77 Camden Street Lower, Dublin 2 Ireland D02 XE80
✆: +353 (0)1 905 8800 ✉: info@ismireland.com
💻: www.ismireland.com

iSM INDEPENDENT SITE MANAGEMENT

Telecommunications Report

DEVELOPMENT
GOWAN HOUSE

23 October 2023

Prepared by
Independent Site Management Limited
Christopher Plockelman
Director
✉:christopher@ismireland.com
✆:+353 (0)1 905 8800
www.ismireland.com

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DEFINITIONS

Author:	Independent Site Management Limited (hereinafter referred to as "ISM")
Mitigation Measures:	means the allowances made for the retention of important Telecommunication Channels (hereinafter referred to as "Mitigation Measures")
Planning Authority:	means Dublin City Council (hereinafter referred to as the "Planning Authority")
Radio Frequency:	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.
Microwave Links:	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.
Report Date:	means the date which the assessment was carried out (hereinafter referred to as "Report Date")
Telecommunication Channels:	means Radio Frequency links & Microwave Transmission links (hereinafter referred to as "Telecommunication Channels")
The Applicant:	means Malclose Limited (hereinafter referred to as the "Applicant")
The Development:	means the proposed development situated at Gowan House, Carriglea Business Park, Naas Road, Dublin 12, D12 RCC4 (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 Malclose Limited (the "Applicant") within its submission to Dublin City Council (the 'Planning Authority'), allows for the retention of important Telecommunication Channels ("Telecommunication Channels") such as microwave links, to satisfy the criteria of both Section 3.2 of the Building Height Guidelines (2018) and Objective 5, within Table 4 of Appendix 3 of the Dublin City Council Development Plan 2022-2028..

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 Authority allows for the retention of important Telecommunication Channels, such as Microwave links, and therefore satisfies both the criteria of Section 3.2 of the Building Height Guidelines (2018) and Objective 5, within Table 4 of Appendix 3 of the Dublin City Council Development Plan 2022-2028.

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

Malclose Limited intend to apply to Dublin City Council for a 7-year permission for a large-scale residential development principally comprising student accommodation at this 0.962 Ha site at Gowan House, Carriglea Business Park, Naas Road, Dublin 12, D12 RCC4.

Works to upgrade of the access road to the west of the site on an area measuring c. 0.081 Ha are also proposed comprising new surfacing to the carriageway, the provision of inbound and outbound bicycle lanes from the development entrance to the Naas Road, the provision of a controlled pedestrian crossing on the access road at the Naas Road junction, and the provision of a further uncontrolled pedestrian and bicycle crossing linking the subject site with the approved Concorde SHD development (ABP Ref: TA29S.312218) to the west.

On the Naas Road, works are proposed on an area measuring c. 0.086 Ha comprising the realignment and widening of the existing pedestrian footpath along the westbound carriageway of the Naas Road and the provision of linkages from the realigned footpath to the development site, and the provision of new controlled pedestrian crossings across the eastbound and westbound carriages of the Naas Road and the provision of a new uncontrolled crossing of the Luas tracks.

The development site area and roadworks areas will provide a total application site area of c. 1.13 Ha.

The proposed development will principally consist of: the demolition of the existing two-storey office/warehouse building and outbuilding (5,172 sq m); and the construction of a development in two blocks (Block 1 (eastern block) is part 2 No. storeys to part 15 No. storeys over lower ground floor and basement levels with roof plant over and Block 2 (western block) is part 9 No. storeys to part 11 No. storeys over basement with roof plant over) principally comprising 941 No. Student Accommodation bedspaces (871 No. standards rooms, 47 No. accessible studio rooms and 23 No. studios) with associated facilities, which will be utilised for short-term lets during student holiday periods. The 871No. standard rooms are provided in 123 No. clusters ranging in size from 3 No. bedspaces to 8 No. bedspaces, and all clusters are served by a communal living/kitchen/dining room.

The development also provides: ancillary internal and external communal student amenity spaces and support facilities; cultural and community floor space (1,422 sq m internal and 131 sq m external) principally comprising a digital hub and co-working space with ancillary cafe; a retail unit (250 sq m); public open space; the daylighting of the culverted River Camac through the site; an elevated walkway above the River Camac at ground floor level; a pedestrian bridge link at first floor level between Blocks 1 and 2; vehicular access at the south-western corner; the provision of 7 No. car-parking spaces, 2 No. motorcycle parking spaces and 2 No. set down areas; bicycle stores at ground and lower ground floor levels; visitor cycle parking spaces; bin stores; substations; hard and soft landscaping; green and blue roofs; new telecommunications infrastructure at roof level of Block 1 including antennas and microwave link dishes, 18 No. antennas and 6 No. transmission dishes, together with all associated equipment; boundary treatments; plant; lift overruns; and all associated works above and below ground.

The gross floor area of the development is c. 33,140 sq m comprising c. 30,386 sq m above lower ground and basement level.

SITE LOCATION/LAYOUT MAP

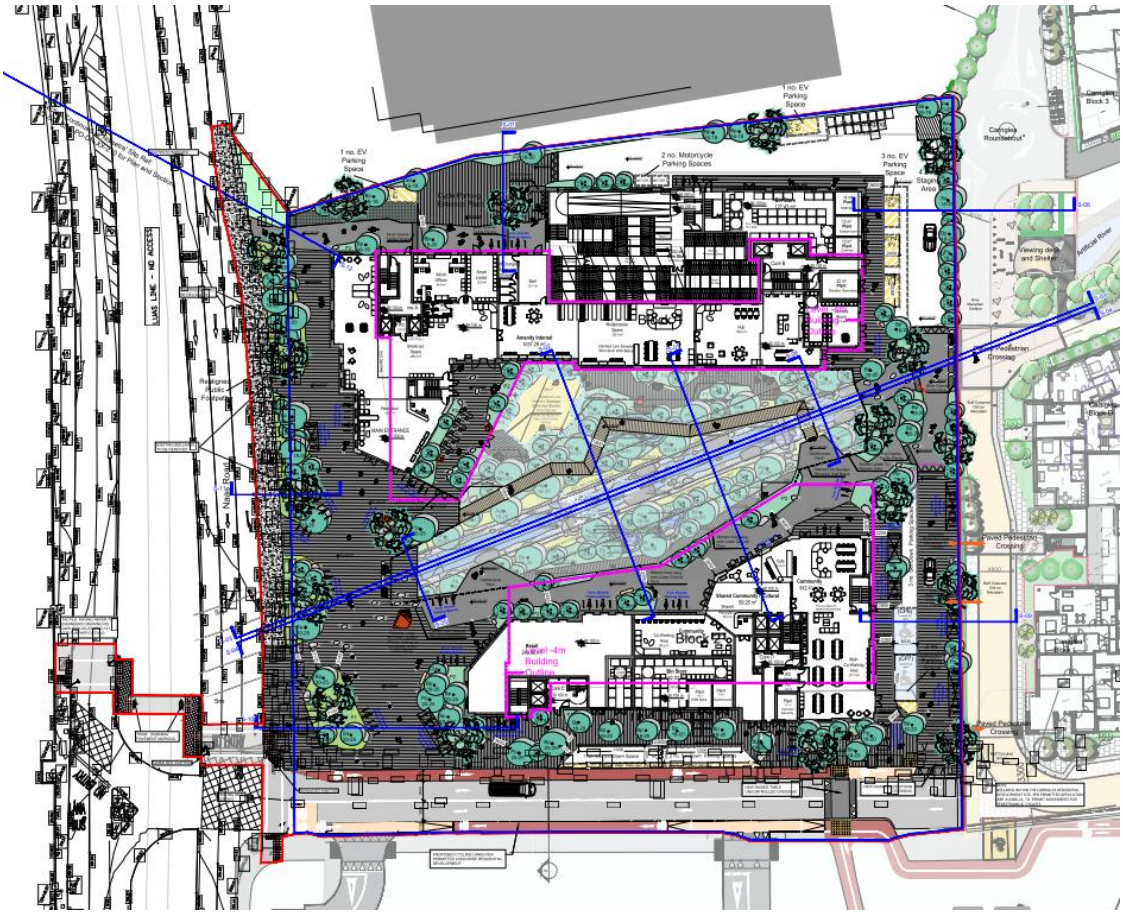


Figure 1

TELECOMMUNICATION CHANNELS

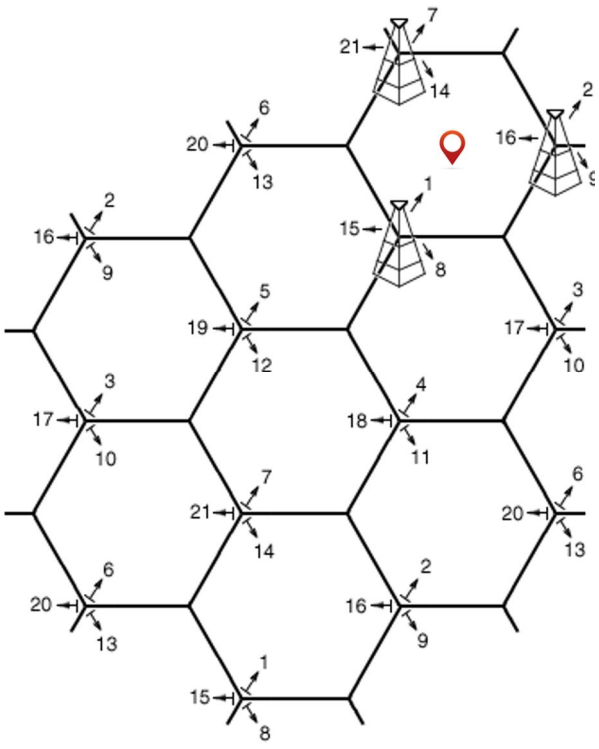
This report assessed the two wireless Telecommunication Channels or networks of Telecommunication Channels that may be affected by the height and scale of a new development, Radio Frequency links & Microwave Transmission links.

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.



As demonstrated on this cell map illustrating Radio Frequency coverage, each Radio Frequency "cell" is supported by at least 3No. base stations sites. This means that should an obstacle occur between an area and a base station site, such as a new development, the affected area will be covered by other base stations from other locations.

Figure 2

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.

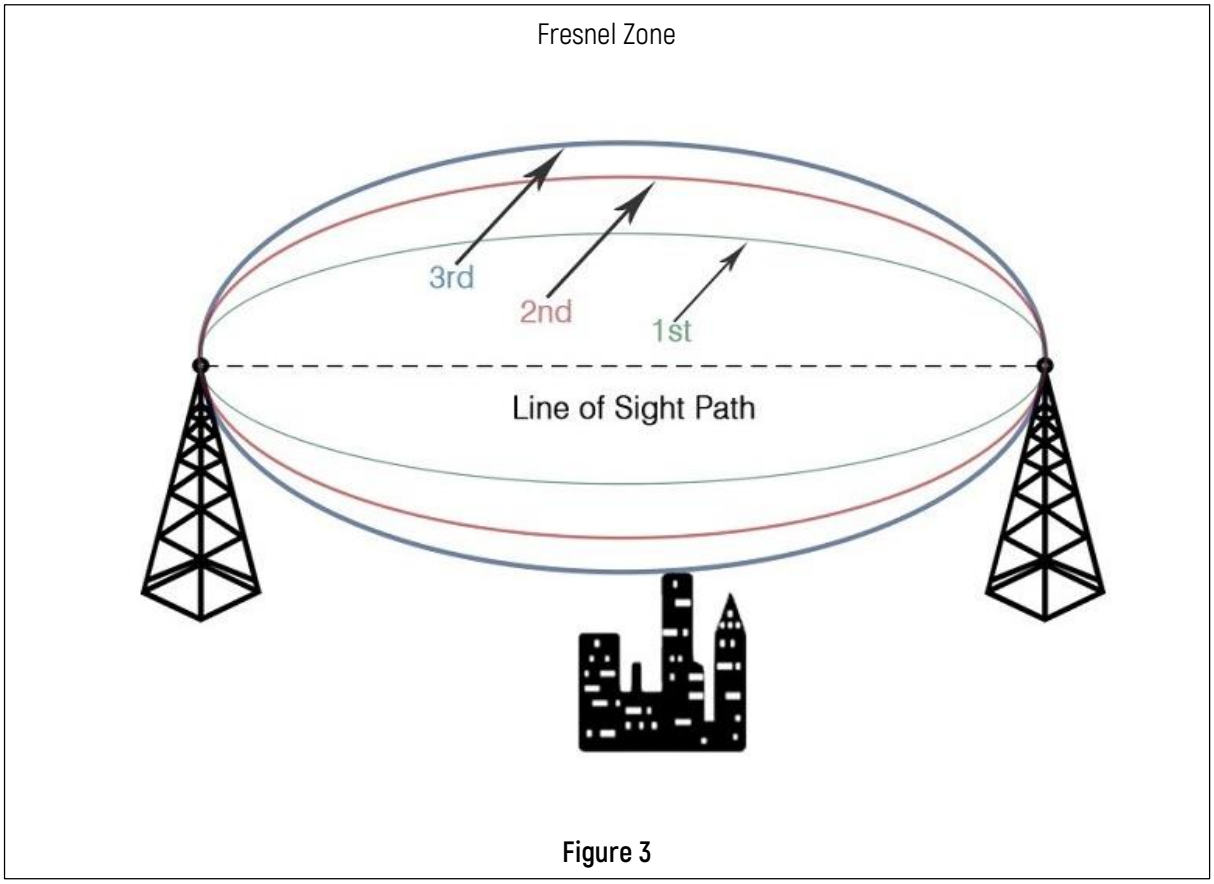


Figure 3

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 2 No. Microwave links that will require the Applicant to make specific allowances for their retention ("Mitigation Measures").

Our assessment also identified 3 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 5 & 6 of the appendices for full analysis.

Impacted Microwave links:

(1) 1 No. is a Microwave link installed by Three Ireland; &

(2) 1 No. is a Microwave link installed by Eir Mobile.

The 2 No. Microwave links are installed on a telecommunication mast hosting Three Ireland and Eir Mobile which is located 240 metres northeast of the development site boundary. This mast is providing cellular coverage for the local area businesses and industrial units together with providing coverage for the local residential neighborhood (Bluebell) and the public road and transport areas running along the Naas Road. Please refer to Figure 4.

The Microwave links are situated at an approximate above ground level height between 15 - 20m (AGL). We've calculated the Fresnel zones of each Microwave link and it is evident that the proposed height and scale of the Development will cause significant diffraction to both Microwave links directed over the proposed development site.

ISM also carried out a full assessment of neighbouring registered and documented 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 drive test throughout the surrounding areas to ascertain what cells were serving the neighbourhoods and business (industrial) districts to the north, south, east & west of the Development site. Refer to Figure 7 of the appendices for full analysis.

Impacted Radio Frequency links:

(1) 1 No. Radio Frequency links installed by Eir Mobile (240°– 265°azimuth sector range)

(2) 1 No. Radio Frequency links installed by Three Ireland) (240°– 265°az sector range)

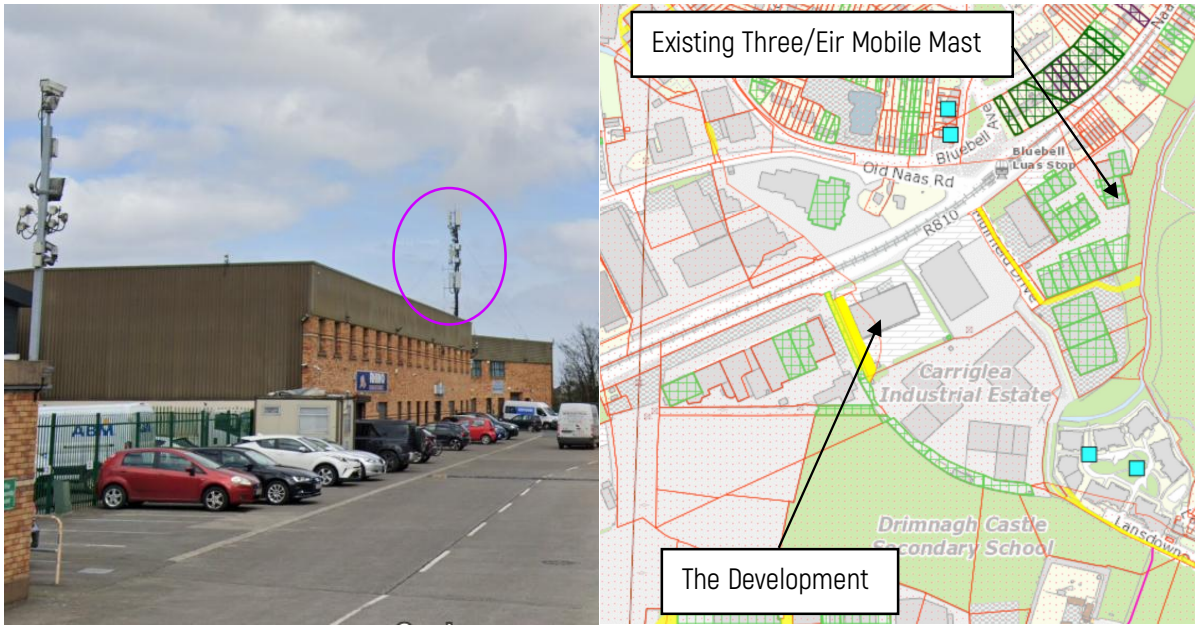
(3) 1 No. is a Radio Frequency link **to be** installed by Eir Mobile (140°–250°az sector range)

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. The assessment identified the local or immediate area is served by 4 cells on sites at a range of distances from the Development.

The drive test data determined that some business (industrial), residential, and the public road and transport areas to the west of the development site, receive signal from Radio Frequency links emanating from a telecommunication mast hosting Three Ireland and Eir Mobile which is located 240 meters northeast of the development site boundary. Please refer to Figure 4.

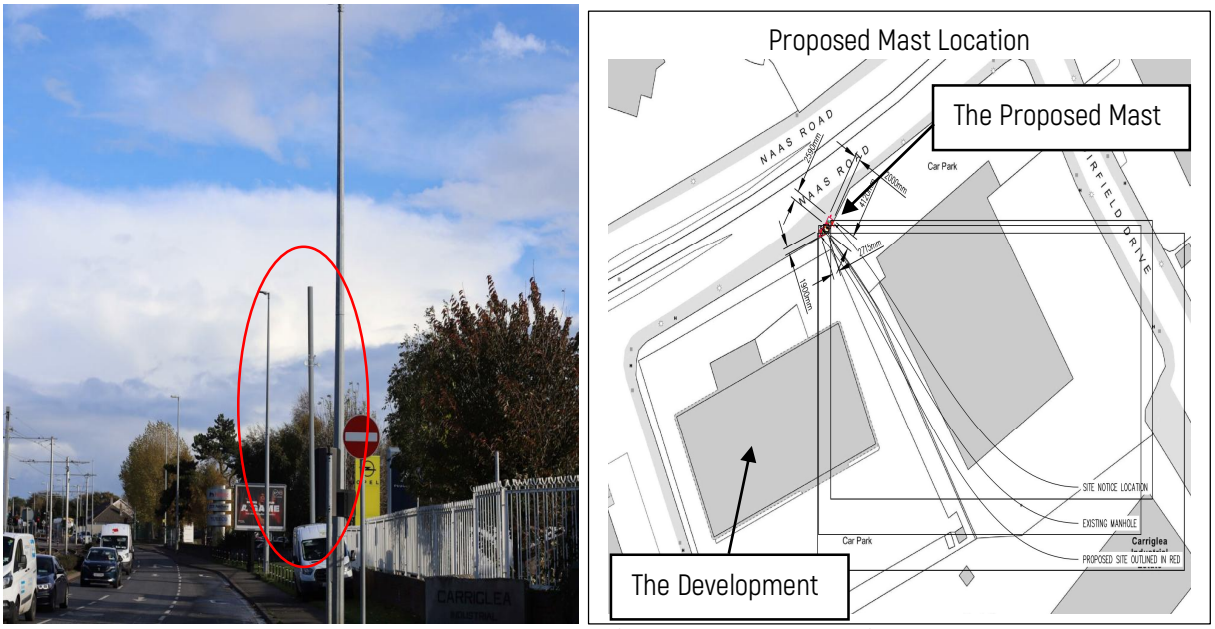
Additionally, Eir Mobile has made a Section 254 Licence Application on public lands on the northeast corner of the development site boundary (Please refer to Figure 4.1). If permitted, the telecommunication mast which is the subject of the Section 254 Licence Application, would provide cellular coverage to the local area businesses (industrial), residential, and the public road and transport areas. It is technologically conceivable that the Development would significantly impact the coverage area to the southwest of the proposed telecommunication mast.

It is therefore our finding that the proposed heights sought by the Applicant will impact the identified Radio Frequency links (existing and proposed). We have set out the impacted areas within Figure 7.



Existing Three/Eir Mobile Mast

Figure 4



Proposed Eir Mobile Mast (section 254 application)

Figure 4.1

MITIGATION MEASURES

To provide an adequate allowance for the retention of the 2No. identified Microwave links that will be impacted by the Development, the Applicant is seeking planning permission to install 3No. support poles, affixed to Ballast Mounts within the enclosed plant area on Block 1.

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 hosting Three Ireland and Eir Mobile 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 3No. 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 within the enclosed plant area on Block 1.

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 both the existing mast hosting Three Ireland and Eir Mobile to the northeast of the development, as well as the Radio link on the proposed telecommunication mast which is currently the subject of a Section 254 Licence Application directly north and immediately adjacent to the Development,

To adequately screen the infrastructure, the support poles used for the antennae will be installed behind Radio friendly sections of the plant screen on Block 1.

Refer to Figures 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 Dublin City Council allows for the retention of important Telecommunication Channels, such as Microwave links, to satisfy both the criteria of Section 3.2 of the Building Height Guidelines (2018) and Objective 5, within Table 4 of Appendix 3 of the Dublin City Council Development Plan 2022-2028.

APPENDICES

Figure 5: Identification of neighbouring registered and documented telecommunication sites (Area Telecommunication Analysis)

Figure 6: Identification of Microwave links disseminating from neighbouring registered and documented telecommunication sites (Microwave Link Analysis)

Figure 7: Identification of local area Cells by Cell ID (Cell Identification Analysis)

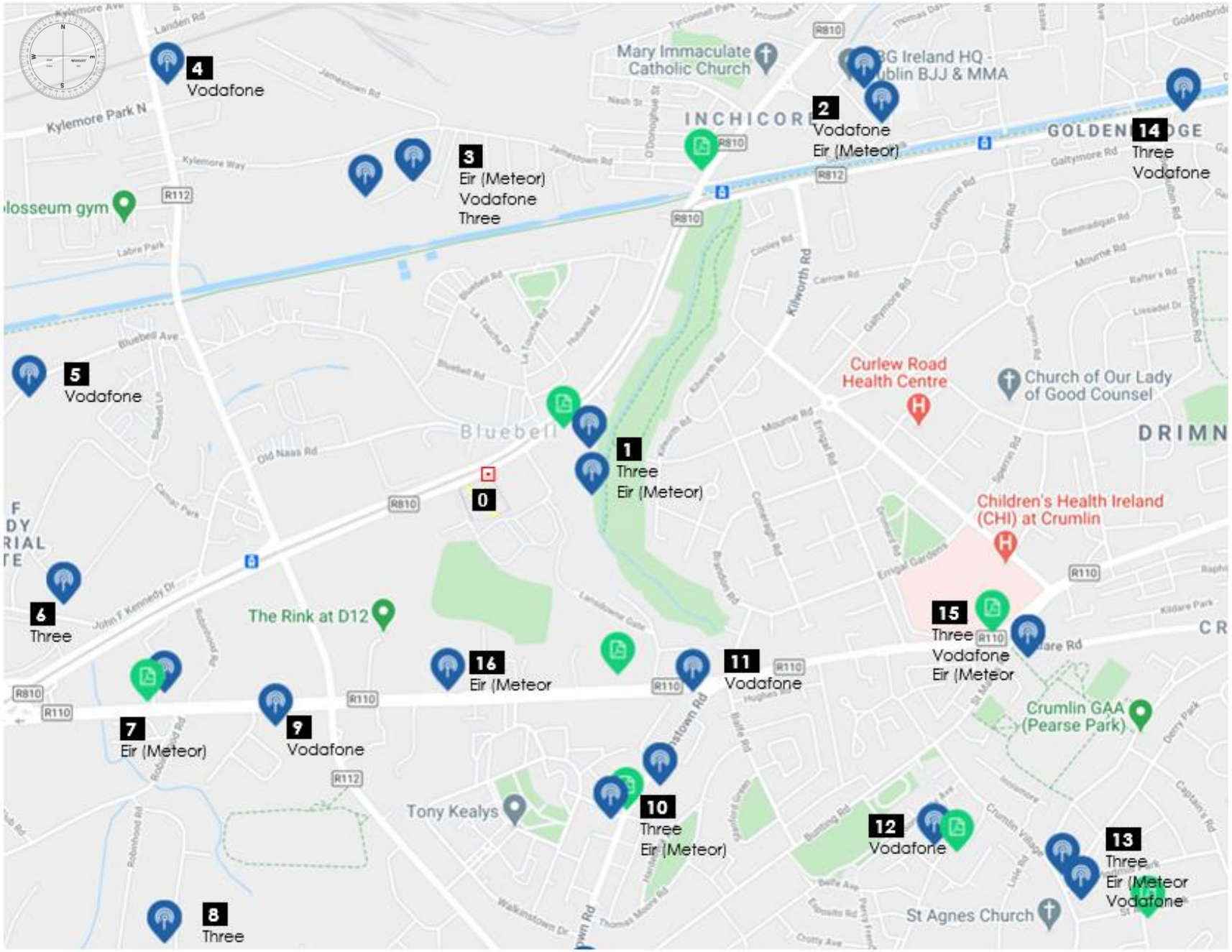
Figures 8: Mitigation Measures (Equipment).

Figures 9: Mitigation Measures (Site Layout / Site Elevation).

Figure 5

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 Naas Road Business Park
2 Goldenbridge Industrial
3 Inchicore ESB
4 Darthmouth House
5 Design & Display
6 Hyundai Ireland
7 Pat white Cars
8 Rose Confectionary
9 Eir Training /Towercom
10 SuperV/Walkinstown Mall
11 Halfway House Pub
12 Crumlin Exchange (fibre)
13 Crumlin Gard & Taxi
14 Davitt Road (Paint Box)
15 Star Bingo
16 Eir Street furniture (fibre)
Section 254 Application

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iSM INDEPENDENT SITE MANAGEMENT
77 Camden Street Lower,
Dublin 2, Ireland D02 XE80
☎ +353 1 905 8800
✉ info@ismireland.com

Client
Malcolse Limited

Project
Gowan House

Option	1
Report Date	17/08/23
File Name	Gowan House

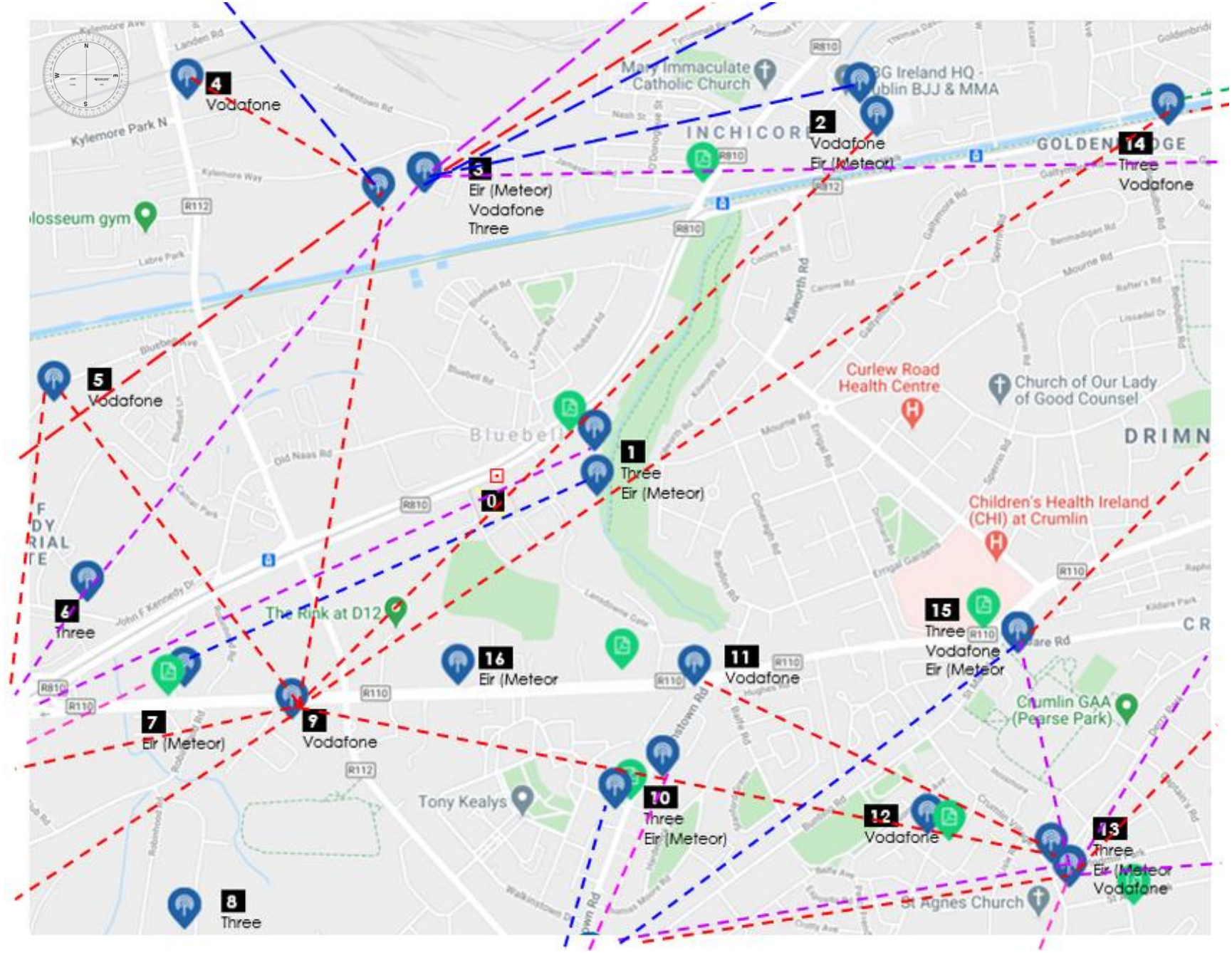
Drawing:
Area Site Analysis

Building	Drawing No.	Zone	Rev
SPN	H 1723		1

Figure 6

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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Drawing:
Link Analysis

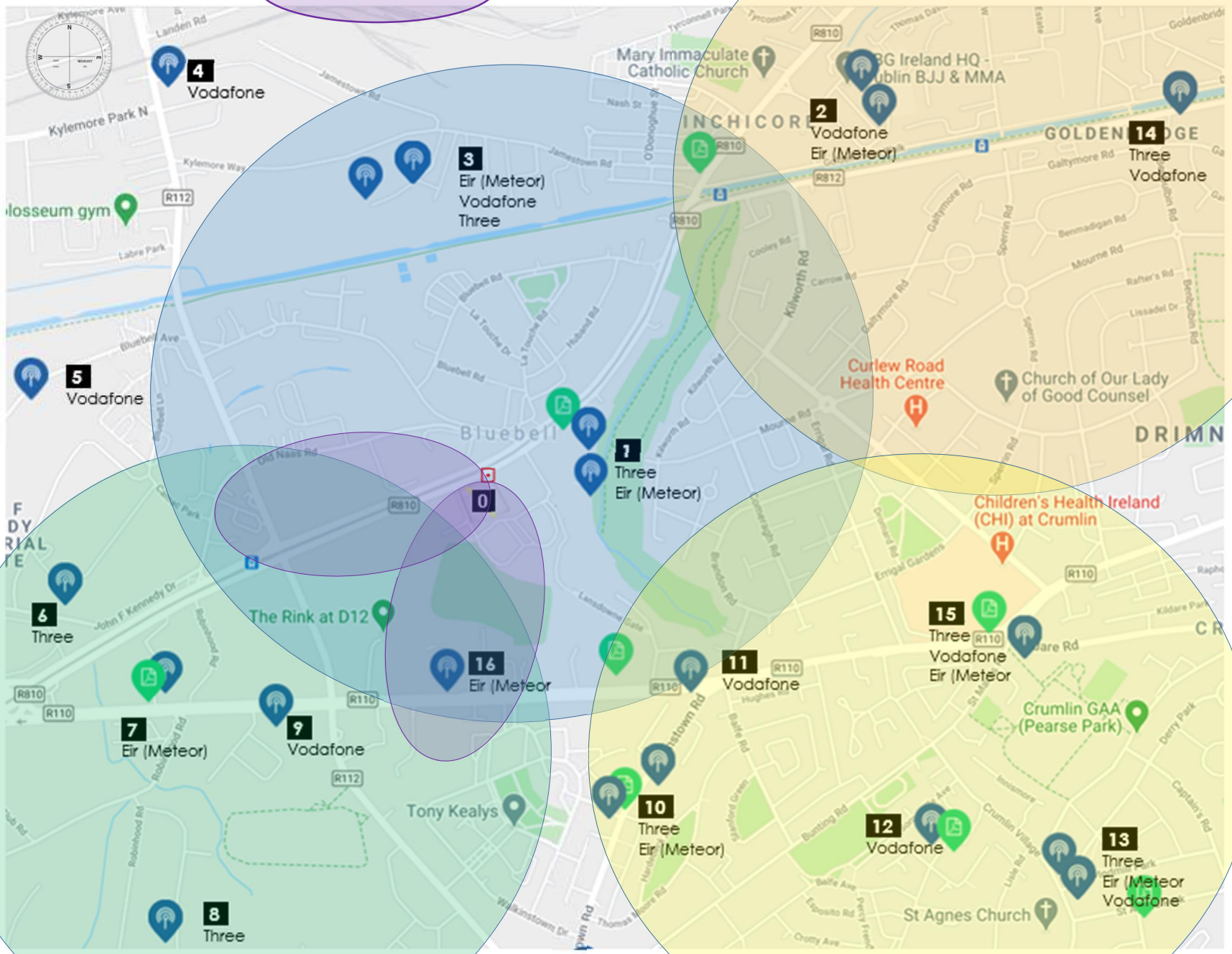
Building	Drawing No.	Zone	Rev
SPN	H 1723		1

Figure 7

Impacted areas.

Drive Test Data

Source: Comreg, ISM



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

- Multiple Cell IDs
- Section 254 Application
- 1 Naas Road Business Park
- 3 Inchicore ESB
- 11 Halfway House Pub
- 16 Eir Street furniture (fibre)
- Multiple Cell IDs
- 2 Goldenbridge Industrial
- 14 Davitt Road (Paint Box)
- Multiple Cell IDs
- 10 SuperV/Walkinstown Mall
- 11 Halfway House Pub
- 12 Crumlin Exchange (fibre)
- 13 Crumlin Gard & Taxi
- 15 Star Bingo
- Multiple Cell IDs
- 6 Hyundai Ireland
- 7 Pat white Cars
- 8 Rose Confectionary
- 9 Eir Training /Towercom
- 16 Eir Street furniture (fibre)

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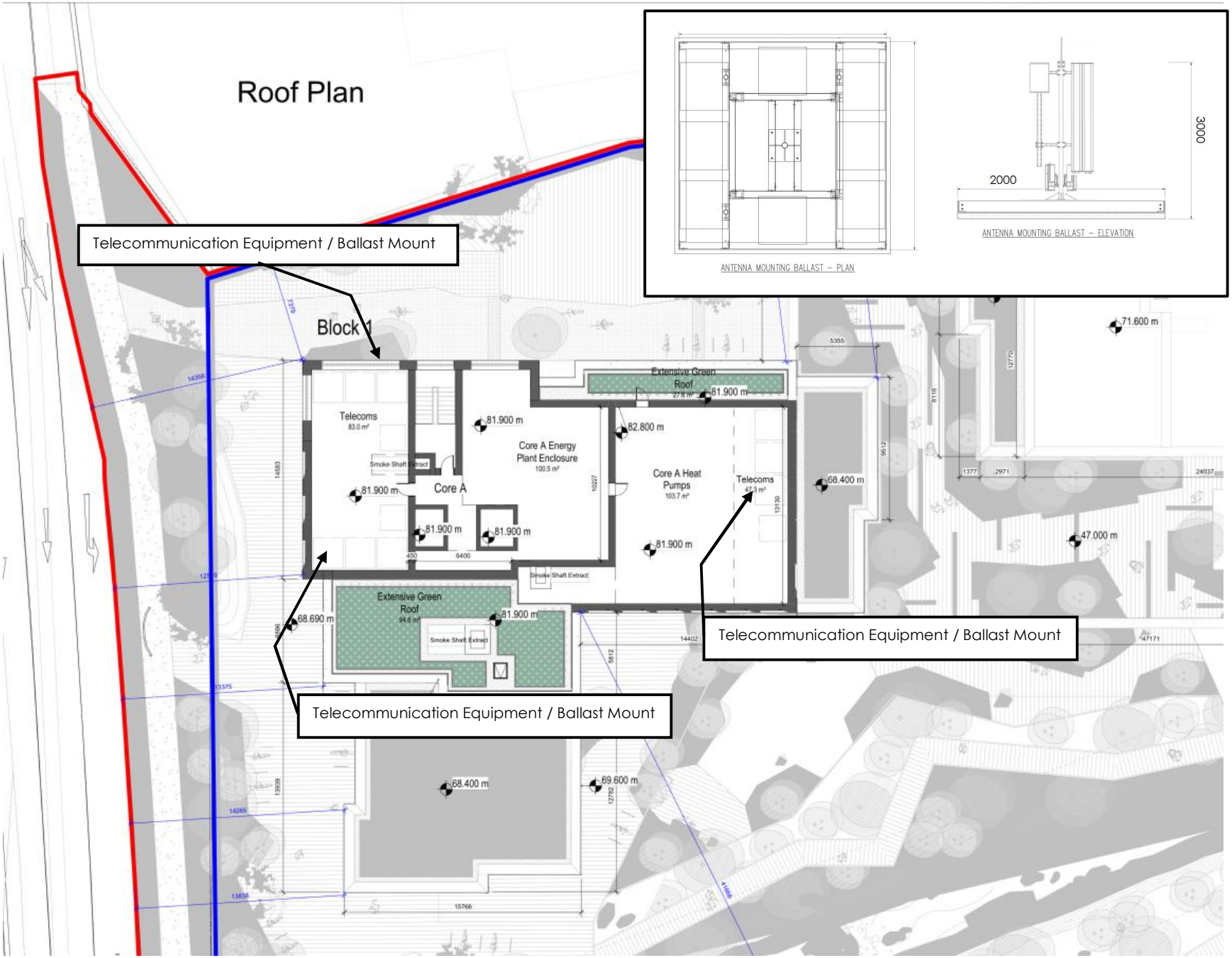
Drawing:
Cell Identification Analysis

Building	Drawing No.	Zone	Rev
SPN	H 1723		1

Figure 8 Mitigation Measure Design Source: ISM



Note
All Dimensions to be checked on site
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This drawing to be read with relevant Consultant Drawings

Proposed Equipment

9No. support poles, affixed to ballast mounts on Block B

9No. 2m 2G/3G/4G antenna & 9No. 5G antennas enclosed within Radio friendly GRP shrouds

6No. Ø0.3m Microwave links each.

3No. Equipment Cabinets

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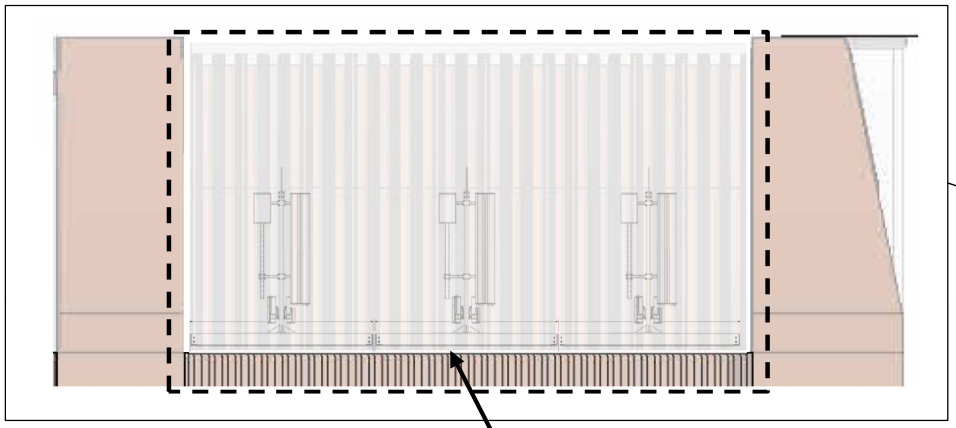
Drawing:
Mitigation Measure

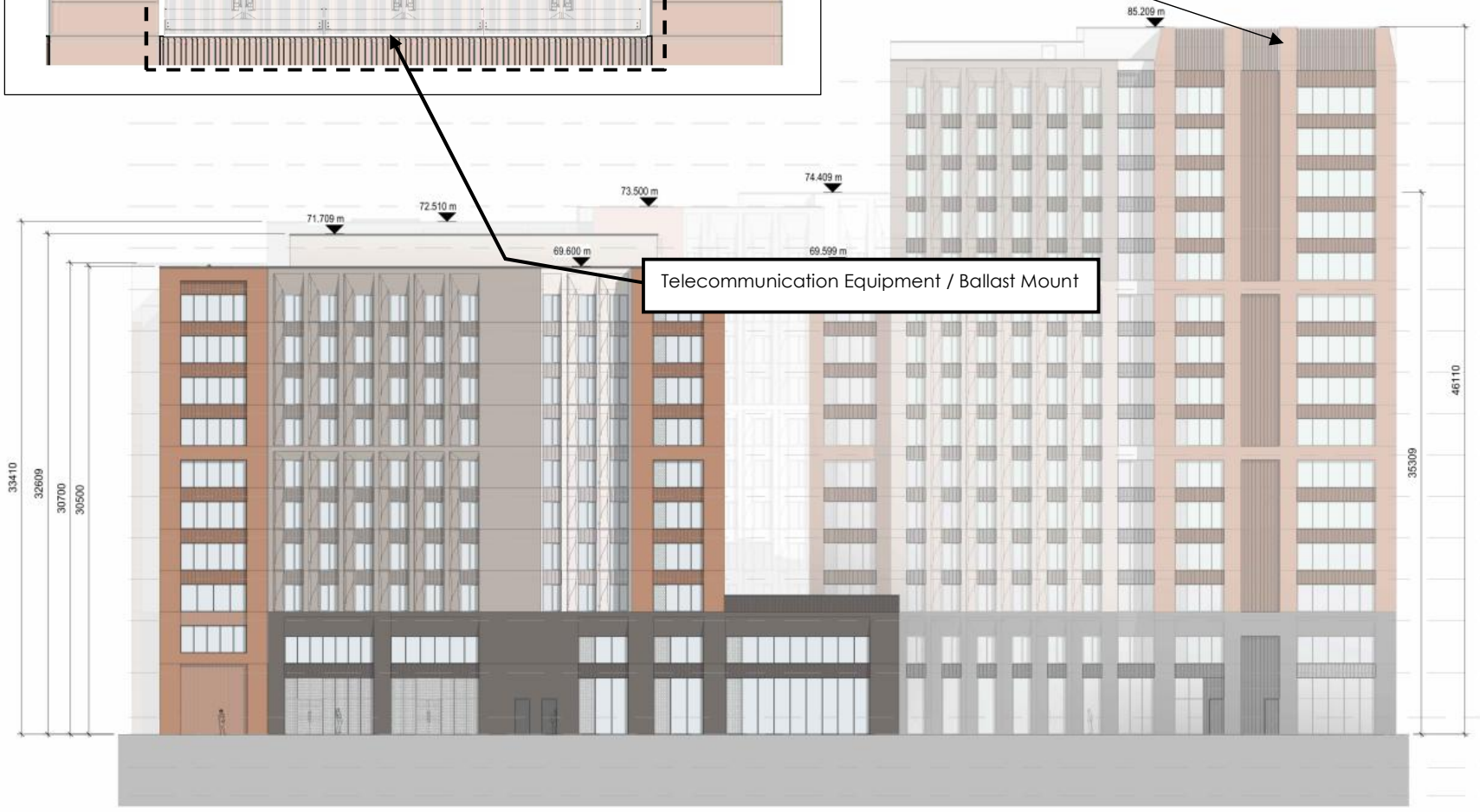
Building	Drawing No.	Zone	Rev
SPN	H 1723		1

Figure 9

Mitigation Measure Design

Source: Three Ireland; Vodafone Ireland; & Eir Mobile





1 East Elevation 1

Note
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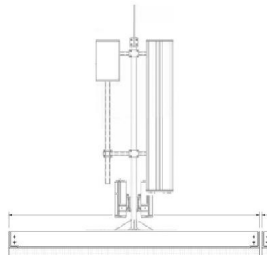
Ballast Mount Antennas



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