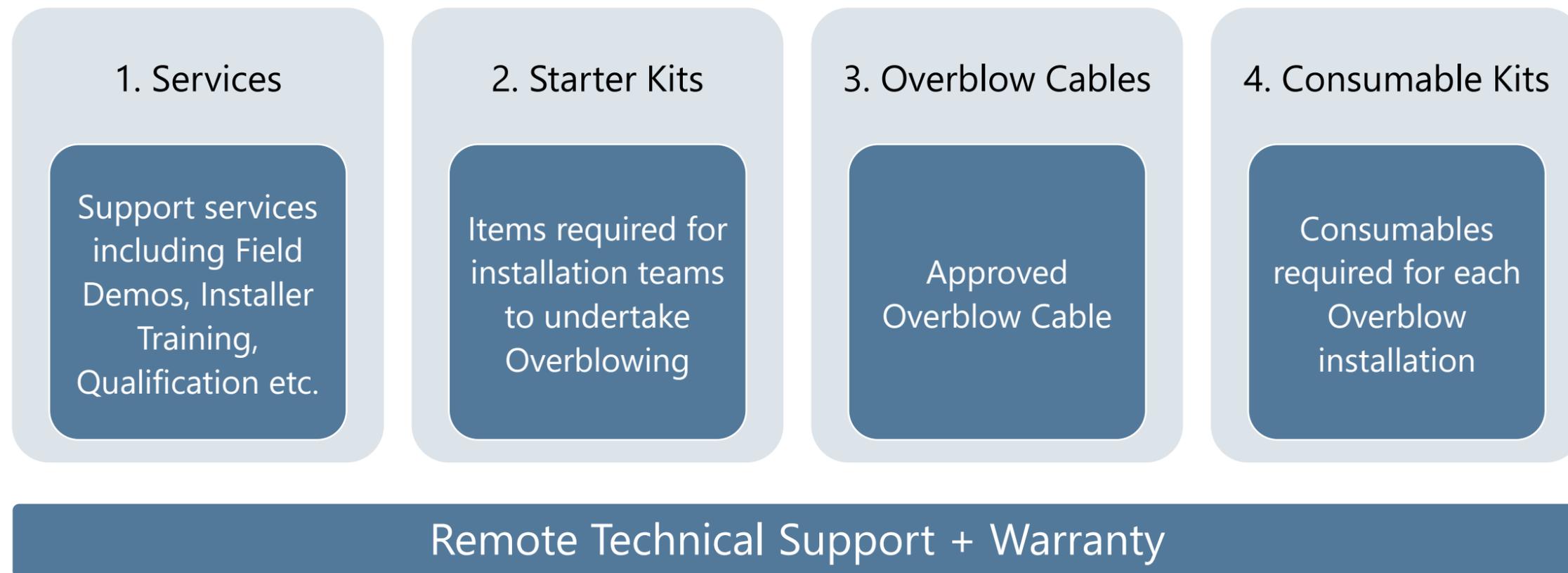
- ✓ 2 day duration
- ✓ Includes basic cable training
- ✓ Includes live installation demonstration and practice
 - ✓ Point to Point Blowing
 - ✓ Centre Blowing
- ✓ Full installation procedures are provided on successful completion



Karona Overblow System – Solution Overview

In addition to the main 4 elements consisting of the Karona Overblow System Prysmian Group can also offer:

- Field demos of the Overblow system
- Supervised Initial Installations
- Approved Connectivity equipment
- Remote Technical Support and Warranty for approved installations



“Superfast, innovative solutions are required in view of the emerging next generation technologies of 5G and future gigabit society, in order to transfer always higher amounts of data simultaneously, even throughout less suitable and less industrialised areas. With this project Prysmian continues to prove that it truly is a global manufacturer that leverages on its worldwide knowledge and capabilities to respond to the always growing technological challenges that its customers are facing.”

Toni Bosch
VP Telecom Solutions at Prysmian Group

“The overblowing technology my team have been using, and worked with Prysmian to develop, saves us time, when waiting for noticing to dig in roads, and money, as it avoids costly civils like clearing duct blockages. It is a great bit of kit which we are rolling out across the UK, in rural and urban settings.”

Andy Whale
Openreach’s Chief Engineer



Thank you

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