



Telecommunication Network
Impact Assessment
G TECH

GTech Surveys Limited

Fixed Point-to-Point Radio / Microwave Link & Telecommunication Network Impact Assessments

New City Court

CHANGE HISTORY

Issue	Date	Details of Changes
0.0	24/11/2018	Working Draft
0.1	21/01/2019	First Draft Issue
Author: G Phillips		Reviewer: O Lloyd

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GTech Surveys Limited

GTech Surveys Limited is a Midlands-based broadcast and telecommunications consultancy conducting projects throughout the entire UK. We undertake mobile phone network, television and radio reception surveys (signal surveys), conduct broadcast interference and reception investigations, and support telecommunications planning work for wind farm developers, construction companies, architects, broadcasters and Local Planning Authorities.

In addition to these broadcast services, we review and prepare Environmental Statement (ES) & Environmental Impact Assessment (EIA) Telecommunications Chapters and documents, liaising with telecommunication providers, and advising developers with respect to associated Section 106 (Town and Country Planning Act 1990) and Section 75 (Town and Country Planning Act 1997, Scotland) agreements and other planning conditions. We also verify television transmitter coverage and performance and are actively involved with the current UK Digital Television Upgrade project, working with Arqiva, at800, Digital UK and Ofcom.

GTech Surveys Limited is a Consultant Member of the Confederation of Aerial Industries and the RDI - the digital sectors professional body and trade organisation. More information about the Confederation of Aerial Industries and CAI consultants can be found on their website - www.cai.org.uk. Only professional broadcast engineers undertake our fully insured products and services. For more information about the current projects we are working on and the companies we work with, visit our TV Reception Surveys, Projects & Clients webpage at – www.gtechsurveys.com

We are listed on Constructionline and are a SMAS Worksafe Contractor and Consultant by SSIP (Safety Schemes in Procurement), making us compliant with industry standard PAS 91:2013 + A1:2017.



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Executive Summary

Impact assessments have been undertaken to determine the potential effects on the operations of local telecommunication infrastructure arising from the proposed New City Court development. Impacts to the operations of fixed radio and microwave telecommunications links have been the primary focus of this study. Impacts to the reception of television and radio broadcast services have been addressed in an accompanying report; GTech Surveys Limited; *Television and Radio Reception Impact Assessment New City Court*, dated 18th December 2018.

Through information and feedback from Ofcom, several fixed point-to-point microwave radio links have been identified that near to the site. The links were mapped with respect to the site and due to acceptable clearance distances between the site and link paths, no adverse impacts on link operations are considered possible.

Arqiva (who own and manage the majority of the UK's broadcast and transmission infrastructure) indicated on email in January 2019 that the proposed development would not have any impact or adverse effect on the functioning of any of their broadcast sites or any radio links passing between transmission sites.

With respect to other fixed links and radio communications channels in the study area, no impacts have been identified to the operations of any link.

TfL were contacted with respect to telecommunication technologies in use at London Bridge Station but have not commented yet on the proposal. Whilst no official confirmation has been received from TfL that the proposed development will not impact any of their radio networks or operations, the proposed development is likely to have a neutral effect on TfL radio networks due to the location (separation distance) of the scheme and the station and the lack of any radio links in use at the station. This report will be updated once feedback from TfL has been received.

Overall, it is considered that the proposed development would have a neutral effect on local telecommunications systems and networks. No mitigation is required because no adverse impacts or effects exist for any local radio or telecommunications network.

This report follows the following structure:

Chapter 1 introduces the work

Chapter 2 discusses the wireless links have been identified in the study area

Chapter 3 provides an initial impact assessment of the likely impacts and effects to the identified wireless links and radio networks

Chapter 4 discusses any feedback from potentially affected telecommunication network operators

Chapter 5 is the conclusion

This study was undertaken during November 2018 and January 2019 to investigate if the proposed development could cause interference to local telecommunications services and systems. The report can be used to support the planning application if required.

1 - Introduction

This report details the findings of investigations to determine the potential impacts to existing fixed point-to-point radio and microwave links from the proposed New City Court development. National, regional and local area planning guidelines exist requiring developers investigate potential impacts to existing local telecommunications networks and wireless infrastructure. These are presented in the Appendix.

Fixed Point-to-point Wireless Radio Links

Within this assessment, consideration has been given to fixed point-to-point microwave links. A fixed point-to-point microwave link is a wireless / radio link (a radio communication system which normally forms part of a more extensive telecommunication network), which can be explained as follows.

Microwave is a line-of-sight wireless communication technology that uses high frequency beams of radio waves to provide high speed wireless connections that can send and receive voice, video, and data information. Microwave links are widely used for point-to-point communications because their small wavelength allows conveniently-sized antennas to direct them in narrow beams, which can be pointed directly at the receiving antenna. This allows nearby microwave equipment to use the same frequencies without interfering with each other, as lower frequency radio waves do. Another advantage is that the high frequency of microwaves gives the microwave band a very large information-carrying capacity; the microwave band has a bandwidth 30 times that of all the rest of the radio spectrum below it. Microwave links carry vital data for all modern communications systems including military and national infrastructure needs for communications, emergency services and government.

Microwave links can be adversely affected by physical obstructions on and near to their transmission path such as construction cranes, wind turbines, tall buildings and trees. In general, the directional nature of microwave links means that interference can be avoided by defining clearance zones beyond which any degradation will be insignificant, or by moving the link to avoid the obstruction. Disruption or interference caused to a microwave link's operation will cause degradation to the voice, video or data carried over the link. This would result in the overall efficiency and reliability of the microwave link to be reduced and could impact the operations of the wider telecommunications network the microwave link is part of. As microwave links are integral parts of some listed UK Critical National Infrastructure ^a, microwave link owners will be required to ensure link performance remains optimal. A methodology to calculate clearance zones for wind turbines has been defined in a paper published by Ofcom (Bacon, 2002)^b and this is also applicable for any other physically tall structure.

^a - <https://www.cpni.gov.uk/critical-national-infrastructure-0>

Radio and microwave links can be many kilometers long and consequently, a site visit is not sufficient to determine their presence. GTech Surveys Limited consulted with Ofcom, radio link owners and the developer to determine the possible impacts on local existing wireless communications channels.

Information received from Ofcom indicated that several radio and microwave links have been identified that cross near to the proposed development's location and the potential for interference to these links has been subsequently investigated. The links are detailed in Table 1 in Chapter 2. Figure 1 indicates the proposed development's location in more detail.

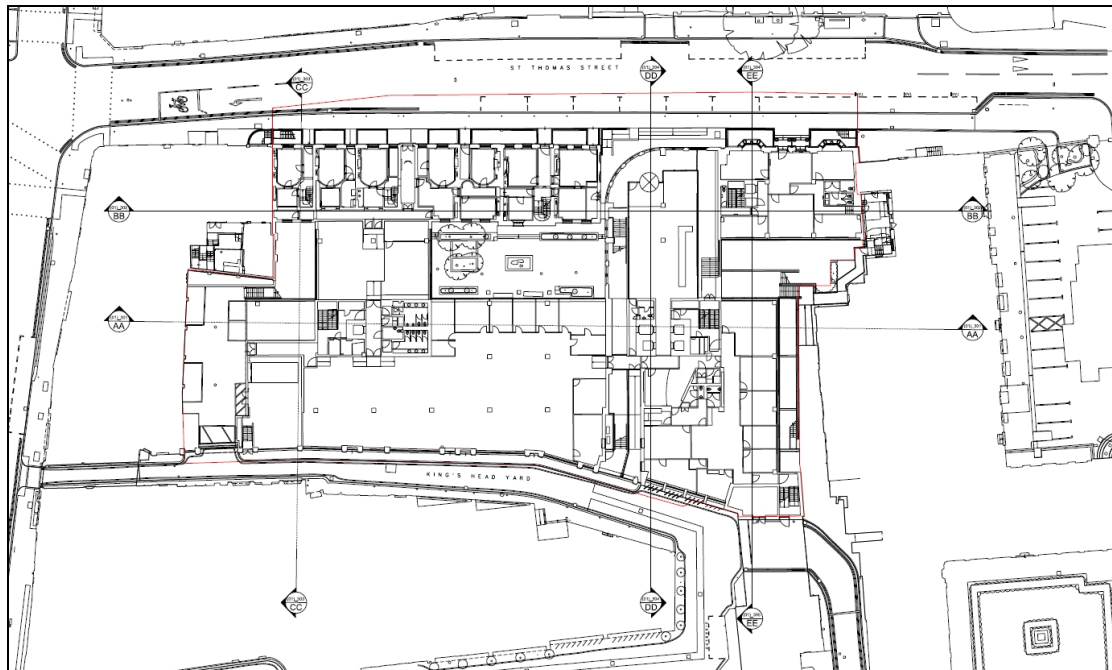


Figure 1 - The Location of the Proposed Development

^b - Title: "Fixed-link wind-turbine exclusion zone method" Author: D F Bacon Status: Released 28 Oct 2002 Version: 1.1 "A proposed method for establishing an exclusion zone around a terrestrial fixed radio link outside of which a wind turbine will cause negligible degradation of the radio link performance."

2 - Identified Fixed Point-to-Point Radio and Microwave Links within a 500m Radius of the Proposed Development's Centre

A search of Ofcom's fixed link database indicated that there were a number of existing fixed links that passed near to the site. Ofcom's Wireless Telegraphy Register (WTR) database was interrogated to determine the start and end points of each link. These were then plotted with respect to the proposed development. Several fixed radio links pass near to the site. The situation can be seen in Figure 2, where the proposed development is delineated in red and the links are shown blue.

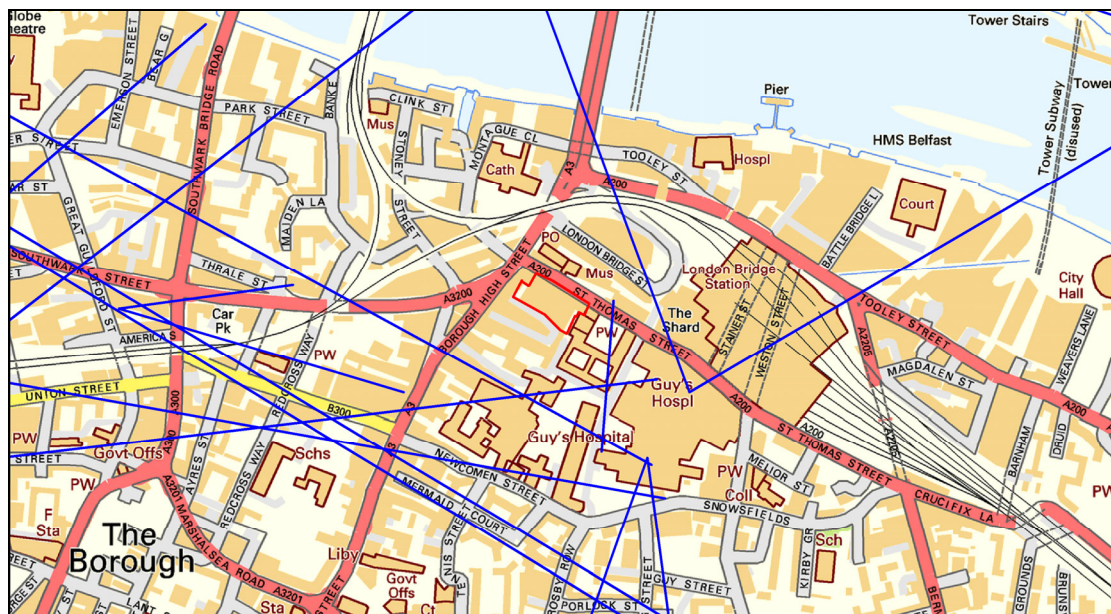


Figure 2 - Fixed radio links (in blue) crossing in proximity to the Proposed Development

An adverse impact to a link's operation may exist only if the link is situated directly above the proposed development, or in close proximity to it (a factor dependent upon the link's operating frequency and Fresnel Zone). Due to the distances from the proposed development to the links identified within the study area, no links require further or additional analysis to determine if any adverse effects exist for the reliable operation of the identified links. For completeness, the closest links to the proposed development are identified in Chapter 3 and shown in Figure 3 with their corresponding link ID.

3 - Fixed Point-to-Point Radio Link Impact Analysis

An adverse impact on the operation and reliability of a link may exist only if a link is situated directly above the proposed development, or near it; a frequency dependent factor*. Whilst a number of links pass near to the site, with the majority emanating from the Guy's Hospital, none pass directly over or unacceptably near to the site. Consequently, no further impact assessments are required. The closest links to the scheme are detailed in Table 1 and shown in Figure 3.

Link ID	Link Owner	Interference Likely	Further Impact Analysis Required?
0936280/1	Rapid Computers Ltd	No	No
0742008/1	Trellisworks Limited	No	No
1113200/1	Airwave Solutions Limited	No	No
1122506/1	Urban Wimax Limited	No	No
1116813/1	Rapid Computers Ltd	No	No

Table 1 – Identified Local Links

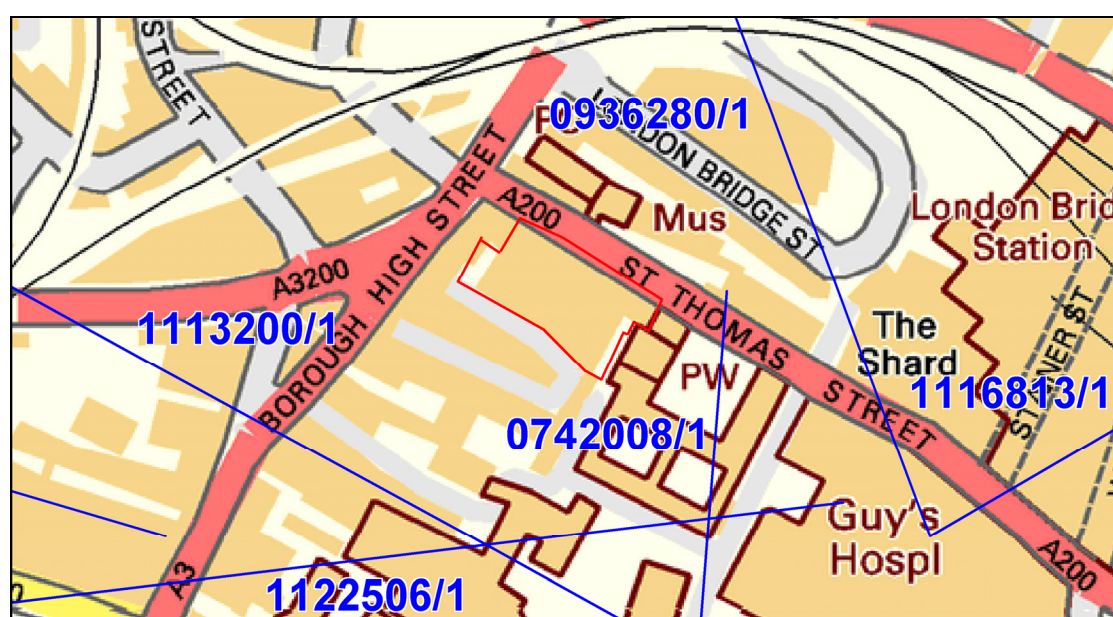


Figure 3 - Fixed point-to-point microwave links crossing near to the Site

* - adverse impacts can occur if any part of the taller parts of the proposed development elements encroach into the link's 2nd Fresnel zone

4 - Technical Feedback from other Radio Network Operators

As requested by the LPA, Arqiva and TfL were contacted to determine if it was likely that the proposed development would impact the operation of any of their radio links or wider telecommunication networks.

A site plan and building elevations were presented in order to assist their initial impact assessments. The organisations were contacted during December 2018. The overall effects and impacts to all links identified are presented in Table 2.

Arqiva

Arqiva is a British telecommunications company which provides infrastructure and broadcast transmission facilities in the United Kingdom and the Republic of Ireland. Its main customers are broadcasters and mobile phone network operators, and its main asset is a network of over 1,000 radio and television transmission sites.

Arqiva confirmed on email 7th January 2019 that the proposed development would not impact the operation of any of their rebroadcast links. These links connect transmission masts together and provide an alternative source of programme content should a main feed fail.

Arqiva further confirmed on email 10th January 2019 that no Arqiva owned transmission sites nearby would be adversely impacted by the proposed development.

TfL

At the time of writing TfL has not responded to our enquires regarding the proposed development and the possibility of interference to radio systems in use at London Bridge Station. However, due to the separation distance between the site and the station, the lack of radio links emanating from the station and the nature of the radio systems considered to be in use at the station, no interference is likely. Furthermore, between the site and the station, several significant tall and wide structures are located; The Shard and Guy's Hospital, effectively already dominating local reception conditions and physically separating (in radio transmission terminology) the proposed development from London Bridge Station.

If TfL reply to our enquiries, this report will be updated to reflect any findings, however it is expected that TfL will consider the proposed development to have a neutral effect upon radio operations in and around London Bridge Station.

Link ID (if any)	Link Owner	Interference Likely	Further Impact Analysis Required?
0936280/1	Rapid Computers Ltd	No due to acceptable separation distances	No
0742008/1	Trellisworks Limited	No due to acceptable separation distances	No
1113200/1	Airwave Solutions Limited	No due to acceptable separation distances	No
1122506/1	Urban Wimax Limited	No due to acceptable separation distances	No
1116813/1	Rapid Computers Ltd	No due to acceptable separation distances	No
No ID	Arqiva	No	No
No ID	TfL	No, but need verification from TfL	Unlikely

Table 2 – Overview of Effects to Identified Local Links and Radio Networks

Assessment Limitations

Telecommunications networks are continuously modified, updated, and changed in order to meet new coverage demands; to better / re-route signal paths; or to deliver new services. Radio base stations and transmission sites may also be added or removed from the various networks as and when required. The analysis based in this report is that regarding the existing operational networks, not any future planned modifications or changes. The analysis is based on information received from Ofcom's Wireless Telegraphy Act Register (WTR) on the 24th November 2018. Any physical or licence changes made to any site considered in the report after those dates may require new impact assessments. As such, GTech Surveys Limited cannot accept liability for omissions in the analysis provided, or its currency however so arising. These data are provided without any representation or endorsement made and without warranty of any kind, whether express or implied, including but not limited to the implied warranties of satisfactory quality, fitness for a particular purpose, non-infringement, compatibility, security and accuracy.

The grid reference coordinates are provided to Ofcom by Fixed Link operators at licence application. They are not verified by GTech Surveys Limited or by Ofcom for accuracy or currency and GTech Surveys Limited or Ofcom makes no guarantees for the currency or accuracy of information or that they are error free. As such, GTech Surveys Limited or Ofcom cannot accept liability for any inaccuracies or omissions in the data provided, or its currency however so arising. These data are provided without any representation or endorsement made and without warranty of any kind, whether express or implied, including but not limited to the implied warranties of satisfactory quality, fitness for a particular purpose, non-infringement, compatibility, security and accuracy.

Impacts / effects on local telecommunication channels and radio systems arising from the use of tower cranes during the construction phase have not been considered in this assessment.

This assessment has not included the possible impacts or effects of additional mobile phone sets in use in the area on mobile phone networks as a result of the operational phase of the proposed development. Each mobile phone operator would need to assess their coverage and data bandwidth provision through their own network monitoring and KPI metrics.

5 - Findings, Recommendations and Conclusions

Ofcom, telecommunications operators and other wireless infrastructure users have been contacted to determine the possible impacts to existing radio communications infrastructure arising from the New City Court development. Tall buildings can cause disruption to telecommunications network operations by creating physical obstructions between transmit and receive locations. It is a requirement under the current London Plan and NPPF that developers investigate the potential impacts to local telecommunications networks and systems from proposed developments.

Several existing microwave links were identified that crossed near to the site and impact assessments were undertaken to determine the magnitude and effects of any possible interference. Due to the acceptable separation distances from the scheme and the radio links, no adverse impacts upon radio link operations are expected.

Arqiva who manage the majority of the UK's broadcast and transmission infrastructure indicated by email that the proposed development would not impact either the operation of any of their transmission sites or would impact the functioning of any of their rebroadcast link network (RBLs – used to provide alternative source of programme content to transmission sites should a main feed fail).

With respect to other telecommunication technologies, particularly radio networks owned and managed by TfL in use at London Bridge Station, whilst no official confirmation has been received from TfL that the proposed development will not impact any of their radio networks or operations, the proposed development is likely to have a neutral effect on TfL radio networks due to the location (separation distance) of the scheme and the station and the lack of any radio links emanating from or going to the station. This report will be updated once feedback from TfL has been received.

Based on impact assessments and the replies to date, it is considered that the proposed development is unlikely to impact local telecommunications and radio networks. No links have been identified that cross the site and Arqiva has indicated their networks and communications channels would not be adversely affected by the scheme. Once a reply from TfL has been received regarding their radio networks in use at London Bridge Station, this report would be updated to reflect any findings, however, is expected that TfL will not identify any possible interference risks.

APPENDIX

Email Correspondence

Planning Policies

Email Correspondence

Arqiva

From: Saleem Shamash <Saleem.Shamash@arqiva.com>
Sent: 10 January 2019 14:17
To: Gareth J Phillips <gareth@gtechsurveys.com>
Subject: RE: New City Court

Hi Gareth

I can now confirm that we have no other sites nearby that might be potentially affected. There will however be many other sites operated by the MNO's and I presume your report will take them into account.

I hope this assists.

Regards

Saleem Shamash BSc (Hons) FRICS MRTPI
Town Planning Manager – National
Estates & Infrastructure
Arqiva

Mobile: 07973 430768

www.arqiva.com

From: Saleem Shamash
Sent: 07 January 2019 09:27
To: 'Gareth J Phillips' <gareth@gtechsurveys.com>
Subject: RE: New City Court

Hi Gareth

Happy New Year.

I had a good break and hope you did too.

I can confirm that we are not concerned about any of our broadcast links.

I am still trying to establish whether any of our telecoms sites might be affected. That said any links used by the mobile operators should be registered with OFCOM, so it is unlikely that we shall uncover any major issues.

I hope this assists for now, but will revert further in due course.

Regards

Saleem Shamash BSc (Hons) FRICS MRTPI
Town Planning Manager – National
Estates & Infrastructure
Arqiva

Issue: 0.1

Planning Policies

National Planning Policies

National Planning Policy Framework (NPPF), July 2018 (Ministry of Housing, Communities & Local Government)

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).

113. The number of radio and electronic communications masts, and the sites for such installations, should be kept to a minimum consistent with the needs of consumers, the efficient operation of the network and providing reasonable capacity for future expansion. Use of existing masts, buildings and other structures for new electronic communications capability (including wireless) should be encouraged. Where new sites are required (such as for new 5G networks, or for connected transport and smart city applications), equipment should be sympathetically designed and camouflaged where appropriate.

114. Local planning authorities should not impose a ban on new electronic communications development in certain areas, impose blanket Article 4 directions over a wide area or a wide range of electronic communications development, or insist on minimum distances between new electronic communications development and existing development. They should ensure that:

a) they have evidence to demonstrate that electronic communications infrastructure is not expected to cause significant and irremediable interference with other electrical equipment, air traffic services or instrumentation operated in the national interest; and

b) they have considered the possibility of the construction of new buildings or other structures interfering with broadcast and electronic communications services.

Regional Planning Policies

The London Plan - The Spatial Development Strategy for Greater London, July 2016 (The Greater London Authority)

Policy 7.7 - Location and Design of Tall and Large Buildings

D) Tall buildings:

should not affect their surroundings adversely in terms of microclimate, wind turbulence, overshadowing, noise, reflected glare, aviation, navigation and telecommunication interference

The London Plan - The Spatial Development Strategy for Greater London. Draft for Public Consultations, December 2017 (The Greater London Authority)

The draft to The London Plan, as published in December 2017, does not contain, or mention anything new or different with respect to telecommunications interference that has not been considered in the current London Plan.

DISCLAIMER

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 taking into account the project objectives, the agreed scope of works, assumed prevailing site conditions and the degree of manpower and resources allocated to the project.

The UK's fixed wireless link networks are highly complex engineering systems and are constantly being modified, re-designed, upgraded and maintained. The links identified in this report are only those present at the time of writing. Any impact analysis undertaken was done so using any data provided by the link's owners or operator, and the developer at the time of writing. Whilst every effort was made to accurately assess any potential impacts, GTech Surveys Limited cannot assume that any of the provided data was factually and technically correct. Although best practice has been applied in understanding the potential impacts, due to the complex nature of the subject, GTech Surveys Limited is not accountable in anyway whatsoever if unexpected impacts occur at any location anywhere in the study area to any wireless radio network or system.

As a site survey has not been undertaken for this work, any impacts or assumptions are derived from modelling and may not accurately reflect actual transmission and reception conditions in the study area during either the pre or post-construction phases. Additionally, local construction work, within the study area may also degrade the quality and reliability of any existing fixed wireless links, yet these unknowns cannot be factored into any impact modelled due to the complexity and unknowns of any potential interference. Adverse impacts on local telecommunication channels and radio systems arising from the use of tower cranes have not been considered in this assessment but will cause similar impacts to those identified by the proposed development.

Telecommunications networks are continuously modified, updated and changed in order to meet new coverage demands, to better / re-route signal paths or deliver new services. Radio base stations and transmission sites may also be added or removed from the various network as and when required. The analysis based in this report is that regarding the existing operational network, not any future planned modifications or changes. The analysis is based on information received from Ofcom on the 24th November 2018 via their webportal. Any physical or licence changes made to any site considered in the report after that date may require new impact assessments. As such, GTech Surveys Limited cannot accept liability for omissions in the analysis provided, or its currency however so arising. These data are provided without any representation or endorsement made and without warranty of any kind, whether express or implied, including but not limited to the implied warranties of satisfactory quality, fitness for a particular purpose, non-infringement, compatibility, security and accuracy.

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Any questions or matters arising from this Report should be addressed in the first instance to the Project Manager