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iSM INDEPENDENT SITE MANAGEMENT



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

DEVELOPMENT
BLACKGLEN ROAD LRD

17 December 2024

Prepared by
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Independent Site Management Limited is a company registered in Ireland with company number 348181 & VAT number IE 6368181N

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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 Dun Laoghaire-Rathdown County 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.
Telecommunication Channels:	means Radio Frequency links & Microwave Transmission links (hereinafter referred to as "Telecommunication Channels")
Report Date:	means the date which the assessment was carried out (hereinafter referred to as "Report Date")
The Applicant:	means Zolbury Limited (hereinafter referred to as the "Applicant")
The Development:	means the proposed development situated on a site of approx. 3.7ha on lands at Blackglen Road, Sandyford, Dublin 18 (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 Zolbury Limited (the "Applicant") within its submission to Dun Laoghaire-Rathdown County 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 Appendix 5, Section 1.4.2 of the Dun Laoghaire-Rathdown County Development Plan 2022-2028.

To provide this assessment, ISM reviewed the Applicant's proposed development (the "Development") 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 Appendix 5, Section 1.4.2 of the Dun Laoghaire-Rathdown County Development Plan 2022-2028.

ABOUT THE AUTHOR

ISM is a consultancy firm and asset management company that provides telecommunication consultancy and telecommunication 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 over 20 years.

ISM is a multidiscipline firm proficient in the 6 main areas in the delivery of telecommunication services:

(1) Telecommunication Asset Management Cellular and Fixed Line Fibre Optic.
(2) Telecommunication Contract and Licensing.
(3) Radio Frequency technology.
(4) Microwave Transmission technology.
(5) In-building distributed antenna systems.
(6) Fixed Line fibre optic & copper technologies.

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

ISM has designed, built and operates 10 in-building distributed antenna systems, and 2 large managed fibre optic networks.

DEVELOPMENT DESCRIPTION

Zolbury Ltd., intend to apply to Dun Laoghaire Rathdown County Council for permission for development for a Large Scale Residential Development (LRD) on a site of approx. 3.86ha on lands at Blackglen Road, Sandyford, Dublin 18.

The development will consist of 192 no. residential units ranging from 2-5 storeys in height, associated resident amenity facilities, a childcare facility, all boundary treatment and landscaping works, site services connections and all site development works to include:

a) Construction of 192 no. residential units, in the form of 6 no. new apartment buildings (A1 – B4), 40 duplexes (C1, C2, C2A) and 14 houses (D1 & D2), to include 33 no. 1-beds, 84 no. 2 -beds, 61 no. 3-beds and 14 no. 4-beds as follows:

- Block A1 (4 storeys) comprising 15 no. apartments (3 no. 1 bed units, 6 no. 2 bed units & 6 no. 3 bed units); a crèche facility of approx. 378.2 sq. m with associated outdoor play space of approx. 170 sq. m; and resident amenity facilities of approx. 31.6 sq. m.
- Block A2 (3-4 storeys) comprising 26 no. apartments (2 no. 1 bed units, 20 no. 2 bed units and 4 no. no. 3 bed units) and resident amenity facilities of approx. 353.6 sq. m.
- Blocks B1 and B2 (2-5 storeys) comprising 51 no. apartments (15 no. 1 bed units, 29 no. 2 bed units, 7 no. 3 bed units).
- Blocks B3 and B4 (2-5 storeys) comprising 46 no. apartments (13 no. 1 bed units, 23 no. 2 bed units and 10 no. 3 bed units).
- Duplex Units C1 (4 storeys), C2 and C2A (3 storeys) comprising 40 duplexes (6 no. 2 bed units, 20 no. 3 bed units and 14 no. 4 bed units).
- House Units D1 and D2 (2 storeys) comprising 14 houses (14 no. 3 bed units).

b) Total Open space (approx. 10,854 sq. m) is proposed in the form of public open space (approx. 8, 686 sq. m), and residential communal open space (approx. 2,168 sq. m). Each residential unit is afforded with associated private open space in the form of a garden/terrace/balcony.

c) The development will be served via a new vehicular access via Blackglen Road. This will be designed as a priority junction with pedestrian and cycle crossings where required to tie in with the Blackglen Road Improvement Scheme.

d) A new toucan crossing is proposed across Blackglen Road just to the east of the new vehicular access. This toucan crossing has been designed as per TL607 of the Cycle Design Manual to allow crossing of pedestrians and cyclists to the northern side of Blackglen Road for improved public transport access.

e) Emergency access only is proposed via Woodside Road.

f) A dedicated wildlife corridor is proposed to the east/south-east side of the site and a public open space (approx. 307 m in length) tree trail to the west/north-west side of the site.

g) Basement/Podium car park areas are proposed below Blocks B1, B2, B3 and B4. A total of 226 no. car parking spaces are proposed, which includes 2 no. car club spaces, 12 no. accessible spaces and 47 no. EV charging spaces (198 no. long-stay spaces, 18 no. visitor space & 10 no. car parking spaces for creche use), in addition to 9 no. motorcycle spaces.

h) A total of 484 no. bicycle spaces are proposed in the form of 442 no. long stay bicycle spaces 42 short-term stay visitor parking.

i) 2 no. ESB substations at surface level.

j) Bin Storage areas for the Duplex blocks are proposed at ground level adjacent to the Duplex blocks.

k) All associated site and infrastructural works to include provision for water services; foul and surface water drainage and connections; internal roads, attenuation proposal; permeable paving; all landscaping works including green infrastructure zones; green roofs; and general plant areas; photovoltaic panels; landscaped boundary treatment; footpaths; public lighting; and electrical services.

SITE LOCATION/LAYOUT MAP

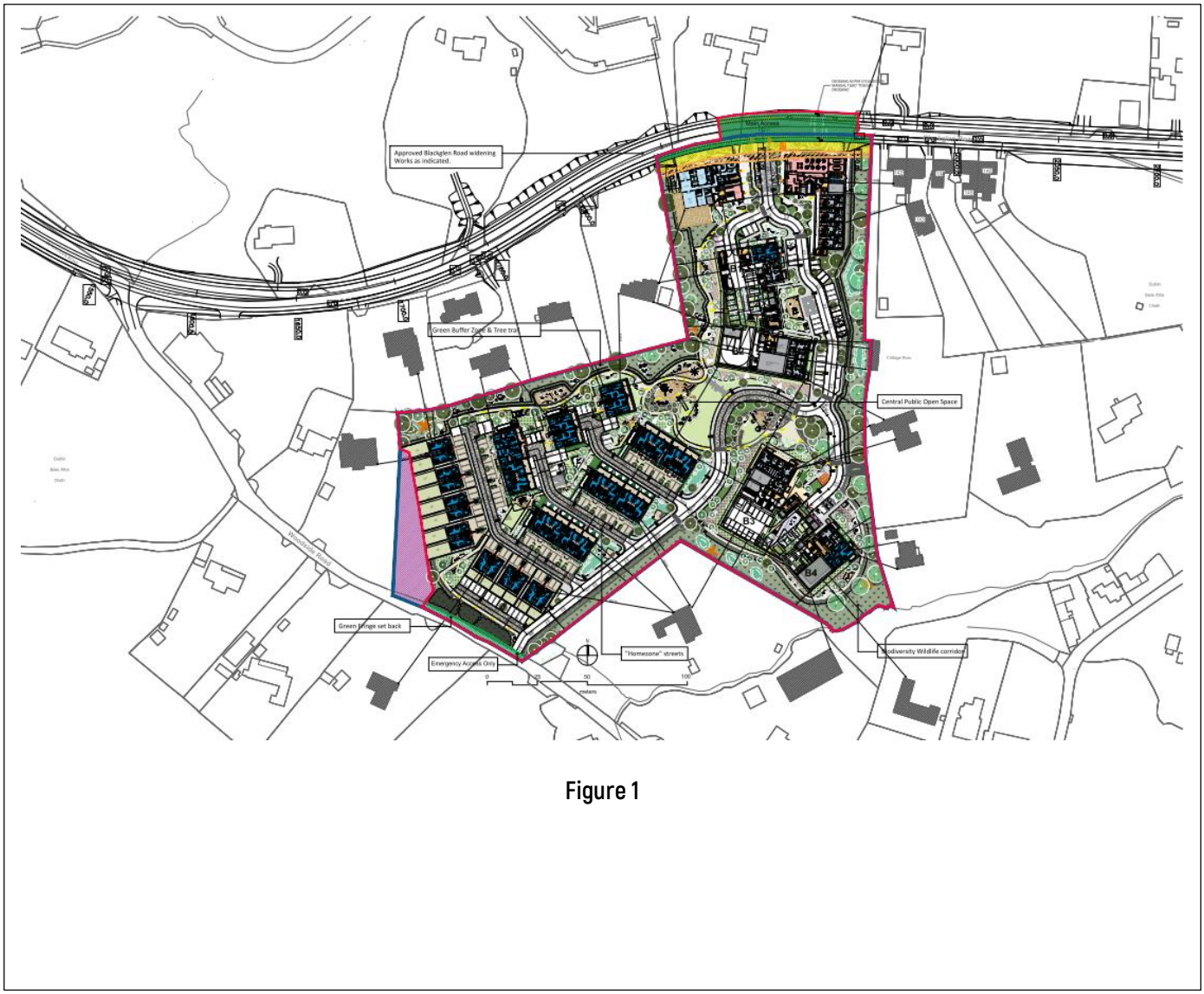


Figure 1

TELECOMMUNICATION CHANNELS

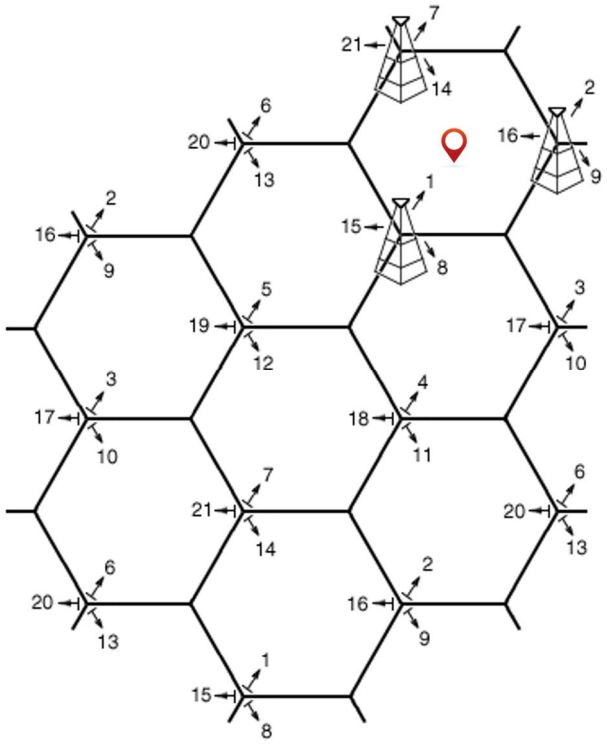
This report assesses the two wireless Telecommunication Channels or networks of Telecommunication Channels that may be affected by the height and scale of a new development, Radio Frequency links & Microwave Transmission links

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.

= a given location

= base station site

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.

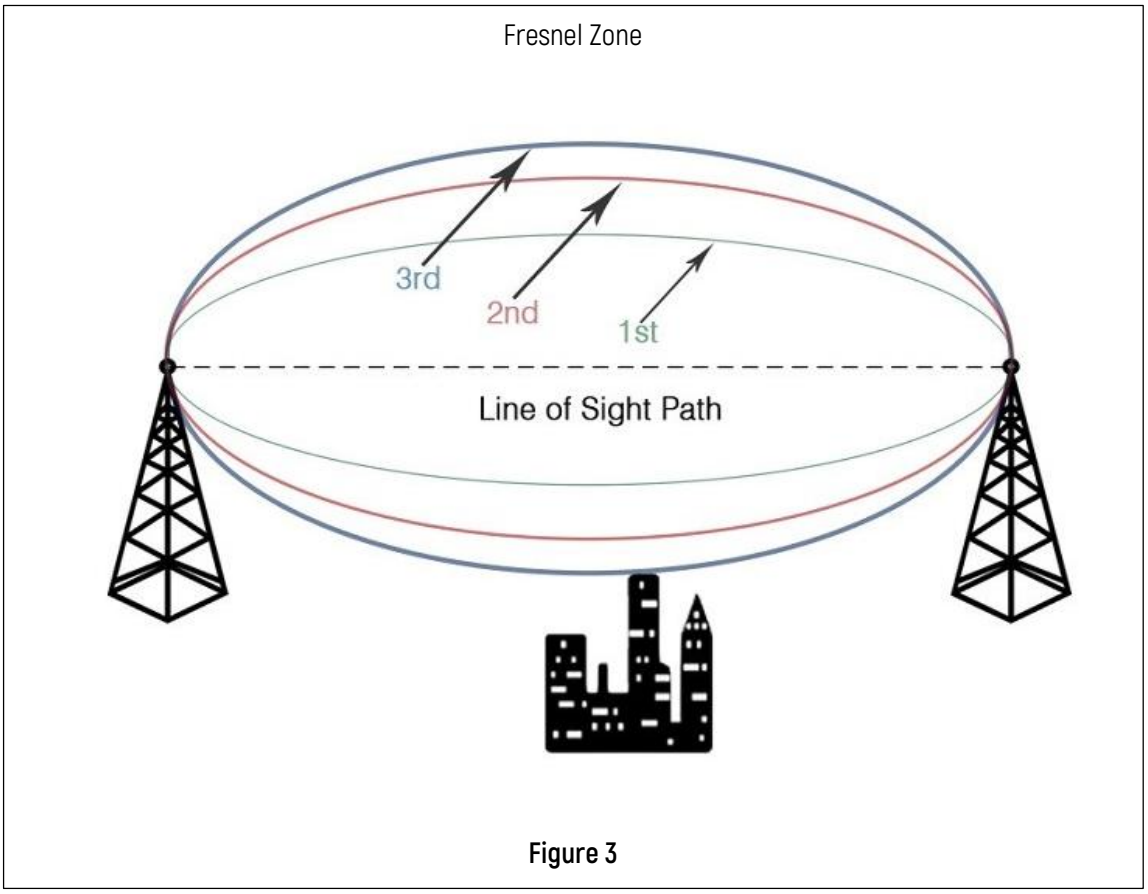


Figure 3

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 did not identify any Microwave links that will require the Applicant to make specific allowances for their retention ("Mitigation Measures").

Our assessment did not identify any 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. The assessment of Microwave Transmission links entailed both a visual survey of each identified neighbouring telecommunication site within a reasonable geographic proximity to the Development and a request for information from telecommunication providers where the visual survey was inconclusive.

ISM 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 residential neighbourhoods and business districts to the north, south, east & west of the Development site. Refer to Figure 7 of the appendices for full analysis.

Our assessment identified Radio Frequency coverage for the local geographic area is served by a **distinct lack of cells** at a range of distances to the Development on less than a 360° basis, which is not a typical cell pattern for urban/suburban Radio Frequency coverage. The drive test data determined that most local business (agricultural or otherwise), residential, and the public road/amenity areas to the north, south, east and west of the development site are very underserved and already receive **poor** signal from Radio Frequency links emanating from telecommunication antenna sites located up to 2.197km from development site to the southwest, up to 1.972km and 1.362km to the southeast, 1.034km to the north west, to the closest at 0.575km to northeast of the development site. By way of comparison, a typical cell pattern for urban or suburban Radio Frequency coverage, has antenna sites at distances from each other ranging

from 250 to 500 metres depending on the population density. The technological prerequisite is to apply mobile cellular sites (1 per Mobile Network Operator) on a ratio of 1 site per 1,500 – 2,000 people. Combine this with the movement from low frequency (2G/3G) to higher frequencies bands (4G/5G) with the added obstacles of modern, energy saving building trends, such as insulation and triple glazing, the internal penetration of mobile signal has become significantly challenging, resulting in a potential requirement for 1 mobile cellular site per 1,500 head of population.

Proximity of Antenna Sites to the Development

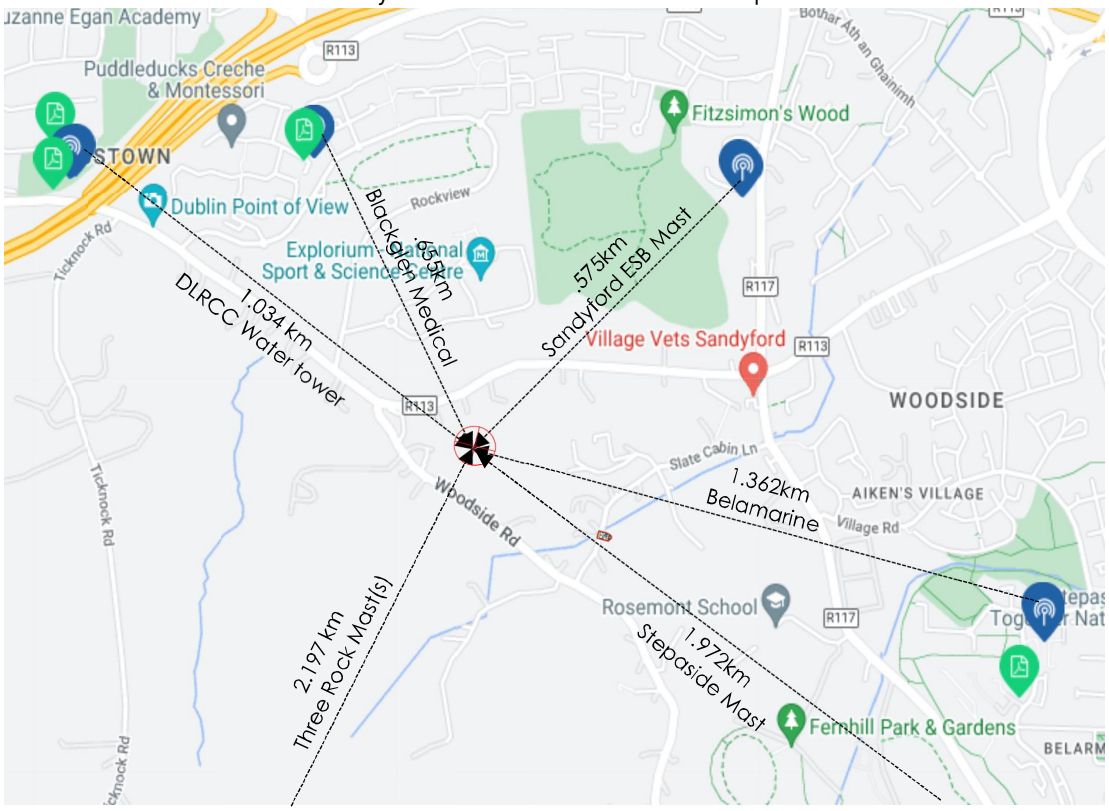


Figure 4

Our assessment recorded an average indoor coverage signal of -115db across all 3 mobile phone networks at the current population levels. With -85db being the benchmark optimal coverage signal, and anything over -100db being poor to bad, -115db denotes pre-existing poor coverage for the local area. Being that population density is a huge factor related to signal level and quality, it is our view that the scale of the Development, with respect to its proposed population density increases, will deteriorate the already existing poor mobile signal conditions in the immediate area.

It is therefore our finding that the local area is significantly underserved by telecommunication channels (mobile phone signal/voice & data services) and any increase in the population density residing in the area resulting from the proposed development will create a significant strain on existing capacity and cell size, which becomes smaller the greater number of people using or accessing it for voice and data services. The aforementioned data collected as part of our assessment, overwhelming supports a technical justification for a new telecom site to be included in the Development strategy for the retention of important Telecommunication Channels (Mitigation Measures).

We have set out the projected deterioration of local area Cells by the proposed Development in Figure 8.

MITIGATION MEASURES

To provide an adequate allowance to support the density and scale of the Development with the appropriate level of telecommunication channels (mobile phone signal /voice & data services), the Applicant is seeking planning permission to install the following:

- 9No. support poles, affixed to ballast mounts on Apartment Block P2 rising 2.5 metres above parapet level. These support poles are sufficient to each accommodate 1No. 2m 2G/3G/4G antenna & 1No. 5G antenna each.
- 3No, support poles, affixed to the rear of the ballast mounts, rising 1 .5 metres above roof level. These support poles are sufficient to accommodate 2No. Ø0.3m Microwave links each.
- Together with all associated telecommunications equipment and cabinets,
- To adequately screen the infrastructure, the support poles used for the antennae will be installed within Radio friendly GRP shrouds.

This will undoubtedly provide an adequate solution for the Applicant to mitigate the impact the Development will have on the existing poor mobile phone signal in the area and provide both the occupants of the Development and the local area with adequate voice and data services to meet modern demands.

Refer to Figures 9 & 10 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 the Planning Authority 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) and Appendix 5, Section 1.4.2 of the Dun Laoghaire-Rathdown County Development Plan 2022-2028.

Design Compliance with the Planning Guidelines for 'Telecommunications Antennae and Support Structures' (1996), and Circular Letter PL 08/12 issued by the Department of the Environment and Local Government (as may be amended from time to time), and to other publications and material as may be relevant in the circumstances."

The proposed telecommunications comply with the Guidelines and Circular on the basis that:

- ✓ They have been sited at rooftop level and painted to match external façade features to minimise their appearance and visual impact from street and other elevated levels and designed to minimise their scale;
- ✓ The antennae are encased in GRP shrouds (painted to match) to reduce the prospect of visual impact;
- ✓ Access to them can be provided via the residential block for management and maintenance;
- ✓ The sharing of existing facilities was considered, but not deemed appropriate as their inclusion as part of the Development is to mitigate its distance from existing facilities and to mitigate the deteriorating impact on the existing telecommunication infrastructure located to the North South and West of the proposed residential blocks;
- ✓ Their size, height and location do not impose a health and safety risk, with the support structures considered to be sufficiently robust; and
- ✓ The design fully considers and caters for the sharing and co-location of these facilities with Ireland's 3no. Mobile Network Operators.

DISCLAIMER

Due to the confidential nature of planning applications/submissions, ISM does not, as standard practice, contact or involve Ireland's licenced Mobile Network Operators, namely: Vodafone Ireland; Three Ireland; or Eircom Limited t/a Eir Mobile, when preparing this report. If contact is made with a Mobile Network Operator, we duly note the source information within our reports.

ISM has wholly relied upon the publicly available information provided by Commission for Communications Regulation, "ComReg", its own extensive record of wireless infrastructure, and the results of a comprehensive visual survey carried out on the Report Date notated herein. Therefore, the specific Mobile Network Operator transmitting the identified telecommunication channel is recorded on a best endeavour basis.

Lastly, please note that telecommunication networks are always evolving, and as such, these findings remain subject to change.

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)

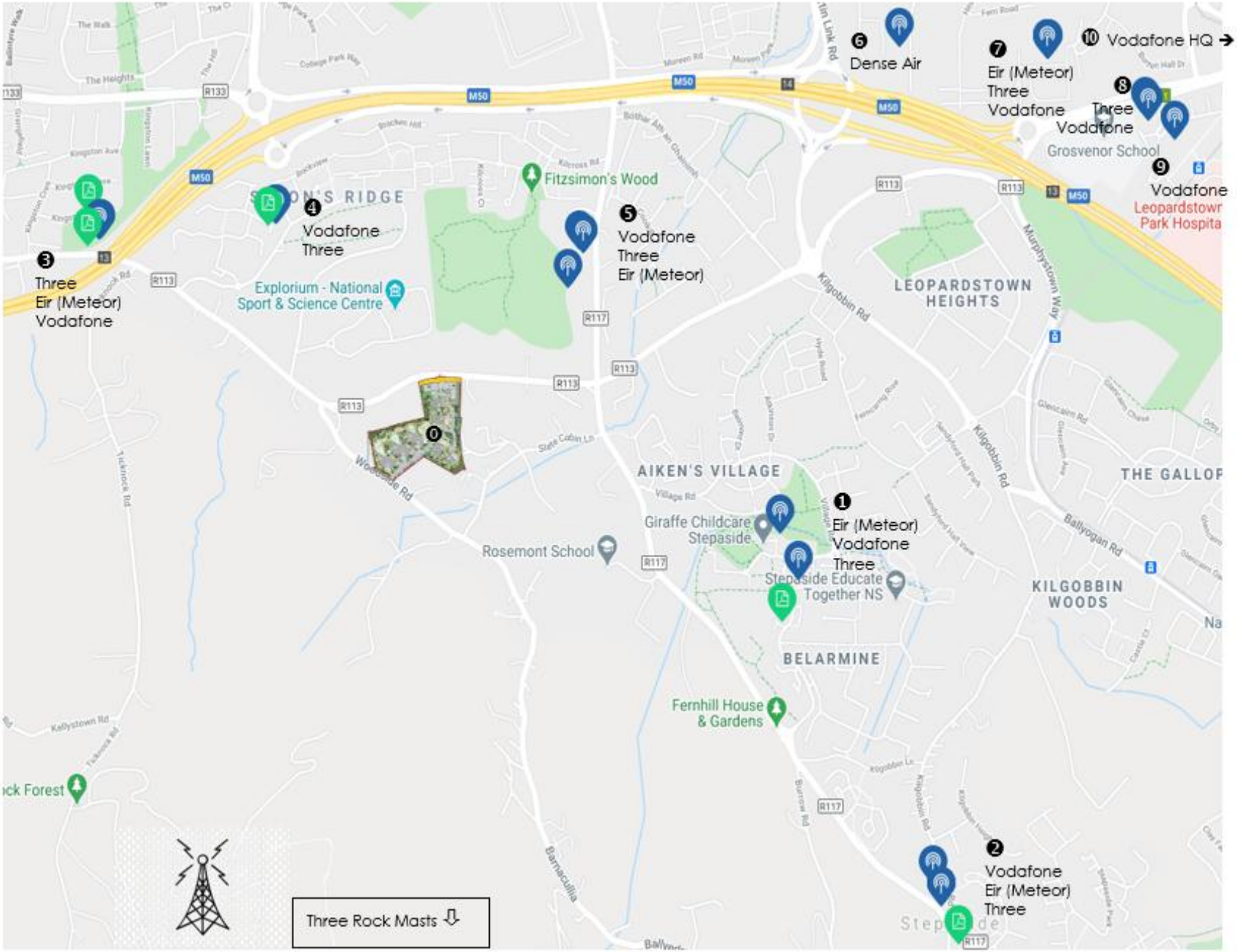
Figure 7: Drive Test Data - Identification of local area Cells by Cell ID (Cell Identification Analysis)

Figure 8: Projected deterioration of local area Cells by the proposed Development

Figure 9: Mitigation Measures

Figure 10: Mitigation Measures

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

- ❶ Proposed Development
- ❶ Belarmine Plaza
- ❷ Stepaside Garda Station
- ❸ DLRCC Water Tower
- ❹ Blackglen Medical
- ❺ Sandyford ESB Mast(s)
- ❻ Sandford St furniture
- ❼ ESB Leapordstown Mast
- ❽ Clayton Hotel
- ❾ Central Park
- ❿ Vodafone Headquarters

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Client
Zolbury Limited

Project
Blackglen Road LRD

Option	1
Report Date	08/11/24
File Name	Blackglen Road LRD

Drawing:
Area Site Analysis

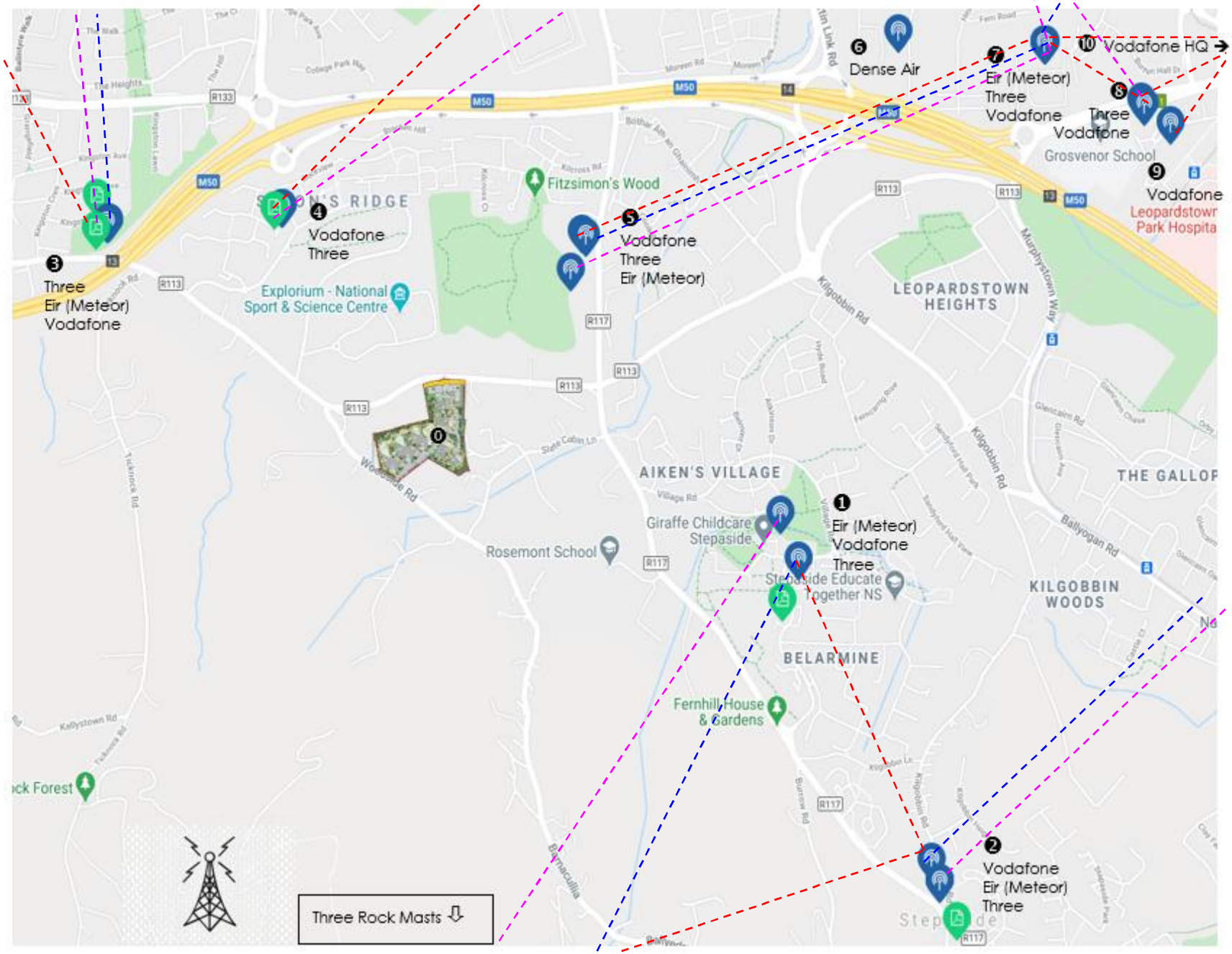
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Figure 6

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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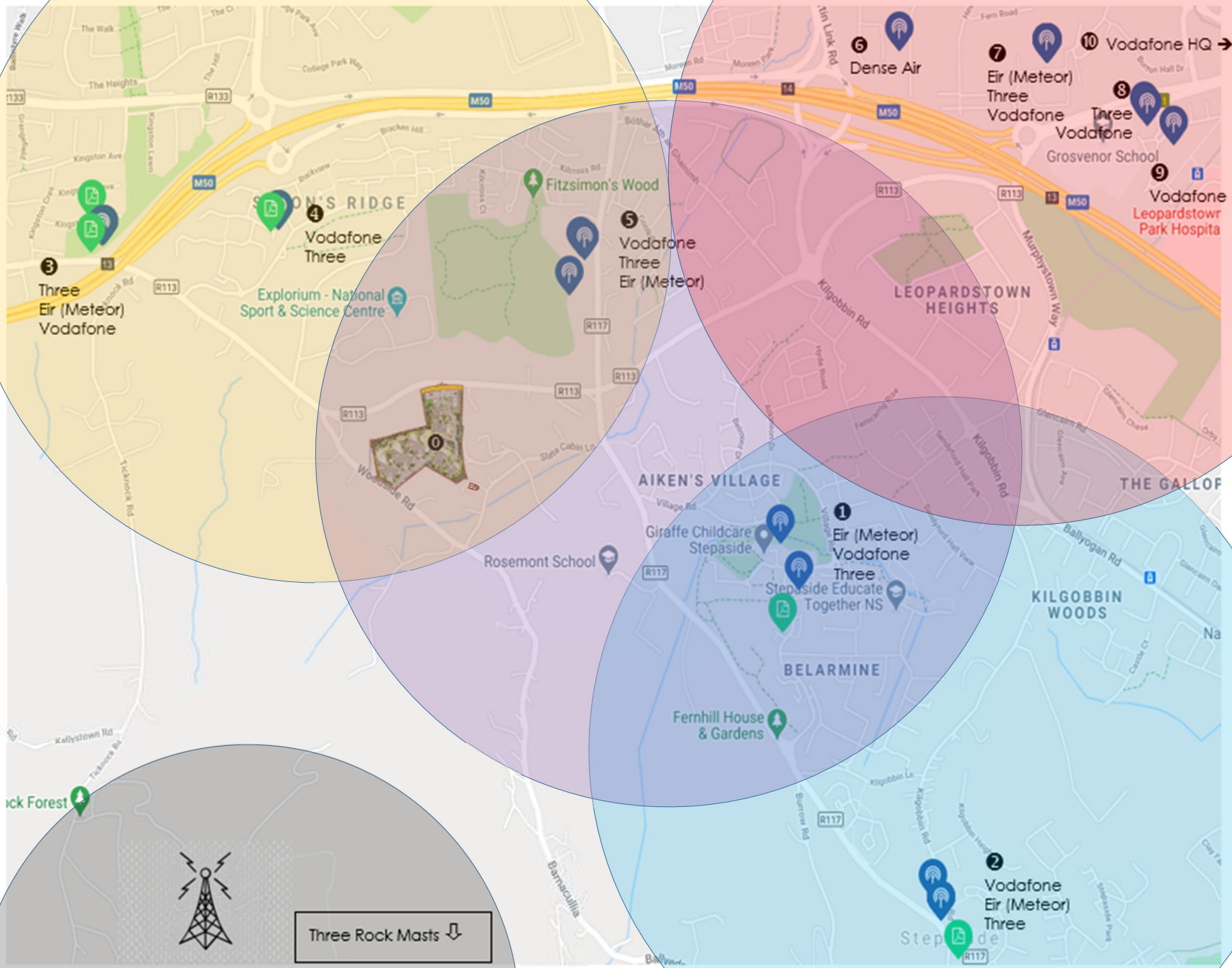
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Drawing:
Link Analysis

Building	Drawing No.	Zone	Rev
SPN	K 0824		1

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Figure 7 Drive Test Data - Identification of local area Cells by Cell ID (Cell Identification Analysis) Source: ISM



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

- Multiple Cell IDs
  - ❶ Belarmine Plaza
  - ❷ Stepaside Garda Stat.
- Multiple Cell IDs
  - ❸ DLRCC Water Tower
  - ❹ Blackglen Medical
  - ❺ Sandyford ESB Mast(s)
- Multiple Cell IDs
  - ❶ Belarmine Plaza
  - ❺ Sandyford ESB Mast(s)
- Multiple Cell IDs
  - ❻ Sandford St furniture
  - ❼ ESB Leapordstown Mast
  - ❽ Clayton Hotel
  - ❾ Central Park
  - ❿ Vodafone HQ

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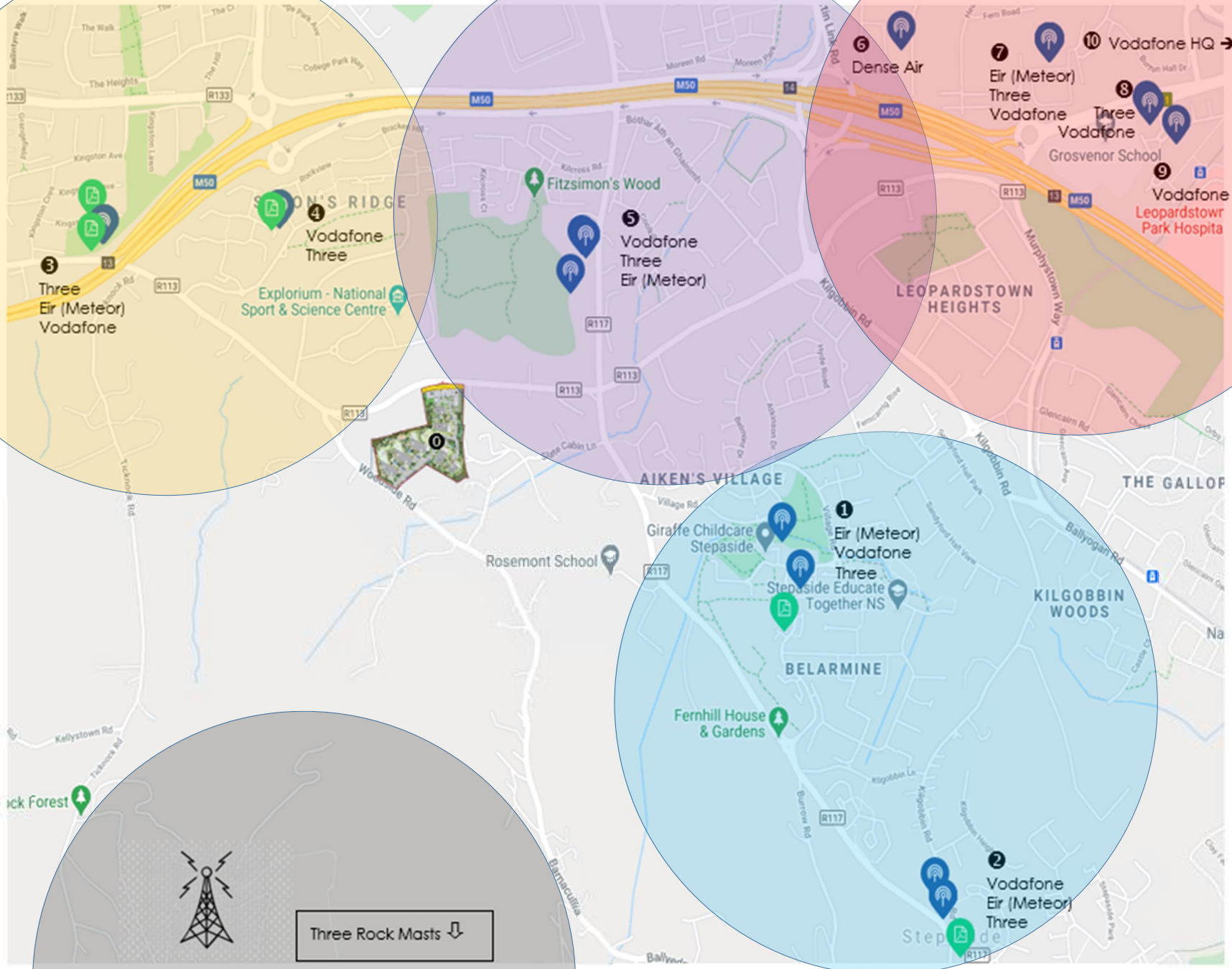
Option	1
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File Name	Blackglen Road LRD

Drawing:
Cell Identification Analysis

Building	Drawing No.	Zone	Rev
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Figure 8 Projected deterioration of local area Cells by the proposed Development Source: ISM



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Cell Identification Analysis

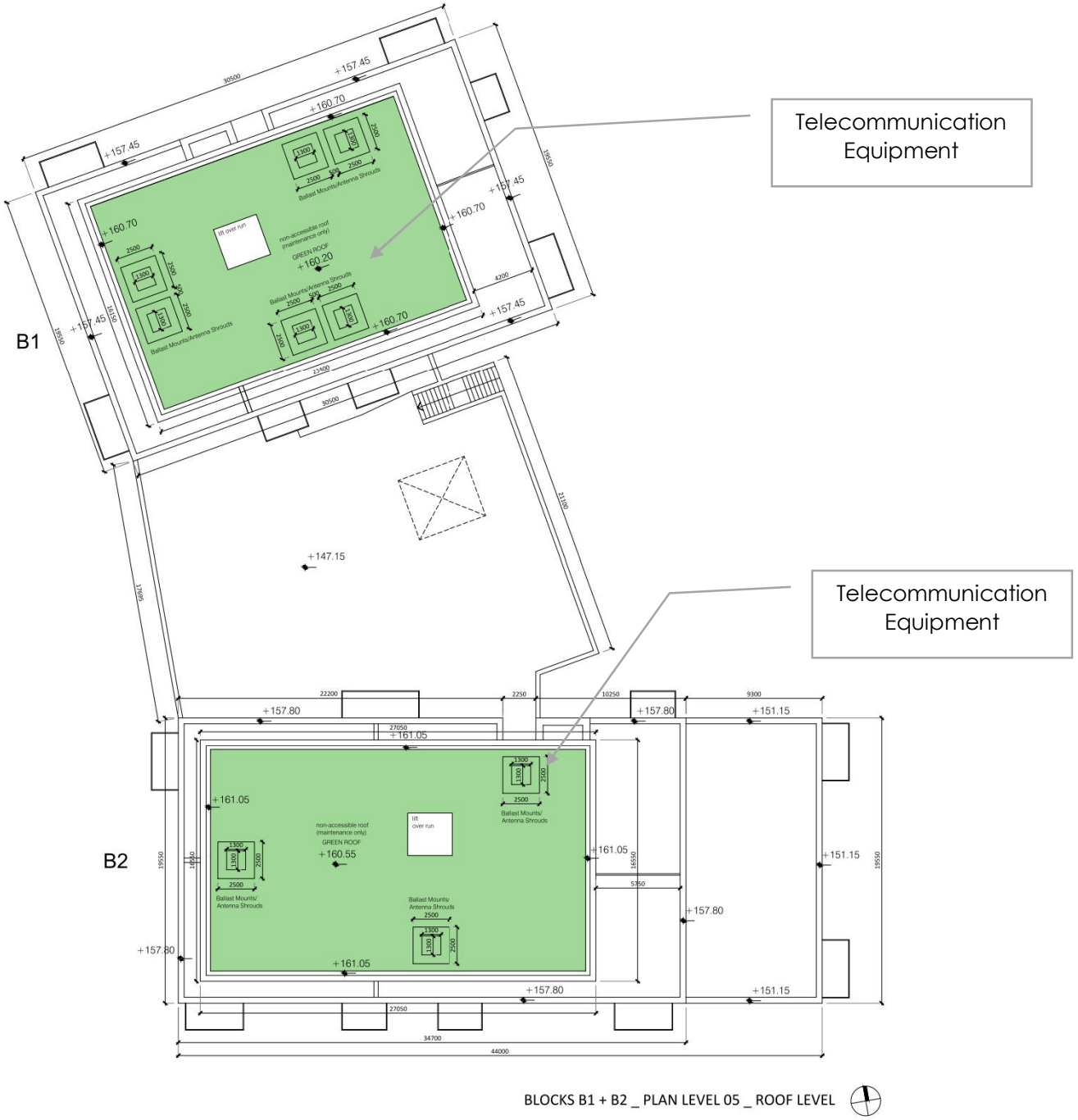
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Figure 9

Mitigation Measure Design

Source: Comreg ISM



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Typical Installation





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Mitigation Measure

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Figure 10

Mitigation Measure Design

Source: Comreg ISM





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The proposed development will principally consist of:

provision of telecommunications infrastructure at roof level comprising:

9 no.0.8m long 5G antennas and 9 no. 2m long hexaband antennas. Each antenna will be enclosed within shrouds (3m in height above parapet). A total of 9 no. shrouds will be provided, each containing 1 no. 5G antenna, 1no hexaband (2G/3G/4G) antenna.

6 no. 0.3m microwave link dishes on 3 no. steel support poles (2m in height above the lift shaft overrun); and

all associated cabinets and equipment.

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Mitigation Measure

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