



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

**DEVELOPMENT
KILTERNAN VILLAGE SHD**

15 June 2022

Prepared by
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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 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 Liscove Limited (hereinafter referred to as the "Applicant")
The Development:	means the proposed development situated at lands at Wayside, Enniskerry Road and Glenamuck Road, Kiltarnan, 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 Liscove 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 now operates 6 in-building distributed antenna systems, and 2 large area managed fibre optic networks.



DEVELOPMENT DESCRIPTION

Liscove Limited intend to apply to An Bord Pleanála for permission for a strategic housing development at this c. 10.8 Ha site at lands at Wayside, Enniskerry Road and Glenamuck Road, Kiltarnan, Dublin 18, which include a derelict dwelling known as 'Rockville' and associated derelict outbuildings, Enniskerry Road, Kiltarnan, Dublin 18, D18 Y199. The site is generally bounded by the Glenamuck Road to the north; Kiltarnan Country Market and the Sancta Maria property to the north and west; a recently constructed residential development named "Rockville" to the north-east; the Enniskerry Road to the south-west; dwellings to the south; and lands that will facilitate the future Glenamuck Link Distributor Road to the east.

Road works are also proposed to facilitate access to the development from the Enniskerry Road; to the approved Part 8 Enniskerry Road/Glenamuck Road Junction Upgrade Scheme on Glenamuck Road (DLRCC Part 8 Ref PC/IC/01/17); and to the approved Glenamuck District Roads Scheme (GDRS) (ABP Ref:HA06D.303945) on the Glenamuck Link Distributor Road (GLDR). Drainage and water works are also proposed to connect to services on the Glenamuck Road and Enniskerry Road.

At the Glenamuck Road access point, this will include works, inclusive of any necessary tie-ins, to the footpath and cycle track to create a side road access junction incorporating the provision of an uncontrolled pedestrian crossing across the side road junction on a raised table and the changing of the cycle track to a cycle lane at road level as the cycle facility passes the side road junction. Surface water and foul drainage infrastructure is proposed towards the north of the site into the drainage infrastructure to be constructed as part of the Part 8 scheme. Potable water is to be provided from the existing piped infrastructure adjacent to the site along Glenamuck Road. These interfacing works are proposed on an area measuring c. 0.05 Ha.

At the GLDR access point, this will include works, inclusive of any necessary tie-ins, to the footpath and cycle track to create a side road access junction incorporating the provision of short section of shared path and an uncontrolled shared pedestrian and cyclist crossing across the side road junction on a raised table. The works will also include the provision of a toucan crossing, inclusive of the necessary traffic signal equipment, immediately south of the access point to facilitate



pedestrian and cyclist movement across the mainline road. All works at the GLDR access point will include the provision of the necessary tactile paving layouts and are provided on an area measuring c. 0.06 Ha.

At the Enniskerry Road, works are proposed to facilitate 3 No. new accesses for the development along with modifications to Enniskerry Road. The 3 No. side road priority access junctions incorporate the provision of an uncontrolled pedestrian crossing across the side road junction on a raised table. The modifications to Enniskerry Road fronting the development (circa 320 metres) includes the narrowing of the carriageway down to 6.5 metres (i.e. a 3.25 metres running lane in each direction) from the front of the kerb on western side of Enniskerry Road. The remaining former carriageway, which varies in width of c. 2 metres, will be reallocated for other road users and will include the introduction of a widened pedestrian footpath and landscaped buffer on the eastern side of the road adjoining the proposed development. The above works are inclusive of all necessary tie-in works such as new kerb along eastern side of Enniskerry Road, drainage details, road marking, signage and public lighting. Potable water is to be provided from the existing piped infrastructure adjacent to the site along the Enniskerry Road. The interface works on Enniskerry Road measures c. 0.19 Ha.

Surface water and foul drainage infrastructure is proposed to connect into and through the existing/permitted Rockville developments (DLR Reg. Refs. D17A/0793, D18A/0566 and D20A/0015) on a total area measuring c. 0.09 ha. The development site area and drainage and roads works areas will provide a total application site area of c. 11.2 Ha.

The development will principally consist of: the demolition of c. 573.2 sq m of existing structures on site comprising a derelict dwelling known as 'Rockville' and associated derelict outbuildings; and the provision of a mixed use development consisting of 383 No. residential units (165 No. houses, 118 No. duplex units and 100 No. apartments) and a Neighbourhood Centre, which will provide a creche (439 sq m), office (317 sq m), medical (147 sq m), retail (857 sq m), convenience retail (431 sq m) and a community facility (321 sq m). The 383 No. residential units will consist of 27 No. 1 bedroom units (19 No. apartments and 8 No. duplexes), 128 No. 2 bedroom units (78 No. apartments and 50 No. duplexes), 171 No. 3 bedroom units (108 No. houses, 3 No. apartments and



60 No. duplexes] and 57 No. 4 bedroom units [57 No. houses]. The proposed development will range in height from 2 No. to 5 No. storeys (including podium/undercroft level in Apartment Blocks C and D and in the Neighbourhood Centre).

The development also provides: pedestrian links from Enniskerry Road and within the site to the neighbouring "Rockville" development to the north-east and a pedestrian/cycle route through the Dingle Way from Enniskerry Road to the future Glenamuck Link Distributor Road; 678 No. car parking spaces (110 No. in the undercroft of Blocks C and D and the Neighbourhood Centre and 568 No. at surface level) including 16 No. mobility impaired spaces, 73 No. electric vehicle spaces, 1 No. car share space, 4 No. drop-off spaces/loading bays; motorcycle parking; bicycle parking; bin storage; the decommissioning of the existing telecommunications mast at ground level and provision of new telecommunications infrastructure at roof level of the Neighbourhood Centre including shrouds, antennas and microwave link dishes (18 No. antennas and 6 No. transmission dishes, all enclosed in 9 No. shrouds together with all associated equipment); private balconies, terraces and gardens; hard and soft landscaping; sedum roofs; solar panels; boundary treatments; lighting; substations; plant; and all other associated site works above and below ground. The proposed development has a gross floor space of c. 43,120 sq m in addition to undercroft levels (under Apartment Blocks C and D measuring c. 1,347 sq m and under the Neighbourhood Centre measuring c. 2,183 sq m, which includes parking spaces, external storage, bin storage, bike storage and plant).



SITE LOCATION/LAYOUT MAP

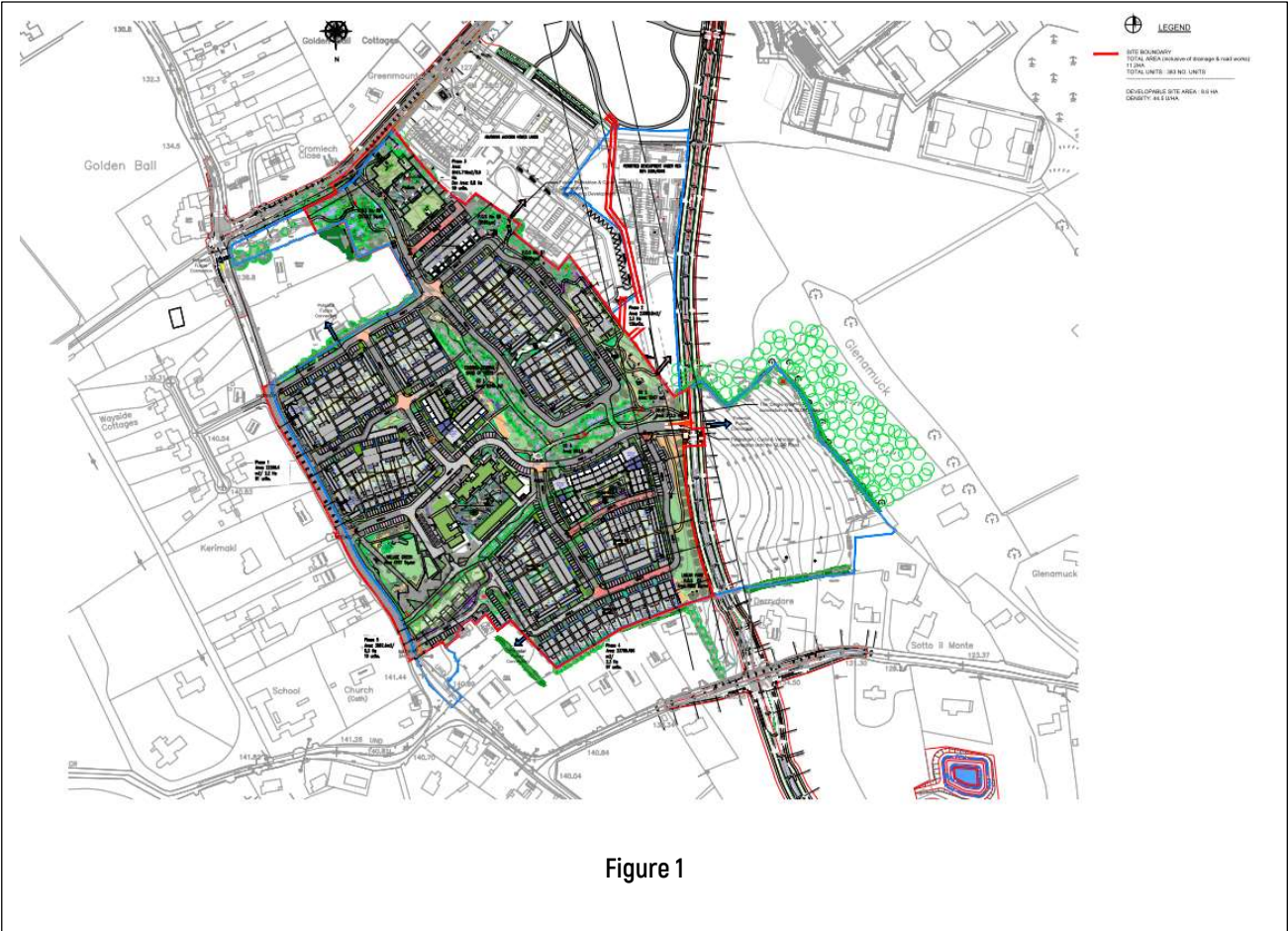


Figure 1



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.

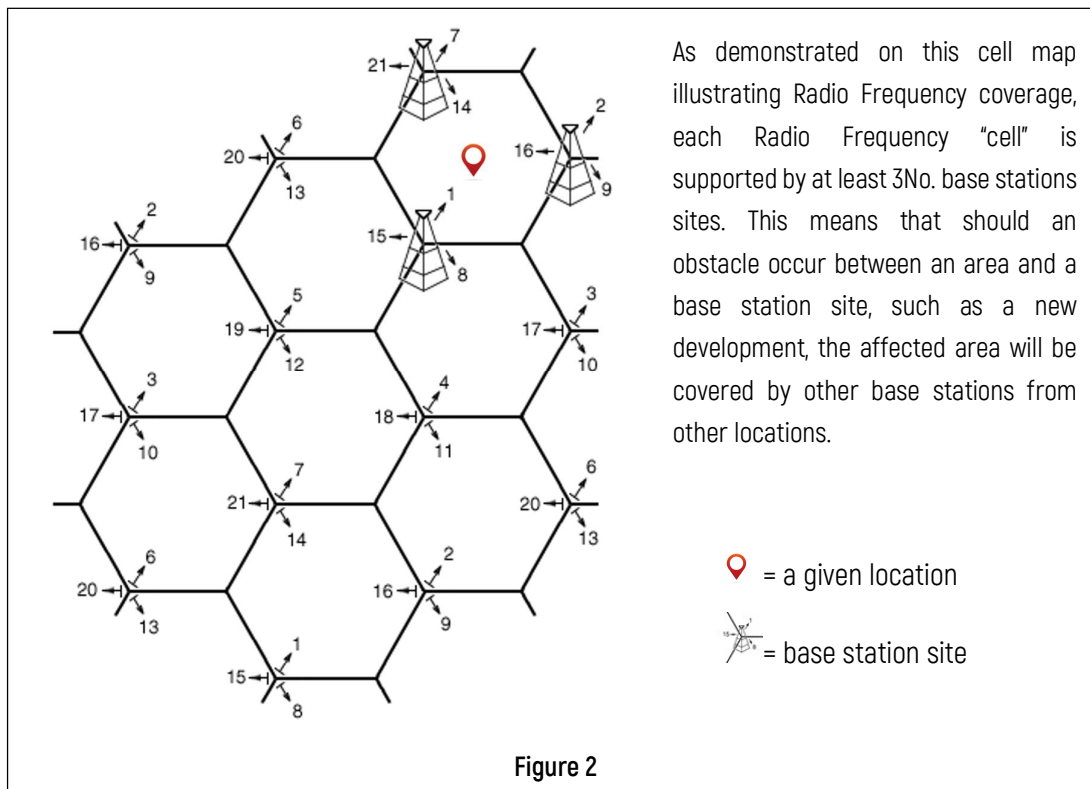
Radio Frequency links & Microwave Transmission Links are used in Ireland's mobile phone and fixed wireless networks and disseminate at an average above ground level height of 20m, making them the most relevant Telecommunication Channels to be assessed in relation to the height and scale of a new development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

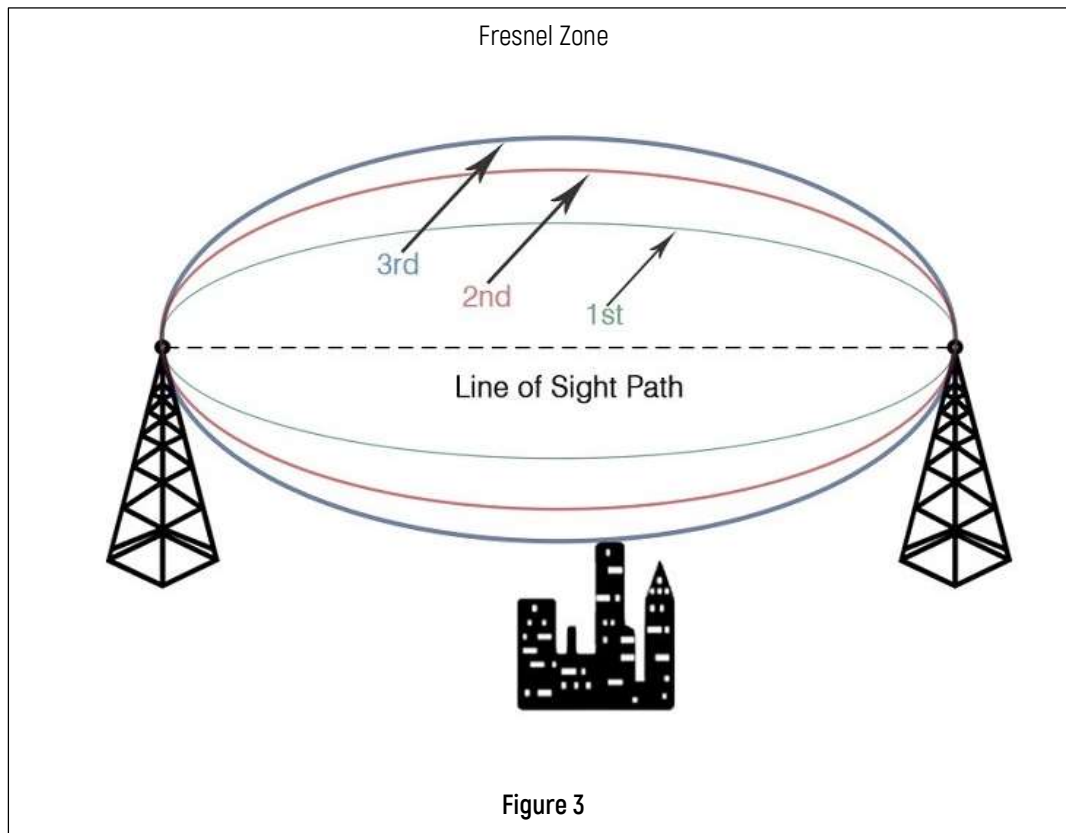




Cellular networks offer a number of desirable features, but most notably, additional cell towers can be added indefinitely and are not limited by the horizon, therefore it can be considered **indeterminable** as to whether a new development affects the Radio Frequency coverage of a geographical area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



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 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 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.

Impacted Microwave links

- (1) 1 No. is a Microwave link installed by Eir Mobile (Meteor) oriented at 43°
- (2) 1 No. is a Microwave link installed by Three Ireland. oriented at 300° (approximately)

Impacted Radio Frequency links

- (1) 3 No. Radio Frequency links installed by Eir Mobile (Meteor)
- (2) 3 No. Radio Frequency links installed by Three Ireland

The azimuths for both Eir and Three are 80° 200° & 320° azimuth respectively

The 2 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 businesses and residential neighborhood in the wider local Kiltarnan area. Refer to Figure 4

These Microwave links are situated at an above ground level height of 17.2m (AGL) and therefore the Fresnel zone of each will be diffracted by the height of the Development. The proposed heights sought within the Development will cause significant diffraction to these Microwave links.



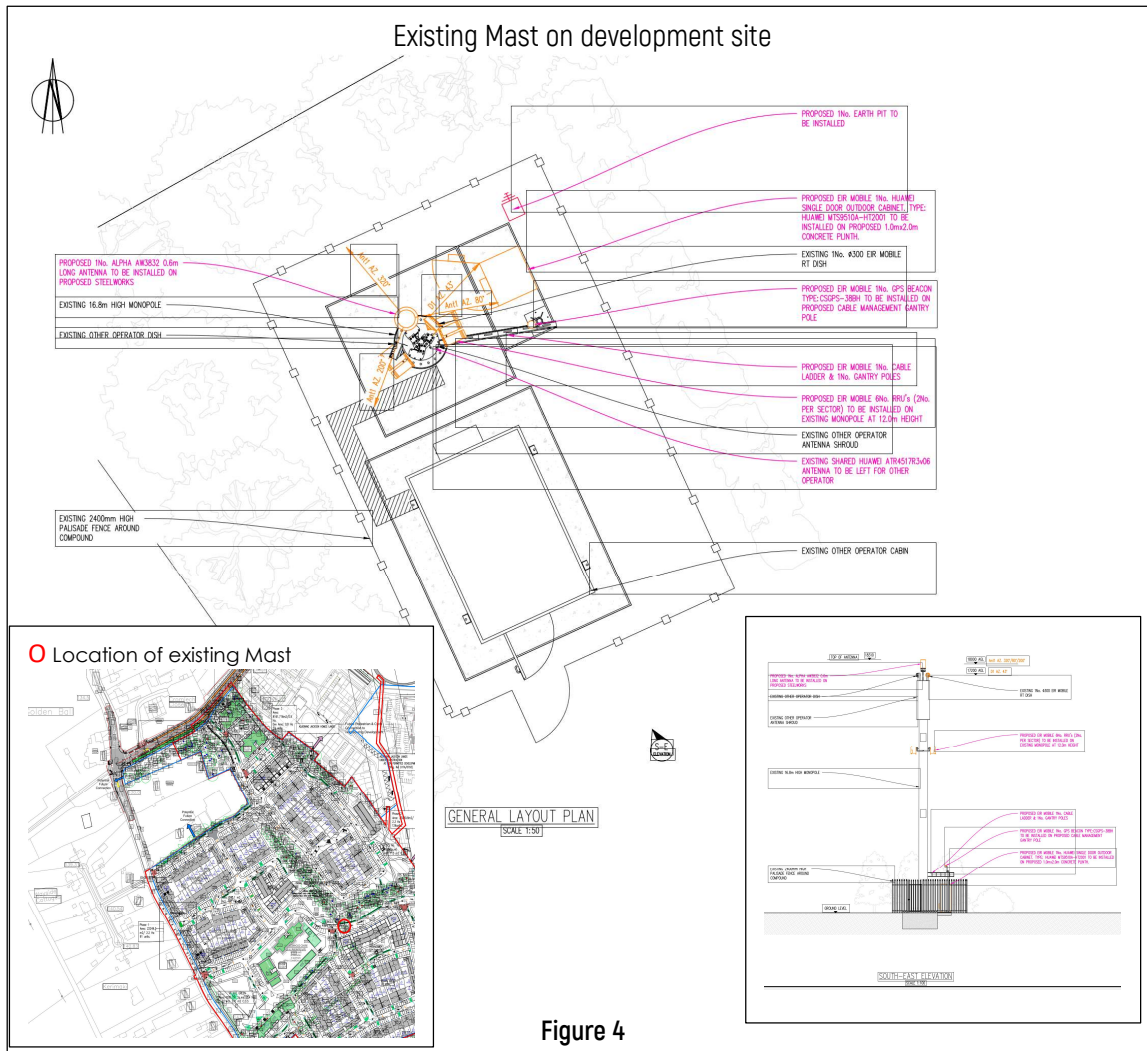


Figure 4

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 7 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 on a 360° basis, which is a typical cell pattern for urban/semi-rural Radio Frequency coverage. However, the walk test data determined that most local business, residential, and the public road areas to the north, south east and 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 within the development site boundary.

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 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 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 the lift shaft overrun on the Development's neighbourhood centre block B, rising 3metres 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 neighbourhood centre 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 (*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, as well as providing some capacity for future links that may or may not be required.

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

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 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)

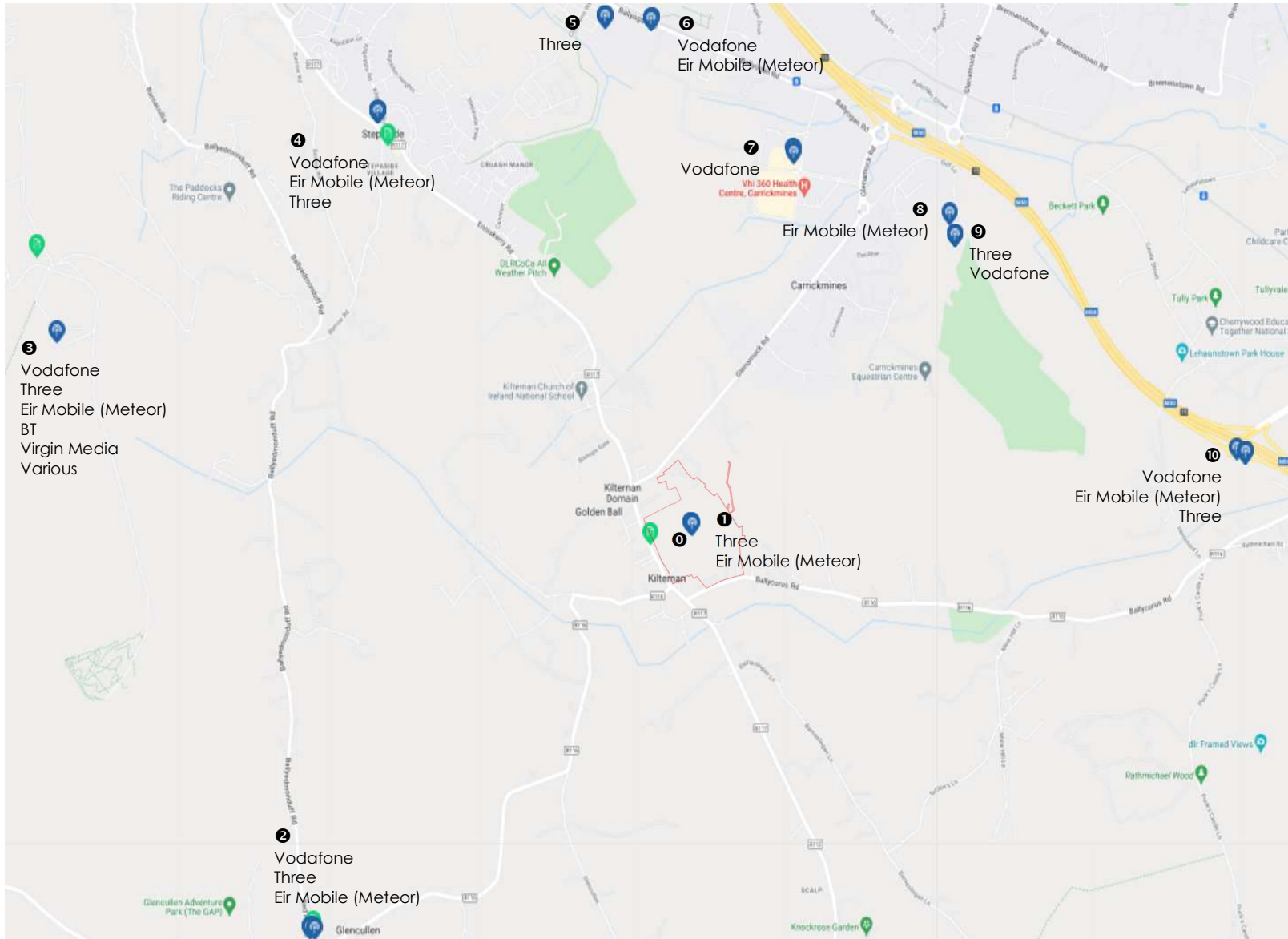
Figure 8: Mitigation Measures

Figure 9: Mitigation Measures

Figure 5

Area Telecommunication Analysis

Source: Comreg



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 Kiltiernan
- 2 Johnny Foxes
- 3 Three Rock*
- 4 Stepside Garda St
- 5 Carrickmines Bird Cage
- 6 Carrickmines ESB
- 7 Vodafone Sales Office
- 8 Golf Lane 1
- 9 Golf Lane 2
- 10 Brides Glen

*Three Rock Mountain hosts a high concentration of telecommunication channels.

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Client
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Project
 Kiltiernan Village SHD

Option	1
Report Date	06/05/22
File Name	Kiltiernan Village SHD

Drawing:
 Area Site Analysis

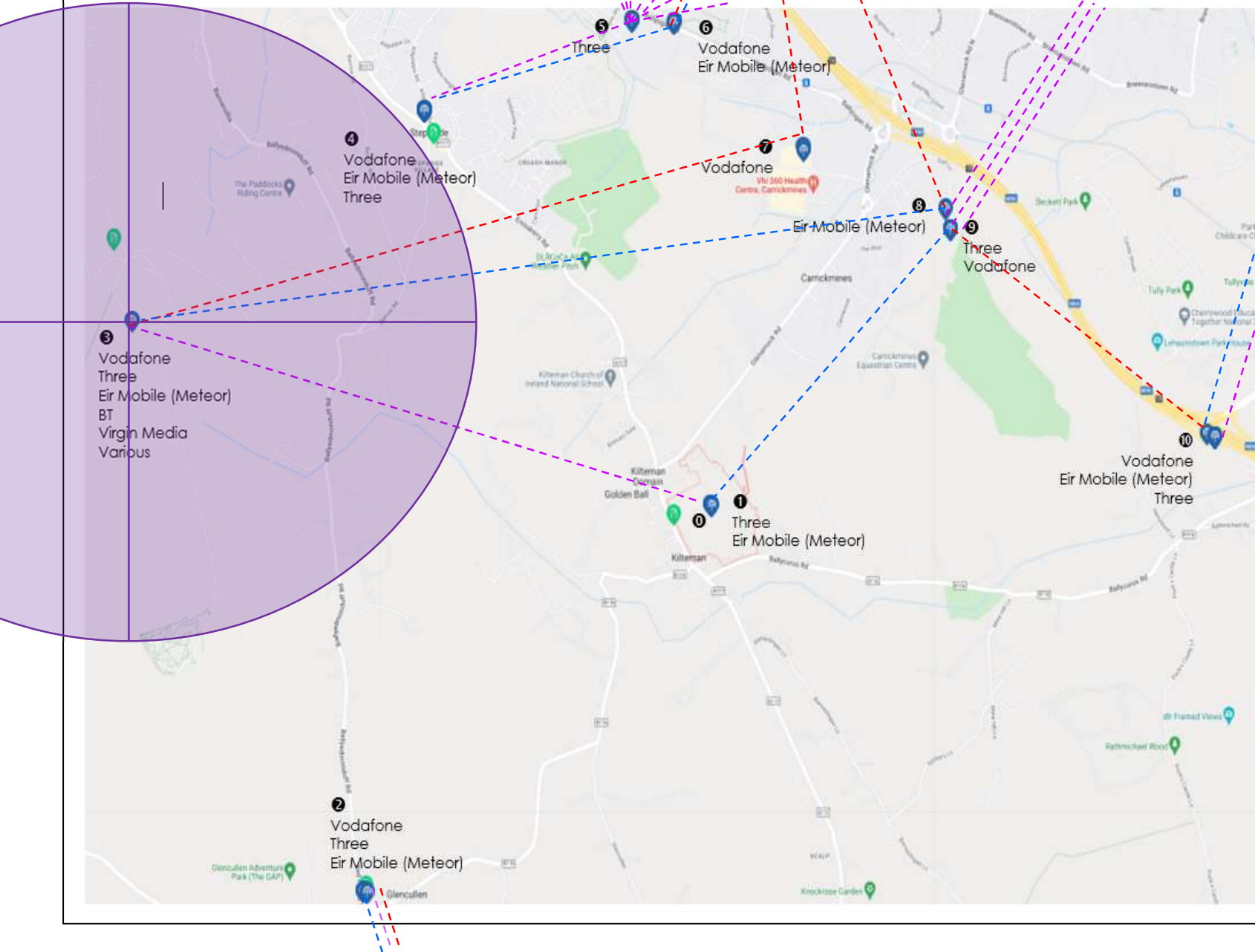
Building	Drawing No.	Zone	Rev
SPN	E 0622		1

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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



Three Rock Mountain hosts a high concentration of telecommunication channels. It is not impacted by the development because of its height which far exceeds those sought by the applicant

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Project
 Kiltamanagh Village SHD

Option	1
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Drawing:
 Link Analysis

Building	Drawing No.	Zone	Rev
SPN	E 0622		1

Figure 7

Walk 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
- ③ Golf Lane 1
- ⑨ Golf Lane 2
- ⑩ Brides Glen
- Multiple Cell IDs
- ⑤ Carrickmines Bird C.
- ⑥ Carrickmines ESB
- ⑦ Vodafone Sales Office
- ⑧ Golf Lane 1
- Multiple Cell IDs
- ① Kiltiernan
- Multiple Cell IDs
- ④ Stepside Garda St

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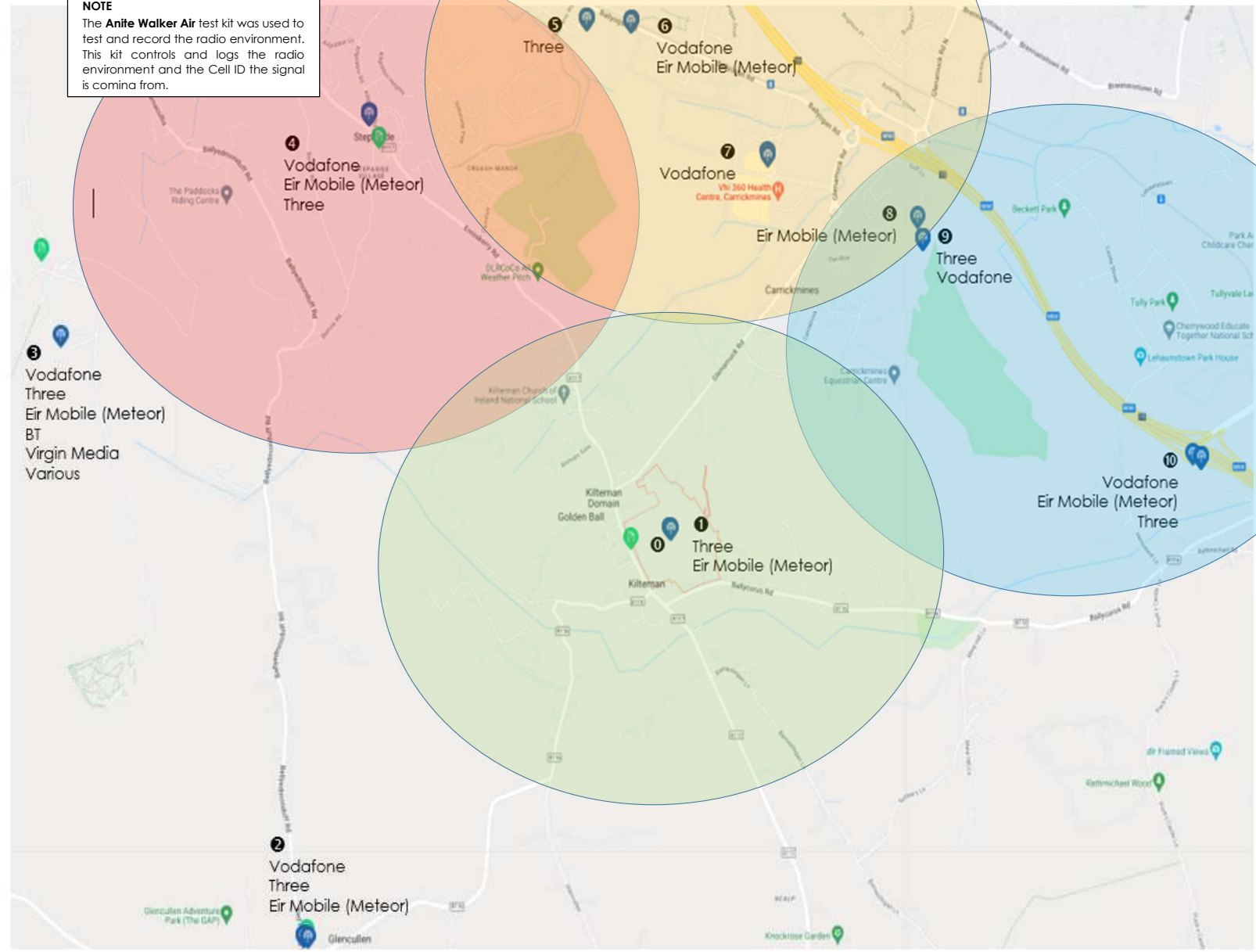
Client
 Liscove Limited
 Project
 Kiltiernan Village SHD

Option	1
Report Date	04/05/22
File Name	Kiltiernan Village SHD

Drawing:
 Cell Identification Analysis

Building	Drawing No.	Zone	Rev
SPN	E 0622		1

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.



③ Vodafone
 Three
 Eir Mobile (Meteor)
 BT
 Virgin Media
 Various

② Vodafone
 Three
 Eir Mobile (Meteor)

① Three
 Eir Mobile (Meteor)

Vodafone
 Eir Mobile (Meteor)
 Three

Vodafone
 Eir Mobile (Meteor)

Vodafone

④ Vodafone
 Eir Mobile (Meteor)
 Three

⑤ Three

⑥

⑦

⑧

⑨

Option	1
Report Date	04/05/22
File Name	Kiltiernan Village SHD

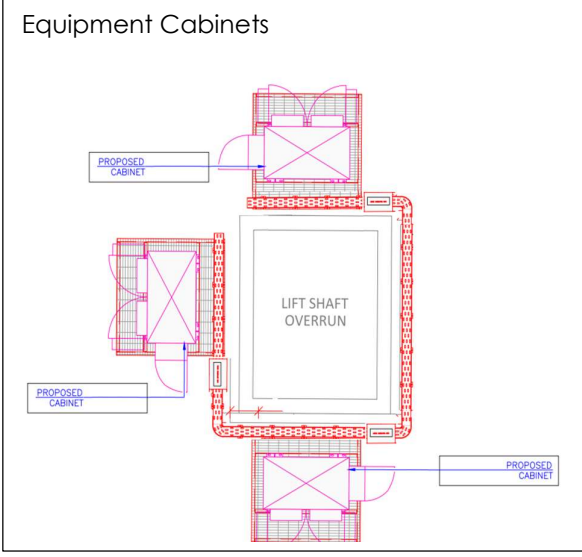
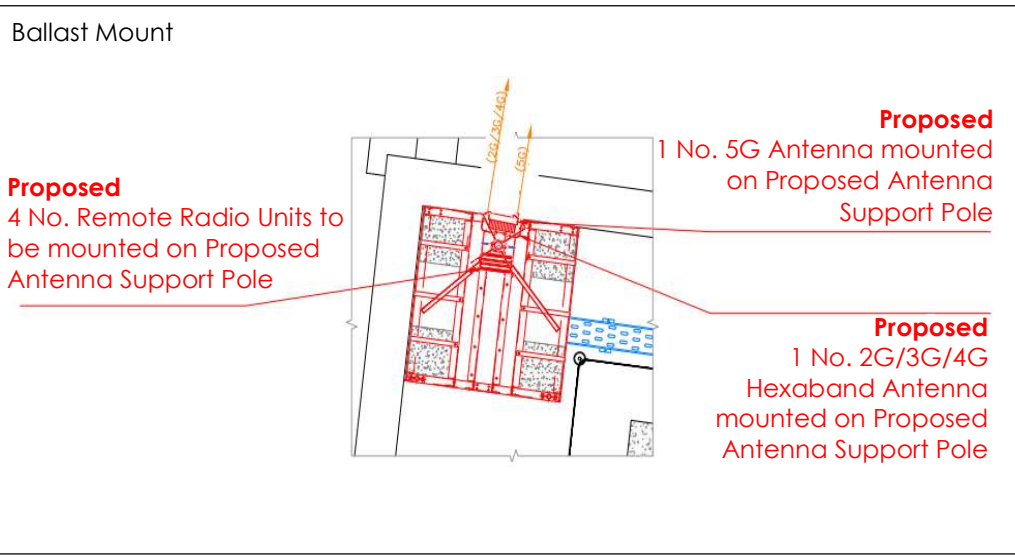
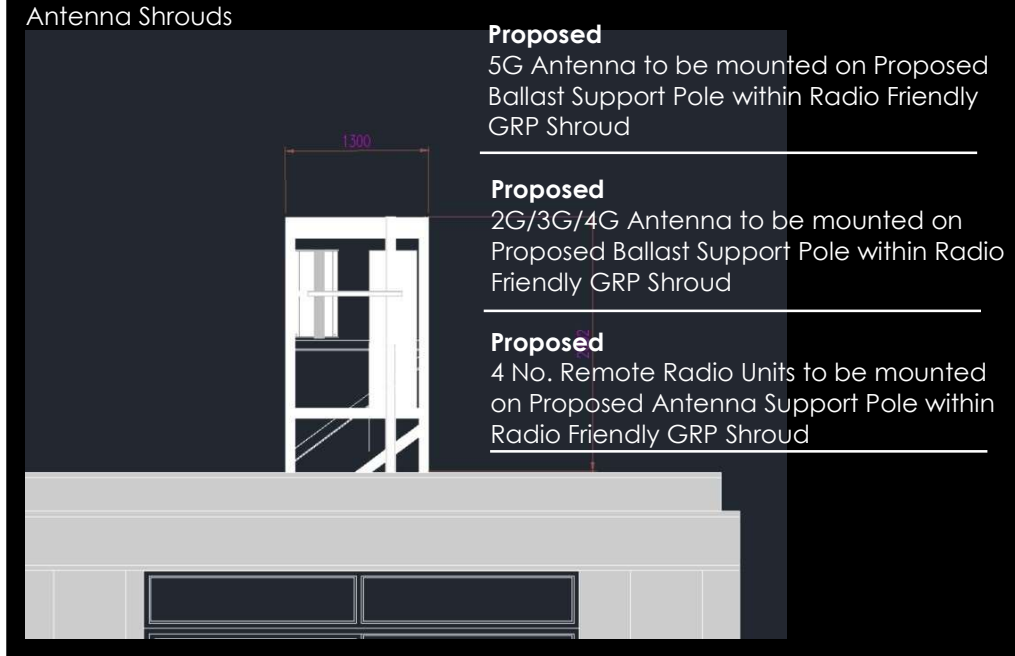
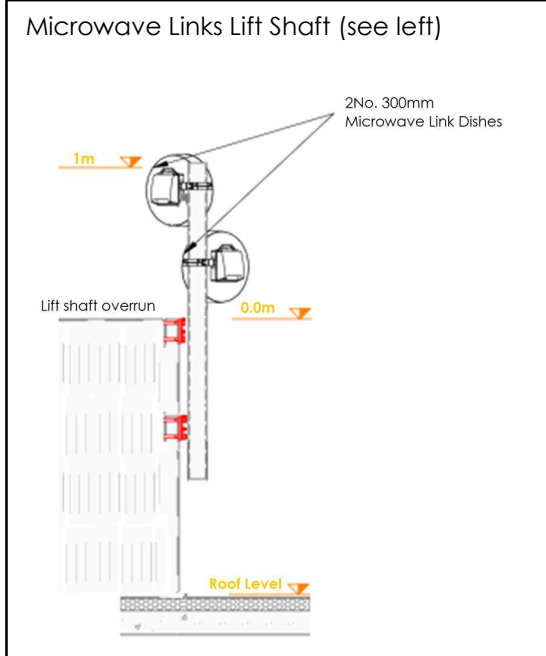
Drawing:
 Cell Identification Analysis

Building	Drawing No.	Zone	Rev
SPN	E 0622		1

Figure 8

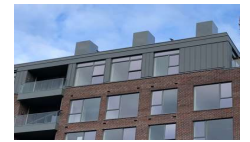
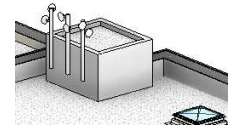
Mitigation Measure Design

Source: Comreg ISM



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

Typical Installation



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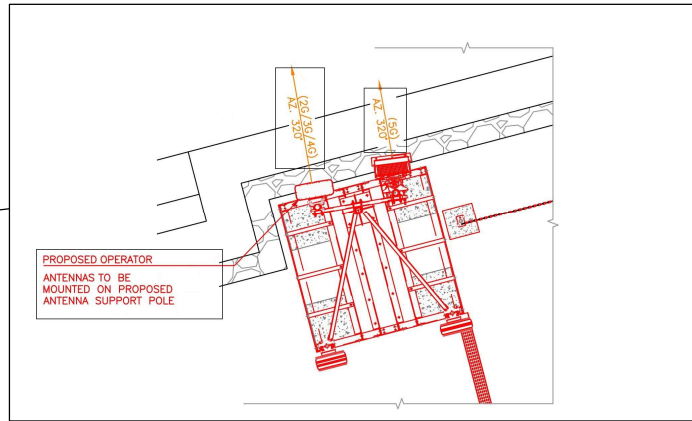
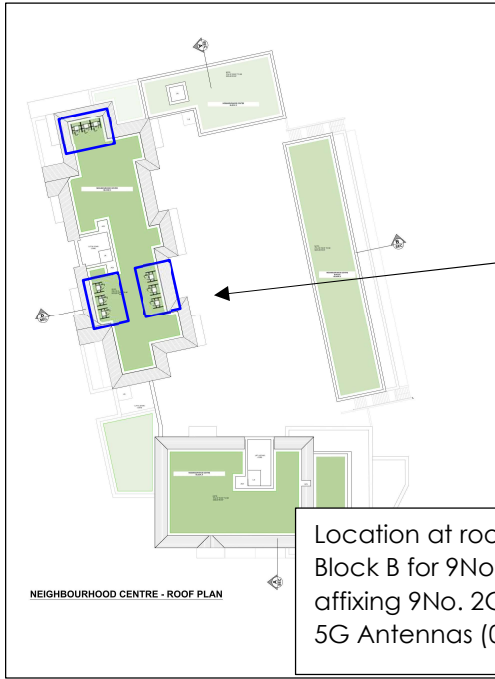
Drawing:
Mitigation Measure

Building	Drawing No.	Zone	Rev
SPN	E 0622		1

Figure 9

Mitigation Measure Design

Source: Comreg ISM



Location at roof level of Neighbourhood Centre Block B for 9No. Ballast Mounts with steel poles affixing 9No. 2G/3G/4G Antennas (2mL) & 9No 5G Antennas (0.8mL) Locations

2G/3G/4G Antennas (2mL) & 5G Antennas (0.8mL) to be mounted on Proposed Ballast Support Pole within Radio Friendly GRP Shroud



Note
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Typical Installation

- Transmission Link
- Location of Steel support Poles

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Drawing:
Mitigation Measure

Building	Drawing No.	Zone	Rev
SPN	E 0622		1

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