

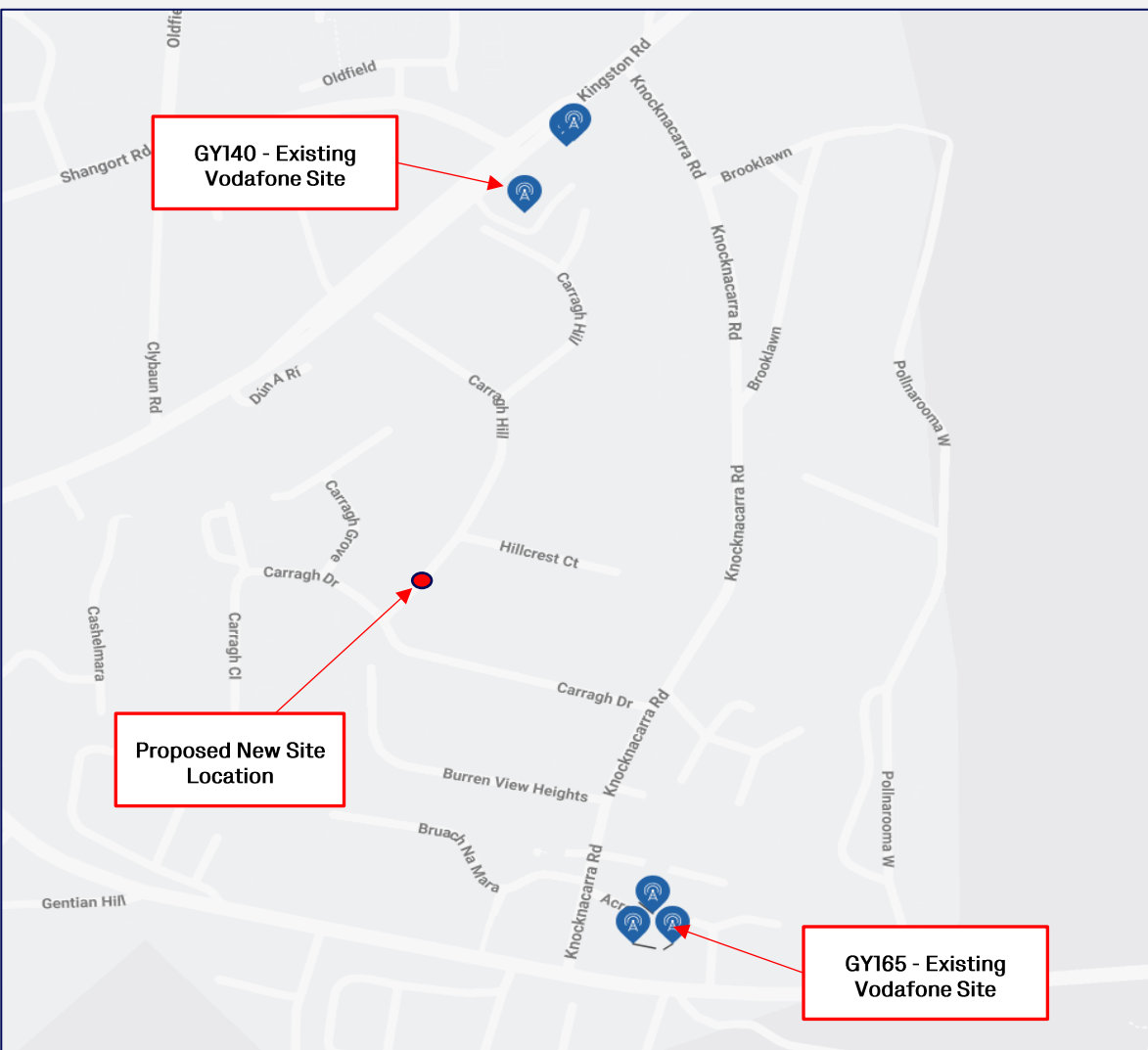
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Proposed New S254 Streetworks Telecoms Site Carragh Hill, Knocknacarra, Galway

Site Technical Justification



 siteviewer.comreg.ie	 Carragh Hill, Galway, Ireland	Licence Type Mobile Masts	Area Ireland
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New Site- Key Service Improvement Objectives

The key objectives of the planned new Streetworks telecoms site at Carragh Hill, Knocknacarra, is to allow Vodafone to significantly enhance customer voice and mobile broadband data experience by improving 4G and especially 5G coverage levels, to the residential areas of Carragh, Hillcrest, Burren View as well as along the Knocknacarra Road area.

Vodafone is currently providing service to these areas by two rooftop sites at Kingston Hall (GY140) and Southern Hills (GY165).

While the site at Kingston Hall has been deployed with all the very latest 4G and 5G technologies and frequency (*capacity*) bands, Vodafone have been unable to upgrade the technologies on the Southern Hills site, as it is not technically feasible to upgrade this rooftop site.

Without the required technology upgrades, the Southern Hill site cannot and will not be able to provide the full spectrum of 4G technologies and frequency bands, and most certainly will not be able to have 5G technologies deployed, technologies that are required for all sites in the Vodafone network, as it enters into the final stages of its network wide sites upgrade program

Because of the inability to provide the required upgrade to the Southern Hills site, it is planned to replace this site with the proposed Streetworks solution telecoms site at Carragh Hill, Knocknacarra.

This new site will not only be able to provide for further enhanced 4G and 5G services to the aforementioned residential areas in the Knocknacarra area, but also for residences located along the R336 coastal road as well as those located in the Gentian Hill and Blake Hill areas

Proposed Site Location In Relation To Immediate Environs



Proposed Site Location

This aerial view shows the proposed site location at Carragh Hill in relation to its immediate environs.

This view clearly demonstrates that the proposed site location is located on a wide grass verge, with a large open green area immediately opposite.

The selection criteria used for proposed site location were

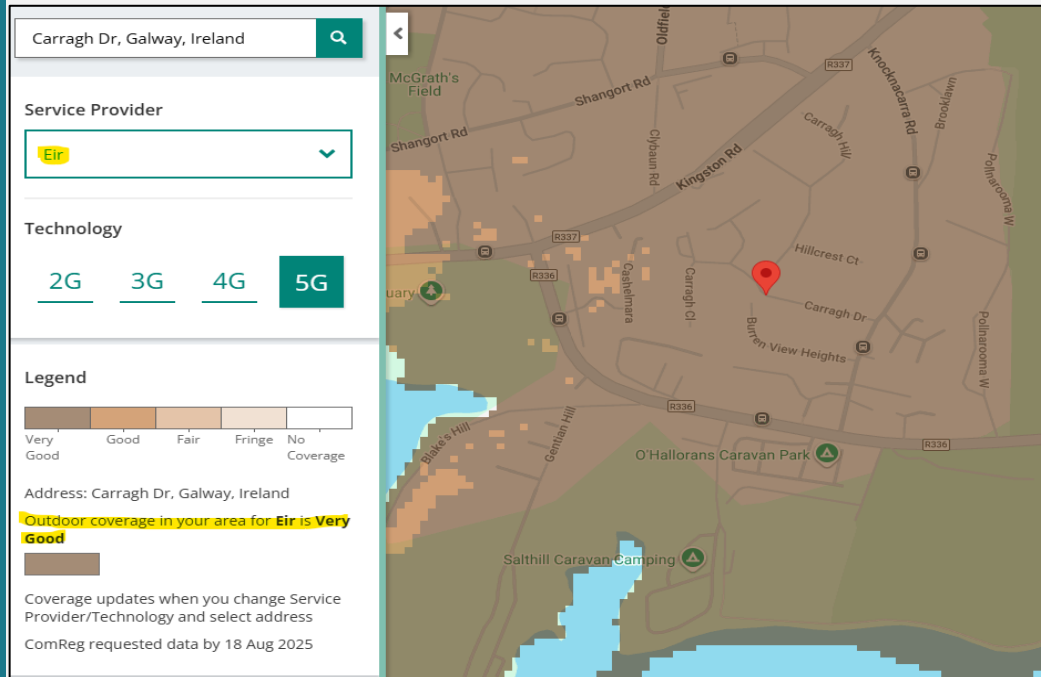
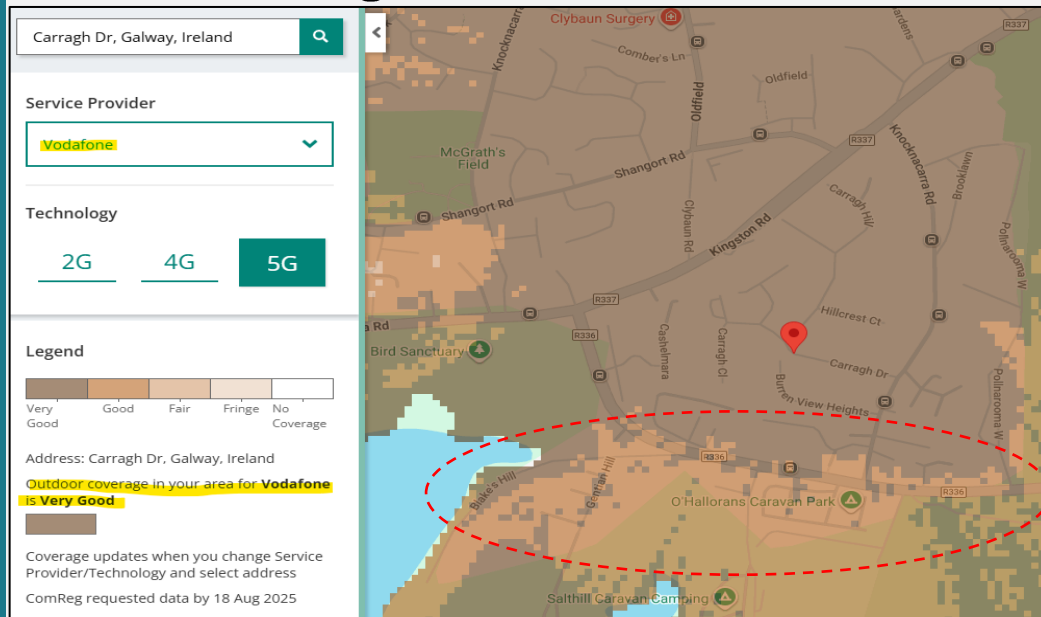
- Its ability to provide the necessary coverage and service enhancements to the surrounding residential areas.
- Not being directly in front of any residences
- Not causing any visual obstructions to vehicle traffic at junctions or corner turnings
- No impact on existing U/G services
- Proximity to existing ESB power i.e. mini-pillar
- Proximity to existing fibre ducting.

The chosen location at Carragh Hill meets all of these site selection criteria

Proposed Site Location In Relation To Immediate Environs



Carragh Hill And Environs - Comreg Coverage Maps Per Operator



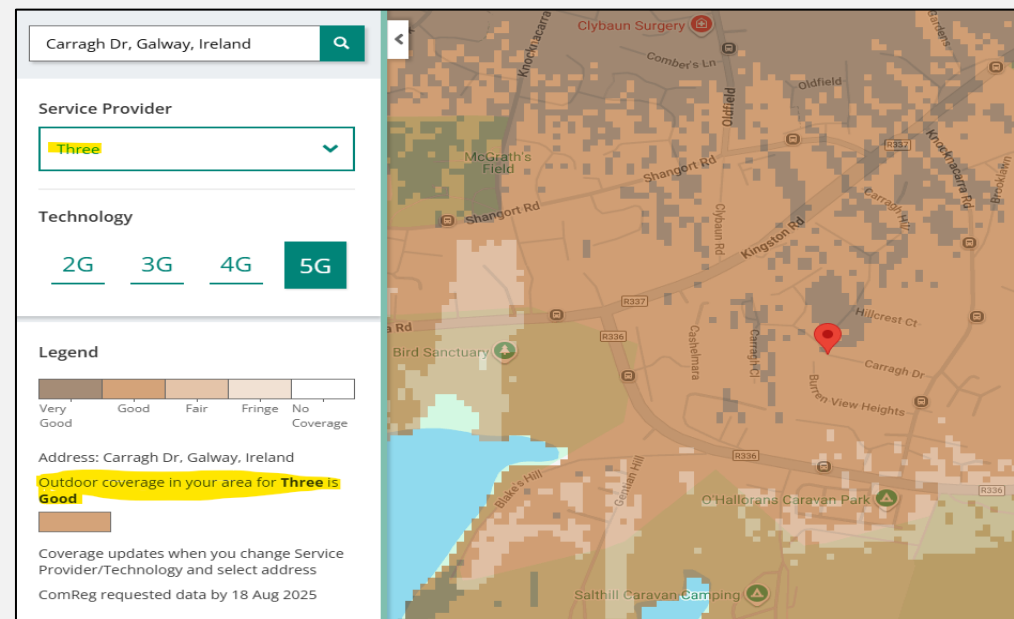
Comreg Mobile Operator Coverage Maps

These screenshots are from The Comreg Coverage Map website and show 5G coverage levels for each of the mobile operators in the greater Knocknacarra area.

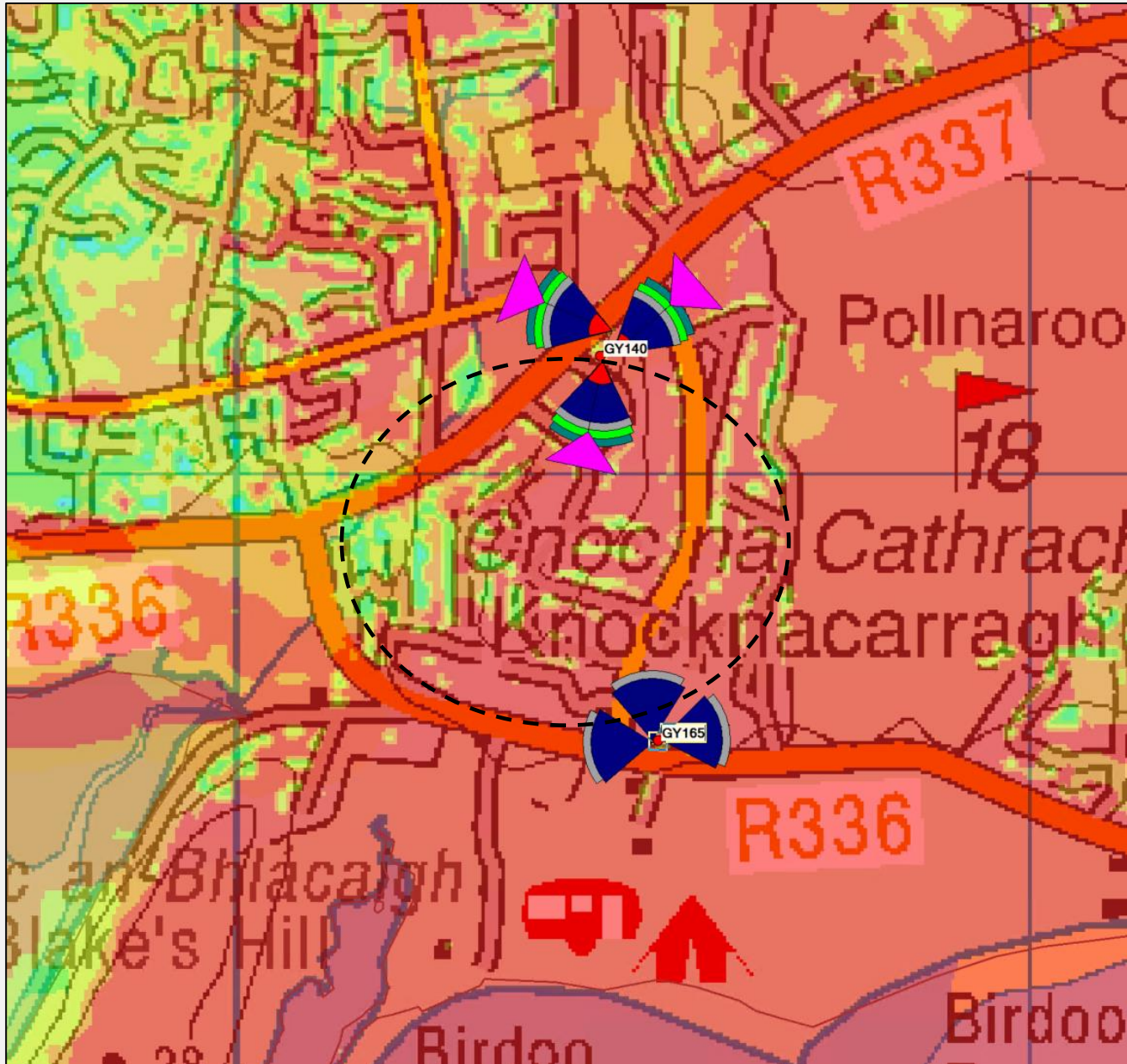
It must be noted that coverage levels shown on the Comreg website are for outdoor coverage levels only and cannot be a reliable guide to coverage/service levels that customer may or may not be able to have indoors, be that in their homes or work places.

The levels of indoor coverage levels very much depend on the materials used in the construction of the building, insulation type used and whether glazing is double or treble etc . These different construction materials can cause very significant signal attenuation as the mobile phone signal passes through them.

With regard to Vodafone's 5G coverage, areas to the southern section of Knocknacarra would certainly have poor if any indoor 5G service, and this is because their site at Southern Hills currently doesn't have and is incapable of having 5G technology deployed to it.



Existing Vodafone 4G Coverage To the Greater Carragh Hill Area



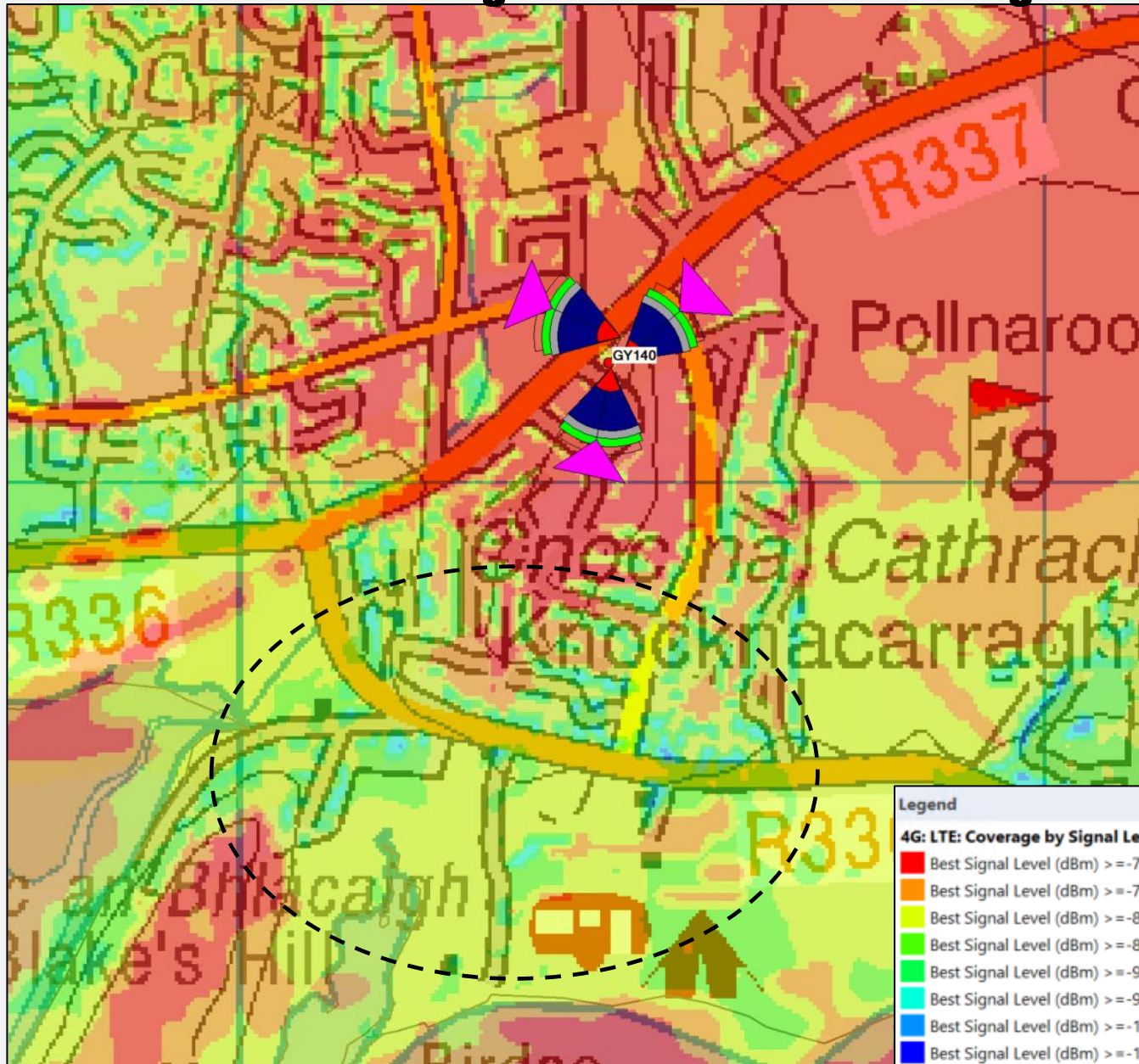
Carragh Hill / Knocknacarra Coverage

This coverage map indicates the existing Vodafone outdoor 4G coverage levels to the Knocknacarra area from the existing sites at Kingston Hall (GY140) and Southern Hills (GY165)

From this coverage prediction map, it is clearly evident that there are still pockets of lower outdoor coverage levels (non red areas) where indoor 4G and especially 5G service levels maybe less than reliable.

Legend	
4G: LTE: Coverage by Signal Level - 5m Resolution	
Best Signal Level (dBm) ≥ -70	Red
Best Signal Level (dBm) ≥ -75	Orange
Best Signal Level (dBm) ≥ -80	Yellow
Best Signal Level (dBm) ≥ -85	Light Green
Best Signal Level (dBm) ≥ -90	Green
Best Signal Level (dBm) ≥ -95	Cyan
Best Signal Level (dBm) ≥ -100	Blue
Best Signal Level (dBm) ≥ -105	Dark Blue

Vodafone 4G Coverage To the Greater Carragh Hill Area – Without Southern Hill site



Carragh Hill / Knocknacarra Coverage

This coverage prediction map indicates the very significant impact that any loss or removal of the site at Southern Hills for non-feasible technical upgrade reasons, would have on the residential areas of south Knocknacarra, if it was not replaced by a suitable alternative site, such as the one being proposed for Carragh Hill.

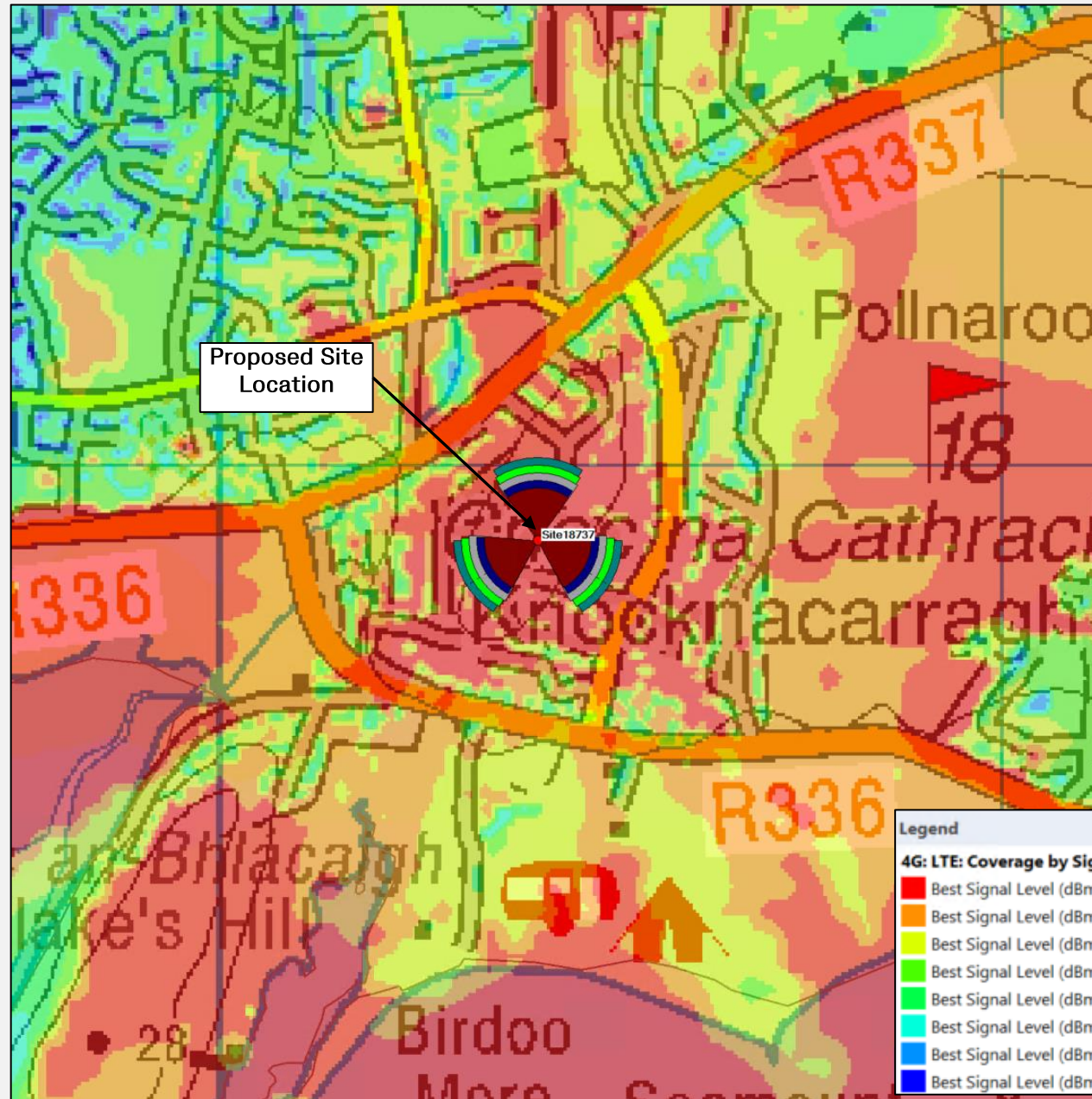
The levels of outdoor 4G coverage levels demonstrated here in the highlighted area, would certainly result in the very likely loss of any reliable level of indoor 4G voice and mobile data services, and absolutely the non-existence of any indoor 5G service.

Legend

4G: LTE: Coverage by Signal Level - 5m Resolution

- Best Signal Level (dBm) ≥ -70
- Best Signal Level (dBm) ≥ -75
- Best Signal Level (dBm) ≥ -80
- Best Signal Level (dBm) ≥ -85
- Best Signal Level (dBm) ≥ -90
- Best Signal Level (dBm) ≥ -95
- Best Signal Level (dBm) ≥ -100
- Best Signal Level (dBm) ≥ -105

Predicted 4G/5G Coverage To the Greater Carragh Hill Area – From Proposed New Site



Carragh Hill / Knocknacarra Coverage

This coverage prediction map demonstrates the levels of 4G & 5G that the proposed S254 telecoms site will provide to the surrounding residential areas in the middle and southern sections of the greater Knocknacarra area.

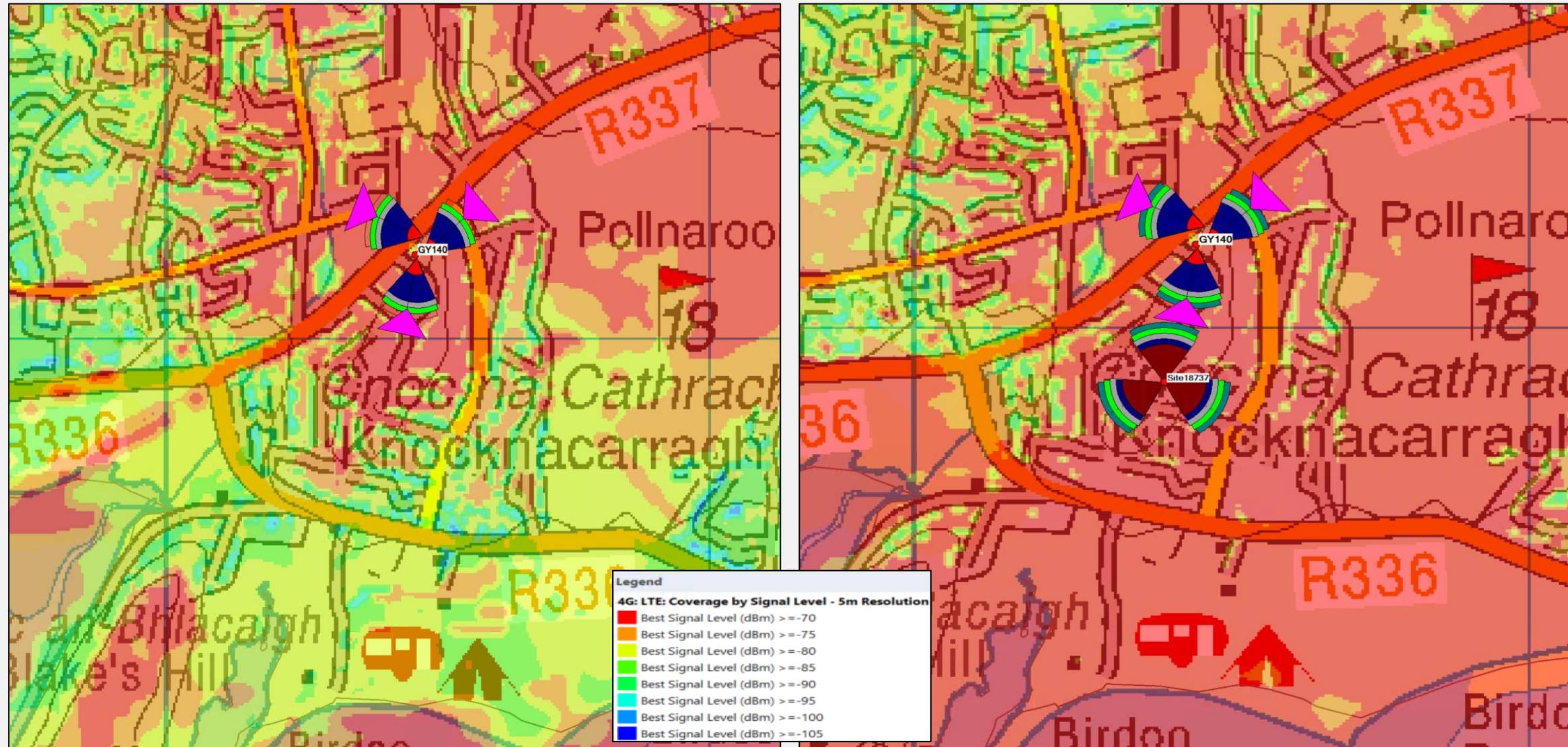
Legend

4G: LTE: Coverage by Signal Level - 5m Resolution

- Best Signal Level (dBm) ≥ -70
- Best Signal Level (dBm) ≥ -75
- Best Signal Level (dBm) ≥ -80
- Best Signal Level (dBm) ≥ -85
- Best Signal Level (dBm) ≥ -90
- Best Signal Level (dBm) ≥ -95
- Best Signal Level (dBm) ≥ -100
- Best Signal Level (dBm) ≥ -105

Predicted Vodafone Composite 4G/5G Coverage To the Greater Carragh Hill Area

These coverage predictions maps provide a comparison between the outdoor coverage levels to the Knocknacarra area on Vodafone service due the non-replacement of the Southern Hills site – and so only the Kingston Hall site (GY140) serving the Knocknacarra area – for non-feasible technical upgrade reasons, with the coverage levels that will be provided to these same residential areas, if the Southern Hills site is replaced with the proposed new Streetworks solution site at Carragh Hill



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