



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

DEVELOPMENT NEWCASTLE SOUTH

08 June 2022

Prepared by
Independent Site Management Limited
Christopher Plockelman
Director

✉: christopher@ismireland.com

☎: +353 (0)1 905 8800

www.ismireland.com

Table of Contents

DEFINITIONS	3
EXECUTIVE SUMMARY	4
ABOUT THE AUTHOR.....	5
DEVELOPMENT DESCRIPTION	6
SITE LOCATION/LAYOUT MAP	7
TELECOMMUNICATION CHANNELS	8
FINDINGS.....	11
MITIGATION MEASURES	14
APPENDICES	15
AREA TELECOMMUNICATION ANALYSIS	16
MICROWAVE LINK ANALYSIS.....	17
WALK TEST DATA	18
MITIGATION MEASURE DESIGN.....	19

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 Body:	means An Bord Pleanála (hereinafter referred to as the "Planning Body")
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 Cairn Homes Properties Limited (hereinafter referred to as the "Applicant")
The Development:	means the proposed development situated at lands at Newcastle South (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 Cairn Homes Properties 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

The development will consist of the construction of 280 no. dwellings, a creche, and open space as follows:

- A. 128 no. 2 storey houses (8 no. 2 bedroom houses, 94 no. 3 bedroom houses, 25 no. 4 bedroom houses and 1 no. 5 bedroom house);
- B. 116 no. apartments in 2 no. 5 storey buildings comprising (54 no. 1 bedroom apartments & 62 no. 2 bedroom apartments, all with terrace or balcony along with solar panels and green roofs at roof level as well as telecommunications infrastructure comprising 9 no. support poles on ballast mounts (to accommodate 1No. 2m 2G/3G/4G antenna & 1No. 5G antenna each) & 3 no. poles on lift overrun (to accommodate 2No. Ø0.3m Microwave links each at roof level of Apartment building B, together with associated equipment and cabinets/shrouds);
- C. 36 no. apartments/duplex apartments in 3 no. 3 storey buildings – (18 no. 2 bedroom apartments and 18 no. 3 bedroom duplex apartments) all with terrace;
- D. Amendment to permitted Creche (c. 518sqm) in 'Graydon'(ABP References: TA06S.305343 & ABP-305343-19) to now provide a Creche of c. 778 sq. m of 2 no. storeys;
- E. Open space, hard and soft landscaping (including public lighting & boundary treatment), communal open space for duplex apartments and apartments; along with single storey bicycle/bin stores and ESB substations;
- F. Vehicular access from the Athgoe Road from a new signalised junction along with upgrades to footpath and pedestrian crossing as well as provision of vehicular/pedestrian/cycle link to permitted 'Graydon' (TA06S.305343) 'Newcastle Boulevard' to the east, as well as 423 no. car parking spaces and 370 no. bicycle spaces and all internal roads, cycleways, green routes and paths;
- G. Provision of Surface water attenuation measures and underground attenuation systems, connection to water supply, and provision of foul drainage infrastructure as well as underground local pumping station to Irish Water specifications and all ancillary site development/construction/landscaping works.

SITE LOCATION/LAYOUT MAP

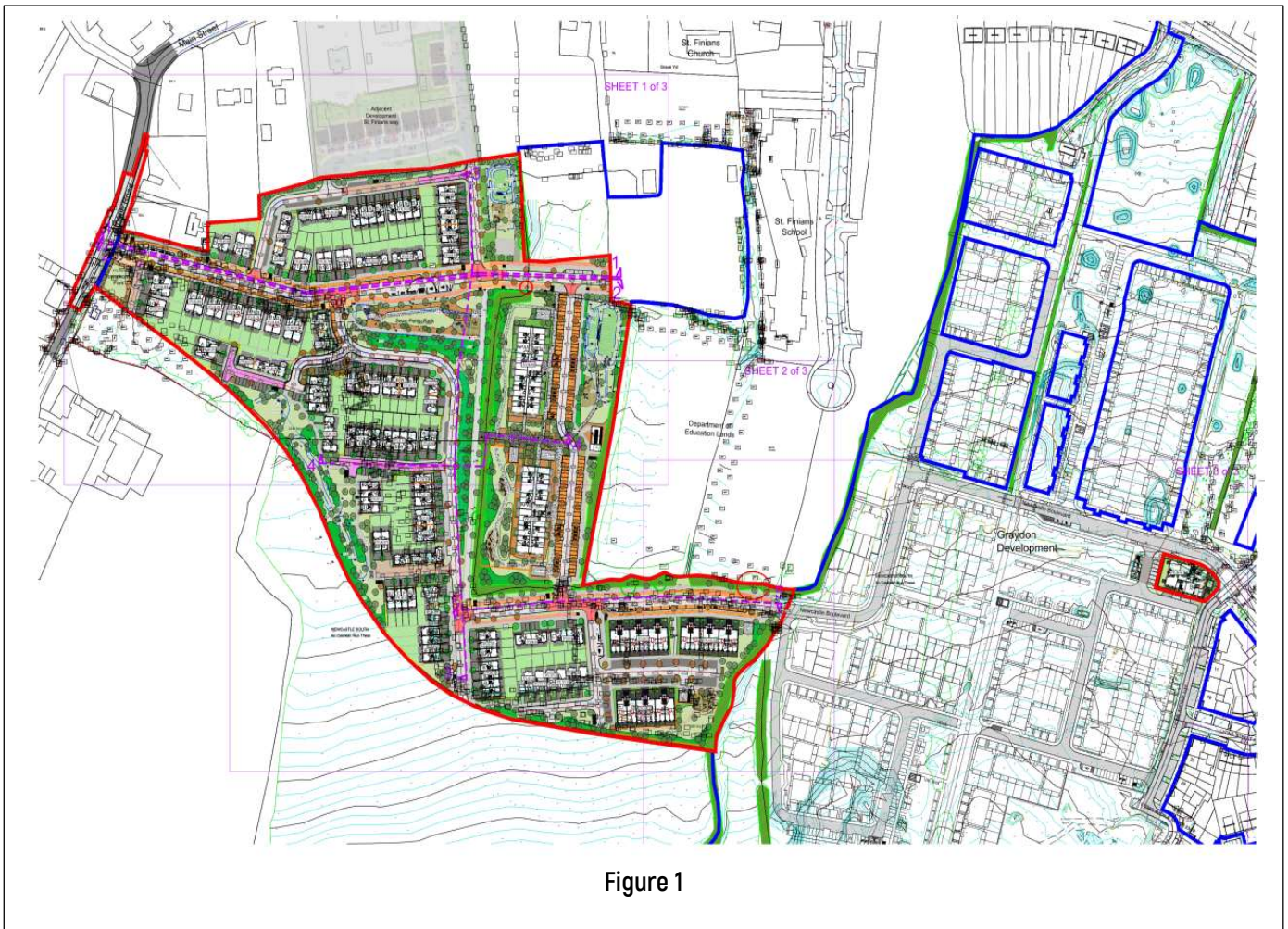


Figure 1

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

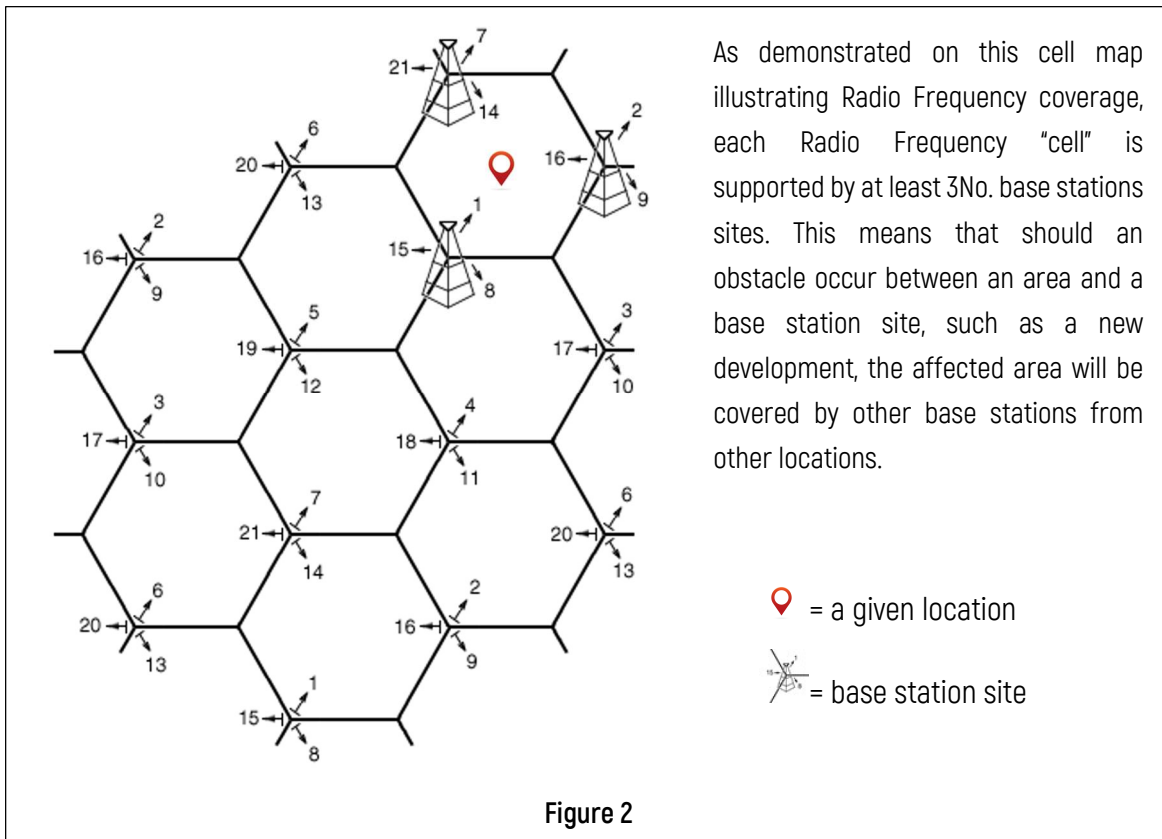
Radio Frequency links & Microwave Transmission Links are used in Ireland's mobile phone and fixed wireless networks and disseminate at an average above ground level height of 20m, making them the most relevant Telecommunication Channels to be assessed in relation to the height and scale of a new development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





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.

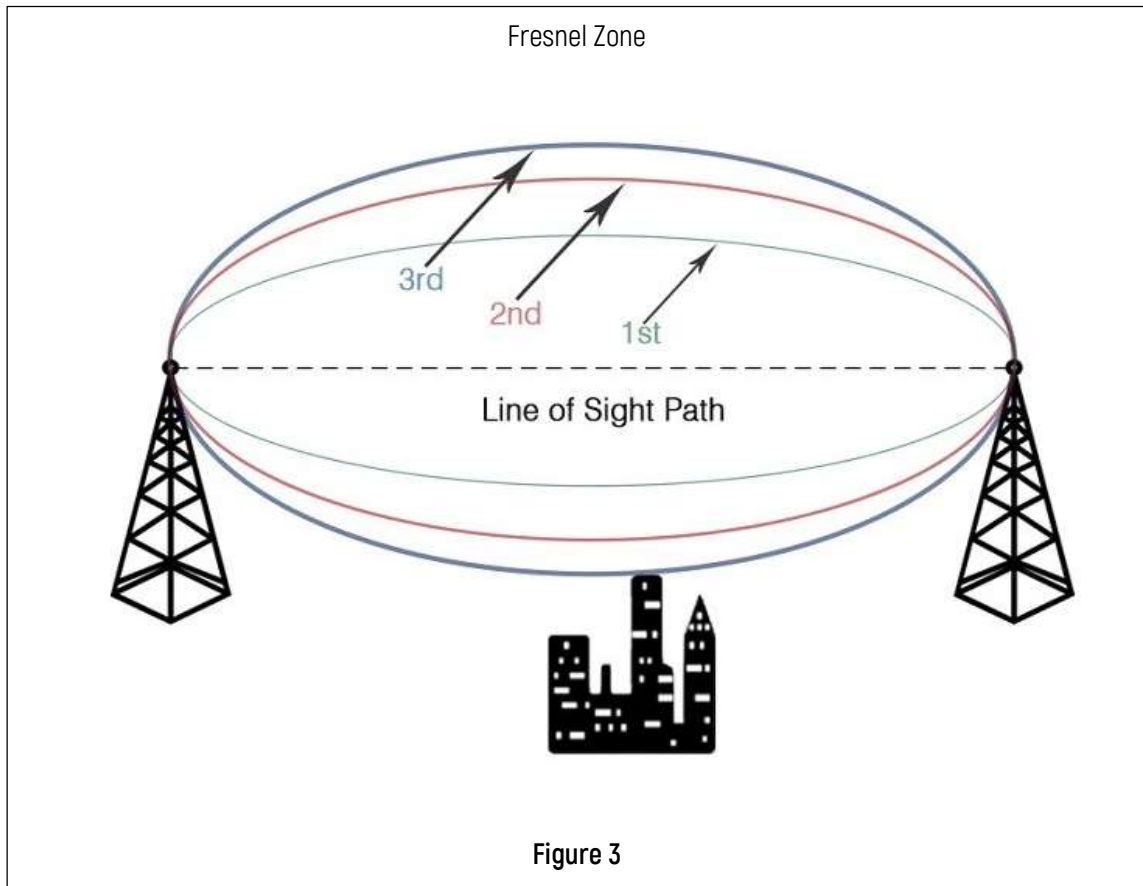


Figure 3

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

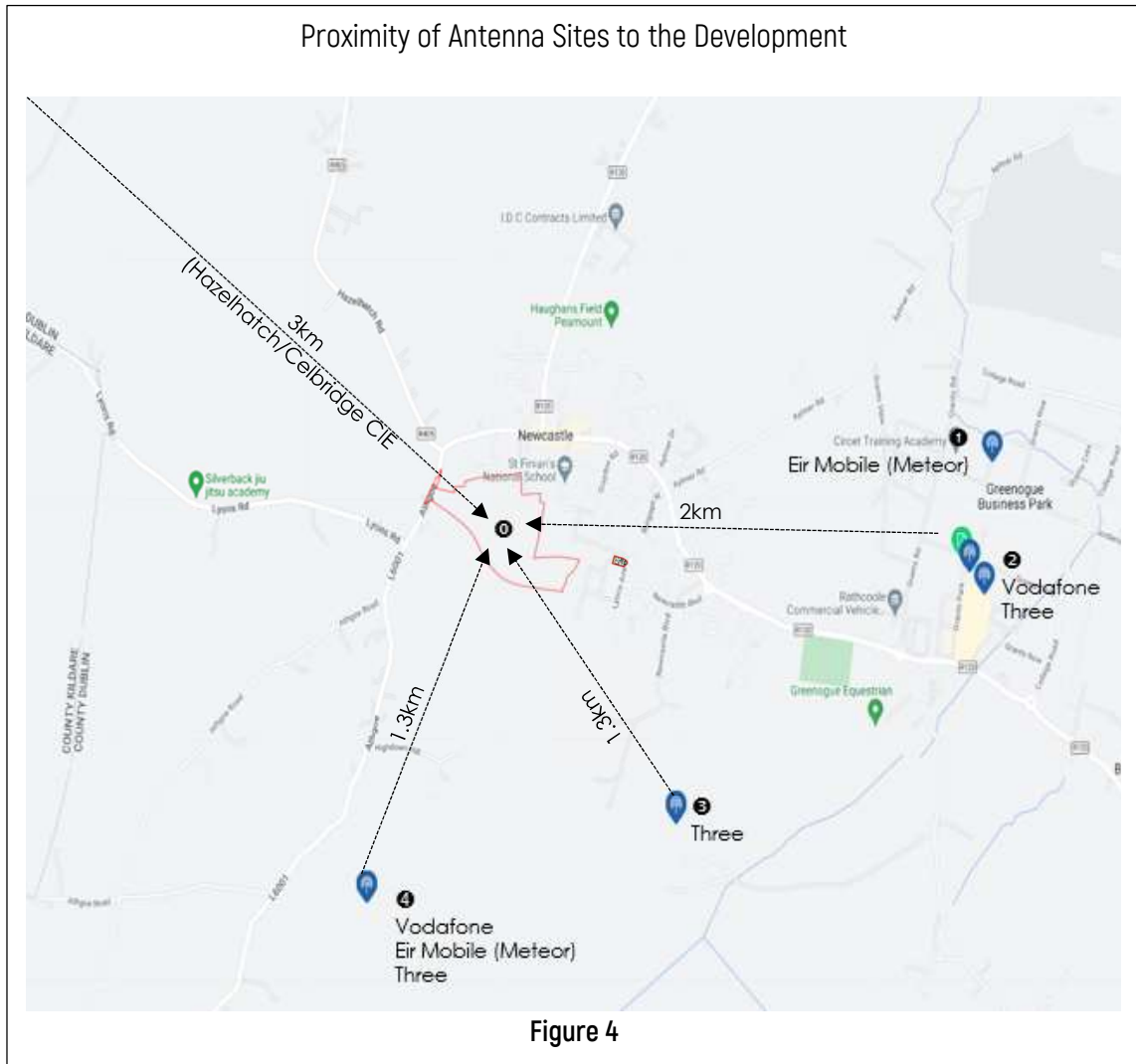
ISM's assessment did not identify Microwave links that will require the Applicant to make specific allowances for their retention ("Mitigation Measures").

Our assessment did not identify 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 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 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 long distances to the Development on less than a 360° basis, which is not a typical cell pattern for urban/semi-rural Radio Frequency coverage. The walk test data determined that most local business, residential, and the public road/amenity areas to the north, south, east and west of the development site or very underserved and receive extremely **poor** signal from Radio Frequency links emanating from telecommunication antenna sites located up to 3km from development site to the northwest, and up to 2km from the east and 1.3km to south-southeast/southwest. By way of comparison, a typical cell pattern for urban/semi-rural Radio Frequency coverage, has antenna sites at distances from each other ranging from 250 to 500 metres depending.



The average indoor coverage signal recorded was -115db across all 3 mobile phone networks. With -85db being the benchmark optimal coverage signal, and anything over -100db being poor too bad, -115db denotes extremely poor coverage for the local area. Being that population density is a huge factor related to signal quality, it is our view that the scale of the Development, with respect to its density as opposed to its height, will deteriorate the already existing bad mobile signal conditions in the immediate area.

We refer to the recent planning application by Vantage Towers Limited (SD21A/0248) to erect a 24 metre high monopole telecommunications support structure with antennas, dishes and associated telecommunications equipment, all enclosed in security fencing, on the grounds of Annie May's Pub, Main Street, Newcastle, Co. Dublin, D22XV65, which was refused permission on visual amenity grounds. Notwithstanding the outcome of the aforementioned planning application, the evidence and data we collected as part of our analysis for this report,

overwhelming supports the technical justifications made therein which are wholly correct with respect to the poor coverage, the need and justification for a new site, and the negative consequences that will transpire to the local area as a result of having little or no mobile phone coverage.

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.

We have set out the impacted area within Figure 7.

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 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 B 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 lift shaft overrun on the Development's Apartment Block B, rising 3metres 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 8 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 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)

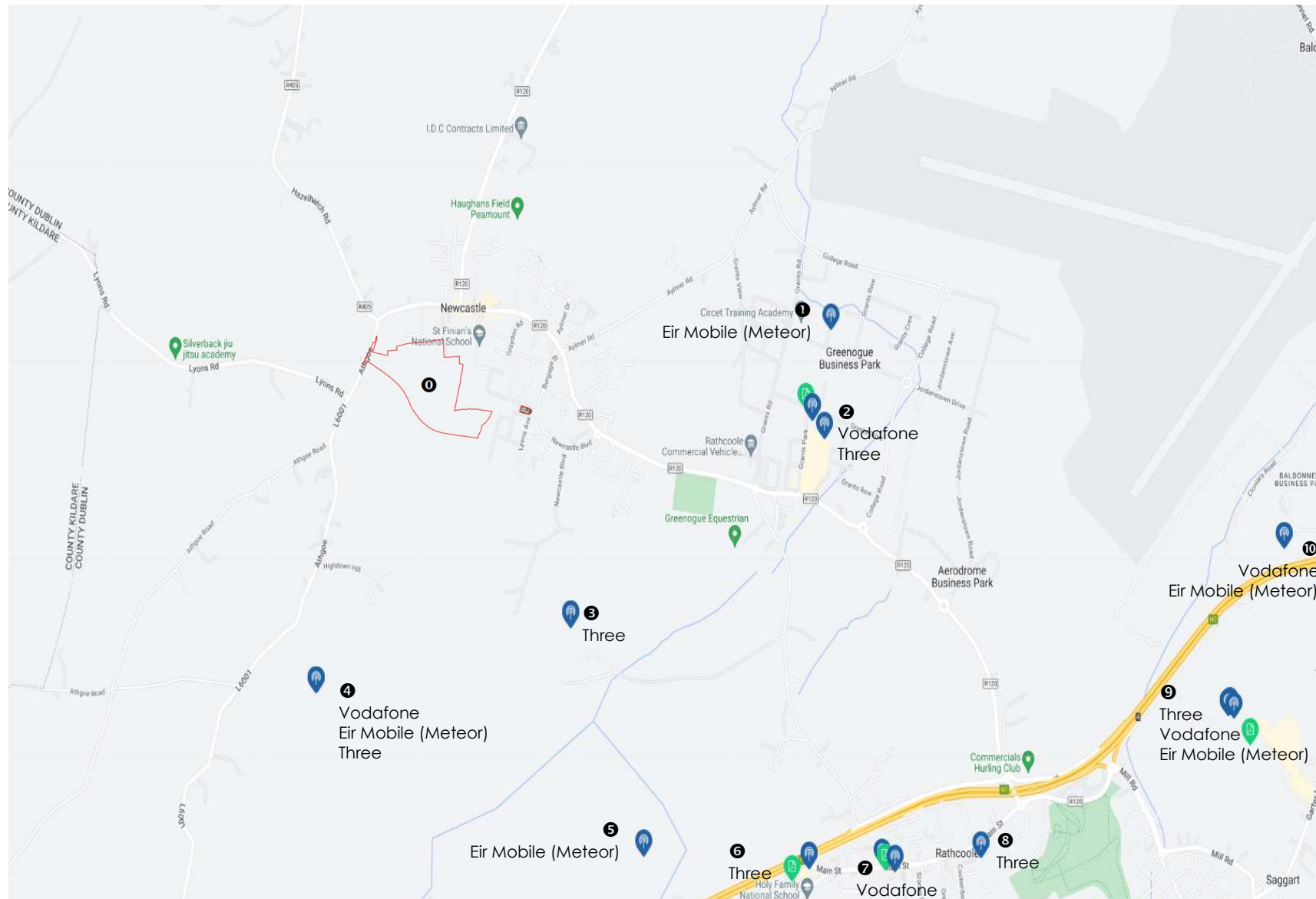
Figure 8: Mitigation Measures

Figure 9: Mitigation Measures

Figure 5

Area Telecommunication Analysis

Source: Comreg



Saggart Hill Mast

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

- ① Proposed Development
- ① Site Tech (Greenogue)
- ② Greenogue 1 & 2
- ③ Pipe Force
- ④ Athgore Road Mast
- ⑤ Rathcoole/Naas Rd
- ⑥ Poitin Still (ISM Site)
- ⑦ Rathcoole Village
- ⑧ Rathcoole Gard St.
- ⑨ City West Hotel
- ⑩ Eir building

--	--	--	--

FINAL

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

Client
 Cairn Homes Properties Limited

Project
 Newcastle South

Option	1
Report Date	23/05/22
File Name	Newcastle South

Drawing:
 Area Site Analysis

Building	Drawing No.	Zone	Rev
SPN	E 2322		1

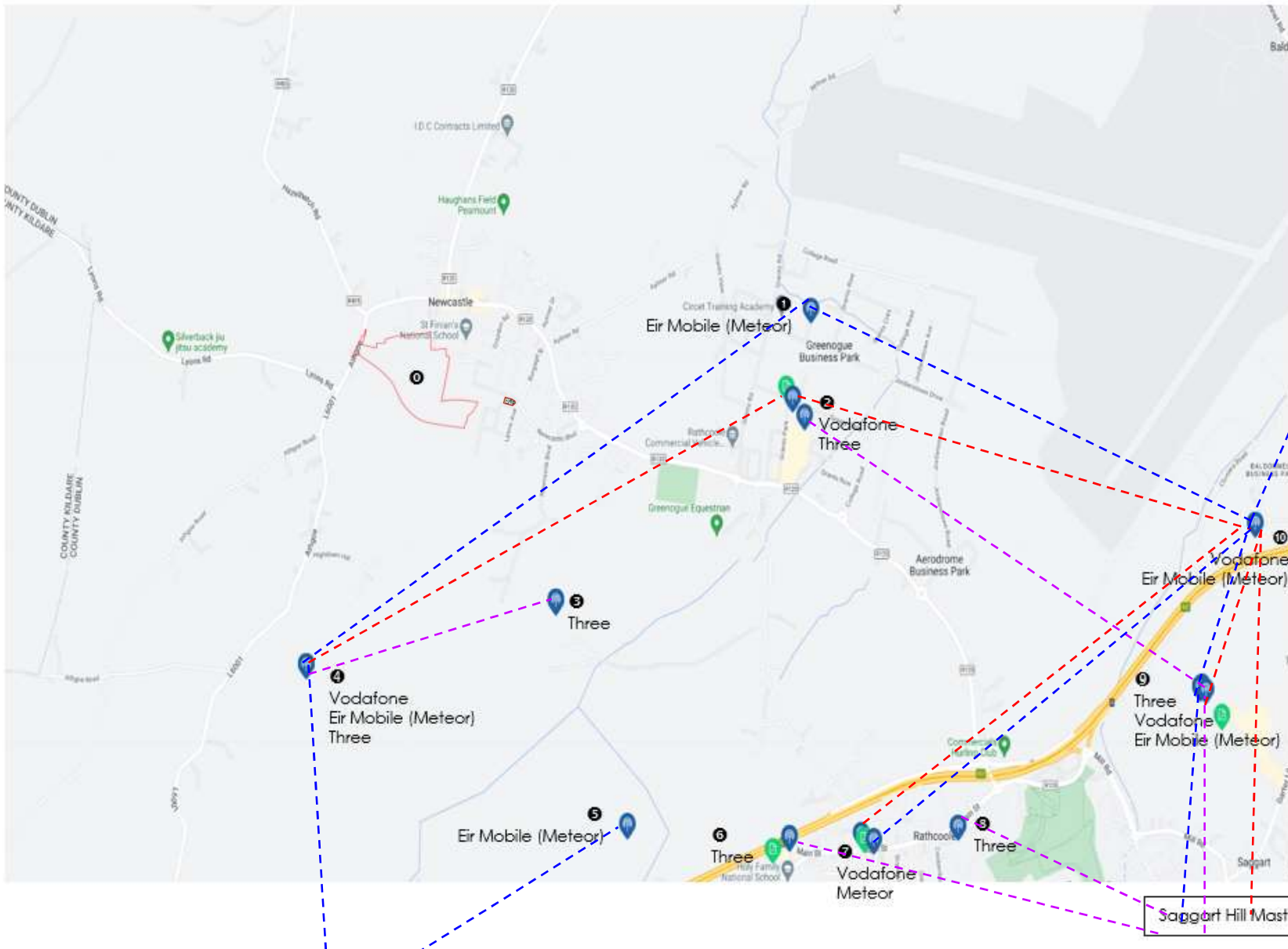
© Independent Site Management Limited

Figure 6

Microwave Link Analysis

Source: Comreg ISM Vodafone Three & Eir Mobile

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



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

FINAL

ism INDEPENDENT
 SITE MANAGEMENT

77 Camden Street Lower
 Dublin 2, Ireland D02 XE80
 +353 1 905 8800
 info@ismireland.com

Client
 Cairn Homes Properties Limited

Project
 Newcastle South

Option	1
Report Date	23/05/22
File Name	Newcastle South

Drawing:
 Link Analysis

Building	Drawing No.	Zone	Rev
SPN	E 2322		1

© Independent Site Management Limited

Figure 7

Walk Test Data

Source: 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
- ① Site Tech (Greenogue)
- ② Greenogue 1 & 2
- Multiple Cell IDs
- ⑤ Rathcoole/Naas Rd
- ⑥ Poitin Still (ISM Site)
- ⑦ Rathcoole Village
- ⑧ Rathcoole Gard St.
- Multiple Cell IDs
- ③ Pipe Force
- ④ Athgoe Road Mast
- Multiple Cell IDs
- ⑨ City West Hotel
- ⑩ Eir building

FINAL



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

Client
 Cairn Homes Properties Limited

Project
 Newcastle South

Option	1
Report Date	23/05/22
File Name	Newcastle South

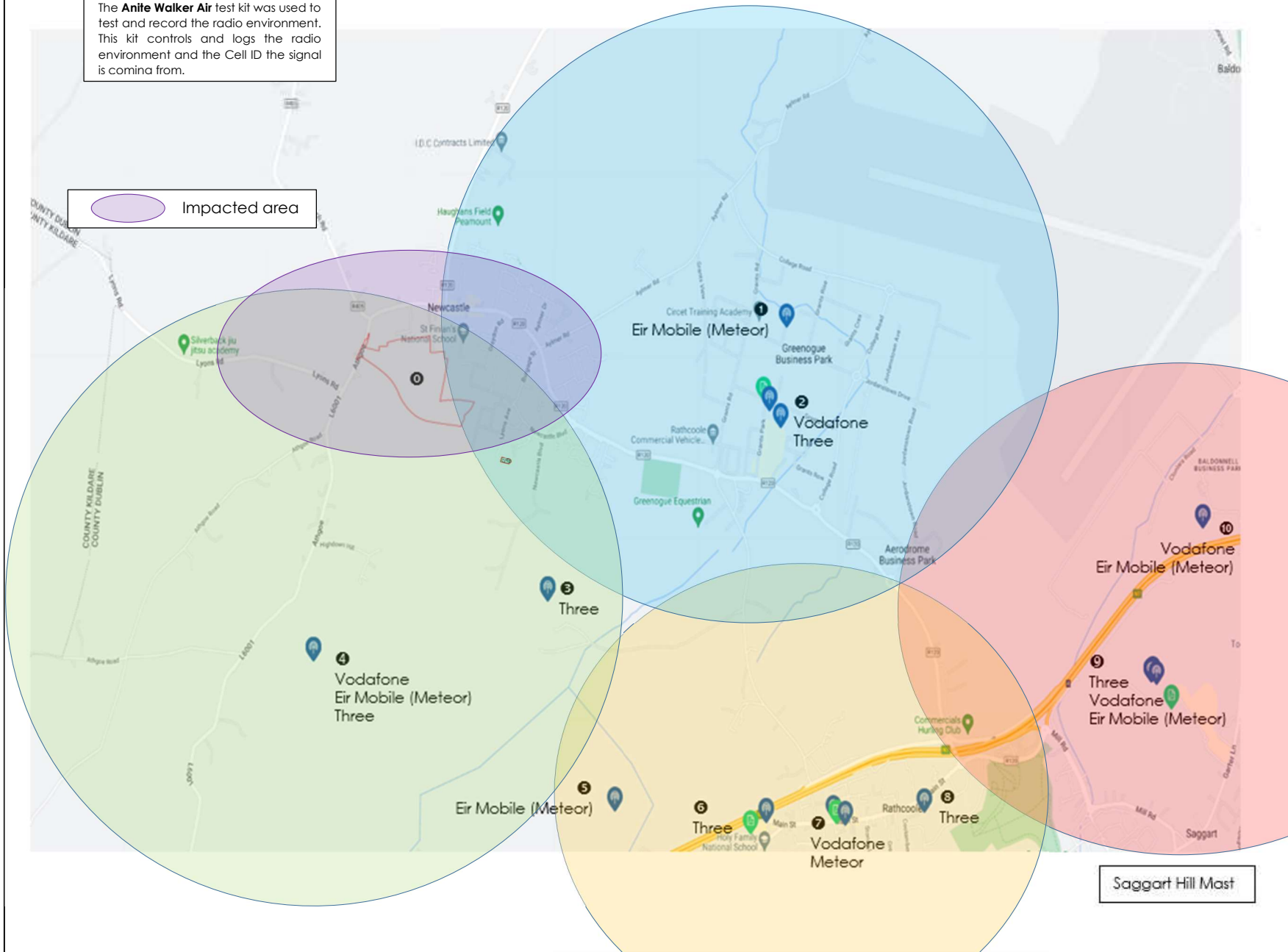
Drawing:
 Cell Identification Analysis

Building	Drawing No.	Zone	Rev
SPN	E 2322		1

© Independent Site Management Limited

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.

Impacted area

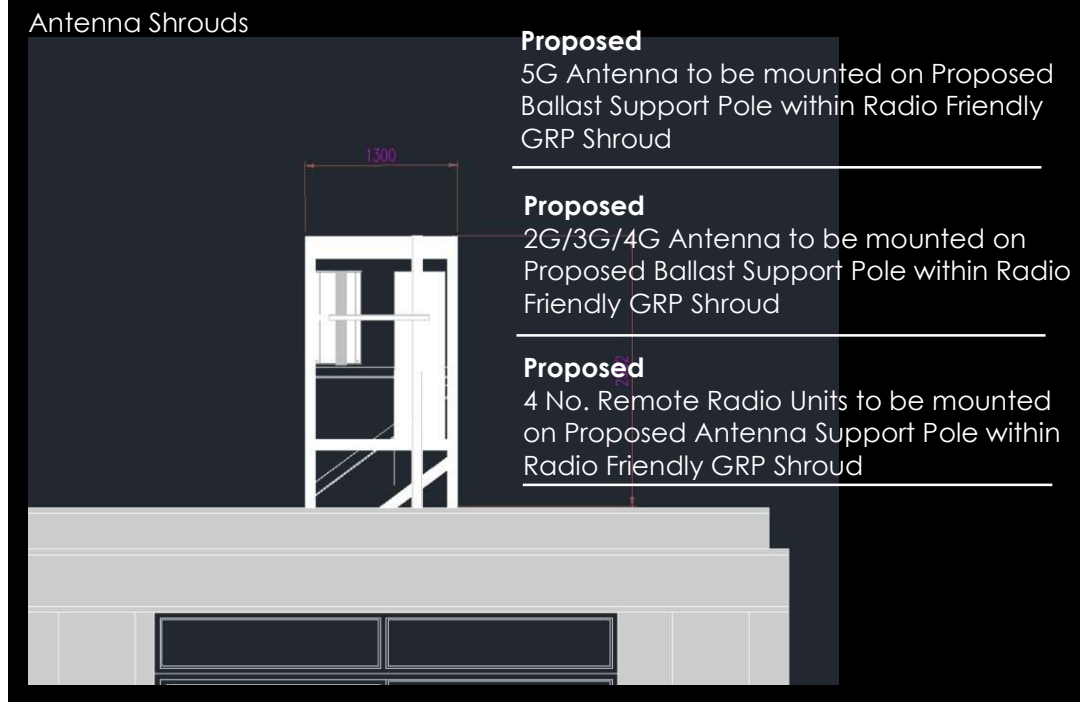
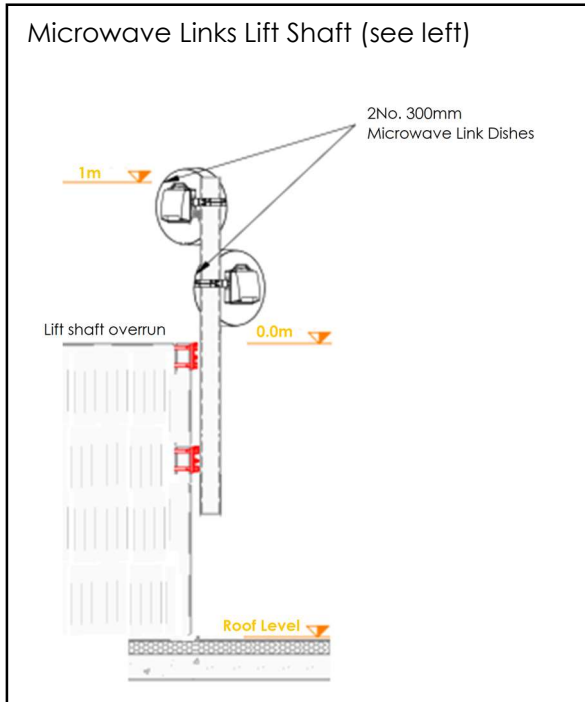


Saggart Hill Mast

Figure 8

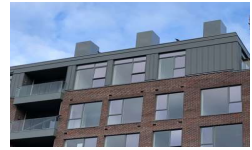
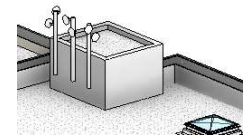
Mitigation Measure Design

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

Typical Installation



FINAL



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

Client
Cairn Homes Properties Limited
Project
Newcastle South

Option	1
Report Date	23/05/22
File Name	Newcastle South

Drawing:
Mitigation Measure

Building	Drawing No.	Zone	Rev
SPN	E 2322		1

© Independent Site Management Limited

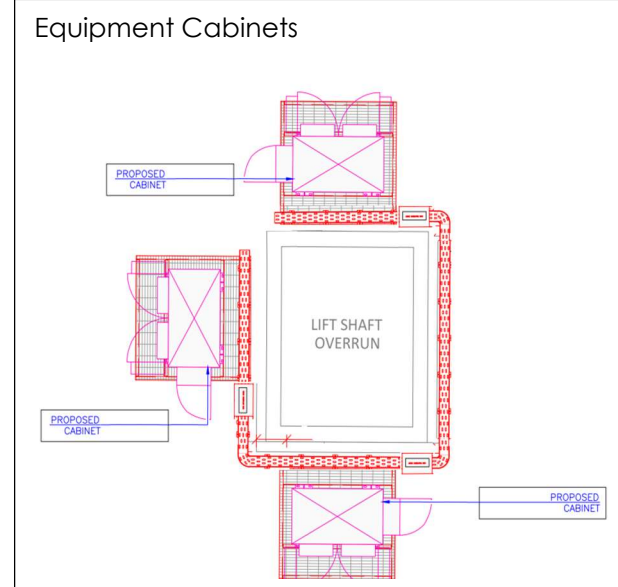
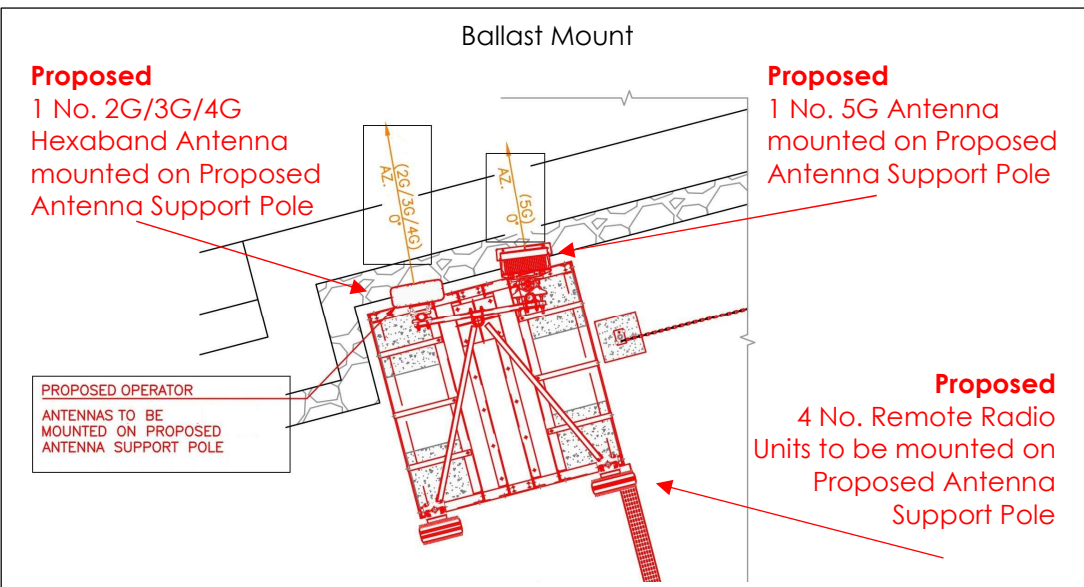


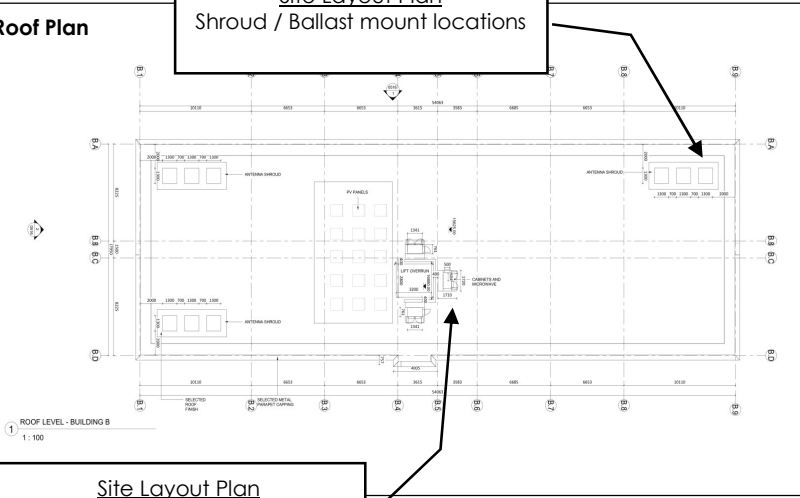
Figure 9

Mitigation Measure Design

Source: Comreg ISM

Roof Plan

Site Layout Plan
Shroud / Ballast mount locations



Site Layout Plan
Equipment Locations

Elevation



Proposed
Microwave Link Dishes

Proposed
Equipment Cabinets

Proposed
2G/3G/4G Antenna (2m long) & 5G Antenna (0.8m long) to be mounted on steel support pole affixed to ballast mount and concealed within Radio Friendly GRP Shroud



2 APARTMENT B - 3D VIEW A

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

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, 1 no 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.

FINAL



77 Camden Street Lower
Dublin 2, Ireland D02 XE80
+353 1 905 8800
info@ismireland.com

Client
Cairn Homes Properties Limited

Project
Newcastle South

Option	1
Report Date	23/05/22
File Name	Newcastle South

Drawing:
Mitigation Measure

Building	Drawing No.	Zone	Rev
SPN	E 2322		1