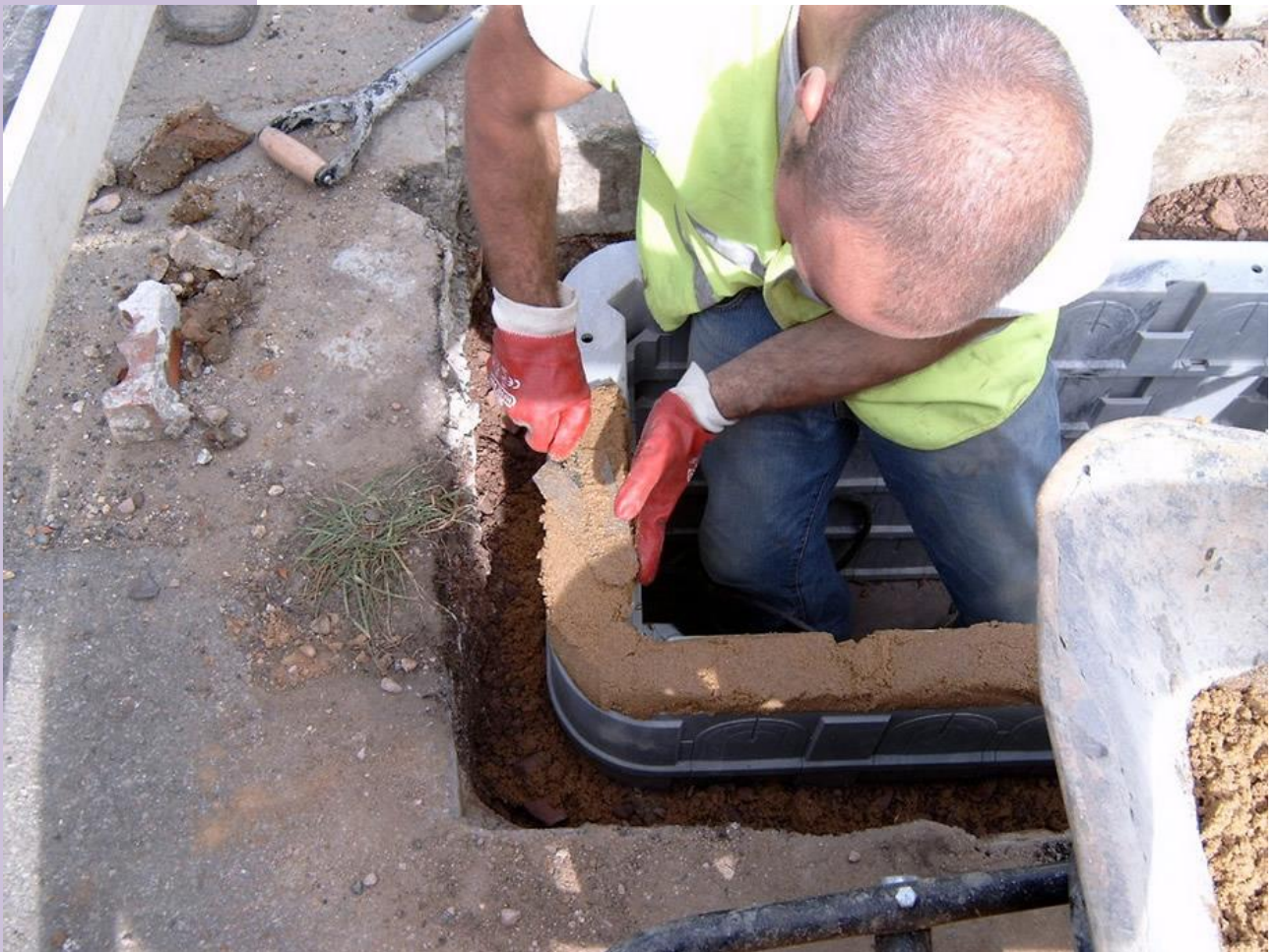


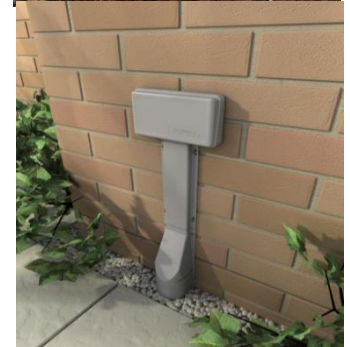
Developers Guide To Telecommunications Infrastructure and Installation

Issue 8



Contents

- 1 Openreach and why we make a good provider**
- 2 Copper and Fibre usage on developments**
- 3 What will we do to assist you with your development?**
 - 3.1 What we need when we contact you
 - 3.2 Local New Sites Representative
 - 3.3 Stores
 - 3.4 Payment policy and Home Builders Federation agreement
- 4 New work affecting existing plant**
- 5 Quality statement**
- 6 New sites offices**
- 6.1 Service distribution point**
- 6.2 Service distribution point specification**
- 7 Next Generation Access For New Build Homes - Guide**
- 8 Lightning Protection**
- 9 Avoiding damage to the Openreach U/G network**
- 10 Contact Information**
- 11 Developer Quality Checklist**
- 12 Labels**
- 13 How It's Done**
 - 1. Duct Laying
 - 2. Duct Sealing
 - 3. Carriageway Chamber Construction
 - 4. Jointing Chamber Construction JBF104
 - 5. Jointing Chamber Construction JBF106
 - 6. Preformed Chamber - Quadbox
 - 7. Frames & Covers
 - 8. Service Pipe Presentation to Property - Copper
 - 9. Service Pipe Presentation to Property - Fibre**
 - 10. General Cabling Information – Copper & Fibre
 - 11. Cabling – Copper
 - 12. Multiple Dwelling Units
 - 13. ONT & BBU Placement Guide
 - 14. Voice & Data Wiring
 - 15. Stores**
 - 16. Useful Contacts
 - 17. Newsites Checklist
 - 18. Developer Quality Checklist
 - 19. FTTP Strategic Newsite - Overview



1. Openreach and why we make a good provider

As a developer, you're at the heart of the projects that are shaping our country, so the decisions you make regarding telecommunications are vital. That's why you should work with us.

With Openreach, you can offer your customers the widest selection of communications providers and services possible. Our network is maintained by more than 21,000 field engineers working nationwide and we are continually investing into bringing superfast broadband to the UK.

But it's not just the quality, reliability, and reach of our network that makes it the obvious choice. There's also our knowledge. We can share our in depth knowledge of the products and services that people will use and an understanding of the wired data network that should be installed during construction. Openreach will assist you in delighting your customers by delivering a home that is ready to receive and consume the growing range of connected services over multiple devices.

As a developer, every decision you make has to be right – or it could mean wasted time and money. We'll guide and support you every step of the way. Together we can plan, design, and build a network that gives your customers access to the very latest services offered by the widest range of communications providers.

2. Copper and Fibre usage on developments

On some sites we use a mixture of copper and fibre to supply the external infrastructure to the properties. Your New Site Representative will confirm the best technology that will be utilised on your development.

For Fibre Only sites we will provide a pure fibre infrastructure, with fibre provided all the way from the exchange to the customer premises

(FTTP). Fibre will be the only communications infrastructure to the site, and will provide all voice and broadband services. Customers will be able to benefit from superfast download and upload speeds. Unpowered optical splitters enable a single fibre to serve up to 32 homes and businesses

The network will be installed and ready to go subject to the customer contacting their Communications Providers to request service.

For Copper only sites, we will provide a standard copper infrastructure which will provide all voice and broadband services. We are also committed to future-proofing our network, so we will provide Fibre tubing to the premises, so that fibre broadband could be provided in the future without the need to conduct major engineering works.

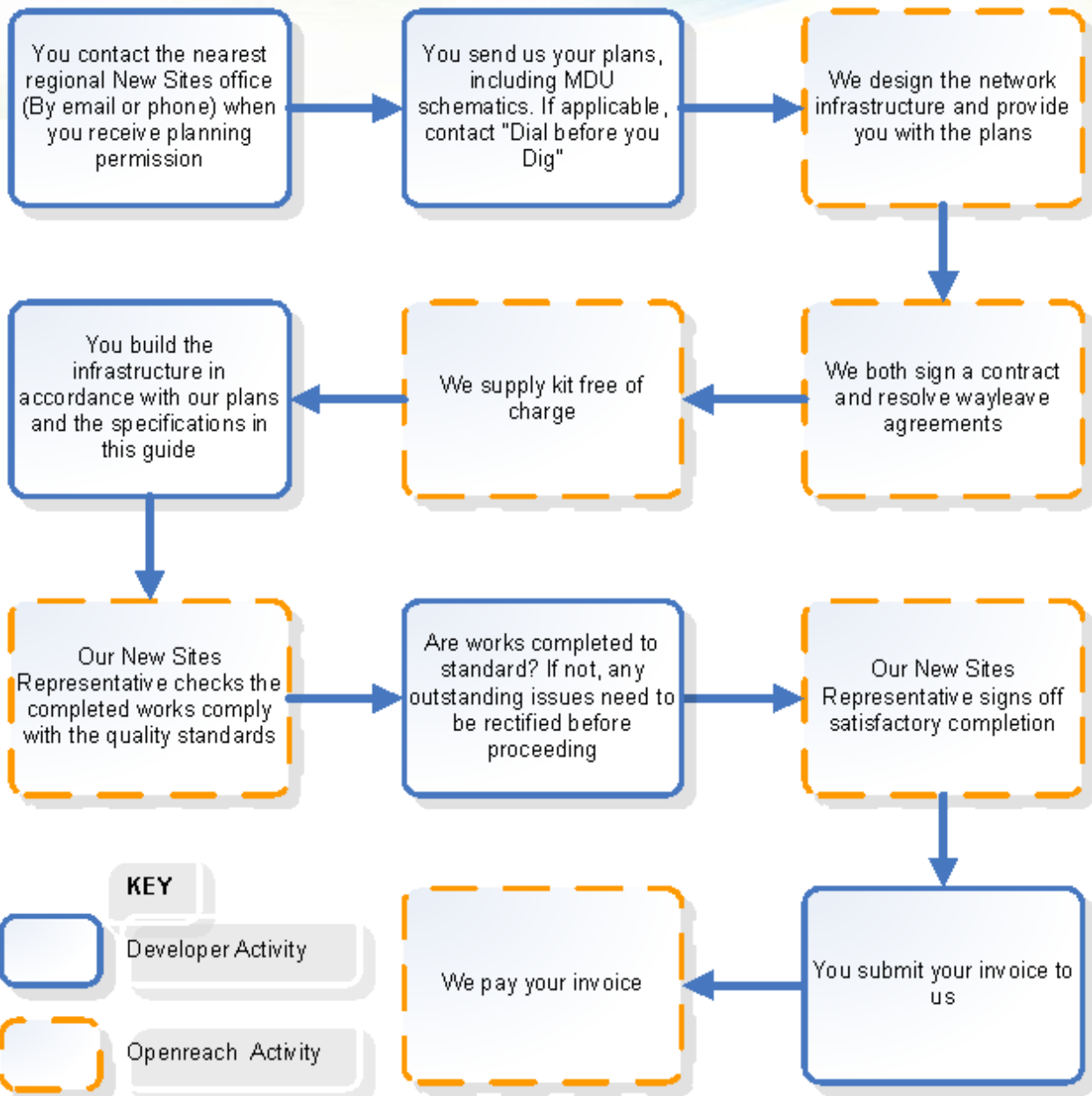
For Fibre and Copper sites we will install a copper and fibre infrastructure so that your customers will be able to receive superfast FTTP broadband. The copper network will be available when your customer moves in. When your customer orders fibre broadband an engineer will visit and connect the home to the fibre infrastructure.

3. What will we do to assist you with your development?

The New Sites team is here to assist you provide a communications network to meet your customers' needs. We can help you at every stage of your development.

It's important that you contact us with your plans as early as possible. Our New Sites Designers (NSD) will design our network infrastructure including duct routes, joint boxes and manholes etc. and provide you with that plan. We also offer you a free service to help you identify our underground network and therefore avoid costly damage.

Simply contact "Dial Before You Dig" by email at dbyd@openreach.co.uk



Process for liaising with Openreach for the planning of telecommunications infrastructure to New Sites

3.1 What we need when you contact us

To make the process as smooth as possible, and allow us to integrate our plans, it is important you contact us as soon as you achieve planning permission.

It would be helpful if you had the following information when you first call:

- Name and location of your development
- Your contact details
- Site Manager contact details.
- Confirmation of planning permission being granted
- Details of your site location with roads and existing buildings.
- Details of your site with Floor plans and plot numbers for all of the properties on the development.
- All drawings are ideally black/white and in PDF format less than 4mb file size
- Proposed site start date and proposed first occupancy date.
- When the first telephone line will be required i.e. lift lines, as these are usually

required quite early in the construction phase.

- Council addressing for the site as soon as it is available to enable us to update our records and improve provision times for our mutual customers.
- A copy of any agreement or licence you have with the local highway authority – e.g. Highways Act 1980 Section 184 or 278 agreements – where your work impacts on the Openreach apparatus in the existing public highway.
- If you are a Utility Group, please provide the name and contact details of the builder.
- All work must be carried out within the requirements of the Health & Safety Work Act 1974 and Management of Health & Safety at Work Regulations 1992 and any other legislation or regulations that affect the task in hand. In particular, your attention is drawn to the Construction Design Management Regulations 1994 and the Construction (Health, Safety and Welfare) Regulations 1996.
- If it is a large development, please include the details such as estimated start date and First occupation Date of each phase, as we will register each phase with its own unique NewSites reference.

3.2 Local NewSites Representative

Openreach NewSites offices are located throughout the United Kingdom. Your New Sites Representative will help guide you through the end to end process – offering friendly advice and an interface between yourself and Openreach.

In the event that you have concerns that are not being addressed by your New Sites Office or New sites Representative, then please contact newsitesesc@openreach.co.uk

3.3 Stores

As part of our service, we will supply all the material items you need to build and install the Openreach network on your site free of charge (excluding modular footway boxes) and arrange to have them delivered direct to your

site.

3.4 Payment Policy and Home Builders Federation agreement

Payment for the construction and installation of the Openreach network on new developments may be made on a per unit basis, at a rate agreed between Openreach and the Home Builders Federation.

More contract information including terms and conditions and payment of invoices can be found on the [Openreach portal > Connecting your development](#)

4. New work affecting existing plant

If your construction work has the potential to affect our plant, if it interfaces with the public highway, or you wish to make alterations which affect our plant within the boundaries of your site, you must inform our “Network Alterations” team.

Either way, after receiving your proposals, we’ll look at our records to assess the possible effects of the work and inform you of the outcome in terms of cost to you (if any) and the precautions that your contractors will need to take.

For a small charge we can supply electronic or paper copies of our plant maps by emailing: stoke.incoming.notices@openreach.co.uk or by calling 0800 169 3849.

You will be informed free of charge if it appears that no chargeable alterations are required, including the necessary precautions that should be taken. If alterations are likely, you will receive written details of the next steps, normally within 20 working days, including any advance payment required. This will enable us to contact you and carry out a more thorough investigation, normally over the next 25 working days, and provide a

specification including a detailed costing.

If preferred for financial purposes, you may initially request a budgetary costing that will not include specific details of the alterations scheme design, but please note this may increase the overall cost of the investigation stages.

Where Openreach consider a detailed investigation is essential to ensure the protection of our network, we will contact you if no response has been received to our initial correspondence, normally within 30 working days. The programme timescales for completion of any physical diversion work can be agreed during the detailed costing stage or later, and will depend on the scale of the works required.

For your information, the costings and associated information our Alterations team provide are based on the principles of The New Roads and Streetworks Act 1991.

Please be aware that Openreach apparatus is afforded legal protection, therefore it is essential you make contact as early as possible so that we can consider all possible alternatives, identify the most cost effective solution and avoid damage that could ultimately affect the people who use our services.

An Openreach NewSites Representative will visit your site and discuss and/or mark existing Openreach plant.

5. Quality Statement

The quality of service we provide to our communication providers depends largely on the reliability of a well-constructed and robust infrastructure. Any non-compliance with the quality requirements must be rectified to a good standard to enable us to provide the quality of services we offer.

If at first fix, the workmanship is of poor quality or during commission it is found that the wiring is faulty or equipment has been damaged, the time and cost incurred correcting this will be at your expense.

Footway and carriageway boxes must be of the required size, shape and construction standard, ducts must be provided at the appropriate entry points into the boxes, tubing needs to be kept clear and internal cabling routed and fixed in a quality fashion.

Your New Sites Representative will conduct regular checks on in progress and completed works. Defects found will be brought to your attention and recorded in a New Site Log to be kept on site. Once the corrective action has been completed or within a timescale agreed to by the developer/site manager and New Sites Representative, a recheck of the work will be carried out.

Many of our quality standards are designed to promote safety, security and reliability in the network therefore it is very important that our quality statements are strictly adhered to.

If in any doubt about any of the required quality standards please contact your local New Sites Representative. They will be happy to provide you with further information on request.

6. Site Offices

If you require construction site office phone lines you'll need to order these through your communications provider as soon as possible. Your communications provider needs to order a ["short duration line for a site office"](#). This is a specific product that will make sure your order follows the right process.

Your communications provider will also ask you for a contact name and number. We want to make sure the right people are talking to each other, so this number should be for someone with the authority to make decisions on the supply of site services when speaking with our survey and planning teams.

6.1 Service Distribution Points

A Service Distribution Point is a cabinet you install and own within which we install our Network Terminating Equipment. It avoids the need to wait for site offices to be located on site (a frequent source of delay) and is a solution that should be considered and agreed at the first site meeting between our New Sites Representative and your representative.

All cabling beyond our Network Terminating Equipment will be yours, although we can offer an end to end service and install cabling beyond the Network Terminating Equipment under time related charges.

It's your choice if you wish to go ahead, but installing an SDP before site offices are in place can really help improve your experience:

- **You're in control** – no more contacting Openreach for line shifts, you can manage them in your time and at your cost
- **Less hassle** – no need to locate and relocate telephone poles across your development
- **Be ready in advance** - provide a suitable/secured SDP in an agreed location and Openreach will connect to it. This can be weeks ahead of your on-site time ensuring your communications are ready to go when you are

6.2. Service Distribution Point Specification

If you choose to install an SDP our NSR will help you agree a suitable location and explain the required specification, but in summary SDP cabinets need to be:

- Robust enough to protect our equipment from damage and lockable
- Suitable for our equipment to be fixed inside easily e.g. screwed onto a wooden back plate
- Large enough to house our equipment:

Your New Sites Representative will confirm the exact specification for your site, but typically this would be 1335mm (H) x 300mm (W) x 200mm (D)

- Fixed rather than mobile
- Not shared with other CPs or other utilities (particularly electricity suppliers)
- Safely accessible by our engineers throughout the life of the build

You can find more information on Site Distribution Points at

http://www.openreach.co.uk/orpg/home/network/downloads/8156_SDP_Leaflet_Web.pdf

7. Next Generation Access For New Build Homes - Guide

There is an industry guideline 'PAS 2016:2010 – next generation access for new build homes guide' produced by BIS and the British Standards Institution (BSI), available at <http://www.culture.gov.uk/publications/7830.aspx> The document advises you how to pre-wire homes to ensure the best end user experience when Superfast Broadband is used.

8. Lightning Protection

Even though this is an uncommon event, some geographic locations are more susceptible to lightning strikes than others. We will, as a matter of course, now check out all new developments whilst in the planning and design stage. If your site is identified as being in an area of higher risk, you may need additional lightning protection and this will be factored in during the build stage of your site.

As a precautionary measure we may ask you to provide an earth wire to the Openreach Main distribution point or run copper tape in the ground to the jointing chambers.

9. Avoiding damage to the Openreach U/G network

Damage to Openreach's network can be expensive for the damager, Openreach and the public/public services. Openreach wants to

work with you to avoid this unnecessary cost, to the benefit of all parties.

Openreach has an extensive underground network that can be located inside and/or on the perimeter of a site. This network is vulnerable to excavation related damage unless appropriate precautions are taken. The precautions for avoiding damage to underground utility plant are contained within the Health & Safety Guide No. 47: 'Avoiding Danger from Underground Services'. This document stresses the need for the availability of utility plans on site and the use of safe digging practices.

To obtain a more precise location of Openreach apparatus (either within your site or on the adjoining ground) and help avoid costly damage, contact:

Dial Before You Dig

Tel: 0800 023 2023

Email: dbyd@openreach.co.uk

Damage to Openreach's network can be expensive with regard to:

- Direct Cost - the cost of repair.
- Operational Cost - delays associated with repair.
- Social Cost - the off-site effects i.e. loss of service to emergency services/centres or the vulnerable in society.

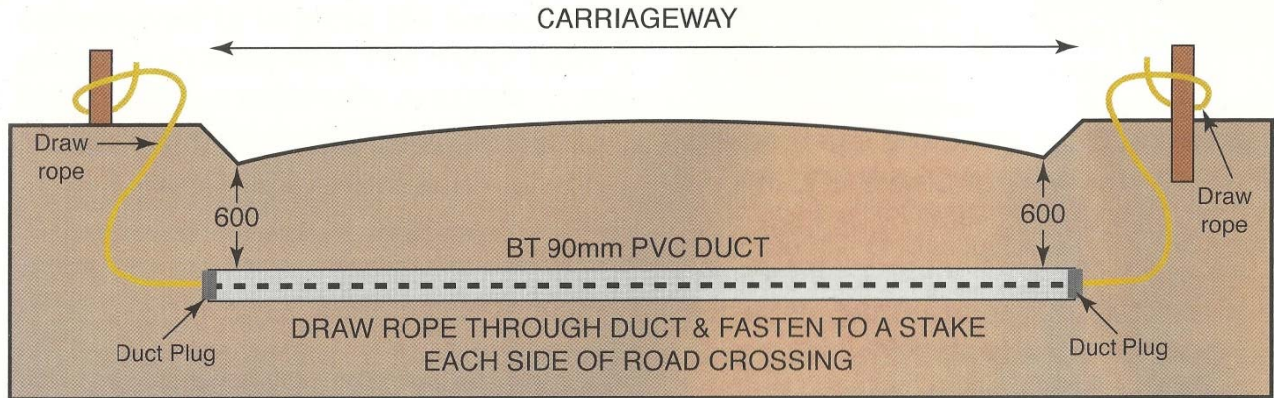
Everyone wishes to avoid these “unnecessary costs”.

Utilisation of Openreach's “Dial Before You Dig” service has a proven record of minimising the potential for damage/cost. Please note:

This is a FREE service.

Duct Laying

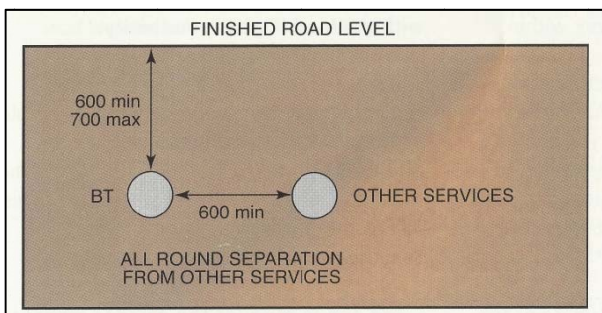
Carriageway Road Crossings



Where our duct crosses a carriageway, adjoining kerbs must be temporarily marked to note positions.

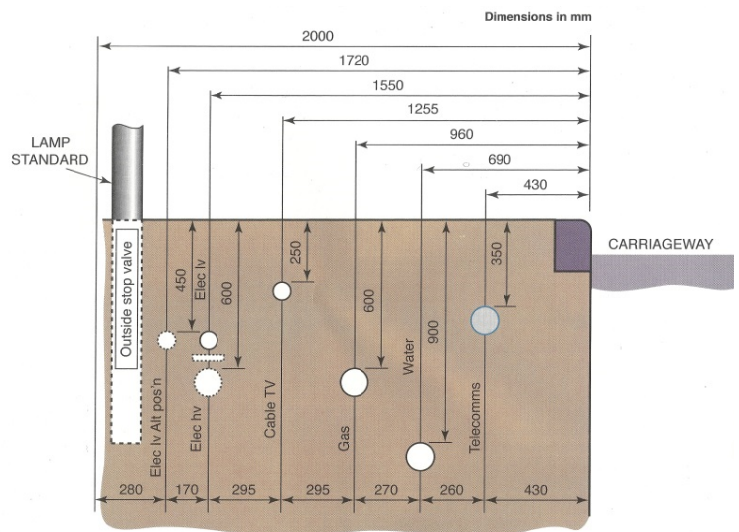
Openreach duct should be laid on an **outer edge of the service trench**, to enable box building. A draw rope should be inserted through the duct and secured to the marker posts at both ends of the crossing. The appropriate **plug – 4B socket end and 4C spigot**

Duct laid beneath a carriageway crossing must be **600mm depth** from the cover of the final surface levels and, for engineering reasons (**NJUG7**), separated from other services **laid in parallel by 600mm** (to permit us to install underground joint boxes without the need for bends). **150mm** of separation is permissible, if the duct is laid at right angles.



Cable marker No. 2 is required at the site entrance/boundary, to ensure link up identification for our contractors.

The latest information on the positioning of Utilities, Mains and Plant can be obtained from the **National Joint Utilities Group**,



<http://www.njug.org.uk/>

Ducting to the Building

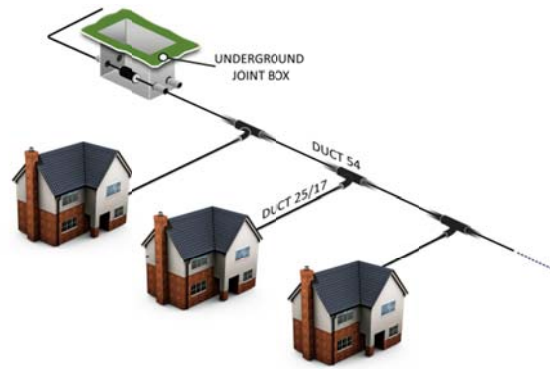
Duct to the premises/building must be laid at a minimum depth of 350mm; 450mm under a soft surface, and be as straight as possible.

Service pipe information

The options of service pipe ducting are in the table shown below:

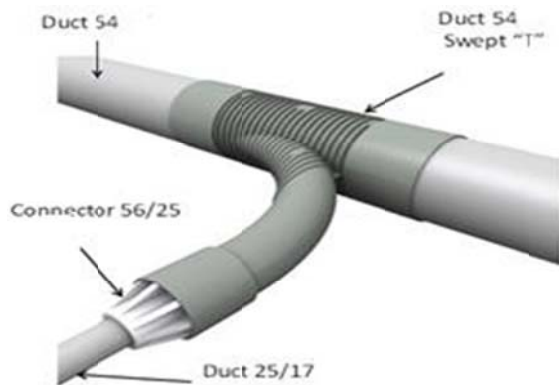
Duct 25/17 = 25mm, Duct 54 = 90mm,
Duct 56 = 50mm

Type of Unit	Copper	Copper & Fibre	Fibre Only
House	Duct 56	Duct 56	Duct25/17
Small apartment block	Duct 56		
Large apartment block	Duct 54 or multiples thereof		



Swept "T" Connection

Drop Duct 25/17 is connected to a Duct 54/56 Swept Tee Connection using a Connector Duct 56/25. The Duct 25/17 minimum bending radius is 450 mm.



Ducting General Principles

- All runs should be laid as straight as possible. If needed, you can carefully bend the ducts or use pre-formed bends supplied by Openreach..
- There should be no more than one pre-formed 90° bend in any single run of duct.
- Pre-formed 90° bends should not be installed in any duct linking two joint boxes.
- Footpath or service strip ducting must be laid at 350mm depth of cover and 450mm depth of cover within premises.
- All space alongside the duct must be backfilled with granular fill to a minimum thickness of 75mm.
- All ducts must be provided with a draw rope after installation, unless it's agreed locally to substitute the draw rope for a lead-in cable.
- Please notify your New Sites Representative when the duct has been laid and is ready for inspection.

Fibre and Copper sites

For sites with fibre and copper service you **must** install a single fibre tube next to the draw rope on each plot, running it from the agreed joint box to the agreed position at the premises.

The fibre tubing will be 2.7/6mm, Blown Fibre Tubing (BFT):


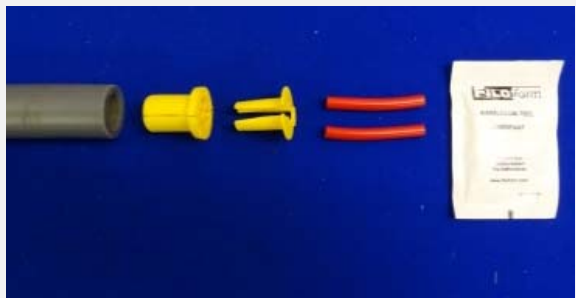


- At the building entry point leave a 2m tail.
- A 3m tail is required at the first jointing chamber.
- Both ends of tubing must be sealed to prevent water and debris entering during and after installation.
- The position of the back box for the internal Customer Splice Point (CSP) should be as close as possible to the point of entry.
- Tubing must be labelled and tied securely in the joint box.
- Draw in tubing in underground duct using a 7mm diameter hand cabling rod, using a 6mm coupling; install the tubing at hand tension only.
- The minimum bend radius for the tubing is 72mm.
- The maximum distance the external tube can be installed into the building is 2m.
- If the distance from the point of entry is greater than 2m then the tube needs to be connected to an internal single 2.7/6mm 'Reduced Fire Hazard' tubing. (RFH)
- RFH must only be installed within the fabric of a building. This type of tubing is unsuitable for installation in an external environment. It should be fixed to walls, surface mounted, using white 6mm cleats at a distance of 400mm on the horizontal & 300mm on the vertical.
- Approved tubing caps will be supplied free of charge by Openreach.

Duct Sealing

It is your responsibility, as the developer, to ensure that the duct is sealed at the premises. It is **imperative** duct sealing be completed to a good standard to prevent the ingress/egress of hazardous gases or water from leaking into internal structures. If tests are positive or you suspect gas at any time, **stop** and follow all the necessary site safety reporting protocols. Record the information in the site log and notify your NSR at your earliest opportunity so that the integrity of the gas seals can be checked and replaced where necessary. The table below details how to seal ducts:

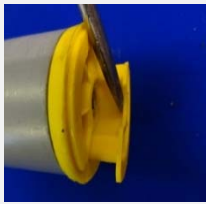
Application	Seal Type	Degree of sealing
Duct 54D whilst laying	Plug Duct 4B, socket end or 4C, spigot end	ingress of foreign matter
Duct 54D open ended without cable	Duct Seal 1A. If the duct is to be cabled within 30 days then use a Plug Pressure 1	ingress/egress of gas or water
Duct 54D open ended with cable	Duct Seal 1A or 1B, depending on cable diameter and quantity of cables	ingress/egress of gas or water
Duct 54D with existing Gland Caulking	Preferred method Duct Seal 1A or 1B, depending on cable diameter and quantity. If the gland is empty and is to be cabled within 30 days then use a Plug Pressure 1 Alternative method Compound 16A with Discs Caulking 1	egress of gas or water
Duct 56 as external lead-in	New Seal – Item Code: 066165	ingress of foreign matter
Duct 25/17 (Strategic network only)	New Seal – Item Code: 066166	ingress/egress of gas or water
For any duct entries where none of the above may be utilised	RISE Duct Seal 100WG or 150WG depending on size and number of ducts to seal	ingress/egress of gas or water

 **Appropriate BT Safety Procedures MUST be followed at all times**

Duct 56 Sealing Kit (Item code 066165) contents	Duct 25mm/17mm Sealing Kit (Item code 066166) contents
 <p>Kit Contents:</p> <ul style="list-style-type: none"> • Main Split Seal • Two Part Spreader • Inner Black Rubber Seal • Lubrication Sachet 	 <p>Kit Contents:</p> <ul style="list-style-type: none"> • Main Split Seal • Two Part Spreader • Two (RED) Filler Rods • Lubrication Sachet
Socket and Spigot Duct Ends (As installed by the builder)	
	 <p>The Duct Gas Block/Seal in the Spigot end of the duct shown on the left The Duct Gas Block/Seal in the Socket end of the duct shown on the right</p>

Duct 56 - Socket End – Installation of Cable

1 - Socket Duct End



- Using a suitable tool carefully lever out one of the two spreaders.
- Repeat for the second spreader

2 - Duct Gas Block/Seal Removal



- Remove Duct Gas Block/Seal from the duct.

3 - Black Inner Rubber Seal Removal



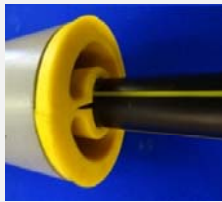
- Open split Duct Gas Block Seal and remove inner black rubber seal.

4 - Duct Gas Block Refitting



- Install BFT.
- Place 4 BFT (6mm) into Duct Gas Block/Seal.
- Lubricant can be applied to the cable sheath to assist when the seal slides into duct.

5 - Duct Gas Block Refitting



- Slide the Duct Gas Block/Seal into the duct
- The lubricant can be used here to assist

6 - Fit Spreaders



- Using lubricant to assist fully slide home the two spreaders

7 - Completed Seal



- Completed Duct Gas Block Seal

Duct 56 - Spigot End – Installation of Cable

1 - Spigot Duct End



- Using a suitable tool carefully lever out one of the two spreaders
- Repeat for the second spreader

2 - Duct Gas Block/Seal Removal



- Remove Duct Gas Block/Seal from the duct

3 - Black Inner Rubber Seal Removal



- Open split Duct Gas Block Seal and remove inner black rubber seal

4 - Fit Seal onto Cable



- Install BFT
- Fit Duct Gas Block Seal around cable

6 - Slide Seal into Duct



- Slide Seal into duct
- Lubricant can be used here to assist

7 - Insert Spreaders



- Insert the spreaders (2 off) and push fully home
- Lubricant can be used to assist

8 - Completed Seal



- Completed Duct Gas Block Seal

Carriageway Chamber Construction JBC4

Carriageway Chamber

The new JBC4 (N) New Sites Carriageway Chamber is a low-cost, double-brick construction chamber, for provision by developers only. It uses the standard 'Carriageway No.4 Frame & Cover' and standard Cable Bearers. The 915mm x 445mm opening of the chamber allows it to house the same copper joints typically installed into a JBF104.

This illustration is a guide. Detailed technical Drawings are also available from your New Sites Designer.

Box design and specification may vary. This will be determined by the duct lay-out and whether multi-way ducts or major road crossings need to be incorporated into the network design.

Materials

- Bricks: Grade B to BS EN771 & BS EN772.
- Cement: BS12 Portland Cement.
- Concrete: Grade 32/40 reinforced concrete with A393 Grade Mesh at 70mm Cover - BS EN 206.
- Mortar: Designated within BS 5628; Part 1 Requirement for Mortar Table 1; Type (i) BS5628.

Base

- Concrete Grade 32/40.
- A393 Grade Mesh at 70mm Cover.

Brickwork

- All brickwork to be keyed in at corners and pointed.
- Brickwork shall be constructed with a 10mm joint thickness of cement mortar and shall be of English Bond.

Frame and Cover

- Carriageway No.4 Frame and Cover to be set on a mortar bed and fitted squarely to box structure to Highway Agency

Document standards HA104.

- BT Item Code 057246 Frame & Cover Carriageway 4E.
- BT Item Code 057250 Frame & Cover Carriageway 4E Lockable.

Lifting keys for this cover can be purchased from: TW Engineering, Angular House, Eagle Road, Quarry Hill Industrial Park, Ilkeston, Derbyshire DE7 4RB. Tel: 0115 932 3223

Description: Lifter Manhole Cover 4B.

Duct Entries

- Where the duct enters the chamber the duct shall enter flush with the wall.
- Duct must not enter through corners and be no less than 75mm from the side wall.
- Duct to enter wall 600 mm minimum depths from top of frame.
- Duct to clear base by 100mm minimum.

Ironwork

- Fit all Bolts, Cable Bearer Wall Types and Bracket Cable Bearer as supplied.
- A single step shall be fitted as defined in the drawing.

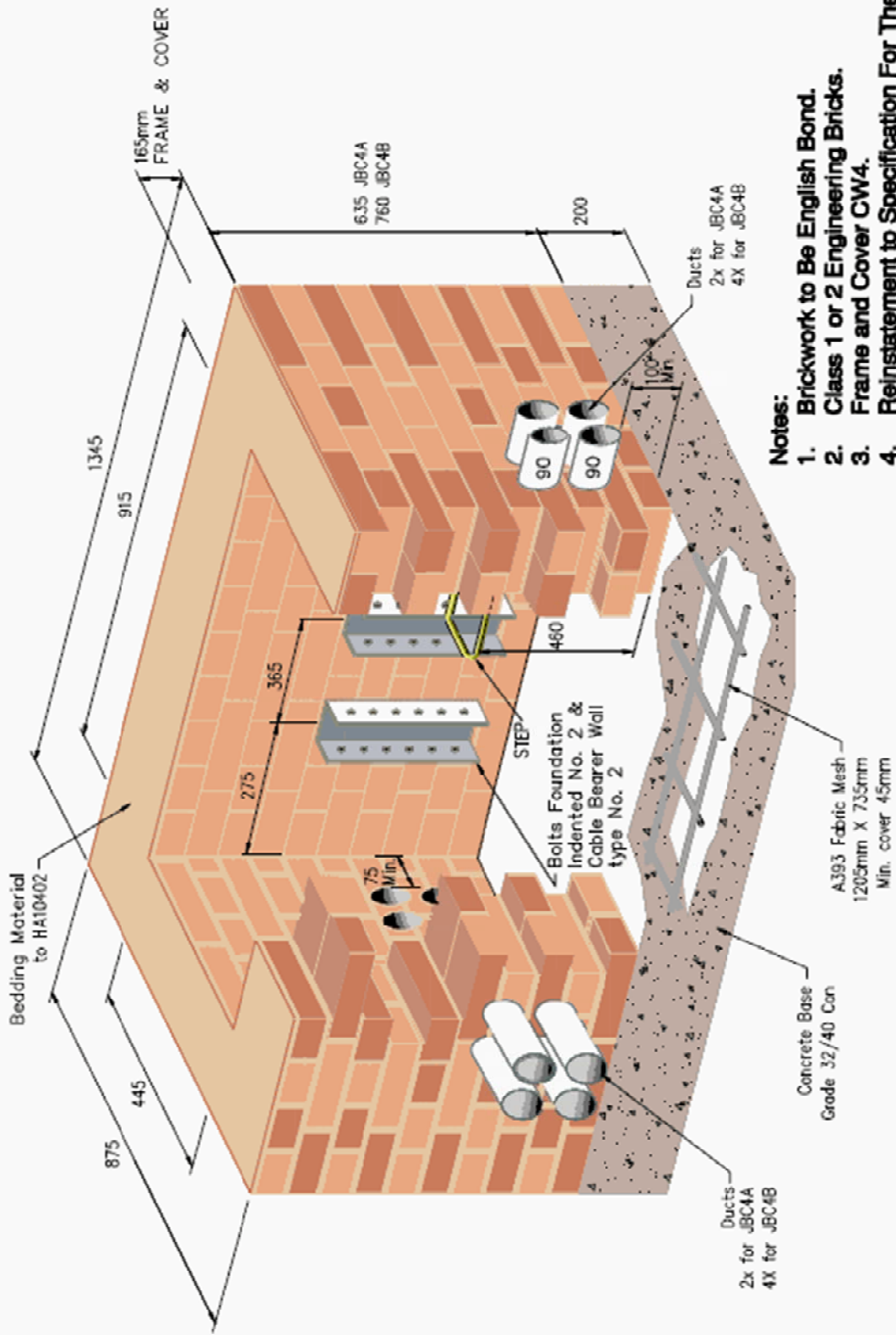
Internal Dimensions

The Carriageway No.4 Frame & Cover with a suitable Mortar bed will sit 165mm above the brickwork. The brickwork construction will have a 915mm x 445mm opening and an 800mm or 925mm depth.

Any deviation from these measurements must be authorised by your NSR.

JOINTBOX JBC4(N)

Drawing Shown Without Frame & Cover for Clarity.



Notes:

1. Brickwork to Be English Bond.
2. Class 1 or 2 Engineering Bricks.
3. Frame and Cover CW4.
4. Reinstatement to Specification For The Reinstatement Of Openings in Highways.

Jointing Chamber Construction – JBF104

The diagrams and specifications you see here illustrate the most frequently used joint boxes at new developments (i.e. [JBF 104](#) and [JBF 106](#)). However, joint box designs and specifications may vary, depending on the duct layout and whether multi-way ducts or major road crossings need to be incorporated into the network design.

Item	Description	No. Off		
		4B	4C	4D
1	Bolts, Foundation, Indented No.2	4	4	4
2	Cable Bearers, Wall Type No.2	2	2	2
3	Frame & Cover No.4c	1	1	1
4	Steps, Manhole No.1	-	1	1
5	Pin Locking, Cable Bearer	2	2	2
6	Bracket Cable Bearer No.8	2	2	2

Materials

- Bricks: British standard EN771-1 Engineering
- Cement: British Standard EN197-1:2000 ordinary mix. 3 parts sand to 1 part cement

Specifications

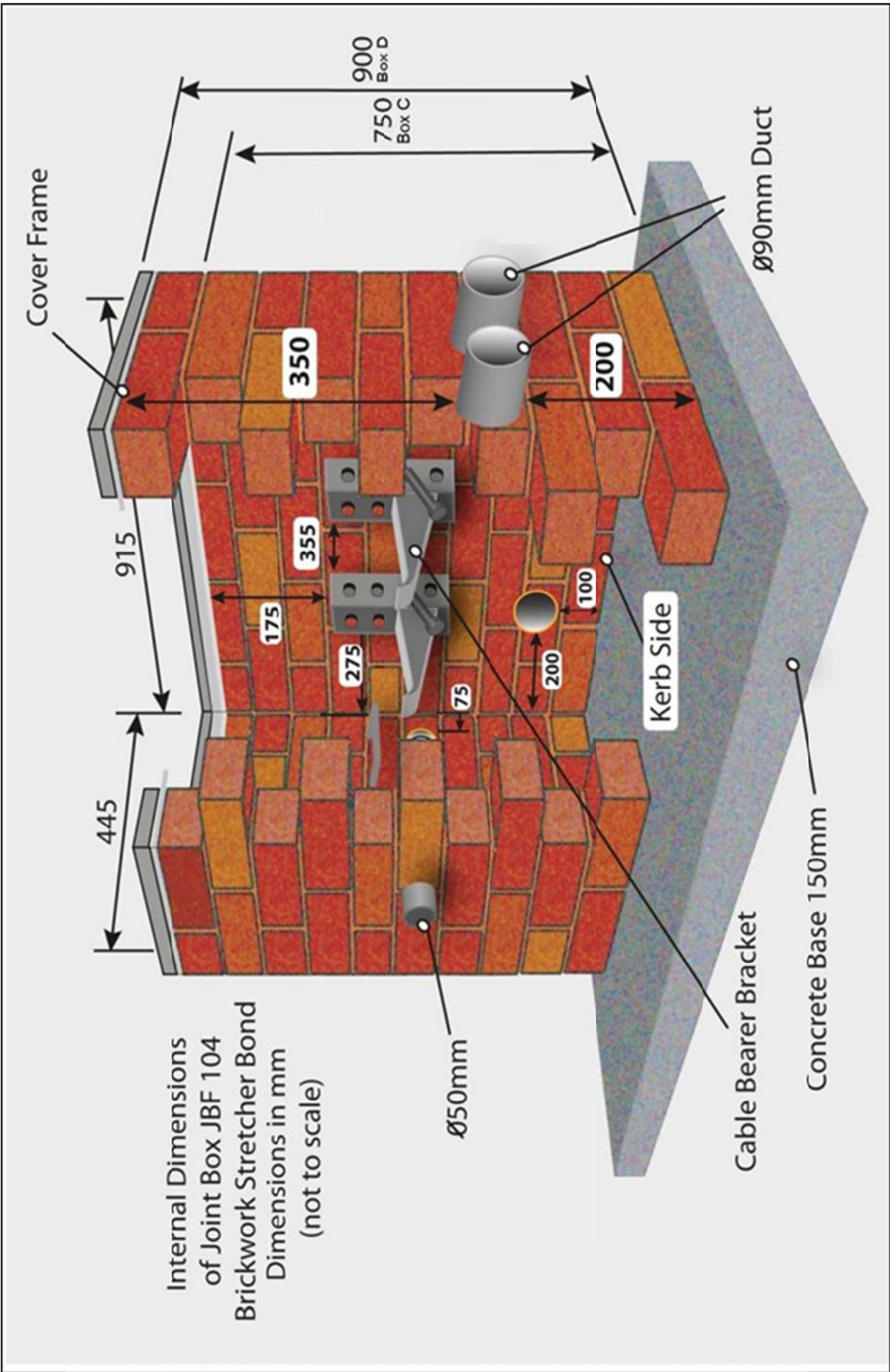
- Base: 150mm concrete, clean and level.
- Brickwork: Keyed in at the corners and pointed.
- Frame and Cover: Set on a mortar bed and fitted squarely to the box structure. You can purchase lifting keys (key No. 5, item code TW1731) for the covers from TW Tools,
- Duct Entries: Must not enter through corners and be no less than 75mm from the sidewall. Should enter wall at a minimum depth of 350mm from the top of the frame, cut flush and clear the base by a minimum of 100mm.
- Bolts: Must be fitted in each box to allow ironwork to be installed.
- Step(s): One step is required in all boxes deeper than 700mm. Two steps are required if the depth of the box is more than 1050mm.
- JBF104(C): 915mm(L) x 445mm(W) x 750mm(D)

- JBF 104(D): 915mm(l) x 445mm(w) x 900mm(d), the minimum depth for boxes either side of road crossings

At no time must minimum box depth be compromised. If minimum the 750mm depth cannot be achieved, consult your Openreach New Sites Representative. The minimum box depth stated for a JBF 104 will accommodate the 4.2 metres of Blown Fibre Tubing (BFT) required to achieve the minimum safe bending radius when joints are in the open work position or in the closed box stored position.

Notes

- All backfill material to be class 6N type
- Workmanship, materials and method of construction are to comply with all current relevant contract documents, British standards and codes of practice for the construction industry.
- All existing services positions are to be verified on site by the contractor prior to starting works.
- All accepted safe digging practices and safe methods of working are to be employed during the installation of the jointbox.
- Concrete to be grade C32/40 with a water cement ration 0.4 minimum. Cement content 380kg/m². Aggregate maximum size 20m All in accordance with BS8500
- All ducts shown are based on maximum recommended values for duct type 54D.
- End ducts to be inline.
- Ducts to be positioned not less than 75mm from a side wall.
- Minimum required ducts shown solid for each joint box variation.
- Short lengths of duct 54D to be used on non-ducted routes. Appropriate duct to be used on ducted routes.
- Drill 1 set of 3 holes using a12mm masonry drill bit to a depth of 80mm for future fitting of MOBRA bracket.



Jointing Chamber Construction – JBF106

The diagrams and specifications you see here illustrate the most frequently used joint boxes at new developments (i.e. [JBF 104](#) and [JBF 106](#)). However, joint box designs and specifications may vary, depending on the duct layout and whether multi-way ducts or major road crossings need to be incorporated into the network design.

Item	Description	No. Off				
		6B	6C	6D	6E	6F
1	Bolts, Foundation, Indented No.2	4	4	4	4	4
2	Cable Bearers, Wall Type No.2	2	-	-	-	-
	Cable Bearers, Wall Type No.3	-	2	2	2	2
3	Frame & Cover No.6C	1	1	1	1	1
4	Steps, Manhole No.1	-	2	2	3	3
5	Grating, Sump No.2	1	1	1	1	1
6	Pin Locking, Cable Bearer	2	2	2	2	2
7	Bracket Cable Bearer No.8	2	2	2	2	2

Materials

- Bricks: British standard EN771-1 Engineering
- Cement: British Standard EN197-1:2000 ordinary mix. 3 parts sand to 1 part cement

Specifications

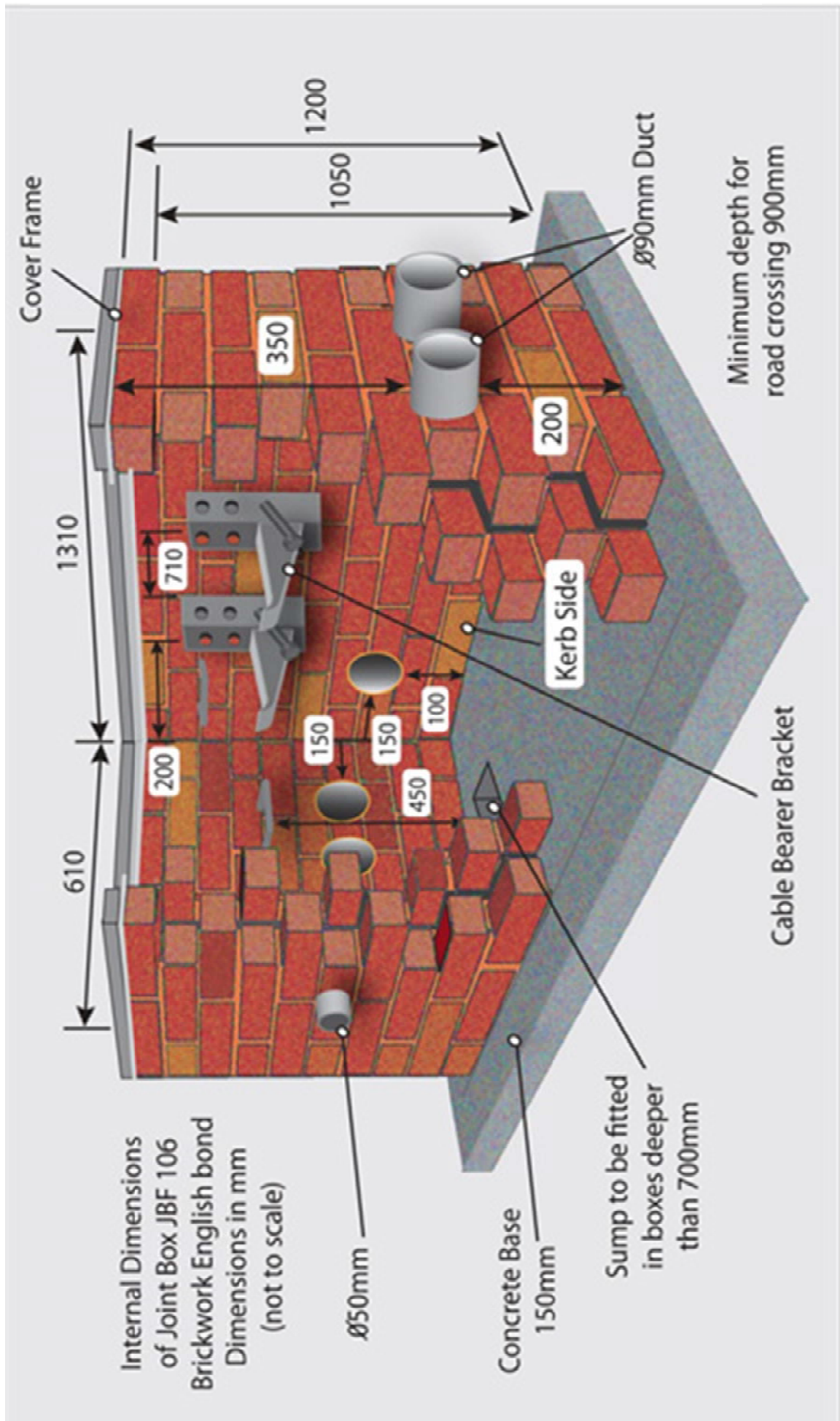
- Base: 150mm concrete, clean and level.
- Brickwork: Keyed in at the corners and pointed.
- Frame and Cover: Set on a mortar bed and fitted squarely to the box structure. You can purchase lifting keys (key No. 5, item code TW1731) for the covers from TW Tools,
- Duct Entries: Must not enter through corners and be no less than 75mm from the sidewall. Should enter wall at a minimum depth of 350mm from the top of the frame, cut flush and clear the base by a minimum of 100mm.
- Bolts: Must be fitted in each box to allow ironwork to be installed.
- Step(s): One step is required in all boxes deeper than 700mm. Two steps are required if the depth of the box is more than 1050mm.
- JBF106(F): 1310mm(L) x 610mm(W) x 1200mm(D)

At no time must the minimum box depth be compromised. If a minimum 750mm depth

cannot be achieved, consult your Openreach New Sites Representative. The minimum box depth stated for a JBF 104 will accommodate the 4.2 metres of Blown Fibre Tubing (BFT) required to achieve the minimum safe bending radius when joints are in the open work position or in the closed box stored position.

Notes

- All backfill material to be class 6N type
- Workmanship, materials and method of construction are to comply with all current relevant contract documents, British standards and codes of practice for the construction industry.
- All existing services positions are to be verified on site by the contractor prior to starting works.
- All accepted safe digging practices and safe methods of working are to be employed during the installation of the jointbox.
- Concrete to be grade C32/40 with a water cement ration 0.4 minimum. Cement content 380kg/m². Aggregate maximum size 20m All in accordance with BS8500
- All ducts shown are based on maximum recommended values for duct type 54D.
- End ducts to be inline.
- Ducts to be positioned not less than 75mm from a side wall.
- Minimum required ducts shown solid for each joint box variation.
- Short lengths of duct 54D to be used on non-ducted routes. Appropriate duct to be used on ducted routes.
- Drill 1 set of 3 holes using a12mm masonry drill bit to a depth of 80mm for future fitting of MOBRA bracket.
- Mesh to be grade B500B or B500C conforming to BS4483
- Step, Manhole to be fitted in all boxes deeper than 700mm



Pre-Formed Chamber – Quadbox

Carriageway Road Crossings

We've approved a pre-formed chamber system – Quadbox™ to speed up the installation process. This means that there's no need for specialist box building teams and concrete backfill..



The Quadbox™ comes in standard 150mm deep structural twin wall ring sections to provide maximum flexibility and strength. Joint box Modular Footways 102, 104 and 106 are the Openreach approved versions

(BT specification LN178). You must provide a clean and level 150mm concrete base for them.

Box furniture items slot into moulded pockets within the chamber, eliminating the need to cast-in fixings or drill on site. Duct entries are also easy to achieve, using a standard hole-saw mounted on a cordless drill



The Quadbox™ isn't available as a free stores item from Openreach, but can be purchased directly from our approved supplier, Cubis Industries <http://www.cubisindustries.com>. Permission needs to be sought from your NSR.

The lightweight high-strength system is supplied as 150mm deep twinwall HDPE rings which are simply stacked on a prepared base and backfilled with suitable as-dug or type 1 material



Furniture

Cable Brackets, Bearers, Pins and Steps (where required) are supplied in a bagged kit and easily slot into purpose designed pockets in the chamber.

The brackets and steps drop into preformed slots

Backfill Materials

Unless agreed with local site representatives, the backfill should be Type 1 material, compacted in 150mm layers using a powered compactor.

Base

A base can be constructed from: 50mm of dry mix concrete on 100mm of compacted Type 1; 150mm of compacted Type 1; 150mm deep concrete base (C20 or dry mix) or 50mm of ready mix concrete on 100mm of compacted Type 1.



Frames & Covers

Non-standard frames and covers are increasingly being fitted by developers on new developments. While they may be sympathetic to the surrounding paved areas, these frames and covers are unapproved, as they cannot be lifted by traditional means - i.e. with a Key Joint Box No.5

Manufacturers who have approved products available will have a current Product Approval Certificate issued by BT.

In order to eliminate the recurring practise whereby unapproved manufacturers have claimed BT approval, a decision has been made to appoint **CUBIS Industries (formerly Salmor Industries) as the sole approved supplier of these products.**

Developers should be aware that BT will take legal proceedings against any developer who fits unapproved frames and covers within the BT network and will claim damages and costs from them. If you are unsure how to specify approved covers, please contact your New Sites Representative or visit www.cubisindustries.com

Only approved frames and covers must be fitted on your site. These need to be lockable. Approved frames and covers are identifiable via the embossed markings on each end:

EN124 (the EU standard), B123 (the class of EN124) and the British Standards kitemark.

Manufacturer's mark (SID or SGP), the year of manufacture (e.g. 09, 10 and 11) and the BT identifier.

These approved frames and covers consist of a galvanised steel fabricated frame, fitted with unfilled galvanised steel fabricated cover trays and cross-beams.

Each cover tray is equipped with two key-hole fittings (in the centre of the short side) one of which carries a BT identity mark and the manufacturers' three letter identification 'SID'.

The other key-hole fitting displays EN124 and B125 together with the BSI Kitemark certifying the covers to BS EN124: 1994.

Each cover tray includes a galvanised expanded steel mesh to assist bond between the cover tray and infill materials. Maximum overall depth of cover is 75mm with an 86mm frame depth and is designed for use with a maximum block of 65mm depth.



If you are planning to install frames and covers that are not supplied by Openreach e.g. for block paving, or you have any doubts about what frames and covers to use, advice should be sought from your New Sites Representative.



Openreach engineers are under strict instructions not to attempt to lift non-standard covers until a local risk assessment has been completed. The covers may be too heavy and the engineer's standard tools may not be suitable. They could put themselves and members of the public at risk

Recessed frames and covers **MUST NOT** be used in carriageway surfaces including entries to industrial sites, factories or in lay-bys.

Security

As part of the Openreach strategy to improve the resilience of the network we have introduced a new range of lockable footway frames and covers.

The covers are secured by one or two integrated locks and fit into a reinforced frame that is that is bolted to the joint box during installation



The installation of the box is the same specification as before, except that we supply you with the lockable frame and cover.

- They can be fitted to Brick, concrete or modular (Quadbox) joint boxes.
- The frame has been strengthened to 5mm steel and has tabs which need to be bent down and bolted to the structure of the joint box during construction.
- A Turnbuckle lock has been introduced within the lid. It is locked and unlocked by pushing down and turning the new Key Security 1A through 90 degrees. All other activities associated with opening the joint box remain unchanged. Ensure the lock is secure before leaving site.



Lockable frames and covers are also available for the “QUADBOX” pre-formed chamber system.

Where ordered, security covers will be supplied pre-fitted in the QUADBOX and should again be installed as the topmost ring. It is important that this ring be installed last to allow for future installation of a secondary security system.

Note - Where there is evidence or significant risk of vehicles using the soft verge eg, as an undertaking area opposite a T-Junction, a passing point on a narrow road or a parking area, it will be necessary to install a Carriageway Chamber, Frame & Cover.

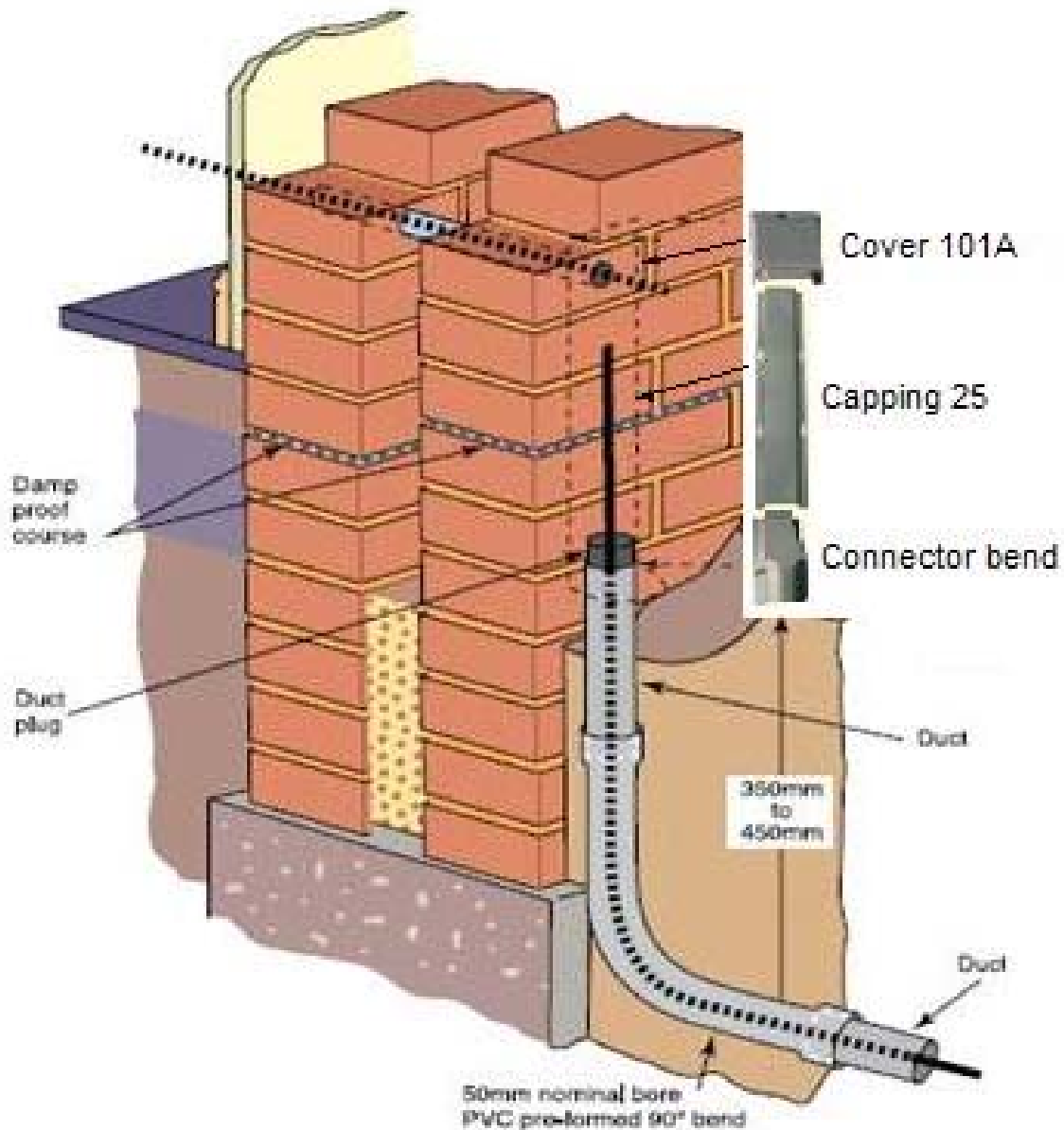
Load Bearing Capacity

Frames and Covers, Footway conforming to BS EN124 class B125 are designed to withstand a minimum test load of 125kN (12 and half tonf) on a specified test block. These frames and covers are capable of carrying static or slow moving wheel loads exerted by any road vehicle complying with the 'Motor Vehicles (Construction and Use) Regulations', by which a maximum static wheel load of approximately 50kN (50 tonf) is imposed.

Frames and Covers, Driveway have a minimum ultimate static load bearing capacity of 90 kN (9 tonf) applied to a 300mm diameter area. These frames and covers are capable of carrying the same wheel loads as stated for frames and covers complying to BS EN124 class B125 in the above paragraph.

All other Frames and Covers, Footway, have a minimum ultimate static load bearing capacity of 25kN (2 and a half tonf) applied to a 100mm diameter area. Obsolescent Frames and Covers, Footway are therefore capable of carrying pedestrian traffic and light static or slow moving vehicular loads only. See Section 6 for further information regarding upgrading of load bearing capacity using replacement covers.

Service Pipe Presentation to Property - Copper



Installation for houses

Lay Openreach grey duct from the footway joint box (with the socket end presented to the joint box) and terminate it with a pre-formed 90° bend on the outside wall of the house. Keep duct runs to a minimum depth of cover of 350mm beneath the proposed finish level (450mm under a soft surface).

Supply and install standard 20mm electrical conduit through the cavity wall at a point vertically above the end of the service duct.

All duct must be provided with a lead-in cable after installation. Leave a 1m tail at the house

end of the duct and a 3m tail the chamber end of the duct.

The service duct must cut level, two bricks below the damp proof course and must be sealed at both ends, using duct plug 1A to prevent foreign matter getting in.

External capping 25 and connector bend 4 should be fitted, as required.

You must also install a single fibre tube next to the draw rope on each plot, running it from the agreed joint box to the agreed position at the premises. This would not be applicable for “copper only” sites.

Please note that:

All internal wires and sockets beyond the master Network Terminating Equipment are you/your customer's responsibility.

Copper installation for apartments and small business properties

You should agree an appropriate method of cable entry with us at the design stage. If you need to make changes along the way, please don't forget to agree them with us first.

Each property must have its own cable running from the main entry point, or as agreed at the initial site meeting/proposal stage. The cables to each property are owned by Openreach and must be terminated on an Openreach master socket, which should be easily accessible for maintenance.

Please note that our wiring should never be terminated directly onto multimedia sockets. If it is and if a fault develops that requires the attention of an Openreach engineer, your customer may incur charges from their communications provider.

Lay Openreach grey duct from the footway joint box, with the socket end presented to the joint box and terminated with a 90° pre-formed bend on the inside of the site wall.

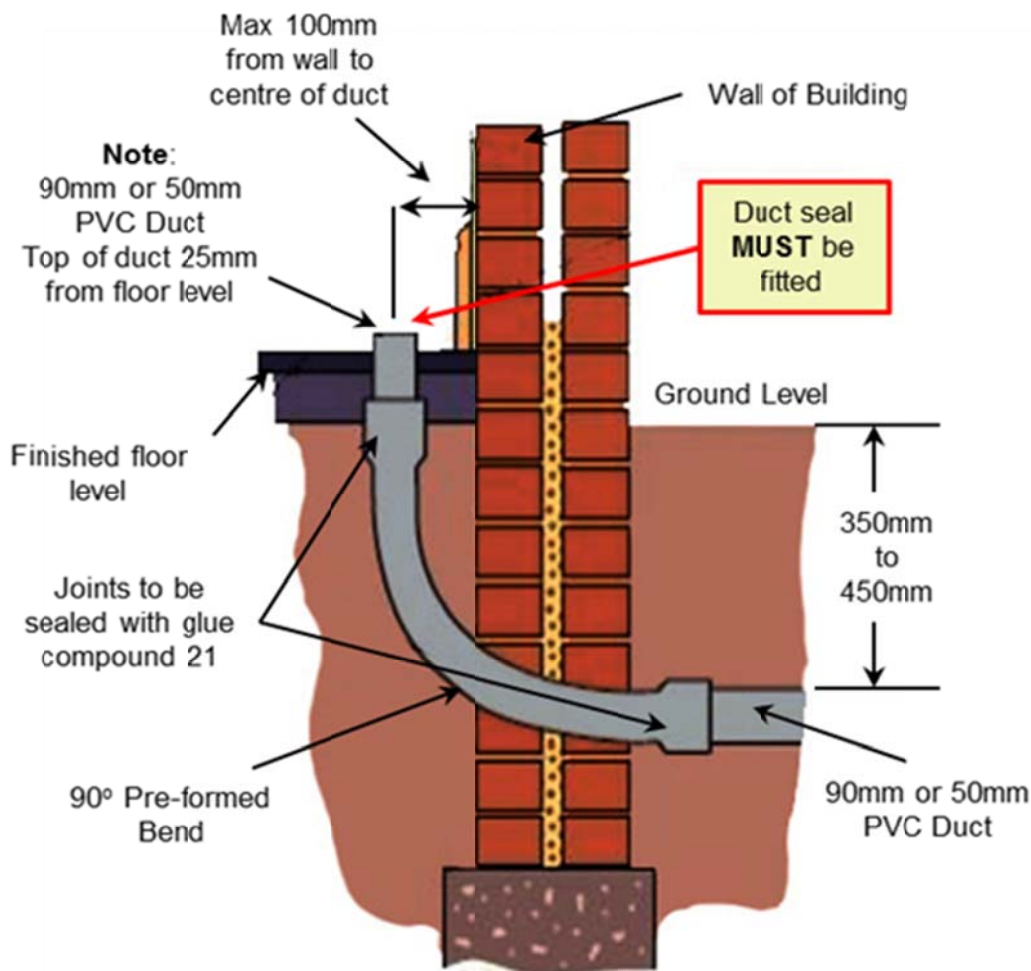
Keep duct runs to a depth of 350mm/450mm beneath the proposed external ground level. The section of duct that passes through the wall/floor must be coated with solvent cement compound 21 and then a dry 3:1 sand/cement mixture.

Any joints inside a property should also be coated with solvent cement compound 21.

Wiring within cavity walls must be installed within 20mm conduit (to ensure easy maintenance).

The Openreach duct should be as close to the finished wall as possible.

Please note that it is your responsibility to ensure that all duct seals have been installed correctly to provide the barrier for the ingress of gas and water.



General Cabling Information – Copper & Fibre

Cable types

Cables within customer premises must conform to the relevant fire regulations. External type cable can be taken up to **2 metres** from the internal building entry point. From that point onwards all cable must either be of retarded, reduced or limited fire hazard properties.

Cable types possessing such properties are RFH (Reduced Fire Hazard) or LFH (Low Fire Hazard) cables. Cable not possessing these properties must be housed in metallic trunking.

Cable Bending Radii

Cabling installation works, such as cabling directly on wall, cable in trunking or on trays for fixing cables must not compromise bending radii of cables. Pulling force on a 7 tube 2.7/6mm must not exceed 1kn or hand tension. The bending radius of a cable is measured to the inner edge of that cable and equals the **multiplying factor times the cable diameter**.

Minimum bending radius for pulling during installation is twelve times the outside diameter.

Copper Cables

The minimum bending radius for copper cables is summarised in the table below.

Copper Cable Type	Minimum Bending Radius
External (PE sheathed)	7 x outside diameter
Internal Twisted Pair (RFH sheathed) <= 20mm	4 x outside diameter
Internal Twisted Pair (RFH sheathed) 21-90mm	6 x outside diameter
Internal Coaxial/Double Braided Cable	6 x outside diameter

See International Standard ISO/IEC 11801 - Generic Cabling Specification for Customer Premises.

Cable optical fibre & blown fibre tubing

The Cable Optical Fibre (PELFH sheathed) minimum bending radii is 12 x the outside diameter for both pulling and setting.

For Blown Fibre Tubing run directly on a wall, in Trunking or on trays the bending radii are not to be set less than the following:

For 5mm Tubes	Bending Radius
7 tube cable PE and RFH type	225mm
4 tube cable PE and RFH type	200mm
2 tube cable PE and RFH type	115mm
1 tube cable PE and RFH type	115mm
1 tube unsheathed	100mm desired – 60mm limit

Blown fibre tube bends should be kept to a minimum, with adjacent bends being spaced no less than one metre apart to maintain blowing integrity. The maximum of 28 right angle bends applies to planning limitations of 600m for 5mm tubing.

Cable separation – power

There is a minimum separation distance between power (supply or distribution) cables and copper communications cables. This separation distance is subject to the voltages and power levels involved. These rules apply to cables containing a metallic content or components. If the site is to be served by fibre only for broadband and telephony services then a Blown Fibre Tubing (**BFT**) containing no metallic components can be run on trays alongside other services. Where copper cables are required for special circuits, i.e., care lines, lift lines, alarms (red care) etc., it may be prudent to maintain the separation distances for Blown Fibre Tubing as copper cables could be installed adjacently at a later date and from a customer perception a separate route may not be possible.

Separation Distances (BS6701)

Cable Types	Distance
Unscreened power lines and unscreened communication cables without a divider	300mm
Unscreened power lines and unscreened communication cables with metallic divider ²⁾	150mm
Unscreened power lines and screened communication cables ¹⁾ without a divider	70mm
Unscreened power lines and screened communication cables ¹⁾ with metallic divider ²⁾	30mm
Screened power lines and unscreened communication cables ¹⁾ without a divider	30mm
Screened power lines and unscreened communication cables ¹⁾ with metallic divider ²⁾	2mm
Screened power lines and screened communication cables ¹⁾ without a divider	15mm
Screened power lines and screened communication cables ¹⁾ with metallic divider ²⁾	1mm

1) The distances depend upon the way the screen and metallic divider is bonded and earthed.

2) The distance also depends on the material of the divider where a non-ferrous material has been chosen i.e. aluminium.

Cable runs - general rules for cabling

Cable runs should be of uninterrupted cable lengths. When cables are run either directly on walls they are to be run horizontally or vertically except when following special architectural features. Horizontally run cables should be secured at regular intervals at least every 300mm.

Vertically run cables should be secured at regular intervals at least every 400mm.

For cables on supported runs these should be secured every 1000mm. When cable trays are provided, cables should be secured every 5m for overhead and under floor applications.

For copper cables choose cleat sizes that just grip the cable used.

Cables must not be run and secured directly onto ceilings except in locations such as cellars or lofts.

Two cables run together should run side by side as close to each other as possible with cleats adjacent.

Cables should not cross each other on flat surfaces.

Two wiring cleats should always be used at a right angle bend and the cable should be tucked into the corner ensuring the appropriate bending radius is not compromised.

Cables are to be secured to the point of entry into equipment.

When cables are run in cellars, the spanning of open spaces from beam to beam is undesirable and may only be adopted for not more than 75mm away from the wall. This is to reduce possibly mechanical strain and damage to the cable. Where a cable to be run is more than 75mm away from a wall then a batten secured to the beam should be used and cabling then is fixed to that.

When fixing cables direct to hard brickwork, where possible the pins should be fixed in to the mortar.

The NSR will advise you on any cable marking and Securing Cable optical fibre and blown fibre tubing.

Cable Optical Fibre fixed directly on walls must either use shouldered cleats that just grip the cable sheath or you can use plate cable fixings. It is important to **prevent distortion** to the sheath, thus compromising the optical performance of the fibres within the cable.

Blown Fibre Tubing fixed directly on walls should use plate cable fixings, with cable ties, or shouldered cleats that **avoid necking** the tubing and restricting the path of the blown fibre bead attached to the bundle for installation.

Note:

Care must be taken when securing the tubing to walls & trays that the outside diameter of the tubing is not squeezed or compressed in any way. Any damage of this nature can hamper or prevent service to the end user. g/labelling where required.

Installation of Trunking, conduit, cable tray or cable grid and associated works

All installations of Trunking, conduit, cable trays or cable grids are to comply with standards quoted in the latest edition of IEE Wiring Regulations or its equivalent to whatever regulation is more current with all up to date British Standard amendments. Contractor's carrying out such works must have suitably trained installers. Contractor employees must be proficient and conversant with the components and installation practices of Trunking, conduit, and cable tray or cable grid. Installations of Trunking, conduit, cable tray or cable grid are not to compromise cable bending radii.

Cabling - Copper

Installing additional telephone sockets as part of the overall building programme avoids the problem of exposed wiring and will enhance the appearance of your development.

All internal cables/wiring should be run inside conduit to enable easy, problem-free maintenance.

Please note that while the provision of internal wiring beyond the Openreach master socket will normally be your/customer's responsibility, you can contract an Openreach engineer to do this work for you. If you're interested, please contact your local NewSites office.

Basic materials

We'll supply with a master socket, which will remain the property of Openreach. You need to purchase the following basic materials yourself:

- Back box for extensions sockets
- Flush-mounted extension socket points
- Internal 4-wire cable.

Installation

Extension cabling must run from the back box of the main socket or external NTE, with 300mm left coiled within it for connection.

Extension sockets must be mounted on single-gang flush steel boxes that conform to British Standard 4662:1970.

Extension sockets should be located close to power sockets for easy equipment connection. However, you must leave a minimum of 50mm between telephone cables and power cables throughout. Where this is not practical, telephone and power cables must be separated by an acceptable divider (i.e. of rigid, non-conducting material).

Where not supported in conduit or Trunking, cables must be cleated at intervals of not more than 300mm. The wiring pattern can be series or spur. The choice is yours.

Please note that:

The wiring and sockets must be of telephone or data grade

The wire diameter must be between 0.4mm and 0.63mm, solid or multi-strand (bell/alarm wire is not suitable under any circumstances) Any faults dealt with onsite by our engineers and proved to be due to your/customer's wiring will be chargeable

You can find detailed information on cable installation and separation is given in the British Standard Code of Practice 6701, Part 1, particularly clause 6 and the relevant sections of the latest IEE Regulations for Electrical Installation (Regulation 525 is of particular importance).

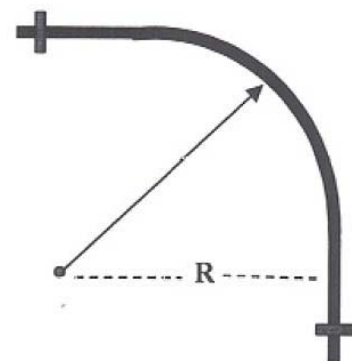
Copper cables

The External (PE sheathed) Copper Cable minimum bending radius is 7 x outside diameter.

The Internal Twisted Pair (RFH sheathed) Copper Cable minimum bending radius is 4 x outside diameter of cables of up to and including 20mm. If the diameter is between 21-90mm, the bending radius will be 6 x outside diameter of the cable. See International Standard ISO/IEC 11801 - Generic Cabling Specification for Customer Premises.

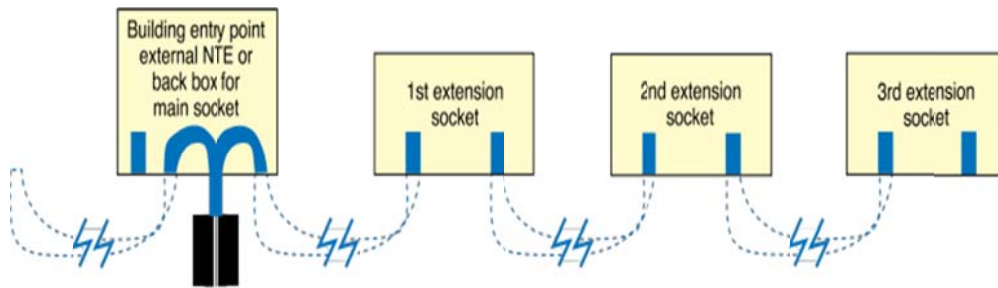
The Internal Coaxial or Double Braided Cable minimum bending radius is 6 x outside diameter.

Minimum bending radius for pulling during installation is 8 times the outside diameter.

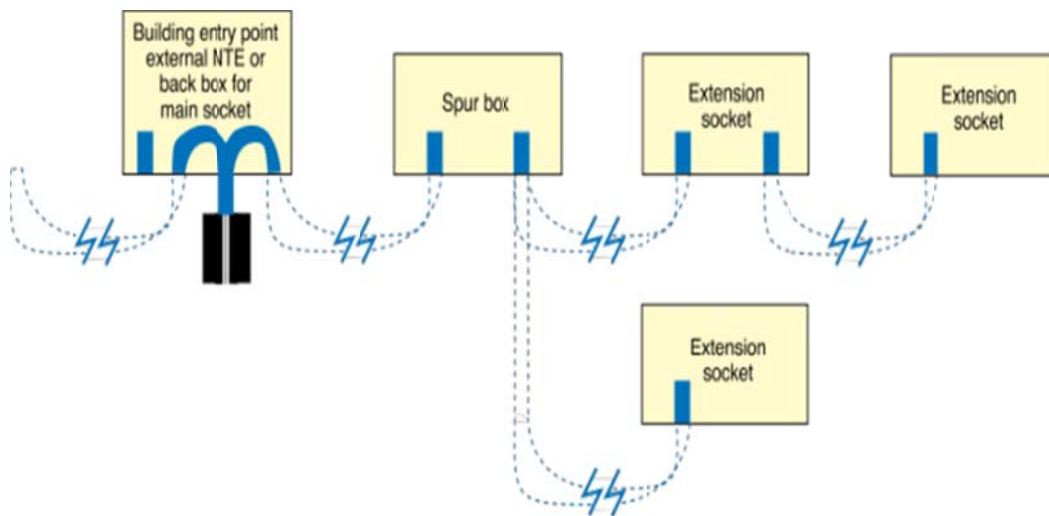


Phone Sockets Cabling Arrangements

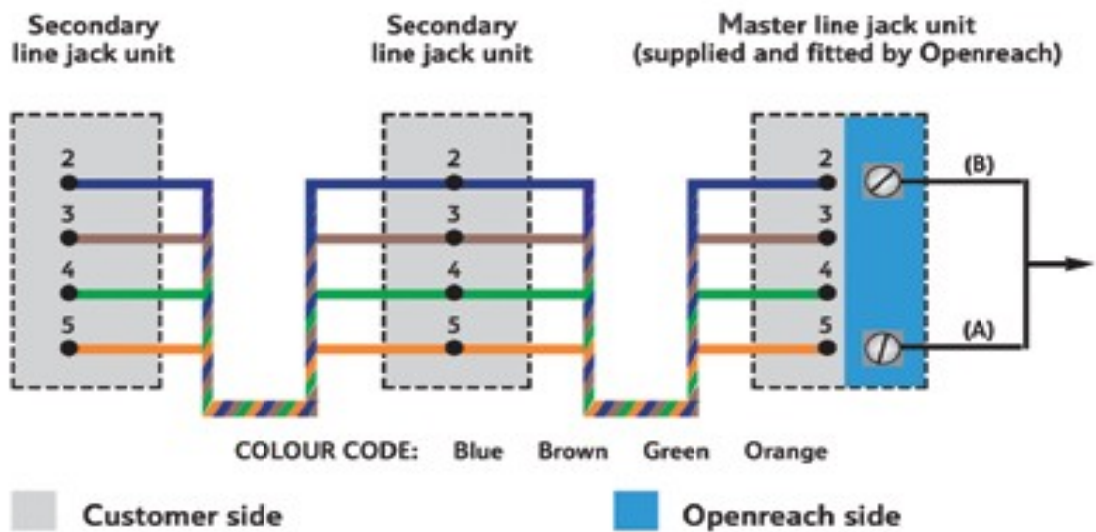
Series Cable Installation



Spur Cable Installation



Extension Wiring



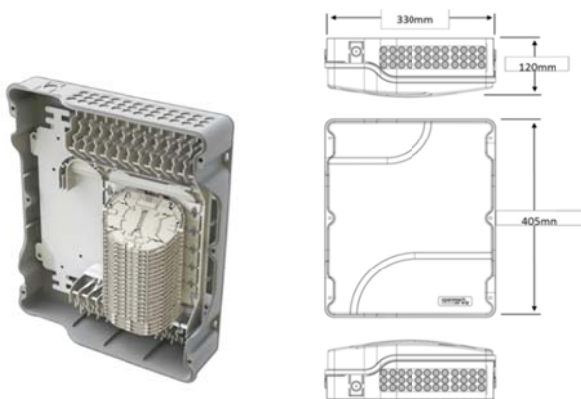
Multiple Dwelling Units

If you, or your architect, provide our New Sites Designer with the Mechanical and Electrical (M&E) drawings for the complex, we will agree a telecoms layout with you and provide a design spreadsheet, equipment/cable specs and timeframes for delivery of stores.

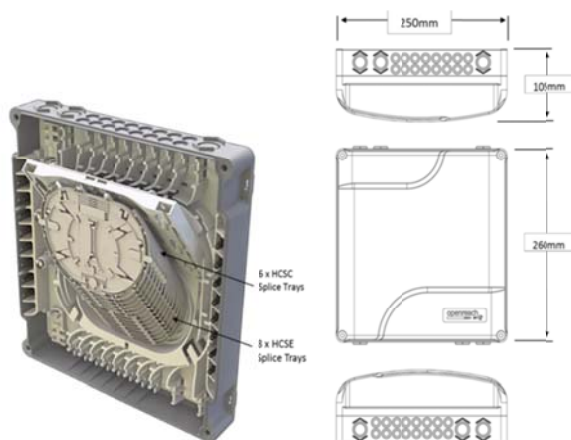
Network Design

For fibre only Multiple Dwelling Units, some of the new network components are moved into the building depending on the size of the complex. When this is done, a fixed fibre cable will run into each apartment rather than blown fibre tubing. Because of this a manifold is not used.

Larger Multiple Dwelling Units will have splitter nodes fitted internally.



Smaller sites may only have internal Fibre Distributions Points.



We will explain whether this is the case for your site.

The locations will be agreed with you by our New Sites Designer. We endeavour to locate

our splitters and Fibre Distributions Points in secure cupboards or risers, ensuring they can be easily accessed without using a ladder – at a minimum height of 0.2m and a maximum of 1.5m

All fire stopping must be in accordance with:

- “The building regulations 2000 (rev.2006) Fire safety, B3 section 7”
- “Fire stopping and penetration seals for the construction industry” ASFP red book
- “Ensuring best practice for passive fire protection in buildings” ASFP

At each apartment you are required to leave a 2 metre length coiled within a back box near to where an ONT would be installed, and 2 metre length at the Openreach Splitter Node/Fibre Distribution Point.

Openreach will install and commission the ONT once permanent power is available.

Installation procedure

We will agree with you whether we install ducting (including the lead in from the box in the street) or whether you do it. However, we would normally ask you to install internal cabling.

We install the splitter nodes and Fibre Distributions Points at our agreed locations and splice the fibres as appropriate.

MDU cabling

Various types of cable are used in MDUs, depending on the local design and building layout.

Labelling

Adhesive fibre cable labels (Laminate marker label optical) are provided on the inside of covers on 6A FDPs. Tag fibre cable labels (Cable marker label optical) are attached to input cables on Internal Splitter Nodes and FDP with Straps Cable Fixing.

Riser Cable

COF207 cable is to be used in risers for **Tactical** installations. It comes in white, 96

fibres format. It should be secured with SCF (Straps Cable Fixing) on trays, or using cleats on walls.

Strategic networks use blown fibre tube bundles to feed the individual internal Splitter Nodes.

Two-fibre customer premises cable (non-terminated) (COF208)

In Strategic Network MDU's we may recommend you additionally install copper cable along with the two-fibre cable at first fix. We will discuss this with you when we discuss the telecom layout following receipt of your M&E drawings. Openreach will install and commission the ONT once permanent power is available.

This product comprises two fibres in a 4.8mm outside diameter ruggedized sheath, non-terminated at both ends. It will be used for internal / external distribution from an FDP or Splitter Node into each apartment.

This cable is available in 2 colours i.e. Black (normally external) and White (normally internal) but both these cables can be used externally or internally as both are UV stable suitable for external use and LSZH (Low Smoke Zero Halogen) suitable for internal use.

Customer Splicing Point

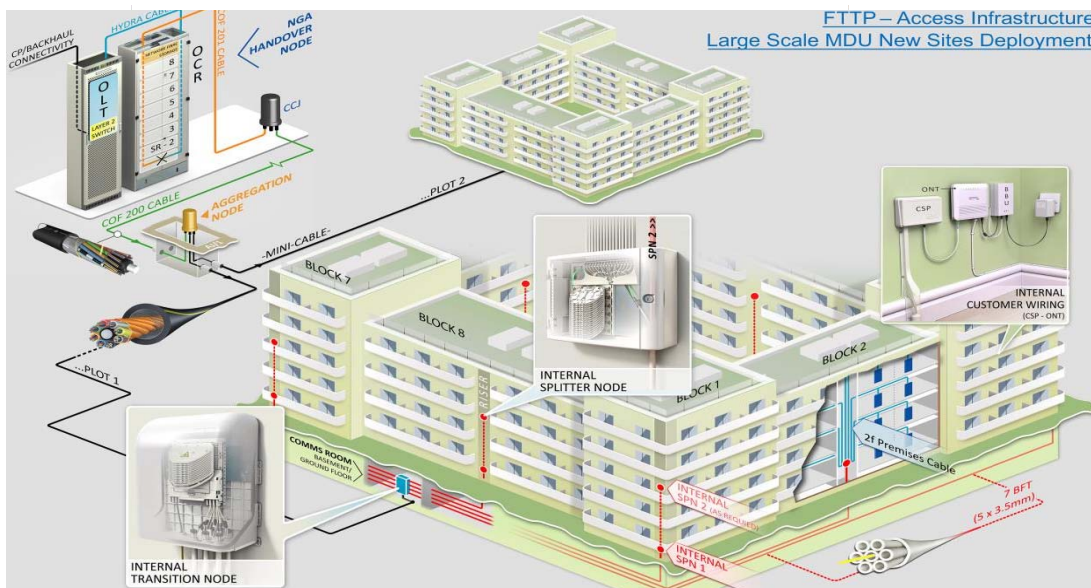
Customer Splicing Points should be provided at agreed locations inside the apartment for aesthetic and security reasons.

It is imperative that the required 2 metre length of 2 fibre EZ Bend cable is left coiled in the back box. This will provide easy retrieval to enable our engineers to complete the equipment installation successfully.



The 2 metre coil of EZ Bend cable should be left in the back box and then a blanking plate secured over the back plate ready for Openreach provision of the CSP and ONT nearby.

Large Multiple Dwelling Units – Network Design Example



The ONT & BBU Placement Guidelines

The Optical Network Termination Unit (ONT)

The ONT is used to convert the digital signals from the Openreach fibre network to a suitable form to be used by the end user.



Ports available on the rear of the ONT

1x Optical Port
4x Ethernet Ports
2x Telephony Ports
1x DC Power Input

ONT Dimensions

Indicative dimensions of the ONT are: 195mm (l) x 155mm (w) x 32mm (h). Dimensions are anticipated to reduce in the future, benefitting from technology improvements.

The ports can be seen in to the left in the image above. The optical port connects to the Openreach network using a connectorised cable to the internal or external customer splicing point (CSP).

The Ethernet ports are used to connect up to the customer data equipment or network.

Battery Backup Unit

The battery backup unit ensures telephone calls can still be made should there be any interruption to the mains power supply.



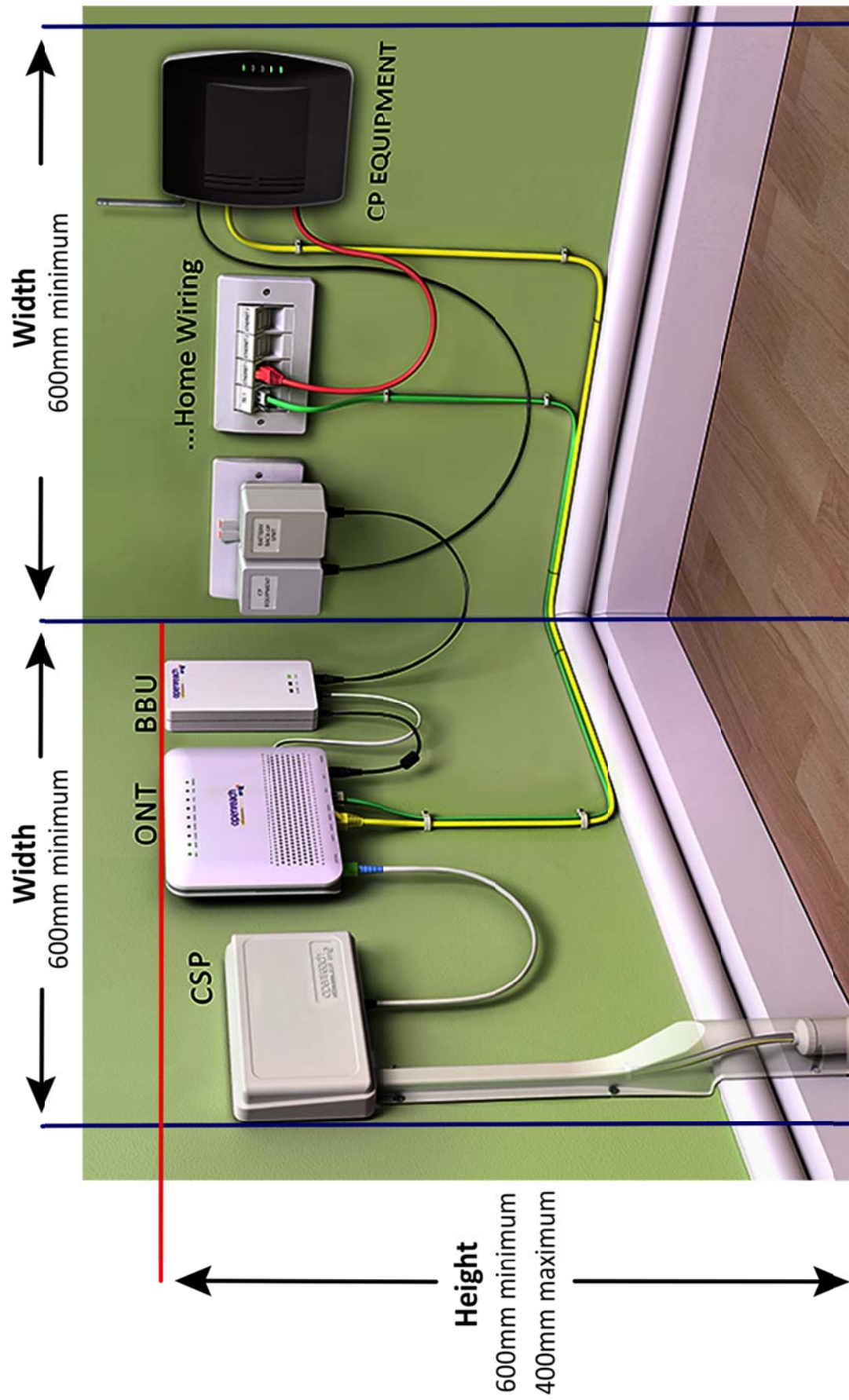
BBU Dimensions

Indicative dimensions of the BBU are: 55mm (l) x 155mm (w) x 35mm (h). Dimensions are anticipated to reduce in the future, benefitting from technology improvements.

Placement guidelines

The following applies to positioning the ONT and BBU:

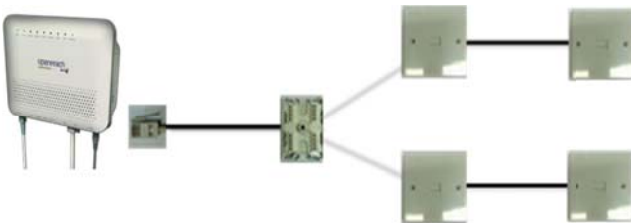
- 400mm above finish level of floor, ideally, but 300mm as a minimum
- Aligned with height of power outlet (double socket)
- Aligned with Customer Lead-In & Customer Splicing Point
- The ONT must be accessible for both end user and Openreach engineer.
- It must be in an environment above +5C but not exceeding 25C
- Where equipment is positioned under the stairs of single dwelling units (SDU) consideration for adequate ventilation must be observed. i.e. this area cannot be used for the storage of bulky items that could reduce or cut off air circulation.
- If trunking is used to hide cables, then please ensure that connectors can easily be located or removed



Voice & Data Wiring

Voice wiring

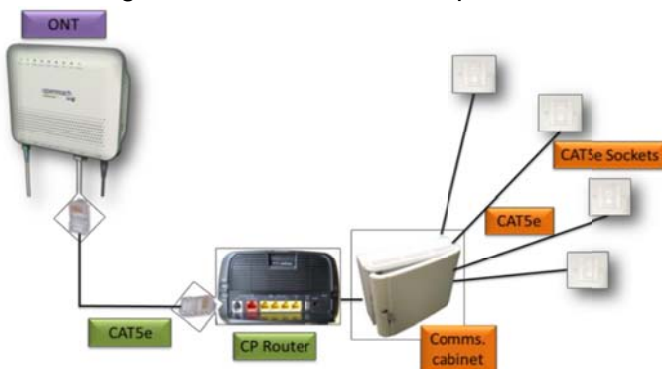
If a minimal voice home wiring installation is required, consisting of a series of interconnected sockets around the house, then one socket should be in close proximity to the ONT. Ideally the socket should be less than 0.5m away. The ONT port and the voice socket should be interconnected by a flying lead (male to male), from the back box to the ONT. The ONT has a standard telephone socket into which a 431A jack will be plugged in order to connect the ONT to the installed wiring.



The 431A jack is available from most electrical wholesalers.

Data wiring

Data wiring for two or more data sockets, must be star configured utilising Cat 5e cabling (or higher spec) as shown in image below. This provides the most flexibility for Ethernet-enabling each location within the premise.



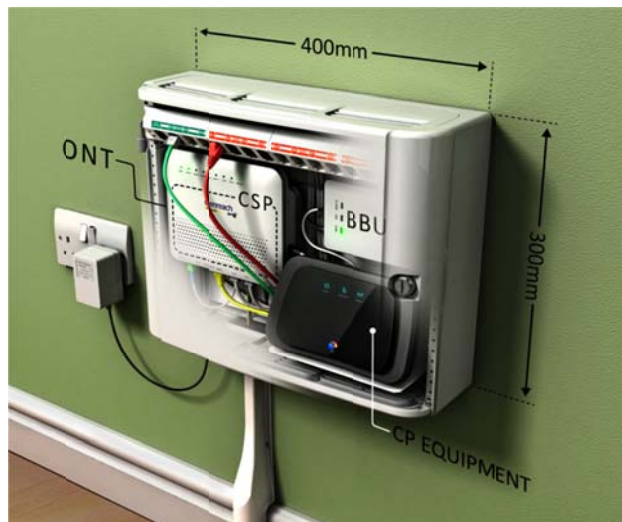
The CP router should be located near the ONT connected by Cat 5e wiring in order to connect to each point as required. Both the CP router

and ONT should be in close proximity of a double power socket.

Depending on the number of end points, you may choose to install a communications cabinet and patch panel to ease cable management

Optional “Comms box” – not supplied by Openreach

Where the drop duct terminates or the CSP has to be mounted in an area of high visual impact the customer could be offered the ‘cost option’ of mounting all the internal components in a ‘Comms Box’ which will house the CSP, ONT, ONT BBU, CP Equipment and Home wiring interface.



Note: The ‘Comms Box’ can be used where the drop duct terminates either internally or externally

A suitable supplier of the Comms Box is Prysmian. They can be contacted on 023 8060 8760 or at www.prysmian.co.uk.

Useful Contacts

Local NewSites Offices

Monday to Friday
09:00 to 16:00

www.openreach.co.uk/newsite

All numbers are a Freephone service.

Scotland & North East

Tel: 0800 141 2650

email: newsitereceptionedinburgh@openreach.co.uk

North west & Cumbria

Tel: 0800 141 2679

Email: newsitereceptionmanchester@openreach.co.uk

Yorkshire & Lincolnshire

Tel: 0800 141 2653

Email: newsitereceptionsheffieldlincs@openreach.co.uk

Wales

Tel :0800 141 2657

Email: newsitereceptionswansea@openreach.co.uk

Midlands

0800 141 2675

newsitereceptioncoventry@openreach.co.uk

East of England

0800 141 2670

newsitereceptioneastofengland@openreach.co.uk

South West

0800 141 2659

newsitereceptionplymouth@openreach.co.uk

London & Berkshire

0800 141 2672

newsitereceptionromford@openreach.co.uk

South East

0800 141 2674

newsitereceptionnorthdowns@openreach.co.uk

Northern Ireland

0800 085 7546

newsite.btni.team@bt.com

British Standards Institute Document

Next generation access for new build homes

Email: www.culture.gov.uk/publications/7830.aspx

Openreach Invoice Enquiries

Tel: Freephone 0800 515 465

Openreach Plant Maps

Call Freephone 0800 169 3849

email stoke.incoming.notices@openreach.co.uk

General Enquiries/Information

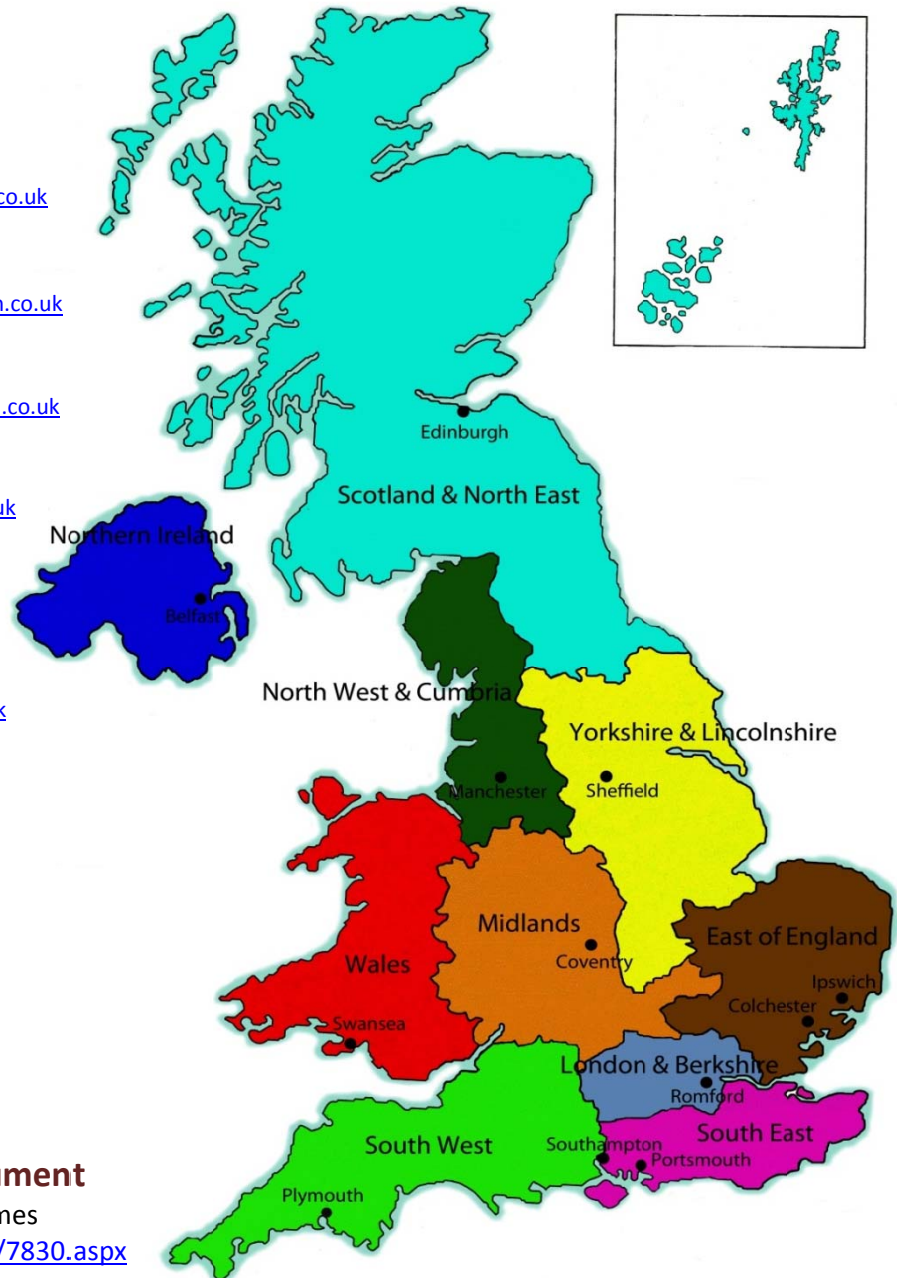
<http://www.openreach.co.uk/orpg/home/contactus/contactus.do>

<http://www.openreach.co.uk>

Dial Before You Dig

Tel: Freephone 0800 023 2023 Option2

email: dbvd@openreach.co.uk



Wayleaves (including Northern Ireland)

Tel: Freephone 0800 581 525

email: wayleaves.north@openreach.co.uk

email: Wayleaves.south@openreach.co.uk

Repayment project offices

If you're a highways authority, utilities company, developer or architect wanting to alter our network, contact the nearest Network Alterations Team to your proposed site.

<http://www.openreach.co.uk/orpg/home/contactus/alteringournetwork/alterationcontacts/alterationcontacts.do>

1 Scotland

Dundee

networkkalts.scotlandnth@openreach.co.uk

Edinburgh

networkkalts.edinburgh@openreach.co.uk

2 North East and Yorkshire

Bradford/Leeds/Sheffield/York

alterations.yorks.g@bt.com

Middlesbrough

networkkalts.middlesboro@openreach.co.uk

Newcastle

networkkalts.newcastle@openreach.co.uk

3 North West

Liverpool

liverpool.repayments@openreach.co.uk

Manchester

networkkalts.manchester@openreach.co.uk

Preston

preston.repayments@openreach.co.uk

4 East Midlands

Leicester

networkkalts.leicester@openreach.co.uk

Lincoln

networkkalts.lincoln@openreach.co.uk

Nottingham

networkkalts.nottingham@openreach.co.uk

5 West Midlands

Birmingham

networkkalts.birmingham@openreach.co.uk

Coventry

networkkalts.coventry@openreach.co.uk

Kidderminster

networkkalts.kidminster@openreach.co.uk

Stoke

networkkalts.stoke@openreach.co.uk

6 Wales

Bangor

networkkalts.bangor@openreach.co.uk

Cardiff/ Newport

networkkalts.swales@openreach.co.uk

SHREWSBURY

networkkalts.shrewsbury@openreach.co.uk

7 Home counties and East Anglia

Cambridge/Luton/Peterborough

networkkalts.eastern@openreach.co.uk

Norwich

alterations.norwich.g@bt.com

Oxford

oxford.repayments@bt.com

Reading

networkkalts.reading@openreach.co.uk

Southend

networkkalts.southend@openreach.co.uk

8 Southwest

Bristol/Exeter/Gloucester/Plymouth/Swindon/Taunton

networkkalts.southwest@openreach.co.uk

9 London (Central & Outer)

City of London

networkkalts.city.of.ldn@openreach.co.uk

North East London

networkkalts.ilford@openreach.co.uk

North West London

networkkalts.nthwestldn@openreach.co.uk

South East London

networkkalts.westkent@openreach.co.uk

South West London

staines.repayments.team@bt.com

10 South and Southeast

Aldershot

networkkalts.aldershot@openreach.co.uk

Bournemouth

networkkalts.bournemouth@openreach.co.uk

Brighton

networkkalts.brighton@openreach.co.uk

Canterbury

networkkalts.canterbury@openreach.co.uk

Gillingham

networkkalts.gillingham@openreach.co.uk

Portsmouth

networkkalts.portsmouth@openreach.co.uk

Redhill

networkkalts.redhill@openreach.co.uk

Southampton

networkkalts.southampton@openreach.co.uk

Tunbridge Wells

networkkalts.tunwells@openreach.co.uk

11 Northern Ireland

Belfast

repayment.planning.mjn87@bt.com



NewSites Checklist

Developer:

.....

Address:

.....
.....
.....

Postcode:.....

NewSites Contact:

Site Manager:

Telephone:

NSR Contact:

Name:

Telephone:

NSI Ref:

1 <input type="checkbox"/>	<p>Confirm the Site Proposals/Optimised layouts (symbols) are on the current plan. Check developer can provide a duct and cable route into site for the build programme to allow provision of cables on plot completion. Explain the charges for re-plans due to any developer's layout changes. Determine location of Sales Office and any requirements for lift lines. (At present Fibre does NOT support lift lines door entries) This may need to override first occupation date on CONGO.</p>
2 <input type="checkbox"/>	<p>Seek to secure the Council Addressing for the site at the earliest opportunity</p>
3 <input type="checkbox"/>	<p>Discuss the developers' responsibilities for quality of work on site, and provision of plant to facilitate cabling and jointing work. Outline the importance of completing work correctly first time to avoid any remedial work. That all duct blockages that prevent Openreach connecting the properties, will incur a charge to the developer, and these will also need to be cleared by the developer. Agree a date with the builder for a joint inspection of work completed to confirm an acceptable quality prior to the first occupancy date.</p>
4 <input type="checkbox"/>	<p>Explain the importance of plot management and the need for the Site Manager to inform the NSR of site progress and plot readiness, ensuring that all the work is complete to provide a telephone connection prior to the property being occupied. Explain also, that Openreach will seek to recover any payments made to its suppliers for abortive visits to sites where plots have been declared ready by the site manager or his staff.</p>
5 <input type="checkbox"/>	<p>Discuss the Builders Guide pointing out the Specifications for:-</p> <ul style="list-style-type: none"> ▶ Laying of Openreach duct, and Construction of Openreach boxes (Minimum depth 600mm Copper site/750mm for Fibre sites). Explain also the option to use Pre-formed chambers at their own cost. ▶ Duct to be cut flush with brickwork keeping them away from the side walls, and that joint boxes are to be clear of debris. ▶ Brackets (channel irons) and bearers to be installed in all boxes. ▶ Box level should be flush with ground level and clear of debris. ▶ In an unmade surface or grass surface a joint box frame shall be surrounded with a 100mm wide strip of grade C30 concrete, finished with the frame. ▶ The duct 56 at the House/Unit shall be cut off 1 course of bricks above finished ground level and directly in line under the entry point to the main socket as per the Builders Guide. ▶ Single dwelling units (SDUs) we require 3m of cable left in designated BT joint boxes and 1m of cable at the House End

<p>6 <input type="checkbox"/></p>	<p>Fibre – Explain NO orders can be made or taken via their service provider until all installation works of our equipment into each plot has been completed and tested, unlike copper (240 volt supply needed for testing).</p> <ul style="list-style-type: none"> ▶ What is the preferred location for the duct entry point at the house end – Internal or external ▶ Discuss the equipment we will need to install including the size and location and the need for a double power socket. ▶ Fibre Single dwelling units (SDUs) we require 3m of tubing left in designated BT joint boxes and 1m of cable at the House End with end stops fitted. ▶ Fibre Multi-dwelling units (MDUs) Fibre cabling / tubing must have a 2 metre coil in each MDU , protection needed to stop damage
<p>7 <input type="checkbox"/></p>	<p>Remind the builder that any changes made to the installation <u>Must be agreed beforehand with the New Site Representative</u> and of their obligations to manage the work carried out on site in accordance with the terms and conditions of the SOD contract. Explain the new payment process, that the PO will be provided at the end of the build unless on large sites part payment is required. Stress that sub-standard work will have to be remedied before payment will be authorised by the NSR. Point out that under the terms and conditions, payment will only be possible for 1 year following the completion of the civils work .</p>
<p>8 <input type="checkbox"/></p>	<p>Explain the stores ordering process and point out the stores page in the current copy of the Builders Guide. Explain stores are to be signed for on delivery and kept in a secure area designated for Openreach stores only. Emphasise free provision/delivery of stores by Openreach and stress that the stores are only intended for Openreach use and any misuse, loss or damage will be thoroughly investigated and charge may be raised.</p>
<p>9 <input type="checkbox"/></p>	<p>With MDU's, stress that Openreach requires an NTE5 that can disconnect the internal sockets for testing purposes and this can be achieved with a NTE5B fitted discreetly so the developer can fit brass/chrome sockets if required. The position must be noted on DNODE</p>
<p>10 <input type="checkbox"/></p>	<p>Discuss provision dates for off-site duct link to site, and the need to mark the duct position, also, building and position of the first joint box on site and cable provision to that joint box</p>
<p>11 <input type="checkbox"/></p>	<p>Check if there is any existing Openreach plant on site that is still in use, if this requires moving, explain it will now be chargeable and produce A55 for NSO plan and process. For Identification of existing plant and Diversions (Dial 0800 9173993 for dial before you dig)</p>
<p>12 <input type="checkbox"/></p>	<p>Check wayleave compliance. Will the plant cross a third parties land? If it does, gather contact details and if possible gain an agreement. Can the proposals be used for a wayleave application without amendment? If not, amend proposal accordingly</p>
<p>13 <input type="checkbox"/></p>	<p>Explain the important of the provision of telecommunication prior to occupation and that broadband is an essential service home owners require when moving in. Home owners in today's society are expecting their internet connection to be important as other statutory undertakings.</p>

Remember - Please do not abuse a New Site Rep

Developer Quality Checklist

Developer:

.....

NSI Ref:

.....

Address:

.....

.....

.....

NSR Contact

Name:

Telephone:

Postcode:

	Item Audited	Checked			Remarks
		Yes	No	N/A	
1	Correct type of duct provided.				
2	Ducts laid at a minimum depth, or exceptions agreed and documented.				
3	2 pair cable or draw rope provided in sound condition and correctly jointed where applicable.				
4	Duct separation distance maintained, or exception agreement obtained and documented.				
5	Bolts fitted during construction of boxes.				
6	Bearers, brackets and steps fitted where applicable.				
7	Ducts properly trimmed and keyed when set in walls.				
8	Frames and covers bedded and correctly installed.				
9	Cement and brick types used as specified or exceptions agreed and documented.				
10	Boxes free of debris or other inappropriate material.				
11	Cable entry at properties installed and properly protected.				
12	XNTE correctly installed.				
13	Internal wiring correctly installed.				

Plot numbers encompassed in this check sheet

Developers Representative:

Print Name:

Signature:

Date:

NewSites Representative:

Print Name:

Signature:

Date:

NB. The above defects have been identified and require remedial action before payment is authorised. If the above defects are claimed as complete and subsequent visits demonstrate otherwise, Time Related Charges will be applied.

FTTP Strategic Newsite - Overview

The delivery of the Strategic New Sites product is an Openreach FTTP service that has been developed especially for new sites whether they be residential or commercial build

The splitter nodes in this network only serve up to 32 premises and there are no external fibre distribution points (FDPs).

This network will be fully deployed and commissioned to all premises when it is first built. There is therefore no need for an Openreach engineering visit when a customer order is received.

As the developer, you will build the duct network on site, as per plans supplied by our New Site Designer.

A Strategic Network, from the street you provide 25/17 duct to the agreed position in each property Then install one 6 mm Blown Fibre Tube (BFT) inside the duct. Each SDU will have one 6 mm Blown Fibre Drop Tube installed from the BFT Manifold box as per plans.

The customer duct is a 25 mm duct (DUCT 25/17 DROP DUCT) This duct is supplied in 50m coils and can be joined if necessary using 25 mm SDMB5 connectors. An adapter has been developed to enable this duct to be connected to Duct 54/56 swept T.

Drop Duct 25/17 (I/C 046897) is connected to a Duct 54/56 Swept Tee Connection (I/C 001792) using a Connector Duct 56/25 Drop Duct (I/C 046898).

It is advisable to fit the connector to the Drop Duct first and it must be driven home to the step inside the connector using a rubber mallet or similar. The connector must also be driven home into the step in the swept tee using similar methods. The Duct 25/17 bending radius is 450 mm.

The duct section from the premises to the underground Manifold will contain a number of swept 'T's. Each 'T' forms the duct connection point for the premises duct to the main Duct 54. Following evaluation, the maximum number of swept 'T's connected in series from

the BFT Manifold to the furthest Address Point must be restricted to twelve.

The maximum distance from the BFT Manifold to the furthest premises can be up to **120 metres**, which is the maximum length achievable with a 9 mm continuous rod (COBRA), but **60 metres** is our preferred length.

You, as developer, or your architect will decide where the 25 mm Customer Drop Duct will terminate in the premises.

On instances where the kit is pre-provided, the location of where the kit is installed is the responsibility of the developer, however it is always good to point out that End Users will be asked to see lights on the ONT and CP equipment when raising a fault, so at the back of a cupboard may not be a practical place to install for on-going management.

The splicing point is the transition point between the external and internal cables and can be located either externally or internally. For drop duct terminating externally, ideally the CSP is mounted above the Capping 25 covering the lead in

Where the drop duct terminates within the premises, the CSP has to be mounted internally and it should be mounted directly above the duct entry.

The entry point must also take account of the need to connect internal home wiring for both ordinary voice phone extensions and data network as well as the need to juxtapose the Openreach Network Termination (ONT) (with power), and any CP equipment e.g. a Router.

The ONT must be located within a metre of a suitable power supply

The CSP and ONT are designed to be co-located.

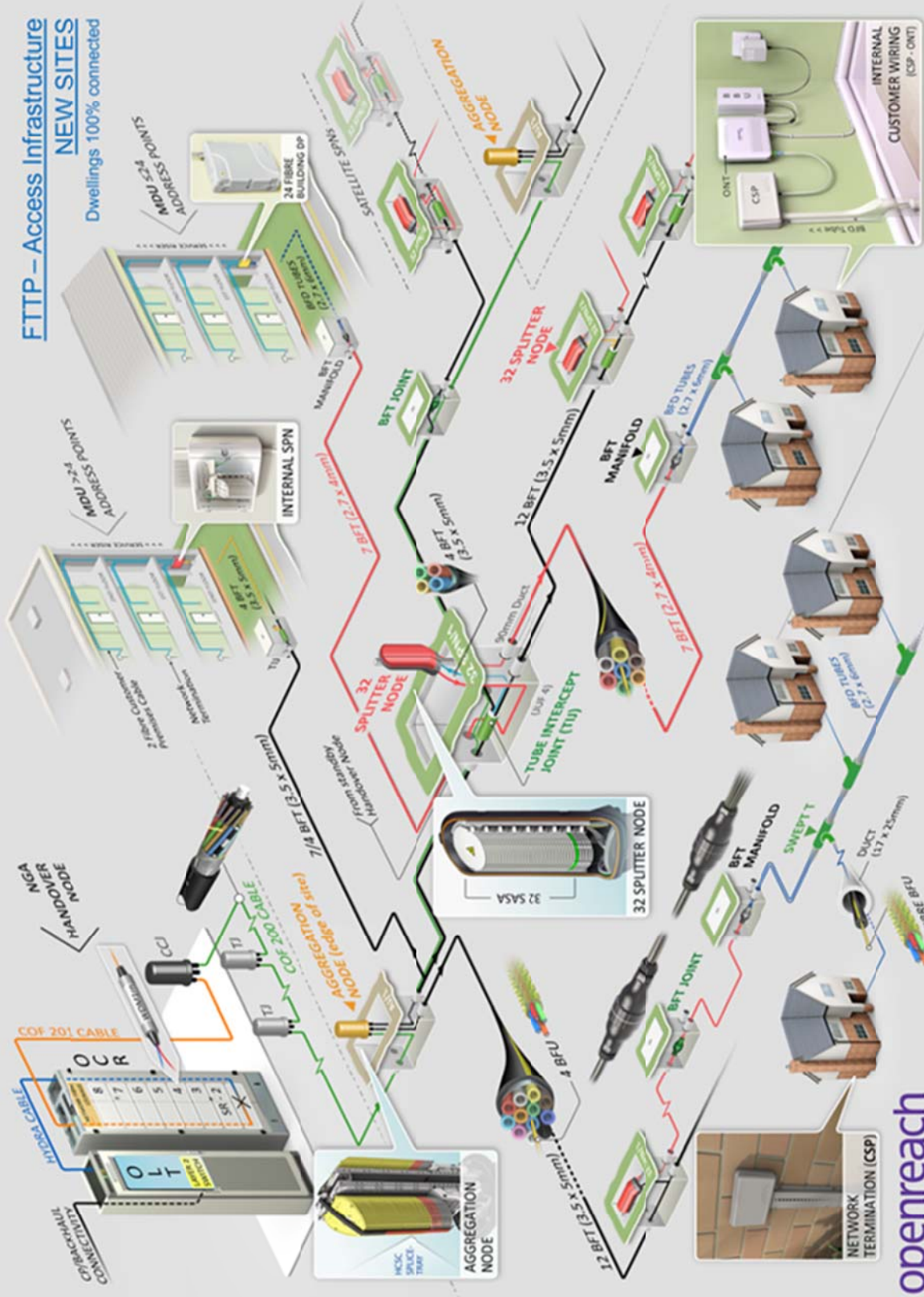
It is the responsibility of the developer to supply suitable internal capping/trunking.

Overleaf is a schematic of a typical Strategic Newsite

FTTP – Access Infrastructure

NEW SITES

Dwellings 100% connected



FTTP Access Infrastructure (version 3.7)



Notice

BT maintains that all reasonable care and skill has been used in the compilation of this publication. However, BT shall not be under any liability for loss or damage (including consequential loss) whatsoever or howsoever arising as a result of the use of this publication by the reader, his servants, agents or any third party. In the event of a discrepancy between the contents of this document and the contract, the Terms & Conditions shall take precedence. This is a living document and will be subject to update and change. The information within this document is provided for information purposes only. The Contract and Price List take precedence.