



## Telecommunications Report - Section 3.2 of the Building Height Guidelines (2018)

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**DEVELOPMENT**  
**An Bord Pleanála – Submission**  
**Richmond Road, Dublin 3**

20 December 2021

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## DEFINITIONS

<b>Author:</b>	Independent Site Management Limited (hereinafter referred to as "ISM")
<b>Mitigation Measures:</b>	means the allowances made for the retention of important Telecommunication Channels (hereinafter referred to as "Mitigation Measures")
<b>Planning Body:</b>	means An Bord Pleanála (hereinafter referred to as the "Planning Body")
<b>Radio Frequency:</b>	means a frequency or band of frequencies in the range 104 to 1011 or 1012 Hz, of the electromagnetic spectrum suitable for use in telecommunications.
<b>Microwave Links:</b>	means the transmission of information by electromagnetic waves with wavelengths in the microwave range (1 m - 1 mm) of the electromagnetic spectrum suitable for use in telecommunications.
<b>Telecommunication Channels:</b>	means Radio Frequency links & Microwave Transmission links (hereinafter referred to as "Telecommunication Channels")
<b>The Applicant:</b>	means Birkey Limited (hereinafter referred to as the "Applicant")
<b>The Development:</b>	means the proposed development situated at the former Richmond Building Providers at 148 Richmond Road, Ballybough Dublin 3 (hereinafter referred to as the "Development")



## EXECUTIVE SUMMARY

Independent Site Management ('ISM') has been engaged to provide a specific assessment that the proposal being made by Birkey Limited (the "Applicant") within its submission to An Bord Pleanála (the 'Planning Body'), allows for the retention of important Telecommunication Channels ("Telecommunication Channels") such as microwave links, to satisfy the criteria of Section 3.2 of the Building Height Guidelines (2018).

To provide this assessment, ISM reviewed the Applicant's proposed development (the "Development"), together with their proposed allowances to retain relevant Telecommunication Channels in the context of the immediate surrounding registered and documented telecommunication sites.

Pursuant to our review, ISM can conclude based on the findings outlined herein that the proposal being made by the Applicant within its submission to the Planning Body allows for the retention of important Telecommunication Channels, such as Microwave links, and therefore satisfies the criteria of Section 3.2 of the Building Height Guidelines (2018).



## ABOUT THE AUTHOR

ISM is a consultancy firm and asset management company that provides telecommunication consultancy and services to developers and property owners.

ISM works closely with all providers of wireless and fixed line telecommunication services to bridge their infrastructure requirements with that of private and public development. ISM has successfully been providing this service in Ireland for 20 years.

ISM is a multidiscipline firm proficient in the 3 main areas in the delivery of telecommunication services:

- (1) Radio Frequency technology;
- (2) Microwave Transmission technology; &
- (3) Fixed Line fiber optic & copper technologies.

ISM has had an integral part in procuring, designing, building and subsequently managing over 300 mobile base station and/or fixed wireless sites, the vast majority of which originated in densely populated, urban environments.

ISM has designed built and operates 6 in-building distributed antenna systems, and 2 large area managed fibre optic networks.



## DEVELOPMENT DESCRIPTION

Birkey Limited intend to apply to An Bord Pleanála for permission for a strategic housing development at this c. 0.61 hectare (c. 6,067 sq m) site at No. 146A and Nos. 148-148A Richmond Road, Dublin 3 (Eircodes D03 W2H1, D03 T6P0, D03 Y8R9, D03 PX27, D03 K6F7, D03 E447 and D03 HR27). The site is bounded to the north-east by Richmond Road and the Leyden's Wholesalers & Distributor Site, to the north-west by an apartment development (Deakin Court), to the south-west by the Tolka River and to the south-east by a residential and commercial development (Distillery Lofts). Improvement works to Richmond Road are also proposed including carriageway widening and a new signal controlled pedestrian crossing facility on an area of c. 0.08 hectares (c. 762 sq m). The development site area and road works area will provide a total application site area of c. 0.69 hectares (c. 6,829 sq m).

The proposed development will principally consist of: the demolition of all existing structures on site (c. 2,346 sq m) including warehouses and 2 No. dwellings; and the construction of a part 6 No. to part 10 No. storey over basement development (with roof level telecommunications infrastructure over), comprising 1 No. café/retail unit (157 sq m) at ground floor level and 183 No. Build-to-Rent apartments (104 No. one bedroom units and 79 No. two bedroom units). The proposed development has a gross floor area of c. 16,366 sq m over a basement of c. 2,729 sq m. The proposed development has a gross floor space of c. 15,689 sq m.

The development also includes the construction of a new c. 126 No. metre long section of flood wall to the River Tolka along the site's southern boundary. The new flood wall is positioned at the top of the existing river bank and will connect to existing constructed sections of flood wall upstream and downstream of the site. The top of the wall will be set at the required flood defence level resulting in typical wall heights of c. 1.2 to 2 metres above existing ground levels. The development will also include the repair and maintenance of the existing river wall on site adjacent to the River Tolka.



The development also provides ancillary residential amenities and facilities; 71 No. car parking spaces including 8 No. electric vehicle spaces, 4 No. mobility impaired spaces and 1 No. car share space; 5 No. motorcycle parking spaces; bicycle parking; electric scooter storage; a drop off space; the decommissioning of the existing telecommunications mast at ground level and provision of new telecommunications infrastructure at roof level including shrouds, antennas and microwave link dishes; balconies facing all directions; public and communal open space; a pedestrian/bicycle connection along the north-western boundary of the site from Richmond Road to the proposed pedestrian/bicycle route to the south-west of the site adjoining the River Tolka; roof gardens; hard and soft landscaping; boundary treatments; green roofs; ESB Substation; switchroom; comms rooms; generator; lift overruns; stores; plant; and all associated works above and below ground.



# SITE LOCATION/LAYOUT MAP



Figure 1



## TELECOMMUNICATION CHANNELS

This report assessed the two wireless Telecommunication Channels or networks of Telecommunication Channels that may be affected by the height and scale of a new development, Radio Frequency links & Microwave Transmission links

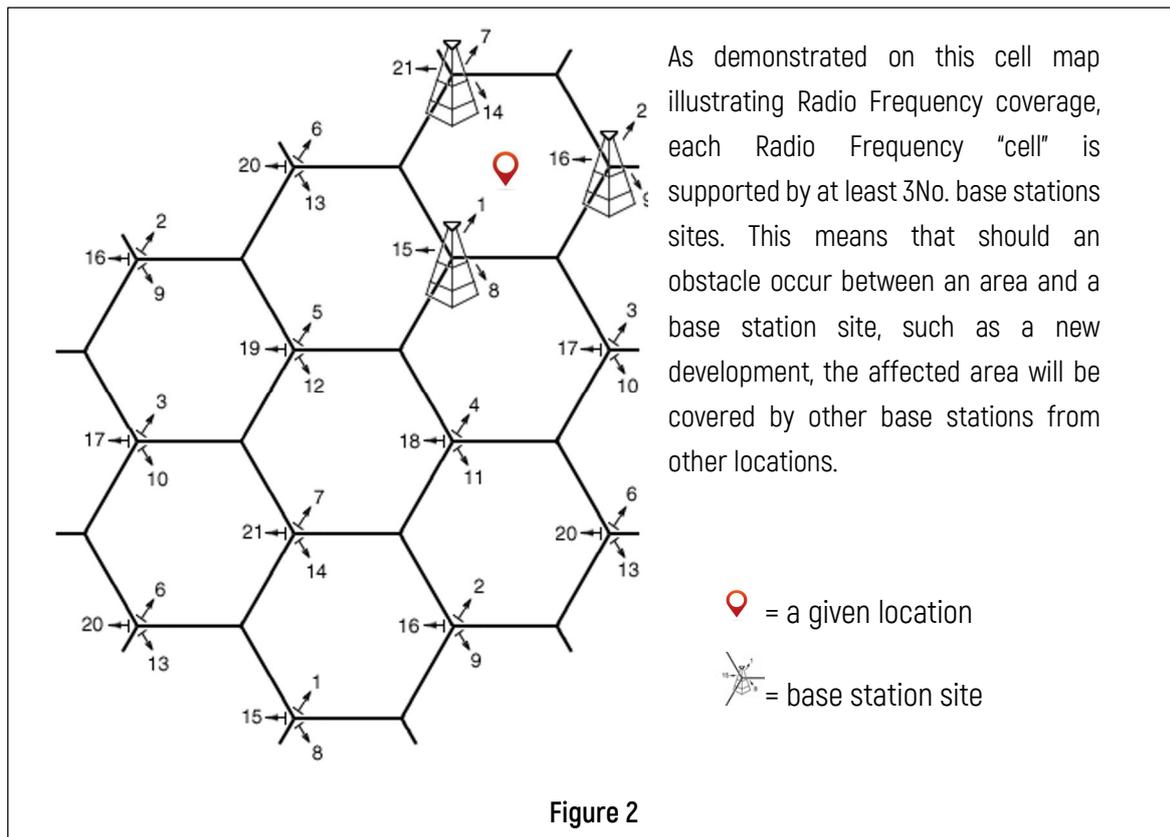
Radio Frequency links & Microwave Transmission Links are used in Ireland's mobile phone and fixed wireless networks and disseminate at an average above ground level height of 20m, making them the most relevant Telecommunication Channels to be assessed in relation to the height and scale of a new development and to that end what allowance the Applicant needs to make for their retention.

Mobile phones send and receive signals via links from nearby antenna sites or cellular towers, technically known as base stations, using Radio Frequency waves. Microwave Transmission links use microwave dishes to "transmit" from these base stations to other base stations forming a network. Radio Frequency waves operate at a lower power within lower frequencies of the radio spectrum, whereas Microwave Transmission operates at higher power within higher frequencies of the radio spectrum.

Radio Frequency waves are distributed over land areas in "cells", each served by at least one fixed-location transceiver (base station), but more normally by three cell sites or base stations. These base stations provide the cell with the network coverage, which can then be used for voice, data, and other types of content. A cell typically uses a different set of frequencies from neighbouring cells to avoid interference and provide guaranteed service quality within each cell.

When joined together, these cells provide Radio Frequency coverage over a wide geographic area (Cellular network). This enables numerous portable transceivers (e.g., mobile phones, tablets and laptops equipped with mobile broadband modems, pagers, etc.) to communicate with each other and with fixed transceivers and telephones anywhere in the network, via base stations, even if some of the transceivers are moving through more than one cell during transmission.





Cellular networks offer a number of desirable features, but most notably, additional cell towers can be added indefinitely and are not limited by the horizon, therefore it can be considered **indeterminable** as to whether a new development affects the Radio Frequency coverage of a geographical area which is being served by multiple base stations, not necessarily the closest.

Conversely, Microwave Transmission links are point-to-point links, which are easily determined to be affected, or not, by the height and scale of a new development. In point-to-point wireless communications, it is important for the line of sight between two base stations to be free from any obstruction (terrain, vegetation, buildings, wind farms and a host of other obstructions). As any interference or obstruction in the line of sight can result in a loss of signal.

While installing Microwave links, it is important to keep an elliptical region between the transmitting Microwave link and the receiving Microwave link free from any obstruction for the proper functioning of the system. This 3D elliptical region between the transmit antenna and the receive antenna is called the **Fresnel Zone**. The size of the ellipse is determined by the frequency of operation and the distance between the two sites.

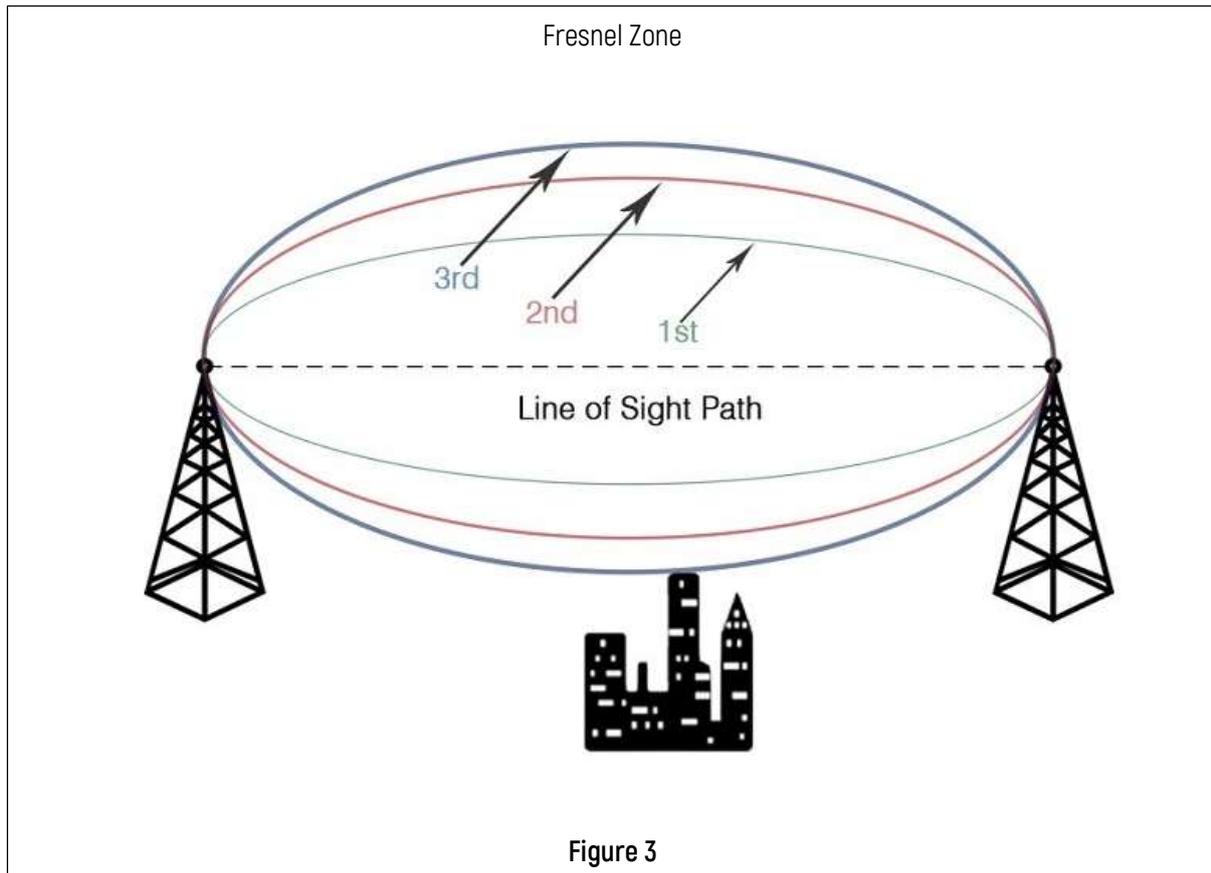


Figure 3

Essentially, if there is an obstacle in the Fresnel zone, part of the radio signal will be diffracted or bent away from the straight-line path. The practical effect is that on a point-to-point Microwave link, referred to herein, the refraction will reduce the amount of energy reaching the receiving microwave dish. The thickness or radius of the Fresnel zone depends on the frequency of the signal – the higher the frequency, the smaller the Fresnel zone. Microwave links are high frequency radio links used for point-to-point transmission.

## FINDINGS

ISM's assessment identified 3 No. Microwave links that will require the Applicant to make specific allowances for their retention ("Mitigation Measures").

Our assessment also identified 6 No. Radio Frequency links that will require the Applicant to make allowances for their retention.

ISM carried out a full assessment of neighbouring registered and documented telecommunication sites to assess what Microwave links would be impacted by the height and scale of the Development. Refer to Figure 4 & 5 of the appendices for full analysis.

### Impacted Microwave links

- (1) 2 No. is a Microwave link installed by Eir Mobile (Meteor).
- (2) 1 No. is a Microwave link installed by Three Ireland.

### Impacted Radio Frequency links

- (1) 2 No. Radio Frequency links installed by Eir Mobile (Meteor) (0° & 120° azimuth respectively)
- (2) 2 No. Radio Frequency links installed by Three Ireland (150° & 30° azimuth respectively)
- (3) 2 No. is a Radio Frequency link installed by Vodafone (200° & 335° azimuth respectively)

The 3 No. Microwave links are installed on a telecommunication mast site located within the site boundary of the proposed development site. This mast is providing cellular coverage for the local area businesses and industrial units together with providing coverage for the local residential neighborhood along both Richmond Road to the north and Distillery Road and Conliffe Seminary to the south. We have been advised however, that this mast does not have the benefit of planning permission. We note that Dublin City Council granted temporary permissions for the temporary use of the mast and that said temporary permission expired June 2021 (DCC Reg. Ref. 2213/16).

These Microwave links are situated at approximate above ground level heights of between 16 - 20m (AGL) and therefore the Fresnel zone of each will be diffracted by the height of the Development. We've calculated the average radiuses of the Fresnel zones of each link which be not to be greater than 1.64m at its widest point which would be at half the distance to the three



end sites. The proposed height the Development will cause significant diffraction to these Microwave links.

ISM carried out a full assessment of neighbouring registered and document telecommunication sites to assess what Radio Frequency links might be impacted by the height and scale of the Development. To assess this, we carried out a walk test throughout the surrounding areas to ascertain what cells were serving the neighbourhoods and business districts to the north, south, east & west of the Development site. Refer to Figure 6 of the appendices for full analysis.

Our assessment identified Radio Frequency coverage for the local geographic area is served by several cells at a range of distances to the development site, which is a typical cell pattern for urban Radio Frequency coverage. However, the local or immediate area is served by 2 cells on sites at very close range.

The walk test data determined that some business, residential, and the public road areas to the north, northeast and northwest of the development site receive signal from Radio Frequency links emanating from a telecommunication mast hosting Three Ireland and Eir Mobile which is located within the development site boundary. The walk test data also determined that some business, residential, and the public road areas to the south southeast and southwest of the development site receive signal from a Radio Frequency link emanating from a Vodafone telecommunication mast located on adjacent lands to the north of the development site.

It is therefore our finding that the proposed heights sought by the Applicant will impact the identified Radio Frequency links. We have set out the impacted areas within Figure 6.

Please note the following that telecommunication networks are always evolving, and as such, these findings remain subject to change.



## MITIGATION MEASURES

To provide an adequate allowance for the retention of the 3No. identified Microwave links that will be impacted by the Development, the Applicant is seeking planning permission to install 3No. support poles, affixed to the lift shaft overrun on block A2 rising 2.36 metres above roof level.

These support poles are sufficient to accommodate 2No. Ø0.3m Microwave links each (*together with associated telecommunications equipment*), which provides an adequate solution for the Applicant to mitigate the impact the Development will have on the existing Microwave links emanating from the existing mast currently within the development site boundary, as well as providing some capacity for future links that may or may not be required.

To provide an adequate allowance for the retention of the 6No. identified Radio Frequency links that will be impacted by the Development, the Applicant is seeking planning permission to install 9No. support poles, affixed to ballast mounts on block A2 rising 2.8 metres above parapet level.

These support poles are sufficient to each accommodate 1No. 2m 2G/3G/4G antenna & 1No. 5G antenna each (*together with associated telecommunications equipment*), which creates the ability for the Applicant to mitigate the impact the Development will have on the existing Radio Frequency links emanating from the mast within the development site and the neighbouring mast site.

To adequately screen the infrastructure, the support poles used for the antennae will be installed within Radio friendly GRP shrouds.

Refer to Figures 7, 8 & 9 of the appendices for full analysis and installation parameters for all the proposed replacement telecommunication infrastructure set out herein.

ISM can therefore conclude that the proposal being made by the Applicant within its submission to An Bord Pleanála allows for the retention of important Telecommunication Channels, such as Microwave links, to satisfy the criteria of Section 3.2 of the Building Height Guidelines [2018].



## APPENDICIES

Figure 4: Identification of neighbouring registered and documented telecommunication sites  
(Area Telecommunication Analysis)

Figure 5: Identification of Microwave links disseminating from neighbouring registered and  
documented telecommunication sites (Microwave Link Analysis)

Figure 6: Identification of local area Cells by Cell ID (Cell Identification Analysis)

Figure 7: Mitigation Measures (1)

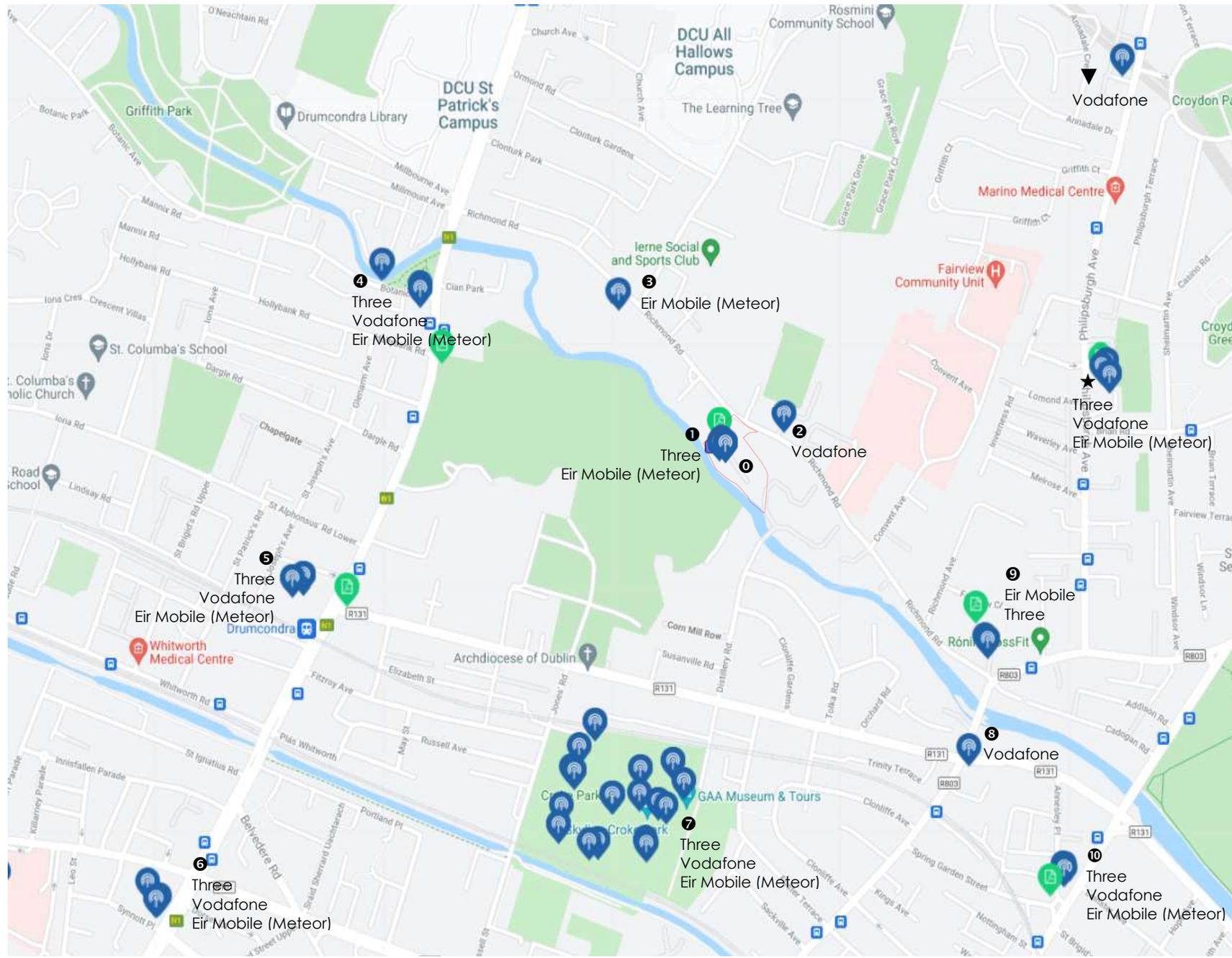
Figure 8: Mitigation Measures (2)

Figure 9: Mitigation Measures (3)

Figure 4

Area Telecommunication Analysis

Source: Comreg



Note  
 All Dimensions to be checked on site  
 No Dimensions to be scaled from this Drawing  
 This drawing to be read with relevant  
 Consultant Drawings

- 0 Proposed Development
- 1 Richmond Builders Prov.
- 2 Charthouse
- 3 Shelbourne F.C.
- 4 Fagan's Pub
- 5 Centre for the Deaf
- 6 Synnott Place
- 7 Croke Park
- 8 Conliffe House
- 9 Meagher's Pub
- 10 Annesley House
- ★ CYMCA (ISM Site)
- ▼ C&T Superstore


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 Birkey Limited  
 Project  
 Richmond Road, Dublin 3

Option	1
Date	20/12/2021
File Name	Richmond Road, Dublin 3

Drawing:  
 Area Site Analysis

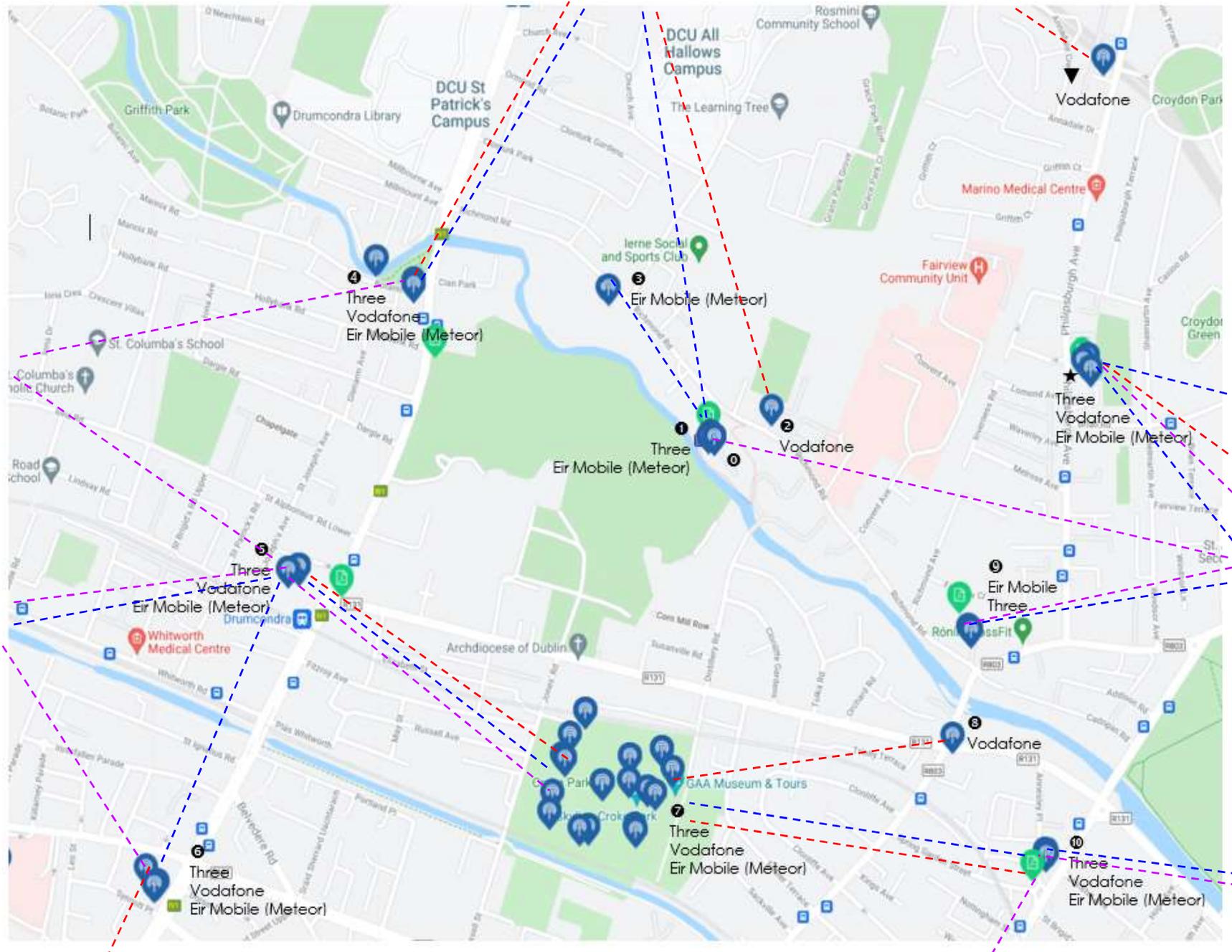
Building	Drawing No.	Zone	Rev
SPN	K 0821		1

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Figure 5

Microwave Link Analysis

Source: Comreg ISM Vodafone Three & Eir Mobile



Note  
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- Three Transmission Link
- Vodafone Transmission Link
- Eir Transmission Link


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<b>Option</b>	<b>1</b>
Date	20/12/2021
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Drawing:  
 Link Analysis

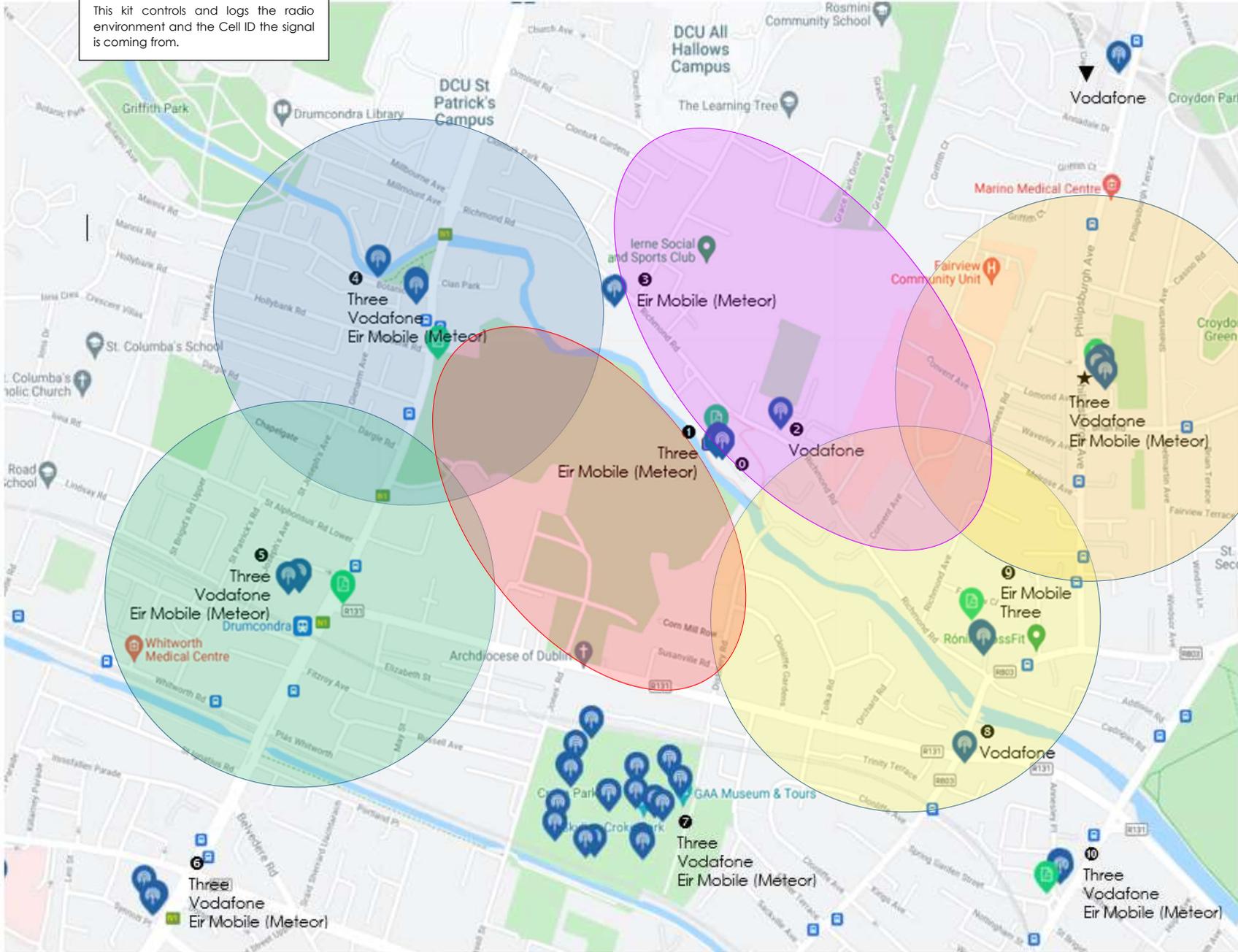
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SPN	K 0821		1

Figure 6

Walk Test Data

Source: Comreg, IS

**NOTE**  
 The **Anite Walker Air** test kit was used to test and record the radio environment. This kit controls and logs the radio environment and the Cell ID the signal is coming from.



Note  
 All Dimensions to be checked on site  
 No Dimensions to be scaled from this Drawing  
 This drawing to be read with relevant Consultant Drawings

- Fagan's Pub Cell ID
- CYMCA Cell ID
- Sch. for the Deaf Cell ID
- Multiple Cell IDs  
 Conliffe House  
 Meagher's Pub
- Impacted Area A.
- Impacted Area B.


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Client  
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<b>Option</b>	1
Date	20/12/2021
File Name	Richmond Road, Dublin 3

Drawing:  
 Cell Identification Analysis

Building	Drawing No.	Zone	Rev
SPN	K 0821		1

Figure 7

Mitigation Measure Design

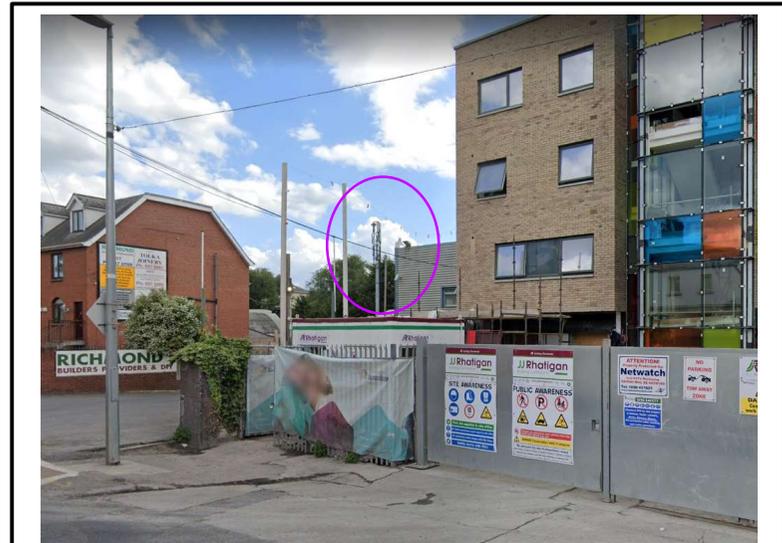
Source: Comreg ISM



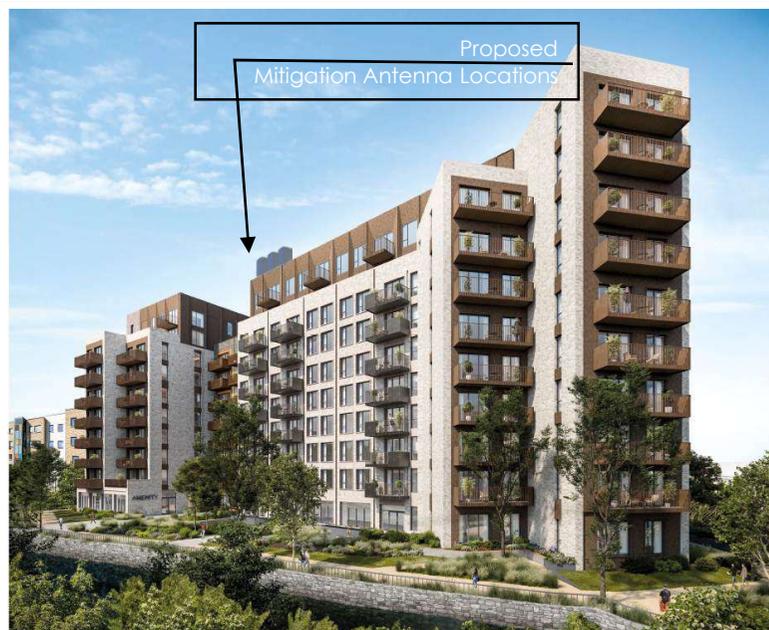
CGI - Southwestern Viewpoint



Existing Vodafone Mast



Existing Three/Eir Mast



Northwestern Viewpoint

Note  
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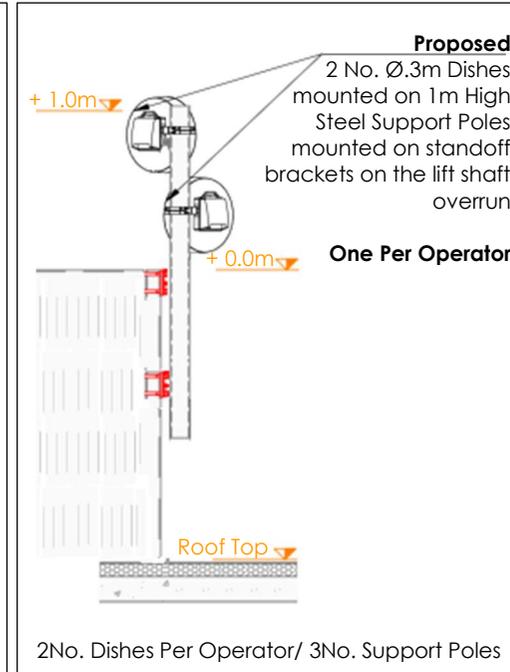
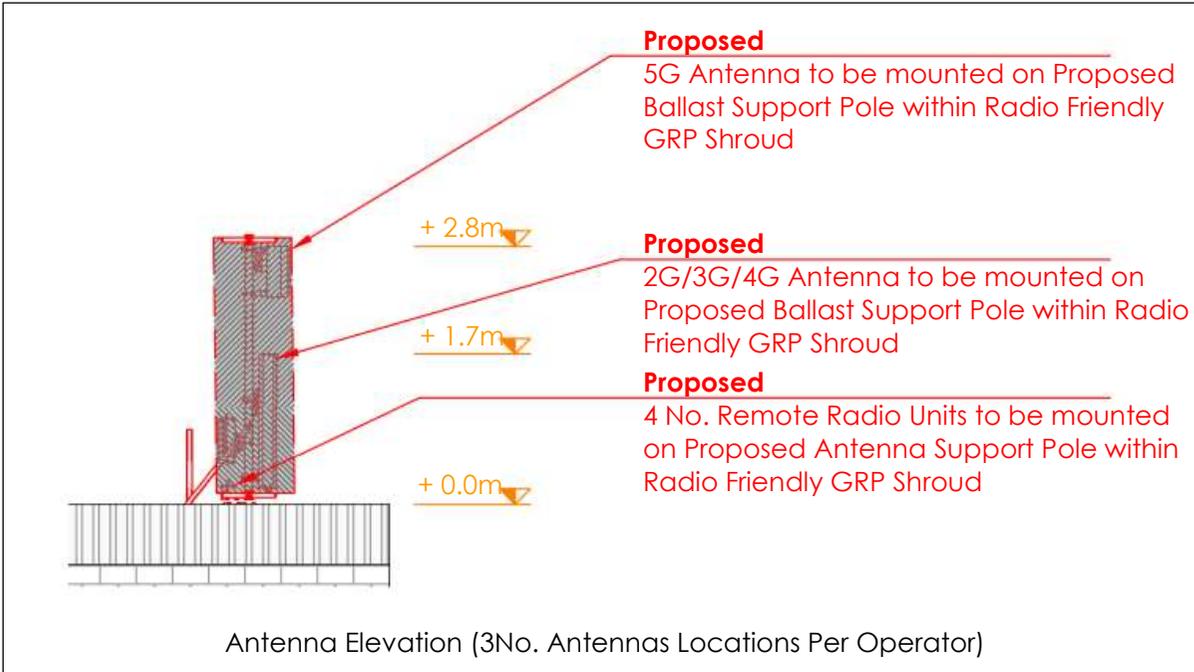
Drawing:  
 Mitigation Measure

Building	Drawing No.	Zone	Rev
SPN	K 0821		1

Figure 8

Mitigation Measure Design

Source: ISM

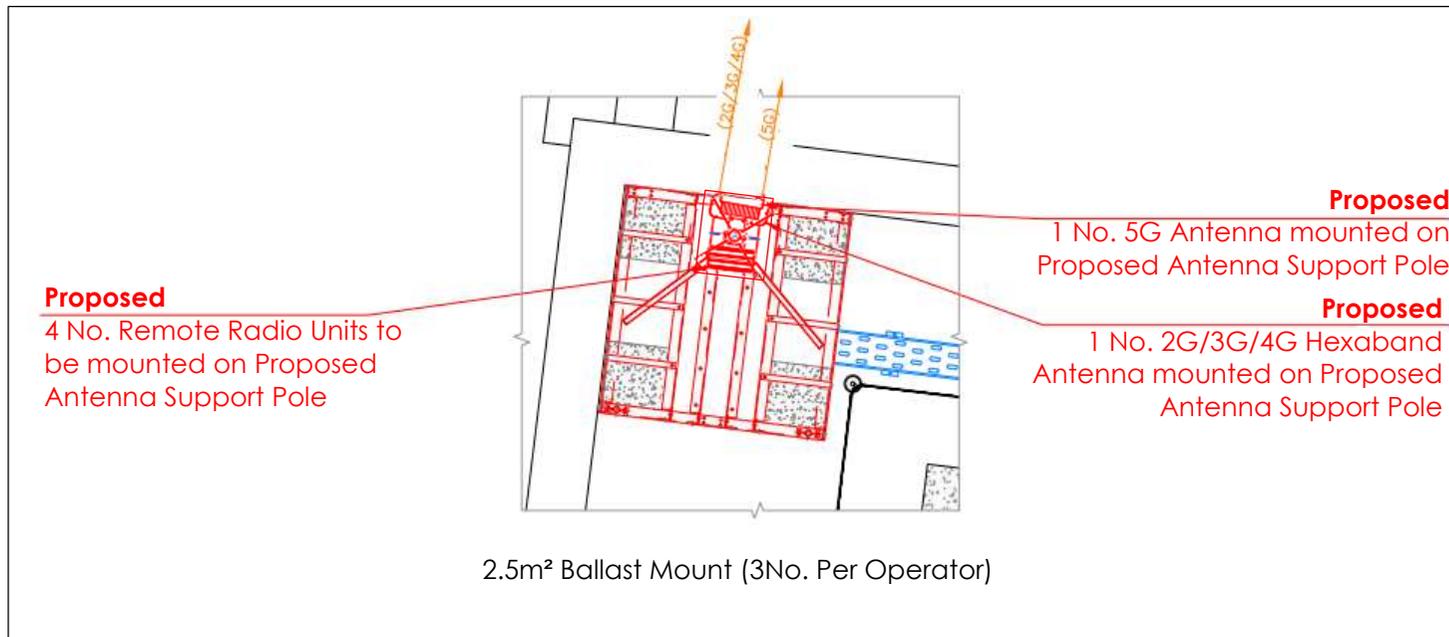


Note  
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Typical Installation



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Option	1
Date	20/12/2021
File Name	Richmond Road, Dublin 3

Drawing:  
Mitigation Measure

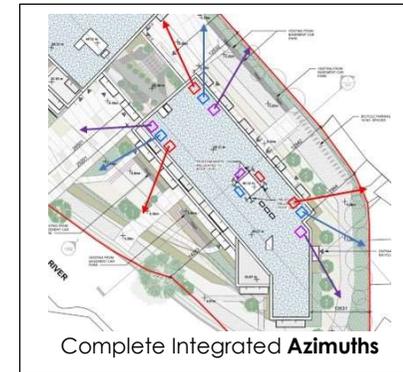
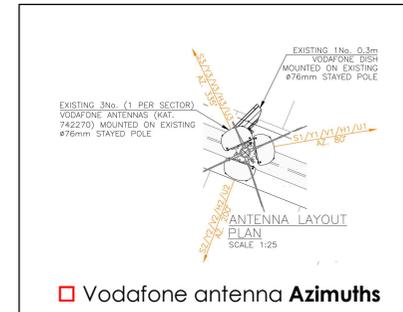
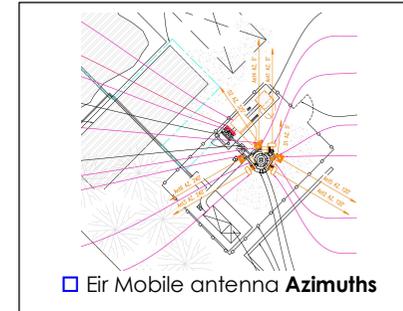
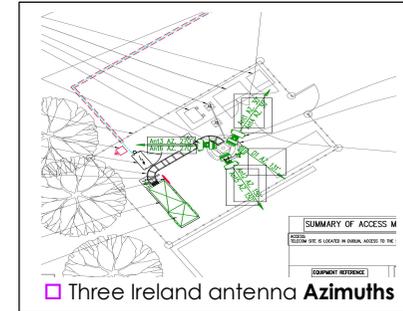
Building	Drawing No.	Zone	Rev
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Figure 9

Mitigation Measure Design

Source: Three Ireland; Vodafone Ireland; & Eir Mobile



Note  
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Proposed Equipment

- Three Ireland**
- 3No. Antenna Ballast Mounts
  - Dish Location
  - ▣ Equipment Cabinet

- Eir Mobile**
- 3No. Antenna Ballast Mounts
  - Dish Location
  - ▣ Equipment Cabinet

- Vodafone Ireland**
- 3No. Antenna Ballast Mounts
  - Dish Location
  - ▣ Equipment Cabinet

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<b>Date</b>	20/12/2021
<b>File Name</b>	Richmond Road, Dublin 3

Drawing:  
Mitigation Measure

Building	Drawing No.	Zone	Rev
SPN	K 0821		1

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