

# Telecommunications Connectivity

## Fixed Network and Mobile Coverage Assessment

Harlequin House  
 7 High Street  
 Teddington  
 TW11 8EE



## FIXED NETWORK SERVICES

BUILDING ENTRIES	
DUCT ENTRIES	1No. DUCT + DIRECT WALL ENTRY
LOCATION	GROUND FLOOR (EAST ELEVATION)
SECURITY	EXCELLENT
OWNERSHIP	BT / VIRGIN MEDIA
DIVERSITY AVAILABLE	YES (LOCATION & CARRIER)
STATUS (CAPACITY)	SPARE CAPACITY AVAILABLE

CARRIERS	
BT OPENREACH	IN BUILDING
VIRGIN MEDIA	IN BUILDING

SERVICES	
BT OPENREACH	COPPER + FIBRE SERVICES – GROUND FLOOR RISER/ACROSS BUILDING (EAST ELEVATION) ADSL BROADBAND AT 8-19Mbps
VIRGIN MEDIA	FIBRE SERVICES – FIRST FLOOR RISER/ACROSS BUILDING (BFP)

ADDITIONAL SERVICES	
LANDLORD	N/A
OTHERS	N/A

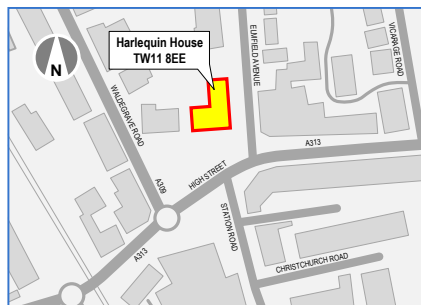
BUILDING DISTRIBUTION	
RESILIENCE	SECURE INTAKE LOCATIONS IN RISER AND STAIR WELL (EAST ELEVATION)
RISERS	SECURE RISER AVAILABLE – RESTRICTED ACCESS
SECURITY	EXCELLENT/GOOD SECURITY THROUGHOUT – BT (EXCELLENT) INTAKE POSITION IN RESTRICTED ACCESS AREA / VIRGIN MEDIA (GOOD) EXTERNAL CABLE EXPOSED FROM CHAMBER TO WALL
TENANT FLOOR SPACE	EXCELLENT CONNECTIVITY/EASE OF INSTALL FROM RISER VIA TRUNKING/CEILINGS

## MOBILE NETWORK SERVICES

OPERATOR SERVICES	THREE, VODAFONE, O2, EE - 2G, 3G, 4G (THREE - 3G/4G ONLY)
COVERAGE SUMMARY	GOOD/VARIABLE COVERAGE ACROSS ALL OPERATORS, POTENTIAL DEGRADATION OF SERVICES IN LIFTS (FAIR EE 5G SERVICES IN BUILDING AT THIS TIME)
BUILDING SOLUTIONS	NO COVERAGE SOLUTIONS IN PLACE AT THIS TIME



**Harlequin House**  
7 High Street  
Teddington TW11 8EE



### Fixed Network Services

BT Services	Excellent
Other Carriers	Excellent
Building Distribution	Excellent

### Mobile Network Services

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

# Fixed Network Connectivity - Carrier Study

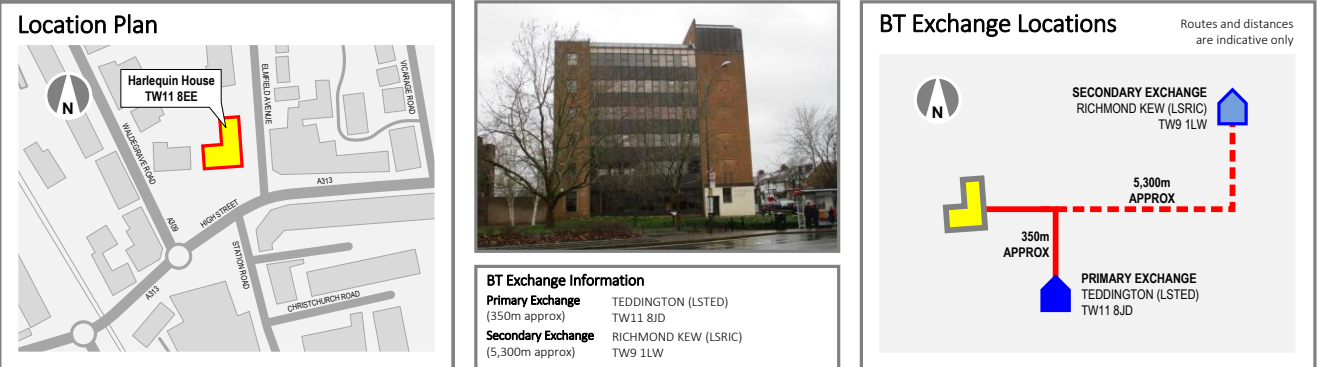
## Harlequin House, 7 High Street, Teddington TW11 8EE

Mar 2020

### STRUCTURE

Harlequin House is an established commercial property located at the junction of High Street with Elmfield Avenue in Teddington. The building extends to ground and five upper floors affording approximately 20,980 sq ft (1,949 sqm) of high quality refurbished office accommodation with perimeter trunking and suspended ceilings throughout. The building is of typical frame construction with a mixture of brick and glazed facades and sits within a town centre environment with other commercial and residential properties of varying height in all directions.

### TOPOGRAPHY



### BT SUMMARY

Harlequin House is located approximately 350m from the BT Teddington Exchange, which is situated to the south east of the building. This exchange provides excellent services including ADSL, ADSL+, SDSL, 21CN WBC and FTTC (to some areas) plus the availability of LLU services from Sky, Talk Talk and Vodafone over BT infrastructure. Based on the standard copper services, Teddington Exchange can offer ADSL broadband speeds of around 8-19Mbps 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. However, the building is noted as currently 'exploring solutions' in respect of FTTC technology delivery but provides no timescales for deployment at this time (Data via the BT website). Richmond Kew Exchange to the north east affords a similar range of services, and could provide a level of diversity and resilience across BT business services if required.

### TELECOMS CARRIERS

Telecommunications carriers with owned infrastructure located adjacent to 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](http://www.bt.com)  
**Virgin Media** Tel: 0800 953 0180 [www.virginmedia.com](http://www.virginmedia.com)

### SUMMARY

The BT copper and fibre services available at Teddington Exchange, and added resilience of a second exchange afford Harlequin House 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 in the building affords an excellent choice of alternative carrier to provide fibre services to any incoming tenant at this time.

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

# Mobile Voice / Data Appraisal - Coverage Predictions

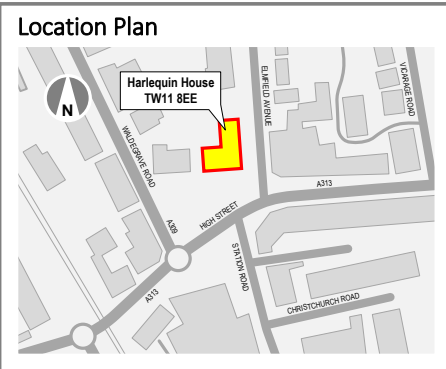
## Harlequin House, 7 High Street, Teddington TW11 8EE

Mar 2020

### STRUCTURE

Harlequin House is an established commercial property located at the junction of High Street with Elmfield Avenue in Teddington. The building extends to ground and five upper floors affording approximately 20,980 sq ft (1,949 sqm) of high quality refurbished office accommodation with perimeter trunking and suspended ceilings throughout. The building is of typical frame construction with a mixture of brick and glazed facades and sits within a town centre environment with other commercial and residential properties of varying height in all directions.

### TOPOGRAPHY



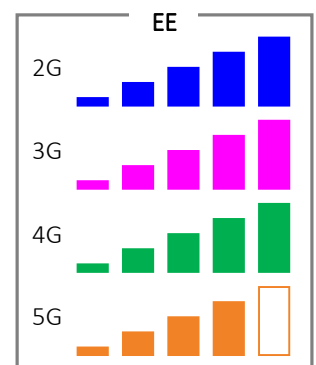
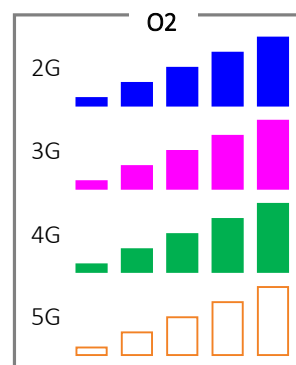
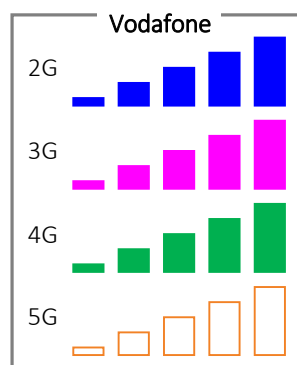
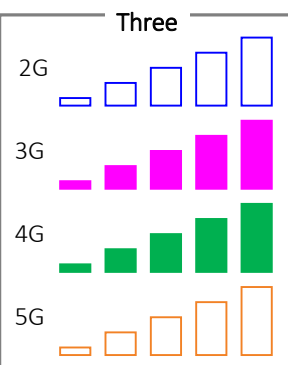
**Building Observations**

- Building sits in a town centre/residential environment
- Adjacent buildings of varying height in all directions
- Building fabric consists of brick and glazed facades
- No noted mobile equipment located on roof top
- No noted in-building coverage solutions in place

### Building Environment



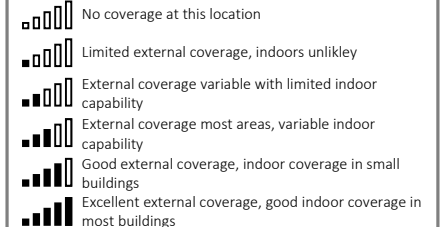
### STREET LEVEL COVERAGE



### OBSERVATIONS

Following our review of the mobile operators coverage details it is clear that Harlequin House affords an excellent level of macro coverage from all operators for 2G, 3G and 4G services. The availability of 5G services across all operators is in early stages of roll-out across the country and currently is limited to a level of service from EE. 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, with good 5G services from EE at this time. Any high concentration of users within the building may impact on the capacity available especially if this is confined to any one single network operator.

### COVERAGE KEY - Street Level



### PREDICTIONS

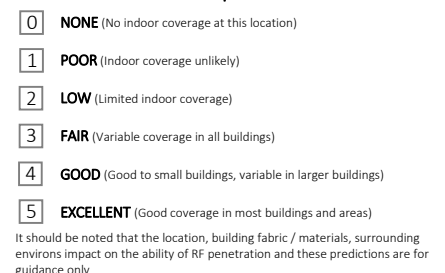
Surrounding buildings, the distance and direction of the serving cells and building construction can all impact on the penetration of signal throughout a building. Based on the location and serving cells, it is envisaged that a good/variable level of coverage will be present throughout the building for 2G, 3G and 4G services with some potential degradation in the lifts across all operators and technologies. In-building coverage across 5G services from EE is considered to be fair at this time. 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	5G
Three	0	4	4	0
Vodafone	4	4	4	0
O2	4	4	4	0
EE	4	4	4	3

Three operates a 3G/4G/5G network only ■ 5G Services are currently in roll-out across the UK in selected cities

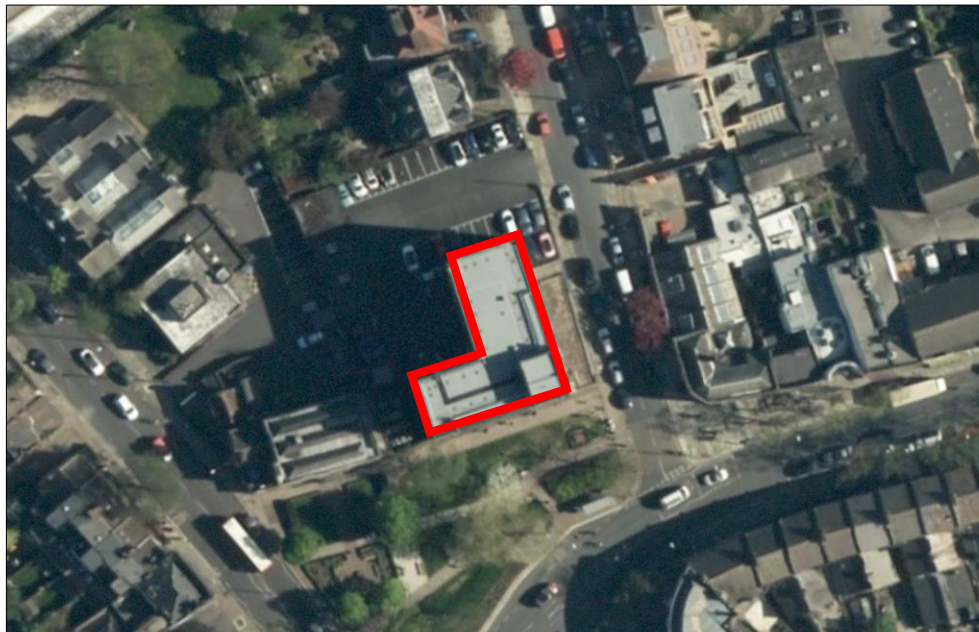
### COVERAGE KEY - Indoor prediction





## Fixed Telecoms Appraisal Summary

In addition to the Fixed Network carrier study completed, a review by survey of the building was undertaken on the 28<sup>th</sup> February 2020. The purpose of this survey was to clearly identify the presence of all fixed telecommunications carrier's infrastructure in the building, adjacent to or within the local environs.



SITE AERIAL VIEW (Building highlighted in red)



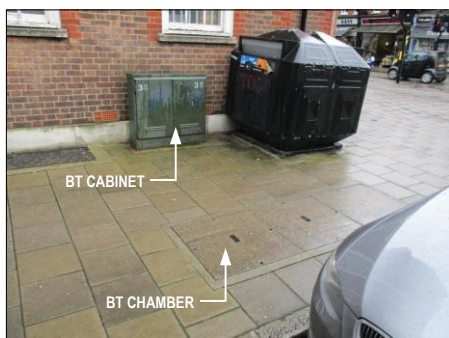
VIEW LOOKING EAST ALONG HIGH STREET



VIEW LOOKING SOUTH ALONG ELMFIELD AVENUE

### Local Carriers

Harlequin House has existing telecommunications access from Elmfield Avenue on the east elevation of the building into the ground floor office area. The survey located a good level of telecommunications chambers and infrastructure owned and operated by BT and Virgin Media outside of the building along Elmfield Avenue on both sides of the carriageway extending into High Street (See **Photographs 1 to 6**). The presence from BT is extensive in this area with infrastructure running along the building frontage on both sides of the carriageway to the south and east elevations, with a noted cabinet opposite the building adjacent to the junction of Elmfield Avenue and High Street. The level of infrastructure from Virgin Media follows a similar path to that of BT with noted chambers in the footway along Elmfield Avenue where connection is provided via an external mounted cable. No other infrastructure from alternative carriers was located in the local environs deemed commercially viable for extension and connection at this time.



**PHOTOGRAPH 1**  
EXISTING BT CABINET AND CHAMBER ON ELMFIELD AVENUE  
ADJACENT TO JUNCTION WITH HIGH STREET OPPOSITE BUILDING

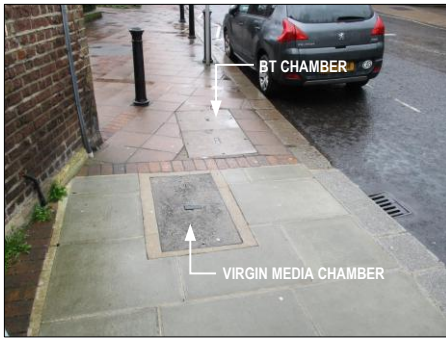


**PHOTOGRAPH 2**  
EXISTING BT CHAMBER IN FOOTWAY ON HIGH STREET  
TO SOUTH ELEVATION OF BUILDING

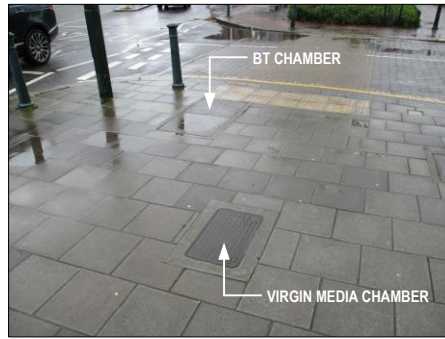


**PHOTOGRAPH 3**  
EXISTING BT AND VIRGIN MEDIA CHAMBERS ON WEST SIDE  
OF ELMFIELD AVENUE OUTSIDE BUILDING





**PHOTOGRAPH 4**  
EXISTING BT AND VIRGIN MEDIA CHAMBERS ON WALDEGRAVE  
ROAD ADJACENT TO JUNCTION WITH HIGH STREET



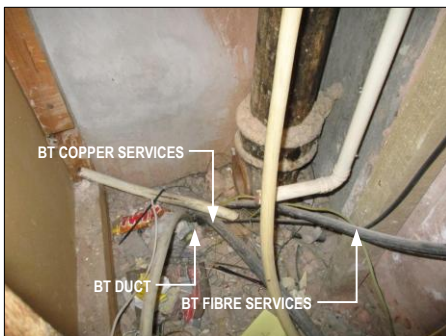
**PHOTOGRAPH 5**  
EXISTING BT AND VIRGIN MEDIA CHAMBERS IN FOOTWAY  
ON HIGH STREET AT JUNCTION WITH ELMFIELD AVENUE



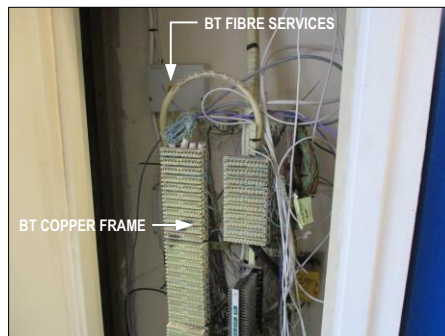
**PHOTOGRAPH 6**  
EXISTING VIRGIN MEDIA CHAMBER AND BUILDING CONNECTION  
IN FOOTWAY ON ELMFIELD AVENUE OUTSIDE BUILDING

## Building Presence

The telecommunications intakes for the building are both located on the east elevation of the building from Elmfield Avenue (See **Photographs 7 to 12**). BT enter this location via a single 90mm diameter (approx) duct into the ground floor riser cupboard providing access for their copper and fibre services. This duct is located in close proximity to the wall with limited visibility via the riser. The copper services are delivered over two cables terminated in an historic frame (DP521) in the riser on the ground floor, with a further joint location in the first floor riser. Based on the incoming cables and notes from BT found adjacent to the intake, we consider 150 copper pairs are present, albeit subject to confirmation from BT. The BT fibre services are delivered over a single cable (multiple tubes/fibres) which is terminated in a gas seal and splice enclosure adjacent to the copper frame in the riser with outgoing blown fibre tubes to the tenant floors. Based on the incoming cable identified and its size we consider that a total of 4No. blown fibre tubes with a capacity of 4/12No. fibres per tube (16/48No. fibres total) are present at this time, albeit subject to confirmation from BT. Virgin Media enter the building directly from their chamber on the east elevation through the wall at high level into the centre stair lobby. The incoming fibre services runs at high level in trunking and is terminated in a building flexibility point (BFP) in the first floor riser accessed from the stair well. Based on the BFP, it is evident that a number of outgoing services are in place to existing tenants running via the riser. All services within the building from both BT and Virgin Media utilise the risers, suspended ceilings and perimeter trunking affording access to all areas.



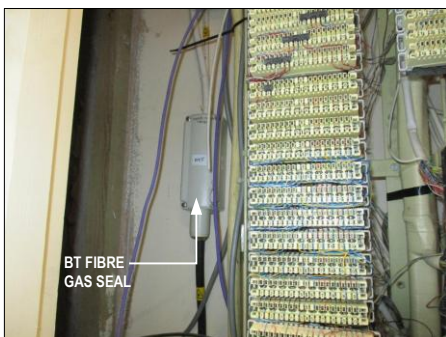
**PHOTOGRAPH 7**  
VIEW OF BT INCOMING DUCT IN GROUND FLOOR RISER  
INCLUDING COPPER AND FIBRE SERVICES



**PHOTOGRAPH 8**  
EXISTING BT COPPER FRAME AND FIBRE SERVICES  
IN GROUND FLOOR RISER ON EAST ELEVATION OF BUILDING



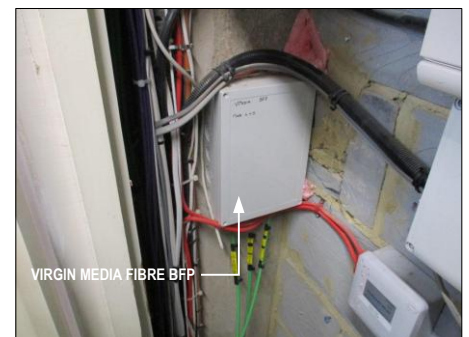
**PHOTOGRAPH 9**  
VIEW OF EXISTING BT COPPER JOINT AND VIRGIN MEDIA  
SERVICES IN FIRST FLOOR RISER ACCESSED FROM STAIR WELL



**PHOTOGRAPH 10**  
BT FIBRE GAS SEAL IN GROUND FLOOR RISER  
ADJACENT TO COPPER FRAME



**PHOTOGRAPH 11**  
VIEW OF VIRGIN MEDIA CABLE ROUTE FROM EXTERNAL  
CHAMBER TO STAIRCASE AREA ON EAST ELEVATION



**PHOTOGRAPH 12**  
TYPICAL VIEW OF VIRGIN MEDIA BUILDING FLEXIBILITY POINT  
(BFP) IN FIRST FLOOR RISER

## Risers and Cable Routes

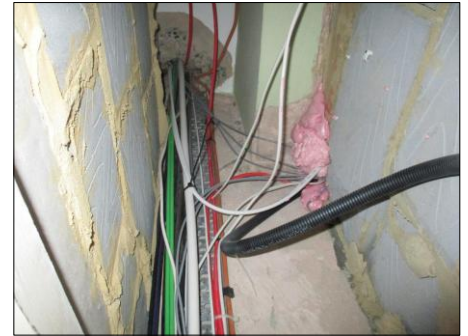
Access from the telecoms intake points run vertically in the risers and across the ceilings affording access to all areas on all floors. It is noted that access to existing ceilings in tenant demises may be required for any new service requirements to the building. Based on our inspection of the building and risers we conclude that access to all floors is excellent in respect of riser location and available space with excellent access into the tenant areas to suit via the perimeter trunking and suspended ceilings (See **Photographs 13, 14 & 15**).



**PHOTOGRAPH 13**  
VIEW OF BT COPPER AND FIBRE SERVICES FROM GROUND FLOOR INTAKE LOCATION TO FIRST FLOOR CEILING LEVEL



**PHOTOGRAPH 14**  
TYPICAL VIEW OF EXISTING TELECOMS SERVICES IN RISER ON FIRST FLOOR



**PHOTOGRAPH 15**  
TYPICAL VIEW OF EXISTING TELECOMS SERVICES IN RISER ON FIRST FLOOR UP TO SECOND FLOOR

## Service Availability

The standard services afforded by BT over its existing copper networks can offer ADSL broadband speeds of around 8-19Mbps at this time. Teddington Exchange has been enabled to provide BT Infinity services over FTTC technology with speeds of up to 80Mbps download and 20Mbps upload. However, the building is noted as 'exploring solutions' in respect of FTTC technology delivery and provides no timescales for deployment 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 19Mbps ADSL lines bonded can increase speed to 38Mbps, 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 in the building affords an excellent level of alternative service should it be required, delivering a similar range of fibre products to that of BT.

## Summary

Based on the level of infrastructure and the availability of services from BT's local exchange we consider Harlequin House has an excellent level of connectivity with the ability to enhance this by means of fibre services where required in minimal timescales from order in respect of BT and Virgin Media.