

# Telecommunications Connectivity

## Fixed Network and Mobile Coverage Assessment

Brunel Road  
Theale  
RG7 4XE



## FIXED NETWORK SERVICES

BUILDING ENTRIES	
DUCT ENTRIES	YES – SINGLE
LOCATION	GROUND FLOOR OFFICE BUILDING
SECURITY	EXCELLENT – RESTRICTED ACCESS
OWNERSHIP	BT
DIVERSITY AVAILABLE	NO
STATUS (CAPACITY)	LIMITED CAPACITY AVAILABLE

CARRIERS	
BT OPENREACH	IN OFFICE BUILDING
VIRGIN MEDIA	OUTSIDE OF SITE
VODAFONE	OUTSIDE OF SITE

SERVICES	
BT OPENREACH	COPPER AND FIBRES SERVICES ADSL BROADBAND AT 10-17Mbps

ADDITIONAL SERVICES	
LANDLORD	N/A
OTHERS	N/A

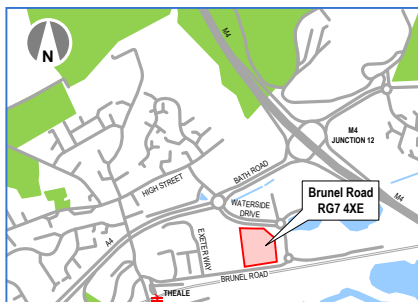
SITE DISTRIBUTION	
RESILIENCE	SINGLE INTAKE LOCATION AT PRESENT, GOOD OPPORTUNITY FOR DIVERSE INTAKE AS PART OF SITE DEVELOPMENT ACROSS BT AND OTHER CARRIERS IF REQUIRED
RISERS	N/A
SECURITY	N/A
TENANT FLOOR SPACE	N/A

## MOBILE NETWORK SERVICES

OPERATOR SERVICES	THREE, VODAFONE, O2, EE - 2G, 3G, 4G (THREE - 3G/4G ONLY)
COVERAGE SUMMARY	GOOD COVERAGE ACROSS ALL OPERATORS TO SITE, IN-BUILDING SERVICES DEPENDANT ON DEVELOPMENT AND BUILDING TYPES
BUILDING SOLUTIONS	N/A



**Brunel Road**  
Theale  
RG7 4XE



### Fixed Network Services

BT Services	Excellent
Other Carriers	Good
Building Distribution	Not Applicable

### Mobile Network Services

Operator	Voice	Data
Three	Good	Good
Vodafone	Good	Good
O2	Good	Good
EE	Good	Good

**STRUCTURE**

Brunel Road is an existing distribution warehouse with associated ancillary buildings located adjacent to the M4 in Theale. The buildings currently extend to approximately 96,850 sq ft (8,998 sqm) and sit within a 6.16 acre site accessed from Brunel Road on the south elevation. The site is under consideration for re-development into either a single unit (100,000 sq ft approx) or a number of smaller units by the current owner. The site is located within an environment of other commercial properties of similar and greater height in all directions with good separation between adjacent premises on three sides.

**TOPOGRAPHY**

### Location Plan

### BT Exchange locations

Routes and distances are indicative only

#### BT Exchange Information

<b>Primary Exchange</b> (650m approx)	THEALE (THTH) RG7 4AR
<b>Secondary Exchange</b> (5,400m approx)	READING TILEHURST (THTT) RG30 6BP

**BT SUMMARY**

Brunel Road is located approximately 650m from the BT Theale Exchange, which is situated to the north west of the site. Theale Exchange provides excellent services including ADSL, ADSL+ and FTTC (to some areas) plus the availability of LLU services from Sky and Talk Talk over BT infrastructure. Based on the existing standard copper services, Theale Exchange can offer ADSL broadband speeds of around 10-17Mbps at this time. This exchange has been enabled to provide BT Infinity services over FTTC technology with speeds of up to 80Mbps download and 20Mbps upload and is currently 'exploring options' with a view to providing FTTC services, but does not indicate timescales at this time (Data via the BT website). Reading Tilehurst Exchange to the north west affords a greater range of services, and could provide a level of diversity and resilience across BT business services should it be required.

**TELECOMS CARRIERS**

Telecommunications carriers with owned infrastructure located adjacent to the site are listed below for information. In addition to these, there are a number of alternative carriers that can provide service, albeit over a third party network such as BT. It must be noted that the presence of infrastructure within the search area does not constitute availability of service.

**British Telecom** Tel: 0800 800 152 www.bt.com  
**Virgin Media** Tel: 0800 953 0180 www.virginmedia.com  
**Vodafone** Tel: 020 7111 3900 www.vodafone.co.uk

**SUMMARY**

The BT copper and fibre services available at Theale Exchange, and added resilience of a second exchange afford Brunel Road an excellent level of services to meet today's business needs with the added advantage of potentially good diversity and resilience opportunities. The physical presence of alternative carriers infrastructure to BT from Virgin Media and Vodafone running alongside the site boundary and in the local environs affords a good choice of alternative carrier to provide fibre services to any incoming tenant albeit subject to local extension to their networks to access the site.

RATING	BT	OTHERS
BT	<span style="background-color: #90EE90; padding: 2px;">4</span>	<span style="background-color: #FF0000; color: white; padding: 2px;">1</span> <b>None</b> (No alternative carriers adjacent to site)
OTHERS	<span style="background-color: #90EE90; padding: 2px;">3</span>	<span style="background-color: #FF0000; color: white; padding: 2px;">2</span> <b>Fair</b> (Carrier services in local environs)
	<span style="background-color: #90EE90; padding: 2px;">2</span> <b>Low</b> (Copper only)	<span style="background-color: #FF0000; color: white; padding: 2px;">3</span> <b>Good</b> (Carrier services adjacent to building/site)
	<span style="background-color: #90EE90; padding: 2px;">3</span> <b>Fair</b> (Copper internal / fibre in environs)	<span style="background-color: #FF0000; color: white; padding: 2px;">4</span> <b>Excellent</b> (Carrier services in building/site)
	<span style="background-color: #90EE90; padding: 2px;">4</span> <b>Good</b> (Copper internally / fibre externally)	
	<span style="background-color: #90EE90; padding: 2px;">4</span> <b>Excellent</b> (Copper/fibre internally) with diversity	

**GLOSSARY OF TERMS**

**ADSL (Asymmetric Digital Subscriber Line)** Asymmetric line speed, the speed from the internet to the user, and the user to the internet are different. Feed over copper cable, governed by distance from exchange to user. (co-exists with voice services)

**ADSL+ (Asymmetric Digital Subscriber Line+)** Asymmetric line speed as above, but with faster connections both downstream and upstream over similar distance following roll-out of BT's 21CN Wholesale Broadband Connect (WBC).

**SDSL (Symmetric Digital Subscriber Line)** Symmetric line speed, the speed between the user and the internet are the same in both directions but cannot co-exist with voice services over the same line.

**FTTC (Fibre to the Cabinet)** Provides fibre to the cabinet, shortening copper cable length requirements to enhance speed

**FTTP (Fibre to the Premises)** Provides fibre direct to the premises at a lower cost than that of standard lease line products

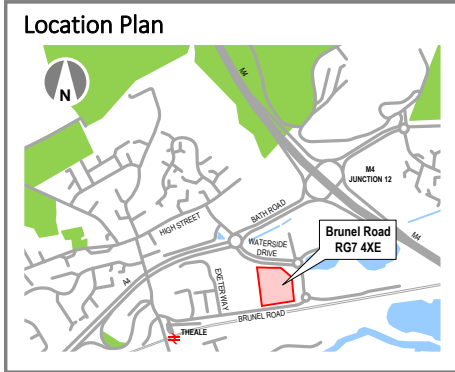
**LLU (Local Loop Unbundling)** Is the process by which third party network operators are able to install equipment into BT exchanges in order to deliver their own services without having to utilise BT's network.

**BT Infinity** (British Telecom) Fibre to the cabinet/premises delivered services from enabled exchanges providing broadband speeds of up to 80Mbps download (subject to conditions) at a lower cost to that of traditional leased fibre services.

STRUCTURE

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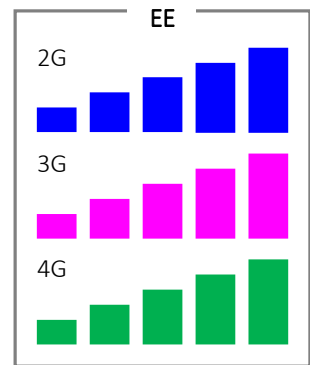
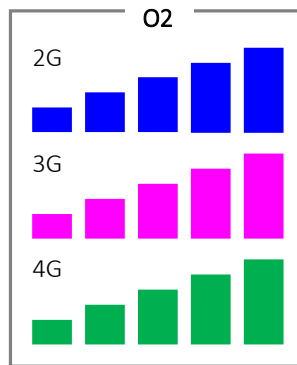
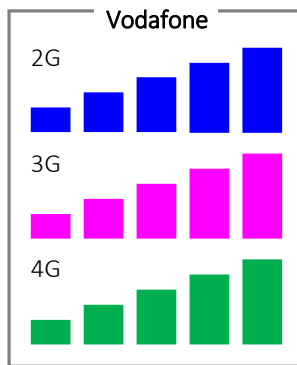
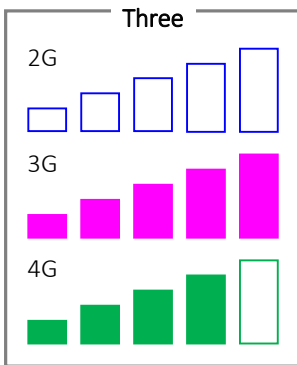
TOPOGRAPHY



- Site / Building Observations**
- Site is located in a commercial property / open environment
  - Adjacent buildings of similar height to west elevation
  - Further buildings to other elevations at distance
  - No noted mobile equipment located within site boundary
  - No internal solution present in existing buildings



STREET LEVEL COVERAGE



OBSERVATIONS

Following our review of the mobile operators coverage details it is clear that the site affords an excellent level of macro coverage from all operators for 2G, 3G and 4G services. Any high concentration of users within future buildings may impact on the capacity available especially if this is confined to any one single network operator. Based on this information it is considered to be a location that affords an excellent level of overall coverage across all operators at street level for 2G, 3G and 4G services.

**COVERAGE KEY - Street Level**

- No coverage at this location
- Limited external coverage, indoors unlikely
- External coverage variable with limited indoor capability
- External coverage most areas, variable indoor capability
- Good external coverage, indoor coverage in small buildings
- Excellent external coverage, good indoor coverage in most buildings

PREDICTIONS

Surrounding buildings, the distance and direction of the serving cells and building construction can all impact on the penetration of signal throughout a building. Based on our assessment, it is envisaged that a general good level of coverage will be present across the site for 2G, 3G and 4G services. The level of in-building coverage will depend on the type and construction of the buildings post development, with some degradation expected in warehouse units with predominantly steel clad facades. In cases of coverage issues, each of the operators can provide solutions to enhance their service of which we can provide details and assist in their procurement and installation should they be required. This extends to full in-building coverage, or specific areas or floors by means of Femto Cell technology. Further to the coverage levels, the availability of service is dependant on capacity. This is the volume of data and simultaneous voice calls the macro cell can accommodate at any one time. Capacity issues result in 'network busy' messages or dropped calls. The level of capacity can be addressed by the operators should the building be populated with a high number of users on a single network which will impact on both them and others using the same cell.

INDOOR SUMMARY

OPERATOR	2G	3G	4G
Three	0	4	3
Vodafone	4	4	4
O2	4	4	4
EE	4	4	4

EE operates under both T-Mobile and Orange brands within the United Kingdom / Three operates a 3G/4G network only

**COVERAGE KEY - Indoor prediction**

- 0 NONE (No indoor coverage at this location)
- 1 POOR (Indoor coverage unlikely)
- 2 LOW (Limited indoor coverage)
- 3 FAIR (Variable coverage in all buildings)
- 4 GOOD (Good to small buildings, variable in larger buildings)
- 5 EXCELLENT (Good coverage in most buildings and areas)

It should be noted that the location, building fabric / materials, surrounding environs impact on the ability of RF penetration and these predictions are for guidance only.

## Fixed Telecoms Appraisal Summary

In addition to the Fixed Network carrier study completed, a review by survey of the site was undertaken on the 22<sup>nd</sup> May 2017. The purpose of this survey was to clearly identify the presence of all fixed telecommunications carrier's infrastructure on the site, adjacent to or within the local environs.



SITE AERIAL VIEW (Site area highlighted in red)



VIEW LOOKING WEST ALONG BRUNEL ROAD



VIEW LOOKING EAST ALONG BRUNEL ROAD

### Local Carriers

The site is accessed from Brunel Road to the south elevation. The provision of services from BT is via existing network infrastructure along the length of Brunel Road extending along the entrance frontage on the north side of the carriageway. It is evident that this infrastructure extends in both directions from the west continuing along Waterside Drive to the east back onto Bath Road. A number of chambers were identified along this route indicating the opportunities for diverse entries onto the site if required. The actual site connection at this time is afforded by a chamber located in the footway to the west side of the entrance with direct access into the existing office building. The existence of other carriers services were identified on a similar route to that of BT along the north side of Brunel Road extending into Waterside Drive. Existing chambers and associated infrastructure from both Virgin Media and Vodafone is extensive along the site frontage with similar opportunities to provide a separate diverse entry to the site if required. No services from either of these two carriers were evident on the site at the time of survey (See Photographs 1 to 6).



PHOTOGRAPH 1  
EXISTING BT CHAMBER IN FOOTWAY ON BRUNEL ROAD TO WEST SIDE OF ENTRANCE (SERVING CHAMBER)



PHOTOGRAPH 2  
EXISTING BT CHAMBER IN FOOTWAY ON BRUNEL ROAD TO EAST OF ENTRANCE



PHOTOGRAPH 3  
EXISTING BT AND VIRGIN MEDIA CHAMBERS IN FOOTWAY / VERGE ON WEST SIDE OF WATERSIDE DRIVE



**PHOTOGRAPH 4**  
 EXISTING VODAFONE CHAMBER IN VERGE ON WEST SIDE OF WATERSIDE DRIVE



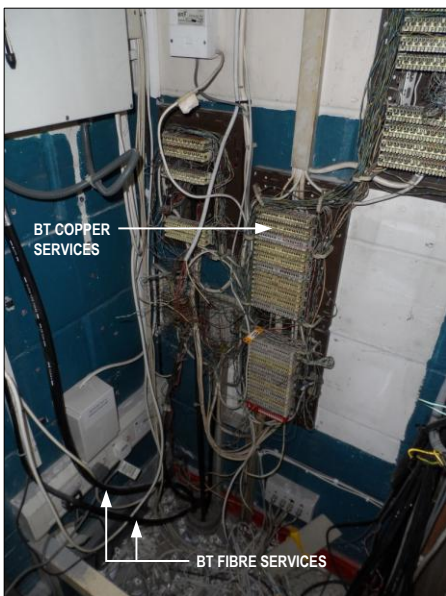
**PHOTOGRAPH 5**  
 EXISTING VODAFONE CHAMBER ON BRUNEL ROAD AT JUNCTION WITH EXETER WAY TO WEST OF SITE



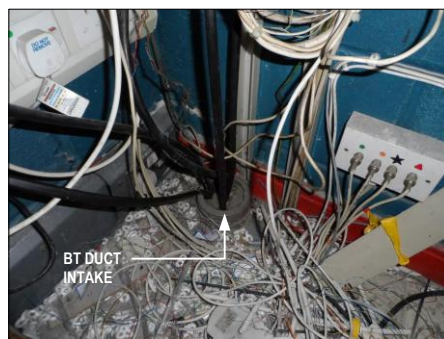
**PHOTOGRAPH 6**  
 EXISTING BT AND VIRGIN MEDIA CHAMBERS ON BRUNEL ROAD AT JUNCTION WITH EXETER WAY TO WEST OF SITE

### Building Presence

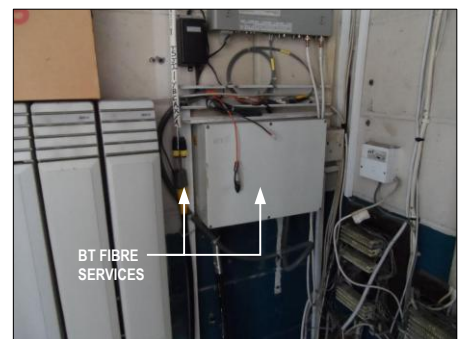
As part of the survey, the existing office building was inspected to understand the current level of telecommunication services entering the site. BT enter the building to the east end adjacent to the main site entrance via a single 90mm diameter (approx) duct in the floor slab providing access for copper and fibre services. The copper services are delivered over 3No. incoming cables each affording approximately 50 pairs. These are terminated in a number of small distribution points (DP's) on the wall above the ducts. A number of outgoing cables exit this location to further DP's within the room and onward to other parts of the building. The fibre services are delivered over 2No. cables (multiple tubes/fibres) terminated in a splice enclosure and gas seal joint. Outgoing blown fibre tubes exit these locations to other parts of the building to suit. Based on the incoming cable sizes we conclude that a total of 4No. blown fibre tubes with a capacity of 4No. fibres per tube (16No. fibres total) are present, but would be subject to confirmation from BT at this time (See **Photographs 7, 8 & 9**). No other services from the alternative carriers were identified within the building as part of the survey.



**PHOTOGRAPH 7**  
 EXISTING BT INTAKE AND ASSOCIATED EQUIPMENT IN OFFICE BUILDING ON GROUND FLOOR (EAST END)



**PHOTOGRAPH 8**  
 BT DUCT INTAKE IN FLOOR SLAB TO OFFICE BUILDING AT EAST END



**PHOTOGRAPH 9**  
 BT FIBRE SPLICE ENCLOSURE ON WALL ABOVE INTAKE DUCT WITH OUTGOING BLOWN FIBRE TUBES

### Service Availability

The standard services afforded by BT over its existing copper networks can only offer ADSL broadband speeds of around 10-17Mbps at this time due to distance constraints. Theale Exchange has been enabled to provide BT Infinity services over FTTC technology with speeds of up to 80Mbps download and 20Mbps upload and is currently 'exploring options' with a view to providing FTTC services, but does not indicate timescales at this time (Data via the BT website). The level of copper services available from BT and other companies that can utilise the BT network will be able to provide enhanced speeds by use of bonded ADSL products where required to increase speed. Typically two 17Mbps ADSL lines bonded can increase speed to 34Mbps, increasing with the number of lines bonded accordingly. In addition to the copper services, it is clear that an excellent level of fibre based business tariff services will be available from BT to provide any level of speed and bandwidth required over fibre products. For example, the introduction of a 100Mbps fibre bearer can be delivered over the existing ducted network affording un-contended upload and download port speeds from 10Mbps to 100Mbps based on the tenants requirements. These are also scalable from initial requirements up to the maximum available speeds in respect of the bearers. Higher bearer capacities are available to suit typically 500Mbps to 1Gbps and beyond where required. Furthermore, there are a host of companies that can provide enhanced products over the existing infrastructure potentially providing smaller businesses a more affordable level of service if so required. The presence of Virgin Media and Vodafone outside of the site with a potential separate entry available over that of BT affords a good level of alternative diverse service subject to network extension at this time, providing similar fibre services to those of BT.

### Summary

Based on the level of infrastructure and the availability of services from BT's local exchange, we consider Brunel Road has an excellent/good level of connectivity with the ability to enhance this by means of fibre services where required in good timescales from order in respect of BT and potentially Virgin Media and Vodafone. The delivery of services from the other carriers outside the site will be subject to the viability of service provision due to infrastructure requirements from the public highway to the site, but their location greatly enhances the connectivity of the site at this time and for the future planned development.