GTech Surveys Limited

Broadband Connectivity Assessment

8/8A St John Street

CHANGE HISTORY

Issue	Date	Details of Changes
0.0	05/05/2020	Working draft
0.1	11/05/2020	First draft issue
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Data Ducting Infrastructure for New Homes - Guidance Note, March 2008, Department for Communities and Local Government

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Executive Summary

A desk-based assessment has been undertaken to determine the current availability of broadband services near to and adjacent to the proposed 8/8A St John Street development. Under Manchester City Council (MCC) planning guidance, certain sized developments require a broadband connectivity assessment. Further guidance can be found in this document; "*Full, Outline, Reserved Matters & Variation/Removal of Conditions Planning Applications - Is Your Application Valid?*", September 2018, MCC. The requirement states;

Broadband Connectivity Assessment

> *All new build residential developments must incorporate measures to facilitate digital connectivity for all new build residential properties having regard to the Data Ducting Infrastructure Guidance produced by the Department for Communities and Local Government. (Section 10 - National Planning Policy Framework (NPPF))*

The findings of the assessment indicate that existing infrastructure and good connectivity is already available, with existing fibre installed along St John Street adjacent to the proposed development. Good download speeds are available. It is suggested that the developer engages with either BT Openreach or Virgin Media to facilitate a connection to their fibre network.

The developer will commit to enable the Proposed Development for robust connectivity and future-proof upgrading by following the guidance presented in *Data Ducting Infrastructure for New Homes - Guidance Note*, March 2008, Department for Communities and Local Government.

This report can be used for reference and to support the planning submission.

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1 - Introduction

This assessment has been prepared to support the planning submission of the proposed 8/8A St John Street development in Manchester. The site is located on the corner of St John Street and Longworth Street. An existing Edwardian property exists to the front of the site with a long external yard to the rear. Both the land and the existing property sit within St John's Street conservation area.

Under Manchester City Council (MCC) planning guidance, certain sized developments require a broadband connectivity assessment. Further guidance can be found in this document; "*Full, Outline, Reserved Matters & Variation/Removal of Conditions Planning Applications - Is Your Application Valid?*", September 2018, MCC. The requirement states;

Broadband Connectivity Assessment

> *All new build residential developments must incorporate measures to facilitate digital connectivity for all new build residential properties having regard to the Data Ducting Infrastructure Guidance produced by the Department for Communities and Local Government. (Section 10 - National Planning Policy Framework (NPPF))*

NPPF Section 10, June 2019, (Ministry of Housing, Communities & Local Government) states;

10. Supporting high quality communications

> *112. Advanced, high quality and reliable communications infrastructure is essential for economic growth and social well-being. Planning policies and decisions should support the expansion of electronic communications networks, including next generation mobile technology (such as 5G) and full fibre broadband connections. Policies should set out how high-quality digital infrastructure, providing access to services from a range of providers, is expected to be delivered and upgraded over time; <u>and should prioritise full fibre connections to existing and new developments (as these connections will, in almost all cases, provide the optimum solution)</u>.*

The assessment details the results of licensed and other available information to address requirements regarding potential broadband connectivity. Figure 1 shows the location of the Proposed Development.

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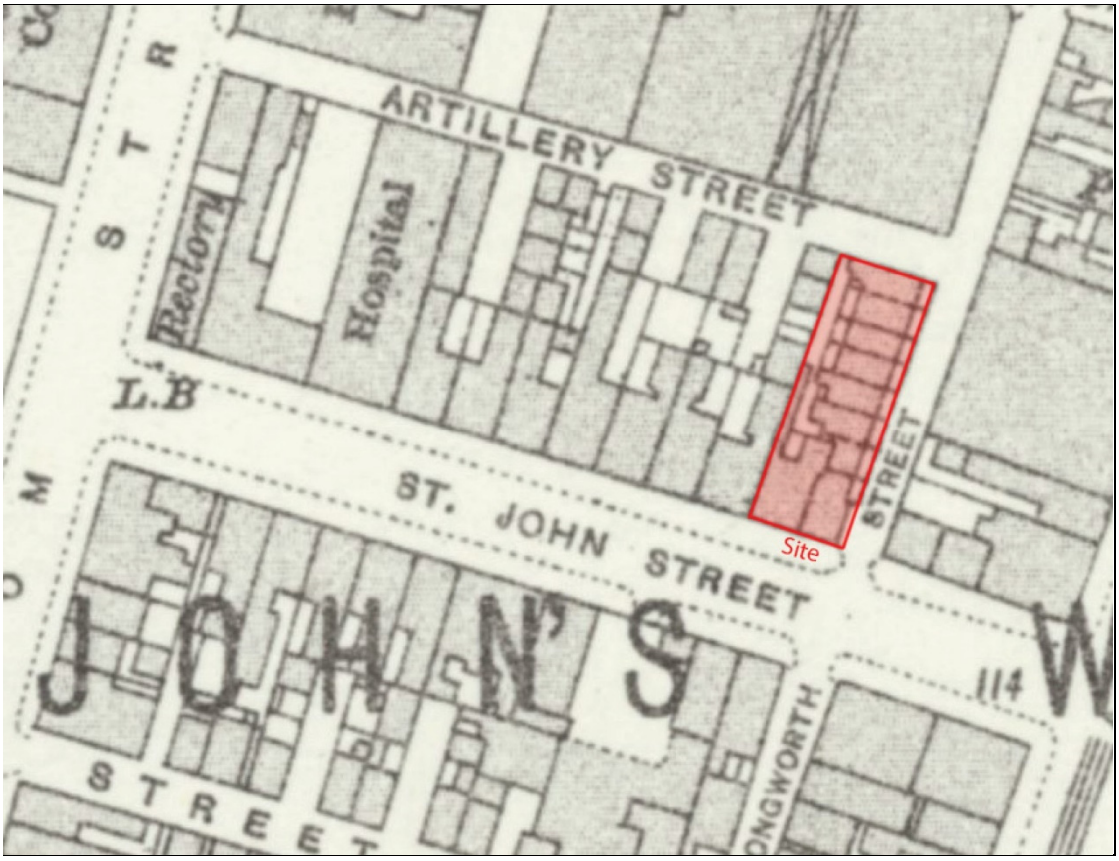

Figure 1 – The Location of the Proposed Development

This report follows the following structure:

Chapter 1 introduces the work

Chapter 2 lists which external infrastructure telecommunications utility providers are operating in the area, with which technology and what likely upload and download speeds are available

Chapter 3 describes the existing local BT Openreach infrastructure (as of 30th April 2020)

Chapter 4 describes the existing local Virgin Media infrastructure (as of 1st May 2020)

Chapter 5 provides guidance for the developer at various phases of the planning process to facilitate an understanding of potential connectivity

Chapter 6 presents the conclusion

This study was undertaken in May 2020 to provide information regarding the connectivity for the Proposed Development and the availability of local broadband services. This report can be used for reference and to support the planning submission.

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2 - External Infrastructure Telecommunications Utility Providers

A number of telecommunications companies and providers exist and operate in the Manchester area. Not all will currently have any infrastructure in operation near the site. Database integration indicates that the following providers are active at the postcode centroid.

Provider	Type of Service *
BT Wholesale	ADSL
BT Wholesale	ADSL Max
BT Wholesale	WBC (21CN)
BT Wholesale	SDSL
BT	FTTC
BT	FTTP
Vodafone	LLU
TalkTalk (CPW)	LLU
Sky Broadband	
Edge	LLU
Zen	LLU
Entanet	LLU

Potential Download Speeds

The postcode centroid is well served with download speeds up to 350 megabits per second (classed as ultrafast broadband) and has superfast broadband (download speeds greater than 24 megabits per second) available.

M3 4DU Availability

FTTH/FTTP	✗
Ultrafast Broadband (>=100 Mbps)	✓
Superfast Broadband (>24 Mbps)	✓
Fibre (FTTC or FTTH or Cable or G.Fast)	✓
Wireless	✗
LLU	✓
A+ ADSL2+	✓
A ADSL	✓

Notes On Connection Options

- Virgin Media cable broadband with maximum speeds 200 to 350 Mbps may be available to you.
- You do not appear to have any Openreach Fibre products available to you.
- BT Wholesale ADSL2+ based services are available from your exchange.
- Sky LLU ADSL2+ is available from your exchange.
- TalkTalk LLU ADSL2+ retail and wholesale services are available from your exchange.
- The package search on our main site will filter product availability based on the data shown on this page when you search there with your postcode.
- All premises in this postcode are believed to be served by the same Openreach technology.

* - See Appendix for definitions

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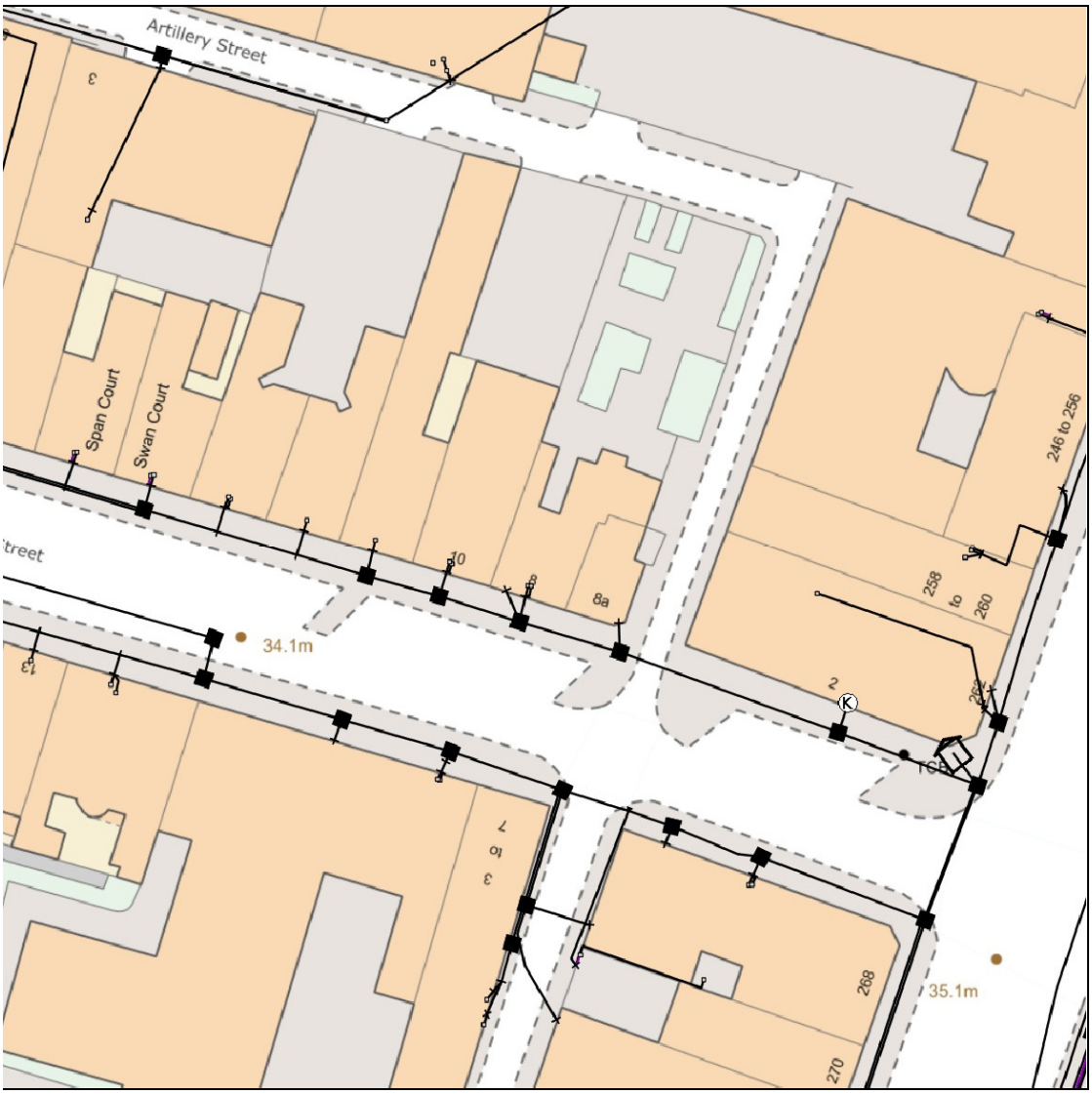
3 - BT Openreach External Infrastructure Availability



KEY TO BT SYMBOLS	Planned	Live
PCP		
Pole		
Box		
Manhole		
Cabinet		

Change Of State	+	Hatchings	
Split Coupling	×	Built	
Duct Tee	▲	Planned	
Building		Inferred	
Kiosk	K	Duct	

Other proposed plant is shown using dashed lines.
BT Symbols not listed above may be disregarded.
Existing BT Plant may not be recorded.
Information valid at time of preparation. Maps are only valid for 90 days after the date of publication.

	Pending Add	In Place	Pending Remove	Not In Use
Power Cable				
Power Duct				N/A

BT Ref : VOW05049V
Map Reference : (centre) SJ8345797922
Easting/Northing : (centre) 383457,397922
Issued : 30/04/2020 17:05:11

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BT Openreach has a universal service obligation (USO) granting remote households the right to request broadband speeds of at least 10Mbit/s by 2020. As part of their obligation, BT Openreach are aggressively installing new fibre and infrastructure throughout the UK and enhancing coverage in major cities.

Based on BT database interrogation on 30th April 2020, there is existing good BT Openreach infrastructure surrounding the Proposed Development, with existing fibre installed along St Johns Street adjacent to the proposed development.

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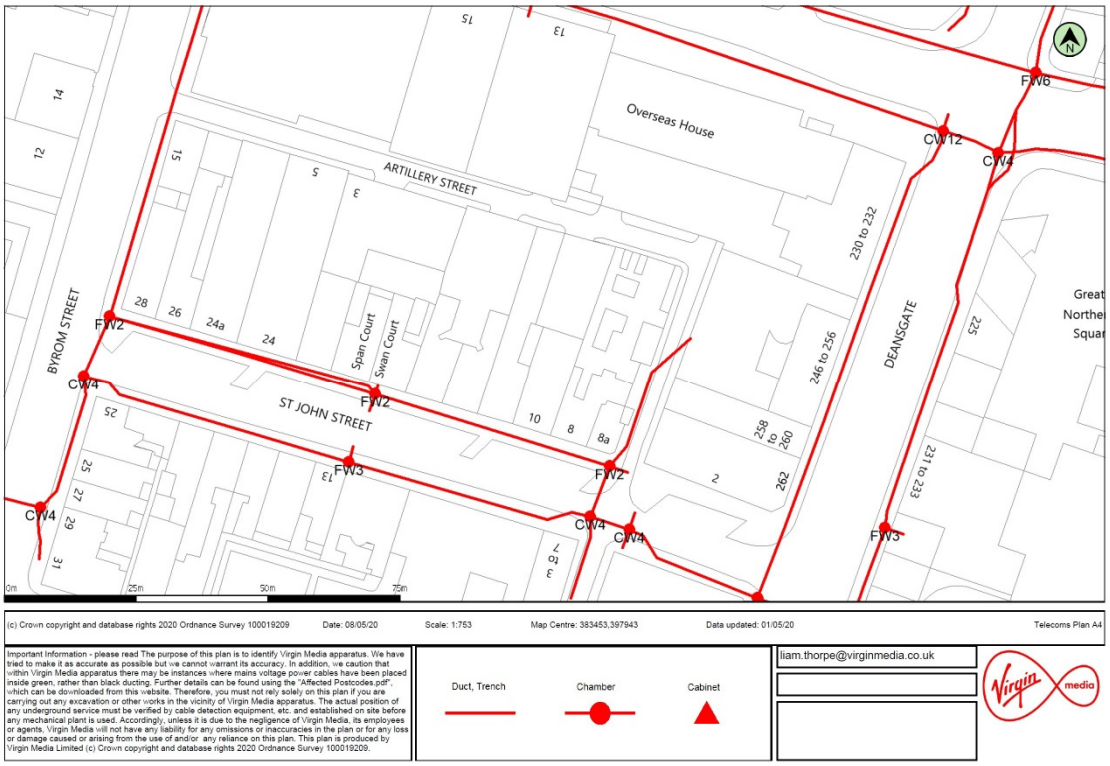
4 - Virgin Media External Infrastructure Availability



Based on Virgin Media's reply on 1st May 2020, there is existing good existing infrastructure surrounding the Proposed Development, with existing fibre installed along St Johns Street adjacent to the proposed development.

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5 - Developer's Guidance and Responsibility

At the Pre-Application Stage

Broadband connectivity is most helpfully and effectively raised at the earliest possible stage of the planning process. This can help to ensure that the need to provide superfast broadband connectivity is considered in prospective applicants' layout planning and costings before proposals reach the planning application stage. At the pre-application stage, prospective applicants:

- Will be reminded of the requirements of local guidance and Section 10 (NPPF) concerning broadband connectivity, i.e. the provision of superfast broadband connectivity;

- Will be advised that occupiers of the proposed development should be able to arrange access to superfast broadband immediately at the point of occupation;

- Will be encouraged to liaise with broadband providers at an early stage to identify whether the proposed development could be connected to existing infrastructure or whether additional infrastructure would be required, and how this would be provided.

For larger developments of 30 or more new homes, the council will also remind developers of the aspiration for full fibre technology and the benefits to future occupiers. Although this is not currently a requirement of local policy, this is the level at which some providers will consider providing full fibre solutions free-of-charge to the developer, if given sufficient notice.

At the Application Stage

Applications for planning permission for major development should be accompanied by evidence of the superfast broadband connectivity of the site, such as this report. This should take the form of a connectivity assessment, or similar proof, from one or more broadband infrastructure providers evidencing the availability of at least superfast broadband speeds. This can be submitted as part of a sustainability statement accompanying the application.

Where superfast broadband connectivity is available, the development should include the infrastructure to connect to this service and make it available to occupiers.

Where superfast broadband connectivity is not currently available:

- Applications should be accompanied by evidence that discussions have been held with a range of providers to upgrade infrastructure to deliver superfast broadband or, for developments of 30 or more homes, full fibre connections.

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- Where one or more providers have agreed to provide superfast broadband connectivity, the development should be designed to connect to this service and make it available to occupiers.

- Where no provider has agreed to provide superfast broadband connectivity, the development should incorporate additional dedicated telecommunications ducting to enable the provision of superfast broadband in future.

Internal Infrastructure

With respect to the internal layouts and necessary infrastructure to provide connectivity in the proposed development, guidance has been published. The recommendations presented to the developer are specified in "Data Ducting Infrastructure for New Homes - Guidance Note", March 2008, Department for Communities and Local Government. Section 2.3 is presented in the Appendix.

Contacting Broadband Providers

Superfast broadband connectivity is often available from broadband providers free of charge for development over a certain scale, provided that sufficient notice is given, typically at least 12 months prior to first occupation. In some cases, providers may request a contribution from the developer.

The developer is recommended to visit the following websites and arrange suitable connection to a superfast broadband provider and to discuss full fibre connection for the propose development.

Provided they have enough notice, telecoms providers will typically cover the cost of fibre to the premises (FTTP) for developments of 30+ homes. This is not an exhaustive list of broadband providers in the city.

BT Openreach -

https://www.ournetwork.openreach.co.uk/

Virgin Media -

http://www.virginmedia.com/lightning/network-expansion/property-developers

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6 - Conclusions

A desktop study has been undertaken to assess the potential for broadband connectivity to the proposed 8/8A St John Street development in Manchester. The study has utilised licensed information and current technical data regarding availability from a number of sources.

The St John Street area already has good download speeds (locally up to 350 megabits per second). Both BT Openreach and Virgin Media both have existing fibre infrastructure in place around the application site.

It is recommended that the developer engage with a broadband infrastructure provider in order to establish the most optimal data infrastructure solution for the Proposed Development. It is considered that both BT Openreach and Virgin Media are well placed to provide the recommended full fibre solution due to the proximity of their nearest nodes to the application site.

Full fibre connections represent the most future-proof form of infrastructure. New development should look to increase the spread of full fibre connections, which have the potential to boost the city's economy; help businesses grow and be more productive; help Manchester compete with other cities and provide more symmetrical upload / download speeds for residents and businesses. Full fibre connections also offer greater reliability and lower energy / maintenance costs.

The developer ensures that the Proposed Development has the correct data ducting infrastructure in place to facilitate future-proof connectivity for all potential occupants, as presented in *Data Ducting Infrastructure for New Homes - Guidance Note*, March 2008, Department for Communities and Local Government.

This report can be used for reference and to support the planning application.

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APPENDIX

Broadband Connection Definitions

Planning Policies

Data Ducting Infrastructure for New Homes - Guidance Note, March 2008, Department for Communities and Local Government

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Broadband Connection Definitions

ADSL - Asymmetric Digital Subscriber Line broadband is a connection provided over home telephone lines. Openreach owns the UK's landline infrastructure, so when you have an ADSL connection, you need to rent your phone line from Openreach. If you already have an existing phone line, the broadband is added onto the package. Openreach was previously owned by BT, but ADSL packages can be sold by providers other than BT through a process known as local loop unbundling (LLU). This means that a secondary provider, for example Plusnet or TalkTalk, put their own software in the telephone exchanges and rent line and exchange space from Openreach. Although not as fast as fibre broadband, ADSL provides a high-quality, reliable connection. But if you live far away from your telephone exchange, or if the cable has degraded, then speeds can drop dramatically.

FTTH (fibre to the home) - Fibre-optic cables run all the way to the outside of the property. This is the quickest service, delivering speeds of up to 900Mbps, but it's not widely available.

FTTB (fibre to the building/basement) - Fibre-optic cables run all the way to your premises, which is why this is sometimes called FTTP (fibre to the premises). For those in flats in a large building, the fibre terminates at the building rather than the individual dwelling. It still provides very fast speeds.

FTTC (fibre to the cabinet) - Fibre-optic cables run all the way to the cabinet in the street, which can be up to 300m away. The cabinet is connected to the property with regular copper wires, which results in a loss of speed. This is the most common connection.

FTTN (fibre to the node) - Roughly the same as above, only the street cabinet can be further away; up to several km away, with the rest of the distance to the property being covered by regular copper wiring.

LLU - LLU stands for local loop unbundling and applies to ADSL (BT line) internet connections. A 'local loop' is another term for the actual cable through which a user will receive broadband and telephone calls.

SDSL - A symmetric digital subscriber line is a digital subscriber line that transmits digital data over the copper wires of the telephone network, where the bandwidth in the downstream direction, from the network to the subscriber, is identical to the bandwidth in the upstream direction, from the subscriber to the network.

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Planning Policies

National Planning Policies

National Planning Policy Framework (NPPF), Ministry of Housing, Communities & Local Government, June 2019

10. Supporting high quality communications

112. Advanced, high quality and reliable communications infrastructure is essential for economic growth and social well-being. Planning policies and decisions should support the expansion of electronic communications networks, including next generation mobile technology (such as 5G) and full fibre broadband connections. Policies should set out how high quality digital infrastructure, providing access to services from a range of providers, is expected to be delivered and upgraded over time; and should prioritise full fibre connections to existing and new developments (as these connections will, in almost all cases, provide the optimum solution).

Regional and Local Planning Policies and Guidance

Manchester City Council (MCC), "Full, Outline, Reserved Matters & Variation/Removal of Conditions Planning Applications - Is Your Application Valid?", September 2018, MCC

Broadband Connectivity Assessment

All new build residential developments must incorporate measures to facilitate digital connectivity for all new build residential properties having regard to the Data Ducting Infrastructure Guidance produced by the Department for Communities and Local Government. (Section 10 NPPF, above)

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2.3 Internal Infrastructure

2.3.1 Understanding the needs

Although this document is intended to provide guidance with respect to data services it is important that the support of such services within the dwelling be considered in the wider context of other cable distribution requirements. Appendix C.2 identifies some of the equipment that may require cabling within a typical dwelling. In summary these may be considered as:

• Communications, entertainment and other equipment that require broadband or at least basic internet connectivity. The connection of such equipment is the prime focus of this guidance

• Other equipment that may require an external network connection other than the internet

• Systems and equipment that require cabling within the dwelling but may or may not have any need for external connectivity.

Equipment within the dwelling may employ a wide range of cabling of both a standard and proprietary type. Some may also connect using a wireless technology. Both cabling and wireless solutions are evolving, and any internal infrastructure will need to offer sufficient capacity and flexibility to meet future requirements.

It should be noted that some of the data connectivity requirements within a dwelling may be met using a wireless rather than cabled solution. The use of wireless technologies is outside the scope of this document. However, ducting is still required to support cabling to wireless hardware.

It is clearly impossible to pre-cable a dwelling to support all possible applications. Indeed, the current provision of telephone and television sockets in homes is often inadequate and lacking in flexibility. The result is that many dwellings have extensive cabling that is often surface mounted or trailed across floors.

2.3.2 What is required

Occupants of dwellings are likely to require:

• Data sockets at ‘useful locations’ throughout the dwelling

• A ‘readily accessible’ location where network equipment can be installed with a simple ‘user-friendly’ method of connecting the network equipment to ‘live’ data sockets

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• Mains electricity sockets that are located near the data sockets.

The possibility of installing data sockets at ‘useful locations’ will depend on the nature of the dwellings and the type of occupancy. However, diverse user needs can only be met by a flexible infrastructure that will allow sockets to be readily installed as and where required.

Such a flexible infrastructure would also offer the potential for supporting other cabling distribution requirements. It is not envisaged that developers install data sockets, data cabling or the associated network equipment although some may choose to do so. Rather developers should install internal ducting that enable the later installation of data cabling, faceplates and sockets, and network equipment with minimal disturbance to either previously installed cables or the fabric of the building. The aim should be to facilitate cable installation by an electrician or a qualified competent person.

The internal infrastructure should be limited to the supporting faceplates and sockets at ‘normal height’ but consideration should be given for sockets and faceplates that maybe located at a higher location within the dwelling to facilitate a wireless solution or wall mounted media systems such as a flat screen television. The internal infrastructure should also be designed to support the installation of devices at ceiling level such as sensors for home security and telecare and ceiling mounted loudspeakers.

2.3.3 Topology and layout

The following issues need be considered in determining the topology and layout of the internal infrastructure for a dwelling:

• Access to the external infrastructure via an external terminal box

• The possible requirement to later accommodate a joint between external and internal grade cabling

• The location of an equipment cabinet that may later accommodate equipment to support the distribution of data services within the dwelling (see Appendix C.2)

• The likely location of any television aerials/dishes, coax and primary sockets of the type often installed by developers. Such consideration should include the needs of digital television and the possible use of a shared television reception system (see Appendix C.2)

• The likely location of any standard telephone sockets and wiring of the type often installed by developers

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• Locations where users may realistically be expected to require a data connection. This needs to be considered in determining the size of the ducting to the areas within a dwelling

• The cable installation requirements (which are likely to be not fully known at the time of infrastructure design and construction) including:

- the number of cables per duct (can be estimated as noted in previous point)
- the length of cable runs – a maximum of 90m from the equipment cabinet is recommended for 'standard' data cables (reference Appendix B.2)
- cable installation requirements including the minimum bending radius (see guidance based on cabling in Appendix D.2) will impact of duct sizing, types of bends and access requirements.

From the above it can be seen that ducts should be routed from an equipment cabinet (located near to the external infrastructure) to at least the main living areas, kitchen and the bedrooms. The ducts should not be restricted to data network use and suitable access points should be included to enable the ducts to be used for other cabling applications (excluding power).

2.3.4 Terminal box

An external terminal box should be installed at each dwelling house or multi occupancy dwelling to facilitate cable. The terminal box may also be required to accommodate joints between internal and external grade cables. The terminal box should be located such that cables can readily pass through the wall to the equipment cabinet.

The terminal box should have minimum dimensions of 300mm height by 300mm width by 150mm depth. The terminal box should have a full-size door (i.e. 300mm by 300mm) that should be lockable, ideally with a standard service key. The terminal box should be designed for external mounting and constructed to withstand minor impacts. In some developments, depending on the location, 'terminal boxes' may be installed as a matter of course to aid in the delivery of local telecommunications and TV-based services. They may be installed by service providers or developers. This document does not rule out the use of these 'terminal boxes' for the above use, but it is recommended that minimum specifications in this guidance be adhered to and ownership and access rights considered.

2.3.5 Equipment cabinet

An equipment cabinet should be installed in each dwelling. The equipment cabinet may be required to later accommodate network termination and network distribution equipment installed by a data service provider and/or resident. This is considered further in Appendix C.2. The equipment cabinet should be located in a dry area that will not be subject to environmental extremes. This essentially dictates a location within the dwelling. Ideally the equipment cabinet should be located to align with the entry into the dwelling of

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the duct from the terminal box. The equipment cabinet should also be easily accessible by residents including those with disabilities (in accordance with the appropriate Building Regulations/ Standards). The equipment cabinet should have minimum dimensions of 300mm height by 300mm width by 150mm depth. However, a larger size equipment cabinet would be preferable and may indeed be essential to support the cable patching requirements in larger dwellings.

The equipment cabinet should have a full-size door (i.e. 300mm by 300mm) that allows easy access for residents or suppliers to draw cables from. The equipment cabinet should be lockable using a manual locking mechanism that is easy to use by residents. It is not recommended that the equipment cabinet is locked using a key that can be removed.

The equipment cabinet should be specifically designed to accommodate network equipment, patch panels and a mains power strip. It should be constructed to facilitate the connection of the ducting detailed above and should be ventilated. Any mains distribution strip must be installed by a qualified competent person in compliance with the appropriate regulation/standard.

The equipment cabinet should be constructed to withstand minor impacts. The equipment cabinet may be required to house wireless network equipment and therefore should not be constructed from a material that will impact the performance of the wireless network.

2.3.6 Building ducts

This document is not intended to provide guidance on specific types of ducts in new and existing buildings. There is likely to be a compromise between cost, aesthetics, flexibility and ease of access. Options that developers may consider, include:

- Vertical duct concealed with other services in riser
- Ducts in-wall with possibly predefined access and socket positions
- Dado ducting
- Skirting ducting (if not intended for sockets)
- Simple surface mounted ducting.

The ducts should be installed such that later cabling, and associated faceplates and sockets, can be installed with minimal disturbance to either previously installed cables or the fabric of the building. The aim should be to facilitate cable installation by an electrician or a qualified competent person. Developers should note that the type and specification of cabling used in dwellings may change. The cable specification upon which this guidance is based (Appendix D.2) should therefore be confirmed with the cable installer or cable vendor. The size of ducts required would depend on the number and diameter of cables that are likely to be installed at any point. This in turn will be impacted on by the topology of the infrastructure which itself will depend on the design of the building and the availability of duct routes. It is therefore not considered

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appropriate to specify duct sizes in this document. However, for guidance the following duct cable capacities are offered:

• Main ducts (that run from the equipment cabinet both vertically and horizontally) should have a minimum cross-sectional area of 800mm2, with the smallest dimension being 20mm (i.e. a 20mm x 40mm duct)

• Other ducts that spur from main ducts to each room should have a minimum cross sectional area of 400mm2, with the smallest dimension being 20mm (i.e. a 20mm x 20mm duct).

Developers are advised to employ larger ducts than specified above where space and / or dwelling construction permits giving consideration to the maximum number of sockets that may be wired in each area/room served. The ducts should enable cables to be installed with a minimum (long term) bending radius of 60mm.

Bends in the ducts should be kept to a minimum. Access points should be provided where there are multiple bends or bends greater than 45 degrees. Access points to under floor horizontal ducting should remain available through floorboards or other floor components. The ducts for data services should be separate from main electricity cables and comply with cable separation and routing standards. Where a vertical duct runs between floors the relevant provisions of the Building Regulations/ Standards should be followed, notably with respect to fire safety, resistance to moisture and resistance to sound.

Ducts should be positioned is such a way that damage from 'DIY' is minimised. A similar approach to the best practice installation of electrical cables and sockets should be considered. The ducts should enable 'standard size' face plates and data sockets to be readily installed for example:

• By removing/cutting a section of ducting to directly insert a faceplate – using ducting that has ideally been designed for the purpose

• Locating faceplates (with appropriate back boxes) adjacent to accessible ducting.

Data sockets (and other sockets supported by the internal infrastructure) must be located at a height above finished level floor that is in accordance with Building Regulations/Standards. Any data sockets located in the loft area should be located in such a position as not to put the resident at risk from trailing cables etc. This document does not provide any guidance on the installation of mains electricity cabling and sockets. However, developers need to recognise that the quantity and location of power sockets may be an issue given the provision of a flexible data services infrastructure. Developers should therefore consider options for a more flexible power provision in accordance with Building Regulations/ Standards.

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2.3.7 Multi-dwelling buildings

The above guidance for a dwelling house also applies to multi-dwelling buildings such as flats or maisonettes with the following exceptions. Each dwelling within the building could have a separate equipment cabinet or a cabinet per floor in a public area. The dwelling ducting from the equipment cabinet should not be routed outside of the dwelling served. The duct(s) from the terminal chamber should be routed to the equipment cabinets in a common duct with controlled access and restrictions allowing only authorised person's access. The common duct may be routed vertically and/ or horizontally. The common duct should have a minimum cross-sectional area of 2000mm2, with the smallest dimension being 40mm (i.e. a 40mm x 50mm duct). This size should serve up to 15 dwellings, but larger duct should be employed if space permits. The common duct cross sectional area should be increased by 2000mm2 for each additional 15 dwellings.

Where a common duct runs between floors, or horizontally between dwellings, the relevant provisions of the Building Regulations/ Standards should be followed. This is especially important with respect to fire safety, resistance to moisture, gas leaks, air tightness and resistance to sound.

2.3.8 Boundaries

At each dwelling the boundary between the external and internal infrastructure should be adjacent to the place where the data service providers' cable may later enter the building. The resident would remain the owner of the ducting that houses the data cable from the service provider. In a multi-dwelling building the boundary between the external and internal infrastructure should be adjacent to the place where the data service providers' cable may later enter the building. The landlord shall therefore have responsibility for a part of the internal infrastructure (including the terminal box and common duct) that may accommodate cables and network equipment that is owned by a data service provider. Subject to the terms of the lease of multi-dwelling buildings, the landlord may also be responsible for the equipment cabinet and ducting within each dwelling. Boundaries for ducting between two premises start and end at the dividing wall. The ownership of the infrastructure within the ducting may remain with the service provider or the original infrastructure owner.

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This Report was completed by GTech Surveys Limited on the basis of a defined programme of work and terms and conditions agreed with the Client. We confirm that in preparing this Report we have exercised all reasonable skill and care considering the project objectives, the agreed scope of works, prevailing site conditions and the degree of manpower and resources allocated to the project.

The findings in this document were correct and accurate on the day of draft issue (11th May 2020) but cannot be guaranteed to remain the same for any defined period. This report assumes that there will be changes to telecommunications networks and other surrounding structures, which may result in different broadband technologies becoming unavailable or degraded. GTech Surveys Limited will not be held liable for costs of any requirement to conduct more diagnostic assessments due to changes within the surveyed environment, or due to changes in networks in the study area. BT Openreach information is valid only for 90 days from issue.

GTech Surveys Limited accepts no responsibility to any parties whatsoever, following the issue of the Report, for any matters arising outside the agreed scope of the works. This work was conducted under GTech Surveys Limited's standard terms and conditions which can be found on our website.

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