



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

DEVELOPMENT GREENFIELDS SWORDS LRD

04 June 2026

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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	15
DISCLAIMER	16
APPENDICES	17
SOURCE INFORMATION.....	17
AREA TELECOMMUNICATION ANALYSIS	18
MICROWAVE LINK ANALYSIS.....	19
DRIVE TEST DATA	20
CELL IMPACT	21
MITIGATION MEASURE DESIGN - ELEVATION.....	22
MITIGATION MEASURE DESIGN - EQUIPMENT.....	23

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 Fingal 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 Jackie Greene Construction Limited (hereinafter referred to as the "Applicant")
The Development:	means the proposed development situated at a site of 2.22 Ha at Greenfields, Swords Business Park, Swords, Co. Dublin (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 Jackie Greene Construction Limited (the "Applicant") within its submission to (the 'Planning Authority'), 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 Authority 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 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 station 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

The proposed development consists of a mixed-use development that constitutes a 'Large-Scale Residential Development' (LRD) at this site of 2.22 Ha principally located at Swords Business Park, Swords, Co. Dublin. The site is principally bound: to the north by an access road and ancillary car park to serve Swords Business Park; to the east by the M1 Motorway; to the south by Mantua Road; and to the west by an access road to serve Swords Business Park. The application site also extends to include parts of: the access road to the north and west for footpath, landscape and foul drainage connection works; Mantua Road to the west for foul drainage connection works; and the green strip to the south at Mantua Road for a pedestrian and cyclist connection.

Permission is sought for a mixed-use development with a gross floor area of 30,358 sq m and principally comprised in 5 No. blocks (A-E), with heights ranging from 1 No. to 9 No. storeys. The proposed block heights are as follows: Block A is 6 No. to 7 No. storeys; Block B is 6 No. to 7 No. storeys; Block C is 6 No. to 7 No. storeys; Block D is 6 No. to 9 No. storeys; and Block E is 1 No. to 9 No. storeys. The development consists of: 289 No. residential apartments (60 No. 1-bed, 200 No. 2-bed and 29 No. 3-bed); retail/commercial unit (701 sq m); and crèche (418 sq m) with outdoor play area (42 sq m).

Permission is also sought for: new multi-modal site entrance to the west; minor relocation of existing northern site entrance to the east; internal road, cycle and footpath network; 132 No. car parking spaces; 13 no. motorcycle parking spaces; cycle parking; hard and soft landscaping, including public open space, communal amenity space (at-grade and as roof gardens atop Block D and Block E) and incidental open space; private amenity space as balconies and terraces facing all directions; public lighting; bin stores; plant rooms; 2 No. sub-stations; green roofs; rooftop plant, PV panels, telecommunications infrastructure, lift overruns and automatic opening vents; and all associated works above and below ground.



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.

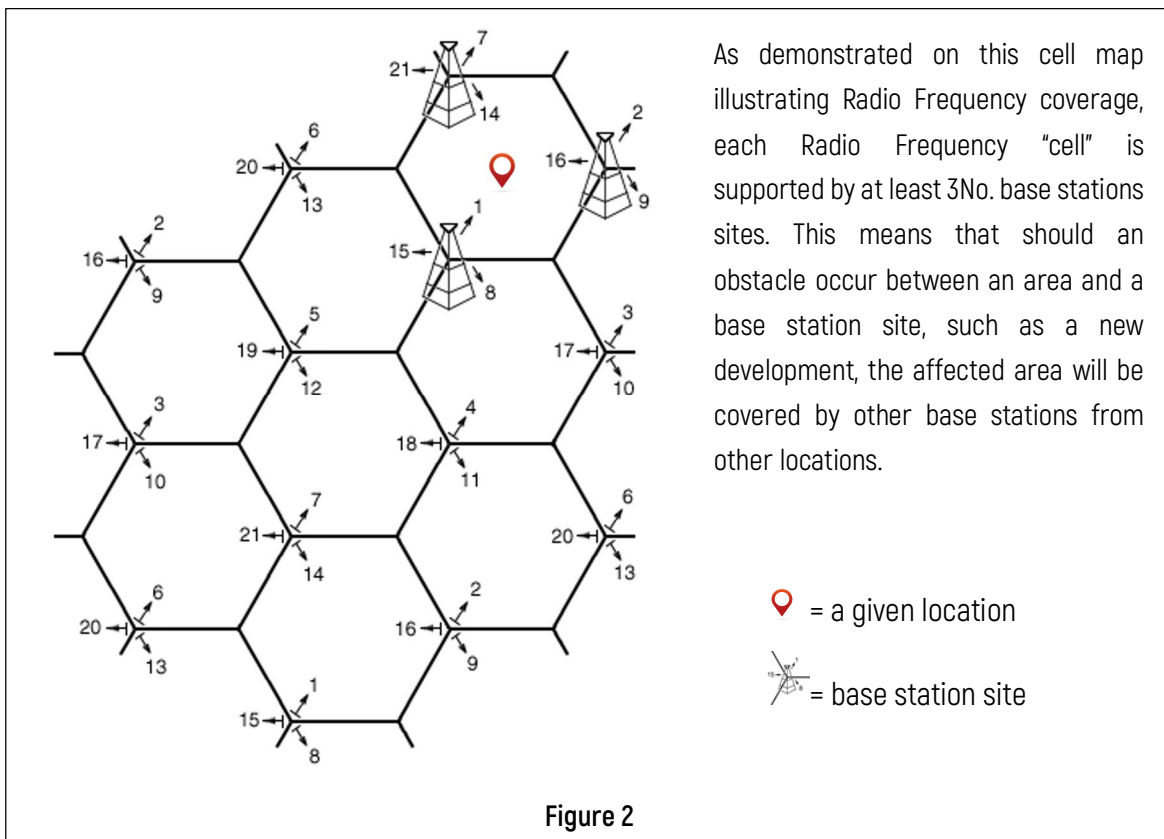
Radio Frequency links & Microwave Transmission Links are used in Ireland's mobile phone and fixed wireless networks and disseminate at an average above ground level height of 20m, making them the most relevant Telecommunication Channels to be assessed in relation to the height and scale of a new development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

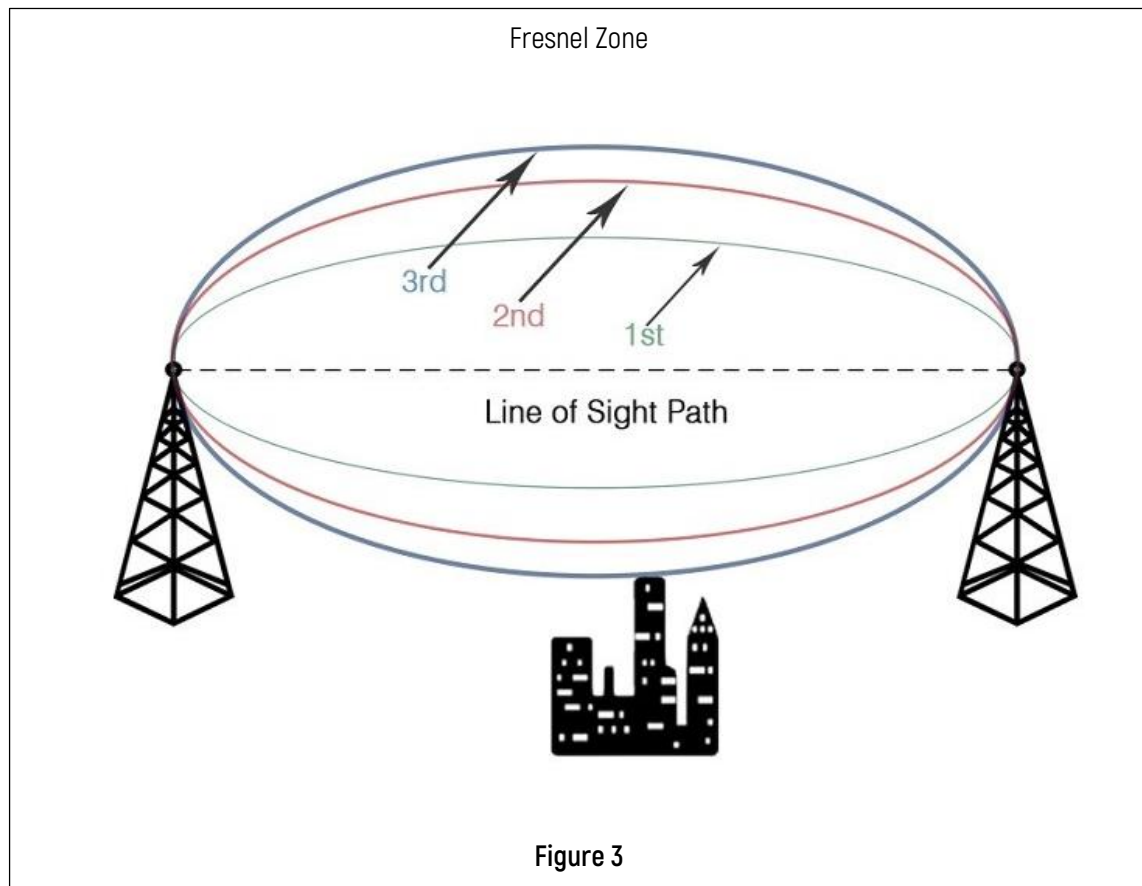




Cellular networks offer a number of desirable features, but most notably, additional cell towers can be added indefinitely and are not limited by the horizon, therefore it can be considered **indeterminable** as to whether a new development affects the Radio Frequency coverage of a geographical area 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 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 multi operator cells** in a suitable proximity to the Development, that would be adequate to support the proposed level of occupation. Currently, there are cells at a range of distances to the Development which are considered insufficient to provide coverage for a population density intended to exceed more than 750 occupants living working and residing. The drive test data determined that most of the local businesses (light industrial/business or otherwise), residential, and the public road and amenity areas to the north and south of the development site receive below optimal signal from the Radio Frequency links emanating from telecommunication antenna sites located up to 840m from the development site to the north by northwest 1.26km to the south by the southeast, up to 1.26km to the west by southwest, and an

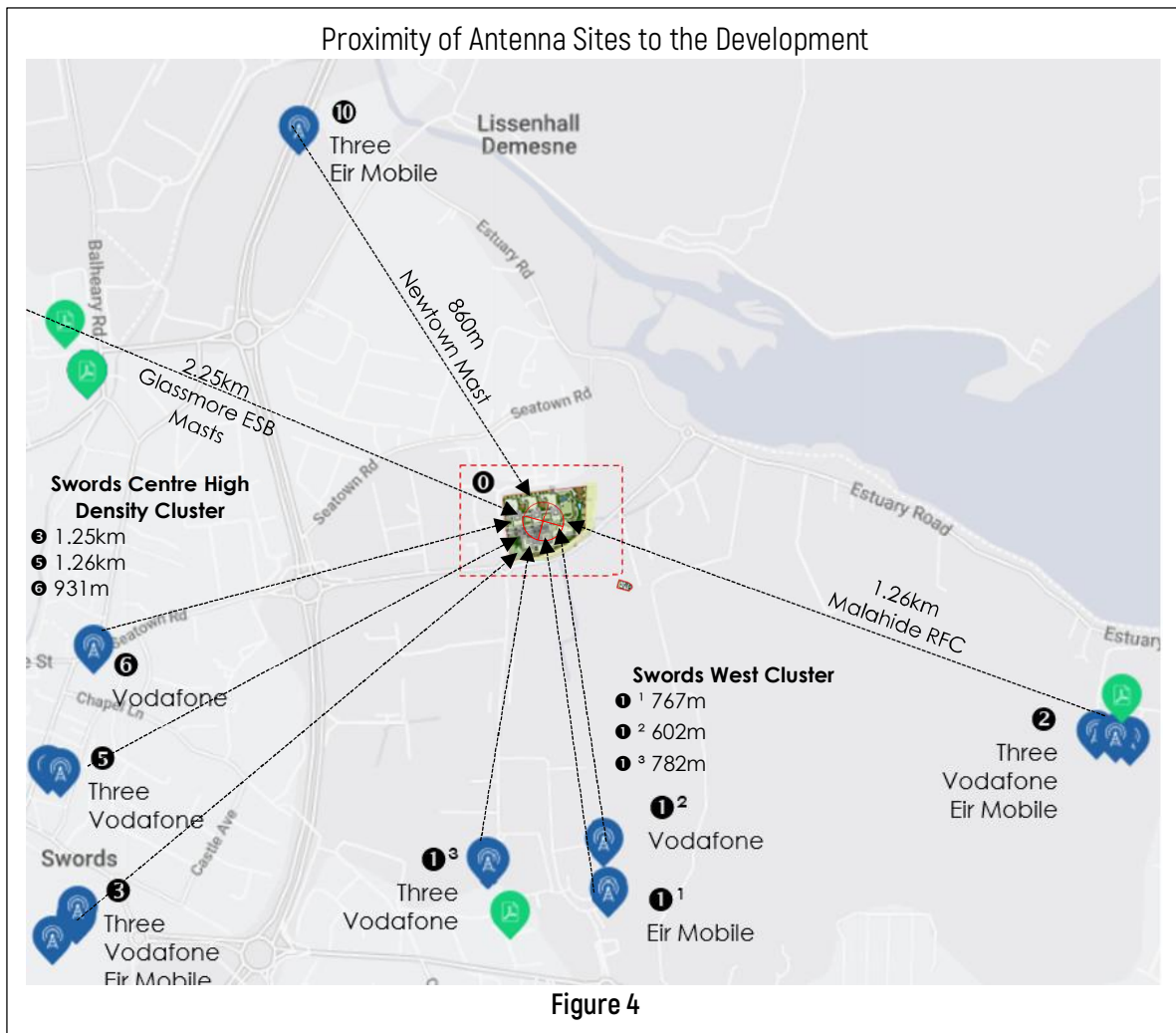


average distance of 717m to the south of the development site. The antenna sites within the Swords Centre High Density cluster to the southwest of the development site should be considered 'area specific' and are likely to be operating at, or close to capacity, supporting the population footfall within the immediate local area they serve. These antennas sites are not designed to provide coverage beyond a 500m radius, especially on the high frequency bands used for LTE and 5G. This can equally be said for the other cell sites located in their current positions. These locations/positions are selected to support and provide coverage for the population, footfall and vehicular traffic within the immediate local area they are serving. It should also be noted that several of the sites identified herein are not multi-operator. We identified that of the 9 closest sites to the Development, only 3 are multi-operator. Therefore, the obvious conclusion is that the addition of the Development into the existing radio environment, with its proposed/intend occupation levels, will result in the dramatic shrinkage of the cells for these surrounding/neighboring antenna sites, leaving large pockets including but not limited to the Development itself devoid of cellular coverage. Please refer to Figure 4 herein.

By way of comparison, a typical cell pattern for urban Radio Frequency coverage, has antenna sites at distances from each other ranging from 250 to 500 meters depending on the population density. The technological prerequisite is to apply mobile cellular sites (1 per Mobile Network Operator) to 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 - 2,000 head of population.

Our assessment recorded an average indoor coverage, at the current population levels, signal levels of -99db to 105-db for Three and Eir mobile networks and ≥ 115 db for Vodafone, in buildings and outdoor locations within the adjacent Swords Business Park. With -85db being the benchmark optimal coverage signal, anything over -100db is considered sub-optimal. Being that population density is a huge factor related to signal level and quality; it is our view that existing limited mobile signal conditions will become weaker and will be significantly impacted as the

area is continuously developed. This conclusion is also not taking into account other permitted (or to be permitted) undeveloped schemes in the local area.



Data collected¹ from recent projects of similar scale and density in areas urban and suburban to Dublin, that have completed and reached occupational status within the last 5 years shows a significant lack of coverage, particularly indoor or internal coverage, due to the deterioration of existing cells which significantly contracted as population density increased. This can even be said of locations whereby mast sites are situated 500 - 800m away. In these areas, data overwhelmingly demonstrates that the ability to make a voice call to emergency services from an internal location within the given development (we tested) is extremely limited if not non-existence.

It is therefore our finding that the local area is currently 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 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 believe the findings herein support a technical justification for a new telecom site to be included in the Development strategy, thus providing for the retention of important Telecommunication Channels (Mitigation Measures).

We have set out the impact to the area within 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 at roof level of Block E, each rising 3 metres above parapet level. These support poles are sufficient to accommodate 1No. 2m 2G/3G/4G antenna & 1No. 5G antenna each.
- 6No. Ø0.3m Microwave links mounted on steel support poles affixed to the rear of the ballast mounts.
- Together with all associated telecommunications equipment and cabinets
- To reduce the visual impact of the infrastructure, the support poles used for the antennae will be installed within Radio friendly GRP shrouds.

This will 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.

Please refer to Figure 9 & 10 of the appendices for full analysis and installation parameters for all the proposed new telecommunication infrastructure set out herein.

ISM can therefore conclude that the proposal being made by the Applicant within its submission to Fingal County Council 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).

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

Figure 8: Cell Impact

Figure 9: Mitigation Measures

Figure 10: Mitigation Measures

SOURCE INFORMATION

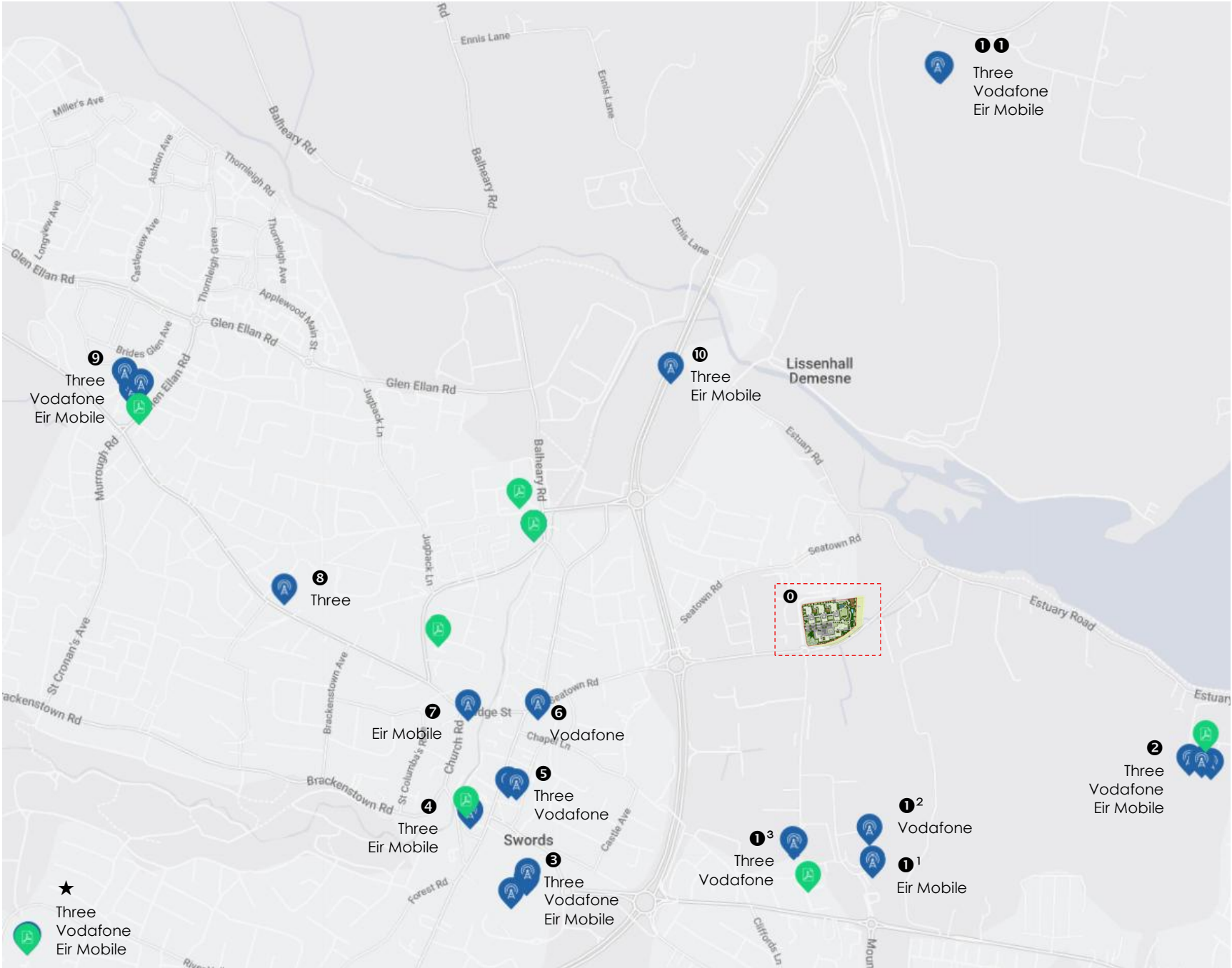
- ¹ The data reference in our findings, from recent projects of similar scale and density in areas urban and suburban to Dublin, was collected by the Author pursuant to carrying out various internal cellular signal drive tests for a large sample of residential and commercial buildings predominantly within the following urban centric local authorities: Dublin City Council; Fingal County Council; South Dublin County Council; Dun Laoghaire Rathdown County Council, and Galway City Council which govern significant proportion of population density within the state.

The data was collected using the Nextivity **COMPASS XR** Scanning receiver tool for site survey & installation and testing. The COMPASS XR scanning receiver can be used globally to deploy and verify multiple technologies, including 5G New Radio networks in sub-6 GHz spectrum, LTE, CBRS, and LMR public safety coverage.

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 Swords West
- 1 A&T
- 2 CH Robinson
- 3 Seamount ESB Mast
- 2 Malahide RFC
- 3 Pavilion Shopping Centre
- 4 Colour trend Mast
- 5 The Plaza
- 6 Fingal CC
- 7 Care Choice N-home
- 8 Swords Shopping Centre
- 9 Glassmore ESB
- 10 Newtown Mast
- 11 Lissenhall Mast
- ★ River Valley SC

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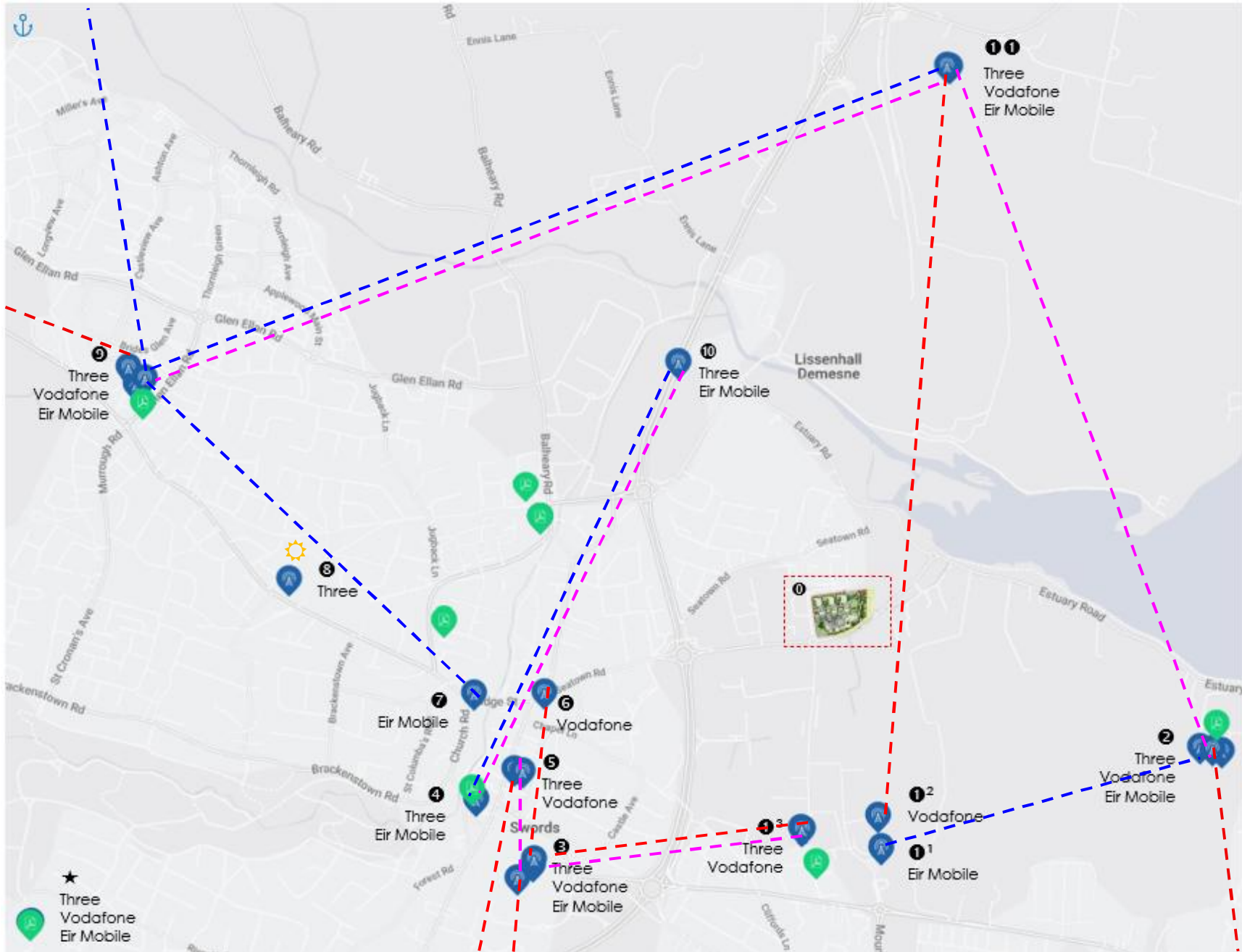
Project
Greenfields Swords LRD

Option	1
Report Date	17/11/2025
File Name	Greenfields Swords LRD

Drawing:
Area Site Analysis

Building	Drawing No.	Zone	Rev
SPN	K 2025		1

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Note
All Dimensions to be checked on site
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- Three Transmission Link
- Vodafone Transmission Link
- Eir Transmission Link

Fibre Transmission link

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Drawing:

Link Analysis

Building	Drawing No.	Zone	Rev
SPN	K 2025		1

Figure 7

Drive Test Data

Source: Comreg, ISM

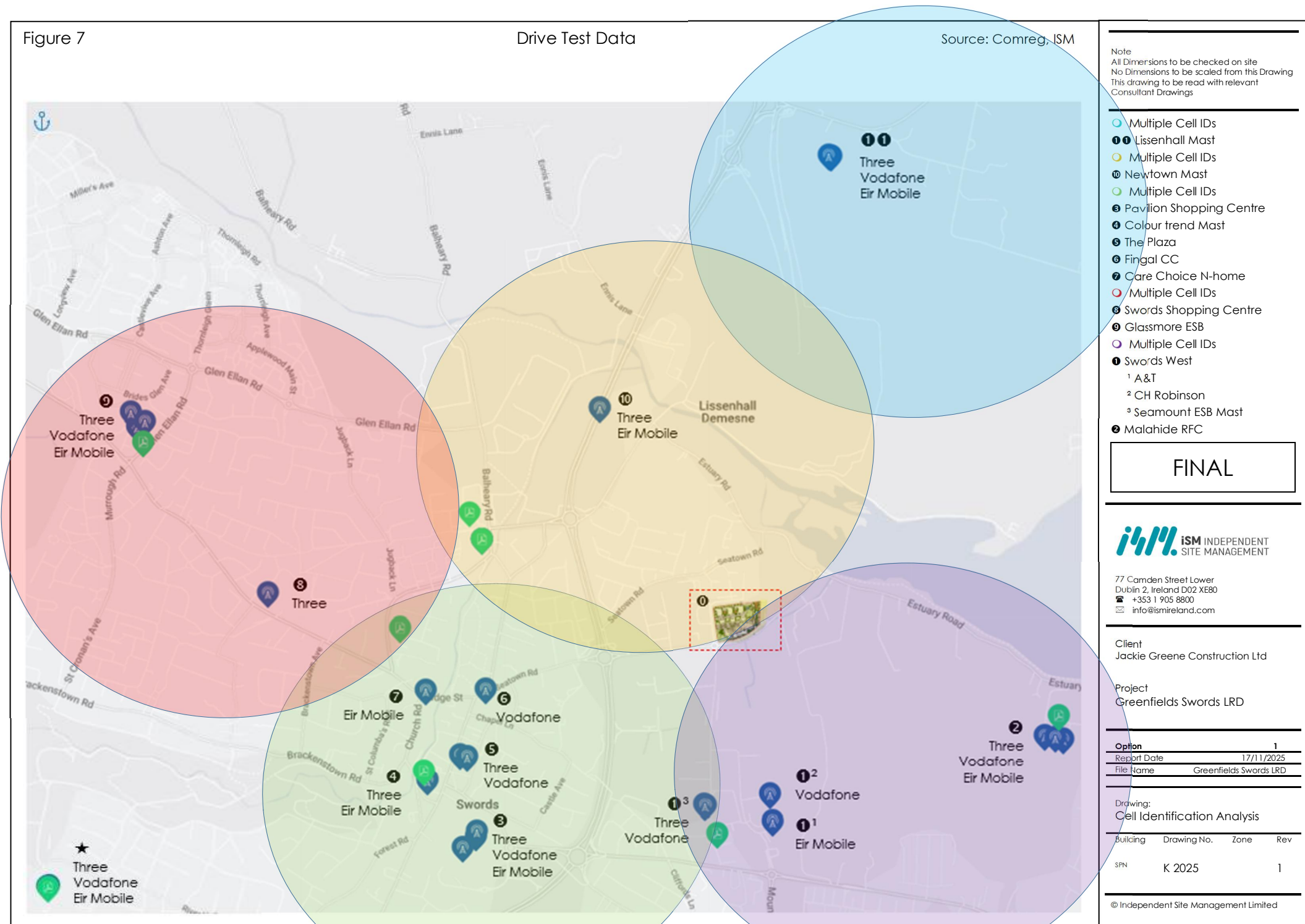
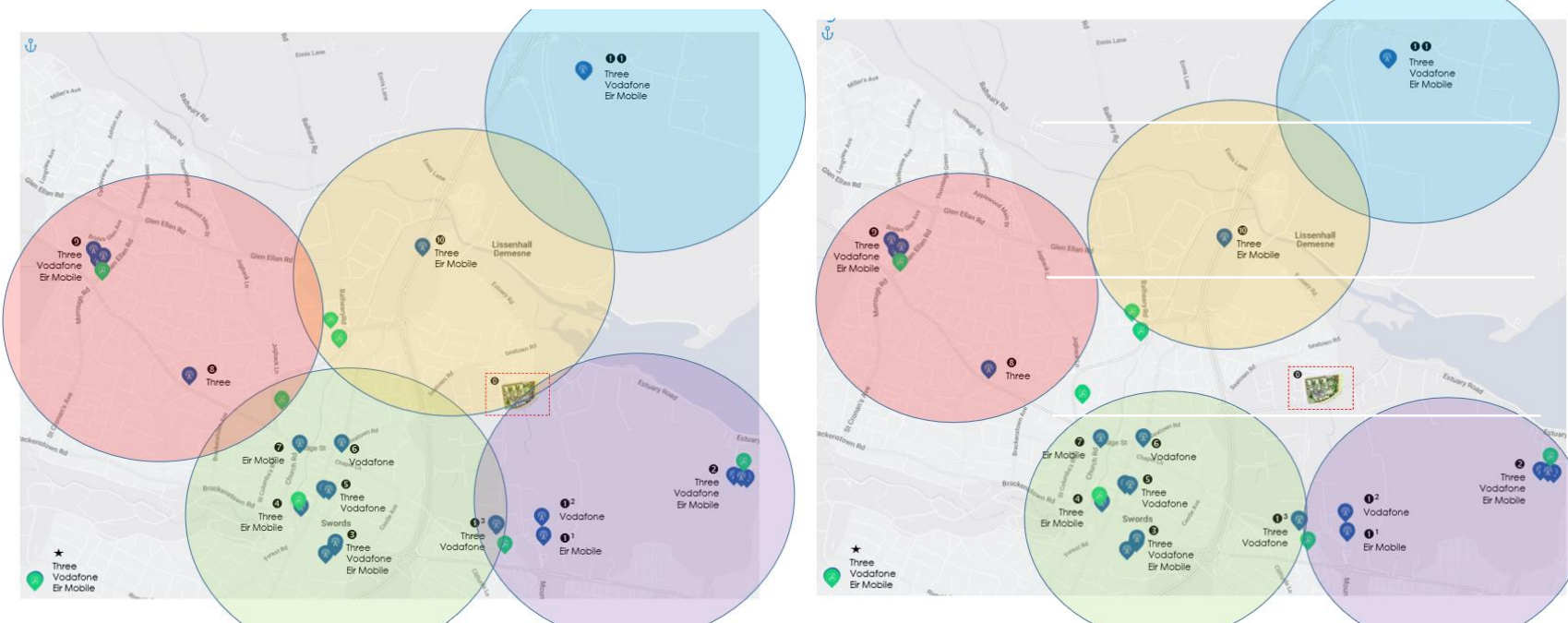


Figure 8

Cell Impact

Source: Comreg ISM



Coverage Cells recorded November 2025

Coverage Cells Prediction POST Development

The increase in the population created by the population will cause the local area cells to shrink and areas both within the proposed development as well as areas outside the Development, will see a large reduction in coverage for voice and data services from all of Ireland's 3 mobile network providers

Note
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Drawing:
Mitigation Measure

Building	Drawing No.	Zone	Rev
SPN	K 2025		1

Figure 9

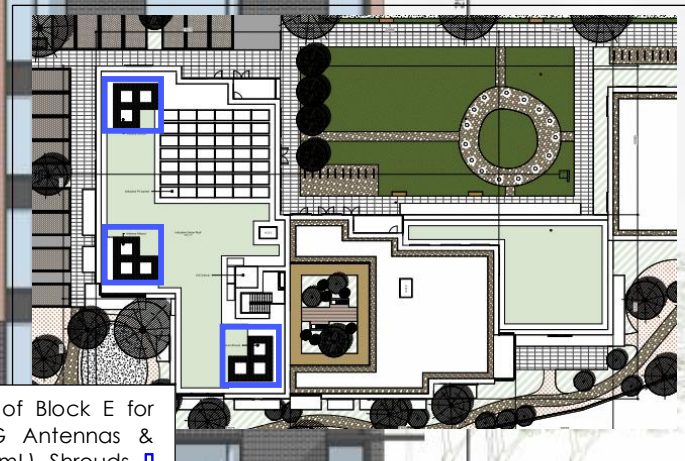
Mitigation Measure Design Elevation

Source: Comreg IS



2G/3G/4G Antennas (2mL) & 5G Antennas (0.8mL) to be mounted on steel support poles affixed to ballast mounts shrouded in GRP Radio friendly material

Locations at roof level of Block E for affixing 9No. 2G/3G/4G Antennas & 9No. 5G Antennas (0.8mL) Shrouds  **Locations**



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

9No. support poles, affixed to ballast mounts at roof level of Block E, each rising 3 metres above parapet level. These support poles are sufficient to accommodate 1No. 2m 2G/3G/4G antenna & 1No. 5G antenna each.

6No. Ø0.3m Microwave links mounted on steel support poles affixed to the rear of the ballast mounts.

Together with all associated telecommunications equipment and cabinets

To reduce the visual impact of the infrastructure, the support poles used for the antennae will be installed within Radio friendly GRP shrouds.

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Drawing:
Mitigation Measure

Building	Drawing No.	Zone	Rev
SPN	K 2025		1

Figure 10

Mitigation Measure Design - Equipment

Source: Comreg IS



Note
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Consultant Drawings

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6No. Ø0.3m Microwave links
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mounts.

Together with all associated
telecommunications equipment
and cabinets

To reduce the visual impact of the
infrastructure, the support poles
used for the antennae will be
installed within Radio friendly GRP
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Mitigation Measure

Building	Drawing No.	Zone	Rev
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