

Ballyfeeny Green Energy Project



Environmental Impact Assessment Report Volume III

Appendix 14-1 - Telecommunications Impact Assessment

September 2025

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Report

Ballyfeeny Green Energy Project Telecommunications Impact Assessment Report

Document Number:

Author: KH

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Executive Summary

Ai Bridges was commissioned by Ballyfeeny Green Energy Limited (the 'Applicant') to evaluate the possible impacts that the proposed wind farm development at Ballyfeeny, Co. Roscommon, could have on existing telecommunications operator networks. The scope of work included field and desktop surveys to determine telecommunications network infrastructure that could be impacted by the proposed development. Consultations with telecom operators were also undertaken to assist in identifying network infrastructure that could be impacted by the proposed wind farm.

The initial telecoms assessment was carried out in November 2022 and was based on the radio links that crossed over the proposed site boundary. (The network analysis findings from the Nov 2022 assessment are provided in Appendix D). In September 2023, Ai Bridges were provided with a revised turbine layout and a 3D assessment of the turbine layout was carried out. (The network analysis findings from the September 2023 assessment are provided in Appendix E). The final turbine layout, provided to Ai Bridges, forms the basis of both the technical analysis presented in Section 5, and the mitigation measure proposals presented in Section 6.

Telecommunications mast-sites with network infrastructure that could potentially be impacted by the wind farm development were identified and field surveys of these mast-sites was carried out. During the field surveys, radio antennas with bearings in the direction of the wind farm were recorded. The findings of the field surveys are provided in Appendix B of this report.

During the consultation process, nineteen telecom operators were contacted. At the time of writing this report, thirteen of these operators have responded to the consultation request. The responses received from each of the telecom operators can be found in Section 3 of this report.

Using the information obtained during the field survey assessments and consultation process a desktop impact analysis was carried out and all of the telecommunication operator networks were analysed using radio planning \ modelling software. Results from the impact analysis indicate that there are ten licensed microwave radio links that pass over the proposed wind farm development. Of the ten radio links that pass over the proposed wind farm, four would be impacted by the proposed wind turbine layout, as outlined in Table 1 below.

Operator	Network Description	Impact of Wind Farm	Mitigation Measures
Eir	Licensed PTP microwave radio link from Ballyfeeny to Edercloon	No impacts.	N.A
Three Ireland	Licensed PTP microwave radio link from Mullaghmacormick to Sliabh Bawn.	Impacted by T01 & T02	Relay the radio link via an existing Telecoms Mast-Site (e.g. the existing mast-site at Lissavaddy).
	Licensed PTP microwave radio link from Ballyfeeny to Ballyleague.	No impacts.	N.A
	Licensed PTP microwave radio link from Ballyfeeny to Lissavaddy.	No impacts.	N.A
	Licensed PTP microwave radio link from Ballyfeeny to Strokestown.	No impacts.	N.A

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Vodafone	Licenced PTP microwave radio link from Mullaghmacormick to Sliabh Bawn.	Impacted by T01 & T02	Relay the radio link via an existing Telecoms Mast-Site (e.g. the existing mast site at Lissavaddy).
	Licenced PTP microwave radio link from Sliabh Bawn to Ballyfeeny.	Impacted by T01	Route the Vodafone service between Sliabh Bawn and Ballyfeeny via a new telecoms relay mast located within the proposed wind farm site boundary.
	Licenced PTP microwave radio link from Ballyfeeny to Lissavaddy.	No impacts.	N.A
	Licenced PTP microwave radio link from Ballyfeeny to Roosky.	Impacted by T02, T04 & T05	Route the Vodafone service between Ballyfeeny and Roosky via a new telecoms relay mast located within the wind farm site boundary.
	Licenced PTP microwave radio link from Ballyfeeny to Edercloon.	No impacts.	N.A

Table 1. Microwave radio links in vicinity of proposed wind farm at Ballyfeeny.

The sections 6.1 and 6.2 contained within this report, outlines the technically viable mitigation measures that are based on industry standard best practice. Mitigation Measures will be implemented to remediate any impacts of the proposed turbines on the Three Ireland and Vodafone Ireland networks. The proposed mitigations measures are based on previous experience of solutions and precedents that have been agreed with telecommunications operators on previous wind farm developments. These include relaying impacted radio links via an existing telecoms mast and re-routing impacted links via a new telecoms relay mast located within the proposed wind farm site. These mitigation measures are outlined in Section 6 of this report.

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Section 1 - Wind Farm Site Information

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1. Introduction

In this section a brief summary of the wind farm site is provided. Details regarding the site's geographic location and the proposed wind turbine dimensions are presented.

1.1 Wind Farm Site Information

The wind farm development is located in County Roscommon, approximately 5km east of Strokestown. The dimensions of the turbines assessed in this report are shown below in Table 2. The coordinates of the turbines are provided in Appendix A.

*Note: The actual turbine model has yet to be finalised, and the dimensions may vary slightly from those presented in the table below; (See **EIAR Chapter 1 Introduction, Table 1-3** for full details of the proposed turbine Technology Options). However, due to the minor change in turbine dimensions it is considered that this will not have any significant bearing on the findings made in this report.*

Wind Farm	Number of Turbines	Turbine Hub Height	Turbine Rotor Diameter
Ballyfeeny	6	90 m	138 m

Table 2. Wind Farm Turbine Details

The location of the proposed wind farm development is shown below in Figure 1.



Figure 1. Location of proposed wind farm.

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Section 2 - Methodology

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2. Introduction

In this section a brief summary of the Telecommunication Impact Study Methodology is provided.

2.1 Methodology

There are four primary stages in preparing and compiling a communication impact study:

- Telecom Operator Consultations
- Field Surveys
- Desktop Survey Network Modelling and Analysis
- Report Generation

A summary of each of these stages is provided below:

Telecom Operator Consultations

Consultations are commenced with telecom operators who are requested to raise any concerns they have regarding the impact of the proposed wind farm on their networks. The consultation process is used to assist in identifying telecoms infrastructure that could be impacted by the proposed wind farm development.

Field Surveys

Field surveys are undertaken and the co-ordinates of communication masts are recorded. During the field surveys of the communication sites, approximations of antenna size, bearing and height are made for the antennas installed on each of the masts surveyed.

Desktop Survey and Analysis

A desktop survey is carried out to plot the wind turbines in a radio planning tool. The radio planning tool uses GIS and terrain mapping databases to enable accurate modelling. A selection of mast-site coordinates is then obtained and inputs from various operators \ service providers are converted from Irish National Grid (Easting and Northing in meters) to degrees minutes seconds format and then imported into the radio planning tool. This provides a means of graphically showing telecommunications sites in the vicinity relative to the proposed wind farm at Ballyfeeny. Figure 2 below shows the proposed wind farm site boundary plotted in the radio planning tool.

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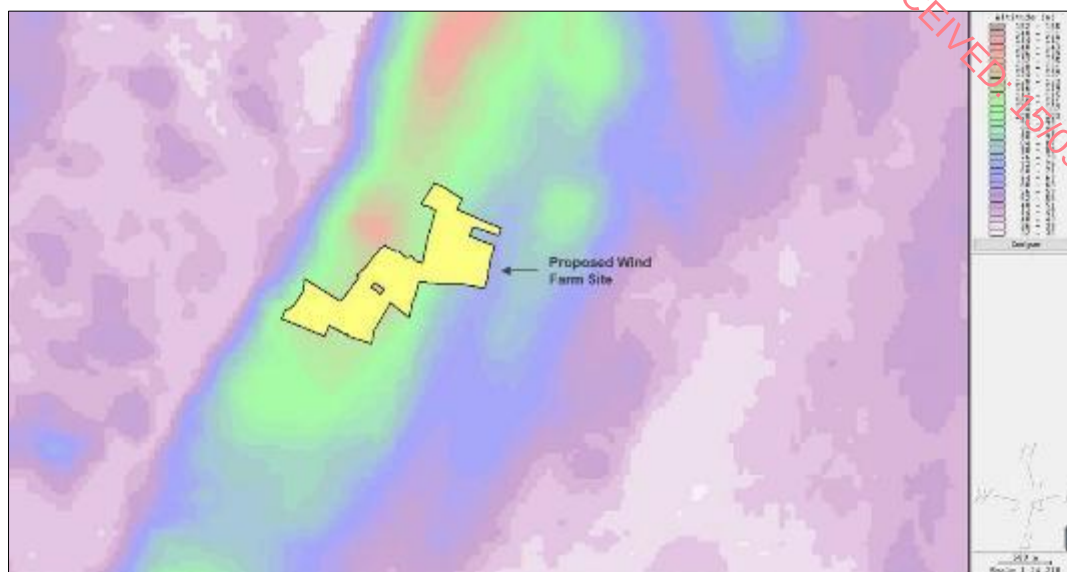


Figure 2. Proposed Wind Farm Site Boundary plotted in Radio Planning Software

The findings from the consultations and field surveys are collated and the communications networks requiring further analysis are identified. Network modelling is used to assess the impact of the turbines on the communications networks. The results from the network modelling are used to determine if mitigation measures are required. Figure 3 below shows an example of a microwave radio link that crosses over/near the wind farm site boundary modelled in radio planning software.

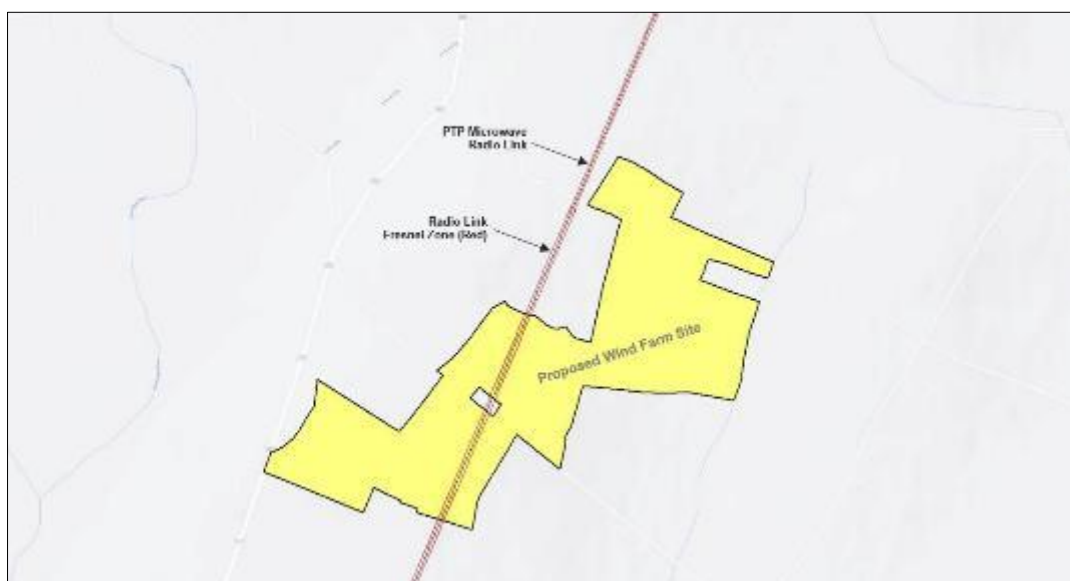


Figure 3. Example of microwave radio link crossing over/near the proposed wind farm site boundary modelled in radio planning software.

Report Generation

The final stage of the communications impact study process is to collate the data and present the findings & analysis into a report for submission.

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Section 3 - Telecom Operator Consultations

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3. Introduction

In this section the consultation process undertaken with telecom operators is described. The response received from each operator is also provided.

3.1 Telecom Operator Consultations

Consultations beginning in September 2022 were undertaken by Ai Bridges, with telecom network operators to assist in identifying telecommunication infrastructure that could be impacted by the proposed wind farm. The operators were requested to raise any concerns they may have regarding impacts to their networks due to the proposed wind farm development. Table 3 lists the telecom operators contacted and the issues raised by the operators. The responses received from each of the Telecom Operators are provided in Sections 3.1.1 to 3.1.19.

ID	Operator	Response Received (Yes/No)	Issues raised by Operator \ Observations.
1	2RN	Yes	No issues regarding transmission links; however, 2RN have requested that a protocol document be signed should the wind farm go ahead (regarding the TV broadcast service in the area).
2	Airwave	Yes	No Impact
3	An Garda Síochána	No	No Impact
4	Broadcast Authority of Ireland (BAI)	Yes	No Impact
5	BT Ireland	Yes	No Impact
6	CIE	Yes	No Impact
7	Dept. of Defence	No	No response. (DoD is a statutory consultee and have previously stated that they will only respond to the Planning Authority at Planning Application Stage.)
8	Eir	Yes	Eir have raised a concern regarding one Licensed PTP microwave radio link.
9	Enet	Yes	No Impact
10	ESB Networks	No	No Impact
11	Imagine Broadband	Yes	No Impact
12	Irish Aviation Authority (IAA)	No	No Impact
13	Irish Water	Yes	No Impact
14	Roscommon County Council	No	No Impact
15	Tetra Ireland (TI)	Yes	No Impact
16	Three Ireland	Yes	Three Ireland have raised a concern regarding four Licensed PTP microwave radio links.
17	Viatel	Yes	No Impact
18	Virgin Media	No	No Impact
19	Vodafone Ireland	Yes	Vodafone have raised a concern regarding five Licensed PTP microwave radio links.

Table 3. Telecom Operators Consulted

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3.1.1 2RN Response to Consultations

2RN provided the following email response to consultations:

"Please find your table below

Site No.	Wind Farm Site	Potential Impact (Y \ N)
7	Ballyfeeny, Co Roscommon	N

We would also ask that a protocol be signed between 2rn and the developer should any of the above sites go ahead."

3.1.2 Airwave Response to Consultations

Airwave provided the following email response to consultations:

"Regarding the locations in the table, we do not have any microwave links nearby."

Site No.	Wind Farm Site	Potential Impact (Y \ N)
7	Ballyfeeny, Co Roscommon	N

3.1.3 An Garda Síochána Response to Consultations

To date no response has been received.

3.1.4 Broadcast Authority of Ireland (BAI) Response to Consultations

The BAI provided the following email response to consultations:

"The BAI does not perform an in-depth analysis of the effect of wind turbines on FM networks. However, we are not aware of any issues from existing windfarms into existing FM networks. Also, the proposed windfarms are not located close to any existing or planned FM transmission sites."

3.1.5 BT Ireland Response to Consultations

BT provided the following email response to consultations:

"We only have a network presence in Louth and Waterford."

3.1.6 CIE Response to Consultations

BT provided the following email response to consultations:

"I am told by my Irish Rail telecoms colleagues that none of these sites are adjacent to or transverse any Irish Rail rail lines or comms links."

3.1.7 Department of Defence Response to Consultations

To date no response has been received.

3.1.8 Eir Response to Consultations

Eir provided the following email response to consultations:

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"We have a number [of] transmission links within the proposed area that would be at risk, the end points of the transmission links are below, if you could design around this and keep a buffer back from the links."

Site No.	Wind Farm Site	Potential Impact (Y \ N)
7	Ballyfeeny, Co Roscommon	Y

Ballyfeeny, Co Roscommon

#	Band	A-end		Height		B-end		Height
Link1	11Ghz	RN_3852	53°47'5.05"N 8° 1'37.91"W	25	<--->	LD_4238	53°48'53.84"N 7°54'1.31"W	26

3.1.9 Enet Response to Consultations

Enet provided the following email response to consultations:

"See below:"

Site No.	Wind Farm Site	Potential Impact (Y \ N)
7	Ballyfeeny, Co Roscommon	N

3.1.10 ESB Networks Response to Consultations

To date no response has been received.

3.1.11 Imagine Broadband Response to Consultations

Imagine Broadband provided the following email response to consultations:

Site No.	Wind Farm Site	Potential Impact (Y \ N)
7	Ballyfeeny, Co Roscommon	N

3.1.12 IAA Response to Consultations

To date no response has been received.

3.1.13 Irish Water Response to Consultations

Irish Water provided the following email response to consultations:

"Apologies for the delay, I was waiting for updates from our communications providers in these areas. I can confirm that there are no communications links traversing any of the areas outlined in your email."

3.1.14 Roscommon County Council Response to Consultations

To date no response has been received.

3.1.15 Tetra Ireland (TI) Response to Consultations

Tetra Ireland provided the following email response to consultations:

Site No.	Wind Farm Site	Potential Impact (Y \ N)
7	Ballyfeeny, Co Roscommon	N

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3.1.16 Three Ireland Response to Consultations

Three Ireland provided the following email response to consultations:

*"Please see below updated table identifying locations with microwave links traversing the areas.
I have also attached the supplied spreadsheet with the link details"*

Site No.	Wind Farm Site	Potential Impact (Y \ N)
7	Ballyfeeny, Co Roscommon	Y

Link Name / ID	Band MHz\GHz	Link Length	Site A					Site B				
			Lat	Long	Easting	Northing	Ant Height	Lat	Long	Easting	Northing	Ant Height
ML050295	18GHz	13.2km			200769	287588	16m			195588	275417	32m
ML021072	26GHz	12.1km			198254	281667	24m			199398	269630	12m
ML017287	13GHz	19.2km			198254	281667	17m			179056	280615	23m
ML020347	26GHz	5.6km			198254	281667	30m			192717	280955	30m

3.1.17 Viatel Response to Consultations

Viatel provided the following email response to consultations:

Site No.	Wind Farm Site	Potential Impact (Y \ N)
7	Ballyfeeny, Co Roscommon	N

3.1.18 Virgin Media Response to Consultations

To date no response has been received.

3.1.19 Vodafone Ireland Response to Consultations

Vodafone provided the following email response to consultations:

Site No.	Wind Farm Site	Potential Impact (Y \ N)
7	Ballyfeeny, Co Roscommon	Y

Link Name / ID	Band MHz\GHz	Link Length	Site A					Site B				
			Lat	Long	Easting	Northing	Ant Height	Lat	Long	Easting	Northing	Ant Height
RN005-RN019	13GHz	13.227			200767	287587	18			195586	275418	18
RN019-RNSCE	23GHz	6.799			195586	275418	19			198252	281671	19
RNSCE-RN041	15GHz	19.044			198252	281671	15			179237	280618	15
RNSCE-RN049	26GHz	8.146			198252	281671	15			204727	286614	15
RNSCE-LD057	23GHz	9.005			198252	281671	20			206606	285032	20

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Section 4 - Field Surveys

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4. Introduction

To assess the accuracy of the network information (radio link co-ordinates, antenna heights etc.) provided by the telecom operators, field surveys of the telecom-mast sites in the vicinity of the proposed wind farm were carried out. During the field surveys, radio antennas with bearings in the direction of the wind farm were recorded. The telecom mast-sites surveyed for this study (labelled Mast-Site A to Mast-Site H) are shown relative to the proposed wind farm site in Figure 4 below. The findings from the field surveys of the mast-sites are presented in Appendix B of this report.



Figure 4. Telecom Mast-Sites Surveyed.

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Section 5 - Desktop Survey Analysis

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5. Introduction

Based on the findings of the consultation process, there are three Telecom Operators with networks in the vicinity of the proposed wind farm that require a detailed technical analysis:

- Eir Network
- Three Ireland Network
- Vodafone Ireland Network

Sections 5.1 to 5.3 below outline the desktop survey analysis findings* for each of the Telecom Operator networks listed above. It should be noted that there have been a number of iterations of the Desktop Survey Analysis completed as shown in Appendix D (2022) and Appendix E (2023) which inform the analysis contained herein.

5.1 Eir Network Analysis

The Eir network in the vicinity of the proposed wind farm consists of one Point-to-Point (PTP) microwave radio link. The radio link is listed in Table 4 below and a Plan View of the Eir network is shown in Figure 5.

Link No.	Operator	Link Description
1	Eir	PTP microwave radio link from Ballyfeeny to Edercloon.

Table 4. Eir Radio Links requiring Analysis

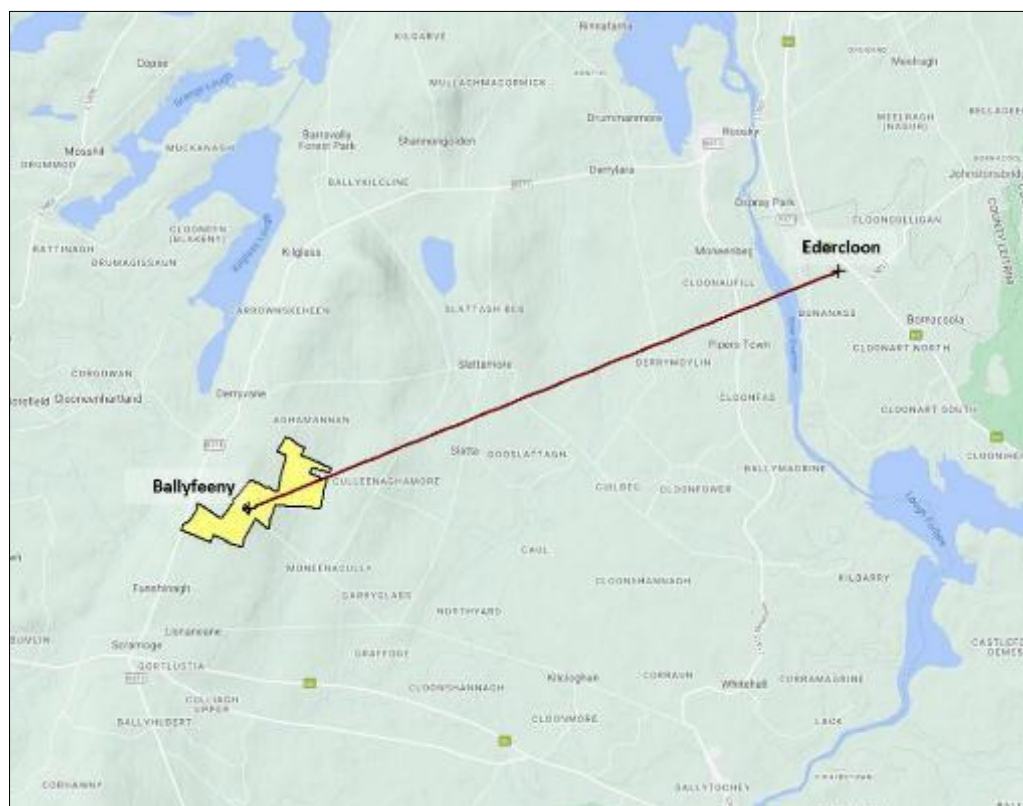


Figure 5. Eir Radio Network – Plan View

* The Desktop Survey Analysis findings are subject to accuracy of the information (GPS co-ordinates, turbine dimensions, etc.) provided to Ai Bridges.

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Figure 6 below shows a close-up plan view of the Eir microwave radio link network relative to the proposed wind turbines. Desktop survey analysis indicates that there is a clearance distance of over 30 m between the Fresnel Zone of the radio link and the blade-tip of the nearest turbine (T04). At this distance, there will be no impact on the radio link.

Table 5 below provides a brief summary of the network analysis for the Eir network in the vicinity of the proposed wind farm.



Figure 6. Eir Network – Plan View

Link ID	Link Description	Link Type	Applicable Fresnel Zone	Wind Farm Impacts
Eir Link 1	Ballyfeeny to Edercloon.	PTP	1 st Fresnel	No impacts. Clearance Distance to nearest turbine > 30m

Table 5. Eir Network – Analysis Summary

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5.2 Three Ireland Network Analysis

The Three Ireland network in the vicinity of the proposed wind farm consists of four Point-to-Point (PTP) microwave radio links. The radio links are listed in Table 6 below and a Plan View of the Three Ireland network is shown in Figure 7.

Link No.	Operator	Link Description
1	Three Ireland	PTP microwave radio link from Mullaghmacormick to Sliabh Bawn.
2	Three Ireland	PTP microwave radio link from Ballyfeeny to Ballyleague.
3	Three Ireland	PTP microwave radio link from Ballyfeeny to Lissawaddy.
4	Three Ireland	PTP microwave radio link from Ballyfeeny to Strokestown.

Table 6. Three Ireland Radio Links requiring Analysis

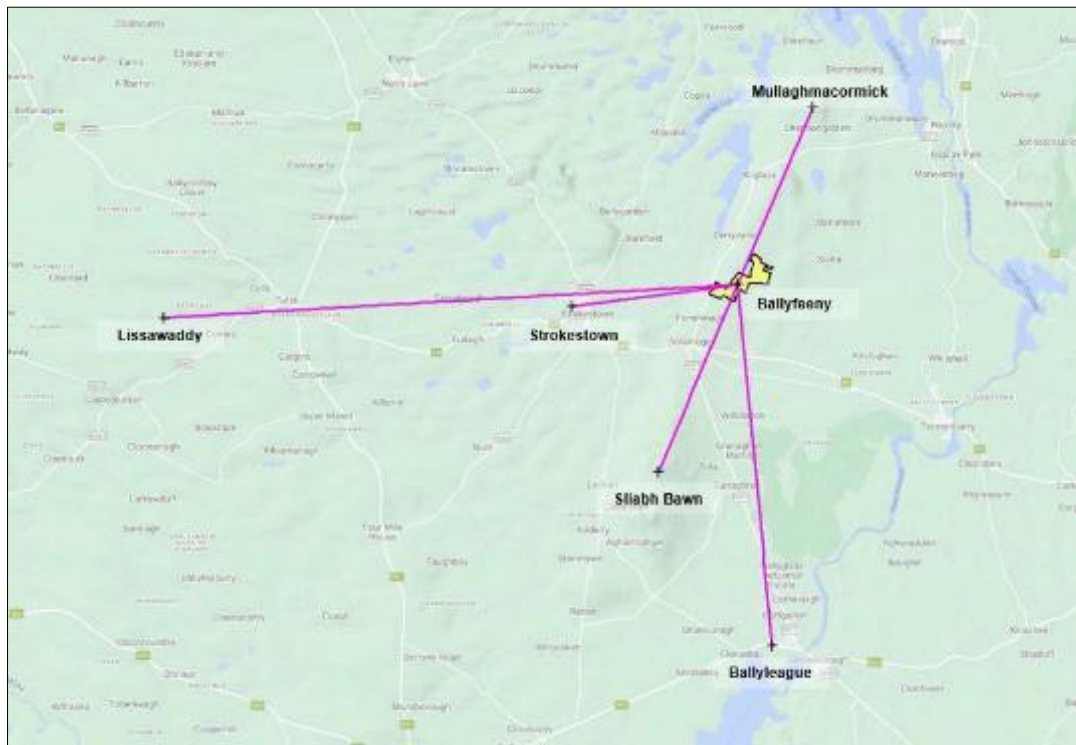


Figure 7. Three Ireland Radio Network – Plan View

Figure 8 below shows a close-up Plan View of the Three Ireland microwave radio link network relative to the proposed wind turbines. The Plan View indicates that Links 2, 3 and 4 would not be impacted by the proposed turbine layout. However, Link 1 (Mullaghmacormick to Sliabh Bawn) would be impacted by two turbines: T01 & T02.

To further assess the Three Ireland network, a 3D analysis was carried out, the results of which confirmed that Link 1 (Mullaghmacormick to Sliabh Bawn) would be impacted by turbines T01 & T02. Mitigation Measures would be required to offset the impact of the proposed turbines on this radio link.

Table 7 below provides a brief summary of the network analysis for the Three Ireland network in the vicinity of the proposed wind farm.

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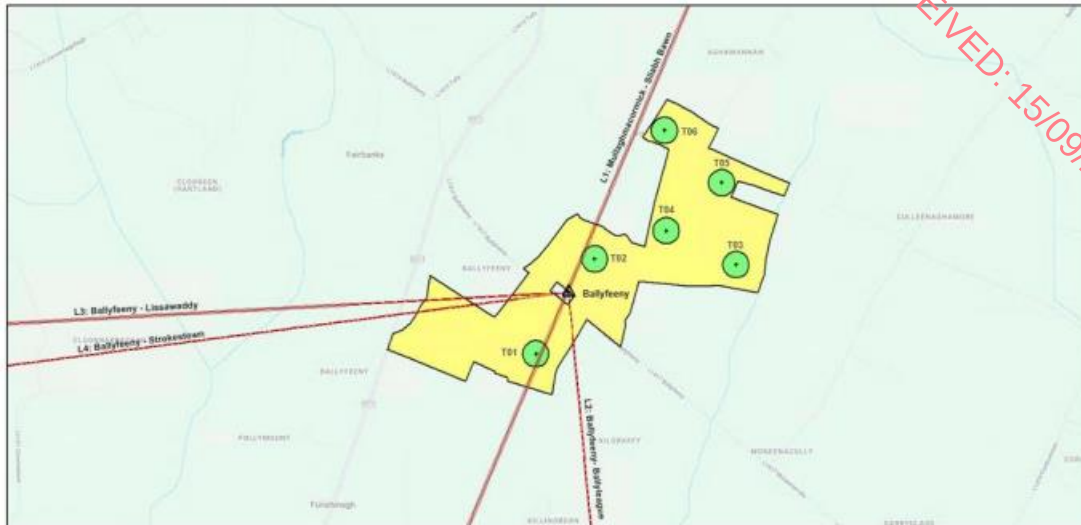


Figure 8. Three Ireland Network – Plan View



Figure 9. Three Ireland Network – 3D View

Link ID	Link Description	Link Type	Applicable Fresnel Zone	Wind Farm Impacts
Three Ireland Link 1	Mullaghmacormick to Slabh Bawn	PTP	1 st Fresnel	Impacted by Turbines T01 & T02 Mitigation Measures Required
Three Ireland Link 2	Ballyfeeny to Ballyleague	PTP	1 st Fresnel	No impacts. Clearance Distance to nearest turbine > 100m
Three Ireland Link 3	Ballyfeeny to Lissawaddy	PTP	1 st Fresnel	No impacts. Clearance Distance to nearest turbine > 100m
Three Ireland Link 4	Ballyfeeny to Strokestown	PTP	1 st Fresnel	No impacts. Clearance Distance to nearest turbine > 100m

Table 7. Three Ireland Network – Analysis Summary

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5.3 Vodafone Ireland Network Analysis

The Vodafone network in the vicinity of the proposed wind farm consists of five Point-to-Point (PTP) microwave radio links. The radio links are listed in Table 8 below and a Plan view of the Vodafone network is shown in Figure 10.

Link No.	Operator	Link Description
1	Vodafone	PTP microwave radio link from Mullaghmacormick to Sliabh Bawn.
2	Vodafone	PTP microwave radio link from Sliabh Bawn to Ballyfeeny.
3	Vodafone	PTP microwave radio link from Ballyfeeny to Lissawaddy.
4	Vodafone	PTP microwave radio link from Ballyfeeny to Roosky.
5	Vodafone	PTP microwave radio link from Ballyfeeny to Edercloon.

Table 8. Vodafone Ireland Radio Links requiring Analysis

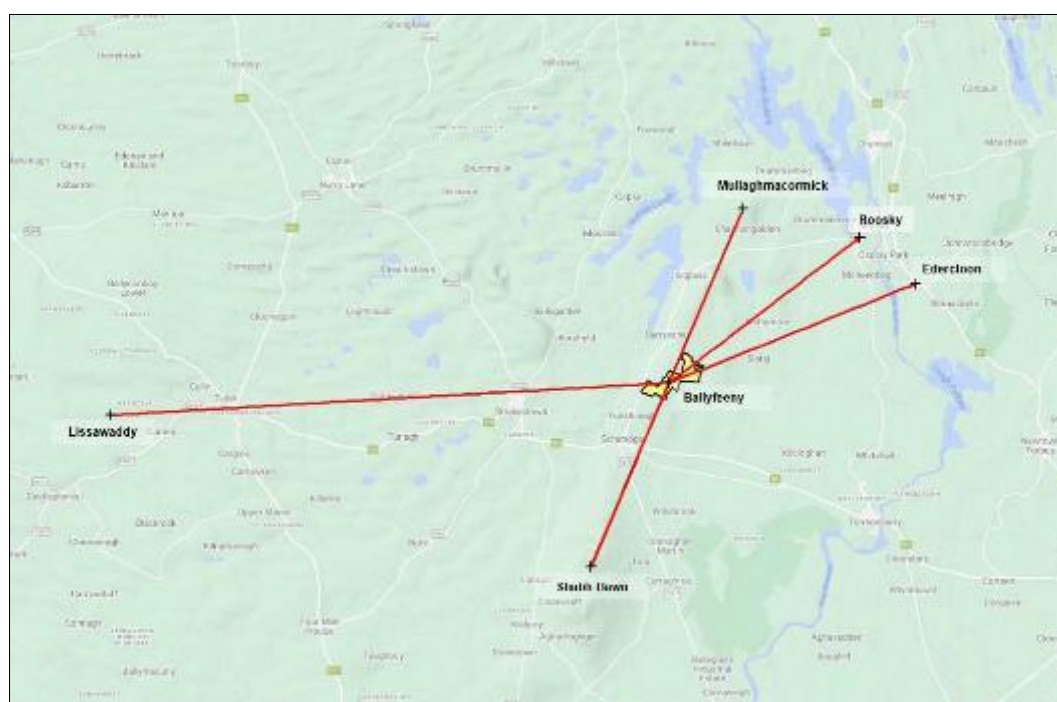


Figure 10. Vodafone Ireland Radio Network – Plan View

Figure 11 below shows a close-up Plan View of the Vodafone microwave radio link network relative to the proposed wind turbines. The Plan View indicates that Links 1, 2 and 4 would be impacted by the proposed turbine layout.

To further assess the Vodafone network, a 3D analysis was carried out, the results of which confirmed that Links 1, 2 and 4 would be impacted by the proposed turbine layout. Mitigation Measures would be required to offset the impact of the proposed turbines on this radio link.

Table 9 below provides a brief summary of the network analysis for the Vodafone Ireland network in the vicinity of the proposed wind farm.

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Figure 11. Vodafone Network – Plan View

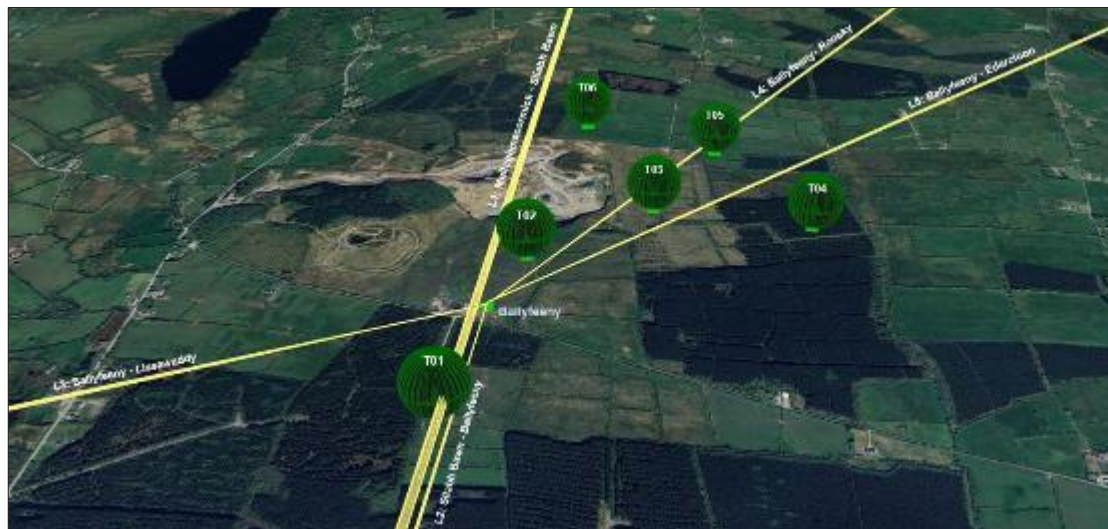


Figure 12. Vodafone Network – 3D View

Link ID	Link Description	Link Type	Applicable Fresnel Zone	Wind Farm Impacts
Vodafone Link 1	Mullaghmacormick to Sliabh Bawn	PTP	1 st Fresnel	Impacted by Turbines T01 & T02 Mitigation Measures Required
Vodafone Link 2	Sliabh Bawn to Ballyfeeny	PTP	1 st Fresnel	Impacted by Turbine T01 Mitigation Measures Required
Vodafone Link 3	Ballyfeeny to Lissawaddy	PTP	1 st Fresnel	No impacts. Clearance Distance to nearest turbine > 100m
Vodafone Link 4	Ballyfeeny to Roosky	PTP	1 st Fresnel	Impacted by Turbines T02, T03 & T05 Mitigation Measures Required
Vodafone Link 5	Ballyfeeny to Edercloon	PTP	1 st Fresnel	No impacts. Clearance Distance to nearest turbine > 30m

Table 9. Vodafone Network – Analysis Summary

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Section 6 - Mitigation Measures

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6. Mitigation Measures

The sections 6.1 and 6.2 herein, outlines the technically viable mitigation measures that are based on industry standard best practice. Mitigation Measures will be implemented to remediate any impacts of the proposed turbines on the Three Ireland and Vodafone Ireland networks. The proposed mitigations measures are based on previous experience of solutions and precedents that have been agreed with telecommunications operators on previous wind farm developments. A protocol agreement would be put in place between the Applicant and the telecoms operator prior to the construction of the proposed wind farm to agree terms such as estate management, operator access, electricity supply, dual redundant electricity supply etc.

6.1 Mitigation Measure Solutions – Three Ireland Network

The most technically viable mitigation measure option to offset the potential impact on the Three Ireland Link between Mullaghmacormick and Sliabh Bawn is to relay the radio link via an existing Telecoms Mast. This mitigation measure is described in Sections 6.1.1 below.

6.1.1 Three Ireland Link 1 - Relay the radio link via an existing Telecoms Mast.

Figure 13 below illustrates how the existing telecoms mast-site at Lissawaddy could be used to relay a radio link between Mullaghmacormick and Sliabh Bawn.

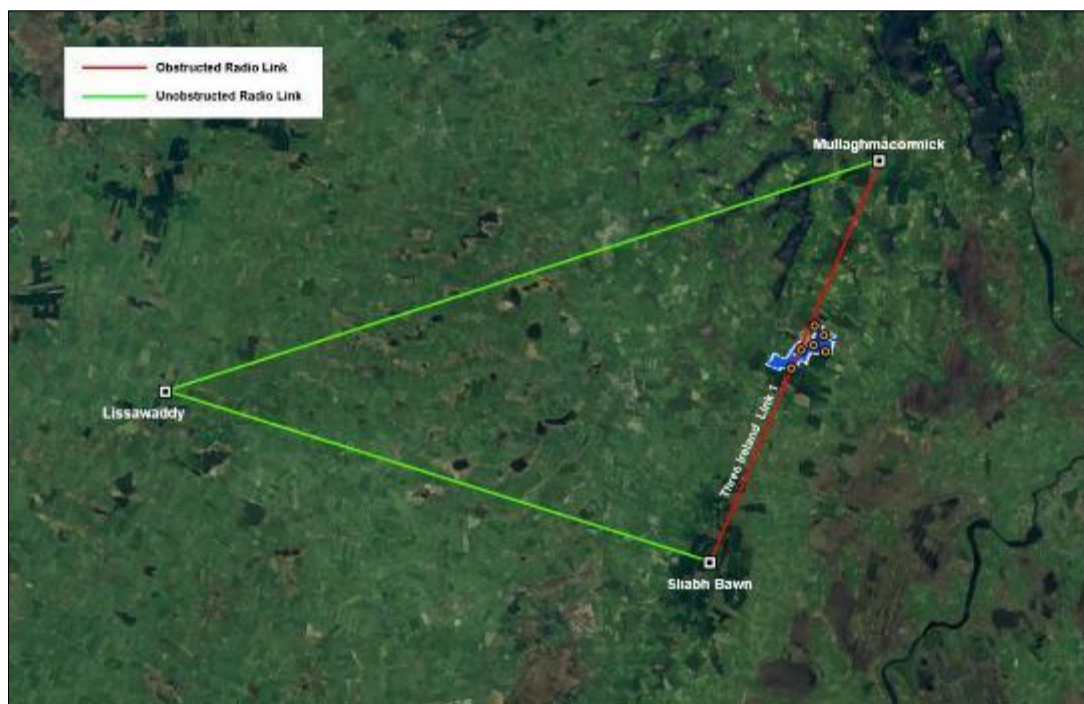


Figure 13. Example of how an existing telecoms mast could be used to relay the radio link between Mullaghmacormick and Sliabh Bawn.

To determine if Lissawaddy could be used as a viable relay-mast, radio link path profiles were generated. Radio Link Budgets were also carried out to determine if the proposed links would meet the Radio Link Availability Criteria required by ComReg for radio licensing. The Radio Link Path Profiles and Radio Link Budgets are based on the following ITU-R Recommendations:

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- ITU-R P.525-2
- ITU-R P.526-11
- ITU-R P.676-8

The radio Path Profiles are shown below in Section 6.1.1.1 and Section 6.1.1.2. The Radio Link Budgets can be found in Appendix C (Sections C.1 and C.2).

6.1.1.1 Path Profile – Mullaghamacormick to Lissawaddy (3IRL)

The radio link path profile shows clear Line-of-Sight (LOS) and the link budget results would pass the radio availability criteria required by ComReg.

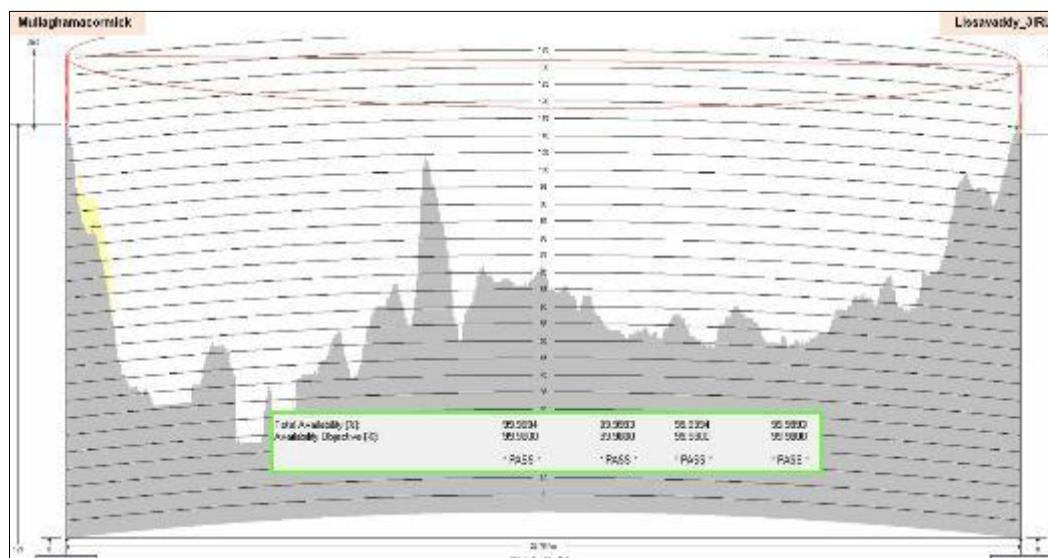


Figure 14. Path Profile – Mullaghamacormick to Lissawaddy (3IRL)

6.1.1.2 Path Profile – Lissawaddy (3IRL) to Sliabh Bawn

The radio link path profile shows clear Line-of-Sight (LOS) and the link budget results would pass the radio availability criteria required by ComReg.

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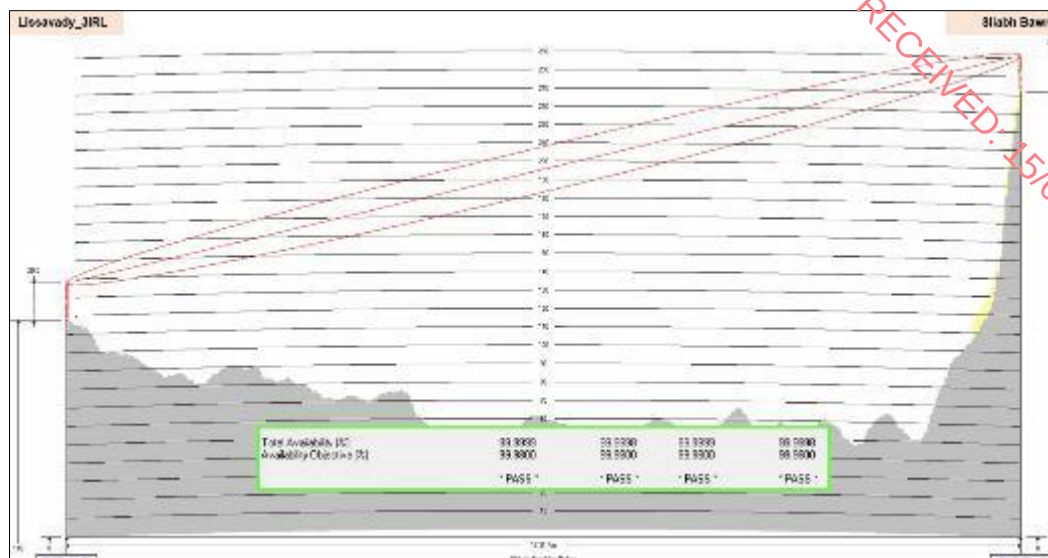


Figure 15. Path Profile – Lissawaddy to Sliabh Bawn

6.1.1.3 Relay radio link via an existing Telecoms Mast – Reference Example

An example of where this mitigation measure was proposed and accepted, is at Tullacondra Wind Farm, Co Cork (planning ref: 245503). In this example, the telecom operator agreed that an impacted radio link could be mitigated by relaying the connection via one of their existing telecom mast sites in the subject area.



Figure 16. Relay radio link via existing Telecoms Mast –
Tullacondra Wind Farm Example

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6.2 Mitigation Measure Solutions – Vodafone Network

The most technically viable mitigation measure option to offset the potential impact on the Vodafone Link 1 (Mullaghmacormick – Sliabh Bawn) is to relay the radio link via an existing Telecoms Mast (see section 6.1.2 above). This mitigation measure is outlined in Section 6.2.1.

To offset the potential impact on Vodafone Link 2 (Sliabh Bawn – Ballyfeeny) and Vodafone Link 4 (Ballyfeeny – Roosky) a relay mast installed within the wind farm site boundary could be used to relay the radio link. This mitigation measure is described in Section 6.2.2.

6.2.1 Vodafone Link 1 - Relay the radio link via an existing telecoms mast.

To mitigate the impact on the radio link between Mullaghmacormick and Sliabh Bawn the most technically viable mitigation measure option, is considered to be the use of an existing telecoms mast to relay that radio link. Figure 16 below illustrates how the existing telecoms mast-site at Lissawaddy could be used to relay a radio link between Mullaghmacormick and Sliabh Bawn.

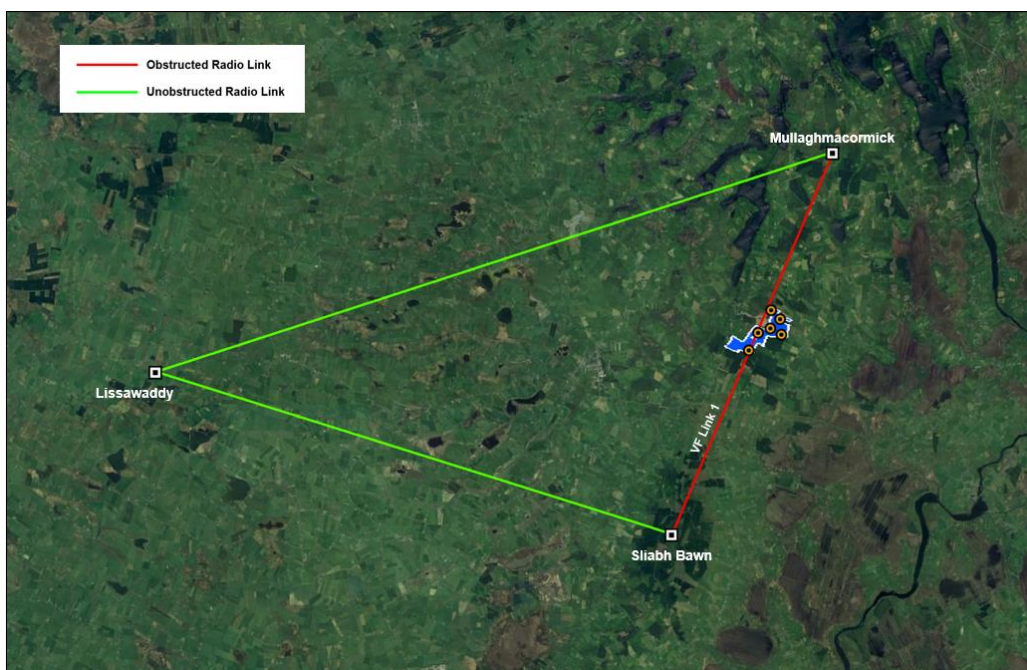


Figure 17. Example of how an existing telecoms mast could be used to relay the radio link between Mullaghmacormick and Sliabh Bawn.

To determine if Lissawaddy could be used as a viable relay-mast, radio link path profiles were generated. Radio Link Budgets were also carried out to determine if the proposed links would meet the Radio Link Availability Criteria required by ComReg for radio licensing. The Radio Link Path Profiles and Radio Link Budgets are based on the following ITU-R Recommendations:

- ITU-R P.525-2
- ITU-R P.526-11
- ITU-R P.676-8

The radio Path Profiles are shown below in Section 6.2.1.1 and Section 6.2.1.2. The Radio Link Budgets can be found in Appendix C (Sections C.3 and C.4).

6.2.1.1 Path Profile – Mullaghmacormick to Lissawaddy (VF)

The radio link path profile shows clear Line-of-Sight (LOS) and the link budget results would pass the radio availability criteria required by ComReg.

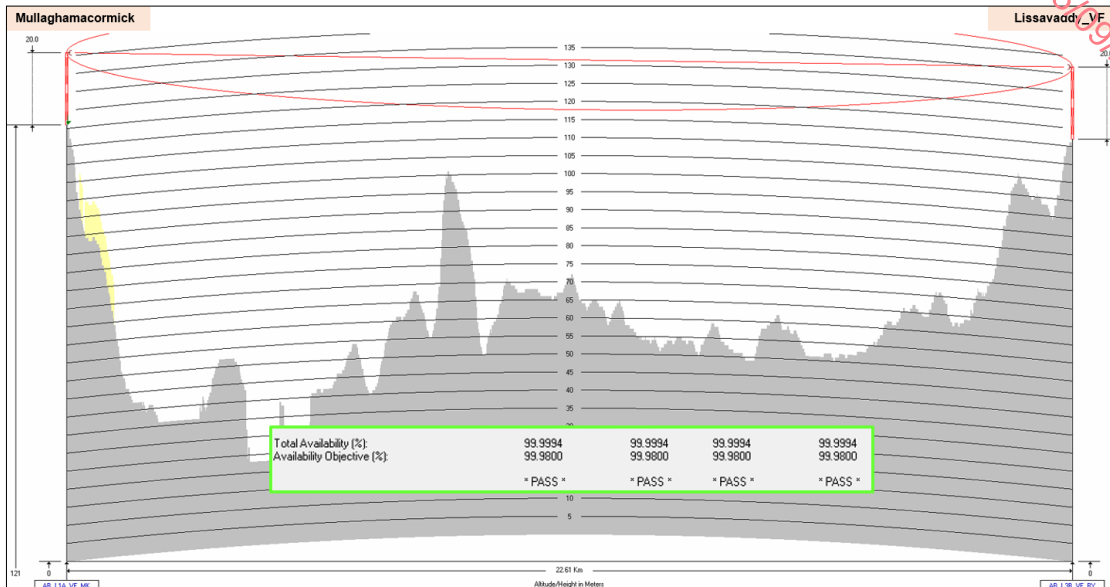


Figure 18. Path Profile – Mullaghmacormick to Lissawaddy (VF)

6.2.1.2 Path Profile – Lissawaddy (VF) to Sliabh Bawn

The radio link path profile shows clear Line-of-Sight (LOS) and the link budget results would pass the radio availability criteria required by ComReg.

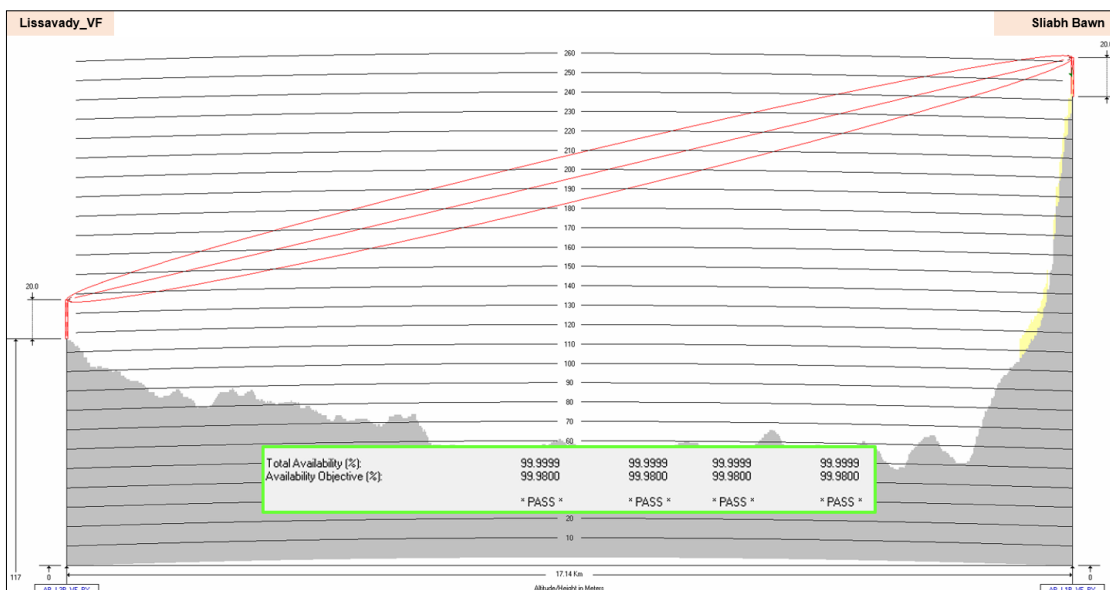


Figure 19. Path Profile – Lissawaddy (VF) to Sliabh Bawn

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6.2.2 Vodafone Link 2 - Route the Vodafone service between Sliabh Bawn and Ballyfeeny via a new telecoms mast located within the wind farm site boundary.

The most technically feasible mitigation measure option to mitigate the potential impact on Vodafone Link 2 would be to route the radio service to/from Sliabh Bawn via a new telecoms relay mast installed within the proposed wind farm site boundary.

Note: A fiber optic cable could be used to connect the new and existing telecoms masts at Ballyfeeny, if this is a requirement for Vodafone.

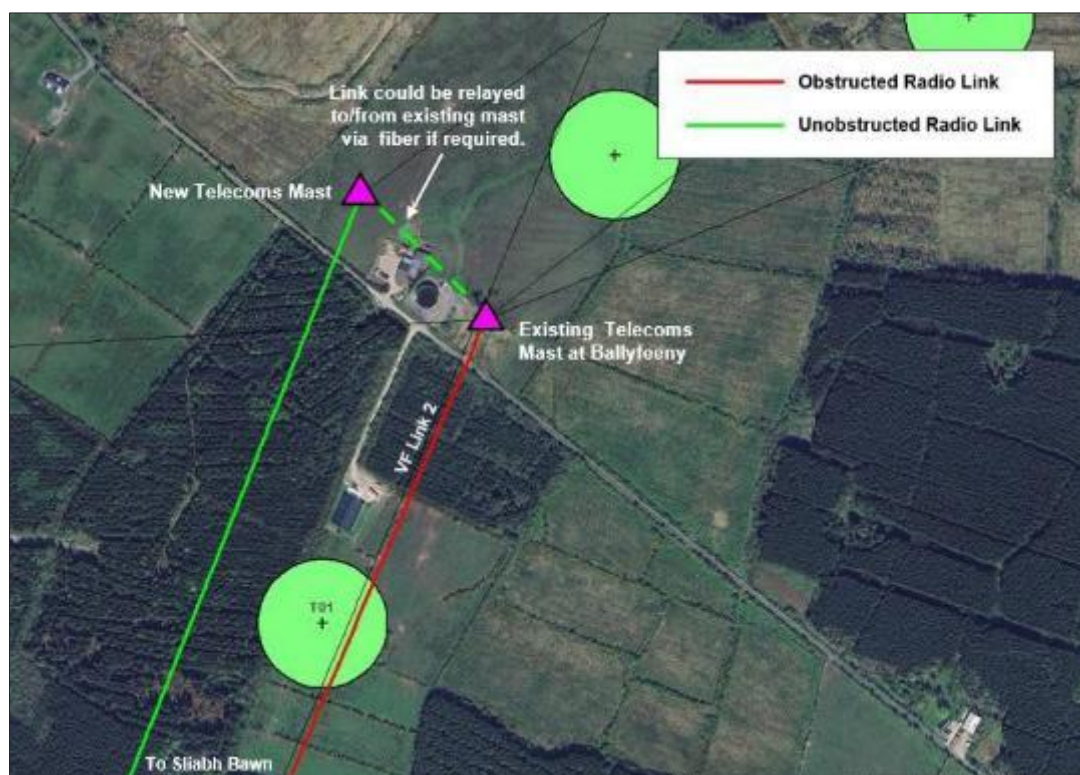


Figure 20. A new telecoms mast installed within the proposed wind farm site boundary could be used to route the Vodafone service between Sliabh Bawn and Ballyfeeny.

To determine if a mast located within the wind farm site boundary could be used as a viable link to/from Sliabh Bawn, a radio link path profile was generated. A Radio Link Budget was also carried out to determine if the proposed link would meet the Radio Link Availability Criteria required by ComReg for radio licensing. The Radio Link Path Profile and Radio Link Budget are based on the following ITU-R Recommendations:

- ITU-R P.525-2
- ITU-R P.526-11
- ITU-R P.676-8

The Radio Path Profile is shown below in Section 6.2.2.1. The Radio Link Budget can be found in Appendix C (Section C.5).

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A 3D model of the proposed radio link was also generated to ensure that it would not be impacted by the turbine layout. The 3D model (Figure 21) confirmed that a radio link from the proposed mast site location would not be impacted by the turbine layout.

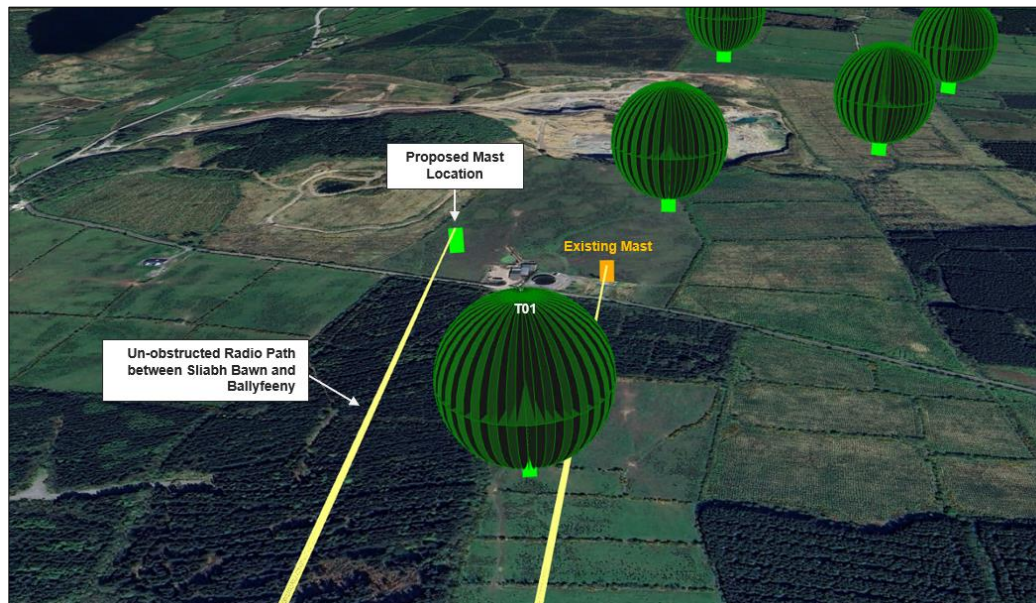


Figure 21. 3D View - Sliabh Bawn to New Telecoms Mast at Ballyfeeny

6.2.2.1 Path Profile – Sliabh Bawn to New Telecoms Mast at Ballyfeeny

The radio link path profile shows clear Line-of-Sight (LOS) and the link budget results would pass the radio availability criteria required by ComReg.

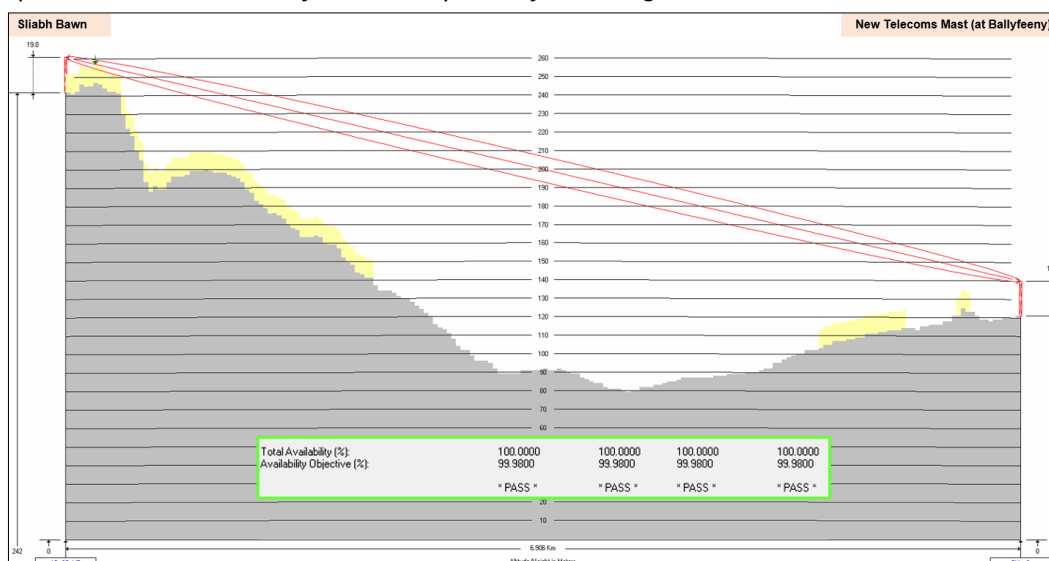


Figure 22. Path Profile – Sliabh Bawn to New Telecoms Mast at Ballyfeeny

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6.2.3 Vodafone Link 4 - Route the Vodafone service between Ballyfeeny and Roosky via a new telecoms mast located within the wind farm site boundary.

The most technically feasible mitigation measure option to mitigate the potential impact on Vodafone Link 4 would be to route the radio service to/from Roosky via a new telecoms mast installed within the wind farm site boundary (See Section 6.2.2.2 above).

Note: A fiber optic cable could be used to connect the new and existing telecoms masts at Ballyfeeny, if this is a requirement for Vodafone.

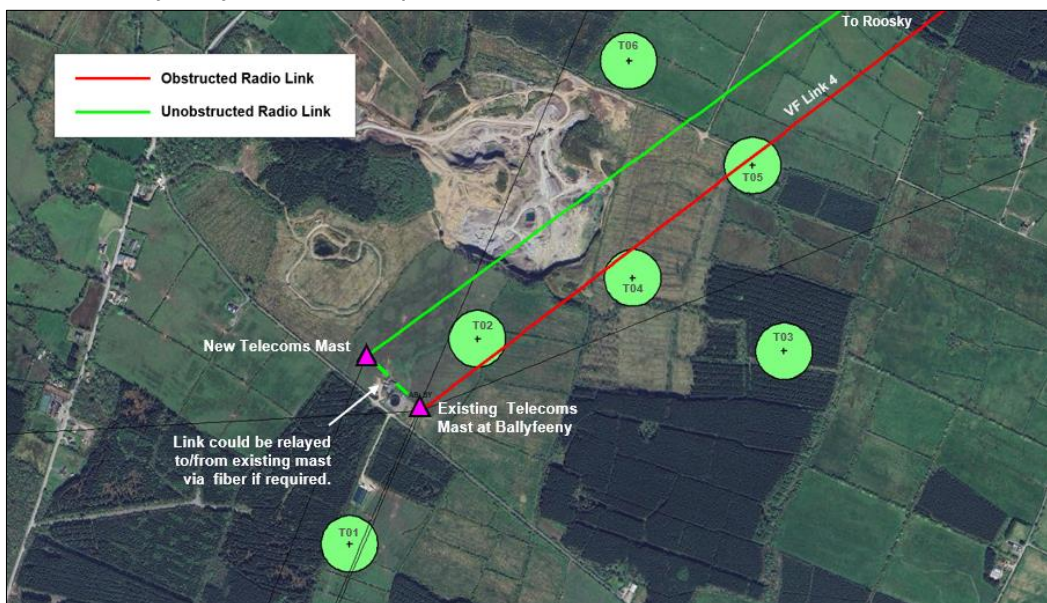


Figure 24. A new telecoms mast located within the proposed wind farm site boundary could be used to route the Vodafone service between Ballyfeeny and Roosky.

To determine if a mast located within the wind farm site boundary could be used as a viable link to/from Roosky, a radio link path profile was generated. A Radio Link Budget was also carried out to determine if the proposed link would meet the Radio Link Availability Criteria required by ComReg for radio licensing. The Radio Link Path Profile and Radio Link Budget are based on the following ITU-R Recommendations:

- ITU-R P.525-2
- ITU-R P.526-11
- ITU-R P.676-8

The Radio Path Profile is shown below in Sections 6.2.3.1. The Radio Link Budget can be found in Appendix C (Section C.6).

A 3D model of the proposed radio link was also generated to ensure that it would not be impacted by the turbine layout. The 3D model (Figure 25) confirmed that a radio link from the proposed mast site location would not be impacted by the turbine layout.

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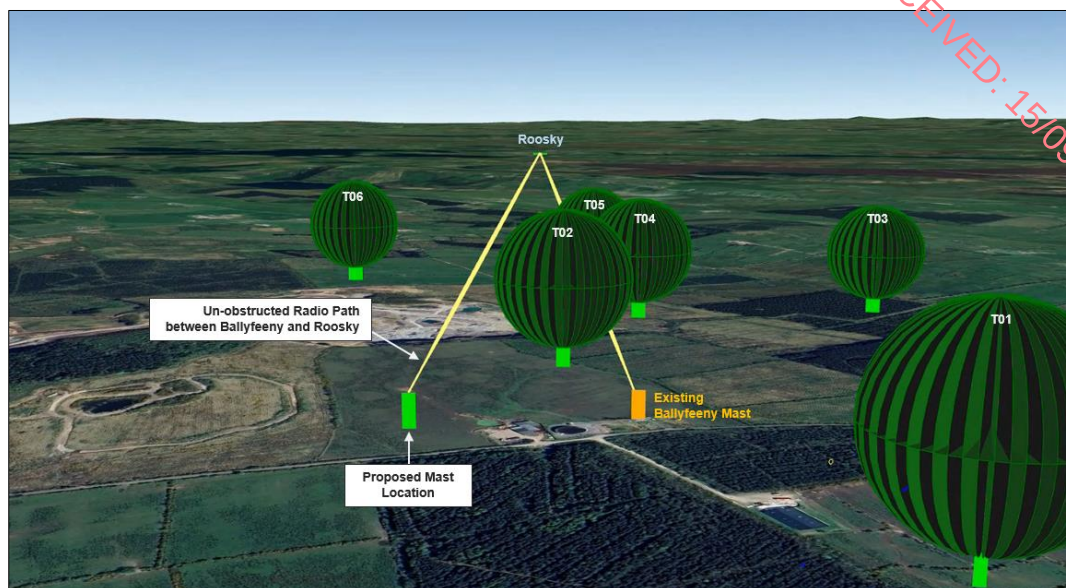


Figure 25. 3D View - New Telecoms Mast at Ballyfeeny to Roosky

6.2.3.1 Path Profile – New Telecoms Mast at Ballyfeeny to Roosky

The radio link path profile shows clear Line-of-Sight (LOS) and the link budget results would pass the radio availability criteria required by ComReg.

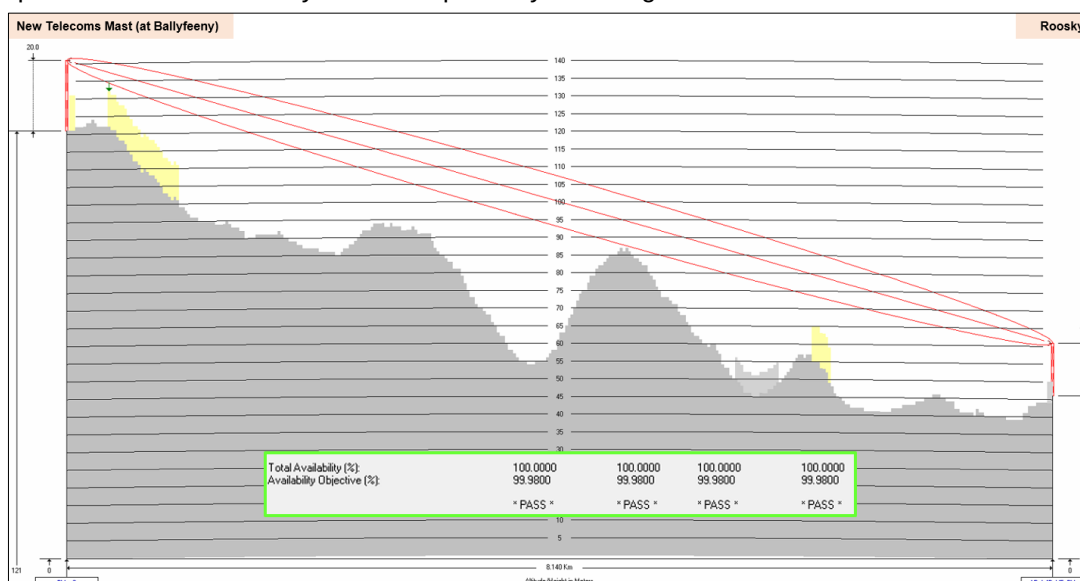


Figure 26. Path Profile – New Telecoms Mast at Ballyfeeny to Roosky

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Section 7 - Conclusions

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7. Conclusions

From the findings made in this report the following conclusions have been made:

- Results from the telecom operator consultations and desktop survey analysis indicate that there are ten radio links that pass over the proposed wind farm site.
- The impacts of the proposed turbine layout on the Telecom Operator radio links are listed below in Table 10.

Operator	Radio Link Description	Impact of Wind Farm	Mitigation Measures
Eir	PTP link from Ballyfeeny to Edercloon	No impacts.	N.A
Three Ireland	PTP link from Mullaghmacormick to Sliabh Bawn.	Impacted by T01 & T02	Relay the radio link via an existing Telecoms Mast-Site (e.g. the existing mast-site at Lissavaddy).
	PTP link from Ballyfeeny to Ballyleague.	No impacts.	N.A
	PTP link from Ballyfeeny to Lissawaddy.	No impacts.	N.A
	PTP link from Ballyfeeny to Strokestown.	No impacts.	N.A
Vodafone Ireland	PTP link from Mullaghmacormick to Sliabh Bawn.	Impacted by T01 & T02	Relay the radio link via an existing Telecoms Mast-Site (e.g. the existing mast-site at Lissavaddy).
	PTP link from Sliabh Bawn to Ballyfeeny.	Impacted by T01	Route the Vodafone service between Sliabh Bawn and Ballyfeeny via a new telecoms mast located within the proposed wind farm site boundary.
	PTP link from Ballyfeeny to Lissawaddy.	No impacts.	N.A
	PTP link from Ballyfeeny to Roosky.	Impacted by T02, T04 & T05	Route the Vodafone service between Ballyfeeny and Roosky via a new telecoms mast located within the wind farm site boundary.
	PTP link from Ballyfeeny to Edercloon.	No impacts.	N.A

Table 10. Radio Links in vicinity of proposed Ballyfeeny Wind Farm development.

- Figure 27 below has been provided to illustrate each of four radio links (1 Three Ireland and 3 Vodafone) that would be impacted by the proposed turbine layout.
- The sections 6.1 and 6.2 of this report, describes the most technically feasible mitigation measures that will be implemented to offset the impact of the proposed turbines on the Three Ireland and Vodafone Networks.
- The most technically feasible mitigation measure to offset the potential impact on the Three Ireland Link between Mullaghmacormick and Sliabh Bawn is to relay the radio link via an existing Telecoms Mast. This mitigation measure is described in Sections 6.1.1.

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- To offset the potential impact on Vodafone Link 1 (Mullaghmacormick – Sliabh Bawn) the radio link will be relayed via an existing Telecoms Mast. This mitigation measure is outlined in Section 6.2.1
- To offset the potential impact on Vodafone Link 2 (Sliabh Bawn – Ballyfeeny) and Vodafone Link 4 (Ballyfeeny – Roosky) a relay mast installed within the wind farm site boundary will be used to relay the radio link. This mitigation measure is described in Section 6.2.2.

Based on previous experience and precedents of similar mitigation proposals being proposed and accepted, the most technically feasible mitigation measures are outlined in this report. The proposed measures will offset the potential impacts of the proposed turbines at Ballyfeeny on the existing telecommunications network infrastructure. The Applicant in this instance will be responsible for all costs associated with the mitigation measures set out. A protocol agreement will be put in place between the Applicant and the telecoms operator (Vodafone Ireland and Three Ireland), prior to the construction of the proposed wind farm to agree terms such as estate management, operator access, electricity supply etc. Based on the implementation of the proposed mitigation measures outlined in this report it is considered that there will be no residual adverse effects on the existing telecommunication infrastructure network as a result of the proposed wind farm.

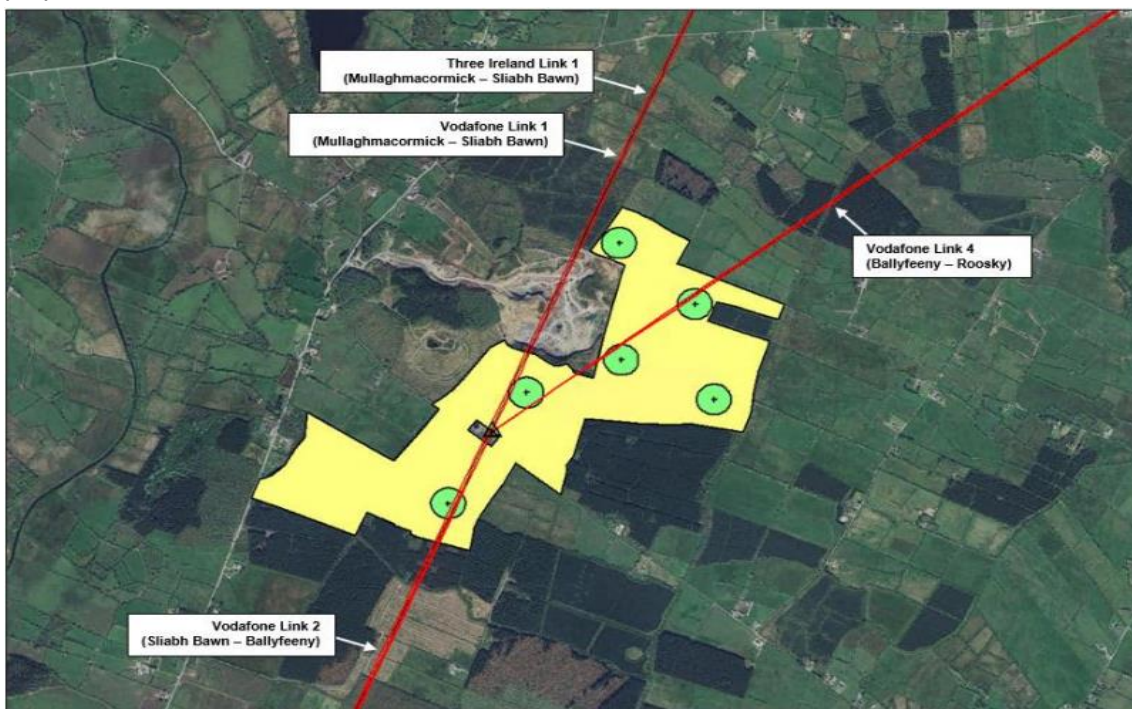


Figure 27. Telecommunication links impacted by proposed turbines

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APPENDIX A – Wind Farm Turbine Coordinates

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Appendix A – Wind Turbine Co-ordinates

The turbine layout, as submitted for planning, was assessed in this Telecommunications Impact Study. The turbine co-ordinates are provided in Table A1 below.

Turbine ID	Co-ordinates (ITM)	
	Latitude	Longitude
T01	598032	781362
T02	598343	781861
T03	599091	781831
T04	598722	782009
T05	599015	782261
T06	598713	782537

Table A1. Ballyfeeny Wind Turbine Co-ordinates

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APPENDIX B – Field Survey Findings

AiBridges <i>Total Broadband Solutions</i>	Procedure: 001	Rev: 7.4
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Appendix B – Field Survey Findings

The telecom mast-sites surveyed for this Telecoms Impact Study are shown relative to the proposed wind farm site in Figure 28 below.



Figure 28. Telecom Mast-Sites shown relative to proposed Wind Farm Site

The findings from the field surveys of each of the mast-sites are presented below.

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Mast-Site A (Ballyfeeny)

Telecommunications Mast-Site A is in the townland of Ballyfeeny, Co Roscommon and is located adjacent to the proposed wind farm site. A photo of the mast at this location is shown in the figure below.

The Telecom Operators who have radio links operating from this mast-site in the direction of the wind farm are listed in Table 11.



Figure 29. Mast A1

Mast ID	Telecom operators with radio links in direction of proposed wind farm
Mast A1	Eir, Three Ireland, Vodafone

Table 11. Field Survey Summary – Mast A1

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Mast-Site B (Edercloon)

Telecommunications Mast-Site B is in the townland of Edercloon, Co Longford and is located approximately 8km northeast of the proposed wind farm site. A photo of the mast at this location is shown in the figure below. The Telecom Operators who have radio links operating from this mast-site in the direction of the wind farm are listed in Table 12.



Figure 30. Mast B1

Mast ID	Telecom operators with radio links in direction of proposed wind farm
Mast B1	Eir, Vodafone

Table 12. Field Survey Summary – Mast B1

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Mast-Site C (Roosky)

Telecommunications Mast-Site C is located in Roosky, Co Roscommon and is approximately 7 km northeast of the proposed wind farm. A photo of the mast-structure at this location is shown in the figure below. The Telecom Operators who have radio links operating from this mast-site in the direction of the wind farm are listed in Table 13.



Figure 31. Mast C1

Mast ID	Telecom operators with radio links in direction of proposed wind farm
Mast C1	Vodafone

Table 13. Field Survey Summary – Mast C1

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Mast-Site D (Mullaghmacormick)

Telecommunications Mast-Site D is located in the townland of Mullaghmacormick, Co Roscommon and is approximately 5 km north of the proposed wind farm. A photo of the mast at this location is shown in the figure below. The Telecom Operators who have radio links operating from this mast-site in the direction of the wind farm are listed in Table 14.



Figure 32. Mast D1

Mast ID	Telecom operators with radio links in direction of proposed wind farm
Mast D1	Three Ireland, Vodafone

Table 14. Field Survey Summary – Mast D1

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Mast-Site E (Ballyleague)

Telecommunications Mast-Site E is located at Ballyleague, Co Roscommon and is approximately 12 km south of the proposed wind farm. A photo of the mast at this location is shown in the figure below. The Telecom Operators who have radio links operating from this mast-site in the direction of the wind farm are listed in Table 15.



Figure 33. Mast E1

Mast ID	Telecom operators with radio links in direction of proposed wind farm
Mast E1	Three Ireland

Table 15. Field Survey Summary – Mast E1

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Mast-Site F (Sliabh Bawn)

Telecommunications Mast-Site F is located at Sliabh Bawn, Co Roscommon and is approximately 7km southwest of the proposed wind farm. A photo of the mast at this location is shown in the figure below. The Telecom Operators who have radio links operating from this mast-site in the direction of the wind farm are listed in Table 16.



Figure 34. Mast F1

Mast ID	Telecom operators with radio links in direction of proposed wind farm
Mast F1	Three Ireland, Vodafone

Table 16. Field Survey Summary – Mast F1

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Mast-Site G (Strokestown)

Telecommunications Mast-Site G is located in Strokestown, Co Roscommon and is approximately 5 km west of the proposed wind farm. A photo of the mast at this location is shown in the figure below. The Telecom Operators who have radio links operating from this mast-site in the direction of the wind farm are listed in Table 17.



Figure 35. Mast G1

Mast ID	Telecom operators with radio links in direction of proposed wind farm
Mast G1	Three Ireland

Table 17. Field Survey Summary – Mast G1

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Mast-Site H (Lissawaddy)

Telecommunications Mast-Site H is located in the townland of Lissawaddy, Co Roscommon and is approximately 19 km west of the proposed wind farm. A photo of the masts at this location is shown in the figure below. The Telecom Operators who have radio links operating from this mast-site in the direction of the wind farm are listed in Table 18.



Figure 36. Mast-Site H

Mast ID	Telecom operators with radio links in direction of proposed wind farm
Mast H1	Three Ireland
Mast H2	Vodafone

Table 18. Field Survey Summary – Mast H1

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APPENDIX C – Radio Link Budget Reports

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Appendix C – Radio Link Budget Reports

C.1 Radio Link Budget Report (Mullaghamacormick – Lissavaddy_3IRL)

Link Budget Report

Site: AB_L1A_3IR_MK (Mullaghamacormick) AB_L3B_3IRL_BY (Lissavaddy_3IRL)

Name:

Type: Cell Cell

Latitude: 53°50'16.5"N 53°46'29.4"N

Longitude: 7°59'20.8"W 8°19'06.2"W

Altitude (m): 121.0 118.0

UserData1: User Data

Datum: World Geodetic System 1984 (WGS 84)

Forward Link		Reverse Link	
Transmission Site:	AB_L1A_3IR_MK	AB_L3B_3IRL_BY	
Reception Site:	AB_L3B_3IRL_BY	AB_L1A_3IR_MK	
Radio Type:	NetRadio0001	NetRadio0001	
Modulation Scheme:	4-QAM	4-QAM	
Bandwidth (MHz):	2	2	
Roll-Off Factor:	0.2	0.2	
Coding Gain (dB):	0	0	
System Gains (dB):	0	0	
Channel Overhead (%):	20	20	
FEC Overhead (%):	0	0	
Reference Temperature (°K):	290	290	
Receiver Noise Figure (dB):	5	5	
Maximum Data Rate (Mbps):	2.667	2.667	
Maximum Bit Rate (Mbps):	3.333	3.333	
Required Bit Error Rate:	BER 10 ⁻³	BER 10 ⁻³	BER 10 ⁻⁶
Service Threshold (dBm):	-91	-90	-91
Carrier to Noise Ratio (dB):	14.965	15.965	14.965
Cross Polarization Improvement Factor (dB):		20	20
Rx Equalization Sig Norm Parameter (Kn,M):		0.1	0.1
Rx Equalization Sig Norm Parameter (Kn,NM):		0.1	0.1
UserData1:	User Data	User Data	
Center Frequency (MHz):	18000	18000	
Channel Bandwidth (MHz):	28	28	
Transmission Power (dBm):	30	30	
Transmission Gains (dB):	0	0	
Transmission System Loss (dB):	0	0	
Transmission Line Loss (dB/100 m):	4	4	
Transmission Line Length (m):	10	10	
Transmission Connection Loss (dB):	0.3	0.3	
Transmission Number of Connections:	2	2	
Transmission Additional Loss (dB):	0	0	
Transmission Losses (dB):	1	1	
Transmission Antenna:	HP2-18-NSMA	HP2-18-NSMA	
Transmission Antenna Size (m):	0.6	0.6	
Transmission Antenna Height (m):	20	20	
Transmission Antenna Gain (dBd):	36.46	36.46	
Transmission Antenna Gain (dBi):	38.6	38.6	
Transmission Power EIRP (dBm):	67.6	67.6	
Reception Gains (dB):	0	0	
Reception System Loss (dB):	0	0	
Reception Line Loss (dB/100 m):	4	4	
Reception Line Length (m):	10	10	
Reception Connection Loss (dB):	0.3	0.3	
Reception Number of Connections:	2	2	
Reception Additional Loss (dB):	0	0	
Reception Losses (dB):	1	1	

AiBridges Total Broadband Solutions	Procedure: 001	Rev: 7.4
Title: Ballyfeeny: Telecommunications Impact Assessment	Approved: KH	Date: 09/09/25

Reception Antenna: HP2-18-NSMA HP2-18-NSMA
Reception Antenna Size (m): 0.6 0.6
Reception Antenna Height (m): 20 20
Reception Antenna Gain (dBd): 36.46 36.46
Reception Antenna Gain (dBi): 38.6 38.6

Link Polarization: Vertical Vertical
Cross Polarization Factor (dB): 30 30

Link Distance (m): 22778.143 22778.143
Azimuth - True (°): 252.158 71.892
Azimuth - Magnetic (°): 254.564 74.419
Transmission Inclination (°): 0.008 -0.008
Reception Inclination (°): 0.008 -0.008

ITU Recommendation: ITU-R P.525-2
Free Space Distance (m): 22778.143 22778.143
Center Frequency (MHz): 18000 18000
Free Space Loss (dB): 144.696 144.696

Max Fresnel Radius (m): 9.742 9.742
Max 2nd Fresnel Radius (m): 13.777 13.777

Earth Radius Factor (K): 4/3
Effective Radius (m): 8502056.000

ITU Recommendation: ITU-R P.526-11
Diffraction Model: Cascade Knife Edge
Diffraction: No LOS Diffraction No LOS Diffraction
Diffraction Loss (dB): 0 0

Clearance Target (%): 60
Minimum Clearance (m): 18.078 18.078
Minimum Clearance Point (m): 22672.422 22672.422

Terrain Reflection Dispersion (°): 0.5
Reflection Area 1 (m): 720.827 720.827
Reflection Area 2 (m): 816.938 816.938
Reflection Area 3 (m): 855.382 855.382
Reflection Area 4 (m): 1681.9 - 1701.2 1681.9 - 1701.2
Reflection Area 5 (m): 1758.819 1758.819
Reflection Area 6 (m): 1797.263 1797.263
Reflection Area 7 (m): 1931.817 1931.817
Reflection Area 8 (m): 1970.3 - 2027.9 1970.3 - 2027.9
Reflection Area 9 (m): 2066.372 2066.372
Reflection Area 10 (m): 7313.994 7313.994
Reflection Area 11 (m): 7371.661 7371.661
Reflection Area 12 (m): 7429.3 - 7583.1 7429.3 - 7583.1
Reflection Area 13 (m): 7679.213 7679.213
Reflection Area 14 (m): 7736.88 7736.88
Reflection Area 15 (m): 7813.8 - 7890.7 7813.8 - 7890.7
Reflection Area 16 (m): 7948.322 7948.322

ITU Recommendation: ITU-R P.676-8
Atmospheric Pressure (hPa): 1013 1013
Standard Temperature (°C): 15 15
Water Vapor Density (g/m³): 7.5 7.5
Atmospheric Gases Loss (dB): 1.379 1.379

Total Path Loss (dB): 146.075 146.075

Reception Signal Level (dBm): -40.875 -40.875

BER 10-3 BER 10-6 BER 10-3 BER 10-6
Service Threshold (dBm): -91 -90 -91 -90
Link Gross Margin (dB): 50.125 49.125 50.125 49.125

ITU Recommendation: ITU-R F.1703-0 / ITU-T G.827
Objective ITU Quality Grade: Short Haul SDH Networks
Unavailability Objective (%): 2.00E-02
Availability Objective (%): 99.9800

 Total Broadband Solutions	Procedure: 001	Rev: 7.4
Title: Ballyfeeny: Telecommunications Impact Assessment	Approved: KH	Date: 09/09/25

ITU Recommendation: ITU-R F.1668-1 / ITU-T G.826
Error Performance Objective BBER (%): 1.60E-05 1.60E-05
Error Performance Objective BBER (s/Month): 0.42 0.42
SESr ESR SESr ESR
Error Performance Objective (%): 1.60E-04 3.20E-03 1.60E-04 3.20E-03
Error Performance Objective (s/Month): 4.205 84.096 4.205 84.096

ITU Recommendation: ITU-R F.1668-1 / ITU-T G.828
Error Performance Objective BBER (%): 4.00E-06 4.00E-06
Error Performance Objective BBER (s/Month): 0.105 0.105
SESr ESR SESr ESR
Error Performance Objective (%): 1.60E-04 8.00E-04 1.60E-04 8.00E-04
Error Performance Objective (s/Month): 4.205 21.024 4.205 21.024

Multipath Model: ITU-R P.530-15
Multipath Planning Type: Quick Planning
Multipath Time Frame: Average annual distribution
ITU Recommendation: ITU-R P.453-9
Point Refractivity Gradient (dN1): -76.7
Geoclimatic Factor: 4.05E-05 4.05E-05
Multipath Occurrence Factor (%): 4.24E+00 4.24E+00

Precipitation Model: ITU-R P.530-15
ITU Recommendation: ITU-R P.837-5 / ITU-R P.841-4
Precipitation Time Frame: Average annual distribution
Precipitation Rate @ 0.01% (mm/h): 22
ITU Recommendation: ITU-R P.838-3
Specific Attenuation (dB/km): 1.708854 1.708854
Rainfall Attenuation (dB): 22.664 22.664

BER 10-3 BER 10-6 BER 10-3 BER 10-6
Fading Outage (%): 6.67E-06 8.39E-06 6.67E-06 8.39E-06
Selective Fading Outage (%): 1.40E-07 1.40E-07 1.40E-07 1.40E-07
Composite Fading Outage (%): 6.81E-06 8.53E-06 6.81E-06 8.53E-06

Fading Outage (s/Month): 0.175 0.221 0.175 0.221
Selective Fading Outage (s/Month): 0.004 0.004 0.004 0.004
Composite Fading Outage (s/Month): 0.179 0.224 0.179 0.224

BER 10-3 BER 10-6 BER 10-3 BER 10-6
Unavailability due to Rain (%): 5.99E-04 6.59E-04 5.99E-04 6.59E-04
Unavailability due to Rain (s/Year): 188.858 207.975 188.858 207.975

BER 10-3 BER 10-6 BER 10-3 BER 10-6
Unavailability due to Fading (%): 6.81E-06 8.53E-06 6.81E-06 8.53E-06
Unavailability due to Rain (%): 5.99E-04 6.59E-04 5.99E-04 6.59E-04
Total Unavailability (%): 6.06E-04 6.68E-04 6.06E-04 6.68E-04
Unavailability Objective (%): 2.00E-02 2.00E-02 2.00E-02 2.00E-02

Unavailability due to Fading (s/Year): 2.146 2.691 2.146 2.691
Unavailability due to Rain (s/Year): 188.858 207.975 188.858 207.975
Total Unavailability (s/Year): 191.004 210.666 191.004 210.666
Unavailability Objective (s/Year): 6307.2 6307.2 6307.2 6307.2

Total Availability (%): 99.9994 99.9993 99.9994 99.9993
Availability Objective (%): 99.9800 99.9800 99.9800 99.9800

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 Total Broadband Solutions	Procedure: 001	Rev: 7.4
Title: Ballyfeeny: Telecommunications Impact Assessment	Approved: KH	Date: 09/09/25

C.2 Radio Link Budget Report (Lissavaddy_3IRL – Sliabh Bawn)

Link Budget Report

Site: AB_L3B_3IRL_BY (Lissawaddy_3IRL) AB_L1B_3IRL_BY (Sliabh Bawn)

Name:

Type: Cell Cell

Latitude: 53°46'29.4"N 53°43'42.8"N

Longitude: 8°19'06.2"W 8°04'03.3"W

Altitude (m): 118.0 242.0

UserData1: User Data

Datum: World Geodetic System 1984 (WGS 84)

Forward Link		Reverse Link	
Transmission Site:	AB_L3B_3IRL_BY	AB_L1B_3IRL_BY	
Reception Site:	AB_L1B_3IRL_BY	AB_L3B_3IRL_BY	
Radio Type:	NetRadio0001	NetRadio0001	
Modulation Scheme:	4-QAM	4-QAM	
Bandwidth (MHz):	2	2	
Roll-Off Factor:	0.2	0.2	
Coding Gain (dB):	0	0	
System Gains (dB):	0	0	
Channel Overhead (%):	20	20	
FEC Overhead (%):	0	0	
Reference Temperature (°K):	290	290	
Receiver Noise Figure (dB):	5	5	
Maximum Data Rate (Mbps):	2.667	2.667	
Maximum Bit Rate (Mbps):	3.333	3.333	
Required Bit Error Rate:	BER 10-3 BER 10-6	BER 10-3 BER 10-6	
Service Threshold (dBm):	-91 -90	-91 -90	
Carrier to Noise Ratio (dB):	14.965 15.965	14.965 15.965	
Cross Polarization Improvement Factor (dB):	20	20	20
Rx Equalization Sig Norm Parameter (Kn,M):	0.1	0.1	0.1
Rx Equalization Sig Norm Parameter (Kn,NM):	0.1	0.1	0.1
UserData1:	User Data	User Data	
Center Frequency (MHz):	18000	18000	
Channel Bandwidth (MHz):	28	28	
Transmission Power (dBm):	30	30	
Transmission Gains (dB):	0	0	
Transmission System Loss (dB):	0	0	
Transmission Line Loss (dB/100 m):	4	4	
Transmission Line Length (m):	10	10	
Transmission Connection Loss (dB):	0.3	0.3	
Transmission Number of Connections:	2	2	
Transmission Additional Loss (dB):	0	0	
Transmission Losses (dB):	1	1	
Transmission Antenna:	HP2-18-NSMA	HP2-18-NSMA	
Transmission Antenna Size (m):	0.6	0.6	
Transmission Antenna Height (m):	20	20	
Transmission Antenna Gain (dBd):	36.46	36.46	
Transmission Antenna Gain (dBi):	38.6	38.6	
Transmission Power EIRP (dBm):	67.6	67.6	
Reception Gains (dB):	0	0	
Reception System Loss (dB):	0	0	
Reception Line Loss (dB/100 m):	4	4	
Reception Line Length (m):	10	10	
Reception Connection Loss (dB):	0.3	0.3	
Reception Number of Connections:	2	2	
Reception Additional Loss (dB):	0	0	
Reception Losses (dB):	1	1	
Reception Antenna:	HP2-18-NSMA	HP2-18-NSMA	
Reception Antenna Size (m):	0.6	0.6	
Reception Antenna Height (m):	20	20	
Reception Antenna Gain (dBd):	36.46	36.46	

AiBridges Total Broadband Solutions	Procedure: 001	Rev: 7.4
Title: Ballyfeeny: Telecommunications Impact Assessment	Approved: KH	Date: 09/09/25

Reception Antenna Gain (dBi): 38.6 38.6

Link Polarization: Vertical Vertical

Cross Polarization Factor (dB): 30 30

Link Distance (m): 17310.426 17310.426

Azimuth - True (°): 107.233 287.435

Azimuth - Magnetic (°): 109.76 289.853

Transmission Inclination (°): -0.41 0.41

Reception Inclination (°): -0.41 0.41

ITU Recommendation: ITU-R P.525-2

Free Space Distance (m): 17310.87 17310.87

Center Frequency (MHz): 18000 18000

Free Space Loss (dB): 142.312 142.312

Max Fresnel Radius (m): 8.493 8.493

Max 2nd Fresnel Radius (m): 12.011 12.011

Earth Radius Factor (K): 4/3

Effective Radius (m): 8502056.000

ITU Recommendation: ITU-R P.526-11

Diffraction Model: Cascade Knife Edge

Diffraction: No LOS Diffraction No LOS Diffraction

Diffraction Loss (dB): 0 0

Clearance Target (%): 60

Minimum Clearance (m): 9.682 9.682

Minimum Clearance Point (m): 17300.842 17300.842

Terrain Reflection Dispersion (°): 0.5

Reflection Area 1 (m): 373.813 373.813

Reflection Area 2 (m): 431.3 - 450.5 431.3 - 450.5

Reflection Area 3 (m): 508.003 508.003

Reflection Area 4 (m): 565.512 565.512

Reflection Area 5 (m): 642.2 - 661.4 642.2 - 661.4

Reflection Area 6 (m): 2674.2 - 2712.5 2674.2 - 2712.5

Reflection Area 7 (m): 2885 - 2923.4 2885 - 2923.4

Reflection Area 8 (m): 3019.3 - 3057.6 3019.3 - 3057.6

Reflection Area 9 (m): 3115.1 - 3172.6 3115.1 - 3172.6

Reflection Area 10 (m): 3230.1 - 3268.5 3230.1 - 3268.5

Reflection Area 11 (m): 3364.319 3364.319

Reflection Area 12 (m): 3421.8 - 3479.3 3421.8 - 3479.3

Reflection Area 13 (m): 3594.4 - 3613.5 3594.4 - 3613.5

Reflection Area 14 (m): 3651.867 3651.867

Reflection Area 15 (m): 3690.2 - 3709.4 3690.2 - 3709.4

Reflection Area 16 (m): 3805.2 - 3824.4 3805.2 - 3824.4

ITU Recommendation: ITU-R P.676-8

Atmospheric Pressure (hPa): 1013 1013

Standard Temperature (°C): 15 15

Water Vapor Density (g/m³): 7.5 7.5

Atmospheric Gases Loss (dB): 1.048 1.048

Total Path Loss (dB): 143.36 143.36

Reception Signal Level (dBm): -38.16 -38.16

BER 10-3 BER 10-6 BER 10-3 BER 10-6

Service Threshold (dBm): -91 -90 -91 -90

Link Gross Margin (dB): 52.84 51.84 52.84 51.84

ITU Recommendation: ITU-R F.1703-0 / ITU-T G.827

Objective ITU Quality Grade: Short Haul SDH Networks

Unavailability Objective (%): 2.00E-02

Availability Objective (%): 99.9800

ITU Recommendation: ITU-R F.1668-1 / ITU-T G.826

Error Performance Objective BBER (%): 1.60E-05 1.60E-05

Error Performance Objective BBER (s/Month): 0.42 0.42

SESR ESR SESR ESR

 Total Broadband Solutions	Procedure: 001	Rev: 7.4
Title: Ballyfeeny: Telecommunications Impact Assessment	Approved: KH	Date: 09/09/25

Error Performance Objective (%): 1.60E-04 3.20E-03 1.60E-04 3.20E-03
Error Performance Objective (s/Month): 4.205 84.096 4.205 84.096

ITU Recommendation: ITU-R F.1668-1 / ITU-T G.828
Error Performance Objective BBER (%): 4.00E-06 4.00E-06
Error Performance Objective BBER (s/Month): 0.105 0.105
SESr ESR SESr ESR
Error Performance Objective (%): 1.60E-04 8.00E-04 1.60E-04 8.00E-04
Error Performance Objective (s/Month): 4.205 21.024 4.205 21.024

Multipath Model: ITU-R P.530-15
Multipath Planning Type: Quick Planning
Multipath Time Frame: Average annual distribution
ITU Recommendation: ITU-R P.453-9
Point Refractivity Gradient (dN1): -76.7
Geoclimatic Factor: 4.05E-05 4.05E-05
Multipath Occurrence Factor (%): 1.42E-01 1.42E-01

Precipitation Model: ITU-R P.530-15
ITU Recommendation: ITU-R P.837-5 / ITU-R P.841-4
Precipitation Time Frame: Average annual distribution
Precipitation Rate @ 0.01% (mm/h): 22
ITU Recommendation: ITU-R P.838-3
Specific Attenuation (dB/km): 1.70886 1.70886
Rainfall Attenuation (dB): 18.585 18.585

BER 10-3 BER 10-6 BER 10-3 BER 10-6
Fading Outage (%): 7.92E-08 9.96E-08 7.92E-08 9.96E-08
Selective Fading Outage (%): 5.42E-09 5.42E-09 5.42E-09 5.42E-09
Composite Fading Outage (%): 8.46E-08 1.05E-07 8.46E-08 1.05E-07

Fading Outage (s/Month): 0.002 0.003 0.002 0.003
Selective Fading Outage (s/Month): 0 0 0 0
Composite Fading Outage (s/Month): 0.002 0.003 0.002 0.003

BER 10-3 BER 10-6 BER 10-3 BER 10-6
Unavailability due to Rain (%): 1.31E-04 1.52E-04 1.31E-04 1.52E-04
Unavailability due to Rain (s/Year): 41.292 47.936 41.292 47.936

BER 10-3 BER 10-6 BER 10-3 BER 10-6
Unavailability due to Fading (%): 8.46E-08 1.05E-07 8.46E-08 1.05E-07
Unavailability due to Rain (%): 1.31E-04 1.52E-04 1.31E-04 1.52E-04
Total Unavailability (%): 1.31E-04 1.52E-04 1.31E-04 1.52E-04
Unavailability Objective (%): 2.00E-02 2.00E-02 2.00E-02 2.00E-02

Unavailability due to Fading (s/Year): 0.027 0.033 0.027 0.033
Unavailability due to Rain (s/Year): 41.292 47.936 41.292 47.936
Total Unavailability (s/Year): 41.319 47.969 41.319 47.969
Unavailability Objective (s/Year): 6307.2 6307.2 6307.2 6307.2

Total Availability (%): 99.9999 99.9998 99.9999 99.9998
Availability Objective (%): 99.9800 99.9800 99.9800 99.9800

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 Total Broadband Solutions	Procedure: 001	Rev: 7.4
Title: Ballyfeeny: Telecommunications Impact Assessment	Approved: KH	Date: 09/09/25

C.3 Radio Link Budget Report (Mullaghmacormick – Lissavaddy_VF)

Link Budget Report

Site: AB_L1A_VF_MK (Mullaghmacormick) AB_L3B_VF_BY (Lissavaddy_VF)

Name:

Type: Cell Cell

Latitude: 53°50'16.5"N 53°46'29.5"N

Longitude: 7°59'20.8"W 8°18'56.3"W

Altitude (m): 121.0 117.0

UserData1: User Data

Datum: World Geodetic System 1984 (WGS 84)

Forward Link		Reverse Link	
Transmission Site:	AB_L1A_VF_MK	AB_L3B_VF_BY	
Reception Site:	AB_L3B_VF_BY	AB_L1A_VF_MK	
Radio Type:	NetRadio0001	NetRadio0001	
Modulation Scheme:	4-QAM	4-QAM	
Bandwidth (MHz):	2	2	
Roll-Off Factor:	0.2	0.2	
Coding Gain (dB):	0	0	
System Gains (dB):	0	0	
Channel Overhead (%):	20	20	
FEC Overhead (%):	0	0	
Reference Temperature (°K):	290	290	
Receiver Noise Figure (dB):	5	5	
Maximum Data Rate (Mbps):	2.667	2.667	
Maximum Bit Rate (Mbps):	3.333	3.333	
Required Bit Error Rate:	BER 10-3 BER 10-6	BER 10-3 BER 10-6	
Service Threshold (dBm):	-91 -90	-91 -90	
Carrier to Noise Ratio (dB):	14.965 15.965	14.965 15.965	
Cross Polarization Improvement Factor (dB):	20	20	20
Rx Equalization Sig Norm Parameter (Kn,M):	0.1	0.1	0.1
Rx Equalization Sig Norm Parameter (Kn,NM):	0.1	0.1	0.1
UserData1:	User Data	User Data	
Center Frequency (MHz):	18000	18000	
Channel Bandwidth (MHz):	28	28	
Transmission Power (dBm):	30	30	
Transmission Gains (dB):	0	0	
Transmission System Loss (dB):	0	0	
Transmission Line Loss (dB/100 m):	4	4	
Transmission Line Length (m):	10	10	
Transmission Connection Loss (dB):	0.3	0.3	
Transmission Number of Connections:	2	2	
Transmission Additional Loss (dB):	0	0	
Transmission Losses (dB):	1	1	
Transmission Antenna:	HP2-18-NSMA	HP2-18-NSMA	
Transmission Antenna Size (m):	0.6	0.6	
Transmission Antenna Height (m):	20	20	
Transmission Antenna Gain (dBi):	36.46	36.46	
Transmission Antenna Gain (dBd):	38.6	38.6	
Transmission Power EIRP (dBm):	67.6	67.6	
Reception Gains (dB):	0	0	
Reception System Loss (dB):	0	0	
Reception Line Loss (dB/100 m):	4	4	
Reception Line Length (m):	10	10	
Reception Connection Loss (dB):	0.3	0.3	
Reception Number of Connections:	2	2	
Reception Additional Loss (dB):	0	0	
Reception Losses (dB):	1	1	
Reception Antenna:	HP2-18-NSMA	HP2-18-NSMA	
Reception Antenna Size (m):	0.6	0.6	
Reception Antenna Height (m):	20	20	
Reception Antenna Gain (dBi):	36.46	36.46	

 Total Broadband Solutions	Procedure: 001	Rev: 7.4
Title: Ballyfeeny: Telecommunications Impact Assessment	Approved: KH	Date: 09/09/25

Reception Antenna Gain (dBi): 38.6 38.6

Link Polarization: Vertical Vertical

Cross Polarization Factor (dB): 30 30

Link Distance (m): 22606.182 22606.182

Azimuth - True (°): 252.022 71.758

Azimuth - Magnetic (°): 254.428 74.284

Transmission Inclination (°): 0.01 -0.01

Reception Inclination (°): 0.01 -0.01

ITU Recommendation: ITU-R P.525-2

Free Space Distance (m): 22606.182 22606.182

Center Frequency (MHz): 18000 18000

Free Space Loss (dB): 144.63 144.63

Max Fresnel Radius (m): 9.705 9.705

Max 2nd Fresnel Radius (m): 13.725 13.725

Earth Radius Factor (K): 4/3

Effective Radius (m): 8502056.000

ITU Recommendation: ITU-R P.526-11

Diffraction Model: Cascade Knife Edge

Diffraction: No LOS Diffraction No LOS Diffraction

Diffraction Loss (dB): 0 0

Clearance Target (%): 60

Minimum Clearance (m): 19.541 19.541

Minimum Clearance Point (m): 28.834 28.834

Terrain Reflection Dispersion (°): 0.5

Reflection Area 1 (m): 720.86 720.86

Reflection Area 2 (m): 816.975 816.975

Reflection Area 3 (m): 855.421 855.421

Reflection Area 4 (m): 1682.008 1682.008

Reflection Area 5 (m): 1739.7 - 1758.9 1739.7 - 1758.9

Reflection Area 6 (m): 1931.906 1931.906

Reflection Area 7 (m): 1970.4 - 2028 1970.4 - 2028

Reflection Area 8 (m): 2066.466 2066.466

Reflection Area 9 (m): 7333.6 - 7372 7333.6 - 7372

Reflection Area 10 (m): 7429.7 - 7487.3 7429.7 - 7487.3

Reflection Area 11 (m): 7583.451 7583.451

Reflection Area 12 (m): 7679.566 7679.566

Reflection Area 13 (m): 7814.1 - 7833.3 7814.1 - 7833.3

Reflection Area 14 (m): 7891.018 7891.018

Reflection Area 15 (m): 8179.362 8179.362

Reflection Area 16 (m): 8621.49 8621.49

ITU Recommendation: ITU-R P.676-8

Atmospheric Pressure (hPa): 1013 1013

Standard Temperature (°C): 15 15

Water Vapor Density (g/m³): 7.5 7.5

Atmospheric Gases Loss (dB): 1.369 1.369

Total Path Loss (dB): 145.999 145.999

Reception Signal Level (dBm): -40.799 -40.799

BER 10-3 BER 10-6 BER 10-3 BER 10-6

Service Threshold (dBm): -91 -90 -91 -90

Link Gross Margin (dB): 50.201 49.201 50.201 49.201

ITU Recommendation: ITU-R F.1703-0 / ITU-T G.827

Objective ITU Quality Grade: Short Haul SDH Networks

Unavailability Objective (%): 2.00E-02

Availability Objective (%): 99.9800

ITU Recommendation: ITU-R F.1668-1 / ITU-T G.826

Error Performance Objective BBER (%): 1.60E-05 1.60E-05

Error Performance Objective BBER (s/Month): 0.42 0.42

SESR ESR SESR ESR

 Total Broadband Solutions	Procedure: 001	Rev: 7.4
Title: Ballyfeeny: Telecommunications Impact Assessment	Approved: KH	Date: 09/09/25

Error Performance Objective (%): 1.60E-04 3.20E-03 1.60E-04 3.20E-03
Error Performance Objective (s/Month): 4.205 84.096 4.205 84.096

ITU Recommendation: ITU-R F.1668-1 / ITU-T G.828
Error Performance Objective BBER (%): 4.00E-06 4.00E-06
Error Performance Objective BBER (s/Month): 0.105 0.105
SESR ESR SESR ESR
Error Performance Objective (%): 1.60E-04 8.00E-04 1.60E-04 8.00E-04
Error Performance Objective (s/Month): 4.205 21.024 4.205 21.024

Multipath Model: ITU-R P.530-15
Multipath Planning Type: Quick Planning
Multipath Time Frame: Average annual distribution
ITU Recommendation: ITU-R P.453-9
Point Refractivity Gradient (dN1): -76.7
Geoclimatic Factor: 4.05E-05 4.05E-05
Multipath Occurrence Factor (%): 3.95E+00 3.95E+00

Precipitation Model: ITU-R P.530-15
ITU Recommendation: ITU-R P.837-5 / ITU-R P.841-4
Precipitation Time Frame: Average annual distribution
Precipitation Rate @ 0.01% (mm/h): 22
ITU Recommendation: ITU-R P.838-3
Specific Attenuation (dB/km): 1.708854 1.708854
Rainfall Attenuation (dB): 22.548 22.548

BER 10-3 BER 10-6 BER 10-3 BER 10-6
Fading Outage (%): 6.04E-06 7.61E-06 6.04E-06 7.61E-06
Selective Fading Outage (%): 1.30E-07 1.30E-07 1.30E-07 1.30E-07
Composite Fading Outage (%): 6.17E-06 7.74E-06 6.17E-06 7.74E-06

Fading Outage (s/Month): 0.159 0.2 0.159 0.2
Selective Fading Outage (s/Month): 0.003 0.003 0.003 0.003
Composite Fading Outage (s/Month): 0.162 0.203 0.162 0.203

BER 10-3 BER 10-6 BER 10-3 BER 10-6
Unavailability due to Rain (%): 5.80E-04 6.39E-04 5.80E-04 6.39E-04
Unavailability due to Rain (s/Year): 182.851 201.493 182.851 201.493

BER 10-3 BER 10-6 BER 10-3 BER 10-6
Unavailability due to Fading (%): 6.17E-06 7.74E-06 6.17E-06 7.74E-06
Unavailability due to Rain (%): 5.80E-04 6.39E-04 5.80E-04 6.39E-04
Total Unavailability (%): 5.86E-04 6.47E-04 5.86E-04 6.47E-04
Unavailability Objective (%): 2.00E-02 2.00E-02 2.00E-02 2.00E-02

Unavailability due to Fading (s/Year): 1.947 2.44 1.947 2.44
Unavailability due to Rain (s/Year): 182.851 201.493 182.851 201.493
Total Unavailability (s/Year): 184.798 203.933 184.798 203.933
Unavailability Objective (s/Year): 6307.2 6307.2 6307.2 6307.2

Total Availability (%): 99.9994 99.9994 99.9994 99.9994
Availability Objective (%): 99.9800 99.9800 99.9800 99.9800

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 Total Broadband Solutions	Procedure: 001	Rev: 7.4
Title: Ballyfeeny: Telecommunications Impact Assessment	Approved: KH	Date: 09/09/25

C.4 Radio Link Budget Report (Lissavaddy_VF – Sliabh Bawn)

Link Budget Report

Site: AB_L3B_VF_BY (Lissawaddy_VF) AB_L1B_VF_BY (Sliabh Bawn)

Name:

Type: Cell Cell

Latitude: 53°46'29.5"N 53°43'42.8"N

Longitude: 8°18'56.3"W 8°04'03.3"W

Altitude (m): 117.0 242.0

UserData1: User Data

Datum: World Geodetic System 1984 (WGS 84)

Forward Link		Reverse Link	
Transmission Site:	AB_L3B_VF_BY	AB_L1B_VF_BY	
Reception Site:	AB_L1B_VF_BY	AB_L3B_VF_BY	
Radio Type:	NetRadio0001	NetRadio0001	
Modulation Scheme:	4-QAM	4-QAM	
Bandwidth (MHz):	2	2	
Roll-Off Factor:	0.2	0.2	
Coding Gain (dB):	0	0	
System Gains (dB):	0	0	
Channel Overhead (%):	20	20	
FEC Overhead (%):	0	0	
Reference Temperature (°K):	290	290	
Receiver Noise Figure (dB):	5	5	
Maximum Data Rate (Mbps):	2.667	2.667	
Maximum Bit Rate (Mbps):	3.333	3.333	
Required Bit Error Rate:	BER 10-3 BER 10-6	BER 10-3 BER 10-6	
Service Threshold (dBm):	-91 -90	-91 -90	
Carrier to Noise Ratio (dB):	14.965 15.965	14.965 15.965	
Cross Polarization Improvement Factor (dB):	20	20	20
Rx Equalization Sig Norm Parameter (Kn,M):	0.1	0.1	0.1
Rx Equalization Sig Norm Parameter (Kn,NM):	0.1	0.1	0.1
UserData1:	User Data	User Data	
Center Frequency (MHz):	18000	18000	
Channel Bandwidth (MHz):	28	28	
Transmission Power (dBm):	30	30	
Transmission Gains (dB):	0	0	
Transmission System Loss (dB):	0	0	
Transmission Line Loss (dB/100 m):	4	4	
Transmission Line Length (m):	10	10	
Transmission Connection Loss (dB):	0.3	0.3	
Transmission Number of Connections:	2	2	
Transmission Additional Loss (dB):	0	0	
Transmission Losses (dB):	1	1	
Transmission Antenna:	HP2-18-NSMA	HP2-18-NSMA	
Transmission Antenna Size (m):	0.6	0.6	
Transmission Antenna Height (m):	20	20	
Transmission Antenna Gain (dBd):	36.46	36.46	
Transmission Antenna Gain (dBi):	38.6	38.6	
Transmission Power EIRP (dBm):	67.6	67.6	
Reception Gains (dB):	0	0	
Reception System Loss (dB):	0	0	
Reception Line Loss (dB/100 m):	4	4	
Reception Line Length (m):	10	10	
Reception Connection Loss (dB):	0.3	0.3	
Reception Number of Connections:	2	2	
Reception Additional Loss (dB):	0	0	
Reception Losses (dB):	1	1	
Reception Antenna:	HP2-18-NSMA	HP2-18-NSMA	
Reception Antenna Size (m):	0.6	0.6	
Reception Antenna Height (m):	20	20	
Reception Antenna Gain (dBd):	36.46	36.46	

 Total Broadband Solutions	Procedure: 001	Rev: 7.4
Title: Ballyfeeny: Telecommunications Impact Assessment	Approved: KH	Date: 09/09/25

Reception Antenna Gain (dBi): 38.6 38.6

Link Polarization: Vertical Vertical

Cross Polarization Factor (dB): 30 30

Link Distance (m): 17139.162 17139.162

Azimuth - True (°): 107.421 287.621

Azimuth - Magnetic (°): 109.947 290.039

Transmission Inclination (°): -0.418 0.418

Reception Inclination (°): -0.418 0.418

ITU Recommendation: ITU-R P.525-2

Free Space Distance (m): 17139.617 17139.617

Center Frequency (MHz): 18000 18000

Free Space Loss (dB): 142.225 142.225

Max Fresnel Radius (m): 8.451 8.451

Max 2nd Fresnel Radius (m): 11.951 11.951

Earth Radius Factor (K): 4/3

Effective Radius (m): 8502056.000

ITU Recommendation: ITU-R P.526-11

Diffraction Model: Cascade Knife Edge

Diffraction: No LOS Diffraction No LOS Diffraction

Diffraction Loss (dB): 0 0

Clearance Target (%): 60

Minimum Clearance (m): 9.68 9.68

Minimum Clearance Point (m): 17129.566 17129.566

Terrain Reflection Dispersion (°): 0.5

Reflection Area 1 (m): 220.7 - 239.9 220.7 - 239.9

Reflection Area 2 (m): 585.4 - 604.6 585.4 - 604.6

Reflection Area 3 (m): 2639 - 2735.0 2639 - 2735.0

Reflection Area 4 (m): 2792.551 2792.551

Reflection Area 5 (m): 2830.937 2830.937

Reflection Area 6 (m): 2946.1 - 3003.7 2946.1 - 3003.7

Reflection Area 7 (m): 3099.636 3099.636

Reflection Area 8 (m): 3253.178 3253.178

Reflection Area 9 (m): 3291.564 3291.564

Reflection Area 10 (m): 3425.9 - 3445.1 3425.9 - 3445.1

Reflection Area 11 (m): 3521.877 3521.877

Reflection Area 12 (m): 3579.456 3579.456

Reflection Area 13 (m): 3637 - 3790.6 3637 - 3790.6

Reflection Area 14 (m): 3828.962 3828.962

Reflection Area 15 (m): 3867.3 - 3886.5 3867.3 - 3886.5

Reflection Area 16 (m): 3924.9 - 3944.1 3924.9 - 3944.1

ITU Recommendation: ITU-R P.676-8

Atmospheric Pressure (hPa): 1013 1013

Standard Temperature (°C): 15 15

Water Vapor Density (g/m³): 7.5 7.5

Atmospheric Gases Loss (dB): 1.038 1.038

Total Path Loss (dB): 143.263 143.263

Reception Signal Level (dBm): -38.063 -38.063

BER 10-3 BER 10-6 BER 10-3 BER 10-6

Service Threshold (dBm): -91 -90 -91 -90

Link Gross Margin (dB): 52.937 51.937 52.937 51.937

ITU Recommendation: ITU-R F.1703-0 / ITU-T G.827

Objective ITU Quality Grade: Short Haul SDH Networks

Unavailability Objective (%): 2.00E-02

Availability Objective (%): 99.9800

ITU Recommendation: ITU-R F.1668-1 / ITU-T G.826

Error Performance Objective BBER (%): 1.60E-05 1.60E-05

Error Performance Objective BBER (s/Month): 0.42 0.42

SESR ESR SESR ESR

 Total Broadband Solutions	Procedure: 001	Rev: 7.4
Title: Ballyfeeny: Telecommunications Impact Assessment	Approved: KH	Date: 09/09/25

Error Performance Objective (%): 1.60E-04 3.20E-03 1.60E-04 3.20E-03
Error Performance Objective (s/Month): 4.205 84.096 4.205 84.096

ITU Recommendation: ITU-R F.1668-1 / ITU-T G.828
Error Performance Objective BBER (%): 4.00E-06 4.00E-06
Error Performance Objective BBER (s/Month): 0.105 0.105
SESR ESR SESR ESR
Error Performance Objective (%): 1.60E-04 8.00E-04 1.60E-04 8.00E-04
Error Performance Objective (s/Month): 4.205 21.024 4.205 21.024

Multipath Model: ITU-R P.530-15
Multipath Planning Type: Quick Planning
Multipath Time Frame: Average annual distribution
ITU Recommendation: ITU-R P.453-9
Point Refractivity Gradient (dN1): -76.7
Geoclimatic Factor: 4.05E-05 4.05E-05
Multipath Occurrence Factor (%): 1.35E-01 1.35E-01

Precipitation Model: ITU-R P.530-15
ITU Recommendation: ITU-R P.837-5 / ITU-R P.841-4
Precipitation Time Frame: Average annual distribution
Precipitation Rate @ 0.01% (mm/h): 22
ITU Recommendation: ITU-R P.838-3
Specific Attenuation (dB/km): 1.70886 1.70886
Rainfall Attenuation (dB): 18.445 18.445

BER 10-3 BER 10-6 BER 10-3 BER 10-6
Fading Outage (%): 7.33E-08 9.23E-08 7.33E-08 9.23E-08
Selective Fading Outage (%): 5.09E-09 5.09E-09 5.09E-09 5.09E-09
Composite Fading Outage (%): 7.84E-08 9.74E-08 7.84E-08 9.74E-08

Fading Outage (s/Month): 0.002 0.002 0.002 0.002
Selective Fading Outage (s/Month): 0 0 0 0
Composite Fading Outage (s/Month): 0.002 0.003 0.002 0.003

BER 10-3 BER 10-6 BER 10-3 BER 10-6
Unavailability due to Rain (%): 1.21E-04 1.41E-04 1.21E-04 1.41E-04
Unavailability due to Rain (s/Year): 38.233 44.588 38.233 44.588

BER 10-3 BER 10-6 BER 10-3 BER 10-6
Unavailability due to Fading (%): 7.84E-08 9.74E-08 7.84E-08 9.74E-08
Unavailability due to Rain (%): 1.21E-04 1.41E-04 1.21E-04 1.41E-04
Total Unavailability (%): 1.21E-04 1.41E-04 1.21E-04 1.41E-04
Unavailability Objective (%): 2.00E-02 2.00E-02 2.00E-02 2.00E-02

Unavailability due to Fading (s/Year): 0.025 0.031 0.025 0.031
Unavailability due to Rain (s/Year): 38.233 44.588 38.233 44.588
Total Unavailability (s/Year): 38.258 44.619 38.258 44.619
Unavailability Objective (s/Year): 6307.2 6307.2 6307.2 6307.2

Total Availability (%): 99.9999 99.9999 99.9999 99.9999
Availability Objective (%): 99.9800 99.9800 99.9800 99.9800

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 Total Broadband Solutions	Procedure: 001	Rev: 7.4
Title: Ballyfeeny: Telecommunications Impact Assessment	Approved: KH	Date: 09/09/25

C.5 Radio Link Budget Report (Sliabh Bawn – New Telecoms Mast at Ballyfeeny)

Link Budget Report

Site: AB_SB_VF (Sliabh Bawn) BY_n3 (New Telecoms Mast at Ballyfeeny)
Name:
Type: Cell Cell
Latitude: 53°43'42.8"N 53°47'10.4"N
Longitude: 8°04'03.4"W 8°01'45.0"W
Altitude (m): 242.0 121.0

UserData1: User Data

Datum: World Geodetic System 1984 (WGS 84)

Forward Link		Reverse Link	
Transmission Site:	AB_SB_VF	BY_n3	
Reception Site:	BY_n3	AB_SB_VF	
Radio Type:	NetRadio0001	NetRadio0001	
Modulation Scheme:	4-QAM	4-QAM	
Bandwidth (MHz):	2	2	
Roll-Off Factor:	0.2	0.2	
Coding Gain (dB):	0	0	
System Gains (dB):	0	0	
Channel Overhead (%):	20	20	
FEC Overhead (%):	0	0	
Reference Temperature (°K):	290	290	
Receiver Noise Figure (dB):	5	5	
Maximum Data Rate (Mbps):	2.667	2.667	
Maximum Bit Rate (Mbps):	3.333	3.333	
Required Bit Error Rate:	BER 10-3	BER 10-6	BER 10-3
Service Threshold (dBm):	-91	-90	-91
Carrier to Noise Ratio (dB):	14.965	15.965	14.965
Cross Polarization Improvement Factor (dB):	20	20	20
Rx Equalization Sig Norm Parameter (Kn,M):	0.1	0.1	0.1
Rx Equalization Sig Norm Parameter (Kn,NM):	0.1	0.1	0.1
UserData1:	User Data	User Data	
Center Frequency (MHz):	23000	23000	
Channel Bandwidth (MHz):	28	28	
Transmission Power (dBm):	30	30	
Transmission Gains (dB):	0	0	
Transmission System Loss (dB):	0	0	
Transmission Line Loss (dB/100 m):	4	4	
Transmission Line Length (m):	10	10	
Transmission Connection Loss (dB):	0.3	0.3	
Transmission Number of Connections:	2	2	
Transmission Additional Loss (dB):	0	0	
Transmission Losses (dB):	1	1	
Transmission Antenna:	HP2-23	HP2-23	
Transmission Antenna Size (m):	0.6	0.6	
Transmission Antenna Height (m):	19	19	
Transmission Antenna Gain (dBd):	38.06	38.06	
Transmission Antenna Gain (dBi):	40.2	40.2	
Transmission Power EIRP (dBm):	69.2	69.2	
Reception Gains (dB):	0	0	
Reception System Loss (dB):	0	0	
Reception Line Loss (dB/100 m):	4	4	
Reception Line Length (m):	10	10	
Reception Connection Loss (dB):	0.3	0.3	
Reception Number of Connections:	2	2	
Reception Additional Loss (dB):	0	0	
Reception Losses (dB):	1	1	
Reception Antenna:	HP2-23	HP2-23	
Reception Antenna Size (m):	0.6	0.6	
Reception Antenna Height (m):	19	19	
Reception Antenna Gain (dBd):	38.06	38.06	

 Total Broadband Solutions	Procedure: 001	Rev: 7.4
Title: Ballyfeeny: Telecommunications Impact Assessment	Approved: KH	Date: 09/09/25

Reception Antenna Gain (dBi): 40.2 40.2

Link Polarization: Vertical Vertical

Cross Polarization Factor (dB): 30 30

Link Distance (m): 6906.340 6906.340

Azimuth - True (°): 21.496 201.527

Azimuth - Magnetic (°): 23.914 203.94

Transmission Inclination (°): 1.004 -1.004

Reception Inclination (°): 1.004 -1.004

ITU Recommendation: ITU-R P.525-2

Free Space Distance (m): 6907.400 6907.400

Center Frequency (MHz): 23000 23000

Free Space Loss (dB): 136.461 136.461

Max Fresnel Radius (m): 4.746 4.746

Max 2nd Fresnel Radius (m): 6.711 6.711

Earth Radius Factor (K): 4/3

Effective Radius (m): 8502056.000

ITU Recommendation: ITU-R P.526-11

Diffraction Model: Cascade Knife Edge

Diffraction: No LOS Diffraction No LOS Diffraction

Diffraction Loss (dB): 10.897 10.897

Clearance Target (%): 60

Minimum Clearance (m): -0.857 -0.857

Minimum Clearance Point (m): 215.823 215.823

Terrain Reflection Dispersion (°): 0.5

Reflection Area 1 (m): 1045.912 1045.912

Reflection Area 2 (m): 1178.7 - 1211.9 1178.7 - 1211.9

Reflection Area 3 (m): 1942.408 1942.408

Reflection Area 4 (m): 2174.833 2174.833

Reflection Area 5 (m): 3502.976 3502.976

Reflection Area 6 (m): 3668.993 3668.993

Reflection Area 7 (m): 3835.011 3835.011

Reflection Area 8 (m): 3934.622 3934.622

Reflection Area 9 (m): 4001.029 4001.029

Reflection Area 10 (m): 4963.932 4963.932

Reflection Area 11 (m): 5395.579 5395.579

Reflection Area 12 (m): 5594.8 5594.8

Reflection Area 13 (m): 5827.225 5827.225

Reflection Area 14 (m): 5993.243 5993.243

ITU Recommendation: ITU-R P.676-8

Atmospheric Pressure (hPa): 1013 1013

Standard Temperature (°C): 15 15

Water Vapor Density (g/m³): 7.5 7.5

Atmospheric Gases Loss (dB): 1.346 1.346

Total Path Loss (dB): 148.704 148.704

Reception Signal Level (dBm): -40.304 -40.304

BER 10-3 BER 10-6 BER 10-3 BER 10-6

Service Threshold (dBm): -91 -90 -91 -90

Link Gross Margin (dB): 50.696 49.696 50.696 49.696

ITU Recommendation: ITU-R F.1703-0 / ITU-T G.827

Objective ITU Quality Grade: Short Haul SDH Networks

Unavailability Objective (%): 2.00E-02

Availability Objective (%): 99.9800

ITU Recommendation: ITU-R F.1668-1 / ITU-T G.826

Error Performance Objective BBER (%): 1.60E-05 1.60E-05

Error Performance Objective BBER (s/Month): 0.42 0.42

SESR ESR SESR ESR

Error Performance Objective (%): 1.60E-04 3.20E-03 1.60E-04 3.20E-03

Error Performance Objective (s/Month): 4.205 84.096 4.205 84.096

 Total Broadband Solutions	Procedure: 001	Rev: 7.4
Title: Ballyfeeny: Telecommunications Impact Assessment	Approved: KH	Date: 09/09/25

RECEIVED: 15/09/2025

ITU Recommendation: ITU-R F.1668-1 / ITU-T G.828
Error Performance Objective BBER (%): 4.00E-06 4.00E-06
Error Performance Objective BBER (s/Month): 0.105 0.105
SESr ESR SESr ESR
Error Performance Objective (%): 1.60E-04 8.00E-04 1.60E-04 8.00E-04
Error Performance Objective (s/Month): 4.205 21.024 4.205 21.024

Multipath Model: ITU-R P.530-15
Multipath Planning Type: Quick Planning
Multipath Time Frame: Average annual distribution
ITU Recommendation: ITU-R P.453-9
Point Refractivity Gradient (dN1): -76.7
Geoclimatic Factor: 4.05E-05 4.05E-05
Multipath Occurrence Factor (%): 3.46E-03 3.46E-03

Precipitation Model: ITU-R P.530-15
ITU Recommendation: ITU-R P.837-5 / ITU-R P.841-4
Precipitation Time Frame: Average annual distribution
Precipitation Rate @ 0.01% (mm/h): 22
ITU Recommendation: ITU-R P.838-3
Specific Attenuation (dB/km): 2.518843 2.518843
Rainfall Attenuation (dB): 12.922 12.922

BER 10-3 BER 10-6 BER 10-3 BER 10-6
Fading Outage (%): 2.15E-09 2.71E-09 2.15E-09 2.71E-09
Selective Fading Outage (%): 3.07E-11 3.07E-11 3.07E-11 3.07E-11
Composite Fading Outage (%): 2.18E-09 2.74E-09 2.18E-09 2.74E-09

Fading Outage (s/Month): 0 0 0 0
Selective Fading Outage (s/Month): 0 0 0 0
Composite Fading Outage (s/Month): 0 0 0 0

BER 10-3 BER 10-6 BER 10-3 BER 10-6
Unavailability due to Rain (%): 0.00E+00 0.00E+00 0.00E+00 0.00E+00
Unavailability due to Rain (s/Year): 0 0 0 0

BER 10-3 BER 10-6 BER 10-3 BER 10-6
Unavailability due to Fading (%): 2.18E-09 2.74E-09 2.18E-09 2.74E-09
Unavailability due to Rain (%): 0.00E+00 0.00E+00 0.00E+00 0.00E+00
Total Unavailability (%): 2.18E-09 2.74E-09 2.18E-09 2.74E-09
Unavailability Objective (%): 2.00E-02 2.00E-02 2.00E-02 2.00E-02

Unavailability due to Fading (s/Year): 0.001 0.001 0.001 0.001
Unavailability due to Rain (s/Year): 0 0 0 0
Total Unavailability (s/Year): 0.001 0.001 0.001 0.001
Unavailability Objective (s/Year): 6307.2 6307.2 6307.2 6307.2

Total Availability (%): 100.0000 100.0000 100.0000 100.0000
Availability Objective (%): 99.9800 99.9800 99.9800 99.9800

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 Total Broadband Solutions	Procedure: 001	Rev: 7.4
Title: Ballyfeeny: Telecommunications Impact Assessment	Approved: KH	Date: 09/09/25

C.6 Radio Link Budget Report (New Telecoms Mast at Ballyfeeny – Roosky)

Link Budget Report

Site: BY_n3 (New Telecoms Mast at Ballyfeeny) AB_L4B_VF_BY (Roosky)
Name:
Type: Cell Cell
Latitude: 53°47'10.4"N 53°49'44.8"N
Longitude: 8°01'45.0"W 7°55'44.5"W
Altitude (m): 121.0 46.0

UserData1: User Data

Datum: World Geodetic System 1984 (WGS 84)

Forward Link		Reverse Link	
Transmission Site:	BY_n3	AB_L4B_VF_BY	BY_n3
Reception Site:	AB_L4B_VF_BY	BY_n3	AB_L4B_VF_BY
Radio Type:	NetRadio0001	NetRadio0001	
Modulation Scheme:	4-QAM	4-QAM	
Bandwidth (MHz):	2	2	
Roll-Off Factor:	0.2	0.2	
Coding Gain (dB):	0	0	
System Gains (dB):	0	0	
Channel Overhead (%):	20	20	
FEC Overhead (%):	0	0	
Reference Temperature (°K):	290	290	
Receiver Noise Figure (dB):	5	5	
Maximum Data Rate (Mbps):	2.667	2.667	
Maximum Bit Rate (Mbps):	3.333	3.333	
Required Bit Error Rate:	BER 10-3	BER 10-6	BER 10-3
Service Threshold (dBm):	-91	-90	-91
Carrier to Noise Ratio (dB):	14.965	15.965	14.965
Cross Polarization Improvement Factor (dB):	20	20	20
Rx Equalization Sig Norm Parameter (Kn,M):	0.1	0.1	0.1
Rx Equalization Sig Norm Parameter (Kn,NM):	0.1	0.1	0.1
UserData1:	User Data	User Data	
Center Frequency (MHz):	26000	26000	
Channel Bandwidth (MHz):	28	28	
Transmission Power (dBm):	30	30	
Transmission Gains (dB):	0	0	
Transmission System Loss (dB):	0	0	
Transmission Line Loss (dB/100 m):	4	4	
Transmission Line Length (m):	10	10	
Transmission Connection Loss (dB):	0.3	0.3	
Transmission Number of Connections:	2	2	
Transmission Additional Loss (dB):	0	0	
Transmission Losses (dB):	1	1	
Transmission Antenna:	HP2-26	HP2-26	
Transmission Antenna Size (m):	0.6	0.6	
Transmission Antenna Height (m):	20	15	
Transmission Antenna Gain (dBd):	38.96	38.96	
Transmission Antenna Gain (dBi):	41.1	41.1	
Transmission Power EIRP (dBm):	70.1	70.1	
Reception Gains (dB):	0	0	
Reception System Loss (dB):	0	0	
Reception Line Loss (dB/100 m):	4	4	
Reception Line Length (m):	10	10	
Reception Connection Loss (dB):	0.3	0.3	
Reception Number of Connections:	2	2	
Reception Additional Loss (dB):	0	0	
Reception Losses (dB):	1	1	
Reception Antenna:	HP2-26	HP2-26	
Reception Antenna Size (m):	0.6	0.6	
Reception Antenna Height (m):	15	20	
Reception Antenna Gain (dBd):	38.96	38.96	

AiBridges Total Broadband Solutions	Procedure: 001	Rev: 7.4
Title: Ballyfeeny: Telecommunications Impact Assessment	Approved: KH	Date: 09/09/25

Reception Antenna Gain (dBi): 41.1 41.1

Link Polarization: Vertical Vertical

Cross Polarization Factor (dB): 30 30

Link Distance (m): 8140.298 8140.298

Azimuth - True (°): 54 234.081

Azimuth - Magnetic (°): 56.413 236.461

Transmission Inclination (°): 0.563 -0.563

Reception Inclination (°): 0.563 -0.563

ITU Recommendation: ITU-R P.525-2

Free Space Distance (m): 8140.691 8140.691

Center Frequency (MHz): 26000 26000

Free Space Loss (dB): 138.953 138.953

Max Fresnel Radius (m): 4.846 4.846

Max 2nd Fresnel Radius (m): 6.853 6.853

Earth Radius Factor (K): 4/3

Effective Radius (m): 8502056.000

ITU Recommendation: ITU-R P.526-11

Diffraction Model: Cascade Knife Edge

Diffraction: No LOS Diffraction No LOS Diffraction

Diffraction Loss (dB): 0 0

Clearance Target (%): 60

Minimum Clearance (m): 4.215 4.215

Minimum Clearance Point (m): 350.485 350.485

Terrain Reflection Dispersion (°): 0.5

Reflection Area 1 (m): 237.425 237.425

Reflection Area 2 (m): 373.097 373.097

Reflection Area 3 (m): 440.9 - 463.5 440.9 - 463.5

Reflection Area 4 (m): 576.604 576.604

Reflection Area 5 (m): 621.828 621.828

Reflection Area 6 (m): 689.7 - 712.3 689.7 - 712.3

Reflection Area 7 (m): 825.336 825.336

Reflection Area 8 (m): 961.007 961.007

Reflection Area 9 (m): 1028.843 1028.843

Reflection Area 10 (m): 1074 - 1096.7 1074 - 1096.7

Reflection Area 11 (m): 1209.7 - 1232.4 1209.7 - 1232.4

Reflection Area 12 (m): 1368.022 1368.022

Reflection Area 13 (m): 1413.2 - 1435.9 1413.2 - 1435.9

Reflection Area 14 (m): 6500.9 - 6546.2 6500.9 - 6546.2

Reflection Area 15 (m): 6614 - 6772.3 6614 - 6772.3

Reflection Area 16 (m): 6840.1 - 6862.7 6840.1 - 6862.7

ITU Recommendation: ITU-R P.676-8

Atmospheric Pressure (hPa): 1013 1013

Standard Temperature (°C): 15 15

Water Vapor Density (g/m³): 7.5 7.5

Atmospheric Gases Loss (dB): 1.077 1.077

Total Path Loss (dB): 140.03 140.03

Reception Signal Level (dBm): -29.83 -29.83

BER 10-3 BER 10-6 BER 10-3 BER 10-6

Service Threshold (dBm): -91 -90 -91 -90

Link Gross Margin (dB): 61.17 60.17 61.17 60.17

ITU Recommendation: ITU-R F.1703-0 / ITU-T G.827

Objective ITU Quality Grade: Short Haul SDH Networks

Unavailability Objective (%): 2.00E-02

Availability Objective (%): 99.9800

ITU Recommendation: ITU-R F.1668-1 / ITU-T G.826

Error Performance Objective BBER (%): 1.60E-05 1.60E-05

Error Performance Objective BBER (s/Month): 0.42 0.42

SESR ESR SESR ESR

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Error Performance Objective (%): 1.60E-04 3.20E-03 1.60E-04 3.20E-03
Error Performance Objective (s/Month): 4.205 84.096 4.205 84.096

ITU Recommendation: ITU-R F.1668-1 / ITU-T G.828
Error Performance Objective BBER (%): 4.00E-06 4.00E-06
Error Performance Objective BBER (s/Month): 0.105 0.105
SESr ESR SESr ESR
Error Performance Objective (%): 1.60E-04 8.00E-04 1.60E-04 8.00E-04
Error Performance Objective (s/Month): 4.205 21.024 4.205 21.024

Multipath Model: ITU-R P.530-15
Multipath Planning Type: Quick Planning
Multipath Time Frame: Average annual distribution
ITU Recommendation: ITU-R P.453-9
Point Refractivity Gradient (dn1): -76.7
Geoclimatic Factor: 4.05E-05 4.05E-05
Multipath Occurrence Factor (%): 1.49E-02 1.49E-02

Precipitation Model: ITU-R P.530-15
ITU Recommendation: ITU-R P.837-5 / ITU-R P.841-4
Precipitation Time Frame: Average annual distribution
Precipitation Rate @ 0.01% (mm/h): 22
ITU Recommendation: ITU-R P.838-3
Specific Attenuation (dB/km): 3.069505 3.069505
Rainfall Attenuation (dB): 17.305 17.305

BER 10-3 BER 10-6 BER 10-3 BER 10-6
Fading Outage (%): 9.50E-10 1.20E-09 9.50E-10 1.20E-09
Selective Fading Outage (%): 1.41E-10 1.41E-10 1.41E-10 1.41E-10
Composite Fading Outage (%): 1.09E-09 1.34E-09 1.09E-09 1.34E-09

Fading Outage (s/Month): 0 0 0 0
Selective Fading Outage (s/Month): 0 0 0 0
Composite Fading Outage (s/Month): 0 0 0 0

BER 10-3 BER 10-6 BER 10-3 BER 10-6
Unavailability due to Rain (%): 0.00E+00 0.00E+00 0.00E+00 0.00E+00
Unavailability due to Rain (s/Year): 0 0 0 0

BER 10-3 BER 10-6 BER 10-3 BER 10-6
Unavailability due to Fading (%): 1.09E-09 1.34E-09 1.09E-09 1.34E-09
Unavailability due to Rain (%): 0.00E+00 0.00E+00 0.00E+00 0.00E+00
Total Unavailability (%): 1.09E-09 1.34E-09 1.09E-09 1.34E-09
Unavailability Objective (%): 2.00E-02 2.00E-02 2.00E-02 2.00E-02

Unavailability due to Fading (s/Year): 0 0 0 0
Unavailability due to Rain (s/Year): 0 0 0 0
Total Unavailability (s/Year): 0 0 0 0
Unavailability Objective (s/Year): 6307.2 6307.2 6307.2 6307.2

Total Availability (%): 100.0000 100.0000 100.0000 100.0000
Availability Objective (%): 99.9800 99.9800 99.9800 99.9800

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APPENDIX D – Desktop Survey Analysis (November 2022)

AiBridges Total Broadband Solutions	Procedure: 001	Rev: 7.4
Title: Ballyfeeny: Telecommunications Impact Assessment	Approved: KH	Date: 09/09/25

Appendix D – Desktop Survey Analysis (November 2022)

The Desktop Survey Analysis results from the Telecommunications Assessment which was carried out in November 2022 are provided below.

AiBridges Total Broadband Solutions	Procedure: 001	Rev: 5.0
Title: Ballyfeeny EIR Impact Assessment	Approved: KH	Date: 08/11/22

5. Introduction

Based on the findings of the consultation process, there are three Telecom Operators with networks in the vicinity of the proposed wind farm that require a detailed technical analysis:

- Eir Network
- Three Ireland Network
- Vodafone Ireland Network

Sections 5.1 to 5.3 below outline the desktop survey analysis findings* for each of the Telecom Operator networks listed above.

5.1 Eir Network Analysis

The Eir network in the vicinity of the proposed wind farm consists of one Point-to-Point (PTP) microwave radio link. The radio link is listed in Table 4 below and a Plan View of the Eir network is shown in Figure 5.

Link No.	Operator	Link Description
1	Eir	PTP microwave radio link from Ballyfeeny to Edercloon.

Table 4. Eir Radio Links requiring Analysis

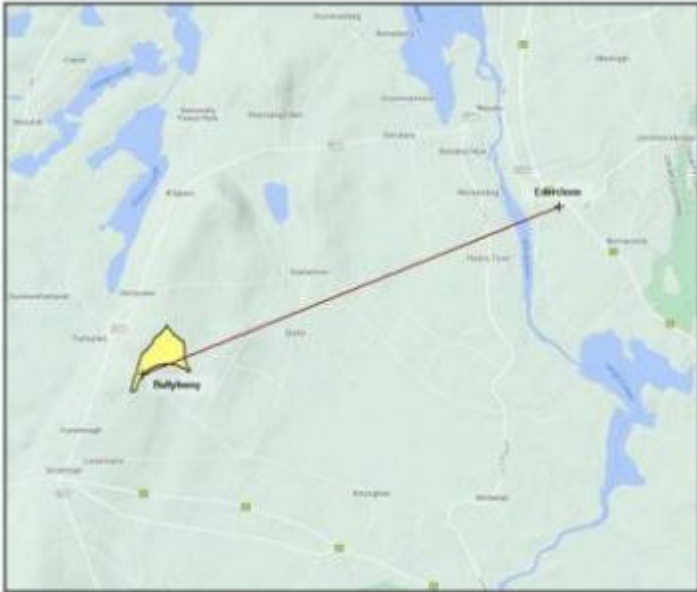


Figure 5. Eir Radio Network – Plan View

* The Desktop Survey Analysis findings are subject to accuracy of the information (GPS co-ordinates, turbine dimensions, etc.) provided to Ai Bridges.

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Figure 6 below shows a close-up view of the Eir microwave radio link network relative to the proposed wind farm site. Desktop survey analysis indicates that the PTP radio link crosses over the wind farm site and the proposed development may impact the operation of the radio link.

Table 5 below provides a brief summary of the network analysis for the Eir network in the vicinity of the proposed wind farm.

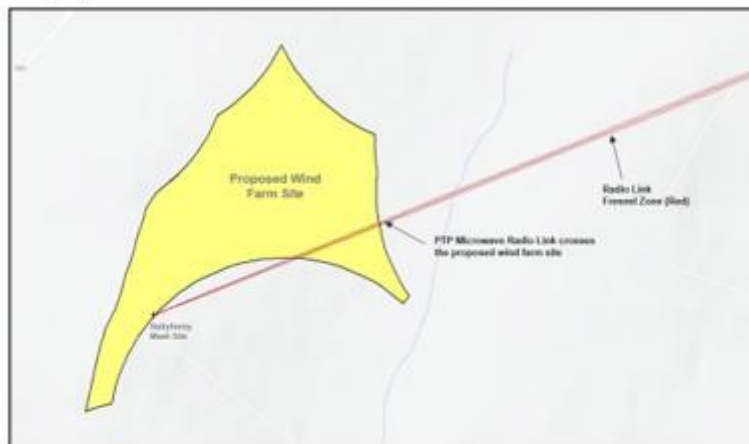


Figure 6. Eir Network – Close-up Plan View.

Link ID	Link Description	Link Type	Applicable Fresnel Zone	Wind Farm Impacts
Eir Link 1	Ballyfeeny to Edencloon.	PTP	2 nd Fresnel	Potentially impacted by wind farm. (Dependent on turbine layout).

Table 5. Eir Network – Analysis Summary

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Title: Ballyfeeny EMI Impact Assessment	Approved: KH	Date: 06/11/23

5.2 Three Ireland Network Analysis

The Three Ireland network in the vicinity of the proposed wind farm consists of four Point-to-Point (PTP) microwave radio links. The radio links are listed in Table 6 below and a Plan View of the Three Ireland network is shown in Figure 7.

Link No.	Operator	Link Description
1	Three Ireland	PTP microwave radio link from Mullaghmacormick to Sliabh Bawn.
2	Three Ireland	PTP microwave radio link from Ballyfeeny to Ballyleague.
3	Three Ireland	PTP microwave radio link from Ballyfeeny to Lissawaddy.
4	Three Ireland	PTP microwave radio link from Ballyfeeny to Strokestown.

Table 6. Three Ireland Radio Links requiring Analysis

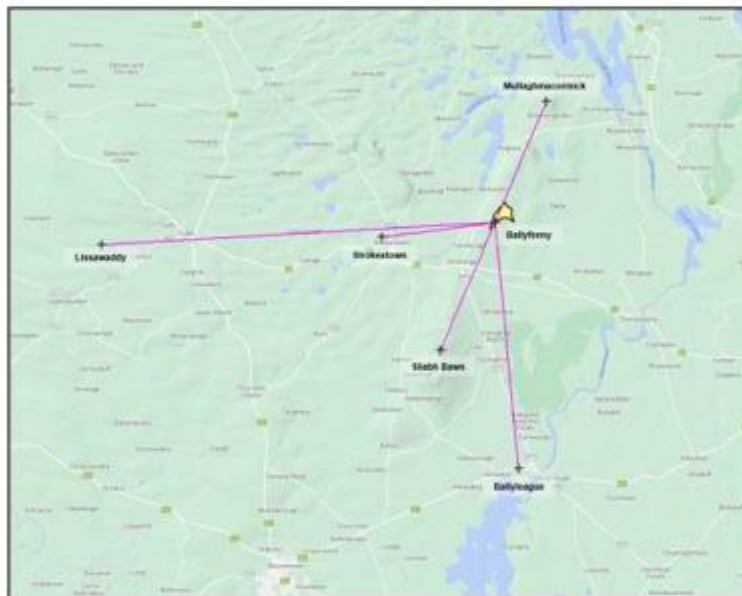


Figure 7. Three Ireland Radio Network – Plan View

Figure 8 below shows a close-up view of the Three Ireland microwave radio link network relative to the proposed wind farm site. Desktop survey analysis indicates that the PTP radio link crosses over the site boundary and the proposed development may impact the operation of the radio link.

Table 7 below provides a brief summary of the network analysis for the Three Ireland network in the vicinity of the proposed wind farm.

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Title: Ballyfeeny EMI Impact Assessment	Approved: KH	Date: 06/11/22

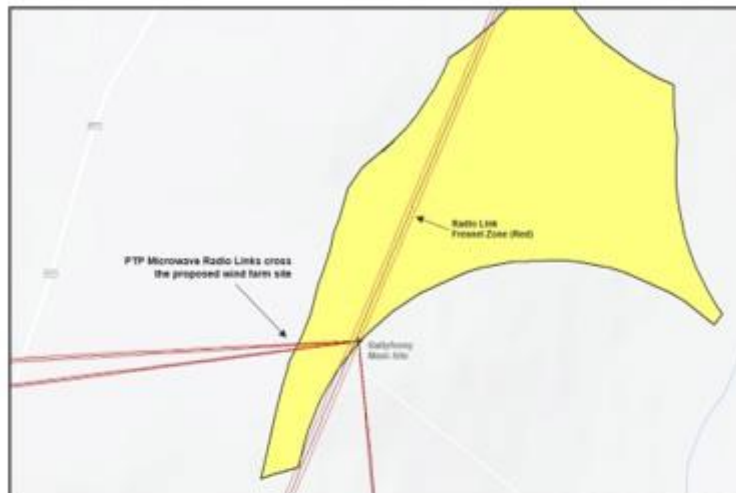


Figure 8. Three Ireland Network – Close-up Plan View.

Link ID	Link Description	Link Type	Applicable Fresnel Zone	Wind Farm Impacts
Three Ireland Link 1	Mullaghmacormick to Sliabh Bawn	PTP	2 nd Fresnel	Potentially impacted by wind farm. (Dependent on turbine layout).
Three Ireland Link 2	Ballyfeeny to Ballyvaugha	PTP	2 nd Fresnel	Potentially impacted by wind farm. (Dependent on turbine layout).
Three Ireland Link 3	Ballyfeeny to Lissawaddy	PTP	2 nd Fresnel	Potentially impacted by wind farm. (Dependent on turbine layout).
Three Ireland Link 4	Ballyfeeny to Strokestown	PTP	2 nd Fresnel	Potentially impacted by wind farm. (Dependent on turbine layout).

Table 7. Three Ireland Network – Analysis Summary

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5.3 Vodafone Ireland Network Analysis

The Vodafone network in the vicinity of the proposed wind farm consists of five Point-to-Point (PTP) microwave radio links. The radio links are listed in Table 8 below and a Plan view of the Vodafone network is shown in Figure 9.

Link No.	Operator	Link Description
1	Vodafone	PTP microwave radio link from Mullaghmacormick to Sliabh Bawn.
2	Vodafone	PTP microwave radio link from Sliabh Bawn to Ballyfeeny.
3	Vodafone	PTP microwave radio link from Ballyfeeny to Lissawaddy.
4	Vodafone	PTP microwave radio link from Ballyfeeny to Roosky.
5	Vodafone	PTP microwave radio link from Ballyfeeny to Ederclon.

Table 8. Vodafone Ireland Radio Links requiring Analysis

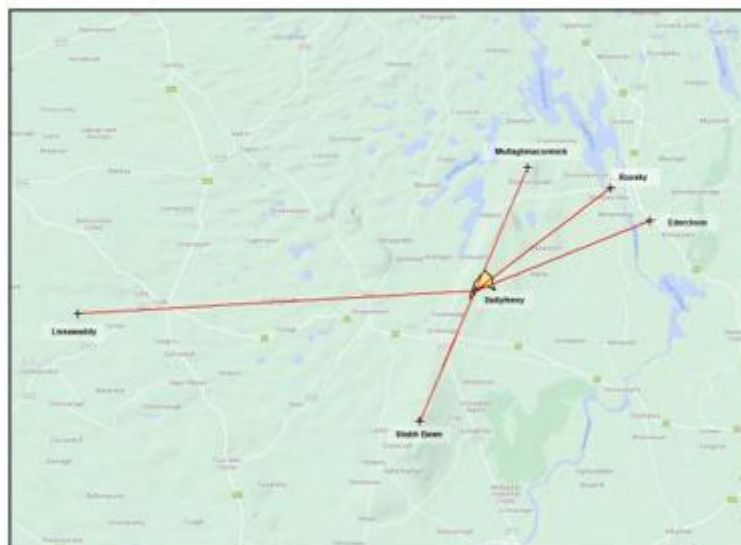


Figure 9. Vodafone Ireland Radio Network – Plan View

Figure 10 below shows a close-up view of the Vodafone Ireland microwave radio link relative to the proposed wind farm site. Desktop survey analysis indicates that the PTP radio links cross over the wind farm site and the proposed development may impact the operation of the radio links.

Table 9 below provides a brief summary of the network analysis for the Vodafone Ireland network in the vicinity of the proposed wind farm.

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AiBridges Total Broadband Solutions	Procedure: 001	Rev: 1.0
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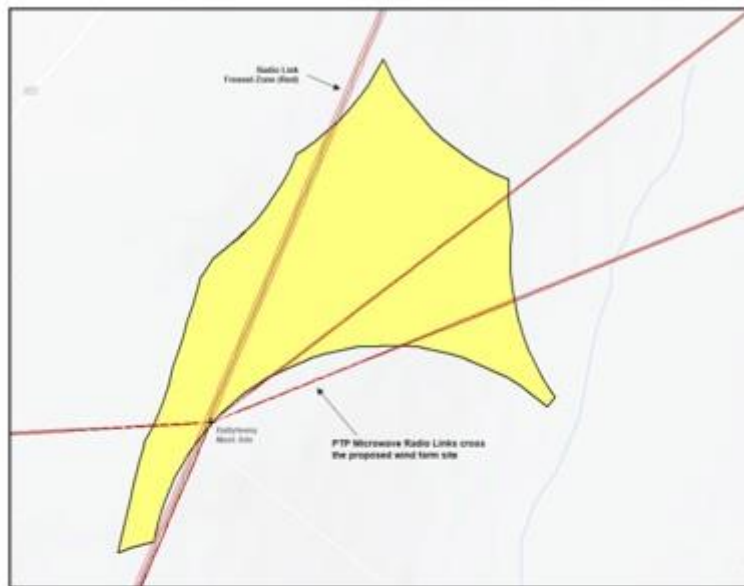


Figure 10. Vodafone Ireland Network – Close-up Plan View.

Link ID	Link Description	Link Type	Applicable Fresnel Zone	Wind Farm Impacts
Vodafone Link 1	Mullaghnacornick to Slabh Bawn	PTP	1 st Fresnel	Potentially impacted by wind farm. (Dependent on turbine layout).
Vodafone Link 2	Slabh Bawn to Ballyfeeny	PTP	1 st Fresnel	Potentially impacted by wind farm. (Dependent on turbine layout).
Vodafone Link 3	Ballyfeeny to Lissawaddy	PTP	1 st Fresnel	Potentially impacted by wind farm. (Dependent on turbine layout).
Vodafone Link 4	Ballyfeeny to Roosky	PTP	1 st Fresnel	Potentially impacted by wind farm. (Dependent on turbine layout).
Vodafone Link 5	Ballyfeeny to Ederscloon	PTP	1 st Fresnel	Potentially impacted by wind farm. (Dependent on turbine layout).

Table 9. Vodafone Ireland Network – Analysis Summary

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APPENDIX E – Desktop Survey Analysis (September 2023)

AiBridges Total Broadband Solutions	Procedure: 001	Rev: 7.4
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Appendix E – Desktop Survey Analysis (September 2023)

The Desktop Survey Analysis results from the Telecommunications Assessment which was carried out in September 2023 are provided below.

Operator	ID	Network Description	Clearance / Interference to nearest turbine(s)
Eir	Eir Link 1	PTP microwave radio link from Ballyfeeny to Edercloon	Clearance: 18.22 m (T02)
Three Ireland	3IRL Link 1	PTP microwave radio link from Mullaghmacormick to Sliabh Bawn.	Interference: -27.74 m (T01a) Clearance: 00.37 m (T02)
	3IRL Link 2	PTP microwave radio link from Ballyfeeny to Ballyleague.	Clearance: > 50 m (T1a)
	3IRL Link 3	PTP microwave radio link from Ballyfeeny to Lissawaddy.	Clearance: > 50 m (T1b)
	3IRL Link 4	PTP microwave radio link from Ballyfeeny to Strokestown.	Clearance: > 50 m (T1b)
Vodafone	VF Link 1	PTP microwave radio link from Mullaghmacormick to Sliabh Bawn.	Interference: -29.97 m (T01a) Interference: -01.60 m (T02)
	VF Link 2	PTP microwave radio link from Sliabh Bawn to Ballyfeeny.	Clearance: 8.94 m to T01a
	VF Link 3	PTP microwave radio link from Ballyfeeny to Lissawaddy.	Clearance: > 50 m (T1b)
	VF Link 4	PTP microwave radio link from Ballyfeeny to Roosky.	Interference: -03.80 m (T02) Interference: -21.68 m (T04) Interference: -33.41 m (T05)
	VF Link 5	PTP microwave radio link from Ballyfeeny to Edercloon.	Clearance: 22.04 m (T02)



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