

# Builder's guide

to telecommunications  
infrastructure and installation



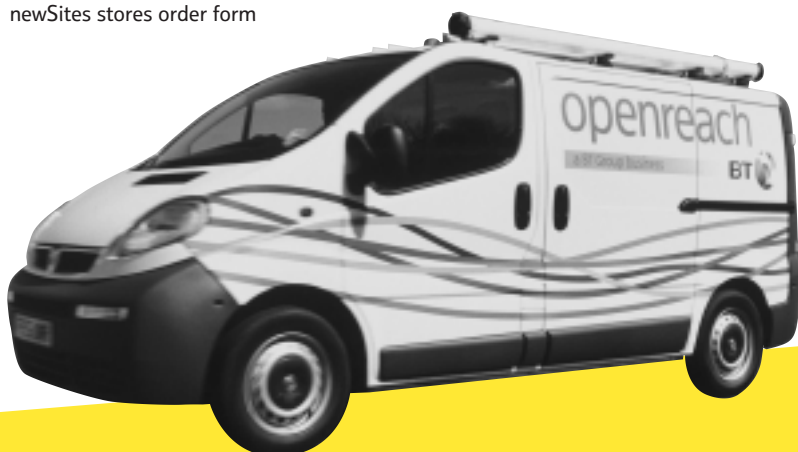
openreach

a BT Group business



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# Welcome to Openreach

Openreach was launched in January 2006 to provide installation and maintenance services on behalf of Communications Providers. We are responsible for the 'first mile' of the national access network – where millions of calls, web searches and business deals are started each day.

Our 25,000 Openreach engineers support and maintain the wiring, fibres and connections which link millions of homes and businesses in Great Britain to the networks of Communications Providers. Over the course of a year, they make 3.5 million customer visits across the length and breadth of the country.

As part of Openreach, the newSites operation is committed to ensuring all Communications Providers have transparent and equivalent access to the local network.

## The Openreach mission

Openreach seeks to be the connectivity partner of choice for Communications Providers, connecting their customers' premises to telecommunications networks via fixed-line local access and backhaul connections. Underpinning this is a commitment to treat all our customers in the same way and develop our network to support their businesses.

We are dedicated to:

- Ensuring equal access to the services and assets associated with the local loop and the copper wires that run between telephone exchanges and end users
- Providing our customers with all the benefits of our network experience and expertise while being independent and accessible to all
- Accelerating the broadband revolution while improving service and reliability
- Reinventing the infrastructure to support the continuing success of the UK telecommunications industry

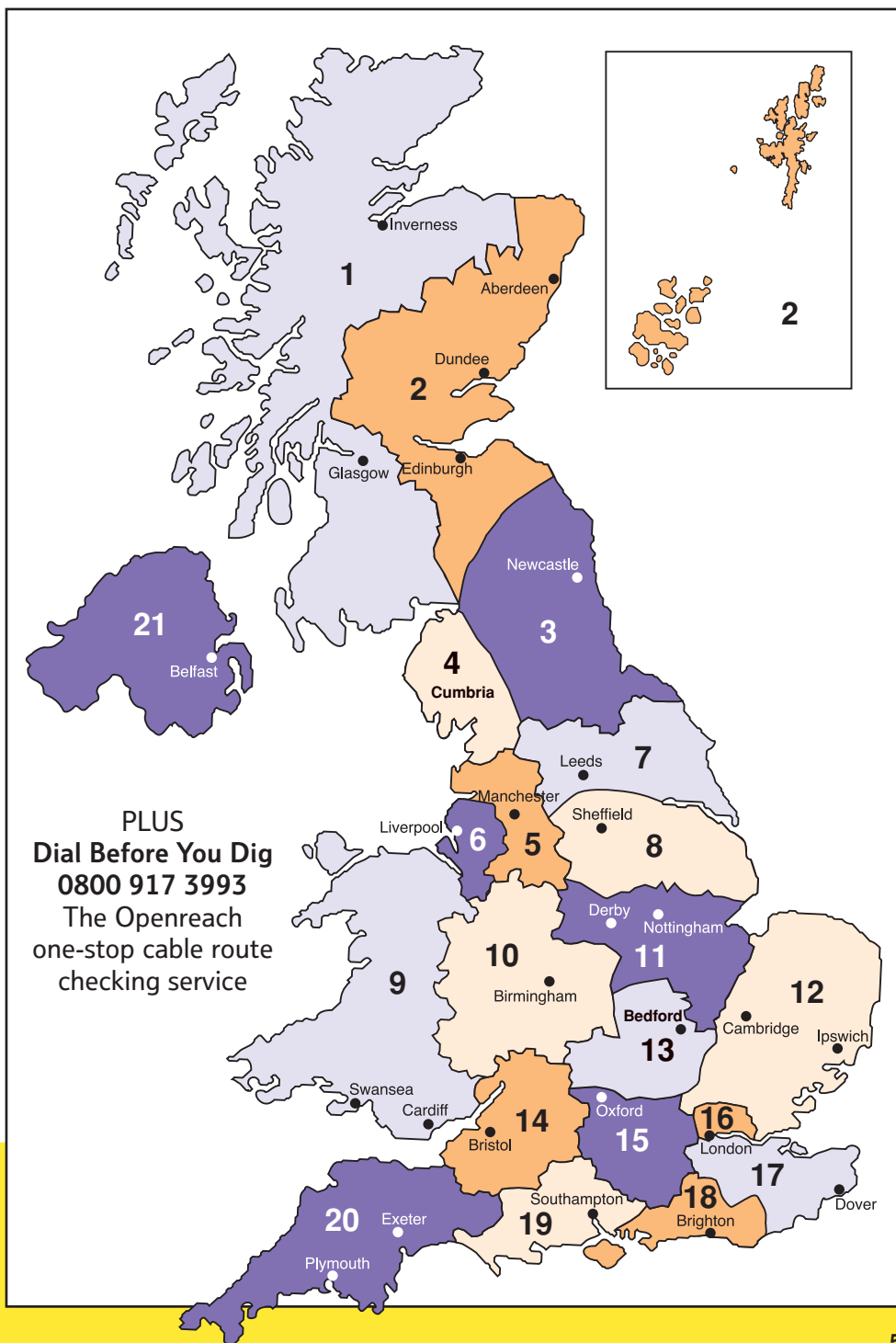
Find out more about Openreach by visiting [www.openreach.co.uk](http://www.openreach.co.uk)

### **Ownership of network apparatus and contracting party**

The network apparatus/equipment to be installed at your development will be owned by British Telecommunications plc ('BT'), and all references to 'Openreach' in this document should be read accordingly. Openreach is an operating division of BT responsible for the physical layers of the BT access and backhaul networks. Similarly any contract with a developer will be with 'BT'.

# How to contact your nearest newSites office

Office	Local Number/E-mail
1 Glasgow	0800 389 8439 newsite.glasgow@openreach.co.uk
2 Edinburgh	0800 389 8364 newsite.edinburgh@openreach.co.uk
3 Newcastle	0800 212 874 newsite.newcastle@openreach.co.uk
4 Lancs & Cumbria	0800 731 7215 newsite.lancscumbria@openreach.co.uk
5 Manchester	0800 731 7208 newsite.manchester@openreach.co.uk
6 Liverpool	0800 731 7166 newsite.liverpool@openreach.co.uk
7 Leeds	0800 3898537 newsite.leeds@openreach.co.uk
8 Sheffield & Lincs	0800 169 0338 newsite.reception.sl@openreach.co.uk
9 Swansea	0800 731 4815 newsite.swansea@openreach.co.uk
10 Kidderminster	0800 731 6901 newsite.kidderminster@openreach.co.uk
11 Nottingham	0800 7318138 newsite.nottingham@openreach.co.uk
12 Felixstowe	0800 592 389 newsite.felixstowe@openreach.co.uk
13 Bedford	0800 731 1877 newsite.bedford.g@openreach.co.uk
14 Bristol	0800 373 529 newsite.bristol@openreach.co.uk
15 Oxford	0800 731 5014 newsite.oxford@openreach.co.uk
16 Romford	0800731 7346 newsite.romford@openreach.co.uk
17 Crayford	0800 731 6962 newsite.crayford@openreach.co.uk
18 Southdowns	0800 234 6753 newsite.southdowns@openreach.co.uk
19 Southampton	0800 234 6752 newsite.southampton@openreach.co.uk
20 Plymouth	0800 212 288 newsite.plymouth@openreach.co.uk
21 Belfast	02890 213686 newsite.btni.team@bt.com



# Make the Openreach newSites office your first port of call

The newSites 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.

Openreach is the preferred supplier in the communications market and by working closely with you we can design and build the network which ensures your customers have access to the latest services offered by these suppliers.

This installation guide will assist you at every stage of your development.

## What we will need from you:

- Confirmation of planning permission being granted.
- Details of your site location and a scaled layout plan.
- Floor plans for all the properties on the development.
- Proposed site start date and proposed first occupancy date or 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.

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.



## What we will give you in return:

- Information on how to gain access to Openreach plans via Maps by Email (MBE) for those who use the Internet (free service). Failing this, we will supply paper copies of the plans showing the relevant existing Openreach plant, but this does incur a small charge.
- Applications for access to MBE can be made via [www.openreach.co.uk](http://www.openreach.co.uk). For other enquiries about Maps by Email, call our helpdesk on 0800 169 3849 or email [stoke.incoming.notices@openreach.co.uk](mailto:stoke.incoming.notices@openreach.co.uk)
- Technical standards and specifications for each stage of your installation.
- Enough material to enable you to complete the proposed works.

Your newSites office is available for full consultation (Monday to Friday) and will help to arrange contracts for plant installation on-site when you need them.

We also provide a FREE service to help you locate our underground network and avoid costly damage. To take advantage of this, just Dial Before You Dig on **0800 917 3993**.

You will be assigned your own newSites team who will make regular contact throughout the programme to help you mark out the best routes for Openreach plant, arrange for the provision of all Openreach materials and organise the installation of main cables when you're ready.

Since the role of the newSites team is to offer advice and ensure that everything goes to plan, an early meeting is recommended.

You can reach the right people quickly and easily via a single contact number – **0800 616 866** – between the hours of 08.30 – 16.30 Monday to Friday. Landline calls will divert automatically to your local office. Alternatively see map on page 5 for your nearest office.

## The Openreach newSites team can be contacted at any stage of the development

At outline planning stage or when permission has been granted, our designers can look at your initial proposals, outline main routes for Openreach cables, and provide all that is necessary for you to plan supplies to your development. Openreach will require a minimum of four weeks notice before on-site work commences. This will allow for the proposed design lay-out to be planned. If this notice period is not given, then a charge may be levied for a premium service.

# The Openreach policy for the supply of telephony services on new developments

- 1 It is the responsibility of the Openreach newSites representative to inform you of the chosen method of connection to the Openreach network. This will be determined by availability in your locality. If you prefer an alternative method of service to that proposed, then this will be considered but additional associated costs may apply. Openreach newSites will endeavour to issue proposals for your site within a four week timeframe prior to your intended site start date. However, if you require a proposed layout in advance of this, a premium service charge will be applied.
- 2 It is important that your designated Openreach newSites office is supplied with a comprehensive final plan of the site layout, ideally including all postal addressing associated with your new development. Any subsequent amendments or layout changes to the original proposal will require updating and this will need to be amended by your newSites designer to ensure that a bespoke service is delivered. Please note: Any re-work requests will incur relevant charges.
- 3 We will seek a written agreement in the form of a wayleave from you which will give us permission to install and keep apparatus on site to serve your prospective customers. If you are building multi-occupancy properties – for example flats or apartments – the wayleave must also include wiring up to and including the Openreach Network Termination Point (NTP) at each property.
- 4 Should you wish to install Openreach plant under contract within the confines of your site, we will agree for you to proceed providing that the necessary quality and safety standards can be met. However, work on our existing network can only be carried out by our own accredited engineers and designated contractors.
- 5 Openreach will advise on site on all technical specifications including the use of all Openreach materials and the positioning of plant. Openreach equipment should only be used for the installation of our own network. Any other use will be deemed to be inappropriate and legal redress will be sought. If Openreach stores are lost, damaged or misused, the cost of replacement will be invoiced against your company.
- 6 In the case of flats or apartments, where you wish to provide service to individual flats beyond the intake duct, we will provide materials to serve each flat. We would, however, require you to provide the conduit and/or cable tray.
- 7 Openreach will provide network to an external NTE or to an internal NTE/DP normally located within three metres of entry into the premises. Charges may apply for other arrangements.
- 8 Whilst construction is in progress, the newSites representative will inspect the work being undertaken on behalf of Openreach. Any sub-standard work found on site will be noted and the site agent will be informed. On-site payments cannot be made until all work has been quality checked and any faults have been corrected to Openreach standards.
- 9 Any payments for work carried out on Openreach's behalf will be made in line with the Inland Revenue's Construction Industry Scheme. Guidance is available at [www.hmrc.gov.uk/new-cis/index.htm](http://www.hmrc.gov.uk/new-cis/index.htm)
- 10 Where there is a need for additional protection or diversion works to our existing network, Openreach will require payment of the estimated costs, in advance, as provided for in the New Roads And Street Works Act 1991 Code of Practice.
- 11 It is the Openreach policy not to share any infrastructure with any other licensed/unlicensed operator. Please contact your newSites team if you require further information.
- 12 Openreach will not normally be involved with the installation of internal extension sockets or associated cabling beyond the Openreach Network Termination Point (NTP). However, we can put you in touch with the correct Openreach department who can provide advice and guidance and even undertake such work on request.
- 13 With the exception of pre-formed chambers, Openreach materials will be delivered free of charge on request. We operate a single day per week delivery service to all regions. Therefore early notification of requirements is needed. If materials are required urgently, a small charge could be incurred.
- 14 The network apparatus/equipment to be installed at your development will be owned by British Telecommunications plc ('BT'), and all references to 'Openreach' in this document should be read accordingly. Openreach is an operating division of BT responsible for the physical layers of the BT access and backhaul networks. Similarly any contract with a developer will be with 'BT'.



# Diversions works affecting Openreach

## Work affecting existing Openreach plant

When our network plant and equipment is affected by the work of others, Openreach, in common with other utility companies, has to follow the correct legal procedures. This helps to establish important details such as who must pay for any alteration work and also helps to determine the timescales which you can expect us to work within.

If your work is likely to affect Openreach plant – for instance where your site interfaces with the existing public highway – you should contact our Network Alterations team to discuss the possible cost implications.

We can supply a budget estimate of the possible costs of alteration works, free of charge, normally within 20 working days of your request. This will include an estimate of our costs for carrying out a site survey and producing a detailed estimate and scheme design and will give you the financial information to help with your own budgeting and enable you to consider possible alternatives if necessary.

When your plans are firmed up, you will need to issue formal legal notices. This will be determined by the precise nature of your work and the arrangements you may have with the local Highway Authority.

Because our network is very complex, notices should be given as early as possible so that we can identify all possible alternatives, and to enable us to design the most cost effective alteration scheme. This will result in overall savings for your scheme.

**Please note that Openreach complies with the New Roads and Streetworks Act 1991 Codes of Practice.**

We aim to produce the detailed estimate and scheme design, normally within 25 working days.

The programme timescales for completion of the physical diversion work can then be agreed and will depend on the scale of the works required.

## Avoiding damage to the Openreach underground network

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 917 3993**

**Fax: 020 8326 4050**

**Email: [dbyd@openreach.co.uk](mailto:dbyd@openreach.co.uk)**

An Openreach representative will visit your site and discuss and/or mark existing Openreach plant. Please note: This is a FREE service.



# Miscellaneous charges and how they apply

In certain circumstances, miscellaneous charges may be levied on developers and/or their contractors.

## Misuse and/or damage to plant

Openreach equipment is provided to you free of charge. However, it should not be misused. Openreach equipment should be used only for the purpose for which it is intended, i.e. Openreach network infrastructure. If Openreach stores items are lost, damaged or otherwise misused, your company will be charged for the cost of replacement.

The Openreach contract states: “Without prejudice to any other rights or remedies available to Openreach, the contractor shall indemnify Openreach against all loss or damage to any property belonging to Openreach arising out of acts or omissions of the contractor, its employees, agents or subcontractors in relation to the performance of the contract.”

If work is undertaken on behalf of Openreach, the terms and conditions of the contract are deemed to have been accepted.

## Requests for underground services

It is the responsibility of the Openreach newSites representative to tell you the method we will use to provide service to your site. Our preferred method, if overhead lines are in the proximity, is by telephone poles and overhead wires. If you insist on an underground service, your company will be invoiced for the costs of survey time, stores delivery, work required to connect your duct to the Openreach network, and any associated labour charges.

## Requests for premium proposals and changes to site proposals

Once Openreach newSites has received the final plan of your site, we will endeavour to issue you with layout proposals four weeks prior to your intended site start date. If you require a layout more than four weeks ahead, or for costing purposes, a charge will be applied.

Once a designed layout of the Openreach infrastructure has been provided, all subsequent requests for revisions or amendments will be charged for.

## Plant location map requests

We will refer all requests for information about the positioning of our plant to our Map by Email service which is available at <http://www.openreach.co.uk/orpg/networkinfo/locatenetwork/mapbyemail.do>

If you prefer not to use this service and require paper copies to be sent by post, a fee (available on request) will be charged, payable by return to the Openreach newSites office.

## The charges

Charges are available on request from your newSites representative.

# Making the infrastructure work for you

If your development requires infrastructure work or build services, let Openreach provide you with a quotation to meet your specification.

Our fully trained specialist will visit your site, discuss your requirements, agree a specification and give you a written quotation for this work. We will then send you a written agreement setting out the terms upon which we will provide the service to you.

## Data Cabling Services

- Category 5e and Category 6 Wiring (1 point to 20,000 points) from a full range of manufacturers
- Fibre Optic Backbones, Inter-building and Cross-campus, Single mode, Multimode and OM3 grade
- Integrated voice backbone cabling
- Cabinets, Open-frames and Patch Panels
- Active Equipment Provision and Patching
- Tracing, Testing and Site Documentation

## Voice Cabling Services

- Pre-wiring of Internal Line Jack Unit/Outlet Points
- Internal/External Multi-pair structured cabling Installations
- Customer distribution frames, and distribution points
- Tap and verification of existing circuits, Tracing, Toning and Site Documentation
- Installing and Testing Handsets

## Let us meet your needs

If you would like a written quotation please ring the 0800 number listed for your location on the map of Britain page with your name and telephone number and we will arrange a visit.

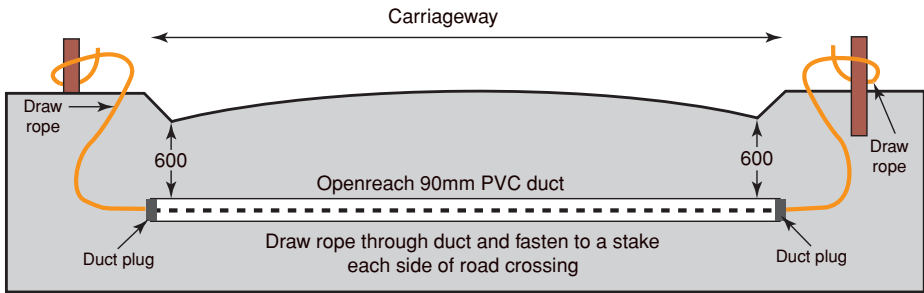
## Cabling Containment Services

To protect your cabling from damage we install a full range of cable containment as follows:

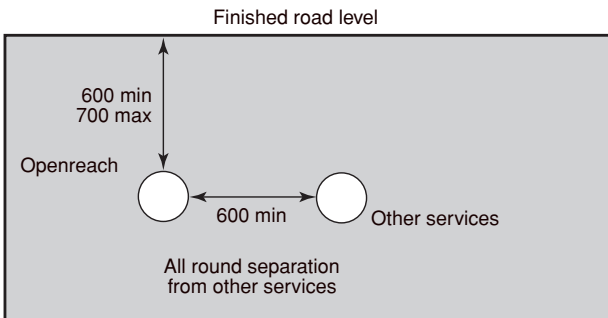
- Dado and Skirting Trunking
- Galvanised Cable Tray
- Wire Cable Basket
- PVC and Metal Round Conduits
- PVC and Metal Trunking
- Flexible Conduit (Kopex)
- Underground Ducts and Draw pits
- Catenary Wires (Overhead)
- Floor outlet boxes (False Floors)



# Arrangement of carriageway roadcrossings



**Fig 1**



## Notes:

1. All PVC duct and drawrope supplied by Openreach
2. Kerbs to be marked each side of road crossing
3. All PVC duct to be laid as straight as possible

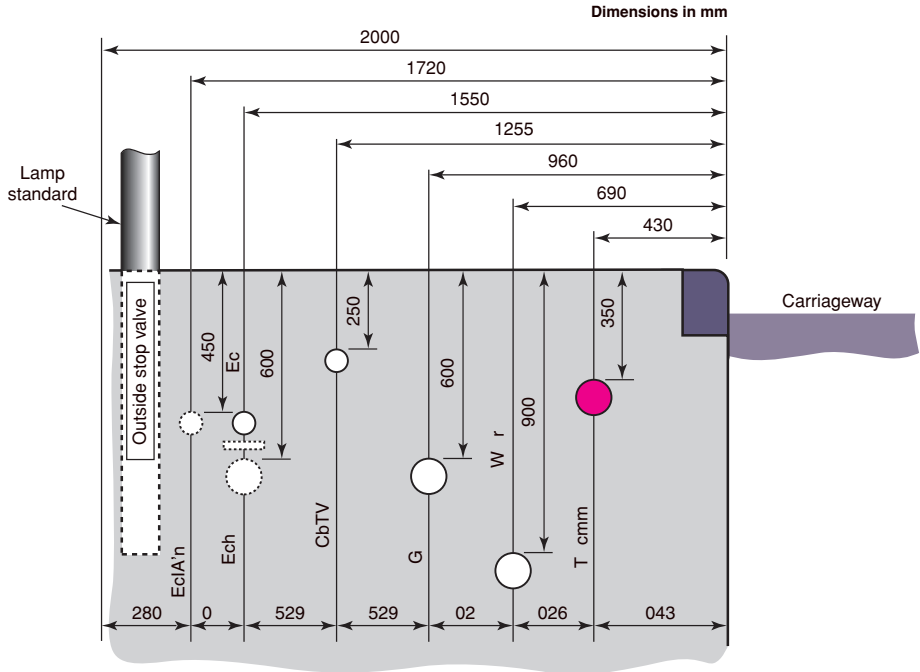
**Dimensions in mm**

**Road crossing laid on new estates by a developer**

**Fig 2**

- Duct laid beneath a carriageway crossing must be 600mm cover from final surface levels and, for engineering reasons (NJUG 7), 600mm separation from other services laid in parallel or 150mm if laid at right angles (see Fig 2).
- Road crossing requires 600mm separation from other services to allow construction of Openreach underground joint boxes without the need for fixed bends.
- Where Openreach duct crosses the carriageway, adjoining kerbs are to be marked temporarily denoting location of duct positions (see Fig 1).
- Openreach duct to be laid on outer edge of service trench to facilitate box building.
- A drawrope is necessary. It is to be inserted through the duct and secured to the marker posts at both ends of the crossing to facilitate future cabling operations. The appropriate duct plug should be fitted to either end of duct (See Fig 1).
- Cable marker No2 will be required at site entrance/boundary to ensure link up identification for Openreach contractors.
- Plug Duct 4B
- Plug Duct 4C

# Arrangement of mains services



## Recommended arrangement of mains in a 2m footway

- Installation of Openreach services is to be executed using either 50mm or 90mm internal diameter grey PVC duct supplied by Openreach.
- Please be aware that Openreach ducting can only be used for telecommunications equipment approved by Openreach.
- All runs should be laid as straight as possible, and deviations should be made by carefully bending the ducts or by the use of pre-formed Openreach bends.
- 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 Openreach joint boxes. Footpath or service strip ducting must be laid at 350mm depth of cover (NJUG7) and 450mm cover in customer's premises.
- All space alongside the duct is to be backfilled with granular fill to a thickness of not less than 75mm. All duct is to be provided with a drawrope after installation, unless local agreement is made to substitute the drawrope for lead-in cable.
- Please notify your newSites team when duct has been laid and is ready for inspection.
- Copies of the NJUG7 recommendation on the positioning of utilities mains and plant for new works can be obtained from: The National Joint Utilities Group Secretariat, 30 Millbank, London SW1P 4RD.

# Pre-formed chamber system

**A pre-formed chamber system, produced by Salmor Industries Ltd. has been approved by Openreach for use by developers.**

Developers have the option to choose this de-skilled, fast-track method of construction which does away with the need for specialist box building teams and concrete backfill. Complete chambers can be constructed from excavation to reinstatement in little more than an hour.

Known as the Quadbox, the system comes in standard 150mm deep structural twinwall ring sections providing maximum flexibility and strength. Jointbox Modular Footways (JMF) 102, 104 and 106 are the Openreach approved versions.

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

The Quadbox's modular design makes it perfect for overbuilding on existing ducted networks. Existing cables can be managed through the chamber walls and duct entries can be cut in any location. Chambers can also be benched to avoid existing services.

As well as saving time and skilled labour, this pre-formed system also has numerous health and safety benefits.

**The Quadbox does not form part of Openreach's free stores listing available to developers. It will need to be purchased direct from the manufacturer.**

For information, go to:  
[www.salmor.co.uk/bodies/modular.htm](http://www.salmor.co.uk/bodies/modular.htm)



# Non-standard frames and covers

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

Openreach will take legal proceedings against any developer who fits non-standard covers and will claim damages and costs against them.

Approved frames and covers can be recognised by the embossed markings on each end of the plate. On one end are the markings EN124 (the EU standard), B125 (the class of EN124) and the BS Kitemark. On the other are the identifier of the manufacturer (SID or SGP), the year of manufacture (03, 04 etc) and the BT identifier. These are the only frames and covers that can be used.

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 engineers' standard tools may not be suitable. They could put themselves and the public at risk by attempting to lift the covers without the appropriate tools.

If you are unsure about the frame and cover to be used, please contact your newSites representative for guidance.

The preferred supplier is Salmor Industries Limited. For information, go to: [www.salmor.co.uk](http://www.salmor.co.uk)





# Jointing chamber construction JBF 104/106

This guide outlines the construction of joint boxes which allow the connection of a property's telephone supply to the main network.

The joint box diagrams opposite and specifications below refer to a JBF 104 and 106 type boxes which are the most common on new developments. Box designs and specifications may vary. This will be determined by the duct lay-out and whether multi-way ducts or major roadcrossings need to be incorporated into the network design.

## Materials

- Bricks (B3921 engineering)
- Cement (BS12 ordinary mix, 3 parts sand to 1 part cement)

## Specifications

- **Base**  
150mm concrete base to be clean and level.
- **Brickwork**  
All brickwork to be keyed in at corners and pointed.
- **Frame and cover**  
Frame and cover frame to be set on a mortar bed and fitted squarely to box structure. Lifting keys for these covers can be purchased from the following supplier:  
TW Engineering, Angular House, Eagle Road, Quarry Hill Industrial Park, Ilkeston, Derbyshire DE7 4RB  
Tel: 0115 932 3223.  
**Description:** Lifting Key No5.  
**Item code:** 129320.
- **Duct Entries**  
Duct must not enter through corners and be no less than 75mm from the side wall. Duct to enter wall 350mm minimum depth from top of frame and cut flush. Duct to clear base by 100mm minimum.
- **Bolts**  
Four bolts to be fitted in each box to allow installation of ironwork.



Correct standard of finished box



Unacceptable standard of finished box

- **Step**  
A step is required in all boxes with a depth greater than 700mm and two steps if greater than 1050mm.

## Internal dimensions

- Length:** 915mm  
**Width:** 445mm  
**JBF 104**  
**Depth:** (B) 600mm  
(C) 750mm  
(D) 900mm (min depth for road crossing)  
**JBF 106**  
(E) 1050mm  
(F) 1200mm

Any deviation from these measurements must be authorised by your newSites team.  
(See diagrams opposite)

**Footnote: These illustrations are a guide. Detailed technical drawings are available from your newSites team.**





# New External Termination Point (NTE)

Openreach has introduced a New External Termination Point (NTE) to be fitted on the outside of all new houses for telecommunications services from September 2007. This is now the demarcation point between Openreach's external network and the developer/customer-provided wiring.

## Installation

Lay Openreach grey duct from the footway joint box (with the socket end presented to the joint box) and terminate with a pre-formed 90° bend at the outside of the house wall. 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.

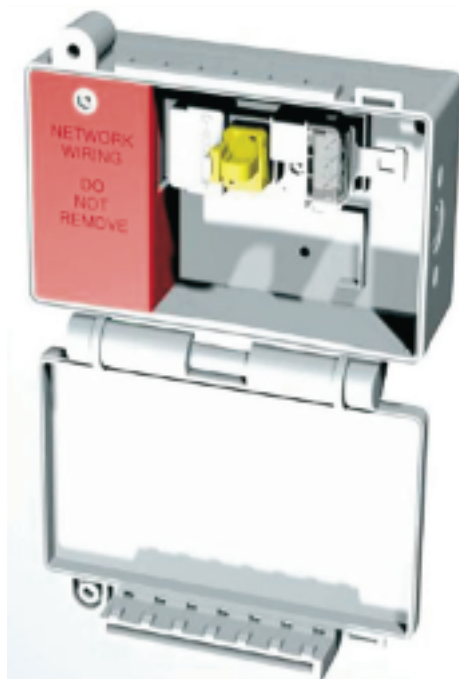
All duct is to be provided with a lead-in cable after installation. Leave one metre at the house and three metre tails in the chamber.

Service duct should be cut level, two bricks below damp proof course and should be sealed at both ends using Duct Plug 1A, to prevent ingress of debris.

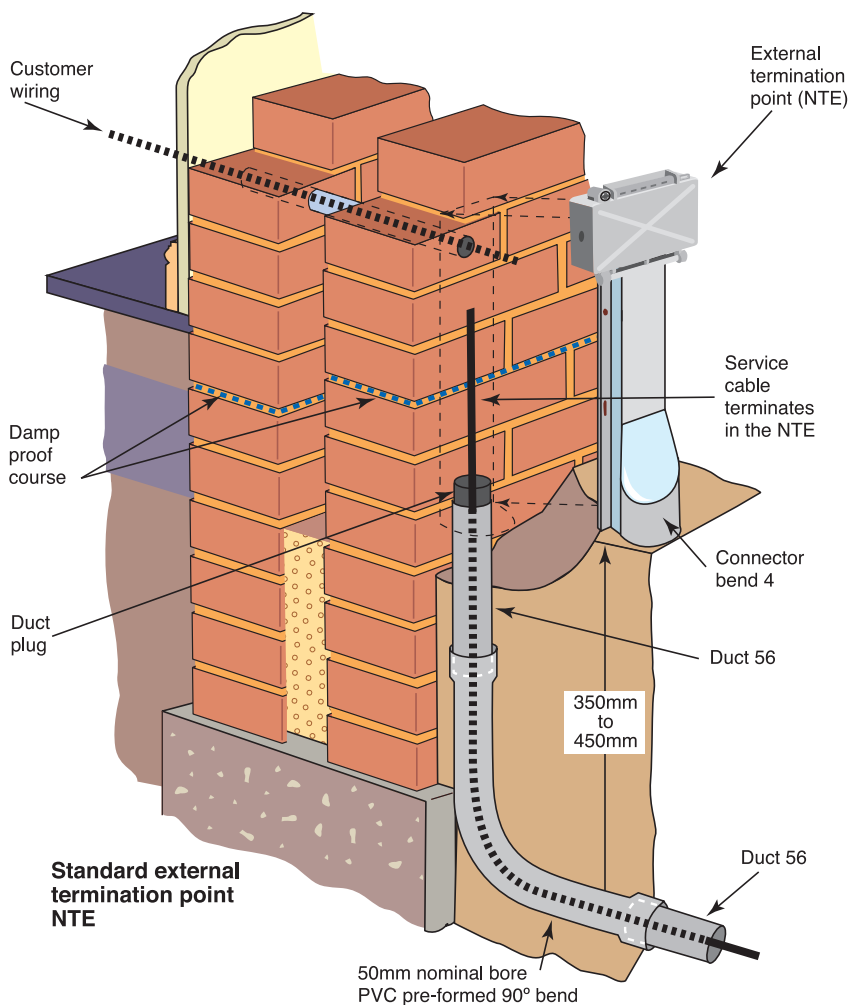
External capping 25 and Connector Bend 4 to be fitted as required.

## Materials available from Openreach

- 90mm and 50mm internal diameter PVC duct, including pre-formed bends and tees
  - Grey PVC capping, bend and cover (Capping 25 and Connector Bend 4)
  - Duct Plug 1A
  - External cable
- (See diagram on page 19)



**All internal wires beyond the external socket will be the responsibility of the builder/customer, unless installed and commissioned by Openreach engineers.**



## Developers benefit because:

- No need to supply and fit backbox for NTE5a.
- All internal sockets are provided by the developer and can be of any design conforming to BS Standard.
- Openreach or its sub-contractors will no longer require access to properties for the installation. So there will be no more asking for keys etc and eliminates the risk of soiling or damage to recently completed interiors.

Developers should ensure that the internal extension wiring is planned to emerge through the outer wall and is terminated on the customer wiring side of the New External Termination Point (NTE).

Multi-occupancy buildings (i.e. flats/apartments) will continue to use the existing NTE5a within the property for now but Openreach is looking at further External NTE/Line Module options.

# Entry into houses/maisonettes – method

The following are instructions for the installation of telephony supply into new houses and flats with a NTE5a fitting. Should you require additional information please consult the Openreach newSites team who will be able to advise you.

## Installation

Lay Openreach grey duct from the footway joint box (with the socket end presented to the joint box) and terminate with a pre-formed 90° bend at the outside of the house wall. 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.

Install an Openreach Back Box or standard single-gang flush steel box in preparation for Openreach's engineer to fit and commission the main socket.

All duct is to be provided with a lead-in cable after installation. Leave one metre at the house and three metre tails in the chamber.

Service duct should be cut level, two bricks below damp proof course and should be sealed at both

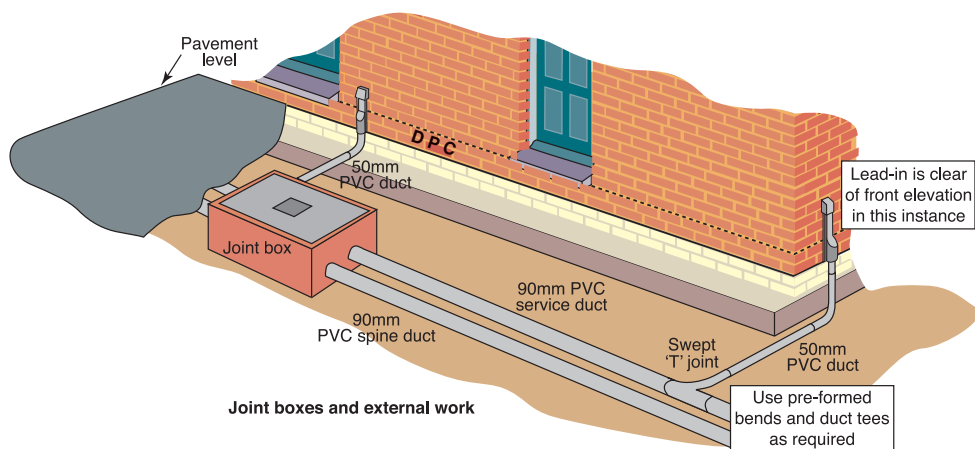
ends using Duct Plug 1A, to prevent ingress of debris.

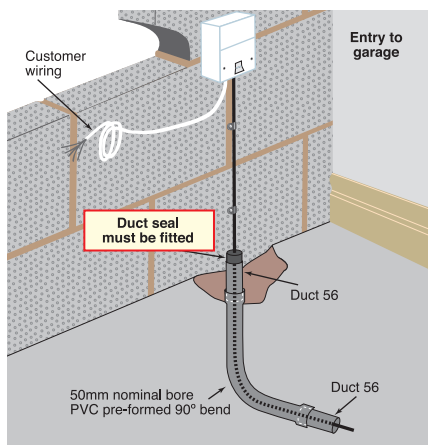
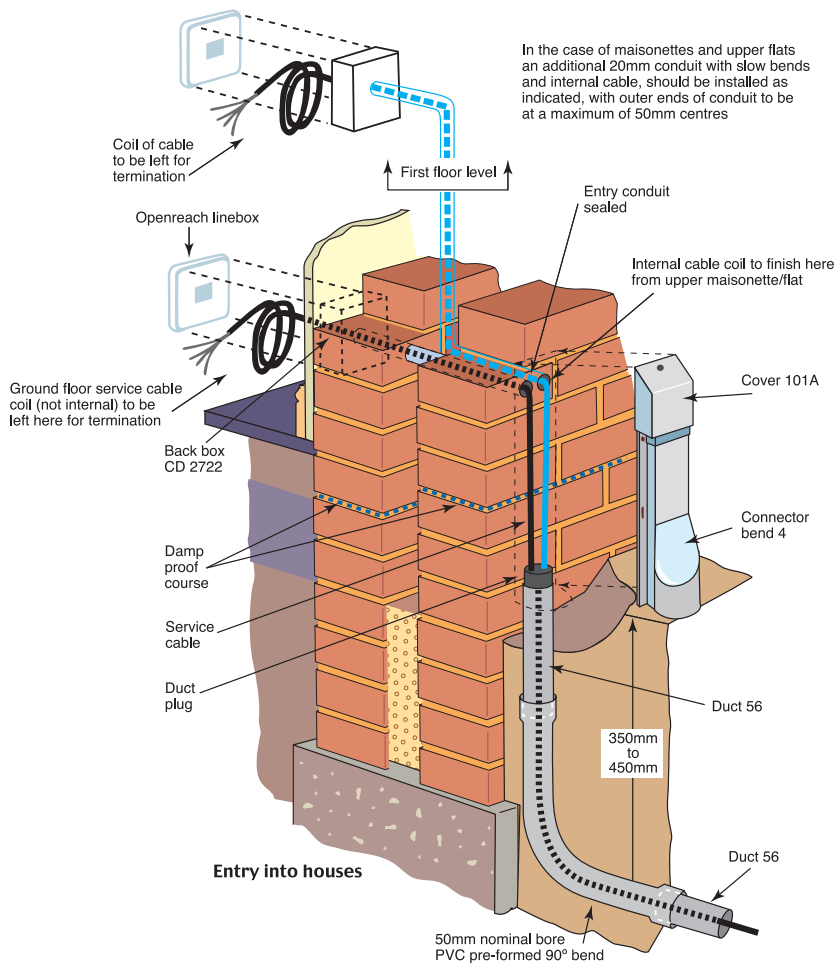
External capping 25, Cover 101a and Connector Bend 4 to be fitted as required.

## Materials available from Openreach

- 90mm and 50mm internal diameter PVC duct, including pre-formed bends and tees
- Grey PVC capping, bend and cover (Capping 25, Connector Bend 4 and Cover 101A)
- Duct Plug 1A
- External cable
- Back Box for Openreach main socket
- Frame Cover
- Brackets
- Bearers
- Foundation Bolts
- Manhole Step required for all boxes deeper than 700mm

(See diagrams below and opposite)

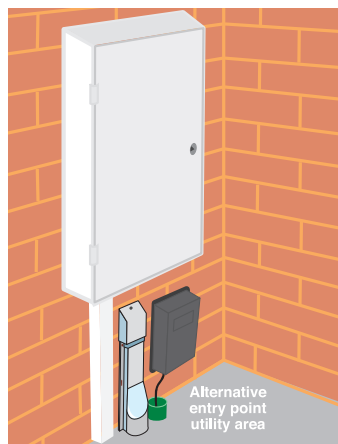




## Alternative entry points

**Left: Inside garage or utility room**

**Right: External utility area**



# Entry into flats and business properties

A number of options are available for cable entry into industrial units. An appropriate method of entry will have been agreed between Openreach and the site developer at the initial design stage. Any subsequent revision which may be required should always be agreed with Openreach before execution.

For a more detailed specification of these methods, please refer to the relevant section of this guide.

The following are instructions for the installation of telephony supply into residential flats, apartments and business properties. Should you require additional information please consult your Openreach newSites team who will advise you.

## Installation

Lay 50mm or 90mm internal diameter grey duct from the footway joint box with the socket end presented to the joint box and terminate with a 90° pre-formed bend at the inside of the site wall. Keep duct runs to a depth of 350mm/450mm beneath the proposed external ground level. (Please refer to Installation Guide on Joint Boxes and External Work and Installation Guide on Ducting for more information).

For new buildings the section of duct which passes through the wall/floor is to be coated with Solvent Cement Compound 21 and then a dry 3:1 sand/cement mixture. Any joints inside a building should also be coated with Solvent Cement Compound 21.

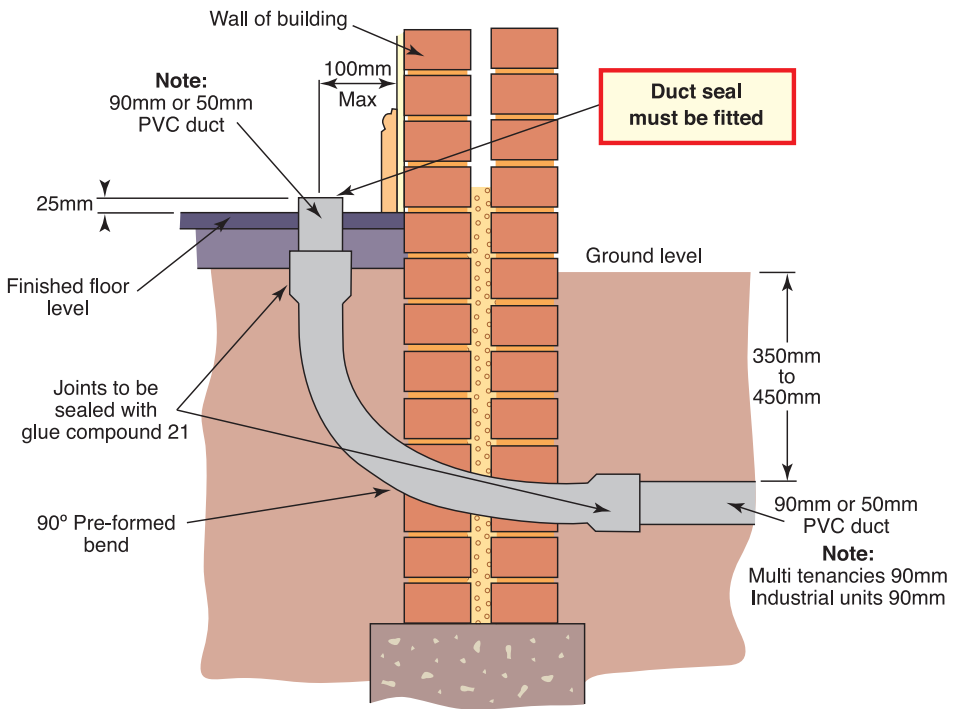
Wiring within cavity walls should be installed within 20mm conduit to ensure hassle free maintenance.

**It is the developer's responsibility to ensure that all duct seals on site have been installed correctly**

## Materials available from Openreach

- 50mm internal diameter PVC duct, including pre-formed bends and tees (Duct No 56).
- 90mm internal diameter PVC duct, including pre-formed bends and tees (Duct No 54D).
- Plugs Pressure.
- Draw Cord.
- Solvent Cement Compound 21.

(See diagram opposite)



## Entry into flats and business properties

### Important

**After installation, seal ducts as follows. Tie drawrope in hole provided on plugs pressure and insert plug pressure into end of duct and tighten. This is to prevent any ingress of water or gas into the property.**

**Note: It is important that the incoming duct is sited so that access can be made at all times for service provision and maintenance.**

# Openreach standard wiring guide

Installing additional telephone sockets as part of the overall building programme avoids the problem of exposed wiring and will enhance the appearance of the finished project. All internal cables/wiring should be run inside conduit to enable future maintenance which does not disturb finished surfaces.

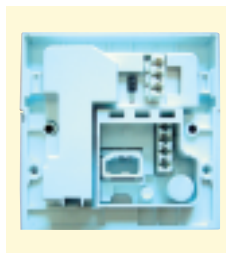
The following is a guide for the connection of extension sockets that you may wish to install at the time of build or construction.

The provision of all internal wires beyond the first socket or external NTE will normally be the responsibility of the builder/customer but, if you prefer, we can arrange for the work to be carried out and commissioned by an Openreach engineer at our normal installation rates (please contact your newSites representative for details).

## Basic materials required

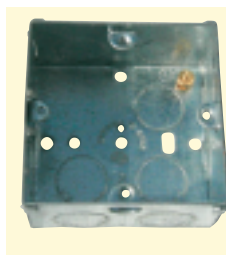
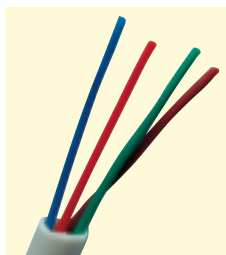
The following materials are not part of our standard provision for new housing developments and may be purchased locally.

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



## Installation of internal extension sockets

This specification defines the work required for the installation of concealed telephone extension cabling and sockets, if carried out by your electrician.



### Please note:

**The main socket or external NTE must be supplied by Openreach**

**Note: All extension wiring beyond the main socket or external NTE is owned by the customer/developer. Any faults attended by Openreach, and proved to be customer's own equipment will be chargeable.**

**For service please contact your communications provider.**



# Installation

Extension cabling shall be run from the Back Box of the proposed main socket or external NTE, with 300mm left coiled within for connection to the main socket or external NTE. Extension sockets shall be mounted on single-gang flush steel boxes conforming to BS 4662:1970. Not more than two extension cable terminations are permitted to any Openreach standard socket.

Extension sockets should be located close to power sockets to facilitate the use of PC modem points and answering and facsimile machines which require both types of supply. However, a distance of not less than 50mm must be maintained between telephone cables and power cables throughout. Where this is not practical they must be separated by an acceptable divider of rigid non-conducting material.

Detailed information on cable installation and separation is given in the British Standard Code of Practice BS6701 Part 1, particularly clause 6 and the relevant sections of the latest IEE Regulations for Electrical Installation (Regulation 525 is of particular importance). Where not supported in conduit or trunking, cables must be cleated at intervals of not more than 300mm.

The wiring pattern for cabling may be either series or spur. Typical patterns are illustrated overleaf.

It is not the responsibility of Openreach to ensure continuity of the cabling unless commissioned to do so.

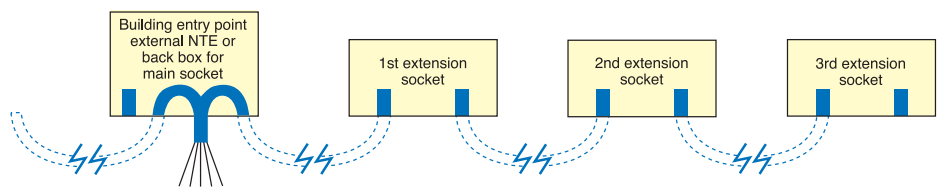
## Guide to telephone socket location

<i>Main Socket</i>	<i>First Extension</i>	<i>Second Extension</i>	<i>Third Extension</i>	<i>Fourth Extension</i>
Lounge	Lounge			
Hallway	Hallway			
	Kitchen	Kitchen		
	Master Bedroom	Master Bedroom	Master Bedroom	
		Second Bedroom	Second Bedroom	
		Study	Study	Study
			Third Bedroom	Third Bedroom
			Fourth Bedroom	Fourth Bedroom

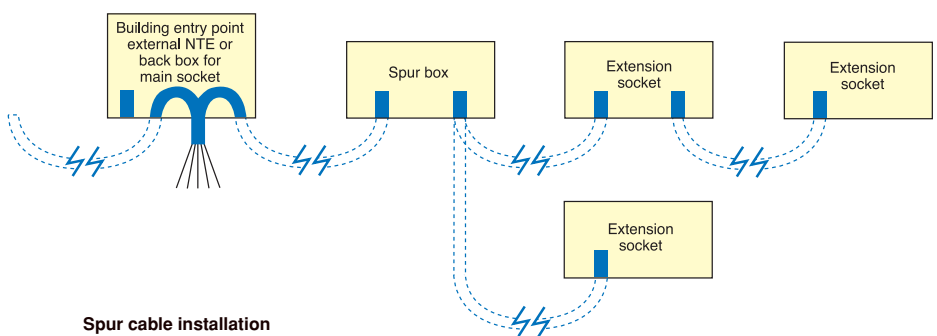
From the options shown within each column, select your one preferred location for each socket.

**Note: If an external NTE is used, no internal main socket is required.**

# Openreach standard wiring guide

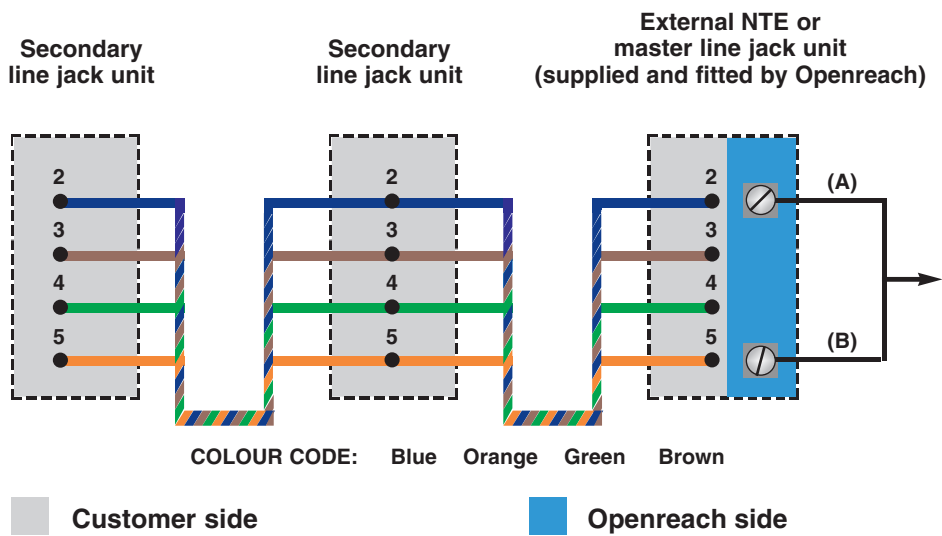


Series cable installation



Spur cable installation

## Phone sockets cabling arrangements (for guidance only)

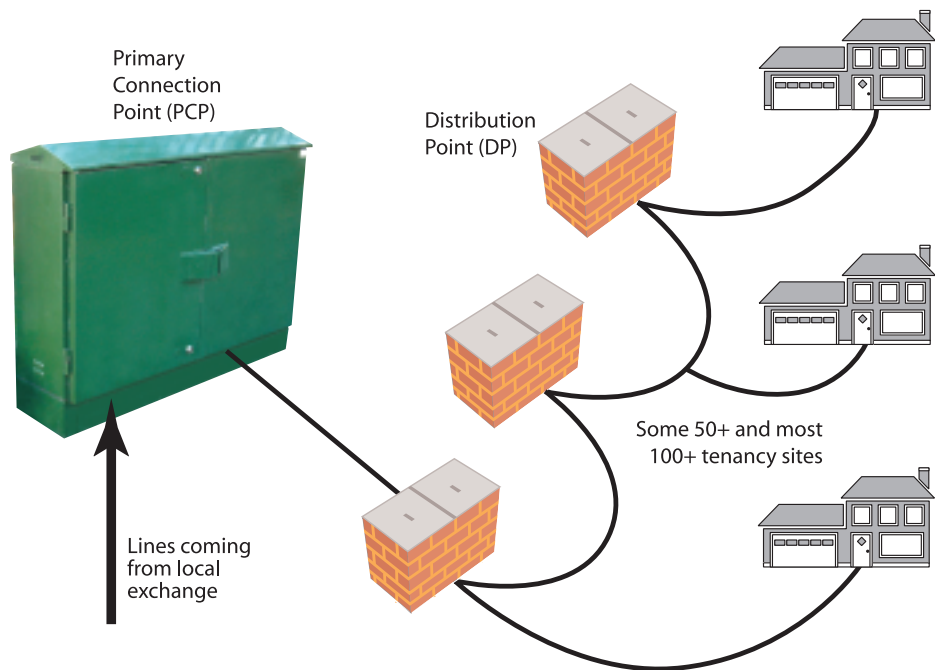


Residential and business extension wiring can be undertaken by Openreach at extra cost

# Broadband provision

Broadband is now established as the must-have technology for high speed global communication. Broadband and next generation networks can be enabled on all new residential sites by using this Openreach network template.

For specific details relating to your own site layout, contact your newSites team.



# Diverse routing

Diverse Routing is an additional cost option available to the business sector which protects the customer's telephony and network systems against cable failure. It is most commonly used in the banking, call centres and emergency services sectors where any interruption to service would create major problems.

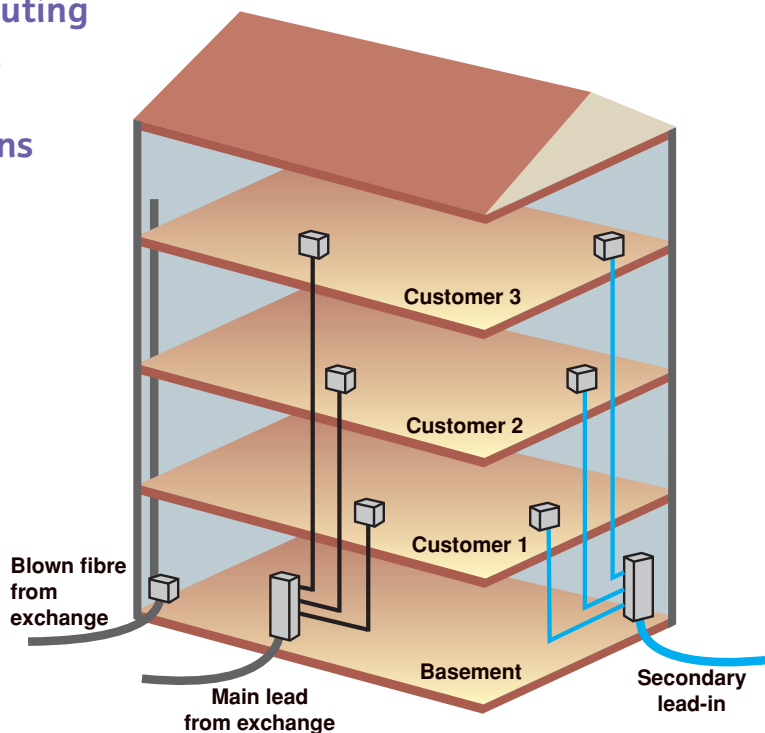
In the unlikely event of a cable failure, the customer's network automatically switches to the alternative connection thus ensuring full access is maintained at all times. Charges for this service are available on request.

# Blown fibre tubing

With people rapidly becoming accustomed to living life in the communications fast lane, there is an increasing likelihood for occupiers to want their property to come with inbuilt fibre optic capability.

To meet this demand, Openreach will require the installation of blown fibre tubing on some multi-occupancy developments. Developers will be requested to run tubing within the building to ensure adequate availability for all customers.

## Diverse routing and blown fibre tube installations



# Wayleaves

Openreach will require a wayleave (consent in writing) to install, maintain, adjust, repair or alter Openreach plant under or over the development for the statutory purpose as defined in our Code of Practice. The only exception is where the owner is the person requiring the telephone service. In that case, the contract between Openreach and the owner is, in effect, the wayleave and gives Openreach permission to install cables across the land.

A wayleave should be obtained prior to installing any Openreach plant or cables.

Openreach currently has two UK offices dealing with queries relating to wayleaves.

■ For enquiries relating to England, Scotland and Wales, please ring 0800 581 525 (option 4) or email [wayleaves.north@openreach.co.uk](mailto:wayleaves.north@openreach.co.uk) or [wayleaves.south@openreach.co.uk](mailto:wayleaves.south@openreach.co.uk)



■ For enquiries relating to Northern Ireland please ring 028 9021 5716 or e-mail [wayleaves.ni@bt.com](mailto:wayleaves.ni@bt.com)

## 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.



# The Openreach payments process

When and where Openreach enters into a contract with the developer or sub-contractor to lay the on-site infrastructure, the following process must be followed to ensure that invoices are paid in a timely manner.

- 1 If Openreach is to pay for works on new residential developments, a contract must first be signed. If you have no contract, please contact your newSites team to discuss this. The rates payable for this type of work have previously been agreed with the House Builders Federation (HBF) and are set rates which are non-negotiable.
- 2 Openreach will only pay invoices on full completion of the site, providing that the required quality standards are met.
- 3 Before the developer submits any invoice he must arrange for a Quality Statement sign off by his newSites representative (NSR). The NSR will then arrange a meeting on site and ensure that all work meets the standards set out in the contract. (No payment will be made if the standards are not met). The form opposite will be the template used in signing-off work ready for payment.
- 4 Once this sheet has been signed, the developer can submit his invoice to our payments duty. The invoice must quote the following:
  - The Openreach purchase order number.
  - The Openreach NSI reference number.
  - The number of plots invoiced and the unit cost per plot.
- 5 If the quality of work falls below the required standard, the NSR will issue the developer with a remedial/snagging list.
- 6 When all remedial work has been completed to the quality standards, the sign-off will take place and the contract payment can then be progressed.



## Developer's Quality Check Sheet

Name of Developer

### Exchange Area

NSI Number

Address

PO/REC Number

Post Code

Estimate Number

Quality Check Status: In Progress\*/Retrospective\*

Receipt Number

SUPERVISED\*/UNSUPERVISED\* – DELETE\*

<b>1</b>	Ducts laid at minimum depth, or exceptions agreed & documented				
<b>2</b>	Separation distances maintained, or exceptions agreed and documented				
<b>3</b>	Ducts correctly bedded & sides compacted (lead-in duct requires gas break N. Ireland only)				
<b>4</b>	Ducts properly trimmed & keyed when set in walls				
<b>5</b>	Jointing chamber constructed in accordance with relevant CN diagrams (CN/NI applies to N Ireland only)				
<b>6</b>	Duct Tee's fitted as per CN diagram and as indicated on Openreach supplied scheme plan				
<b>7</b>	Frame and covers bedded correctly and fitted level				
<b>8</b>	Jointing chamber furniture fitted as specified				
<b>9</b>	Cement & brick types as specified or exceptions agreed and documented				
<b>10</b>	Cable correctly installed and labelled in accordance with current LN174 specification				
<b>11</b>	Cable entry to dwellings installed and protected in accordance with 'Openreach Installation Guide'				

*Plot Numbers/House Numbers encompassed in this check sheet*

[illegible]

THIS DEVELOPER'S QUALITY CHECK SHEET CERTIFIES THAT ALL WORK HAS BEEN CARRIED OUT IN ACCORDANCE WITH THE CONTRACT SPECIFICATION, OR AGREED ALTERNATIVES

**Site Manager's Name:**

(print) Sign:

Date:

THE ABOVE LISTED WORK MEETS THE AGREED SPECIFICATIONS AND IS AUTHORISED FOR PAYMENT

**YES**

**NO**

NSR Ein Number:

OUC:

**newSites Rep Name:**

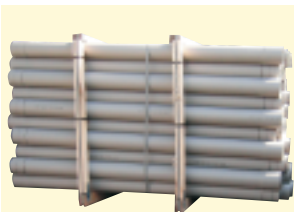
(print) Sign:

Date:

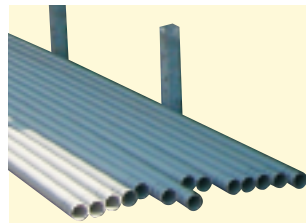
## newSites stores list



**DUCT 54 (90mm) 6m length**  
(order in metres)  
Code: 100268



**DUCT 54 (90mm) 1.5m length**  
(order in metres)  
Code: 095070



**DUCT 56 (50mm) 3m length**  
(order in metres)  
Code: 100271



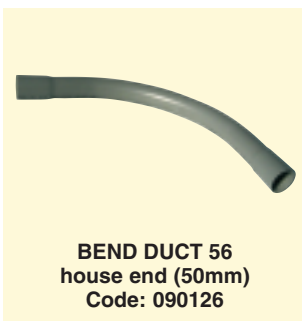
**BEND DUCT 54A**  
(90mm)  
Code: 094937



**BEND DUCT 54B**  
(90mm)  
Code: 095065



**BEND DUCT 54C**  
(90mm)  
Code: 095265



**BEND DUCT 56**  
house end (50mm)  
Code: 090126



**BEND DUCT 56A**  
(50mm)  
Code: 094929



**BEND DUCT 56B**  
(50mm)  
Code: 095002



**COLLAR DUCT 56**  
(50mm)  
Code: 093989



**COLLAR DUCT 54**  
(90mm)  
Code: 093933

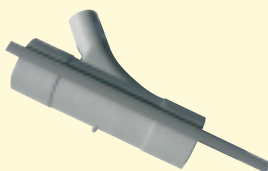


**DUCT REDUCER**  
(90mm to 50mm)  
Code: 095049





**DUCT TEE 54/56**  
(90mm to 50mm)  
Code: 001792



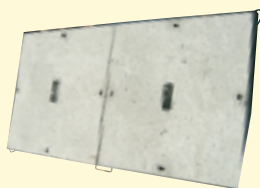
**DUCT TEE**  
(54/56 Split)  
Code: 094976



**DUCT TEE 56/56**  
(50mm to 50mm)  
Code: 095004



**FRAME AND  
COVER 104C**  
Code: 075875



**FRAME AND  
COVER 106C**  
Code: 075877



**BOLTS FOUNDATION**  
No 2  
Code: 070131



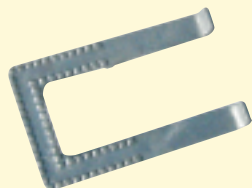
**CABLE BEARER**  
Wall Type 3  
Code: 070283



**BRACKET CABLE  
BEARER**  
Code: 070210/1/2



**PINS LOCKING CABLE  
BEARER**  
Code: 070858



**STEPS MANHOLE**  
No 1  
Code: 071236



**PLUG PRESSURE No 1**  
(90mm)  
Code: 075856



**PLUG PRESSURE No 3**  
(50mm)  
Code: 075857

## newSites stores list



**PLUG DUCT 1A**  
100 in a bag (50mm)  
Code: 094987



**COVER 101A**  
(cover enter to house)  
Code: 071987



**CAPPING 25**  
(for house wall)  
Code: 072180



**CONNECTOR BEND**  
(cover duct at wall)  
Code: 095096



**DRAWROPE**  
(500m on a drum)  
Code: 071830



**CABLE 2pr**  
(200m on a drum)  
Code: 034468

**BACK BOX CD2722**  
(for master socket)  
Code: 072012

**NETWORK TERMINATING  
EQUIPMENT 5A**  
Code: 314444



**COMPOUND  
No 21**  
Code: 071821

# newSites stores order form

Duct 54 90mm	Code	Qty	Duct 56 50mm	Code	Qty
Duct 54 (6M)	100268		Duct 56 (3M)	100271	
Duct 54 (1.5M)	095070		Duct 56 – 90° (House Bend)	090126	
Duct 54A 90° (Bends)	094937		Duct 56B – 45° (Tee Bend)	095002	
Duct 54C 30° (Bends)	095265		Duct 56A – 90° (Long Bend)	094929	
Duct 54B 18° (Bends)	095065		Duct 56 (Split Duct)	095086	
Duct 54 10° (Bends)	094958		Duct 56 Kits Repair 2A	095089	
Duct 54D (Split) 3M	095039		Duct 56A Collar	093989	
Duct 54 Repair Kit 3A	095051		Duct 56/56 Tees	095004	
Duct 54/56 Tee (Solid)	001792		Duct Marker No2	071986	
Duct 54/56 Reducer	095049		<b>Blown Fibre Tubing</b>	<b>Code</b>	<b>Qty</b>
Duct 54A Collar	093933				
Duct 54/56 Tees (Split)	094976		<b>Cable &amp; Rope</b>	<b>Code</b>	<b>Qty</b>
			Drawrope 500mt Drum	071830	
<b>Joint Box Items</b>	<b>Code</b>	<b>Qty</b>	Cable PET 2 Pair (200mt Reel)	034468	
Bolts Foundation No. 2	070131		Cable Eqmt 2503G 4W (Blk)	034507	
Pins Locking Cable Bearer	070858		Cable Eqmt 2502 4W (white)	031310	
Bracket Cable Bearer 3	070210		Cable Eqmt 8 Wire	035144	
Bracket Cable Bearer 5	070211		<b>Miscellaneous Items</b>	<b>Code</b>	<b>Qty</b>
Bracket Cable Bearer 8	070212		Blanking Plates	534913	
Cable Bearer Wall Type 2	070282		NTE 5A	314444	
Cable Bearer Wall Type 3	070283		Capping 25	072180	
Joint Box 23	094960		Connector Bend 4	095096	
Joint Box 23 (Cover)	094961		Cover 101A	071987	
Joint Box 26	095037		Plugs Duct 1A (bag of 100)	094987	
Frame & Cover 102C	075874		Compound 21	071821	
Frame & Cover 104C	075875		Plug Pressure 1	075856	
Frame & Cover 106C	075877		Plug Pressure 3	075857	
Grating Sump	094956		Single BackBox CD2722	072012	
Bolt 38 for Joint Box 36	072589		Plug Duct 4C (roadcrossings)	095106	
Steps Manhole No. 1	071236		Plug Duct 4B (roadcrossings)	095105	

<b>NSI Ref No</b>		<b>Date of Order</b>	
<b>SITE NAME/ADDRESS</b>			
		<b>Post Code</b>	
<b>Contact Name</b>		<b>Contact No</b>	
		<b>Fax No</b>	
<b>Part or Complete Stores Order for Site</b>		<b>PART/COMPLETE</b> <i>delete which does not apply</i>	

<b>COMPLETED FORM FAX TO</b>
------------------------------

FOR ADDITIONAL ITEMS NOT LISTED ABOVE PLEASE CONTACT THE NEWSITES OFFICE

## Useful contact numbers

### National newSites

0800 616 866

[www.openreach.co.uk/newsite](http://www.openreach.co.uk/newsite)

### Network Protection dial before you dig

0800 917 3993

[www.dialbeforeyoudig.com](http://www.dialbeforeyoudig.com)

### Openreach Invoice Unit (enquiries)

0800 515 465

### Wayleaves (England, Scotland & Wales)

0800 581 525

email: [wayleaves.north@openreach.co.uk](mailto:wayleaves.north@openreach.co.uk)

or [wayleaves.south@openreach.co.uk](mailto:wayleaves.south@openreach.co.uk)

### Wayleaves (Northern Ireland)

028 9021 5716

email: [wayleaves.ni@bt.com](mailto:wayleaves.ni@bt.com)

Your Openreach NSR:

Name:

Telephone No:

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