





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

DEVELOPMENT CORRIB CAUSEWAY PHASE 1, DYKE ROAD, GALWAY – Submission

24 February 2025

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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 Pleanàla (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.
Report Date:	means the date which the assessment was carried out (hereinafter referred to as "Report Date")
Telecommunication Channels:	means Radio Frequency links & Microwave Transmission links (hereinafter referred to as "Telecommunication Channels")
The Applicant:	means Galway City Council (hereinafter referred to as the "Applicant")
The Development:	means the proposed development situated at Corrib Causeway Phase 1, Dyke Road, Galway (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 Galway City Council (the "Applicant") within its submission to An Bord Pleanàla (the 'Planning Body') 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 Chapter 3, Section 3.2 of the Urban Development and Building Height Guidelines as referenced in Chapter 1, Section 1.8.5 of the Galway City Council City Development Plan 2023-2029.

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 Body 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 Chapter 3, Section 3.2 of the Urban Development and Building Height Guidelines as referenced in Chapter 1, Section 1.8.5 of the Galway City Council City Development Plan 2023-2029.



# 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 proposal will consist of the construction of a new residential development of 219 no. apartment units and a childcare facility (approx. 241 sq m) in the form of 1 no. new residential block (5 - 9 storeys over lower ground floor level) with associated car parking, bicycle parking, public and communal open spaces, and all ancillary works on a site area of 1.144 ha.

The development will provide for:

- a) 219 no. residential apartment units (109 no. 1-bedroom units, 100 no. 2-bedroom units and 10 no. 3-bedroom units) each with an associated private open space area in the form of a balcony/terrace.
- b) A new raised pedestrian boardwalk along the western elevation of the building.
- c) Open Space (approx. 2,778 sqm) is proposed in the form of (a) public open space (approx. 1,183 sqm) to the west of the proposed building fronting on to Dyke Road accommodating outdoor seating, planting, a sunken garden and pedestrian pathways and connections; and (b) communal open space (approx. 1,605 sqm) to the east of the proposed building in the form of a courtyard including outdoor seating, planting, a children's play area and outdoor sports equipment.
- d) A childcare facility (approx. 241 sqm) with dedicated external play area (approx. 60 sqm) at ground floor level.
- e) A total of 33 no. car parking spaces at surface level to include 2 no. accessible spaces and 2 no. set down / drop off spaces to serve the childcare facility.
- f) A total of 465 no. bicycle parking spaces to include 330 no. standard spaces, 100 no. visitor spaces including 25 no. cargo bicycle spaces and 10 no. bicycle parking spaces dedicated for the childcare facility staff all at surface / lower ground floor level.
- g) Vehicular access is proposed via Dyke Road at 2 no. locations (to the north west and south west of the site). Pedestrian and Cyclist access is also delivered throughout the site via Dyke Road and includes a pedestrian crossing at Dyke Road. Pedestrian / cyclist connections to adjoining development to the north east and south east are also delivered.



- h) The proposal also provides for a further vehicular access point to the south of the main development site to facilitiate new access to the existing southern car park. A total of 12 no. of car parking spaces are removed with 161 no. car parking spaces remaining at this location.
- i) 2 no. telecommunications lattice towers (overall height 6.45 m and 7.67 m) affixed to the rooftop supporting 9 no. 2m 2G/3G/4G antennas; 9 no. 0.8m 5G antennas; 6 no. 0.3m microwave transmission links; together with all associated telecommunications equipment and cabinets.

The development will also provide for all associated site development works, infrastructure, excavation and clearance works including decommissioning the existing Black Box Theatre waste water pumping station and providing a new pumping station complete with emergency storage, all boundary treatment, public lighting, internal roads and pathways, ESB substations, switch room, water tank rooms, storage room, meter rooms, sprinkler tank room, parcel stores, comms room, bin storage, bicycle stores, hard and soft landscaping, play equipment, below ground attenuation tanks, nature based SUDs features, green roofs, roof plant, site services and connections for foul drainage, surface water drainage and water supply.

This planning application is accompanied by an Environmental Impact Assessment Report and Natura Impact Statement.



# SITE LOCATION/LAYOUT MAP





#### TELECOMMUNICATION CHANNELS

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

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

Mobile phones send and receive signals via links from nearby antenna sites or cellular towers, technically known as base stations, using Radio Frequency waves. Microwave Transmission links use microwave dishes to "transmit" from these base stations to other base stations forming a network. Radio Frequency waves operate at a lower power within lower frequencies of the radio spectrum, whereas Microwave Transmission operates at higher power within higher frequencies of the radio the radio spectrum.

Radio Frequency waves are distributed over land areas in "cells", each served by at least one fixedlocation 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, <u>buildings</u>, 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 1 No. Microwave links that will require the Applicant to make specific allowances for its retention ("Mitigation Measures").

Our assessment also identified 3 No. Radio Frequency links that will require the Applicant to make allowances for their retention.

ISM carried out a full assessment of neighbouring registered and documented telecommunication sites to assess what Microwave links would be impacted by the height and scale of the Development. Please refer to Figure 5 & 6 of the appendices for full analysis.

Impacted Microwave links

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

Impacted Radio Frequency links

- 1. 1 No. Radio Frequency link installed by Eir Mobile (Meteor)
  - 1.1. Sector orientation range that will be blocked 170° to 245° azimuths
- 2. 1 No. Radio Frequency links installed by Three Ireland
  - 2.1. Sector orientation range that will be blocked 195° to 245° azimuths
- 3. 1 No. is a Radio Frequency link installed by Vodafone
  - 3.1. Sector orientation range that will be blocked 220° to 290° azimuths



Figure 4



The 1 No. Microwave link is installed on an Eir Mobile telecommunication mast site located immediately adjacent to the site boundary on the neighbouring Galway Retail Park. This mast is providing cellular coverage for the local area businesses (retail park) and light industrial units together with providing coverage to local residential neighbourhoods, public amenity spaces/areas and transit corridors along both Dyke and Headford Roads.

This Microwave link is situated at an approximate above ground level height of between 12 -18m (AGL) and oriented south to southeast across the site boundary of the proposed new development. Therefore, its our finding that the proposed massing of the Development will cause diffraction to the identified Microwave link.

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 neighbourhoods and business districts to the north, south, east & west of the Development site. Please 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, which is a typical cell pattern for urban Radio Frequency coverage. However, the local or immediate area is served by 1 cell site at very close range to the proposed development.

The drive test data determined that some business, residential, and the public road areas to the south, southwest and southeast of the development site receive signal from Radio Frequency links emanating from telecommunication masts hosting Vodafone Ireland, Three Ireland and Eir Mobile, which are located immediately adjacent to the site boundary on the neighbouring Galway Retail Park. These masts are providing cellular coverage for the local area businesses (retail park) and light industrial units together with providing coverage to local residential neighborhoods, public amenity spaces/areas and transit corridors along both Dyke and Headford Roads. Please refer to Figure 7.



The Development will categorically block the antenna propagation for orientations from each of the 3No. mobile network operators on the neighbouring Galway Retail Park ranging from 170° to 290° azimuths.

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.



### MITIGATION MEASURES

To provide an adequate allowance for the retention of the 1No. identified Microwave Transmission link that will be impacted by the Development and the retention of the 3No. identified Radio Frequency links that will be impacted by the Development, the Applicant is seeking planning permission to install - 2No. steel support structures affixed to the roofs of the proposed residential block.

3No. 2m 2G/3G/4G antennas, 3No. 0.8m 5G antennas and 3 No. 0.3m Microwave Transmission links will be situated on a steel support structure on the north end and 6No. 2m 2G/3G/4G antennas, 6No. 0.8m 5G antennas and 3 No. 0.3m Microwave Transmission Links will be situated on a steel support structure on the south end of the roof (*together with all associated telecommunications equipment*). This solution is adequate to mitigate the impact the Development will have on the existing 1No. identified Microwave Transmission Link and the 3No. Radio Frequency links emanating from the 3No. masts within the neighbouring Galway Retail Park to the north by northeast of the Development.

Please refer to Figure 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 Pleanàla 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) Chapter 3, Section 3.2 of the Urban Development and Building Height Guidelines as referenced in Chapter 1, Section 1.8.5 of the Galway City Council City Development Plan 2023-2029.



# 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)

Figures 8: Mitigation Measures (Equipment).









