

Telecommunications Connectivity

Fixed Network and Mobile Coverage Assessment

Betchworth House
 57-65 Station Road
 Redhill
 Surrey
 RH1 1DL

ewave
telecommunications rating

Fixed Network Services

BT Services	Excellent
Other Carriers	Good

Mobile Network Services

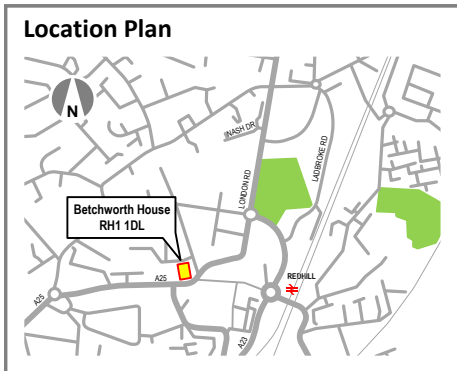
Operator	Voice	Data
Three	Good	Good
Vodafone	Good	Good
O2	Good	Good
EE	Good	Good



STRUCTURE

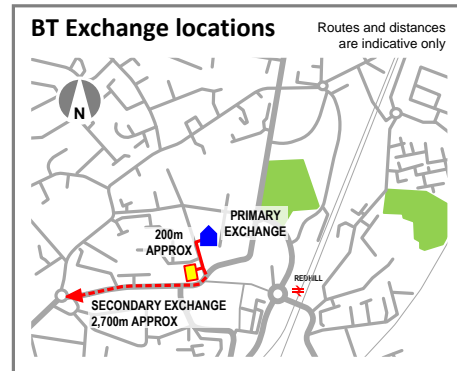
Betchworth House is an established commercial office property located in Redhill town centre. The building is over four floors, affording available Grade A office accommodation suites up to approximately 4,668 sq ft (434 sqm) of over open floor plates with suspended ceilings and under floor trunking grids throughout. The building is of typical frame and concrete floor construction with brick and glazed facades to all elevations, and sits within an environment of other commercial properties of similar sizes and heights with good separation between adjacent buildings.

TOPOGRAPHY



BT Exchange Information

Primary Exchange (200m approx)	REDHILL (LSRED) RH1 1QY
Secondary Exchange (2,700m approx)	REIGATE (LSREI) RH2 OSP



BT SUMMARY

Betchworth House is located approximately 200m from the BT Redhill Exchange, which is situated to the north east of the building. Redhill Exchange provides excellent services including ADSL, ADSL+, SDSL, 21CN WBC and FTTC (to some areas) plus the availability of LLU services from C&W, Talk Talk and Sky all over BT infrastructure. Based on the existing standard copper services, it can offer broadband speeds of around 17Mbps at this time. This exchange has been enabled to provide BT Infinity services over FTTC with speeds of up to 80Mbps download and 20Mbps upload but is not currently indicating availability to this location, and provides no dates for such services to be deployed at this time (Data via the BT website). Reigate Exchange to the south west affords a similar level 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 the building 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 7390 3900 www.vodafone.co.uk
- Level 3** Tel: 020 7954 5454 www.level3.com

SUMMARY

The BT copper and fibre services available at Redhill Exchange, and added resilience of a second exchange afford Betchworth House an excellent level of services to meet today's business needs, with the added advantage of good diversity and resilience opportunities. The physical presence of an alternative carriers infrastructure to BT from Virgin Media outside of the building and Vodafone and Level 3 in the local environs affords a choice of alternative carrier to provide fibre services to any incoming tenant, albeit subject to new building entry requirements and varying levels of network extension.

RATING		BT		OTHERS	
1	Low (Copper only)	1	None (No alternative carriers adjacent to site)	1	None (No alternative carriers adjacent to site)
2	Fair (Copper internal, fibre external)	2	Fair (Carrier services in local environs)	2	Fair (Carrier services in local environs)
3	Good (Copper / Fibre internally)	3	Good (Carrier services adjacent to building/site)	3	Good (Carrier services adjacent to building/site)
4	Excellent (Copper/Fibre internally) with diversity	4	Excellent (Carrier services in building/site)	4	Excellent (Carrier services in building/site)

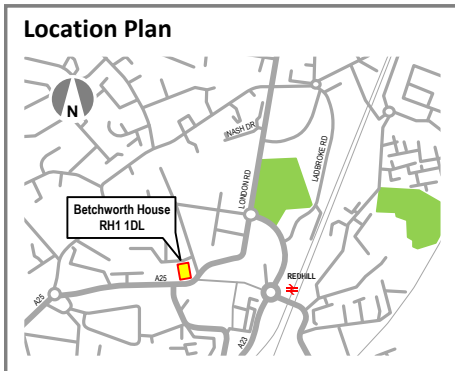
GLOSSARY OF TERMS

- 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

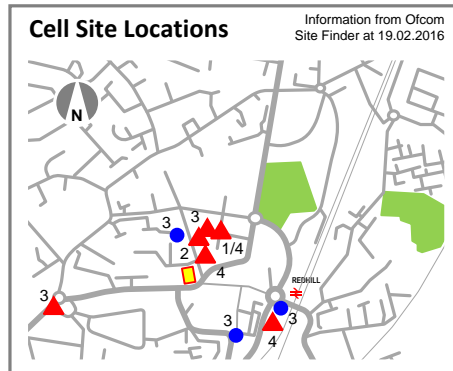
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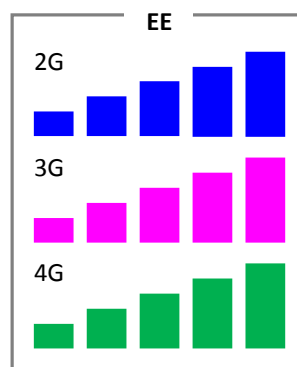
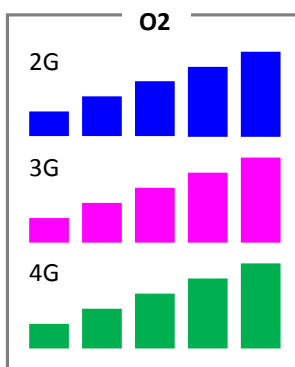
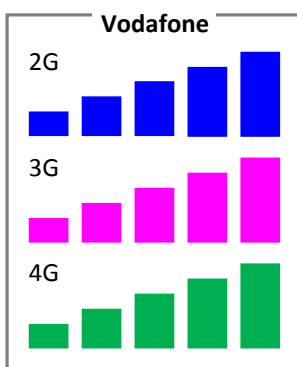
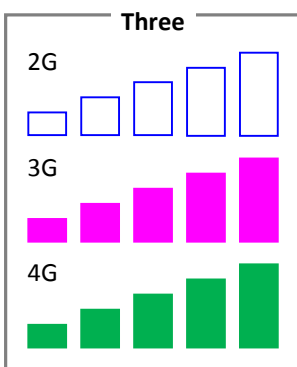


Cell Site Information
 ▲ Macro site typically >10m above ground level
 ● Street level micro cells typically <10m above ground level
 All locations are approximate only

Operators
 1. Three
 2. Vodafone
 3. O2
 4. EE



STREET LEVEL COVERAGE



OBSERVATIONS

Betchworth House affords an excellent level of macro coverage from all operators for 2G, 3G and 4G services. The closest serving cells are detailed in respect of 2G, 3G and 4G services and can be seen vary in location and distance, providing general coverage to the building. Any high concentration of users within the units 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 the location and serving cells, it is envisaged that a good/variable level of coverage will be present throughout the building for 2G, 3G and 4G services, with some potential degradation of services in lower level parking areas. 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.

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	4
Vodafone	4	4	4
O2	4	4	4
EE	4	4	4

EE operates under both the TMobile 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 building was undertaken on the 16th February 2016. The purpose of this survey was to clearly identify the presence of all existing fixed telecommunications carrier's infrastructure in the building, adjacent to, or within the local environs.



SITE AERIAL VIEW (Building highlighted in red)



LOOKING NORTH ALONG QUEENSWAY



LOOKING NORTH ALONG WARWICK ROAD

Local Carriers

Betchworth House has access for telecommunication services predominantly along the east elevation from Warwick Road. The existing level of telecommunications infrastructure adjacent to the building extends to that from BT and Virgin Media at this time. In addition, existing infrastructure from both Vodafone and Level 3 is present in the local environs to the north along Queensway and Clarendon Road. Typically BT presence is extensive with a number of chambers along Warwick Road and Queensway providing connection into the building. The local BT chamber considered to be serving the building is located in the footway on the east elevation in Warwick Road providing access into the lower level parking area (See **Photograph 1**). Further BT chambers are present at various locations adjacent to the building on both sides of the road from the exchange which is located in Warwick Road. In addition to BT, Virgin Media have a good presence adjacent to the building and in the local environs with an existing chamber and cabinet located outside of the building entrance. This extends from their network which is extensive along the footways in all directions (See **Photographs 2, 3, 4, 5 & 6**).

Based on the layout of the building, we consider that any additional building entries, such as Virgin Media would be best placed adjacent to that of BT. This would require extension of their network from the junction of Queensway with Warwick Road to facilitate connection. This however is based on our initial survey and would be subject to further investigation to confirm viability.



PHOTOGRAPH 1
EXISTING BT CHAMBER IN FOOTWAY ON WARWICK ROAD SERVICING BUILDING



PHOTOGRAPH 2
EXISTING BT CHAMBER ADJACENT TO BUILDING IN FOOTWAY ON WARWICK ROAD



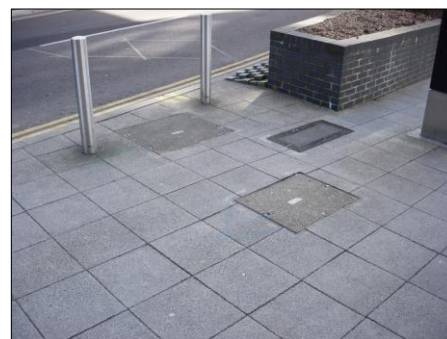
PHOTOGRAPH 3
EXISTING BT AND VIRGIN MEDIA CHAMBERS IN FOOTWAY ADJACENT TO BUILDING FRONT ENTRANCE



PHOTOGRAPH 4
 EXISTING VIRGIN MEDIA CHAMBERS AND CABINET IN FOOTWAY ADJACENT TO BUILDING FRONT ENTRANCE



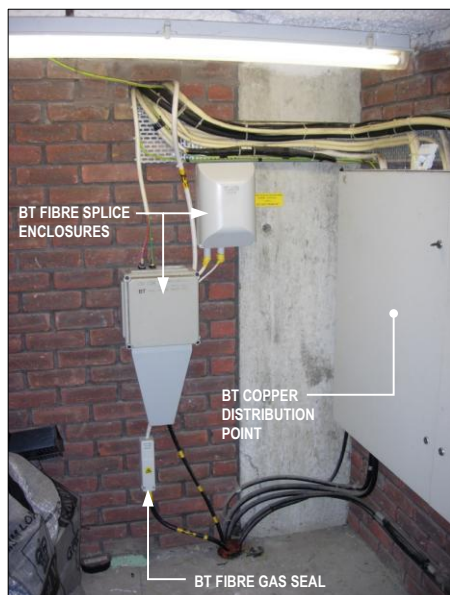
PHOTOGRAPH 5
 EXISTING BT AND VIRGIN MEDIA CHAMBERS IN FOOTWAY ON QUEENSWAY OPPOSITE BUILDING



PHOTOGRAPH 6
 EXISTING VIRGIN MEDIA CHAMBERS IN FOOTWAY ON QUEENSWAY OPPOSITE BUILDING

Building Presence

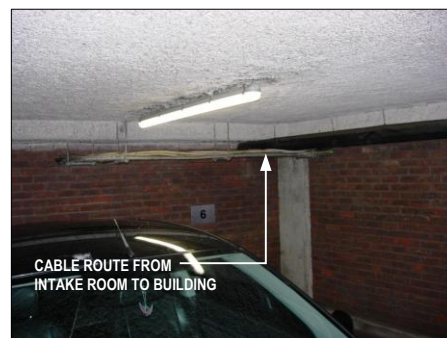
The point of telecommunications intake is located in a small room within the lower level parking area (Parking Bay 7) at the north east corner of the building. The BT intake consists of two 100mm diameter (approx) ducts through the floor slab from the local external chamber. The duct has a total of seven incoming cables providing both copper and fibre services to the building. The level of copper services extends to approximately 300-400 pairs over five cables terminating in a distribution point (DP) on the wall with multiple outgoing cables. The fibre entering the building is over two cables (multiple fibres/tubes) terminated in a gas seal and a fibre splice enclosure, plus extension on the wall above to the intake ducts (See **Photograph 7**).



PHOTOGRAPH 7
 EXISTING BT INTAKE LOCATION INDICATING COPPER AND FIBRE SERVICES



PHOTOGRAPH 8
 EXISTING BT CABLE EXIT LOCATION AT HIGH LEVEL FROM INTAKE ROOM TO CAR PARK AREA

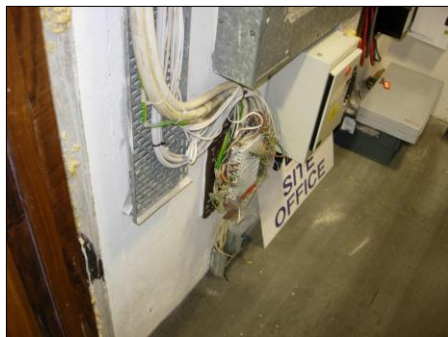


PHOTOGRAPH 9
 EXISTING BT CABLE ROUTES FROM INTAKE ROOM TO BUILDING IN CAR PARK AREA

Access to the tenant floors from the point of intake is via high level containment across the car parking soffit into the building beneath the floor into the main riser (See **Photograph 8 & 9**). This riser runs the full height of the building with riser cupboards on each floor. We investigated the riser location on all floors as part of the survey and found BT copper and fibre services were present at all levels. Typically copper DP's are present with varying levels of copper pairs. In respect of the fibre services, gas seals were

present on a number of floors with a main splice enclosure on the 1st Floor with multiple outgoing blown fibre tubes. Clearly the building is well served by both copper and fibre to all levels and tenants areas. The space within the riser cupboards is good with adequate space for any additional termination equipment required to provide services to all floors. Based on our inspection of the building and risers we conclude that access to all floors is excellent in respect of riser locations and available space, with good access into the tenant areas via the suspended ceiling space or under floor trunking grid (See **Photographs 10, 11, 12, 13, 14 & 15**).

No further services from alternative carriers were identified entering or within the building at this time.



PHOTOGRAPH 10
EXISTING BT COPPER SERVICES IN RISER CUPBOARD
IN RECEPTION ON GROUND FLOOR



PHOTOGRAPH 11
EXISTING BT FIBRE SERVICES IN RISER CUPBOARD
IN RECEPTION ON GROUND FLOOR



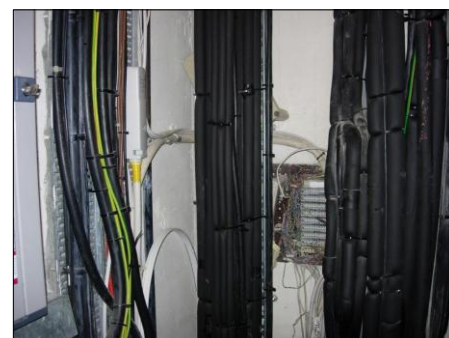
PHOTOGRAPH 12
EXISTING BT COPPER SERVICES IN RISER CUPBOARD
ON FIRST FLOOR LANDING



PHOTOGRAPH 13
EXISTING BT FIBRE SPLICE ENCLOSURE IN RISER
CUPBOARD ON FIRST FLOOR LANDING



PHOTOGRAPH 14
EXISTING BT COPPER AND FIBRE SERVICES IN RISER
CUPBOARD ON SECOND FLOOR LANDING



PHOTOGRAPH 15
BT COPPER AND FIBRE SERVICES IN RISER CUPBOARD
ON THIRD FLOOR LANDING

Service Availability

The standard services afforded by BT over its existing copper networks provides a level of broadband services with speeds expected in the region of 17Mbps. This exchange has been enabled to provide BT Infinity services over FTTC with speeds of up to 80Mbps download and 20Mbps upload but is not currently indicating availability to this location, and provides no dates for such services to be deployed at this time (Data via the BT website). However, the current level of business tariff services available from BT will provide an excellent level of service at this time affording any level of speed and bandwidth required over fibre products. Furthermore, there are a host of companies that can provide enhanced products over the existing infrastructure providing smaller businesses a more affordable level of service if so required.

The presence of BT fibre services already in place in the building, and Virgin Media outside of the building affords a choice of carrier to provide additional fibre based services to any incoming tenant albeit subject to a new building entry, connection, wayleaves and/or third party agreements.

Summary

Based on the level of infrastructure and the availability of services from BT's local exchange, we consider Betchworth House has an excellent/good level of connectivity with the ability to enhance this by means of additional fibre services where required in minimal timescales from order. The presence of the Virgin Media outside of the building, and Vodafone and Level 3 in the local environs affords a good alternative provision of service and diversity at this time albeit subject to network extension, new building intake positions and rights of access requirements.