

GTech Surveys Limited

Desk-Based Television and Radio Reception Impact Assessment

7-9 Piccadilly, Manchester

CHANGE HISTORY

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0.0	25/10/2021	Working draft
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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 (pre- and post-construction signal surveys), conduct broadcast interference and reception investigations, and support telecommunications planning work for wind energy developers, construction companies, architects, broadcasters and Local Planning Authorities.

In addition to radio interference modelling services and television reception surveys, we produce EIA and ES Telecommunications Chapters (also known as an 'Electronic Interference Chapter'); satisfying the requirements of Part 5, Regulation 18 (Parts 5a and 5b) of The Town and Country Planning EIA Regulations 2017. We peer review ES and EIA work, liaising with telecommunications providers (Arqiva, BT etc.) and advise developers with respect to associated Section 106 (Town and Country Planning Act 1990) and Section 75 (Town and Country Planning (Scotland) Act 1997) agreements.

GTech Surveys Limited is a consultant member of the Trade Association for Content Delivery - (Confederation of Aerial Industries Ltd - CAI) and the RDI - the digital sector's professional body and trade organisation. We are listed on Constructionline and verified as a Safety Schemes in Procurement (SSIP) member by Safety Management Advisory Services (SMAS), making us compliant with the industry standard PAS 91:2013 + A1:2017.

Professional broadcast trained project engineers deliver, and supply QBE insured technical products to support planning applications, discharge planning conditions (including S106 Agreements) and for due diligence. For more information about GTech Surveys Limited please visit our website - www.gtechsurveys.com



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Executive Summary

A reception impact assessment has been undertaken to determine the potential effects on the local reception of television and radio broadcast services from the proposed 7-9 Piccadilly development in Manchester. Under Manchester City Council (MCC) planning guidance, any development over four storeys requires a TV and radio reception impact assessment. Consequently, this report has been produced to support the planning application submission. Accordingly, impacts to the reception of VHF (FM) radio, digital terrestrial television (also known as Freeview) and digital satellite television services (such as Freesat and Sky), have been assessed. Impacts to the reception of analogue television services have not been assessed in this study because analogue terrestrial television services were switched off in Manchester (Granada TV region) during 2009 and throughout the rest of the UK by 2012.

Due to the likely existing excellent coverage and the robust nature of reception conditions in any theoretical signal shadow zone, the Proposed Development is not expected to impact the reception of digital terrestrial television (DTT also known as Freeview) services.

Due to lack of viewers and satellite dishes in any theoretical signal shadow zone, the Proposed Development will not cause any interference to local digital satellite television reception, such as Freesat and Sky.

The Proposed Development is unlikely to adversely impact the reception of VHF(FM) radio broadcasts due to the likely existing good coverage in the study area and the technology used to encode and decode radio signals.

Overall, the Proposed Development is unlikely to cause any interference to the reception of any television or radio broadcast platform. As no interference is expected, no mitigation measures are required to restore the reception of any broadcast service for any user. This report can be used to support the planning application submission.

1 - Introduction

This report outlines the findings of a reception impact assessment to determine the viewing preference of residents located around the proposed 7-9 Piccadilly development and identifies what effects the Proposed Development may have on the reception of television and radio broadcast services.

This Report has been prepared by GTech Surveys Limited on behalf of its Client, Thackeray Investments (the “Applicant”) to accompany a full planning application for the proposed redevelopment of the property at 7-9 Piccadilly, Manchester City Centre.

The Proposed Development (to which this report relates) comprises the retention of the commercial unit on the ground floor, with the conversion of the upper floors into high quality Grade A office accommodation, including the sensitive introduction of a third, fourth and fifth floor onto Piccadilly Gardens with a sixth floor set back to provide the opportunity for an attractive roof terrace. In terms of access, the proposals include for a main entrance to the proposed offices from Back Piccadilly.

The proposal comprises of the retention of ground floor commercial units (Class E(a) retail and Sui Generis Hot Food Takeaway) and partial demolition of the upper floors at 7-9 Piccadilly to provide for the development of a six storey office development (use Class E(g)) above the retained commercial units at ground floor, together with rooftop amenity area, cycle parking, public realm improvements and associated works. The proposal includes upgraded facades to Piccadilly alongside a new frontage and access (pedestrian and servicing) to Back Piccadilly to incorporate a new office entrance / reception area.

The Application Site extends to approximately 0.07 hectares and comprises a three-storey building with commercial premises (currently comprising a Superdrug and Greggs store) at ground floor level with storage on the upper floors. Figure 1 shows the location of the Application Site.

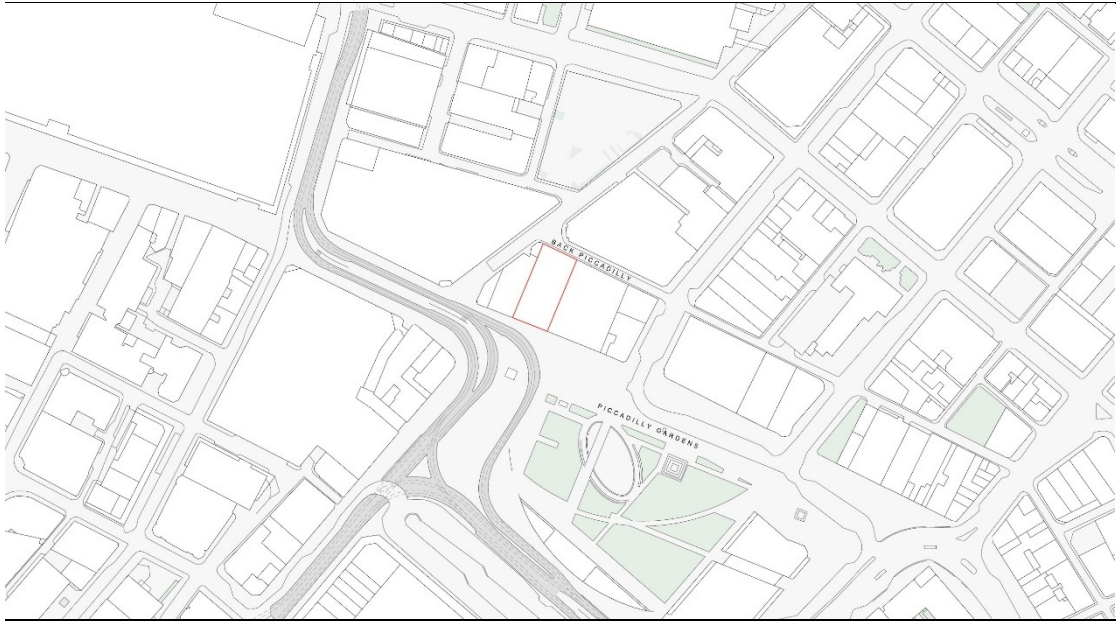


Figure 1 - The Location of the Application Site

Under Manchester City Council (MCC) planning guidance, any development over four storeys requires a TV and radio reception impact 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 (revised January 2020), MCC. The requirement states;

Television Reception

MCC planning guidance, any development over four storeys requires a TV reception impact assessment.

Information on TV and radio reception and interference. Please provide a report on the possible interference created by the proposed development on TV and radio reception within the area. (Core Strategy Policy EN2)

Additionally, national requirements under The National Planning Policy Framework (NPPF), July 2021 (Ministry of Housing, Communities & Local Government) states at paragraph 116, that local planning authorities should ensure that;

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

A desktop study was undertaken, based on broadcast transmission information, plans of the Proposed Development and maps of the area. The relevant TV and radio signal study area for the Proposed Development was identified. Modelling techniques were then used to predict the potential effects upon television and radio broadcast reception in the area. The impacts from the Proposed Development are consequently analysed, and together with various mitigation options, conclusions are drawn on the overall effects of the Proposed Development on television and radio broadcast service reception for local residents.

This study was undertaken during November 2021 to investigate whether the Proposed Development could cause interference to local television and radio broadcast reception. The effects on VHF (FM) radio, digital terrestrial television and digital satellite television service reception are discussed.

This report follows the following structure:

Chapter 1 introduces the work

Chapter 2 discusses the different forms of structure generated television and radio interference and how these can impact the reception of different television and radio broadcast platforms

Chapter 3 describes the available television and radio services in the study area

Chapter 4 describes the **likely** television and radio reception conditions around the Site

Chapter 5 describes the predicted impacts of the Proposed Development upon television and radio broadcast reception before any mitigation measures are applied

Chapter 6 describes any suitable mitigation measures for any affected TV viewer or radio listener

Chapter 7 presents the conclusion

2 - The Mechanisms of Interference to Television and Radio Broadcast Services

Terrestrial Television Services

Any structure will produce two zones of potential disruption to television reception. One zone is where the development creates a 'shadow' (affects all television broadcast platforms) and the other where it gives rise to a 'reflection'. At the frequencies used for broadcasting, the processes of creating a 'shadow' or a 'reflection' are somewhat more complicated than with visible light but thinking of the problem in these terms is still a helpful way of approaching the matter.

Signal 'Shadowing' Effects

In the area behind the structure, the television transmitter is effectively screened from the viewer and the strength of the signal is reduced - Figures 2 and 3.

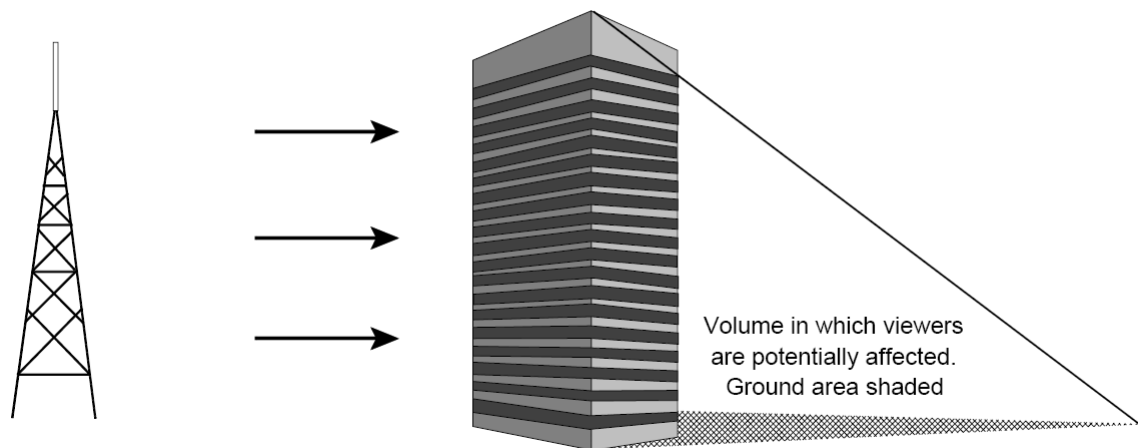


Figure 2 - Affected area in the 'shadow' zone behind the structure

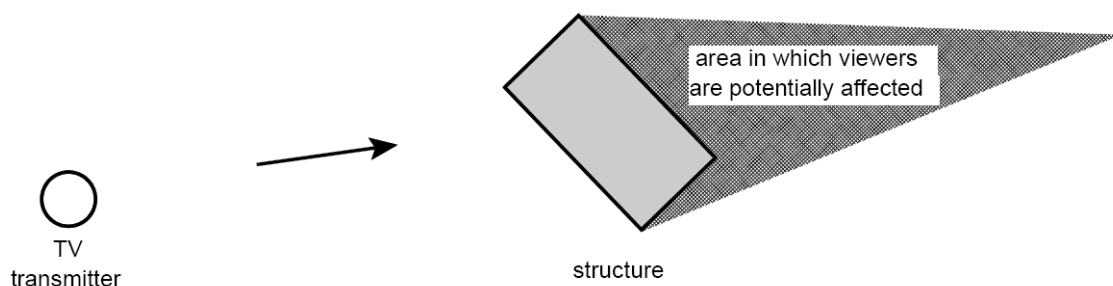


Figure 3 - Plan view of the 'shadow' zone

Television signals do not create such a 'hard' shadow as visible light, and for the purposes of explanation, a 'shadow' zone must be considered which is divided into three sub-zones.

i. Within a few tens of metres from a solid structure, over the region where optical view of the transmitter is lost, the reduction in signal strength is critically dependent on the specific design and composition of the structure. For most brick and concrete buildings, the reduction can be severe and, in some cases, almost total if existing reception conditions are poor.

ii. Further away from the structure (e.g. beyond 25 to 50 metres, but this varies depending on its size) the limit of the 'shadow' zone and signal reduction are determined by diffraction at the edges of the structure and reflection off surrounding structures. The simple condition of whether or not a location has an optical view of the transmitter is not enough to classify the potential interference zone adequately. In general, the effect is that the signal appears to bend around the sides of the structure; the shadow zone reduces in size and the signal strength is reduced by much less than simple ray optics would suggest.

iii. Even further away from the structure (e.g. 250m) complex multiple reflections and diffraction, caused by structures in the locality, may result in the 'shadow' zone becoming almost non-existent, against interfering signals that arrive on significantly different bearings. This can result in an increase in the ratio of wanted to unwanted signal as presented to the television receiver.

Signal 'Reflection' Effects

The second zone of potential interference is produced by 'reflection' or 'scattering' of the incident signal, see Figure 4.

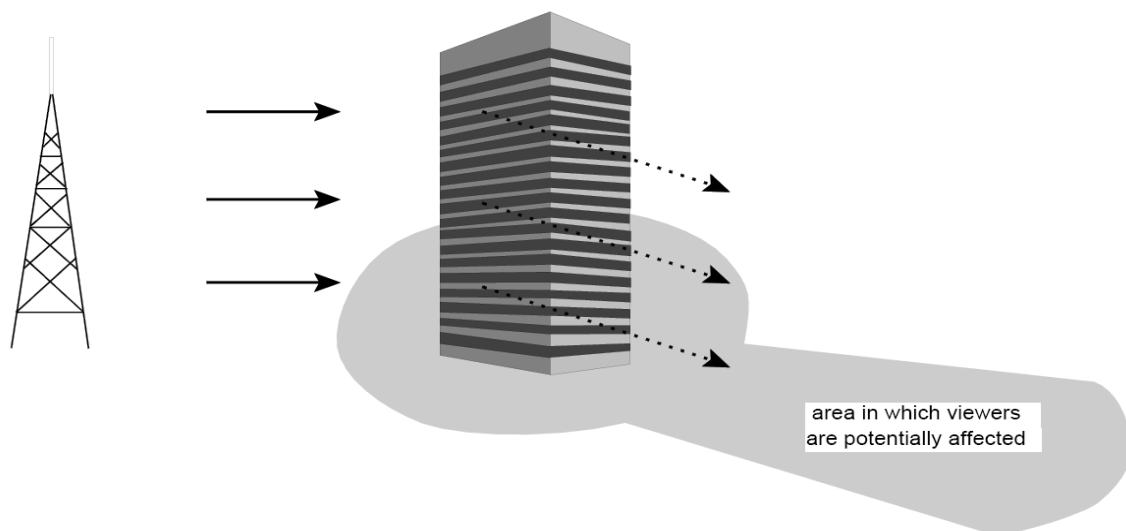


Figure 4 - Affected areas in the 'reflected' zone of the structure

Consider Figure 5, the direct signal travels a distance P1 to the viewer, whilst the signal reflected from the structure travels slightly further, distance (P2 + P3). Although travelling at the speed of light, the different path lengths can mean that one signal arrives with a significant delay relative to the other. This results in a degradation in signal quality.

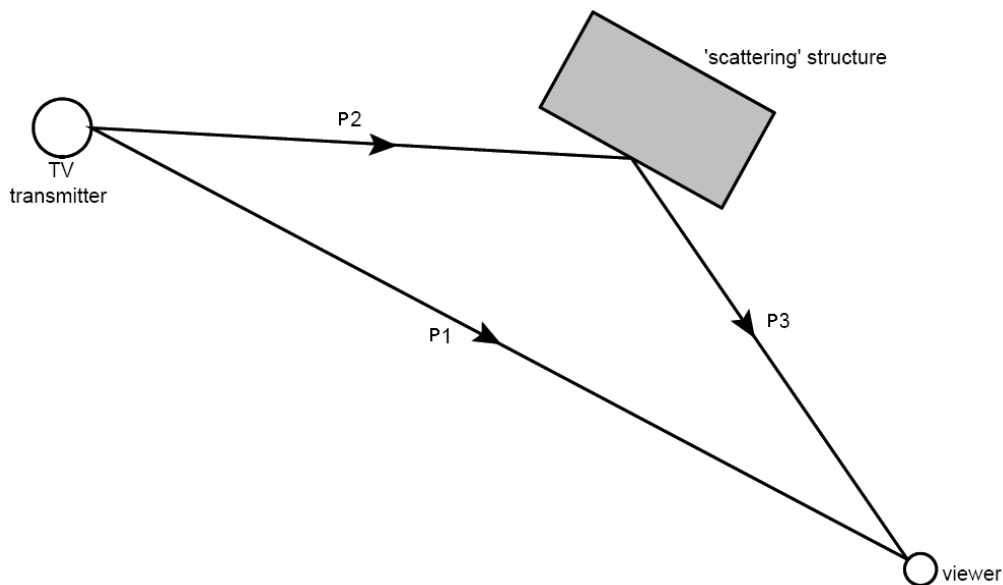


Figure 5 - Direct and Indirect Signal Paths

To avoid interference, it is necessary to ensure that the ratio of wanted signal along the direct path (P1) to the unwanted signal along indirect paths (P2+P3) is sufficiently high. Domestic TV receiving antennas generally have a significant directional response to incoming signals, which means that the antenna may discriminate against interfering signals that arrive on significantly different bearings. This can result in an increase in the ratio of wanted to unwanted signal, as presented to the television receiver.

Digital Terrestrial Television (DTT) - Freeview

The digital television broadcast platform offers many advantages over older analogue broadcast technologies. Due to the way picture signals are encoded and broadcast, digital television offers a much more resilient platform against interference. The construction of digital signals ensures that they are much more impervious to the effects of interference from indirect secondary reflections, which consequently ensures good quality and coherent data stream integrity at the receiver, resulting in an interference free picture. Disruption to DTT services is normally caused by a poor-quality receiving antenna system or locally generated wideband electrical noise. Signal blocking caused by buildings can also degrade received signal quality.

Digital Satellite Television Services - Freesat & Sky

Digital satellite television services are provided by geo-stationary earth orbiting satellites positioned above the equator. To ensure good reception of digital satellite television services, satellite receive antennas (satellite dishes) are normally positioned away from trees and other clutter and are orientated to face the southern (south-southeast) skies.

Disruption to digital satellite television services is normally caused by an obstruction on the line of sight from the satellite to the receive antenna e.g. a tall building or tall trees. Adverse weather can also influence reception. In the United Kingdom, Freesat and Sky services come from the 28.2 degrees east ASTRA satellite cluster.

Figure 6 below shows typical clearance distances and obstruction heights for interference free satellite television reception.

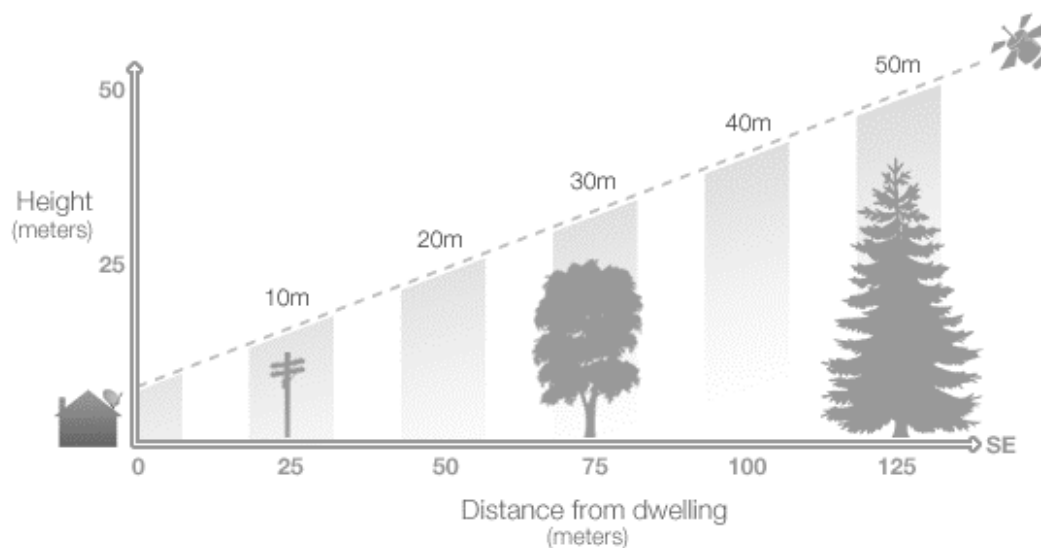


Figure 6 - Typical Clearance Distances and Obstruction Heights for Interference Free Satellite Television Reception

VHF (FM) Radio

VHF (FM) radio services are broadcast from similar structures as terrestrial television services. Many things can cause radio interference, however simple remedies exist that can quickly reduce the effects. Most reception problems on FM radio are caused either by a weak signal or by some kind of interference.

Radio transmission signals will reflect into 'shadow' areas and also reflect from structures to cause 'multi-path' effects. The effect of multiple signals is to create zones of signal cancellation and signal enhancement. This is often demonstrated by the need to carefully position portable radio receivers for good reception or the fluctuation in signal quality whilst listening to VHF (FM) broadcasts in a vehicle. Due to the wavelength of the VHF (FM) signal (at 100 MHz, the wavelength is 3 metres), zones of interference can quickly and easily physically move around, as the interference is generated from the sum interaction of all incoming signals. Consequently, prediction of VHF (FM) interference is not practically possible due to the complex interaction of reflected signals with wanted signals, the design of radio receivers and radio signal propagation characteristics.

Buildings rarely cause radio interference but there is little that can be done during the design stage to reduce any adverse effects. Due to the lower frequencies in use for radio transmission (with respect to television services) and the methods by which the radio signals are encoded, it is very unlikely that a new structure in an already cluttered urban environment will disrupt the reception of radio services.

3 - Available Television and Radio Broadcast Services

Terrestrial Television Services

The area around the Site is no longer served by analogue television transmissions due to the completed Digital Television Switchover. All analogue services were switched off in the Granada television region during 2009.

Digital Terrestrial Television (DTT) - Freeview

The study area is served by DTT services (Granada TV region) from the Winter Hill transmitter (grid reference SD 66053 14463), on a bearing of 311° (with respect to true north) and 24km away. The Winter Hill transmitter is shown with respect to the Site in Figure 7. Technical transmission information for each digital television service broadcast from the Winter Hill transmitter site is detailed in Table A, found in the Appendix - *Television Transmission Frequencies*.

Up to date technical information regarding the Granada TV region and Winter Hill transmitter group can be found on the Digital UK website - <http://www.digitaluk.co.uk>

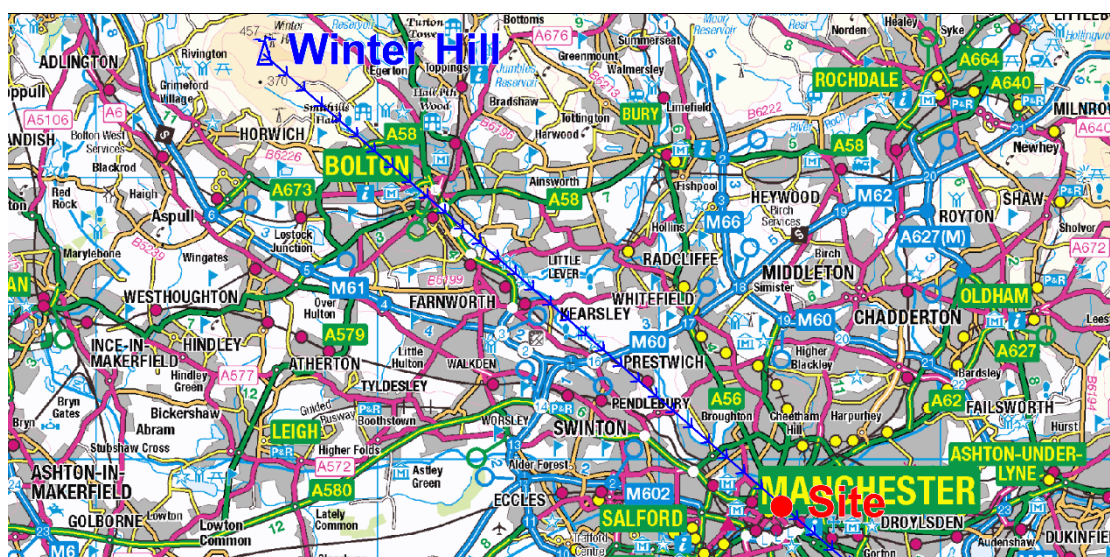


Figure 7 - The Locations of the Winter Hill Transmitter, the Site and the direction of the incoming DTT signals at the Site (indicated by the blue arrowed line)

Non-Terrestrial Television Services (Digital Satellite Television)

For the reception of the 28.2 degrees east ASTRA satellite cluster (Freesat and Sky services), dish elevations of 22.8 degrees are required at this latitude. Optimal receive dish azimuths are 143.8 degrees with respect to true north (approximately southeast).

VHF (FM) Radio

The areas around the Site are served by VHF (FM) radio services of

BBC Radio 1, 2, 3, and 4 from the Holme Moss transmitter (NGR SE 09550 04050)

Technical transmission information for each radio service broadcast from the Holme Moss transmitter are detailed in Table B in the Appendix - *VHF (FM) Radio Transmission Frequencies*.

4 - Description of Baseline

No baseline survey was undertaken, but an assessment of likely reception conditions has been provided. NB - As no baseline signal survey has been undertaken, possible impacts and effects to the reception of television and radio services may occur that cannot be identified through desktop-based work alone.

The Winter Hill transmitter is the main Freeview transmitter for the region. Due to proximity of the transmitter with respect to the study area, reception conditions are expected to be optimal. Whilst the study area is densely cluttered (with existing buildings and structures), reception conditions around the Proposed Development are expected to be excellent and interference is likely to be minimal. Freeview's coverage checker¹ indicates that coverage throughout the area is excellent and the technical quality of the received signals would be very good. In this location, all terrestrial antenna systems will be orientated towards the Winter Hill transmitter, on a bearing of 311° (with respect to true north).

It is expected that digital satellite television reception around the Proposed Development is currently free from interference, on the provision that any satellite dishes are mounted in locations where line-of-sight views to the serving satellites are clear. During the installation of dishes, signals levels would have been assessed to ensure that optimal reception is possible.

¹ <https://www.freeview.co.uk/freeview-channel-checker>

5 - Predicted Impacts and Effects

Methodology

To assess the effects of the Proposed Development upon television and radio broadcast service reception, the structures were considered to create interference to services in the immediate areas around the Site, in signal reflection areas and in the signal shadow zones. These methods, used in conjunction with broadcast transmission information, development plans, maps of the study area and modelling techniques, contribute towards predicting the potential effects upon television and radio broadcast reception in the study area. The predicted effects on television and radio broadcast reception are discussed below and summarised in Table 1.

Digital Terrestrial Television - Freeview

Due to the expected good coverage around the Site and the relatively low form of the Proposed Development (a height increase of 13.15m), the Proposed Development is not expected to have any adverse impact upon the reception of DTT services around the Site. As no interference is expected, no mitigation measures are required to restore the good reception of digital terrestrial television broadcasts.

Digital Satellite Television - Freesat and Sky

Tall structures, trees and buildings can disrupt digital satellite television reception by causing obstructions on the line of sight to the signal receive dish from the serving satellite. This is discussed further in Chapter 2.

Using the mathematical tangent function and based on the maximum height of the Proposed Development, the angle and orientation of the incoming satellite signals, theoretical signal shadow zones for the 28.2E ASTRA satellite cluster are up to an additional 32m from the base of the proposed building. This area extends in a northwesterly direction (323.5 degrees with respect to true north) from the building's base. However, it is unlikely that there are any satellite dishes located in this area and consequently no interference will occur. As no interference is expected, no mitigation measures are required to restore the good reception of digital terrestrial television broadcasts.

VHF (FM) Radio

Modelling VHF (FM) radio interference in a cluttered urban environment is not possible due to the number of constantly changing variables. VHF(FM) broadcast radio reception is likely to be robust throughout this part of the country. Whilst any structure will change local signal propagation characteristics, due to the technical methods involved with encoding and receiving radio transmissions, reception remains possible. Overall, the Proposed Development is not expected to impact the reception of VHF (FM) radio broadcasts.

Broadcast platform	Area(s) of predicted interference	Risk of interference & reasoning	Mitigation
DTT (Freeview)	Nothing identified	No because coverage is likely to remain robust	Not required
Digital Satellite TV (Freesat & Sky)	An additional 32m to the NW of the Site	No because there are no dishes located in this area	Not required
VHF(FM) Radio	Non-identified	No because coverage is robust	Not required

Table 1 - Summary of Predicted Interference

Predicted Effects - Conclusions

The Proposed Development is not expected to cause any interference to the reception of DTT – Freeview services

The Proposed Development is not expected to cause any interference to the reception of digital satellite television services

The Proposed Development is not expected to affect VHF(FM) radio reception

6 - Mitigation Measures

As no interference to the reception of any television or radio broadcast platform has been identified, no mitigation measures are required to restore broadcast service reception.

7 - Conclusions

A desktop-based study has been performed to assess the possible effects and impacts on the reception of television and radio broadcast services from the proposed 7-9 Piccadilly development in Manchester. The study has focused on the reception of VHF (FM) radio and the two television broadcast platforms that could possibly be impacted by the Proposed Development - digital terrestrial television and digital satellite television services.

Digital Terrestrial Television (DTT) - Freeview

Due to likely existing excellent coverage and robust nature of the DTT signal in the study area, the Proposed Development is not expected to have any adverse effect upon the reception of Freeview television services.

Digital Satellite Television - Freesat & Sky

Due to lack of viewers and satellite dishes in any theoretical signal shadow zone, the Proposed Development will not cause any interference to local digital satellite television reception.

VHF(FM) Radio

Due to the likely existing good coverage and robust technical nature of the broadcast radio network with respect to building-generated signal interference, the Proposed Development is not expected to affect the reception of VHF(FM) radio services.

Overall, the Proposed Development is unlikely to cause any interference to the reception of any television or radio broadcast platform. As no interference is expected, no mitigation measures are required to restore the reception of any broadcast platform. This report can be used to support the planning submission.

APPENDIX

Television Transmission Frequencies

VHF (FM) Radio Transmission Frequencies

References

Mapping Data

Planning Policies - National Planning Policies

Planning Policies - Regional and Local Planning Policies and Guidance

Television Transmission Frequencies

Digital TV Multiplex	Multiplex Operator	UHF Channel Number *	Channel Frequency Fc (MHz) **	Transmitter Power (kW)
BBC A	BBC	32	562.000	100.0
D3&4	Digital 3 & 4	34	578.000	100.0
BBC B - HD	BBC	35	586.000	100.0
SDN	SDN	29	538.000	100.0
Arqiva A	Arqiva	49	698.000	100.0
Arqiva B	Arqiva	37	602.000	100.0
COM7 - HD	Arqiva	55	746.000	22.9

Table A - Winter Hill Digital Terrestrial Television Services

Public Service Broadcaster (PSB) Digital Multiplexes
Commercial (COM) Digital Multiplexes

* - Digital multiplexes with a "+" or "-" sign operate with a frequency offset making the channel frequency + or - 167 kHz

** - The nominal channel frequency, Fc (in Megahertz) of the multiplex can be calculated using $F_c = 8n + 306$, where 'n' is the UHF channel number

VHF (FM) Radio Transmission Frequencies

Service	Frequency (MHz)	Transmitter Power (kW)
BBC Radio 1	98.9	250
BBC Radio 2	89.3	250
BBC Radio 3	91.5	250
BBC Radio 4	93.7	250

Table B - Holme Moss VHF (FM) Radio Services

Information correct at time of writing. Information provided by DigitalUK and Arqiva

References

The building information found in Chapter 2 was sourced from the following Ofcom document –

http://licensing.ofcom.org.uk/binaries/spectrum/fixed-terrestrial-links/wind-farms/tall_structures.pdf

Mapping Data

This report includes mapping and mapping data provided by Ordnance Survey (OS), under the terms of the Open Government Licence, OS data Crown copyright and database copyright (2021).

Planning Policies - National Planning Policies

National Planning Policy Framework (NPPF), Ministry of Housing, Communities & Local Government, July 2021

10. Supporting high quality communications

116. 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.

Planning Policies - 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 (revised January 2020), 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)

Television Reception

MCC planning guidance, any development over four storeys requires a TV reception impact assessment.

Information on TV and radio reception and interference. Please provide a report on the possible interference created by the proposed development on TV and radio reception within the area. You may wish to contact the Office of Communications (Ofcom) on tel. 0207 981 3000 for suggestions of companies who may be able to carry out such work. (Core Strategy Policy EN2)

Tall Buildings

*If the proposed building is considered to be a 'Tall Building', you will need to make a case for the height of the tall element and take into consideration Historic England and Design Council guidance on 'Tall Buildings'. The design statement should make reference to Design Council guidance to assess its impact on the surrounding area. A visual impact assessment with visualisations of the building form key views needs to be included. The statement should include details of pre-application discussions held with local residents and the outcome of these discussions. If the Proposal is a Tall Building, it may require an Environmental Statement, as it would have the potential to generate significant impacts over and above the existing use(s) on site. Most notably impacts relating to visual impact; wind microclimate; sunlight / daylight / shading / solar dazzle / privacy and overlooking; transport issues; noise and vibration; air quality; ground conditions and contamination; water resources hydrology; **radio and television interference**; and sustainability. (Core Strategy Policy EN2)*

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 and the degree of manpower and resources allocated to the project.

The UK's terrestrial television network is a highly complex engineering system and is constantly being modified, re-designed, upgraded and maintained. The likely reception conditions detailed in this report would be those prevailing at the time of writing in the study area. Engineering work at transmitter sites, weather conditions and the time of the year will influence the quality and coverage of terrestrial services and their susceptibility to interference. Whilst every effort was made to accurately quantify the available television transmissions and services at the time of writing, GTech Surveys Limited cannot assume that any part of the television broadcast network or transmission from any transmitter will be operating with the same engineering specification during the post-construction phase.

As a baseline signal survey has not been undertaken for this work, any impacts or assumptions are derived from modelling and may not accurately reflect actual reception conditions in the study area during either the pre- or post-construction phases. Additionally, local construction work, buildings and existing operational wind farms within the study area will degrade the quality and reliability of any received television services, yet these unknown influences cannot be factored into any impact modelled due to the complexity of the potential signal interference.

Modelling parameters assume that all installed antenna systems are mounted at least 10m AGL and installed to a modern standard, with all components meeting CAI quality standards. Antennas mounted at lower heights and poor-quality installations will be more prone to the effects of interference from external sources and as such, reception conditions to installations with the aforementioned characteristics have not been accounted for in any impact modelling. Consequently, properties with such installations may be prone to interference effects that have not been identified. Such installations are commonly found in camping and caravan parks, on bungalows and properties where it is not possible to attach an antenna to the exterior roof. Antennas mounted in lofts are also more prone to interference effects arising from the signal attenuation caused by roofing materials. Again, reception conditions to properties with the aforementioned antenna installation characteristics have not been accounted for in any impact modelling and as such, properties with these installations may be prone to interference effects that have not been identified.

Digital terrestrial television (Freeview) coverage may vary as a result of engineering works or any frequency changes authorised by Ofcom. We advise that consumers always check future reception predictions (<https://www.freeview.co.uk/corporate/detailed-transmitter-information>) before buying TV equipment. GTech Surveys Limited, Ofcom and Digital UK are not responsible for household TV reception arrangements.

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, found on our website.

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