

GTech Surveys Limited

Telecommunications Impact Assessment

B&Q Cricklewood

CHANGE HISTORY

Issue	Date	Details of Changes
0.0	01/05/2020	Working draft
0.1	06/07/2020	First draft issue
0.2	30/07/2020	Second draft issue – application boundary updated and general editing
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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.

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Executive Summary

A telecommunications impact assessment has been undertaken to support the outline planning application for the redevelopment of the B&Q Cricklewood Site in Barnet.

This assessment considers the potential impacts to local telecommunication infrastructure and radio networks due to the proximity of Network Rail property and the local Cricklewood railway station, as required by the National Planning Policy Framework (NPPF), February 2019 (Ministry of Housing, Communities & Local Government). Impacts to broadcast television and radio reception are not considered to be significant and consequently it was suggested that these could be conditioned in at a later date during the detailed design stage.

Accordingly, impacts to local telecommunications systems and networks have been investigated. Feedback indicated that a number of wireless link and radio operators have existing telecommunications infrastructure in use near to the application site. Arqiva, The JRC and Transport for London all indicated that the proposed development was unlikely to cause any unwanted interference to the operations of any existing radio system or network.

Network Rail (NR) indicated that the Application Site was located adjacent to an existing GSM-R radio mast and that the Applicant would need to enter into a Applicant funded Basic Asset Protection Agreement (BAPA) in order for NR to undertake the required impact assessments. Due to the proximity of the radio mast to the Proposed Development, it is advised that the BAPA is arranged as soon as possible in order to assess the potential impacts and ramifications on radio network and the Proposed Development. This is particularly important as the mast and wider GSM-R network provides vital train to control room communications, which form part of essential rail safety systems.

Ericsson indicated that a microwave link passes directly through the Application Site, connecting two local transmission sites. It is necessary that further impact assessments are undertaken to determine the possible impacts and effects of the scheme on the operations of the identified microwave link. It is advised the Applicant approaches Ericsson to form a framework to undertake the required impact assessments.

Overall, the Proposed Development has the potential to disrupt radio network operations for Network Rail and Ericsson. It is advised that the Applicant engages and liaises with both parties to assess the magnitude of any possible effects once impact assessments have been undertaken. Moving forward, this would enable both Network Rail and Ericsson to formulate any mitigation required to maintain the correct operations of their respective radio networks, whilst allowing the Proposed Development to continue without causing interference or telecommunications disruption.

1 - Introduction

This report outlines the findings of a study undertaken to assess the possible impacts and effects on local telecommunications systems and radio networks that may arise from the proposed B&Q Cricklewood redevelopment. Requirements under The National Planning Policy Framework, February 2019 (Ministry of Housing, Communities & Local Government) states:

“10. Supporting high quality communications

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:

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

Consequently, impacts to the operation of electronic communications systems and radio networks has been investigated, with the emphasis on Network Rail and Transport for London wireless and telecommunications infrastructure.

This report is structured as follows:

- Chapter 1 introduces the work;
- Chapter 2 describes the wireless networks, radio and microwave links that have been identified in the study area;
- Chapter 3 provides a basic assessment of impacts and effects on local wireless networks and radio links arising from the scheme, and summates any feedback from telecommunication network operators; and
- Chapter 4 presents the conclusion.

This study was undertaken between January and July 2020 to investigate if the proposed development could cause interference to local telecommunications services and radio systems. The report can be used to support the outline planning application if required, or for guidance. Figure 1 shows the location of the application site.



- Application boundary
- Existing building
- Existing road

Figure 1 - The Location of the Application Site

2 - Radio Links and Telecommunications Networks in the Study Area

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:

Fixed Point-to-point Wireless Radio Links

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.

If unwanted interference is expected as a result of a proposed development or through the use of tower cranes etc. normal practice is for the radio network's owner to investigate engineering solutions to ensure the continued operation of the radio circuit. Depending upon the nature of the communications channel and the availability of other suitable sites, such mitigation may include;

- Relocating antennas to new locations on the mast where the proposed development / tower crane will no longer cause unwanted obstructions;
- Using another local mast / radio tower to bounce (dogleg) the affected radio link around the unwanted obstruction;
- Using a wired / fibre connection rather than a radio link to complete the affected circuit; and
- Using a temporary location near to the site to mount antennas whilst the proposed development is under construction and then relocating antennas to positions on the proposed development once construction is complete.

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.

A search of Ofcom's fixed link database indicated that there were a number of existing fixed microwave links that passed near to and over the Site. Ofcom's Wireless Telegraphy Register 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 and over the Application Site. The situation can be seen in Figure 2, where the Application Site is delineated in red and the microwave links are in shown blue.

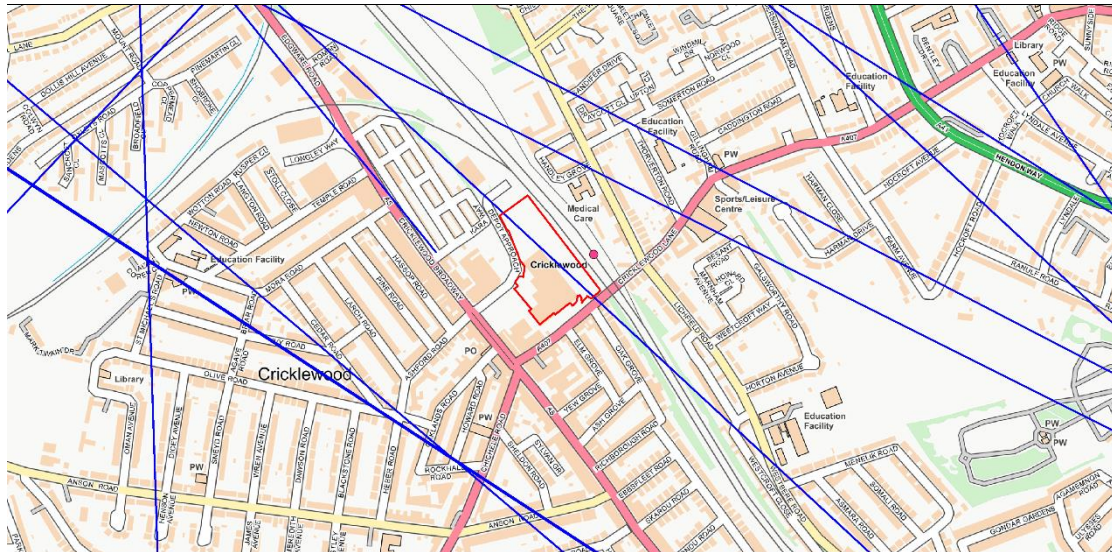


Figure 2 - Fixed links (in blue) crossing over and adjacent to the Application Site

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

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."

An adverse impact on the operation and reliability of a microwave link may exist only if a link is situated directly above the Application Site, or near to it*; a frequency dependent factor. One link crosses over the application site and requires detailed impact assessment. The link is listed in Table 1 and shown in Figure 3.

Link ID	Link Owner	Interference Likely	Detailed Impact Assessment Required?
0858180/1	Ericsson	Highly likely	Yes, by Ericsson

Table 1 - Identified Local Fixed Radio Links Passing near to or over the Application Site

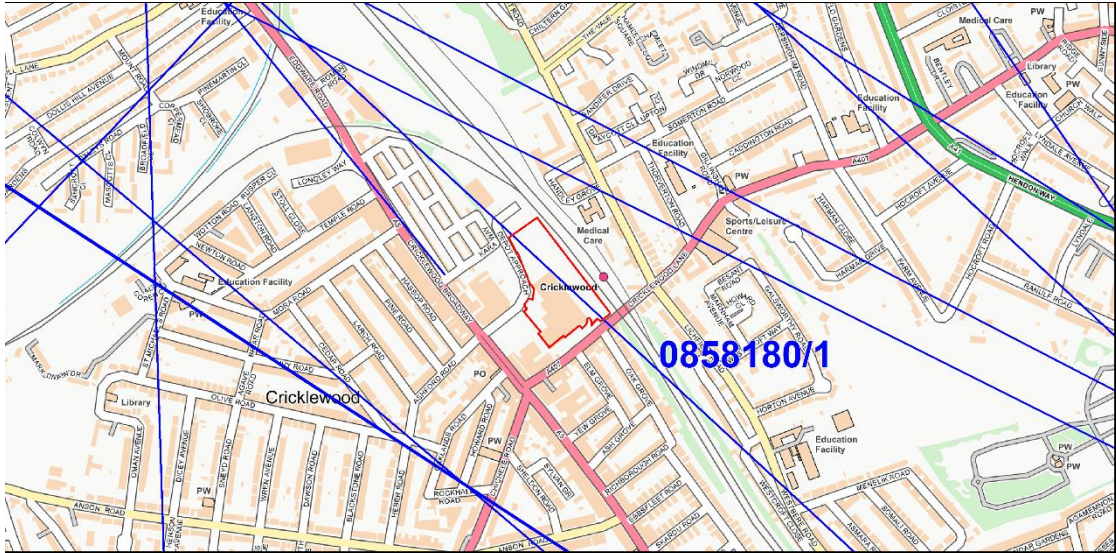


Figure 3 - Identified Fixed links (in blue) crossing over and adjacent to the Application Site

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

3 - Telecommunications Impact Assessments

The JRC, TfL, Network Rail and Arqiva (a UK telecommunications infrastructure operator, who manage and transmit the majority of the BBC's national, regional and local television and radio services from their transmission sites), were contacted to determine if the proposed development was expected to adversely impact any of their local radio or telecommunications systems.

Ericsson was also contacted to determine:

- a) The operational status of the link (refer to Table 1) i.e. live, awaiting decommissioning, rerouted, not active / not in use etc;
- b) If the proposed development is likely to impact the operation of the link if still active or required for redundancy circuits; and
- c) What mitigation / engineering solutions exist in order to maintain the operation of the link if an adverse impact has been identified

A site plan and illustrative building elevations were presented to all link owners and radio network operators in order to assist their initial impact assessments. The telecommunication network owners and operators were contacted during January, February and March 2020.

Feedback from Telecommunications and Radio Network Operators

Transport for London (TfL)

TfL indicated by email 20th January 2020 that the proposed development was unlikely to adversely impact the operation of any of their existing assets. TfL stated;

"I can confirm that TfL assets will not be affected by radio and telecommunications works at the Proposed B&Q Cricklewood Development as per plan and details provided by you.

However, there are Network Rail assets close to this site. Please contact them directly to query what affect if any your proposals will have on the railway."

Arqiva

Arqiva confirmed by email 20th January 2020 that the Proposed Development would not impact any of their broadcast networks or services.

However, they did advise that an assessment of potential television and radio reception interference should be undertaken at some point.

The JRC

The JRC confirmed by email 17th June 2020 that the Proposed Development would not impact any of their local radio or telecommunications networks or services.

Network Rail (NR)

The application site is adjacent to an existing Network Rail (NR) telecoms site. NR confirmed that the application site was close to existing telecoms infrastructure stating;

“Our GSM–R tower is at the Station but looks like your site is further to London. With it being so close it may impact but the Asset Protection team will do a formal check and response. We generally don’t have point to point microwaves.”

Network Rail provided a map of the area with the telecoms site indicated, Figure 5. In order to better show the mast’s location with respect to the application site, Figure 6 was produced.

Network Rail further stated;

“Until the Asset Protection Team enters into a Basic Asset Protection Agreement (BAPA) with a Applicant, we are unable to progress works. Please see clause 33 of the Development Works Adjacent to the Operational Railway guidance notes, previously attached, which explains in more detail. Network Rail is publicly funded and is obliged to recover any costs incurred solely as a result of the developer’s works.*

A PAN 61 form is needed because the development may affect sighting of radio transmission. Asset Protection will proceed with this Outside Party scheme but not until an agreement is in place; please try to reason with our position as Network Rail is government funded.”

* - See Appendix

Additional impact assessments have been requested from NR, but despite continued enquiries, no further feedback or assistance has been provided. Due to the location of the mast to the application site’s boundary, further liaison with NR is required future Reserved Matters Applications evolve. The Applicant will need to engage directly with NR and enter into an Applicant funded BAPA in order for NR to undertake the required impact assessments during the Reserved Matters Application stage.



Figure 5 - Network Rail mast Location

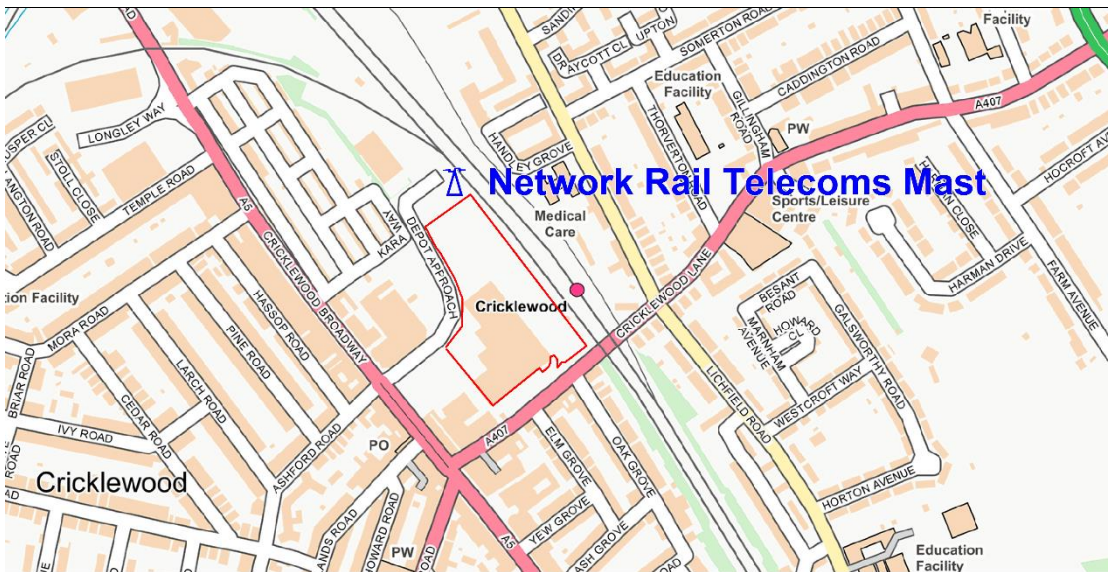


Figure 6 - The Network Rail Telecoms Mast near the Application Site

Ericsson on behalf of MBNL (Mobile Broadband Network Limited - EE and Three)

Ericsson manage and plan the network on behalf of MBLN which operates EE's 2G network and both EE and Three's 4G network.

Ericsson stated the Proposed Development had the potential to cause interference to link 0858180/1 and link ML 101858. Ericsson stated;

"I can confirm MBNL have a radio mast/MW link within 250m/100m of your proposed development and therefore we have objections to your proposal.

At this stage my advice would be to relocate your proposed development of its current location. Failing that, we would require detailed diagrams of the proposed area and possibly GPS of both ends coupled with line of site.

Our guidelines stipulate an acceptance of proposed development 250m clear of a communication mast and a distance of 100m of an existing microwave link mitigating any interference. Separating distance less than that is analyzed case by case basis where we will consider an acceptable distance of 70m. Any distance less than that we would require GPS of both ends & LOS to be carried out by the proposal company.

Please note, if any of the details of the application, particularly the location or size of the development should change, it will be necessary to re-evaluate the proposal. Any changes made to the proposed site location of any proposed development, will require a further desktop study to re-confirm the minimum clearance criteria set within the MBNL guidelines. Any mitigation works required to our links or sites as a result of this development will be at the developer cost."

Using data provided by Ericsson, the two links have been plotted and are shown in Figure 7.

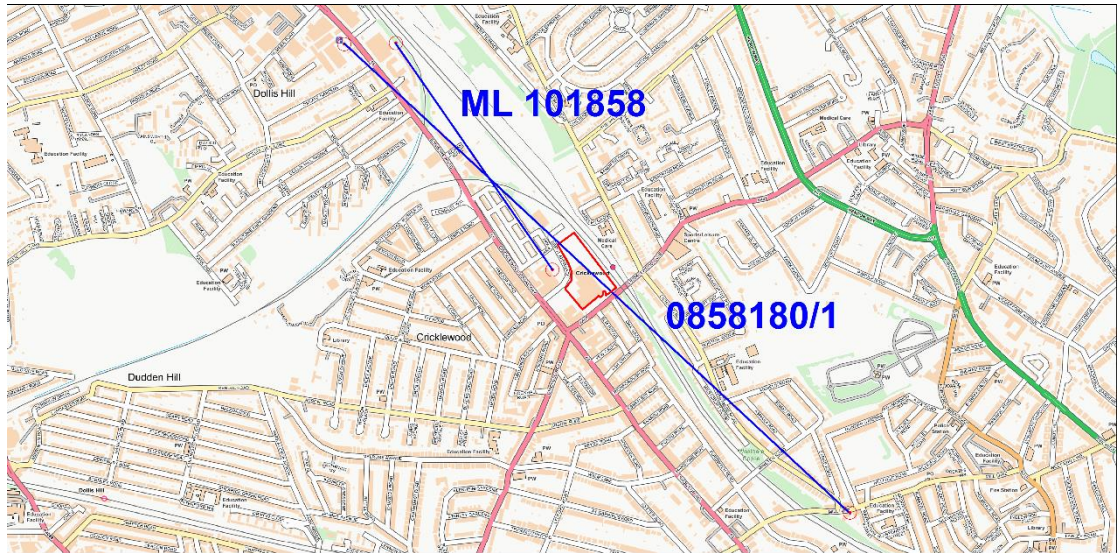


Figure 7 - Ericsson link 0858180/1 and link ML 101858 crossing over and adjacent to the Application Site

Due to the location of their mast to the application site's boundary (to the immediate west) and the live link that crosses over the Application Site, further liaison with Ericsson is required as the scheme and planning stages evolve because it is likely that disruption to link 0858180/1 will occur due to the heights of the Proposed Development and the position / path of the link. The Applicant will need to engage directly with Ericsson and enter into an agreement with Ericsson in order for Ericsson to undertake the required impact assessments during the Reserved Matters Application stage.

Rebroadcast Links

The Arqiva operated digital terrestrial television (DTT) relay network uses rebroadcasting links to pick up the transmitted television multiplexes. The television relay stations take the incoming DTT broadcast signal from the nearest parent transmitter (Crystal Palace in this case) amplify it and rebroadcast to the target coverage area.

The center of the Application Site is c. 700m from the main Crystal Palace television transmitter to Hemel Hempstead television transmitter RBL path (the path indicated blue, passing to the west of the Proposed Development, shown in Figure 8).

Arqiva requires a clearance of 500m from a site to an RBL to ensure robust RBL operations remain. At over 700m, the professional opinion is that the Proposed Development would not impact this RBL link based on the good clearance distance between the RBL and the Application Site.

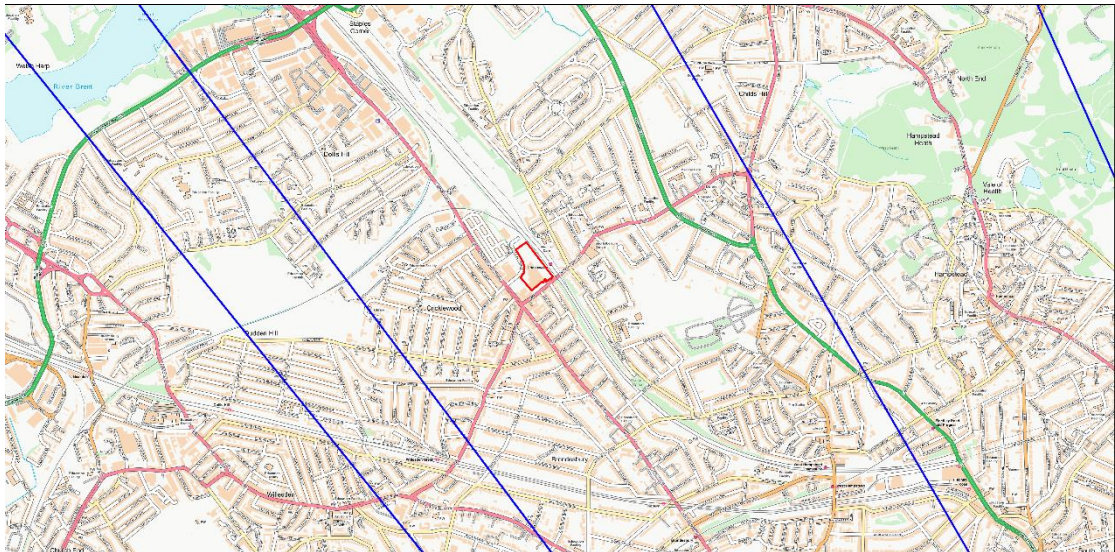


Figure 8 - The Finchley relay RBL path (the path in blue, passing to the west of the application site)

4 - Conclusions

A telecommunications impact assessment has been undertaken to support the Outline Planning Application for the redevelopment of the B&Q Cricklewood Site in Barnet.

Local, regional and national telecommunications operators were contacted to determine if the proposed development would cause any unwanted interference to existing radio and wireless networks. Feedback indicated that several wireless link and radio operators have existing telecommunications infrastructure in use near to the application site.

Arqiva, The JRC and Transport for London all indicated that the proposed development was unlikely to cause any unwanted interference to the operations of any existing radio system or network.

An Arqiva operated rebroadcast link (RBL) from the main Crystal Palace television transmitter to Hemel Hempstead television relay is situated to the west of the application site. However, due to the distance between the application site and RBL, no interference is thought possible.

Network Rail (NR) indicated that the application site was located adjacent to an existing GSM-R radio mast and that the Applicant would need to enter into a Applicant funded Basic Asset Protection Agreement (BAPA) in order for NR to undertake the required impact assessments. At the time of writing, this has not occurred and must be undertaken during the RMAs decision stage. Due to the proximity of the radio mast to the proposed development, it is advised that the BAPA is arranged during the Reserved Matters stage in order to assess the potential impacts and ramifications on radio network and scheme.

Ericsson indicated that a microwave link passed directly through the application site, connecting two local transmission sites. It is required that further impact assessments are undertaken to determine the possible impacts and effects of the scheme on the operations of the identified microwave link. It is advised the Applicant approaches Ericsson to form a framework to undertake the required impact assessments. At the time of writing, this has not occurred. Due to the path of the link with respect to the proposed development, it is advised that a working framework is arranged as soon as possible in order to assess the potential impacts and ramifications on Ericsson's local radio network.

Overall, the proposed development has the potential to disrupt radio network operations for Network Rail and Ericsson. It is advised that the Applicant engages and liaises with both parties to assess the magnitude of any possible effects once impact assessments have been undertaken. Moving forward, this would enable both Network Rail and Ericsson to formulate any mitigation required to maintain the correct operations of their respective radio networks, whilst allowing the proposed development to continue without causing interference or telecommunications disruption. This is particularly important for

Network Rail, as the GSM-R network provides vital train to control room communications which form part of essential rail safety systems.

APPENDIX

Network Rail – General Engineering Guidance in Respect of Development Works adjacent to the Operational Railway (Issue 2.0 Revision 0 28/03/2017)

UK Planning Policies

Network Rail

General Engineering Guidance in Respect of Development Works adjacent to the Operational Railway (Issue 2.0 Revision 0 28/03/2017)

Listed below are Network Rail's general guidance notes for enabling development works to be carried out safely adjacent to the operational railway. Not all of the following will be applicable to every scheme and discussion will be required to determine scheme specific issues. It may also be practicable to dispense with some aspects depending on proposed methods of working.

- 1) CDM Regulations & Other Requirements The works are to be carried out in accordance with the Construction (Design & Management) Regulations 2015 and the Health & Safety at Work Act 1974. Network Rail requires a copy of the Health & Safety Plan produced in accordance with CDM Regulations. The plan must include the identity of the Principal Designer / Principal Contractor and identify the measures to deal with hazards associated with working in or adjacent to the railway environment.
- 2) Health & Safety Executive The Proposer's Principal Designer / Principal Contractor is to inform the Health & Safety Executive of the commencement of works. Network Rail requires a copy of Form 10 for information purposes. Network Rail will inform the Railway Inspectorate.
- 3) Detailed Plans 3 copies of fully detailed plans of the development within 10 metres of Network Rail's boundary should be forwarded to Network Rail's Asset Protection Project Manager before work on the development commences on site. This is to assure Network Rail that adjacent property and the Operational Railway will not be adversely affected during and after carrying out of the development. The drawings should be to scale with dimensions and levels, including cross-sections where alterations to the existing ground levels are proposed, showing existing and proposed ground levels
- 4) Safety of the Operational Railway The railway adjacent to the site should be considered to be operational 24 hours a day and any overhead electrified equipment present is energised at 25,000 volts. No plant, material or equipment is to be placed in a position where in the event of accident, malfunction or failure it could fall within 3 metres of either the nearest operational railway line or any overhead electrified equipment. If this cannot be complied with the works must be carried out during a possession/isolation of the railway (see Item 7).
- 5) Supervision Certain operations adjacent to the operational railway must be supervised by Network Rail. These are likely to be:-
 - a) Erection of temporary/permanent fence
 - b) Tree felling or lopping
 - c) Demolition of structures
 - d) Crane working
 - e) Erection/dismantling of scaffolding
 - f) Blasting
 - g) Plant working
 - h) Erection of steelwork/cladding

- i) Piling
- j) Painting
- k) Removal of temporary fence

The level of supervision required will be dependent on method statements and how the Contractor performs regarding railway safety.

6) Method Statements Detailed written method statements, including risk assessments, are required for any construction works adjacent to Network Rail's boundary. These are to be submitted to Network Rail well in advance of the works (a minimum of four weeks notice should be assumed) for approval, specify plant type, positions, movements, reach, etc. and indicate compliance with Item 4 above. Network Rail's Site Manager will provide an acceptance of method statement form template for the Contractor's use and give advice on format and information required. Network Rail requires written confirmation (supported by diagrams in the method statements as necessary) that there will be no uncontrolled collapse of any structure, material or equipment that could come within 3 metres of the operational railway track or the overhead electrified equipment.

7) Possessions/Isolations Development works adjacent to Network Rail's boundary that cannot comply with Item 6 are to be carried out during a full possession/isolation of the operational railway. A possession is a closure of the operational railway. An isolation is a switching off of the power to the overhead line electrified equipment.

A minimum of 18 weeks' notice is required to arrange possessions/isolations of the operational railway; this is to allow Network Rail to programme alternative routing of trains in the area, if necessary, for manpower resources to be scheduled and to allow possession timetables to be published. A possession/isolation must start and finish only when Network Rail indicates. Possessions may be shortened or cancelled by Network Rail at short notice, for operational reasons, and the person/organisation instigating the works (the Developer) must be prepared and make allowance for this in any contract. Network Rail will not be held responsible for any costs incurred as a result of such cancellations, but every effort will be made to provide a replacement possession at the earliest opportunity. If the Developer/Contractor cancels a booked possession at less than 10 working days' notice Network Rail may still incur costs that will be recoverable. Cancellation of a booked isolation will incur a minimum charge of 25% of the total cost of the isolation. An allowance of up to one hour's working time will be lost at the beginning and end of a possession to place and remove protective arrangements.

8) Bar Charts Network Rail will require hour-by-hour bar charts that are to be produced by the Contractor to show the programming of the proposed works within a possession/isolation to demonstrate that the works can be completed in the time available and provide reasonable assurance that they will not over-run. The charts are also required to show at what stages the works can be left in a stable condition in case a possession/isolation is shortened or a Network Rail engineering train is to be passed through the possession and must be approved by Network Rail as part of the possession booking process. If over-run of a possession/isolation occurs then the Developer will be expected to reimburse Network Rail for any train delay costs incurred. Written acceptance of this condition is required before works commence.

9) Calculations Engineer's calculations are required to demonstrate the stability and structural integrity of any structure that is to be left in a partially erected state adjacent to Network Rail's boundary. Independent check certifications are required for these calculations. The information should be submitted for Network Rail acceptance not less than four weeks prior to the works taking place.

10) Temporary Works Drawings, method statements and calculations are required for any temporary works in proximity to Network Rail's property or the operational railway. Independent check certificates are required for these calculations. The information should be submitted for Network Rail acceptance not less than four weeks prior to the works taking place.

11) Temporary Fence A temporary fence is required between the site and the Operational Railway. This is to be at least 1.5m high chestnut paling, or similar, mounted on substantial posts, not less than 3.0m from the nearest rail (or overhead line masts/signal posts/etc.), approved by Network Rail and erected under Network Rail supervision/protection.

12) Scaffolding Scaffold design drawings including calculations plus an independent design check certificate must be submitted to Network Rail for acceptance, not less than 10 days prior to the works commencing. Any scaffolding on or near Network Rail property is to be tied back, have fully boarded decks and be fully screened from the Railway with boarding or debris netting. On completion of the scaffolding, inspection and examination should be in accordance with all applicable regulations in force. A copy of the scaffold completion certificate should be handed to Network Rail plus a copy of the scaffold inspection reports (F91 Register) on a weekly basis. Method statements for erection and dismantling must also be accepted by Network Rail and should again be submitted not less than four weeks prior to the works taking place.

13) Dust As dust clouds can affect railway signal sighting, adequate measures for preventing dust blowing onto Network Rail property are to be in operation during the works. These measures are to be approved by Network Rail before the works commence.

14) Crane and Piling Rig Working All crane working and piling operations are to be approved by Network Rail. In particular, piling work must comply with Network Rail Standard NR/L3/INI/CP0063, Piling adjacent to the running line. Method statements are required for any crane or piling rig operations on site. They are to indicate technical details of the equipment including load capacity, radii and diagrams showing jib length, position, outriggers position and anticipated load lifts etc. Drawings are required to show crane and piling rig movements and lifting positions about the site. Any crane and piling rig working is to be supervised by Network Rail. Cranes or piling rigs may only work parallel to or pointing away from the railway when not in a possession situation and must always swing away from the railway. Safeguards must be in operation to stop any sluing over the railway. The necessary plant legislative documents will be required and a crane supervisor will be required for cranes of over 50 tonne capacity. All plant certification is to be checked by Network Rail. Attention is drawn to the following:-

a) A level and stable platform is to be maintained for cranes or piling rigs.

b) Large continuous flight auger piling equipment is undesirable in close proximity to the railway. This is due to the loose cables and hoses associated with this method.

c) Placing of pile reinforcement and any casings is to comply with Item 4.

d) Concrete pumping hoses are to be kept at low level and in good condition, as it is dangerous to have concrete or water spraying in proximity of high voltage cables.

15) Geotechnical Information Network Rail require to be advised of the geotechnical information regarding the site and be assured that whatever construction method is used is suitable. Written confirmation is required stating that the integrity of the railway formation or structures will not be impaired by piling or other construction methods. In particular the pulling of soils from under Network Rail structures by auguring is to be avoided.

16) Services Search If excavations are required in close proximity to Network Rail's boundary and or cable ducts, etc., then Network Rail require to carry out a Service Search. The cost of this search is to be reimbursed by the Developer. A service search will take six weeks to produce. Network Rail recommend that the Developer carry out a thorough service search over the entire site before works commence.

17) Earthworks and Excavations There is to be no surcharging, removal or undermining of Network Rail's cutting slopes, embankments or retaining structures without specific agreement from Network Rail. Network Rail reserve the right of support at all times. Details of earthworks, e.g. ground raising or lowering, and excavations for foundations, basements, etc. within 15 metres of Network Rail's boundary are to be submitted to Network Rail for prior approval. The structural integrity of Network Rail's formation or structures must not be compromised. Stability calculations together with supporting independent design check certification and geological information will be required to prove this where necessary. Network Rail may require the Proposer to monitor ground levels and track levels and alignment regularly while earthworks are taking place and for at least 2 weeks before commencement and after completion. Details of any retaining walls associated with ground level alterations adjacent to the railway boundary are to be submitted for Network Rail consideration and acceptance.

18) Ground Improvement / Dewatering Any operation involving ground vibration (Dynamic Compaction etc.) that could have an effect on Network Rail's infrastructure will be limited to a maximum peak particle velocity of 10mm per second at Network Rail's boundary. If the works can affect a Network Rail structure this value will be further reduced to a maximum peak particle velocity of 5mm per second at the structure. There is to be no dewatering adjacent to or under Network Rail property or structures unless it is unavoidable, in which case the following is required:-

a) Settlement and stability calculations for the railway corridor for all stages of construction/dewatering.

b) Calculations to be supported by independent design check certification.

c) Network Rail requires the Proposer to monitor ground levels and track levels and alignment regularly while dewatering is taking place and for at least 2 weeks before commencement and after completion.

19) Drainage Storm/surface water must not be discharged on to Network Rail's property or into Network Rail's culverts or drains except by agreement with Network Rail. Suitable drainage or other works must be provided and maintained by the Developer to prevent surface flows or run-off onto Network Rail's property. Proper provision must be made to accept and continue existing drainage discharging from Network Rail's property. Full details to be submitted to Network Rail for approval.

20) Permanent Fence In view of the change of circumstances due to the development immediately adjoining an operational railway line, it is essential the Developer provides and thereafter maintains a substantial fence, e.g. concrete post and weldmesh, galvanised steel palisade, solid wall of concrete, brick or masonry, adjacent to Network Rail's boundary. This is to be agreed in writing with Network Rail Property. The design and/or positioning should preferably be such that future maintenance can be carried out without access to Network Rail property. The Developer is to notify Network Rail four clear weeks prior to the commencement of all fencing works to enable any necessary supervision/inspection to be arranged. The boundary fence specification is to be submitted for approval by Network Rail. The boundary location is to be agreed with Network Rail Property before these works commence. No permanent or temporary fence is to be constructed within 3 metres of the Network Rail overhead electrified equipment. Metal fencing adjacent to Network Rail overhead electrified equipment is to be bonded out to the railway earth return.

21) New Roads etc. Where new roads, turning spaces or parking areas are to be situated adjacent to a railway which is at or below the level of the development, suitable parapets, crash barriers or high kerbs should be provided to prevent vehicles accidentally driving/rolling onto the railway or damaging the lineside fencing.

22) Lighting schemes for the illumination of new roads, parking, garage areas, security, etc., must be submitted for Network Rail's prior approval. Lighting schemes could affect sighting of railway signalling therefore Network Rail reserves the right to have any lights screened. Lighting schemes are to be approved by Network Rail's Signalling Engineer.

23) Visual Interference With Track Signals Network Rail's signals should not be obscured or their sighting affected by the works, both in a temporary or permanent situation. The affect on Network Rail's signalling should be assessed by Network Rail on behalf of the Developer to ensure that a risk is not imported on to the Operational Railway. The cost of such an assessment to be funded by the Developer. Any works to the signalling and associated equipment that may be necessary is to be carried out by Network Rail at the cost of the Developer. Large areas of Red or Green cladding or painted structure that face on to the railway could affect the sighting of track signals. The Developer should be aware that if these colours are chosen then they could be instructed to change the colours if a signalling sighting problem is encountered. The Developer will be responsible for the cost of these changes. Large areas of reflective cladding or mirror type glazing could affect the sighting of track signals in the vicinity of the Railway. If signal sighting problems are encountered due to reflected sunlight then the Developer will be responsible for eliminating the problem.

24) Play Areas etc. Children's play areas, open spaces, amenity areas, garage blocks, etc., should not be sited adjacent to the railway unless the Developer provides and maintains a substantial security fence along the boundary.

25) Tree Planting Network Rail requires to approve tree planting schemes in proximity of the operational railway.

26) Access Permits Site Access Permits are required for any non-Network Rail personnel working on Network Rail property. Network Rail normally requires 2 weeks notice for issue of Site Access Permits. There is to be no access onto Network Rail land without authorisation from Network Rail. Protection and/or supervision is required for any works on Network Rail land.

27) Dangerous Substances Any dangerous substances found on site during the works are to be reported to Network Rail and disposed of in the correct manner, in accordance with HASAW and COSHH Regulations. Hazardous materials and explosives required in connection with construction of the development, or for the day to day business of the development on completion, must not be stored adjacent to the railway boundary.

28) Lead Paint Any burning, scraping or grinding of lead paint is to be carried out in accordance with the current safety regulations, Control of Lead at Work Regulation 1980 & ACOP - Control of Lead at Work.

29) Network Rail Access over the Development Area Any existing reserved rights of access for Network Rail across the development site are to be maintained during and on completion of the works. Details of any temporary or permanent alterations reserved access routes are to be agreed with Network Rail Property.

30) Clearance from Network Rail Boundary All buildings and structures should be situated at a sufficient clearance from Network Rail's boundary to allow construction and future maintenance to be carried out from the Developer's land, thus minimising the need for provision by Network Rail of staff for protection/supervisory duties.

31) Alterations to Network Rail's Infrastructure Network Rail reserves the right to alter any aspect of its operational infrastructure. The Developer should be aware of the possibility that trains may stop at signals adjacent to the development and the associated noise and vibration that may emanate from the passage of trains and the operation of infrastructure equipment, and also that much railway maintenance work is undertaken at night.

32) Emergency Procedures Network Rail's Agent for site safety will produce a set of emergency procedures that set out how trains are to be stopped in case of emergency. These procedures are to be displayed on the site near the operational railway when works are taking place. All site staff are to be made familiar with the procedures.

33) Network Rail Costs Network Rail, in keeping with all businesses, is a commercially driven organisation and as such, is obliged to recover any costs incurred solely as a result of the Developers works, e.g.:-

a) Project Management, including approval of method statements, and attendance at safety meetings, etc.

b) Provision of attendance, supervision and protection.

c) Provision of possessions and isolations as required.

d) Provision of service search as required.

These costs are to be borne by the Developer under a Basic Asset Protection Agreement. A draft Agreement and associated estimate of Network Rail's costs will be prepared when the level of involvement has been established and must be completed before works commence.

UK Planning Policies

National Planning Policies

National Planning Policy Framework (NPPF), February 2019, Ministry of Housing, Communities and Local Government

10. Supporting high quality communications

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

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 Applicant. 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, prevailing site conditions and the degree of manpower and resources allocated to the project.

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 which can be found on our website.

This Report is issued in confidence to the Applicant and GTech Surveys Limited have no responsibility to any third parties to whom this Report may be circulated, in part or in full, and any such parties rely on the contents of the report solely at their own risk.

The UK's radio and telecommunication networks are highly complex engineering systems and are constantly being modified, re-designed, upgraded and maintained. The data detailed and used in this report were those available at the time of the assessment. Whilst every effort was made to accurately assess the available data at the time of report production and 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 unpredicted impacts occur to any radio or telecommunications network at any location anywhere in the study area.

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