MWP

Screening for Appropriate Assessment Report and Natura Impact Statement

Deer Park Large-scale Residential Development (LRD), off Park Road, Killarney, County Kerry.

Ross-Park Residential HS Limited.

September 2026

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Summary of Findings – Appropriate Assessment

Project Title	Deer Park Large-scale Residential Development
Project Proponent	Ross-Park Ltd.
Project Location	The proposed development site is located off Park Road in the townland of Ardshanavooly in Killarney, County Kerry.
Screening for Appropriate Assessment (Stage 1)	The screening for Appropriate Assessment (AA) is undertaken to determine the potential for likely significant effects of the construction and operation of the proposed Deer Park Large-scale Residential Development (LRD), individually, or in combination with other plans or projects, in view of the conservation objectives of certain Natura 2000 sites identified within this report.
Stage 1 Conclusion	During the screening process, it was objectively concluded, that the proposed LRD will not result in likely significant effects on the following designated Natura 2000 sites: ▪ Killarney National Park SPA (004038) ▪ Sheheree (Ardagh) Bog SAC (000382) ▪ Castlemaine Harbour SAC (000343) ▪ Old Domestic Building, Curraglass Wood SAC (002041) However, there was uncertainty as to the absence of significant effects, specifically regarding the population of lesser horseshoe bat (*Rhinolophus hipposideros*) [1303] for which Killarney National Park, MacGillycuddy's Reeks and Caragh River Catchment SAC (000365) is selected. Therefore, it could not be objectively concluded during the screening process that the proposed LRD will not significantly affect the lesser horseshoe bat population of the following Natura 2000 site: ▪ Killarney National Park, MacGillycuddy's Reeks and Caragh River Catchment SAC (000365) Therefore, an AA is required, and a Natura Impact Statement (NIS) is necessary to assess the implications of the development, alone and in combination with other plans/projects, on the integrity of this Natura 2000 site.
Natura Impact Statement (Stage 2)	In cases where an AA is required, an NIS is prepared and includes a report of a scientific examination of evidence and data, carried out by competent persons to identify and classify any implications of a project, individually, or in combination with other plans or projects, for Natura 2000 sites in view of the conservation objectives of the sites.
Stage 2 Conclusion	For the reasons set out in detail in this AA and in the light of the best scientific knowledge in the field, all aspects of the project which, by itself, or in combination with other plans or projects, which may affect the relevant Natura 2000 site have been considered. This NIS contains information which the competent authority may consider in making its own complete, precise and definitive findings and conclusions and upon which the competent authority is capable of determining that all reasonable scientific doubt has been removed as to the effects of the project on the integrity of the relevant Natura 2000 sites. Provided that the mitigation measures are implemented in full, it is considered that the proposed development, either individually or in combination with other plans/projects, will not affect the integrity of the following Natura 2000 site, or any other Natura 2000 site: • Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC (000365)

1. Introduction

Ross-Park Residential HS Limited ('the Applicant') intend to lodge a Planning Application to Kerry County Council (KCC) for a large-scale residential development (LRD) on a 3.8-hectare site located off Park Road in the townland of Ardshanavooly in Killarney, County Kerry. The proposed Deer Park LRD will consist of 188 no. residential units comprising a mix of semi-detached, townhouse, mews, and apartments, with ancillary crèche, landscaping and all associated site development works.

1.1 Legislative Context and Purpose of the Assessment

The Habitats Directive (92/43/EEC) seeks to conserve natural habitats and wild fauna and flora through the designation of Special Areas of Conservation (SACs), while the Birds Directive (2009/147/EC) seeks to protect bird species of special importance via the designation of Special Protection Areas (SPAs). It is the responsibility of each European Union member state to designate SPAs and SACs that form part of Natura 2000, a network of protected sites throughout the European Community. The European Communities (Birds and Natural Habitats) Regulations 2011-2021 transpose the Habitats Directive and the Birds Directive into Irish law. The requirement for AA of the implications of plans and projects on the Natura 2000 network of sites comes from Habitats Directive (Article 6(3).

Within this document, Section 3 comprises a Stage One screening for AA report which aims to establish whether the proposed LRD is likely to result in significant effects on nearby Natura 2000 sites (either alone or in combination with other plans or projects) in view of the site's conservation objectives. The screening for AA has been prepared to provide a sufficient level of information to the competent authority, in this case KCC, on which to base their own screening for AA for the proposed development.

This study is based on a preliminary impact assessment using both publicly available data and data collected during surveys at the proposed development site. It comprises a description of the proposed development (in Section 3.2), particularly the aspects that could interact with the receiving environment, the identification in Section 3.5 of the impacts that are reasonably foreseeable as potentially ensuing from it, and a determination as to whether these predicted impacts, either alone or in combination with the other plans or projects identified in Section 3.4, are likely to have significant direct and/or indirect effects on the Natura 2000 sites identified in Section 3.6.2, in view of those sites' conservation objectives.

The need to apply the precautionary principle (the absence of scientific evidence on the significant negative effect of an action cannot be used as justification for approval of this action) in making any key decisions in relation to the tests of AA has been confirmed by European Court of Justice case law. Therefore, when applied to Article 6(3) procedure, where significant effects are likely, possible or uncertain at the screening stage, an AA will be required, in which case a Stage 2 NIS will be prepared (see Section 4).

1.2 Statement of Competency

This report has been prepared by Pat Ryan BSc. (Hons) Wildlife Biology, with additional input from Úna Williams (BA. (Mod.), MSc.).

Pat has over 13 years' experience in professional consultancy. He has extensive experience of ecological impact assessments, drafting biodiversity chapters for EIAR and AAs, both screening and NIS, and, as author of the NIS, appeared as an Expert Witness at the An Bord Pleanála (ABP) Oral Hearing on the South Kerry Greenway (ABP reference: PL08 .302450) in October 2019.

Experience germane to the QI that is the subject of assessments in this NIS comprises:

- In 2017 and 2018, he carried out Passive Automatic Bat Surveys in Killarney National Park; and
- In the summers of 2018 and 2019, he carried out 15 consecutive nights of roost emergence counts at the lesser horseshoe bat roost in Deenagh Lodge (Bat Site Code: 296). The surveys were conducted under supervision by National Parks and Wildlife Service (NPWS) staff and included one hour of post-emergence monitoring to record post-emergence activity.

Úna has worked at Malachy Walsh and Partners (MWP) Engineering and Environmental Consultants in County Kerry since 2019. She is an experienced field ecologist with a diverse ecological survey profile including habitats, flora, mammals, and birds, and has worked on research teams both in Ireland and abroad. Úna has designed and carried out several Collision Risk Models for proposed wind farms and has authored and contributed to numerous ecological reports and assessments. She graduated from Queen's University Belfast in 2018 with an MSc in Animal Behaviour and Welfare, and from Trinity College Dublin in 2008 with an Environmental Science degree.

The report has been prepared in compliance with the requirements of the legislative framework that pertains and is consistent with the guidance documents variously described, cited and footnoted in the body of the text.

1.3 Overview of Proposed Development

The proposed LRD will comprise the construction of 188 no. residential units consisting of a mix of semi-detached, townhouse, mews, and apartments, together with an ancillary crèche on a 3.8-hectare site located off Park Road in the townland of Ardshanavooly in Killarney, County Kerry. The proposed development will also deliver part of the Killarney Strategic Links Project – Links Road A–C.

The location of the proposed development site (PDS) is shown in **Figure 1-1**, below.

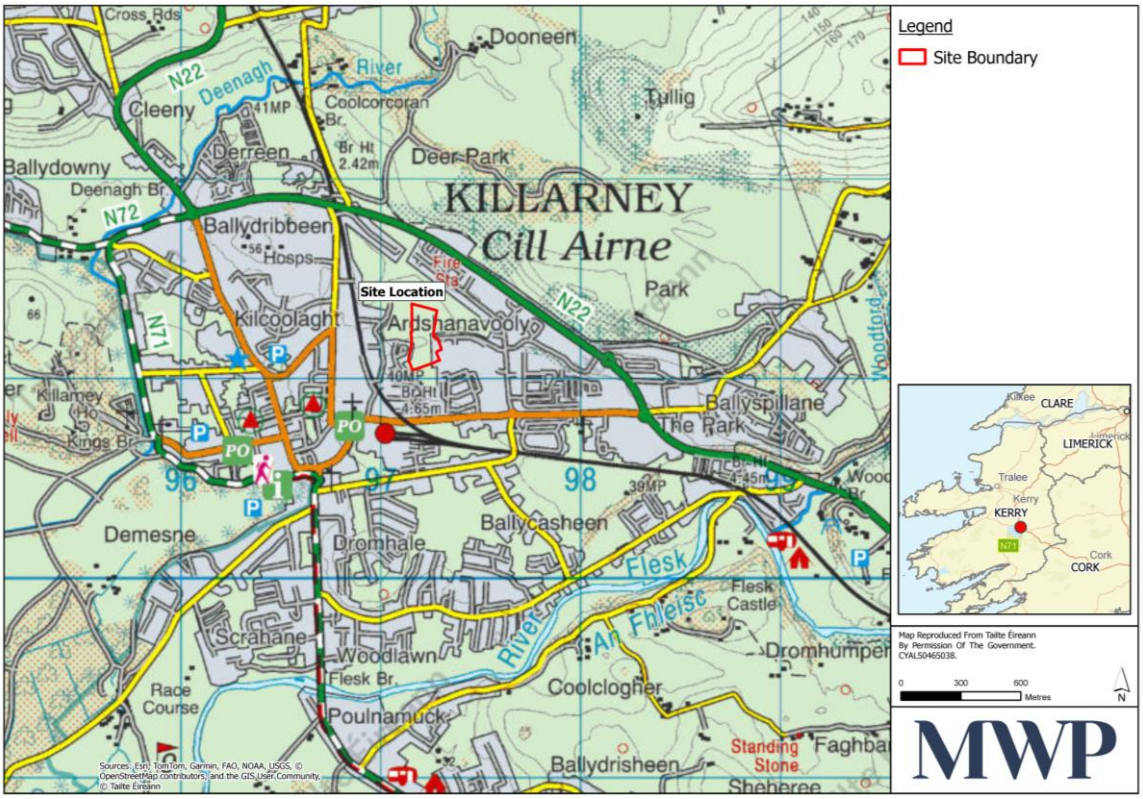


Figure 1-1: Location of proposed development site at the northern side of Killarney town in County Kerry.

1.4 Stages of Appropriate Assessment

The AA process is a four-stage process with issues and tests at each stage. The purpose of the first stage, the screening assessment, is to record in a transparent and reasoned manner the likely effects on European sites of a proposed development. An important aspect of the AA process is that the outcome at each successive stage determines whether a further stage in the process is required.

The four different stages of AA are summarised in **Appendix 1** of this report.

2. Assessment Methodology

2.1 Introduction

A plan or project can only be authorised by a competent authority if it has made certain that it will not adversely affect the integrity of the Natura 2000 sites relevant to the project in view of their conservation objectives, either alone or in combination with other plans and projects. This can only be the case where "no reasonable scientific doubt remains as to the absence of such effects"[1].

As set out in the NPWS guidance (DEHLG, 2010) (and other guidelines listed in **Section 2.2**, below), the task of establishing whether a plan or project is likely to influence a Natura 2000 site(s) is based on a preliminary impact assessment using available information and data, including that outlined below in **Section 2.3**, and other available environmental information, supplemented as necessary by local site information and ecological surveys. This is followed by a determination of whether it is likely that the effects identified could be significant. The precautionary principle approach is required.

2.2 Appropriate Assessment Guidance

This assessment has been undertaken in accordance with the following:

- European Commission (EC) guidelines '*Assessment of plans and projects in relation to Natura 2000 sites - Methodological Guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC*' (EC, 2021);
- EC Notice '*Managing Natura 2000 sites: The provisions of Article 6 of the 'Habitats' Directive 92/43/EEC*' (EC, 2019);
- National Parks and Wildlife Service (NPWS) guidelines '*Appropriate Assessment of Plans & Projects - Guidance for Planning Authorities*' (DEHLG, 2010); and,
- Office of the Planning Regulator (OPR) Practice Note '*Appropriate Assessment Screening for Development Management*' (OPR, 2021).

2.2.1 Zone of Influence (ZOI)

In establishing Natura 2000 sites potentially affected by the proposed development, the 'zone of influence' (ZOI) concept was applied. The ZOI for a project is the area over which ecological features may be affected by biophysical changes because of the proposed project and associated activities (CIEEM, 2018). According to OPR (2021), specifically in relation to Natura 2000 sites, the ZOI of a project is the geographical area over which it

[1] European Court of Justice Case C-127/02 Landelijke Vereniging tot Behoud van de Waddenzee.

could affect the receiving environment in a way that could have significant effects on the Qualifying Interests (QIs) of a designated site. The ZOI will vary for different ecological features depending on their sensitivity to an environmental change (CIEEM, 2018).

The ZOI for a project should be established on a case-by-case basis using the Source-Pathway-Receptor (S-P-R) framework and not by arbitrary distances (such as 15 km). In the context of AA there is a clear difference between the 'impact' which is the source and the 'effect', which is how it relates to the site-specific conservation objectives. When assessing impact, Natura 2000 sites are only considered relevant where a credible or tangible S-P-R link exists between the project and a protected species or habitat type. In order for an impact to occur there must be a risk initiated by having a 'source' (e.g. excavation), a 'receptor' (e.g. a protected species/habitat), and an impact pathway between the source and the receptor (e.g. a waterbody which connects the proposal site to the protected species or habitat). The ZOI is likely to extend beyond the project site such as where there are ecological or hydrological links beyond the project site boundary. In the case of protected sites with water dependent habitats or species, and a plan or project that could affect water quality or quantity, for example, it may be necessary to consider the full extent of the upstream and/or downstream catchment.

The ZOI of the proposed development in Killarney was identified during the desk study through a review of available information on the proposal, the impacts considered likely to arise as a result, distance from Natura 2000 sites and their QIs, and review of any landscape or ecological connectivity between the proposed development and Natura 2000 sites and other publicly available information as described in the desk study (see Section 2.3, below). Following the identification of Natura 2000 sites located within the potential ZOI of the proposed development, the potential effects associated with the proposal are identified before an assessment is made of the likely significance of these effects.

2.2.2 Assessment Criteria

The task of establishing whether a plan or project is likely to have an effect on a Natura 2000 site(s) is based on a preliminary impact assessment using available information and data, supplemented as necessary by local site information and ecological surveys. This is followed by a determination of whether there is a risk that the effects identified could be significant. The precautionary principle is required.

Once the potential impacts that may arise from the proposal are identified the significance of these is assessed using the following key indicators:

- Habitat loss, alteration, or degradation
- Water quality
- Disturbance and/or displacement of species
- Habitat or species fragmentation

The criteria for assessing significance, in view of the site-specific conservation objectives, is as follows:

- degree of habitat loss (absolute, relative), changes in habitats structure/habitat degradation
- risk of species populations' displacement, level of disturbance, reduction of species home range, feeding area, refuge areas, alteration of favourable condition for breeding
- importance of the habitats and species affected, e.g. representativeness, local variety
- importance of the site (e.g. limit of distribution area for certain habitats and species, stepping stone, important for ecological connectivity)
- disruption or alteration of ecological functions; and,

- changes to key ecological features of the site (e.g. water quality).

2.3 Desktop Study

A desk study was carried out to collate available information on the natural environment of the PDS. This comprised a review of the following publications, data and datasets:

- Ordnance Survey Ireland (OSI) Aerial photography and 1:50000 mapping;
- National Parks and Wildlife Service (NPWS) website and online map viewer;
- National Biodiversity Data Centre (NBDC) online mapping resources and species records;
- Teagasc soil maps (accessed via NBDC);
- Geological Survey Ireland (GSI) spatial datasets;
- Environmental Protection Agency (EPA) water quality and environmental datasets;
- Water Framework Directive (WFD) datasets for the relevant river basin district;
- Bat Conservation Ireland (BCIreland) datasets;
- Kerry County Development Plan 2022–2028, including Variation No. 2 – Killarney Municipal District Settlements Plan[2];
- Records obtained from the NPWS Rare and Protected Species Database;
- Review of records of plant species protected under the Flora (Protection) Order 2015 and the Irish Red Data Book (Wyse Jackson *et al*., 2016)[3];
- Natura 2000 Standard Data Forms; and,
- Other sources and research listed in **Section 0**, below, and as footnotes throughout the report.

Cognisance was also taken of, *inter alia*, King, *et al*. (2011), Wyse Jackson, *et al*. (2016), Marnell *et al*. (2019), Nelson, *et al*. (2019), Gilbert *et al*. (2021), Marnell *et al*. (2022) and Hodgetts & Lockhart (2025).

2.4 Field Surveys

The desk-based study was supplemented by multi-disciplinary ecological walkover surveys and targeted species surveys of the PDS, undertaken by MWP ecologists on multiple dates between September and October 2024, with additional targeted bat surveys carried out between May and August 2025.

Summaries of the survey methodologies employed are provided in the sections below.

2.4.1 Habitats and Flora

Surveys had regard to '*Best Practice Guidance for Habitat Survey and Mapping*' (Smith *et al.*, 2011). Habitats within and bounding the PDS were categorised to Level 3 according to Fossitt (2000). Habitats occurring within the site were assessed for their potential suitability for terrestrial mammal species.

[2] https://consult.kerrycoco.ie/en/consultation/proposed-variation-no-2-kerry-county-development-plan-2022-2028/chapter/proposed-variation-no-2-kerry-county-development-plan-2022-2028 Accessed: 14th August 2026
[3] County Development Plan | (c) Kerry County Cuncil (kerrycoco.ie) Accessed: 14th August 2026

In conjunction with the habitat surveys, botanical surveys were completed within the development footprint and included a 'look-see' search methodology (NRA, 2009) within habitat features likely to support protected species. This aimed to confirm the presence of plant species protected by Section 21 of the Wildlife Act, 1976 as amended)[4].

2.4.2 Invasive Alien Plant Species (IAPS)

During all ecological surveys within the PDS, the presence of invasive alien plant species (IAPS) was surveyed and recorded. These species comprised those:

- listed in the Third Schedule[5] to the European Communities (Birds and Natural Habitats) Regulations 2011[6] (as amended);
- listed in Part 1 of the First Schedule of the EU (Invasive Alien Species) Regulations 2024[7]; and,
- that fall within the purview of Section 52 (7) (c) and the Definition in Section 52 (8) of the Wildlife Act, 1976[8] (as amended) which reads:

  > *For the purposes of subsection (7), any reference to wild* [……] *plants, flowers, roots, seeds or spores refers only to exotic[9] species thereof.*

Surveys were based on NRA (2010), TII (2020a, 2020b) and on the extensive collective experience of the survey team.

2.4.3 Non-volant Mammals

During multi-disciplinary ecological walkover surveys, habitats within the PDS were systematically examined for evidence of terrestrial mammal activity such as prints, droppings, burrows, dens/setts, feeding signs and movement trails. Surveys were undertaken with reference to '*Animal Tracks and Signs*' (Bang & Dahlström, 2006).

Wildlife cameras were deployed at selected locations across the site in September 2024 under NPWS Licence No. 227/2023 to gather information on the presence and activity of terrestrial mammal species. Incidental records of other fauna, including bird species observed or heard during surveys, were also noted where relevant.

2.4.4 Bat Species

Summaries of the bat survey methodologies are provided hereunder – see Bat Survey Report in Appendix 2 for full survey details.

The following bat surveys were undertaken with reference to best practice guidance (Collins, 2023):

- Bat foraging and commuting habitat suitability assessment;
- Preliminary Roost Assessment (PRA);
  - Ground-level inspection of trees for potential roost features
- Night-time Bat Walkover (NBW) Surveys; and,

[4] Listed in S.I. No. 235 of 2022 - Flora (Protection) Order 2022.
[5] A list of non-native species subject to restrictions under Regulations 49 and 50.
[6] S.I. No. 477/2011.
[7] S.I. No. 374 of 2024.
[8] *Number* 39 *of* 1976.
[9] Exotic is used here in the botanical sense of being non-native (Comerford, 2001 cited in TII, 2020b).

- Passive Automated Bat (PAB) Surveys.

Bat Foraging and Commuting Habitat Evaluation

As part of the bat survey programme, linear habitat features within the PDS, such as hedgerows and treelines, were assessed in terms of plant species composition, overall condition, structural diversity and degree of connectivity to the wider landscape, to evaluate their potential suitability for foraging and commuting bats.

Each habitat feature was assigned a suitability rating of 'Negligible', Low', 'Moderate' or 'High' (Collins, 2023).

Preliminary Roost Assessment

A daytime Preliminary Roost Assessment (PRA) was undertaken on 7th May 2025. Trees within the PDS were inspected from ground level for features with potential to support roosting bats, including cracks, cavities, splits, knot holes, loose bark and dense ivy (*Hedera helix*) cover. Evidence of bat activity, such as droppings, staining and feeding remains, was also searched for.

Each tree was assigned a suitability category 'Negligible', Low', 'Moderate' or 'High' for roosting bats as per Collins (2023). No buildings or structures were present within the PDS; therefore, the assessment focused on trees located along site boundaries.

Nighttime Bat Walkover (NBW) Surveys

Night-time bat walkover surveys were undertaken on 15th May, 16th June, 24th July and 26th August 2025 as per Collins (2023). Surveys were designed to observe bat behaviour across the PDS, supplement data gathered from static detectors and allow a more detailed analysis of bat activity and habitat use.

The surveys involved walking predetermined transect routes around the PDS, with stopping points at regular intervals (approximately every 200 to 250 m) to observe and record bat activity (see **Figure 2-1**, below). Information was gathered on species presence, number of individuals, flight direction, flight behaviour, and associations with landscape features such as treelines and hedgerows.

Surveyors used hand-held bat detection equipment to record bat calls, including BATLOGGER M2 detectors and Wildlife Acoustics Echo Meter Touch 2 software on Samsung tablets. Nightfox Night vision goggles were also used to assist with visual observation and counting of individual bats.

Surveys commenced approximately 20 minutes before sunset and continued for approximately 1.5 to 2 hours after sunset. For the purposes of this assessment, a bat pass refers to a bat detected acoustically and/or visually during the survey and may represent either a commuting individual passing through the PDS or a foraging bat actively using habitat features.

Ambient light levels were measured during June and August 2025 using a handheld Digital Illuminance Light Meter (AOPUTTRIVER AP-881E).



Figure 2-1: Nighttime bat walkover (NBW) survey route used within the PDS.

Passive Automated Bat (PAB) Surveys

Ground-level static surveys were undertaken at the PDS in May, June, July, and August 2025, to capture seasonal variation in bat activity, as per Collins (2023). Units were deployed for five consecutive nights during each of these months. Three full-spectrum bio-acoustic recording units (Song Meter Mini) were deployed at pre-selected sampling points (SP) within the PDS to record bat activity and assess spatial and temporal patterns of site use (see **Figure 2-2**, below).

Static detector locations were selected to sample habitat features with highest suitability for bat activity such as treelines, hedgerows and scrub. Artificial lighting was also considered during placement, as northern and eastern parts of the PDS are influenced by light spill from street lighting and adjacent commercial and residential areas.



Figure 2-2: Sampling point (SP) locations of PAB detector deployment.

2.4.5 Birds and Marsh Fritillary (*Euphydryas aurinia*)

During the multi-disciplinary walkover surveys, all bird species observed or heard calling were recorded and the PDS was searched for the essential habitat component[10] for devil's-bit scabious (*Succisa pratensis*), the foodplant of the marsh fritillary (*Euphydryas aurinia*)[11].

3. Stage 1: Screening for Appropriate Assessment

The screening assessment sets out clearly and reasonably the direct and/or indirect likely effects on relevant Natura 2000 sites of the proposed Deer Park LRD, either alone or in combination with other plans and projects, and whether these likely effects are significant. Screening for AA (Stage 1) determines the need for a full AA (Stage 2) and consists of several steps, each of which is addressed in the following sections:

3.1 Establishment of whether the development is necessary for the management of a Natura 2000 site(s).

3.2 Description of the existing site's ecological characteristics and a summary of the field survey results.

3.3 Description of the proposed development.

3.4 Identification of other plans, projects and activities with which the proposed development could interact to create in-combination effects.

3.5 Identification and description of potential individual and cumulative impacts (in-combination effects) of the project.

[10] https://www.npws.ie/research-projects/animal-species/invertebrates/marsh-fritillary-euphydryas-aurinia
[11] A Qualifying Interest (QI) for which SAC (000365) is designated.

3.6 Identification of European site(s) potentially affected by the proposed development.

3.7 Assessment of the significance of potential impacts on Natura 2000 site(s).

3.8 Conclusion of screening stage.

3.1 Management of Natura 2000 Sites

The proposed development is not connected with or necessary to the conservation management of any Natura 2000 site.

3.2 Description of Existing Site

3.2.1 General Site Description

The PDS, illustrated in **Figure 3-1**, below, comprises an agricultural greenfield site located within the townland of Ardshanavooly, to the east of Killarney town centre. The site is currently managed as improved agricultural grassland and is used for silage production. The site is enclosed by a combination of hedgerows, treelines, and boundary features, with adjoining land uses including residential housing, commercial/retail development, and additional agricultural lands. Deerpark Retail Park is located immediately to the east, with established residential areas to the south and west. Further agricultural land occurs to the north and northeast.

The area surrounding the PDS comprises a mix of urban development, agricultural fields, transport infrastructure, and boundary vegetation, providing varying levels of ecological connectivity through hedgerows, treelines, and green spaces. The River Flesk is situated to the south of the PDS, the River Deenagh to the west. Both are at a remove of approximately 1.5 km, and, in both cases, the intervening areas are occupied by the urban fabric of Killarney town – see **Figure 3-1**, below. There are no natural watercourses within, or in the areas adjacent to, the PDS. There is, therefore, no hydrological link between the PDS and any surface water body.

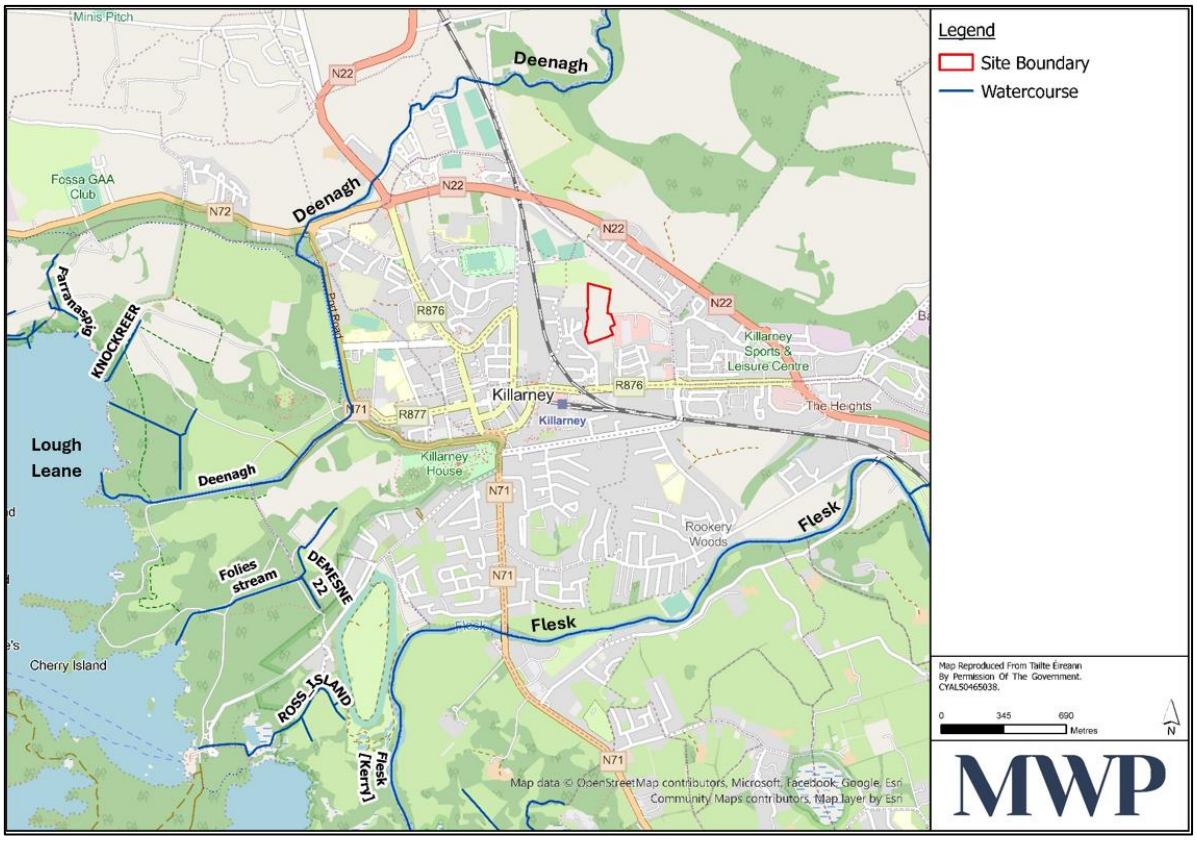


Figure 3-1: Location of PDS in Killarney town and location of watercourses nearest the PDS.

The PDS is situated within the Laune–Maine–Dingle Bay Water Framework Directive (WFD) catchment (EPA Code: 22) and the Laune_SC_010 sub-catchment (EPA Code: 22_14). This catchment encompasses the area drained by the Rivers Laune and Maine and includes all streams entering tidal waters between Glanearagh Head and Clogher Head in County Kerry, covering a total area of approximately 2,036 km².The underlying aquifer in the area is classified by the Geological Survey Ireland as a Regionally Important Aquifer – Karstified (Diffuse).

3.2.2 Habitats and Flora

The habitats recorded are listed below in **Table 3-1,** with a description of their distributions within the PDS. A habitat map is provided in **Figure 3-2**, below.

Table 3-1. Habitats recorded at the PDS.

Level 3 Habitat Code	Habitat Description
BL3 Buildings and artificial surfaces	Hardstanding and built structures, that form the boundary fence of the adjacent retail park occur along the eastern boundary of the PDS This habitat comprises concrete surfaces, fencing, lighting infrastructure and disturbed ground. Vegetation is sparse and largely confined to ruderal species occurring along margins and fence lines.
GA1 Improved agricultural grassland	Majority of PDS comprises improved agricultural grassland managed for silage production. The sward is species-poor and dominated by perennial ryegrass and other agricultural grasses, with occasional common herbaceous species. Regular cutting and fertiliser application have resulted in low botanical diversity.

Level 3 Habitat Code	Habitat Description
WL1 Hedgerows	Hedgerows occur along sections of the PDS boundary and are composed of a mix of native woody species. The hedgerows are generally intact and moderately dense, providing structural connectivity across the landscape. Ground flora is typical of improved agricultural field margins and includes grasses and common ruderal species.
WL2 Treelines	Habitat present along field boundaries consisting of mature and semi-mature trees of varying species and age classes. The understorey is limited in places due to agricultural management.
WS1 Scrub	Small areas of scrub present along field edges and boundaries, consisting of scattered shrubs and bramble-dominated patches. These areas provide structural diversity within an otherwise open agricultural landscape.



Figure 3-2: Map of habitats recorded at PDS (categorised according to Fossitt, 2000).

3.2.2.1 Invasive Alien Plant Species (IAPS)

No IAPS listed in the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations 2011 (as amended) or listed in Part 1 of the First Schedule of the European Union (Invasive Alien Species) Regulations 2024 was recorded. Two species, namely butterfly bush (*Buddleja davidii*) and cherry laurel (*Prunus laurocerasus*) that fall within the purview of Section 52 (7) (c) and the Definition in Section 52 (8) of the Wildlife Act, 1976, were recorded. These species and their vector materials are listed below in **Table 3-2** while distribution of the IAPS recorded at the PDS are presented in **Figure 3-3**, below.

Table 3-2. Summary details of the two IAPS species recorded at the PDS.

Species	Description of distribution at PDS	ITM	Vector Materials
Butterfly bush (*B. davidii*)	Occurs in small, scattered patches along the site boundary, primarily associated with disturbed ground and fence lines. Individual plants and small clumps recorded at multiple locations. No large continuous stands present.	497125 591129 497134 591228 497135 591231 497136 591241	Living plant Seed[12] Stem/root fragments

[12] Small and light enough to be dispersed by wind.

Species	Description of distribution at PDS	ITM	Vector Materials
		497262 591264	
Cherry laurel (*P. laurocerasus*)	Dense, established stand located along western boundary, forming a continuous linear thicket adjacent to boundary walls and scrub habitats. Locally dominant in this area.	497262 591252	Living plant Seed[13]



Figure 3-3: Distribution of IAPS recorded at the PDS.

3.2.3 Non-volant Mammals

Evidence of non-volant mammals was recorded during the ecological walkover surveys of the PDS. Mammal trails were noted along the perimeter of the PDS, particularly to the southeast, southwest and north, leading to and from adjacent scrub and hedgerow habitats. Trail cameras were deployed at locations to the northeast and southeast of the PDS. Footage from the cameras confirmed the presence of badger (*Meles meles*) within the PDS.

3.2.4 Bat Species

3.2.4.1 Bat Foraging and Commuting Habitat

The PDS is dominated by improved agricultural grassland (see **Figure 3-2**, above), which is open and exposed and therefore offers limited suitability for foraging bats. There are treelines and intermittent hedgerows along the northern, western and parts of the southern site boundaries, which provide sheltered edge habitat that afford commuting routes and foraging habitat for lesser horseshoe bats. While the northern, western, and parts of the southern site boundaries extend into the surrounding suburban landscape providing connectivity to the wider landscape, the eastern and southeastern boundaries interface with residential development, a retail complex and

[13] Each seed is within a fruit.

illuminated areas, which reduce their functional value for lesser horseshoe bats the most photophobic of bat species resident in Ireland.

Ambient light levels measured during June and August 2025 using a handheld Digital Illuminance Light Meter are shown in Table 3-3 below. For further details refer to Bat Survey Report in Appendix 2.

Table 3-3. Ambient Light Levels measured at the PDS during June and August 2025.

Stopping Points*	Light Level (lx)	
	June	August
1		24.65
2		12.03
3		1.95
4	0.15	0.88
5	0.10	0.16
6		0.15

* See Figure 2-2, above, for stopping point locations.

3.2.4.2 Preliminary Roost Assessment (PRA)

No bats, confirmed roosts, or evidence of bat use (e.g. droppings, staining, feeding remains) were recorded during the inspections and no buildings or structures were present within the PDS.

Trees along the site boundaries were assessed as having Negligible to Low suitability for roosting bats; however, a small number of mature boundary trees contained features such as knot holes, splits and ivy cover, providing Moderate to High suitability for roosting bats.

3.2.4.3 Nighttime Bat Walkover (NBW) Survey

Two lesser horseshoe bat passes were recorded at Stop 4 on May 15th.

3.2.4.4 Passive Automated Bat (PAB) Surveys

One lesser horseshoe bat pass was recorded at SP1 on 16th June during the PAB survey, which equates to 0.01% of all bat passes recorded.

3.2.5 Birds and Marsh Fritillary

Birds

During site visits, the following bird species were recorded: blackbird (*Turdus merula*), song thrush (*Turdus philomelos*), wren (*Troglodytes troglodytes*), chaffinch (*Fringilla coelebs*), pied wagtail (*Motacilla alba*), wood pigeon (*Columba palumbus*), hooded crow (*Corvus cornix),* jackdaw (*Corvus monedula*), magpie (*Pica pica*) and rook (*Corvus frugilegus*).

Scrub, hedgerows and treelines within the PDS provide suitable nesting habitat for common bird species.

Marsh Fritillary

The PDS does not offer suitable habitat for marsh fritillary. The essential habitat component[14], the foodplant for the species devil's-bit scabious was not recorded and the site does not provide the habitat conditions required by the marsh fritillary, which are wet grasslands or damp meadows with a mosaic of vegetation structure.

3.3 Characteristics of the Proposed Development

3.3.1 Key Elements of Proposed LRD

The proposed LRD will comprise the following principal elements:

- Site clearance works, including the removal of vegetation and topsoil prior to the commencement of construction. This will include the removal of small areas of scrub and the felling of a limited number of trees along sections of the site boundary. Existing hedgerows and treelines will be retained where practicable and incorporated into the final layout.
- The construction of 120 no. two and three storey houses comprising:
    - 53 no. townhouse units (37 no. 3-bed, 16 no. 4-bed)
    - 48 no. semi-detached units (30 no. 3-bed, 18 no. 4-bed)
    - 19 no. mews units (19 no. 2-bed mews houses)
- The construction of 68 no. apartments in 2 no. four storey blocks (36 no. 1-bed, 32 no. 2-bed).
- The construction of a crèche facility (approx. 175.1 m^2) to accommodate 40 children containing two large dedicated classrooms, a sleep room, and rear children's garden.
- The provision of 223 no. car parking spaces distributed throughout the development in association with residential units, visitor parking, and the crèche facility.
- The provision of 141 no. bicycle parking spaces
- Ancillary site works include provision of bin storage facilities, 1 no. ESB substation, landscaping, water services and drainage infrastructure and all associated site development works.
- Vehicular access to the development will be provided via the Killarney Strategic Links Project - Links Road A-C, part of which will be delivered by the proposed development. The design includes short-term and longer-term future accesses reflecting the phased delivery of Links Road A-C. Also included within the design are pedestrian/cycle infrastructure to and from Friary Downs/R876 to the south and internally within the development site and adjoining areas.

The layout of the proposed development with the locations of access points to the site – both initial and future - are shown in **Figure 3-4**, below. For more detailed drawings, see **Appendix 3** for the proposed LRD layout, the Unit Type Plan, and the Temporary Links Project Road layout.

[14] https://www.npws.ie/research-projects/animal-species/invertebrates/marsh-fritillary-euphydryas-aurinia



Figure 3-4: Layout of the proposed Deer Park LRD in Killarney town and locations of access points to the site – both initial and future.

3.3.2 Size, Scale, Area, Land-take

The overall area encompassed within the proposed redline development boundary is approximately 3.8 hectares of which approximately 3.5 hectares is developable area.

The proposed Deer Park LRD will consist of 188 no. residential units comprising a mix of semi-detached, townhouse, mews, and apartments, with ancillary crèche, landscaping and all associated site development works.

There is no spatial overlap with any Natura 2000 site; therefore, there will be no land take from within any Natura 2000 site. There is an indirect hydrological connection between the LRD's operational phase and certain Natura 2000 sites via the proposed connection to Killarney Urban Wastewater Treatment (UWWT) plant which will receive wastewater from the development and discharge treated effluent to the waters of Lough Leane.

3.3.3 Details of physical changes that will take place during the various stages of implementing the proposal

3.3.3.1 Site Set-up and Clearance

Site set-up will include the establishment of temporary construction facilities, including welfare facilities, site offices, and a designated construction compound within the study area. Temporary hoarding and secure fencing will be erected around the site boundary and compound area as required to ensure site security and public safety. Safety signage will be installed at appropriate locations, and traffic and pedestrian management measures will be implemented for the duration of the construction phase.

The study area is currently a greenfield site comprising agricultural grassland. No existing buildings or structures requiring demolition are present within the study area.

Site clearance works will include the removal of vegetation, stripping of topsoil, and general ground preparation within the study area to facilitate construction. Excavated topsoil will be temporarily stored on site for reuse in landscaping works, where appropriate, or removed off site by a licensed contractor.

Following site clearance, earthworks will be undertaken as required to facilitate the construction of building foundations, drainage infrastructure, internal roads, and associated services.

All temporary construction compounds, site offices, welfare facilities, material storage areas, refuelling areas, and associated infrastructure will be located entirely within the red line boundary of the proposed development site. No temporary compounds or construction-related infrastructure will be located outside the proposed development boundary.

Access to the PDS will be provided via the priority junction of Friary Downs and Park Road at the eastern side of the site. No vehicular access to the study area will be provided via the residential estates located to the west of the site. In the long term, access to the LRD will be via the proposed Inner Relief Road (Killarney Strategic Road A-C) linking the N22 with Park Road. However, prior to the completion of the Relief Road, a temporary strategic links road layout will be utilised – see temporary road layout drawing in Appendix 3.

Internal access roads within the development will be constructed to provide access to all residential units, apartment buildings, and associated infrastructure, as shown on the Site Layout Drawings in Appendix 3.

3.3.3.2 Construction Phase

The construction phase will involve excavation and groundworks required to facilitate the construction of building foundations, installation of underground drainage networks, utility infrastructure, and internal roads and services. Excavations will be undertaken to depths appropriate to foundation and infrastructure requirements, anticipated to range between approximately 1.5 m and 3.0 m below existing ground level, with localised deeper excavations for drainage infrastructure where required. Construction works will include the construction of residential units and the ancillary crèche building on engineered foundations, together with the installation of associated infrastructure including foul drainage, surface water drainage, water supply infrastructure, internal access roads, footpaths, public lighting, and utility services.

Ancillary site development works will include landscaping, installation of services infrastructure, and completion of all associated external works within the study area.

Construction Sequence (indicative)

The indicative construction sequence will include the following stages:

- Excavation of soils to foundation level and preparation of formation layers
- Construction of reinforced concrete foundations and substructures
- Construction of building superstructures including load-bearing walls, floors, and roof structures
- Installation of external finishes including roofing and cladding systems
- Installation of mechanical and electrical infrastructure and services
- Internal fit-out works including partition installation, fixtures, and finishes
- Installation and connection of utility services
- Construction of internal roads, footpaths, and external infrastructure

- Landscaping, reinstatement, and completion of external works
- Testing, commissioning, and final completion of the development.

3.3.3.3 Operational Phase

During the operational phase, the proposed development will function as a residential development with an ancillary crèche and associated infrastructure.

Operational activities will include:

- Routine residential occupancy and use
- Routine maintenance of buildings and infrastructure
- Maintenance of landscaped areas, public open space, and drainage infrastructure
- Operation of public lighting and utility services

Surface water drainage infrastructure, including Sustainable Drainage Systems (SuDS), will operate on a passive basis, facilitating infiltration of surface water runoff to ground.

3.3.4 Description of resource requirements for the construction/operation and decommissioning of the proposal (water resources, construction material, human presence etc.)

3.3.4.1 Construction-related Materials (indicative)

Construction of the proposed development will require a range of typical building and civil engineering materials.

These will include, but are not limited to:

- Temporary site hoarding and fencing
- Concrete (in-situ and precast), reinforcement, and formwork
- Masonry, brickwork, and blockwork
- Structural steel and non-structural metalwork
- Timber and wood-based construction materials
- Roofing materials, cladding, and waterproofing systems
- External wall finishes and internal finishes including plaster, render, and tiling
- Drainage infrastructure including foul and surface water pipes, manholes, gullies, and associated fittings
- Water supply infrastructure including watermain pipework and fittings
- Sustainable Drainage Systems (SuDS) infrastructure including attenuation storage systems, bioretention areas, swales, and associated components
- Road construction materials including sub-base aggregates (e.g. Clause 804), base course materials, asphalt surfacing, kerbs, channels, and edgings
- Electrical and telecommunications ducting and associated infrastructure
- Signage and street furniture

- Landscaping materials including topsoil, aggregates, and planting materials
- All materials will be sourced from licensed suppliers and transported to the study area by road.

3.3.4.2 Construction Plant and Machinery Required (indicative)

Construction activities will utilise standard construction plant and equipment typically associated with residential development projects. This may include:

- Hydraulic excavators
- Mini excavators
- Dumper trucks
- Mobile cranes
- Concrete delivery trucks and concrete pumps
- Telescopic handlers
- Compaction equipment including rollers and vibrating plates
- Road construction equipment including asphalt pavers and kerbing machines
- Scissor lifts and elevated work platforms
- Site vehicles including vans and light goods vehicles

All plant and machinery will be operated in accordance with relevant health and safety and environmental regulations.

3.3.4.3 Water Requirement

During the construction phase, water will be required for general construction activities including dust suppression, concrete works, and welfare facilities.

Water supply during both the construction and operational phases will be provided via connection to the existing 250 mm public watermain to the east of the site. Following a pre-connection enquiry to Uisce Éireann, they have advised that the connection is feasible subject to infrastructural upgrades.

3.3.4.4 Human Resource Requirement

Construction activities will require a temporary workforce on site. It is anticipated that the number of construction personnel present on site will vary depending on the stage of construction, with workforce levels estimated to range from approximately 50 personnel during typical construction activities to a peak of approximately 80 personnel per day during intensive construction phases.

During the operational phase, human presence will be typical of a residential development, consisting of residents, visitors, and routine maintenance personnel.

3.3.5 Description of timescale for the various activities that will take place as a result of implementation (including likely start and finish date)

The construction phase of the proposed development is anticipated to be undertaken in a single phase. The total duration of construction, including site preparation, infrastructure installation, building construction, landscaping, and commissioning, is estimated to be approximately 24 to 36 months. This timeframe is typical for a residential development of this scale.

Construction will commence following the granting of planning permission and completion of all statutory requirements, including approval of construction management documentation and service connection agreements with Uisce Éireann.

Construction working hours will be in accordance with the requirements of the planning authority and are anticipated to be as follows:

- Monday to Friday: 07:00 to 19:00
- Saturday: 07:00 to 16:00
- No construction activities will take place on Sundays or public holidays, unless otherwise agreed in writing with the planning authority.

Following completion of construction and commissioning, the development will enter the operational phase, during which the residential units and ancillary infrastructure will be permanently occupied and maintained.

3.3.6 Description of wastes arising and other residues (including quantities) and their disposal

3.3.6.1 Construction phase

Construction activities associated with the proposed development will generate typical construction and demolition (C&D) wastes. As the study area is currently a greenfield site, no demolition waste from existing buildings or structures is anticipated.

General non-hazardous construction wastes may include:

- Soil and subsoil arising from excavation and site levelling works (estimated volume approximately 5,764 m³). Excavated material will be reused on site where suitable, including backfilling and site level adjustments. Additional imported fill material (approx. 24,243 m³ total fill requirement) will be required to achieve proposed finished levels. Imported fill will be sourced from licensed suppliers and will be free from contamination and invasive plant material.
- Surplus concrete, masonry, brick, and blockwork materials
- Timber, wood products, and formwork materials
- Metals including reinforcement steel and pipework offcuts
- Plastics including packaging materials and pipework offcuts
- Plasterboard, insulation materials, and internal finishing materials
- Paper, cardboard, and packaging waste
- Green waste arising from vegetation clearance
- General mixed non-hazardous construction waste

Excavated material suitable for reuse may be reused within the study area for landscaping and reinstatement works where appropriate. Surplus excavated material not suitable for reuse will be removed off site by licensed waste contractors to authorised recovery or disposal facilities. Waste materials will be segregated at source and removed from the study area by licensed waste contractors to authorised waste recovery or disposal facilities.

No demolition waste is anticipated as there are no existing buildings or structures within the study area.

Hazardous Materials and Hazardous Waste

Potentially hazardous wastes arising during construction may include:

- Fuels, oils, and lubricants associated with construction plant
- Paints, solvents, adhesives, and sealants
- Waste electrical components
- Contaminated absorbent materials and spill response materials
- Invasive plant species material or vector materials

All hazardous materials will be stored in designated secure areas in appropriate containers. Fuel storage areas will incorporate appropriate secondary containment measures, such as bunded storage or double-skinned tanks, to prevent accidental release. Emergency procedures and spill response measures will be implemented, including the provision of spill kits and appropriate training for site personnel.

Surface Water and Drainage During Construction

Temporary drainage measures will be implemented during construction to manage surface water runoff within the study area until the permanent surface water drainage infrastructure becomes operational. There are no watercourses traversing the proposed development site and there are none within the immediate vicinity.

Temporary welfare facilities will be provided during construction and will be serviced by licensed contractors.

Waste Storage, Handling, and Disposal

All waste materials will be segregated at source where practicable and stored in designated areas within the PDS.

Waste materials will be collected by licensed waste contractors and transported off site to authorised waste recovery or disposal facilities in accordance with applicable waste management legislation.

Waste management during construction will be undertaken in accordance with a Construction and Demolition Waste Management Plan prepared for the proposed development.

3.3.6.2 Operational Phase

During the operational phase, waste generated within the proposed development will be typical of residential and ancillary uses. This will include:

- Dry mixed recyclables such as paper, cardboard, plastic, and metal packaging
- Organic waste including food waste and green waste
- Glass waste
- General non-recyclable household waste
- Garden waste arising from routine landscaping maintenance
- Minor quantities of other household waste such as batteries and small electrical items.

All waste generated during the operational phase will be managed in accordance with applicable waste management legislation and collected by licensed waste contractors for transport to authorised waste recovery or disposal facilities.

Once operational, the proposed development will connect to the existing public foul gravity sewer network, discharging to the existing 225 mm diameter foul sewer located along to the south of the PDS along Friary Downs Road. Following a pre-connection enquiry to Uisce Éireann, this wastewater connection is 'feasible subject to upgrades'. Wastewater will ultimately discharge to Killarney UWWT plant (D-0037).

3.3.6.3 Surface Water and Sustainable Urban Drainage Principles

The development has been designed in full accordance with Sustainable Urban Design Principles. Surface water (stormwater) run-off from the proposed development will be routed through a series of onsite Sustainable Urban Drainage System (SUDS) elements, which have been incorporated into the project at design stage to reduce the run-off rate of any stormwater discharge. SUDS elements are widely used as nature-based solutions to 'collect, slow, treat and convey water'[15] to alleviate detrimental effects of urban stormwater drainage on receiving watercourses. Chapter 13 of Volume 1 of the Kerry County Development Plan (2022-2028) outlines the systematic implementation of best practice stormwater management systems, including SUDS, which are to be employed as standard for all new developments. Objective 13-24 of the Plan confirms the Council's support for 'the incorporation of SUDS in all public and private development in urban areas'[16].

Surface water run-off from the impermeable surfaces of roofs and hardstanding areas of the LRD will be gathered and managed through a SUDS network comprising a combination of engineered attenuation and infiltration measures and nature-based drainage features including attenuation tanks and petrol interceptors, rain gardens, permeable paving and swales. The system is designed to operate as a treatment train, incorporating source control, conveyance, attenuation, and infiltration stages.

This new sewer system has been designed taking cognisance of the Greater Dublin Regional Code of Practice for Drainage Works (GDSDS)[17] and the CIRIA SuDS manual (Woods Ballard *et al.,* 2015).

3.3.6.3.1 Surface Water Attenuation

Attenuation storage tanks are used to create a below-ground void space for the temporary storage of surface water before infiltration or discharge at limited rates to public sewers or watercourses. With regards the proposed Deer Park LRD, surface water from the roofs and hardstanding areas will be gathered via rainwater outlets, downpipes, storm drains, and ground surface gullies and conveyed to a series of central drainage channels that then direct the stormwater to one of three onsite cellular attenuation tanks located under the public open spaces of the proposed development – see **Figure 3-5**, below, for public (active) space locations. The surface water stored in these tanks will then infiltrate naturally to groundwater through the soil beneath. Site investigation works carried out in February 2026, confirmed that subsoil at the PDS is composed of sandy gravels that will allow full infiltration of storm water to ground.

[15] Presentation Title Slide Accessed: 15th July 2026.
[16] Kerry CoCo Devlopment Plans (469474)_Volume 1_R10.indd Accessed: 17th July 2026.
[17] https://www.dublincity.ie/planning-and-land-use/planning-application-rules-and-exemptions/greater-dublin-regional-code-practice-drainage-works Accessed: 17th August 2026.



Figure 3-5: Proposed open spaces of the LRD including three public open spaces (active open space) totalling approximately 0.392 hectares (10.6% of the overall gross area of the site) [adapted from Design Rationale Report prepared by Cunnane Stratton Reynolds Land Planning & Design].

Petrol interceptors will be provided on the inlet to the proposed attenuation storage tanks to capture all possible hydrocarbon contaminants within the collected surface water and improve the quality of water leaving the tanks before infiltration. Additionally, catch pits installed at the manholes located immediately upstream and downstream of the tanks will prevent build-up of silt within them.

3.3.6.3.2 Rain Gardens and Bioretention

Bioretention is the 'land-based practice that uses the chemical, biological and physical properties of plants, microbes and soils to control both the quality of water and the quantity of water within a landscape (Coffman & Winogradoff, 2002). Many SUDS elements rely on the mechanism of bioretention for the 'infiltration, filtration, storage and uptake by vegetation' (Dunnett & Clay, 2007) of surface water run-off. Rain gardens utilise this bioretention model to replace paved surfaces or managed/disturbed areas with vegetation that can more effectively capture and absorb excess surface water before filtering it through the soil. The retention, detention, and evapotranspiration of rainfall that rain gardens facilitate, decreases peak discharge rates at source and reduces run-off volumes to downstream drainage infrastructure.

The rain garden system will consist of a vegetation layer over a multi-layered build-up that includes a growing medium, drainage layers and waterproof membrane. This system will provide temporary surface and sub-surface storage and will contribute to improved water quality through natural filtration and pollutant interception – see

Figure 3-6, below. Within the Deer Park LRD, proposed rain gardens will be installed at the central and southern public open spaces and at eastern side near the crèche and apartment blocks.

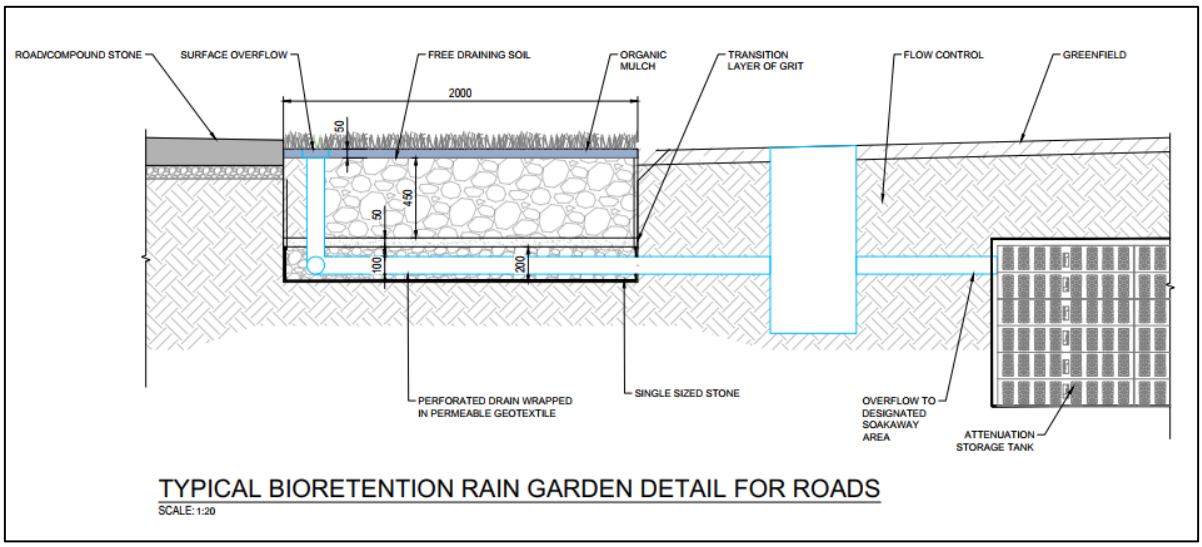


Figure 3-6: Indicative illustration of bioretention rain garden.

3.3.6.3.3 Dry Swales and Permeable Paving

Dry swales are depressed grass channels that work by capturing sheet flow from a road's surface which then slows down the entry of surface water into the surface water drainage system. As a management measure for rainwater run-off within the proposed LRD, dry swales will be installed around the northern and central public spaces of the proposed development (see Figure 3-5, above, for public (active) space locations).

The proposed dry swales are flat-bottomed shallow channels with gently sloping sides that are designed to guide and store surface water into the channels – refer to Figure 3-7, below. Stone check dams will be placed along the length of the swales at ten to twenty metre intervals to assist in reducing flow velocities and to act as a screening mechanism to remove any pollutant load in the runoff. Filter drains will be installed beneath the swales to maximise infiltration capacity and increase attenuation volume capacity.

Additionally, Grasscrete[18] will be used at the central and southern public open spaces to further reduce surface water run-off and act as a highly effective armour layer for surface water movement and storage.

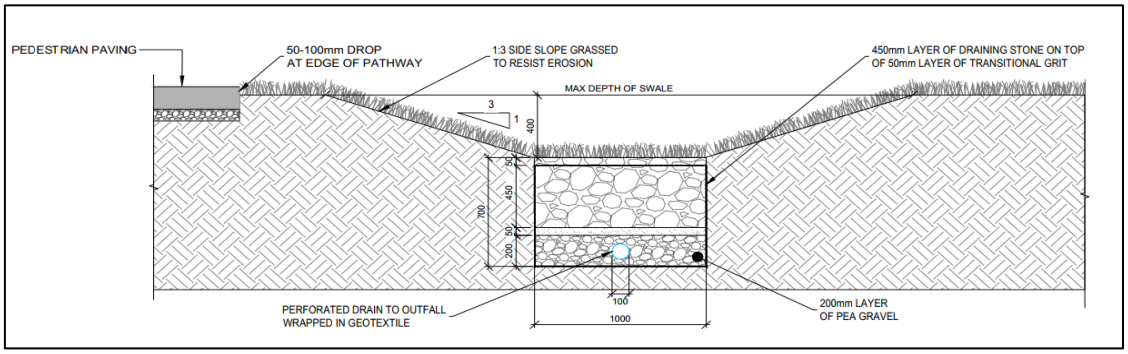


Figure 3-7: Indicative illustration of a typical dry swale.

[18] GrasscreteBrochure.pdf Accessed: 14th August 2026.

3.3.7 Identification of wastes arising and other residues (including quantities) that may be of particular concern in the context of the Natura 2000 network

The following substances and residues may arise during the construction and operational phases of the proposed development and are identified as having potential to affect the receiving environment if not appropriately managed:

- Fuels, oils, and lubricants associated with construction plant and machinery
- Chemical substances and residues including paints, solvents, sealants, and adhesives
- Waste concrete, cementitious materials, and washout residues arising from construction activities
- Effluent from temporary welfare facilities during construction
- Surface water runoff from construction areas prior to completion of permanent drainage infrastructure
- Invasive plant species material or vector materials

These materials will be stored, handled, and disposed of in accordance with applicable environmental protection legislation and best practice construction management procedures. Appropriate measures will be implemented during construction to ensure that these materials do not pose a risk to the receiving environment.

During the operational phase, wastewater generated by the proposed LRD will discharge via the public foul sewer network to Killarney UWWT plant for treatment prior to discharge in accordance with Uisce Éireann licensing and regulatory requirements. Surface water generated during the operational phase will be managed via a Sustainable Drainage System (SuDS) network designed to facilitate infiltration to ground – see Section 3.3.6.3, above.

The Project Manager/Contractor will ensure best practice guidance on correct invasive and non-native species control procedures are adhered to. Work will be reviewed by the Project Manager and/or a NPWS Authorised Officer at regular intervals to ensure that correct procedures are followed.

3.3.8 Description of any additional services required to implement the project or plan, their location and means of construction

A temporary site compound will be established within the study area by the appointed contractor. The compound will include site offices, welfare facilities, and designated areas for storage of plant, equipment, and materials.

Temporary and permanent access to the PDS will be provided via the existing road network serving the Deerpark and Ardshanavooly area, including access via Friary Downs Road and Deerpark Road, as shown on the Site Layout Drawings submitted as part of the planning application.

A Construction Traffic Management Plan will be implemented to manage construction traffic and ensure safe access to and from the PDS for the duration of the construction phase.

All services infrastructure required to facilitate the proposed development, including water supply, foul drainage, surface water drainage, electricity, and telecommunications infrastructure, will be installed underground within the PDS in accordance with the project design drawings.

3.4 Identification of Other Projects or Plans or Activities

3.4.1 Introduction

A cumulative impact arises from incremental changes caused by other past, present or reasonably foreseeable actions, together with the project. A review was undertaken of relevant existing and proposed projects, activities and plans that could act in combination with either the construction or operational phases of the proposed development to determine whether any potential significant cumulative effects may arise. The results are presented in the following subsections, and in-combination impacts will be considered in Section 3.7.5, below.

3.4.2 Plans

Plans considered include:

- Kerry County Development Plan 2022-2028[19].
- Kerry County Council Local Authority Climate Action Plan 2024-2029[20].
- Killarney Municipal District Local Area Plan 2023-2029[21].

3.4.3 Permitted and Proposed Developments

A search of Kerry County Council's online planning enquiry system was undertaken on 24th September 2026 to identify granted and/or ongoing planning applications within the vicinity of the PDS. The review focused on developments permitted within the last five years, together with any larger-scale proposals that could potentially contribute to cumulative impacts on habitats, species, or ecological processes. Relevant planning applications identified during this review are summarised in Table 3-4.

Table 3-4. List of granted and on-going planning applications within the vicinity of the PDS.

Application No.	Applicant	Location	Proposed Development	Status
2660718	Wrightwood Development Ltd	Ardshanavooly, Park Road, V93V08F	LRD. Construction of 123 no. dwellings, 139 no. surface car parking spaces, 272 no. bicycle parking spaces and all associated site works.	Decision made to grant: 23/09/26
2560467	Michael Hegarty	Countess Shopping Centre, Park Road, Killarney	Permission for (A) change of use of existing singular retail unit to 2 no. units. Unit 1 a Café/Restaurant without takeaway facilities and unit 2 a Restaurant with ancillary takeaway facilities, (B) carry out alterations to existing front façade at Countess Shopping Centre.	Granted: 28/07/25
KCC: 2460523 ACP: 321077	Tim Lyne	Park Road, Killarney	Demolish existing dwelling house/outbuildings; construct two new detached dwellings, and all associated site works.	ACP Grant (after appeal): 02/09/25
2360106	Tim Lyne	Site A, Deerpark Road, Killarney	Planning permission to construct two-storey building for office use and financial/professional services, and all ancillary site works at Site A.	Granted: 27/08/24

[19] County Development Plan | (c) Kerry County Council [Accessed 09/02/2026]
[20] www.kerrycoco.ie/kerry-county-council-local-authority-climate-action-plan-2024-2029/ [Accessed 09/02/2026]
[21] https://consult.kerrycoco.ie/ga/system/files/materials/2001/Killarney%20MD%20Issues%20Paper%20-%2008-02- 23%20FINAL.pdf [Accessed 09/02/2026]

Application No.	Applicant	Location	Proposed Development	Status
2460491	The Platform ICAV	Deerpark Retail Park	Change from retail/offices to medical/wellness centre; associated elevational changes.	Granted: 15/10/24
24320	Wrightwood Development Ltd.	Ardshanavooly, Park Road	Change carpark, bin storage to 2 no. one-bedroom apartment & 1 no. one-bedroom accessible apartment; installation of pitched roof between apartments 5 and 6 relocation of window on 1st floor to side elevation of apartment 11; previously granted under 23/991.	Granted: 30/10/24
23991	Wrightwood Development Ltd.	Ardshanavooly, Park Road	(a) construct creche (b) construct 14 no. 1-bedroom and 2 no. 2-bedroom apartments, (c) new access road, parking and associated works within revised site boundaries.	Granted: 15/12/23
KCC: 22454 ABP: 314150	Aldi Stores (Ireland) Limited	Ardshanavooly, Killarney	Retention of amendment to opening hours to: 0900 to 2200 Monday to Friday and 0900 to 2100 on Saturdays, Sundays and Public Holidays and to no restrictions on delivery hours.	ABP Grant (after appeal): 28/11/23

3.4.4 EPA Licensed/Registered Facilities

There are no IPPC, IPC or IEL[22] facilities or urban wastewater treatment (UWWT) plants within the immediate vicinity of the proposed development site. The nearest EPA facility with an active licence is Killarney UWWT plant (Licence Number: D0037-01) located off Ross Road approximately 1.6 km west of the PDS. Refer to **Table 3-5**, below, for details of other licenced facilities within the vicinity of the PDS.

Table 3-5. EPA-registered facilities with active licences located within the environs of the PDS

Name	Active Licence Type	Active Licence No.	Location Relative to PDS
Killarney UWWT	Urban Waste Water	D0037-01	Approximately 1.6 km west
Liebherr Container Cranes Limited	IPC	P0146-02	Approximately 3.8 km north-west
Killarney Waste Disposal	Waste	W0217-02	Approximately 4 km north
Coolcaslagh Transfer Station	Waste	W0072-01	Approximately 7 km north-east

3.4.5 Existing Land-use and Ongoing Activities

Existing land-use within the PDS is agricultural grassland used for silage production. There is a mix of land uses extending away from the development site, including residential, agriculture and education. Given the location of the proposed residential development, it is considered that the activities synonymous with a major town comprise the main activities with which the proposal could interact synergistically to potentially create significant in-combination effects.

In addition to the activities typical of a large town, Killarney's status as a major tourism destination affects the range of services provided and the levels of human activity in the town. There is also some, albeit limited, potential that agriculture, which dominates the undeveloped rural area adjacent to Killarney could interact with the proposed residential development.

[22] Integrated Pollution Control (IPC) Licence (formerly IPPC Licence), and Industrial Emissions Licence (IEL)

3.5 Identification of Potential Impacts and Effects

Potential likely direct, indirect or secondary ecological impacts arising because of the proposed development (either alone or in combination with other plans or projects) are identified in this section.

Table 3-6. Description of elements of the project likely to give rise to potential ecological impacts.

Construction Phase
• Increased human activity which will vary as the different work elements described in **Section 3.3** are undertaken. • Use of plant machinery. • Construction activities described in **Section 3.3**. • Generation of general construction and C&D waste. • Increased noise and air emissions associated with construction activity. • Use of fuels/oils/lubricants, concrete and other such substances.
Operation phase
• Domestic and other waste generated in the normal course of events by any entity designed to accommodate the likely number of residents. • Blackwater and greywater from the accommodation. • Surface runoff (stormwater, rainwater) from buildings and surrounds. • Street and residential lighting. • Traffic (car headlights).

Table 3-7. Direct, indirect or secondary ecological impacts of construction and operational phases (either alone or in combination with other plans or projects) which have the potential for having significant effects.

Describe any likely direct, indirect or secondary ecological impacts of the project (either alone or in combination with other plans or projects) by virtue of: • *Size and scale;* • *Land-take;* • *Distance from Natura 2000 Site or key features of the Site;* • *Resource requirements;* • *Emissions;* • *Excavation requirements;* • *Transportation requirements;* • *Duration of construction, operation etc.; and Other.*	There is no spatial overlap between the PDS and any Natura 2000 site. The closest designated site - Killarney National Park, MacGillycuddy's Reeks and Caragh River Catchment SAC - is located approx. 0.8 km southwest of the PDS. There are no watercourses draining the PDS; therefore, there is no direct hydrological connection between the proposal site and any Natura 2000 site. Once operational, the development will discharge wastewater to the public foul sewer resulting in additional loading of Killarney UWWT plant. The plant discharges treated water into Lough Leane, which overlaps with Killarney National Park, MacGillycuddy's Reeks and Caragh River Catchment SAC and Killarney National Park SPA. Any operational issues leading to discharge of untreated water into the lake is a potential ecological impact. Therefore, there is a tenuous indirect hydrological link with these Natura 2000 sites. Construction Phase ▪ There will be no direct loss/alteration of habitats within any European site. ▪ In-direct species disturbance/displacement impacts may potentially occur through potential indirect water quality/habitat impacts and via increased lighting at the PDS. Operational Phase ▪ No direct habitat impacts are envisaged during operational phase. ▪ There is, albeit limited, risk of indirect aquatic habitat and/or water quality impacts due to discharge of wastewater to the public system. ▪ In-direct species disturbance/displacement impacts may potentially occur through potential indirect water quality/habitat impacts, as above. ▪ In-direct disturbance of lesser horseshoe bat may occur via increased levels of artificial lighting at the LRD.

3.6 Identification of Potentially Effected Natura 2000 Sites

An evaluation based on the S-P-R model to determine which Natura 2000 sites are the plausible ecological receptors for potential impacts of the proposed LRD was conducted. This evaluation considered the scope, scale, nature and size of the project, its location relative to Natura 2000 sites, and the degree of connectedness that exists between the project and the Natura 2000 sites and their respective features of conservation interest as potential ecological receptors.

The outcome of this was that certain Natura 2000 sites were determined to be outside the likely ZOI of the proposal due to the absence of plausible impact pathways, whether ecological and/or structural, and thus it was objectively concluded that the proposal does not include any element that has the potential to significantly affect the conservation objectives for any Natura 2000 sites outside of those identified in Section 3.6.2.

Identifying the Natura 2000 sites that may be affected takes into consideration all aspects of the project that could have potential effects on any Natura 2000 sites located within a likely ZOI of the proposed LRD. This considers all the designating features (species, habitat types) that are significantly present on the sites and their conservation objectives.

The Natura 2000 sites within the likely ZOI of the proposal, along with their respective features of conservation interest, distance from the PDS and the rationale for inclusion for further assessment, are outlined in Table 3-8, below. The locations of these designated sites relative to the PDS are shown in Figure 3-8, below.

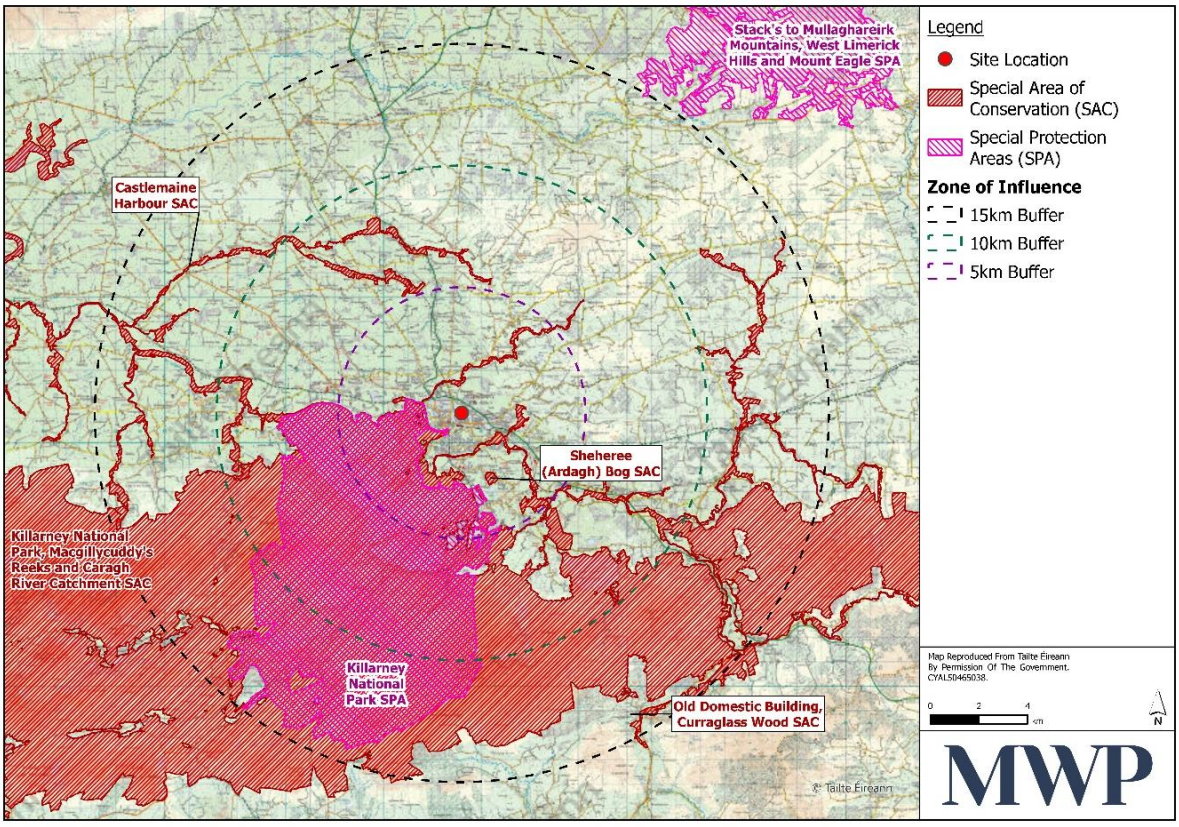


Figure 3-8: Locations of Natura 2000 sites in relation to the PDS.

Table 3-8. Natura 2000 sites located within the potential ZOI, details of their qualifying interests (QIs), approximate distance from development boundary and, using the SPR framework, identification of which sites are located within the actual ZOI.

Designated site & code	Qualifying features of conservation interest	Approximate distance from PDS	Located within the Actual ZOI?
Killarney National Park, MacGillycuddy's Reeks and Caragh River Catchment SAC (000365)	▪ Oligotrophic waters containing very few minerals of sandy plains (*Littorelletalia uniflorae*) [3110] ▪ Oligotrophic to mesotrophic standing waters with vegetation of the *Littorelletea uniflorae* and/or *Isoeto-Nanojuncetea* [3130] ▪ Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation [3260] ▪ Northern Atlantic wet heaths with *Erica tetralix* [4010] ▪ European dry heaths [4030] ▪ Alpine and Boreal heaths [4060] ▪ *Juniperus communis* formation heaths or calcareous grasslands [5130] ▪ Calaminarian grasslands of the *Violetalia calaminariae* [6130] ▪ Molinia meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*) [6410] ▪ Blanket bogs (* if active bog) [7130] ▪ Depressions on peat substrates of the *Rhynchosporion* [7150] ▪ Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles [91A0] ▪ Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*) [91E0]* ▪ *Taxus baccata* woods of the British Isles [91J0]* ▪ Sea lamprey (*Petromyzon marinus*) [1095] ▪ Brook lamprey (*Lampetra planeri*) [1096] ▪ River lamprey (*Lampetra fluviatilis*) [1099] ▪ Salmon (*Salmo salar*) [1106] ▪ Killarney shad (*Alosa fallax killarnensis*) [5046] ▪ Freshwater pearl mussel (*Margaritifera margaritifera*) [1029] ▪ Lesser horseshoe bat (*Rhinolophus hipposideros*) [1303] ▪ Otter (*Lutra lutra*) [1355] ▪ Kerry slug (*Geomalacus maculosus*) [1024] ▪ Marsh fritillary (*Euphydryas aurinia*) [1065] ▪ Killarney fern (*Trichomanes speciosum*) [1421] ▪ Slender naiad (*Najas flexilis*) [1833]	0.8 km to the southwest	**Yes** - indirect, tenuous hydrological link with proposed development site via the public foul sewer network and the discharge of treated effluent to Lough Leane. As a precautionary measure, Castlemaine Harbour SAC is also deemed to lie within the ZOI since the SAC's upper reaches are less than one kilometre downstream from Lough Leane's outflow (Laune River). These three Natura 2000 sites are located within the actual ZOI of the proposed development and will be further assessed.
Killarney National Park SPA (004038)	▪ Merlin (*Falco columbarius*) [A098] ▪ Greenland white-fronted goose (*Anser albifrons flavirostris*) [A395]	0.85 km to the southwest	

Designated site & code	Qualifying features of conservation interest	Approximate distance from PDS	Located within the Actual ZOI?
Castlemaine Harbour SAC (000343)	▪ Estuaries [1130] ▪ Mudflats and sandflats not covered by seawater at low tide [1140] ▪ Annual vegetation of drift lines [1210] ▪ Perennial vegetation of stony banks [1220] ▪ Vegetated sea cliffs of the Atlantic and Baltic coasts [1230] ▪ *Salicornia* and other annuals colonising mud and sand [1310] ▪ Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1330] ▪ Mediterranean salt meadows (*Juncetalia maritimi*) [1410] ▪ Embryonic shifting dunes [2110] ▪ Shifting dunes along shoreline with *Ammophila arenaria* (white dunes) [2120] ▪ Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130] ▪ Dunes with *Salix repens* ssp. *argentea* (*Salicion arenariae*) [2170] ▪ Humid dune slacks [2190] ▪ Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*) [91E0] ▪ Sea Lamprey (*Petromyzon marinus*) [1095] ▪ River Lamprey (*Lampetra fluviatilis*) [1099] ▪ Atlantic Salmon (*Salmo salar*) [1106] ▪ Otter (*Lutra lutra*) [1355] ▪ Petalwort (*Petalophyllum ralfsii*) [1395]	5.3 km to the northwest	
Sheheree (Ardagh) Bog SAC (000382)	▪ Active raised bogs [7110]* ▪ Degraded raised bogs still capable of natural regeneration [7120]	2.5 km to the southeast	**No** plausible impact pathways exist to link PDS to either SAC. Both terrestrial habitats of Sheheree (Ardagh) Bog SAC situated up-gradient of PDS with no viable hydrological or ecological link to PDS. At 14 km away, the PDS is considerably outside the lesser horseshoe bat's preferred foraging/ commuting zone of 2.5 km from the roost (NPWS & VWT, 2022) at Curraglass Wood SAC - there is no potential for significant effects to the lesser horseshoe bat population of SAC. Both SACs are not located within the ZOI of the proposed development.
Old Domestic Building, Curraglass Wood SAC (002041)	▪ Lesser horseshoe bat (*Rhinolophus hipposideros*) [1303]	14 km to the southeast	

Asterisk (*) denotes a priority habitat considered to be in danger of disappearance.

3.6.1 Natura 2000 Sites Located Outside the ZOI

Bearing in mind the information set out above in Table 3-8, the following two Natura 2000 sites are considered to lie outside the ZOI of the proposed development described in Section 3.3, above, and will, therefore, not be discussed further in this screening for AA report:

- Sheheree (Ardagh) Bog SAC (000382)
- Old Domestic Building, Curraglass Wood SAC (002041)

3.6.2 Natura 2000 Sites Located Inside the ZOI

Bearing in mind the information set out above in Table 3-8, the following three Natura 2000 sites are considered to be located within the ZOI of the proposed development described in Section 3.3, above, and will, therefore, be discussed further in this screening for AA report:

- Killarney National Park, MacGillycuddy's Reeks and Caragh River Catchment SAC (000365)
- Killarney National Park SPA (004038)
- Castlemaine Harbour SAC (000343)

3.6.3 Conservation Objectives

According to the Habitats Directive, the *conservation status of a natural habitat* will be taken as 'favourable' within its biogeographic range when:

- its natural range and areas it covers within that range are stable or increasing, and
- the specific structure and functions which are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future, and
- the conservation status of its typical species is favourable as defined below.

According to the Habitats Directive, the *conservation status of a species* means the sum of the influences acting on the species concerned that may affect the long-term distribution and abundance of its populations. The conservation status will be taken as 'favourable' within its biogeographical range when:

- population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats, and
- the natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future, and
- there is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.

Conservation Objectives Series documents are available for all three Natura 2000 sites located within the ZOI:

- Killarney National Park, MacGillycuddy's Reeks and Caragh River Catchment SAC 000365. Published 23rd October 2017.
- Killarney National Park SPA 004038. Published 6th August 2024.
- Castlemaine Harbour SAC 000343. Published 24th July 2026.

The above documents were downloaded on 26th September 2026. No management plan is available for any of these sites. All conservation objectives, together with other Natura 2000 site information, are available on http://www.npws.ie/protectedsites/.

3.7 Assessment of Significance of Potential Impacts

This section considers the potential ecological impacts identified in the previous section and determines whether the proposed LRD is likely to have significant effects on the three Natura 2000 sites listed in **Section 3.6.2**.

The likelihood of significant effects is determined based on the following indicators:

- Water quality
- Habitat loss, alteration, or degradation
- Disturbance and/or displacement of species
- Habitat or species fragmentation.

The likelihood of significant in-combination effects is assessed in **Section 3.7.5,** below.

3.7.1 Water Quality

There are no watercourses at the PDS or within at least 1.5 kilometres of it, therefore, there will be no direct impacts on water quality during either the construction or operational phases of the proposed development.

The development will allow treated stormwater to infiltrate naturally through the soil beneath the proposed new stormwater system and will discharge sewage and wastewater to Killarney UWWT plant via the existing public foul sewer network during operation. This plant has a primary discharge point to Folies Stream which drains to Lough Leane approximately one kilometre downstream from the plant's emission point.

Lough Leane overlaps with both the Killarney National Park, MacGillycuddy's Reeks and Caragh River Catchment SAC and the Killarney National Park SPA while the inner reaches of Castlemaine Harbour SAC extend inland to less than one kilometre downstream of Lough Leane – refer to **Figure 3-9**, below. These three designated sites are, therefore, indirectly linked to the proposed development via the existing public foul sewer and based on the precautionary principle, have the potential to be impacted because of the proposed Deer Park LRD.

3.7.1.1 Construction Phase

Construction in general can pose a risk to the aquatic environment via several mechanisms. Excavation works, ground movement and disturbance, and the storage and stockpiling of materials can result in sediment erosion and run-off which can lead to siltation of the aquatic environment. The use of plant and machinery poses a risk of accidental ingress of fuel, oils, and lubricants to the aquatic environment, as does on-site storage of these and other such substances. The use of concrete and other cementitious materials, the generation of washout as well as the use of chemicals also pose a risk to water quality. In general, such materials can enter the aquatic environment via direct discharges to drainage features, overland flow, and/or leaching to groundwater in the event of a spillage/leakage.

There are no rivers/streams at the proposed development site (refer to **Figure 3-1**, above), and all construction works will be confined to the area within the proposed development's redline boundary. Surface water run-off generated during the construction phase has the potential to indirectly effect water quality of nearby European sites via ingress to the public stormwater network. However, run-off will be controlled at source by the appointed Contractor while construction industry best practice CIRIA[23] guidelines will be fully implemented. As per standard

[23] CIRIA - Construction Industry Research and Information Association

procedures, a temporary drainage system will be installed prior to commencement of works to manage and collect any surface water run-off during construction.

In relation to potential indirect water quality impacts that may arise via the use of temporary welfare facilities and the associated generation of sewage/wastewater, these facilities will be maintained regularly and accordingly by an approved and permitted contractor who will remove effluent to a licenced facility for disposal. Consequently, this aspect of the proposal is not considered to have the potential for significant indirect water quality effects on the three Natura 2000 sites listed in Section 3.6.2, above.

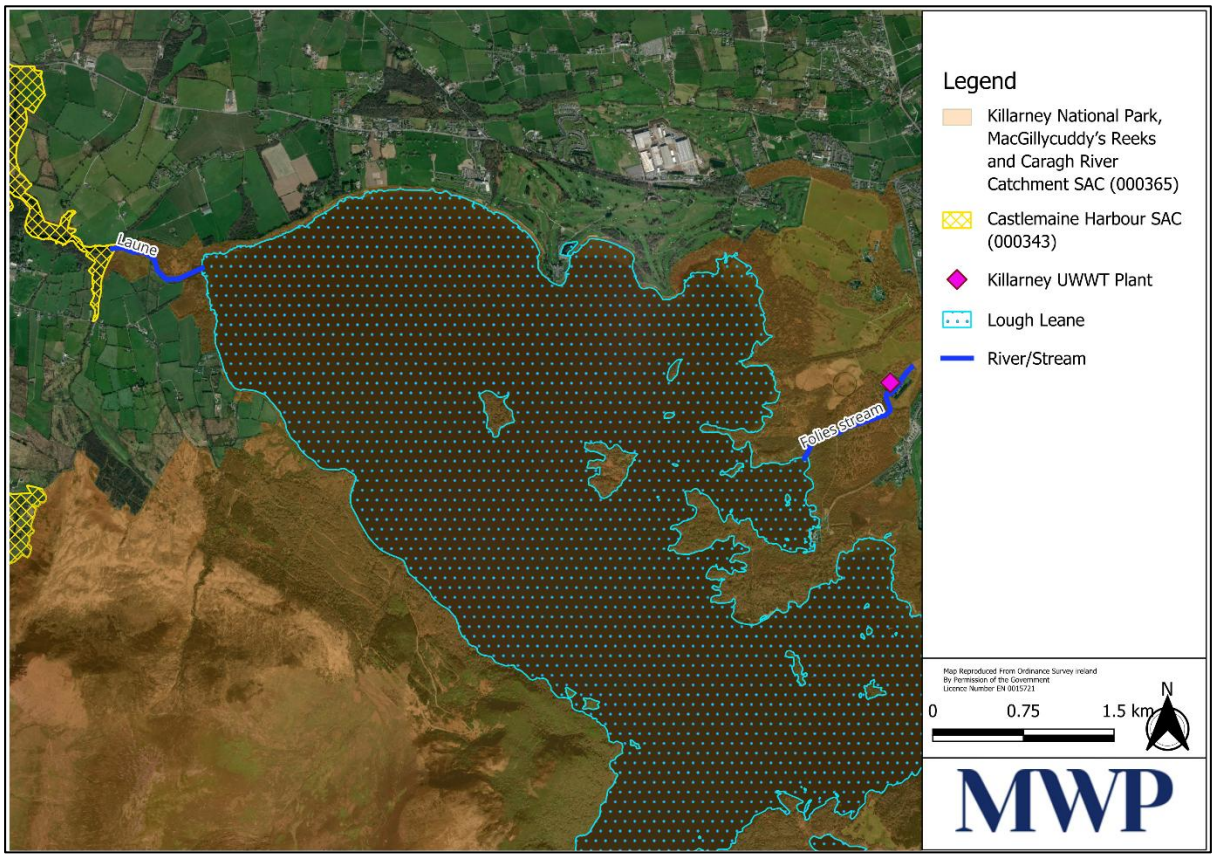


Figure 3-9: Hydrological connectivity between Killarney UWWT Plant and the two SACs within the ZOI (Killarney National Park SPA also overlaps with Lough Leane).

3.7.1.2 Operational Phase

During the operational phase of the proposed development, the most likely sources of indirect water quality/habitat alteration impacts which could potentially result in secondary effects on receiving aquatic habitats and/or species are those arising from surface water run-off and/or wastewater discharge.

3.7.1.2.1 Surface Water Run-off

The levels of surface water run-off generated during the operational phase of the proposed development are likely to be higher than current levels due to the construction of additional impermeable hard surfaces and the clearance of on-site vegetation. Therefore, there is a theoretical risk to the water quality in receiving drains/watercourses via storm run-off from built areas which has the potential to result in ingress of fuel and oil residues, sediment/silt to the aquatic environment. This risk is heightened during periods of heavy rainfall. Consequently, both the rate and quality of storm water run-off from the operational development are important factors with regards the quality of water within receiving drains/watercourses which could lead to impacts on aquatic species/habitats.

However, a new proposed stormwater system for the operational phase of the proposed development has been considered in detail and has incorporated several widely used SUDS elements into the design – see Section 3.3.6.3,

above, for details. Measures include the use of attenuation tanks, petrol interceptors, rain gardens and dry swales to intercept, detain and infiltrate run-off to provide greater at-source control and reduce the run-off rate of any stormwater discharge, allowing surface water management to form part of the overall green infrastructure network. Each of these SUDS mechanisms provides various stormwater treatment, storage and/or attenuation functions by which surface water run-off from the proposed development will be managed prior to infiltrating naturally through the soil.

3.7.1.2.2 Wastewater

Once operational, the proposed development will connect to the existing public foul gravity sewer network, discharging to the existing 225 mm diameter foul sewer located along to the south of the PDS along Friary Downs Road. Wastewater will ultimately discharge to Killarney UWWT plant (D-0037). This UWWT plant discharges treated effluent (following tertiary treatment) firstly into Folies Stream and then into the lake waters of Lough Leane (see **Figure 3-9**, above).

A review of the latest available Annual Environmental Report (AER) 2024[24] for Killarney UWWT plant available on the Licence and Enforcement Access Portal (LEAP)[25], reported that discharge from the UWWT plant 'is compliant with the Emmission Limit Values (ELVs) set in the Wastewater Discharge Licence' and that the discharge from the plant 'does not have an observable negative impact on the Water Framework Directive status'. Furthermore, according to the AER, treatment capacity of the plant will not be exceeded in at least the next three years, while in response to an enquiry, Uisce Éireann advised on 27th June 2025 that connection to the existing wastewater network sewer is 'Feasible subject to upgrades'.

Finally, information publicly available on the EPA website[26] specifies that Killarney UWWT plant has a population equivalent (p.e.) of 25,214 and a plant design capacity of 54,000, thereby, the plant has sufficient capacity to process the wastewater generated by the proposed development during its operational phase.

3.7.1.3 Water Quality – Conclusion

Bearing in mind the information set out in the preceding **Sections 3.7.1.1** and **3.7.1.2**, and due to the location of the proposed development within an existing suburban residential landscape on the edge of Killarney town, the absence of any direct impact pathways or hydrological connections between the proposal site and any Natura 2000 site, the proposal to incorporate a new surface water drainage system servicing the development, and the capacity for wastewater treatment at Killarney UWWT plant, significant water quality impacts within Natura 2000 sites are not likely. In conclusion, significant direct or indirect water quality impacts on Killarney National Park, MacGillycuddy's Reeks and Caragh River Catchment SAC, Killarney National Park SPA or Castlemaine Harbour SAC because of either the construction or operational phases of the proposed Deer Park LRD are not considered likely.

3.7.2 Habitat Loss/Alteration

The proposed development site does not overlap with any Natura 2000 site and, consequently, there will be no direct loss/alteration of the qualifying habitats of conservation interests for which Killarney National Park, MacGillycuddy's Reeks and Caragh River Catchment SAC or Castlemaine Harbour SAC are designated.

As set out in **Table 3-8**, above, there is a tenuous hydrological link between the proposed development and the two SACs sites listed in **Section 3.6.2**, above, of which Killarney National Park, MacGillycuddy's Reeks and Caragh River Catchment SAC is designated for a variety of freshwater habitats while Castlemaine Harbour SAC is designated for coastal and estuarine habitats. However as concluded in **Section 3.7.1**, above, there is no potential

[24] https://leap.epa.ie/docs/0eb1c7d6-33c6-43b8-96a5-69ad42fec5c8.pdf
[25] https://leap.epa.ie/ Accessed 16th September 2026
[26] https://gis.epa.ie/EPAMaps/Water Accessed: 23rd September 2026

for significant indirect impacts to the water quality of either SAC arising from the proposed development and there is, therefore, also no potential for significant indirect alteration of aquatic habitats to occur.

While not designated for any specific habitats, Killarney National Park SPA is encompassed within the Killarney National Park, MacGillycuddy's Reeks and Caragh River Catchment SAC site boundary and is, therefore, also not at risk of any indirect habitat impacts due to no viable impact pathway for waterborne impacts to connect the PDS to the co-located SAC and SPA sites.

In conclusion, it has been objectively determined that significant direct or indirect habitat loss or alteration impacts within Killarney National Park, MacGillycuddy's Reeks and Caragh River Catchment SAC, Castlemaine Harbour SAC or Killarney National Park SPA because of the proposed LRD are not predicted. Therefore, significant effects to the conservation objectives of these Natura 2000 sites with regard direct or indirect habitat loss/alteration impacts because of the construction/operation of the proposed development are not envisaged.

3.7.3 Disturbance or Displacement of Species

3.7.3.1 Killarney National Park, MacGillycuddy's Reeks and Caragh River Catchment SAC (000365)

3.7.3.1.1 Aquatic Species

As listed in Table 3-8, above, Killarney National Park, MacGillycuddy's Reeks and Caragh River Catchment SAC is designated for the protection of the seven freshwater aquatic species. The likelihood of significant disturbance or displacement impacts on the seven QI species resulting from water quality impairment has already been determined as negligible in Section 3.7.1, above. Likewise, any species disturbance/displacement due to habitat loss/alteration is also not envisaged for reasons set out in Section 3.7.2, above.

As a consequence, significant direct, indirect, or secondary disturbance or displacement impacts ensuing from either the construction or operational phases of the proposed LRD on the Killarney National Park, MacGillycuddy's Reeks and Caragh River Catchment SAC (000365) are not likely in view of the site's conservation objectives for the following seven freshwater aquatic species:

- Sea lamprey (*Petromyzon marinus*) [1095]
- Brook lamprey (*Lampetra planeri*) [1096]
- River lamprey (*Lampetra fluviatilis*) [1099]
- Salmon (*Salmo salar*) [1106]
- Killarney shad (*Alosa fallax killarnensis*) [5046]
- Freshwater pearl mussel (*Margaritifera margaritifera*) [1029]
- Slender naiad (*Najas flexilis*) [1833]

3.7.3.1.2 Kerry Slug and Killarney Fern

As evidenced in Section 3.2, above, the highly specific habitat requirements of Kerry slug and Killarney fern are not available at the PDS. As a consequence, significant direct, indirect, or secondary disturbance or displacement impacts ensuing from either the construction or operational phases of the proposed LRD on Killarney National Park, MacGillycuddy's Reeks and Caragh River Catchment SAC (000365) are not, in view of the site's conservation objectives for either of these species, likely.

3.7.3.1.3 Marsh Fritillary

As evidenced in Section 3.2, above, the PDS lacks devil's-bit scabious the essential habitat component[27] required for marsh fritillary and, therefore, the site cannot support this species. Consequently, significant direct, indirect,

[27] https://www.npws.ie/research-projects/animal-species/invertebrates/marsh-fritillary-euphydryas-aurinia.

or secondary disturbance or displacement impacts ensuing from either the construction or operational phases of the proposed LRD Killarney National Park, MacGillycuddy's Reeks and Caragh River Catchment SAC (000365) are not, in view of the site's conservation objectives for this species, likely.

3.7.3.1.4 Otter

No evidence of the semi-aquatic species otter, including any breeding or resting sites, was recorded during any of the ecological field surveys carried out on-site. Additionally, there are no watercourses within at least 1.5 kilometres of the PDS and the likelihood of significant disturbance or displacement impacts on otter resulting from water quality impairment has already been determined as negligible in Section 3.7.1, above.

Furthermore, the characteristics of the PDS that militates against members of the SAC's otter population utilising the PDS, or its surrounds, is the entirely urban character of the areas intervening between the PDS and the nearest rivers, the Flesk and Deenagh (see Figure 3-1, above). These intervening areas are occupied by extensive housing estates where the associated levels of human activity, road traffic, etc., preclude any likelihood that otter use the PDS or surround areas to any significant extent. In light of these factors, it is reasonable to expect that members of the otter population for which the SAC is designated will preferentially select the habitats of higher ecological value within the SAC, comprising 1,246.2 km of river length and 2,710.3 ha of lakes (NPWS, 2017), rather than those at the PDS or surrounding areas which they are likely to avoid.

Consequently, significant direct, indirect or secondary disturbance or displacement impacts ensuing from the construction or operational phases of the proposed LRD on Killarney National Park, MacGillycuddy's Reeks and Caragh River Catchment SAC (000365) are not likely in view of the site's conservation objectives for otter.

3.7.3.1.5 Lesser Horseshoe Bat

Surveys described in Section 3.2.4, above, indicate that this species has been recorded at the PDS. While the frequency with which the species was recorded is low, since the proposed LRD will irreversibly alter the footprint at the PDS from the current semi-natural, low ecological value to man-made habitats of no intrinsic ecological value, there is uncertainty as to the absence of significant direct species disturbance or displacement effects on the population of lesser horseshoe bat for which the SAC is selected.

It is concluded, therefore, that significant behavioural displacement impacts on the Killarney National Park, MacGillycuddy's Reeks and Caragh River Catchment SAC (000365) cannot be excluded and an AA will be required. In addition to the loss of habitats, the proposed LRD will introduce light e.g., street lighting and generate other sources of light spill e.g., light trespass from a building or window into the outside environment during the operational phase.

3.7.3.2 Killarney National Park SPA (004038)

3.7.3.2.1 Merlin

The SPA is selected for the protection of a breeding population of this species (estimated in 2014 to be five pairs[28]). The species breeds in open and semi-open areas such as moorland, mountain, and blanket bog. In open country, eggs are laid in a scrape on the ground amid bushes but in forested areas, old tree nests of crows, rooks, or magpies are used. A hunting merlin will normally set up a vigil from an elevated perch such as a fencepost or tree stump awaiting smaller birds, typically in the 1- to 2-ounce range, that it catches in midair. Once on the wing it is nimble in flight and will pursue its prey for extended periods, accelerating towards the prey throughout. They attack at high speed, horizontally or even from below, chasing the prey upwards until it tires.

[28] https://www.npws.ie/sites/default/files/protected-sites/synopsis/SY004038.pdf

As can be seen from **Section 3.2**, the habitats within the site are not suitable as breeding habitat for this SCI species. It is concluded, therefore, that direct, indirect, or secondary impacts on the breeding activity of the merlin population for which this site is selected are not reasonably foreseeable.

While there is some limited possibility that the species hunts at the PDS, it is unlikely that the site is essential to the ecological resources of the SPA that support the structure and function of the resident population, given the highly urbanised nature of the area surrounding the PDS. The natural range of the species within the SPA will not be reduced because of the proposed LRD and there is, and will continue to be, a sufficiently large habitat to maintain its population on a long-term basis in the 10,328 ha[29] encompassed within the SPA boundary.

In light of the characteristics of the project described in **Section 3.3**, bearing in mind the impacts identified in **Section 3.5** and the evidence provided in the preceding paragraphs, it is concluded that significant direct, indirect or secondary disturbance or displacement impacts as a result of the proposed LRD on Killarney National Park SPA (004038) are not, in view of the site's conservation objectives for merlin, as a result of either the construction or operational phases of the proposed LRD, likely.

3.7.3.2.2 Greenland White-fronted Goose

The SPA is selected for the protection of a non-breeding, over-wintering population[30] of this species. Traditionally, the species wintered predominantly in bogs. Over time, due to habitat damage, flocks began to winter increasingly in freshwater marshes, wet grasslands[31] and on intensively managed grasslands. Flocks are highly sensitive to disturbance and have abandoned favoured feeding areas if human disturbance levels increase (Fox *et al.*,1998).

As can be seen from **Section 3.2**, the habitats within the PDS are not suitable as foraging or roosting habitat for this SCI species. In fact, the urban setting alone is sufficient to ensure that the species has, and will continue to do so, actively avoid the location. Considering these characteristics, it is considered that the population of this species for which the SPA is selected will not be present within the ZOI of any impact identified in **Section 3.5**. The natural range of the species within the SPA will not be reduced and there is, and will continue to be, a sufficiently large habitat to maintain its population on a long-term basis.

In light of the characteristics of the project described in **Section 3.3** and bearing in mind the impacts identified in **Section 3.5** and the evidence provided in the preceding paragraphs, it is concluded that significant direct, indirect or secondary disturbance or displacement effects, as a result of the proposed LRD on Killarney National Park SPA (004038) are not, in view of the site's conservation objectives for this species, as a result of either the construction or operational phases of the proposed LRD, likely.

3.7.3.2.3 Species referred to in Article 4 of Directive 2009/147/EC and listed in Annex II of Directive 92/43/EEC

While the two species for which the SPA is designated enjoy priority status regarding special conservation measures that must be adopted and implemented, in Case C-66/23,[32] the First Chamber of the European Court of Justice (ECJ) found that the conservation objectives of a site must be defined while also taking account of other species of birds which must be protected under Article 4 of the Birds Directive and which are present in a significant manner in the SPA concerned, without that site having been designated as an SPA for those species.

Considering this, an assessment of the likelihood of significant impacts on such species may prove useful to determine whether a site's conservation objectives are being met[33]. The Natura 2000 Standard Data Form for the Killarney National Park SPA (004038)[34] lists the following species referred to in Article 4 of Directive 2009/147/EC and listed in Annex II of Directive 92/43/EEC:

[29] https://natura2000.eea.europa.eu/Natura2000/SDF.aspx?site=IE0004038
[30] < 20 birds (see https://www.npws.ie/sites/default/files/protected-sites/synopsis/SY004038.pdf)
[31] https://www.wexfordwildfowlreserve.ie/wildlife-2/greenland-goose/
[32] Judgment of the Court (First Chamber) of 12 September 2024. Case C-66/23
[33] See Judgment of the Court (First Chamber) of 12 September 2024. Case C-66/23, paragraph 54.
[34] https://natura2000.eea.europa.eu/Natura2000/SDF.aspx?site=IE0004038

Non-migratory

Raptor

- Peregrine falcon (*Falco peregrinus*)

Wintering (Migratory)

Waterfowl (ducks)

- Eurasian teal (*Anas crecca*)
- Mallard (*Anas platyrhynchos*)
- Common pochard (*Aythya ferina*)
- Tufted duck (*Aythya fuligula*)
- Common goldeneye (*Bucephala clangula*)
- Eurasian coot (*Fulica atra*)

Coastal seabird

- Black-headed gull (*Larus ridibundus*)
- Great cormorant (*Phalacrocorax carbo*)

Breeding (Migratory)

Passerines[35]

- Common redstart (*Phoenicurus phoenicurus*) Rare summer visitor to deciduous woodland in Co. Wicklow.
- Wood warbler (*Phylloscopus sibilatrix*) Rare summer visitor to deciduous woodlands in Co. Wicklow.
- Garden warbler (*Sylvia borin*) Scarce summer visitor to woodlands in the midlands and northern Ireland.
- Ring ouzel (*Turdus torquatus*) Rare summer visitor from mid-March to September to uplands, mainly in counties Donegal and Kerry.

None of the waterfowl or coastal or raptor species are considered rare and as can be seen from **Section 3.2**, the habitats within the PDS are not suitable as foraging or roosting habitat for the waterfowl, which are highly specialised in terms of the types of habitats they are adapted to feed in and the prey items they require. While the coastal species may be somewhat less restrictive in terms of prey selection it is, nevertheless, reasonable to expect that both species would preferentially select coastal habitats rather than those at the PDS and in the surrounding landscape.

In relation to peregrine,[36] this species rarely breeds in Ireland, nesting on the ground in moorland, mountain and blanket bog and woodland, and has recently taken to nesting in forestry plantations adjacent to moorland. Prey, primarily small passerines, is caught by surprise attack from a low gliding flight close to the ground, by persistence pursuit or from a vertical dive. While there is some limited possibility that the species hunts at the PDS, it is unlikely that the PDS is essential to the ecological resources within and around the SPA that support the structure and function of the resident population. The natural range of the species within the SPA will not be reduced because of the proposed LRD and there is, and will continue to be, a sufficiently large habitat to maintain its population on a long-term basis in the 10,328 ha[37] encompassed within the SPA boundary.

With regard to common redstart, wood warbler, garden warbler and ring ouzel, notwithstanding their inclusion in the site's Standard Data Form, in light of the information on the distribution of each, they are highly unlikely to be present in the PDS, its surrounds or the SPA and are not, therefore, likely to be exposed to any impacts from either phase of the proposed LRD.

Given the project characteristics set out in **Section 3.3**, bearing in mind the impacts identified in **Section 3.5**, and the evidence provided in the preceding paragraphs, it is concluded that significant direct, indirect or secondary disturbance or displacement effects as a result of the proposed LRD on these species are not reasonably

[35] https://birdwatchireland.ie/irelands-birds-birdwatch-ireland/list-of-irelands-birds/
[36] Notes from: https://birdwatchireland.ie/birds/merlin/
[37] https://natura2000.eea.europa.eu/Natura2000/SDF.aspx?site=IE0004038

foreseeable. Therefore, significant impacts on Killarney National Park SPA (004038) arising from either the construction or operational phase of the proposed LRD are not likely, in view of the site's conservation objectives.

3.7.3.3 Castlemaine Harbour SAC (000343)

This SAC is selected for the protection of three fish species – sea lamprey, brook lamprey and salmon - otter and the terrestrial plant species petalwort.

As set out in Table 3-8, above, Castlemaine Harbour SAC is included within the ZOI of the proposed LRD as a precautionary measure by virtue of the SAC's location less than one kilometre downstream from Lough Leane's outflow via the River Laune and the possibility of indirect water quality impacts to its designated fish and otter populations. However, as detailed in Section 3.7.1, above, the likelihood of significant disturbance or displacement impacts to the QI freshwater species of Lough Leane for which the Killarney National Park, MacGillycuddy's Reeks and Caragh River Catchment SAC is designated because of water quality impairment has already been determined as negligible.

Since Castlemaine Harbour SAC is located slightly further downstream from Lough Leane, as illustrated in Figure 3-9, above, it is reasonable to conclude that the populations of the three fish species and otter for which the SAC is designated will also not be significantly disturbed or displaced as there is no viable impact pathway for waterborne impacts to connect the PDS to this SAC.

In relation to petalwort, this plant species is entirely terrestrial and within the SAC is limited to three populations within the dune slacks at Inch and a single population at Rossbeigh (NPWS, 2026). Both locations are more than thirty kilometres from the PDS and there is, therefore, no viable impact pathway linking this species to the proposed LRD.

Given the project characteristics set out in Section 3.3, bearing in mind the impacts identified in Section 3.5, and the evidence provided in the preceding paragraphs, it is concluded that significant direct, indirect or secondary disturbance or displacement effects because of the proposed LRD on the populations of sea lamprey, brook lamprey, salmon, otter and petalwort for which Castlemaine Harbour SAC is designated are not reasonably foreseeable. Therefore, significant impacts on Castlemaine Harbour SAC (000343) arising from either the construction or operational phase of the proposed LRD are not likely, in view of the site's conservation objectives.

3.7.4 Habitat or Species Fragmentation

Habitat fragmentation has been defined as 'reduction and isolation of patches of natural environment' (Hall, *et al*., 1997) cited in (Franklin, *et al*., 2002) which results in spatial separation of habitat areas which had previously been in a state of greater continuity. Adverse effects of habitat fragmentation on species include the increased isolation of populations which can detrimentally impact on the resilience or robustness of the populations.

Section 3.7.1 demonstrates that significant water quality impacts are not likely, Section 3.7.2 concluded that significant habitat loss, alteration, or degradation effects within the Natura 2000 sites listed are not likely, and Section 3.7.3 concluded that significant species disturbance or displacement impacts are not expected to ensue within two Natura 2000 sites within the ZOI of the proposed Deer Park LRD, namely Killarney National Park SPA (004038) and Castlemaine Harbour SAC (000343). Having regard to the location, nature and scale of the proposed LRD and the conclusions cited herein, above, it is concluded that significant habitat or species fragmentation effects within either Killarney National Park SPA (004038) or Castlemaine Harbour SAC (000343) are not, in view of the sites' conservation objectives, likely.

However, as there is uncertainty as to the absence of significant effects, specifically with regard to the population of lesser horseshoe bat for which the Killarney National Park, MacGillycuddy's Reeks and Caragh River Catchment SAC (000365) is selected, a Natura Impact Statement, which will include an assessment of the likelihood of habitat or species fragmentation effects, will be required.

3.7.5 In-Combination Effects

When in-combination effects are assessed, it is necessary to identify the types of impacts that may ensue from other sources in the existing environment that, in combination with those ensuing from the project under consideration, may affect aspects of the structure and function of the relevant Natura 2000 sites (EC, 2001; 2021). The potential impacts from the proposed LRD have been identified in Section 3.5, above, and the Plans, Projects, and Activities, with which the proposed LRD could interact to create adverse effects on the integrity of Natura 2000 sites listed in Section 3.6.2 have been identified in Section 3.4, above.

Sections 3.7.1 to 3.7.4, inclusive, have concluded that there is no likelihood that the impacts identified in Section 3.5 will reach a threshold of interactive potential that are of a sufficient character, magnitude, duration, or intensity to cause or create in-combination impacts with the Plans, Projects and Activities identified in Section 3.4. It is concluded, therefore, that significant in-combination effects within Killarney National Park SPA and Castlemaine Harbour SAC are not likely, in view of the sites' conservation objectives.

However, as there is uncertainty as to the absence of significant effects, specifically with regard to the population of lesser horseshoe bat for which the Killarney National Park, MacGillycuddy's Reeks and Caragh River Catchment SAC is selected, an NIS that includes an assessment of the likelihood of in-combination impacts between the proposed LRD and the Plans, Projects, and Activities identified in Section 3.4, above, is required.

3.8 Conclusion of Screening Stage

It has been objectively concluded that the following Natura 2000 sites are not likely to be significantly affected by the proposal, individually or in-combination with other plans or projects, in view of their conservation objectives:

- Killarney National Park SPA (004038)
- Sheheree (Ardagh) Bog SAC (000382)
- Castlemaine Harbour SAC (000343)
- Old Domestic Building, Curraglass Wood SAC (002041)

However, there is uncertainty as to the absence of significant effects, specifically in relation to the population of lesser horseshoe bat for which Killarney National Park, MacGillycuddy's Reeks and Caragh River Catchment SAC is selected.

It is concluded, therefore, that significant effects on Killarney National Park, MacGillycuddy's Reeks and Caragh River Catchment SAC cannot, in view of this site's conservation objectives, be excluded at this stage. Therefore, in respect of Killarney National Park, MacGillycuddy's Reeks and Caragh River Catchment SAC (000365), the project should proceed to Stage 2 of the AA process and as such, an NIS is required. It is concluded that all other Natura 2000 sites have been correctly screened out or excluded from further consideration based on objective information that the project, individually or in-combination with other plans or projects, will have no, or no appreciable, effects on those sites.

4. Stage 2: Natura Impact Statement (NIS)

4.1 Introduction

The Stage 1: screening for AA carried out in Section 3, above, concluded that there is uncertainty as to the absence of significant effects that the proposed LRD may bring about on the population of lesser horseshoe bat (*Rhinolophus hipposideros*) for which the Killarney National Park, MacGillycuddy's Reeks and Caragh River Catchment SAC (000365) site is selected. Consequently, significant effects on this SAC could not be excluded during

the screening process in view of the site's conservation objectives and, therefore, this NIS has been prepared for use by the Competent Authority, in this case KCC, to assist in completion of its own AA.

4.2 Identification of Potential Impacts

The screening for AA report in Section 3, above, concluded that there was uncertainty as to whether certain impacts could occur because of the proposed LRD, namely disturbance and/ or displacement of species impacts, or habitat or species fragmentation impacts thereby potentially undermining the Conservation Objectives, and affecting the integrity, of the Killarney National Park, MacGillycuddy's Reeks and Caragh River Catchment SAC (000365) site. That uncertainty is engendered by the presence of impact sources at a location within the foraging range of a receptor QI species, namely lesser horseshoe bat.

Sources:

- Habitat loss from within the footprint of the proposed LRD.
- Security lighting for site works.
- Street and residential lighting

Receptor:

- Population of lesser horseshoe bat for which Killarney National Park, MacGillycuddy's Reeks and Caragh River Catchment SAC (000365) is designated.

Table 4-1. Elements of project likely to give rise to potential ecological impacts on lesser horseshoe bat.

Construction Phase
• Habitat loss from within the footprint of the proposed LRD. • Security lighting for site works.
Operational Phase
• Habitat loss from within the footprint of the completed LRD • Street and residential lighting

4.3 Selection of Qualifying Features for Impact Assessment

The uncertainty as to the absence of significant effects on Killarney National Park, MacGillycuddy's Reeks and Caragh River Catchment SAC (000365) pertains specifically to the population of lesser horseshoe bat for which the site is selected. That uncertainty is as to the likelihood that disturbance and/or displacement of species effects and/or habitat or species fragmentation effects could ensue because of:

- Habitat loss from within the footprint of the proposed LRD.
- Security lighting for site works.
- Street and residential lighting

When Natura 2000 sites are selected for AA, then all the qualifying features of conservation interest must be included in that stage of the assessment. However, when assessing impact, qualifying features are only considered relevant where a credible or tangible source-pathway-receptor (S-P-R) link exists between the proposed LRD and a protected species or habitat type. In order for an impact to occur there must be a risk initiated by having a 'source' (e.g. erosion of soil from ground disturbance), a 'receptor' (e.g. a protected aquatic or riparian habitat or species associated with such habitat), and an impact pathway between the source and the receptor (e.g. a watercourse which provides connectivity between the impact source and the ecological receptor).

Identifying a risk that could, in theory, cause an impact does not automatically mean that the risk event will occur, or that it will cause or create an adverse impact. However, identification of the risk does mean that there is a latent possibility of ecological or environmental damage occurring, with the level and significance of the impact

depending upon the nature of the risk, the extent of the exposure to the risk and the characteristics of the receptor. Therefore, bearing in mind the scope, scale, nature and size of the proposed LRD, its location relative to the distribution of the species and habitats listed and the degree of connectedness that exists between the proposed LRD and the potential receptors, it is considered that not all of them are within the zone of potential impact. The rationale for the evaluations based on these factors to determine which species and habitats are the plausible ecological receptors for potential impacts of the unmitigated proposal, is provided above in Section 3.7.

4.3.1 Characteristics of Lesser Horseshoe Bat

4.3.1.1 Species Ecology

Ireland's only Annex II-listed bat species[38],the lesser horseshoe bat is mainly found in counties on Ireland's western seaboard (Mayo, Galway, Clare, Limerick, Kerry and Cork) and its strongholds are found in County Kerry, west Cork and County Clare. Although this species has declined in many European countries, Ireland is considered a stronghold for the species.

This species, as do all bat species resident in Ireland, feeds exclusively on insects, and, in the summer, generally emerges from roosts at dusk. They feed close to the ground, gleaning their prey from branches and stones. They often carry their prey to a perch to consume, leaving the remains beneath (Marnell *et al*., 2022). Individuals, and groups, will use several different foraging sites in the same night and move between them to locate areas of high insect density. As is the case with all bat species, lesser horseshoe bats exhibit a high level of site fidelity, repeatedly returning to the same foraging sites night after night (Entwistle *et al*., 2001). As an acutely light- phobic species, lesser horseshoe bats will rarely cross open ground and are particularly averse to doing so unless it is very dark (Schofield, 2008 cited in NPWS, 2024).

Light levels as low as typical full moon levels, i.e. around 0.1 lx[39] can alter the flight activity of bats (Voigt *et al*., 2018) and lesser horseshoe bats have been found to avoid commuting along routes lit with artificial light at levels as low as 3.7 lx (NPWS, 2024). Reliability of supply of prey biomass is foundational to each species' capacity to maintain populations at viable levels (in this regard see content on metabolic constraints in Section 4.3.1.2). Bats will know from experience and repetition where insects are likely to be more abundant and will return to these areas. As a result of these variables, bats can be unevenly distributed within any given area due to the influence of localised conditions even on small scales (de Jong & Ahlén, 1991). The habitats of significance to lesser horseshoe bat within the PDS are listed and described in Table 3-1. The ambient light levels are listed in Table 3-3.

4.3.1.2 Metabolic Constraints

Two fundamental behavioural characteristics impose a high metabolic cost on all bat species: flight and the use of acoustic signalling to navigate, hunt, and communicate. As true fliers, rather than gliders, bats use flapping flight which is one of the most expensive activities in terms of metabolic cost (Winter *et al*., 1998). In addition, the metabolic costs of acoustic signalling are about eight times that of the silent animal (Ophir *et al*., 2010), and the cost of echolocation can be even higher. As a group, therefore, bats have evolved to favour minimal mass because of the energetic demands of flight, hunting, and communication and have developed behaviours that minimise other metabolic costs.

The wing of a bat resembles a modified human hand with a flexible skin membrane that extends between each long finger bone, and it is the many movable joints that make bats agile fliers. Because of the thin wing membrane, flying during the heat of the day may be hazardous causing excessive absorption of heat and resulting in dehydration and possible heat prostration. Nocturnality offers protection from heat and helps bats maintain body temperature and moisture. It also affords protection from aerial predators most of which hunt during the day.

[38] Habitats Directive [92/43/EU]
[39] The SI unit for illuminance (lux) is lx. It is a measure of how much the incident light illuminates a surface

Even though they share the characteristics of all mammals - hair, regulated body temperature, the ability to bear live young, and to nurse them; bats are the only mammals to truly fly. Flying consumes so much energy that each female bat is only able to produce a single offspring each year, and a bat typically will need to consume about one-third of its body weight in food per night; a common pipistrelle, for example, can eat over 3,000 insects in a single night. As insectivores, bats in Ireland feed on arthropods which contain the energy-rich carbohydrate chitin in their exoskeleton, which is indigestible for the typical mammalian gastrointestinal tract. However, European vespertilionid bat species have evolved an enzymatic adaptation (acidic mammalian chitinase) which enables them to digest chitin present in the primary food source to optimise resource use and energy intake (Strobel *et al*, 2013).

This aspect of their ecology, this high metabolic demand, is a key determinant in the foraging strategies of all bat species. Speculative foraging carries too low a risk/reward ratio in that the metabolic costs of flight and echolocation are so high that bats will seek out locations that have previously rewarded energy cost inputs. This aspect of their behaviour is demonstrated by the previously mentioned high level of site loyalty exhibited by bat species and the repeated return to the same foraging sites night after night (Entwistle *et al*., 2001). In addition, because the cost of flight increases with decreasing body size, de Jong (1994) (cited in Erickson *et al*., 2003) hypothesized that smaller bats, such as lesser horseshoe, with slower flight could be restricted from using habitats where insect abundance was low and long-distance foraging flights were required.

Differences in activity on different nights could be the result of climatic conditions, insect availability, or morphological differences between species. Cooler and windier nights tend to suppress the flight activity of bats (Anthony *et al*., 1981; O'Farrell, 1967; Stebbings, 1968; all cited in Erickson *et al*., 2003) by imposing thermoregulatory stress and by reducing the activity of their insect prey. Strong winds can also increase the cost of flight and can affect the net energy gain for foraging bats (Weimerskirch et al., 2012; cited in Møller, 2013)

4.3.1.3 Population Resident within the SAC

The population resident within the SAC will use a variety of roosts during the year, besides the main summer maternity and winter hibernation roosts, including night roosts, satellite roosts and auxiliary roosts. Summer roosts are situated in home core range areas and are used by the bats to minimise commuting distances between foraging bouts (NPWS, 2024). The Bat Conservation Trust (BCT) in a 2016 literature review defined a Core Sustenance Zone (CSZ) as the area:

'surrounding a communal bat roost within which habitat availability and quality will have a significant influence on the resilience and conservation status of the colony using the roost' (BCT, 2016).

The significance of the CSZ is given further expression and definition in Irish publications e.g., in Conservation Objectives documents, such as NPWS (2017), which include maps identifying potential foraging habitats within a 2.5 km foraging zone of established roosts. While all linear features such as hedgerows, treelines and stone walls provide vital connectivity for this species, they do so most importantly within the 2.5 km CSZ around each roost (Schofield, 2008 cited in NPWS, 2024).

There are four established roost sites that support the resident population for which the SAC is designated, the closest of which to the PDS is No. 296 which is both a winter and summer roost (Map 10, NPWS, 2017).

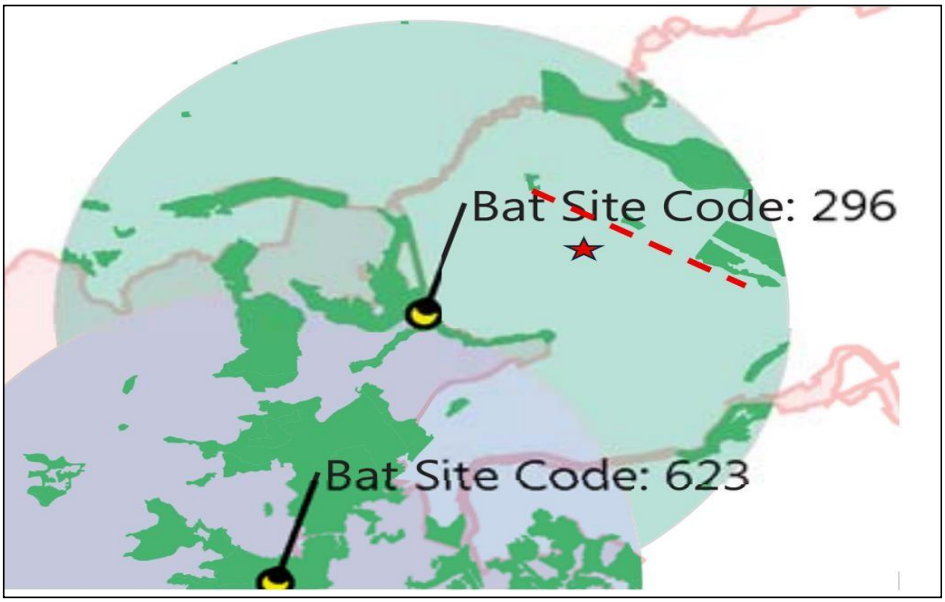


Figure 4-1: Extent of Core Sustenance Zone of Roost ID 296 in relation to the PDS - dashed red line illustrates the approximate location of the N72 Killarney By-pass [adapted from Map 10. NPWS, 2017].

4.3.2 Legal Status

All species of bats in Ireland are listed on Schedule 5 of the 1976 Act, and are therefore subject to the provisions of Section 23, which make it an offence to:

- *Intentionally kill, injure or take a bat;*
- *Possess or control any live or dead specimen or anything derived from a bat;*
- *Wilfully interfere with any structure or place used for breeding or resting by a bat;*
- *Wilfully interfere with a bat while it is occupying a structure or place which it uses for that purpose*

All bat species are listed in Annex IV of the Habitats Directive as species protected across their entire natural range and the lesser horseshoe bat is further listed, under Annex II, as a species for which core areas of their habitat must be protected within the Natura 2000 network of protected sites. Under Regulation 51 of the European Communities (Birds and Natural Habitats) Regulations 2011 (as amended) in regard to the animal species listed in Annex IV of the Habitats Directive, a person will be guilty of an offence whereby that person

a. *deliberately captures or kills any specimen of these species in the wild,*
b. *deliberately disturbs these species particularly during the period of breeding, rearing, hibernation and migration,*
c. *deliberately takes or destroys eggs of those species from the wild,*
d. *damages or destroys a breeding site or resting place of such an animal, or*
e. *keeps, transports, sells, exchanges, offers for sale or offers for exchange any specimen of these species taken in the wild, other than those taken legally as referred to in Article 12(2) of the Habitats Directive.*

4.3.3 Conservation Status

Article 17 reporting (NPWS, 2019) assessment of the conservation status of the species, at the end of the reporting period, was:

- Overall Assessment of Conservation Status: Inadequate

- Overall trend in Conservation Status: Deteriorating

4.4 Assessment of Potentially Significant Effects

There follows in Sections 4.4.1 and 4.4.2 hereunder an evaluation, in light of the impact sources identified in Section 4.2, above, and in light of the measures designed to achieve the Conservation Objectives of the SAC, of potentially significant adverse effects which may arise as a result of the proposed LRD on the population of lesser horseshoe bat for which the SAC is selected.

Residual impacts are assessed in Section 6, below. The determination as to whether the integrity of Killarney National Park, MacGillycuddy's Reeks and Caragh River Catchment SAC (000365) will, beyond reasonable scientific doubt, be adversely affected by the proposed LRD is set out in Section 7, below

4.4.1 Disturbance / Displacement of Species

Only three lesser horseshoe bat passes were recorded at the PDS. Two were recorded at Stop 4 on May 15th during the NBW survey. Ambient light levels ranged from 0.88 lx to 1.95 lx at two locations within this section in August. The other bat pass was recorded at SP1, which was located on the treeline/hedgerow on the southern boundary, in June, during the PAB survey. Ambient light was not measured at this location.

The negligible level of activity recorded at the PDS is consistent with the known foraging behaviour of this species. Reliability of supply of prey biomass is foundational to each species' capacity to maintain populations at viable levels. Consequently, each species' adaptations and metabolic demands govern ecological resources e.g., foraging grounds, each species utilise. This fundamental trait leads to the emergence of established behaviour or patterns of behaviour such as how a roost's population navigates through a landscape and which foraging sites are used.

At an individual and at population level, by which, for the purposes of the analysis set out in this section of this NIS, we mean the population originating at Deenagh Lodge, bats know, from experience, the locations, within their foraging ranges, where insect prey biomass is likely to be most abundant. Based on this knowledge, populations and individuals' frequent locations that have previously rewarded energy cost inputs and will have a high level of site loyalty - routinely returning to the same foraging sites night after night (Entwistle *et al*., 2001)

Conversely, each species avoids sites that are inaccessible, due to lack of suitable connecting corridors, or unsuitable, due to lack of prey resources. They do so because speculative foraging carries too low a risk/reward ratio in that the metabolic cost of flight is so high that bats preferentially select out locations that have previously rewarded energy cost inputs[40].

Lesser horseshoe bats normally forage in woodlands/scrub within 2.5 km of their roosts (Schofield, (2008) cited in NPWS (2017)) and this aspect of their behaviour is illustrated, as a circle with a radius of 2.5 km, in Map 10: NPWS (2017)[41]. As can be seen from Figure 4-1, above, the PDS is within the Foraging Range[42] of the population resident in the basement of Deenagh Lodge[43]. However, the survey data demonstrate that usage of the PDS by this species is rare in the extreme and is neither routine, repeated nor sustained. At best, it is sporadic and, on the basis of the survey data, it is clear that the PDS is clearly not a resource that contributes to supporting the structure and function of the population resident in in the basement of Deenagh Lodge nor for the overall population for which the SAC is selected.

Because of the quietness of the call lesser horseshoe bats do not typically hunt in the open seeking prey on the wing at significant distances. Rather, individuals hunt close to, and glean their prey from, surfaces on which the prey have alighted, e.g., leaves or branches. The relative quietness of the species' echolocation call allows them

[40] Each bat typically will need to consume about 1/3 of its own body weight in food per night.
[41] Shows a 2.5 km zone around known roosts, identifies potential foraging grounds and illustrates the gross woodland areas within the zone.
[42] See also notes on Core Sustenance Range in Section 4.3.1.3
[43] Bat Site Code: 296. Approximately 1.5km to the west of the PDS

to hunt in cluttered environments, and the species is uniquely adapted to hunt within woodland canopies and preferentially selects these areas to forage. While the species can and do navigate and forage hunt along linear features such as treelines, it is to the woodland foraging grounds, with their high and reliable volumes of prey biomass, that the species display site loyalty - returning night after night.

This aspect of their ecology, this preference for foraging in woodlands, is reflected in the fact that woodlands and scrub are categorised as valuable foraging habitats for the species in NPWS, 2017. While linear habitats are valued and protected as commuting corridors, it is clear from what is known about the species, including information in NPWS (2017), that it is primarily their function as connective corridors linking areas of woodlands that are of value rather than as foraging resources, per se.

As can be seen from **Table 3-1**, the site comprises either open or linear habitats. In light of the information in the preceding paragraphs, it is clear that the site is intrinsically of negligible value to this species as foraging habitat and even the connectivity value to, and from, the wider landscape, of the linear habitats it does provide is significantly reduced because of the relatively low value of the adjacent habitats which largely comprise a built environment that is artificially lit.

While the PDS is currently unlit internally it can be seen from the bat survey data, and from the light levels listed in **Table 3-3**, that light spill from the adjacent urban fabric is sufficient to preclude significant levels of foraging or commuting activity by lesser horseshoe bat which is the most acutely light-phobic of the species resident in Ireland (NPWS & VWT, 2022). This species has been found to avoid commuting along routes lit with artificial light at levels as low as 3.7 lx (NPWS, 2024), Stone *et al*. (2012) found lesser horseshoe bat activities significantly reduced even at levels as low as 3.6 lx and BCT (2023) found that the average light level on hedgerows most regularly used by this species had been recorded at 0.45 lx. The point here is that, even in its current undeveloped state, the site exists within and is surrounded by a substantial area of artificial light and is significantly modified from an unlit natural state of darkness or semi-darkness. Considering the species' avoidance of light levels exceeding those referenced above, it is reasonable to deduce that the existing conditions in the wider urban area already significantly reduce, or even all but preclude, significant levels of lesser horseshoe bat activity in the area surrounding the PDS and at the PDS.

4.4.1.1 Construction Phase

The current lighting levels will remain largely unchanged for the construction phase during which lighting use will be limited and, where required, will be focused on the PDS and will be cowled as appropriate.

In light of the characteristics of the project described in **Section 3.3** and bearing in mind the potential impacts identified in **Section 4.2** with the evidence and analysis provided in **Section 4.4.1**, above, it is concluded that adverse direct, indirect or secondary disturbance or displacement effects, as a result of the construction phase of the proposed LRD on Killarney National Park, MacGillycuddy's Reeks and Caragh River Catchment SAC (000365) are unlikely to occur in view of the site's Conservation Objectives for the population of lesser horseshoe bat for which the site is selected.

4.4.1.2 Operational Phase

Notwithstanding the rarity of this species' detection at the PDS as evidenced by the survey data, an area of woodland is mapped, in the aforementioned Map 10: NPWS (2017), as a Potential Foraging Ground (PFG) for the population of lesser horseshoe bat that is resident in Deenagh Lodge (see Map 10: NPWS (2017) and **Figure 4-1**). This area of woodland is situated in the townland of Deerpark, approximately 300 m to the northeast of the PDS on the northeastern side of the N72 Killarney By-Pass. Since this species is the most photophobic of all Irish bat species, it is necessary to determine whether light spill emanating from the PDS will adversely affect the behaviour of this cohort of the population for which the SAC is selected.

Ensuring that there is no significant increase in artificial light intensity along commuting routes within 2.5 km of known roosts is a Target set out in NPWS (2017) that must be maintained in order for the favourable conservation condition of the species to be maintained - which is itself necessary to ensure that the Conservation Objectives of the Killarney National Park, MacGillycuddy's Reeks and Caragh River Catchment SAC (000365), as they pertain to this species, are met. Residential lighting will be required for safe pedestrian and vehicular movement at night along the roads and footpaths in the proposed LRD once completed. Minimum requirements are set out in the applicable guidance and plans such as the Kerry CDP (2022-2028) and Code of Practice BS 5489-1:2020 – TC[44].

It is proposed that streetlamps distributed appropriately will properly illuminate the proposed Deer Park LRD. The requirement generally for residential developments such as the one considered in this NIS is to light the road, verge and footpath to the minimum level, as far as the boundary line of adjacent properties. In addition, the access roadway must be adequately lit. Walkways across green areas are generally not lit unless otherwise advised by the local authority[45].

Habitat availability has a significant influence on the resilience and conservation status of any colony using a roost (BCT, 2016). It is known that loss of commuting routes linking roosts to foraging sites is one of the major threats to this species (McAney, 1994; McGuire, 1998; Roche, 2001 cited in NPWS, 2024). Any such loss would impair the conservation condition of the species and would undermine the Conservation Objectives set out in NPWS (2017) and, thereby, the integrity of the SAC. It is not necessary that this linear feature be removed for its function to be negated, in fact, any increase in artificial light at night (ALAN) intruding onto a commuting corridor is a threat of equal import to this species, and indeed to all bat species (NPWS, 2024). As was noted previously, Stone *et al*. (2012) found lesser horseshoe bat activities significantly reduced even at levels as low as 3.6 lx, while BCT (2023) found that the average light level on hedgerows most regularly used by this species was recorded at 0.45 lx. If light levels were to increase because of the proposed LRD, there is then significant risk of a cascade of adverse effects on the population's ability to survive, reproduce and maintain population numbers in the SAC.

In the specific circumstances that pertain here, direct adverse effects would include habitat loss as the population could no longer commute to the PFG illustrated in Map 10: NPWS (2017) and **Figure 4-1**, and the loss of prey biomass consequent to that habitat loss. The primary indirect effect would likely be habitat fragmentation (Hanski, 1998), i.e. 'reduction and isolation of patches of natural environment' (Hall, *et al*., 1997 cited in Franklin, *et al*., 2002) which results in spatial separation of habitat areas which had previously been in a state of greater continuity. Therefore, the metabolic costs to the species could be excessive or perhaps even untenable should the PFG no longer be available leading to displaced bats seeking an alternative route to the PFG via other linear features.

The intensity (illuminance[46]) of light falling on an object is inversely proportional to the square of the distance from the source. In short, an object (of the same size) twice as far away receives only one-quarter of the energy. It is self-evident, therefore, that the distance between the PDS and the PFG will reduce the intensity of light emanating from street lighting within the PDS of the light falling on the PFG or on a commuting corridor to it. With regard to glare from car lights emanating from the site, either low or high beam: any car headlight illumination driving within or exiting from the LRD will normally be irregular, infrequent and unlikely to be of a magnitude or duration sufficient to exert any effect on the PFG or on a commuting corridor to said PFG.

Adapted from drawings contained within the Outdoor Lighting Report in **Appendix 4**, **Figure 4-2**, below, illustrates the horizontal illuminance of the proposed lighting scheme's luminaires and the extent of light spill likely to emanate from them. The solid blue lines denote the outer extent and comprise all points with lux values of 1.5 which, as clearly illustrated in **Figure 4-2**, situates this 'leading edge' within the PDS boundary.

While significant reliance can be placed on the evidence provided in the preceding paragraphs and sections, to ensure beyond a reasonable scientific doubt that light spill from the PDS will not affect the ecological function of the PFG or any commuting corridor to it, mitigation measures are provided in **Section 5,** below.

[44] Design of road lighting of roads and public amenity areas.
[45] https://publiclighting.ie/wp-content/uploads/2021/05/ARUP-PL-Retrofitting-Guidance- Document-August-2020-1.pdf.
[46] The measurement of the amount of light falling onto (illuminating) and spreading over a given surface area

Residual impacts are assessed in **Section 6**, below. A determination as to whether the integrity of Killarney National Park, MacGillycuddy's Reeks and Caragh River Catchment SAC (000365) will, beyond reasonable scientific doubt, be adversely affected by the proposed LRD, is provided in **Section 7**, below

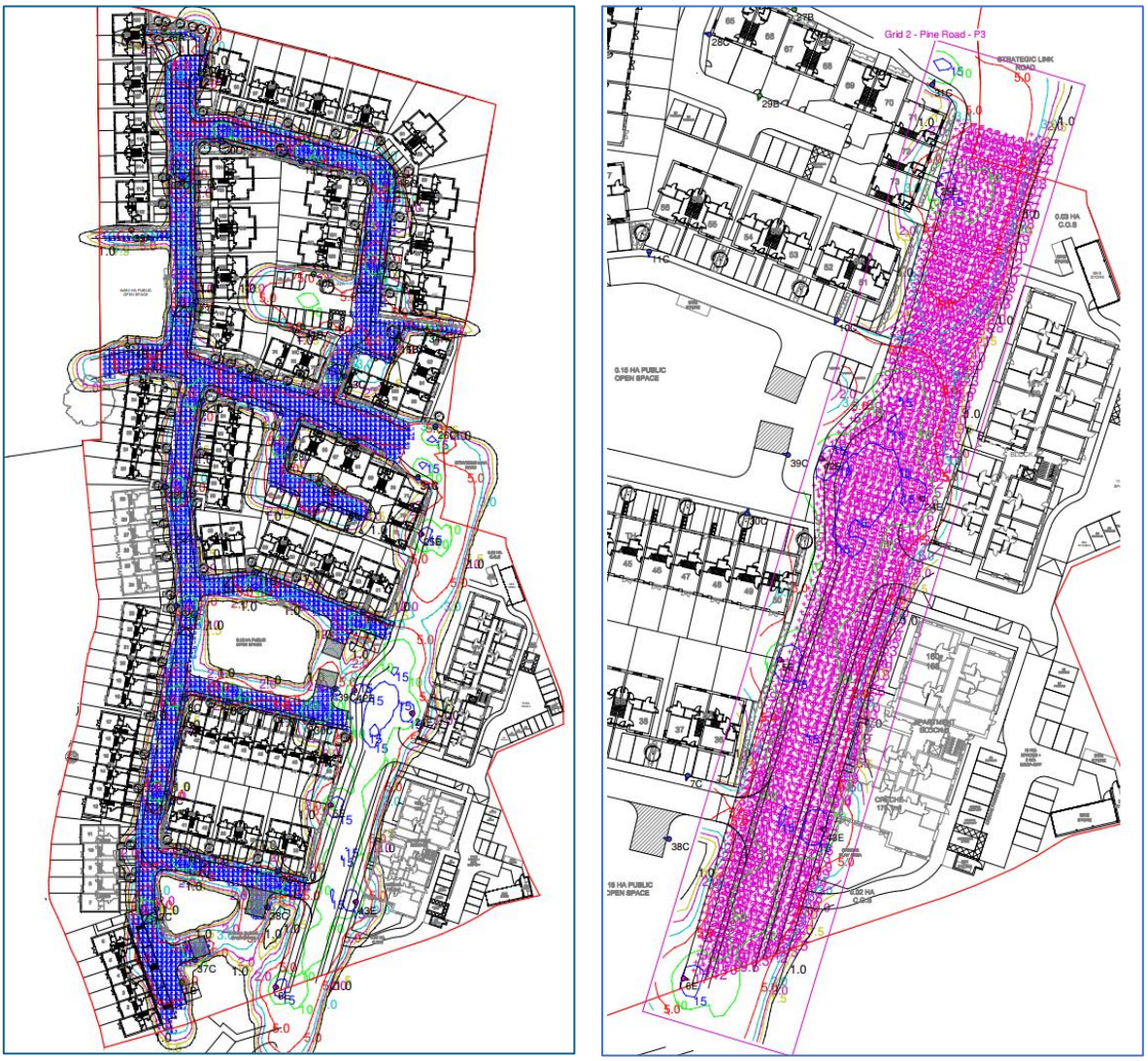


Figure 4-2: Indicative Light Spill [adapted from Outdoor Lighting Report prepared by Urbis Schréder Limited and presented in Appendix 4].

4.4.2 Habitat or Species Fragmentation

4.4.2.1 Construction Phase

In light of the characteristics of the project described in **Section 3.3,** bearing in mind the impacts identified in **Section 4.2,** and the conclusion in **Section 4.4.1**, pertaining to species disturbance or displacement impacts, it is concluded that adverse direct, indirect or secondary habitat or species fragmentation effects as a result of the proposed LRD on Killarney National Park, MacGillycuddy's Reeks and Caragh River Catchment SAC (000365) are not, in view of the site's Conservation Objectives for the population of lesser horseshow bat for which the site is selected, likely, as a result of the construction phase of the proposed LRD.

4.4.2.2 Operational Phase

For the Conservation Objectives of the SAC to be met as they pertain to this species, significant loss of linear habitat within 2.5km of qualifying roosts must be avoided. While the proposed LRD will not have any direct effect

on the PFG or on a commuting corridor to it, it is not necessary that this linear feature be removed for its function to be negated, in fact, any increase in artificial light at night (ALAN) intruding onto the commuting corridor is a threat of equal import to this species, and, indeed to all bat species (NPWS, 2024). And while the woodland corridor will remain intact and in situ, its function as a link connecting roost and foraging grounds will be eliminated if light spill from the PDS causes an increase in light levels in the woodland corridor along the Deenagh River, thereby depriving the species of vital element supporting the structure and function of the population for which this SAC is selected.

To ensure, beyond a reasonable doubt, that light spill from the PDS will not in any way affect the ecological function of the PFG or on a commuting corridor to it, mitigation measures are provided in **Section 5**, below.

Residual impacts are assessed in **Section 6**, below. A determination as to whether the integrity of the Killarney National Park, MacGillycuddy's Reeks and Caragh River Catchment SAC (000365) will, beyond reasonable scientific doubt, be adversely affected by the proposed LRD, is provided in **Section 7**, below

4.5 Assessment of Effects on the Conservation Objectives of the Killarney National Park, MacGillycuddy's Reeks and Caragh River Catchment SAC (000365)

In **Section 4.3**, above, it was determined which QI of the SAC (000365) was potentially exposed to adverse effect due to impacts ensuing from the proposed LRD and thus required further assessment in the NIS.

The effects of the project on the QI selected will now be assessed against the measures designed to achieve the Conservation Objectives of the site. To maintain the favourable conservation condition of the population of lesser horseshoe bats for which the site is selected, certain Attributes must be maintained in a favourable conservation status (NPWS, 2017). These Attributes and the Targets which must be met to ensure maintenance of the species' favourable conservation status are listed in **Table 4-2**, below. The table includes an assessment of the expected effect; the rationales supporting the assessments are included.

Table 4-2. Assessment of potentially significant effects to lesser horseshoe bat.

Attribute/ Measure	Target	Assessment of Potentially Significant Effects	Mitigation
Population per roost (number)	Min. & max. numbers for roosts including minimum of 176 in winter & 315 in summer for Roost ID 296	PDS is 1.5 km to the east of Roost 296. Given the intervening distance it is considered that the PD will not result in direct or indirect significant effects on the population of Roost 296 or any other roost. Significant adverse effects are unlikely.	No
Winter roosts (condition) Summer roosts (condition)	No decline No decline	PDS is 1.5 km to east of Roost 296. Given the intervening distance it is considered that the PD will not result in direct or indirect significant effects on the population of Roost 296 or any other roost. There will be no direct effects on summer or winter roosts, no damage or disturbance to a roost or to the habitat immediately surrounding a roost which could lead to a decline in its condition. Significant adverse effects are unlikely.	No
Number of auxiliary roosts (number & condition)	No decline	Lesser horseshoe bats rely on a network of sites that may include satellite, transitional and night roosts along with summer and winter roost sites. Roosts may include suitable mature trees. Given the intervening distance between the PDS and the roosts, there will be no direct effects on auxiliary roosts, no damage or disturbance to a roost or to the habitat immediately surrounding a roost which could lead to a decline in its condition. Significant adverse effects are unlikely.	No

Attribute/ Measure	Target	Assessment of Potentially Significant Effects	Mitigation
Extent of potential foraging habitat (ha)	No significant decline	Proposed LRD may result in increased artificial lighting on the PFG some 300 m to the northeast of the PDS and on the corridor to it resulting in a barrier to the movement of lesser horseshoe bat. This may result in the reduction in usage of the corridor and a reduction in the availability of potential foraging habitat for bats. Significant adverse effects cannot be ruled out.	Yes
Linear features (km)	No significant loss, within 2.5 km of qualifying roosts.	The proposed LRD may result in increased artificial lighting on the PFG some 300 m to the northeast of the PDS and on the corridor to it resulting in a barrier to the movement of lesser horseshoe bat along this linear feature. This may result in the reduction in usage of the corridor and a reduction in usage of the linear feature/corridor. Significant adverse effects cannot be ruled out.	Yes
Light pollution (lux)	No significant increase in artificial light intensity adjacent to named roosts or along commuting routes within 2.5 km of those roosts.	PDS is 1.5 km to the east of Roost 296. There will, therefore, be no significant increase in artificial light intensity (illumination or glare) adjacent to the roost. The species use the PFG some 300 m to the northeast of the PDS. Artificial lighting from the proposed LRD could create a barrier to movement thereby fragmenting habitats and disrupting commuting routes and altering commuting behaviour, reducing commuting activity. Significant adverse effects cannot be ruled out.	Yes

4.6 Assessment of Potentially Significant Cumulative Effects

As well as singular effects, the potential for in-combination or cumulative effects also need to be considered. A cumulative effect arises from incremental changes caused by another past, present or reasonably foreseeable future actions together with the development. The EC (2021) guidelines on the provision of Article 6 of the Habitats' Directive state that the phrase '*in combination with other plans or projects*' in Article 3(3) of the Habitats Directive refers to the cumulative effects due to plans or projects '*that are currently under consideration together with the effects of any existing or proposed projects or plans*.'

When in-combination impacts are assessed, it is necessary to identify the types of impacts that may ensue from the project under consideration and from other sources in the existing environment that cumulatively are likely to affect aspects of the structure and function of the relevant European sites (EC, 2021).

Other plans, projects and activities relevant to the proposed development are listed in Section 3.4, above.

4.6.1 Plans

The Kerry County Development Plan (CDP) (2022-2028), the Kerry County Council Local Authority Climate Action Plan 2024-2029 and the Killarney Municipal District LAP (2018-2024) all have the necessary environmental safeguards in place to prevent significant effects to Natura 2000 sites. Adherence to the overarching policies and objectives of the Kerry CDP (2022-2028) and any future development plans will ensure that local planning applications and subsequent planning grants will comply with the core strategy of proper planning and sustainability and with the requirements of relevant EU Directives, National Legislation and environmental considerations, thereby ensuring there is no potential for significant in combination effects on Natura 2000 sites.

It is concluded that adverse direct, indirect or secondary in-combination impacts between the Plans listed in Section 3.4.2, above, and the proposed LRD on the population of lesser horseshoe bat for which the Killarney National Park, MacGillycuddy's Reeks and Caragh River Catchment SAC is designated are not likely in view of the site's Conservation Objectives.

4.6.2 Permitted and Proposed Developments

Many of the developments listed in Table 3-4, above, are either one-off dwellings or comprise modifications to existing structures which are unlikely to comprise plausible impact sources of a magnitude sufficient with which the proposed LRD could interact.

With regard to the other development applications identified: in light of the nature of the proposed developments and bearing in mind the assessments in Sections 4.4.1, 4.4.2 and 4.5, above, it is unlikely that the magnitude, duration or intensity of any putative impacts ensuing from these projects, would be sufficient to synergistically interact with the impacts identified in Section 4.2.

The proposed Deer Park LRD will result in a temporary increase in artificial lighting within the vicinity of the site during the construction phase, and a permanent increase in artificial light levels during the operational phase. However, implementation of the recommended mitigation measures with regard to lighting outlined in Section 5.3, below, will prevent any adverse effects on the lesser horseshoe bat population for which the SAC is designated. With regards the possibility of in-combination lighting impacts on lesser horseshoe bat populations, the proposed LRD (KCC: 2660718) granted for the site adjacent to the PDS (see Table 3-4, above) submitted a screening for AA report which found no potential for significant impacts to lesser horseshoe bat resulting from any increase in artificial lighting for the granted LRD (MOR, 2026). Therefore, there is no potential for any in-combination effects to arise with regards the effects of artificial lighting on the lesser horseshoe bat population that the proposed Deer Park LRD may give rise to.

It is concluded, therefore, that adverse direct, indirect or secondary in-combination impacts between the developments listed in Table 3-4, above, and the proposed LRD on the population of lesser horseshoe bat for which the Killarney National Park, MacGillycuddy's Reeks and Caragh River Catchment SAC is designated are not likely in view of the site's Conservation Objectives.

4.6.3 EPA-Licenced/Registered Facilities

There are no plausible impact sources of light from any of the EPA Licenced/Registered facilities, identified in Section 3.4.4, above, with which the proposed LRD could interact to create or cause in-combination impacts on the population of lesser horseshoe bat for which the SAC is selected. Therefore, in-combination impacts with the EPA licenced facilities are not likely.

It is concluded that adverse direct, indirect or secondary in-combination impacts between the EPA Licenced/Registered facilities, listed in Table 3-5, above, and the proposed LRD on the population of lesser horseshoe bat for which the Killarney National Park, MacGillycuddy's Reeks and Caragh River Catchment SAC is designated are not likely in view of the site's Conservation Objectives.

4.6.4 Existing Land-use and On-going Activities

No in-combination impacts are predicted with the existing land-use and on-going activities listed in Section 3.4.5, above. In general, agricultural activities result primarily in increased nutrient/sediment run-off to watercourses and habitat loss or fragmentation within the landscape via removal of hedgerows, treelines and other landscape features. With regard to the range of services provided and the levels of human activity in Killarney town resulting from the town's status as a major tourism destination: in general, while there are seasonal and even daily

variations in the levels of visitor activities, none of these activities, either individually or collectively, could affect the conservation condition of any of the QI habitats and species for which the SAC is selected.

It is concluded that adverse direct, indirect or secondary in-combination impacts between the existing land-use and on-going activities listed in in Section 3.4.5, above, and the proposed LRD on the population of lesser horseshoe bat for which the Killarney National Park, MacGillycuddy's Reeks and Caragh River Catchment SAC is designated are not likely in view of the site's Conservation Objectives.

5. Mitigation

5.1 Retention and Protection of Key Linear Features

Boundary vegetation, particularly along the northern and north-western site boundaries adjoining the golf course and associated green infrastructure, represents the principal ecological resource within the site for commuting and foraging bats. To prevent fragmentation of flight lines and maintain ecological functionality, the following measures are recommended:

- Retain existing boundary treelines and hedgerows wherever possible, particularly along the northern and north-western site boundaries.
- Where removal of sections of vegetation is unavoidable, implement compensatory planting using native species to maintain connectivity.
- Reinforce existing gaps in boundary vegetation with native broadleaf planting to maintain continuous linear features suitable for use by commuting bats.
- Any works in proximity to retained trees and hedgerows should follow tree protection guidelines (e.g. BS 5837).

Retention of these features will ensure continuity of established commuting routes and maintain current levels of lesser horseshoe bat activity across the site.

5.2 Compensatory Planting and Habitat Enhancement

Where tree or hedgerow vegetation removal is required as part of the development, compensatory planting should be undertaken to maintain ecological connectivity and foraging opportunities:

- Replace any removed trees or hedgerows with native broadleaf species such as oak (*Quercus* spp.), birch (*Betula* spp.), rowan (*Sorbus aucuparia*), hazel (*Corylus avellana*), hawthorn (*Crataegus monogyna*), blackthorn (*Prunus spinosa*) or willow (*Salix* spp.).
- Establish continuous native hedgerow planting along new boundaries where existing vegetation cannot be retained.
- Incorporate a mix of tree, shrub and understorey planting to increase structural diversity and support invertebrate abundance for foraging bats.
- Manage newly planted areas without the routine use of fertilisers or herbicides to encourage healthy communities of natural ground flora and invertebrate species.

5.3 Lighting Design and Dark Corridors

Artificial lighting has the potential to impact bat activity, particularly along boundary vegetation used for commuting and foraging. To minimise impacts:

- All lighting should follow BCT's Guidance Note 08/23: *Bats and Artificial Lighting at Night* (BCT, 2023).
- Maintain dark corridors along retained boundary vegetation, particularly along the northern and northwestern boundaries.
- Use full cut-off, low-intensity luminaires with warm colour temperatures (<2700K) where lighting is required.
- Direct lighting away from treelines, hedgerows and retained or newly planted ecological corridors.
- Avoid column lighting adjacent to boundary vegetation where possible; use low-level or directional lighting where illumination is required for safety.
- Implement lighting curfews, dimming or motion sensors where operationally feasible.

Sensitive lighting design will ensure that current bat activity patterns are maintained and that commuting routes remain functional.

5.4 Protection of Trees with Bat Roost Potential

A small number of trees within the site were identified as having Low to Moderate bat roost potential. While no roosts were confirmed during surveys, these features should be treated with precaution:

- Trees identified as having bat roost potential should be retained where possible.
- Where removal is required, pre-felling bat surveys to be undertaken by a suitably qualified bat ecologist.
- Pre-felling inspections should be timed appropriately and undertaken within 24–48 hours of removal.
- If a bat roost is identified, works must cease and consultation with NPWS undertaken to determine licensing requirements.
- Where no roosts are identified, felling should proceed using soft-felling techniques under ecological supervision.

5.5 Construction Phase Safeguards

To minimise disturbance to foraging and commuting bats during construction:

- Restrict night-time construction lighting and ensure any required lighting is directional and fully baffled.
- Avoid unnecessary lighting of retained boundary vegetation.
- Protect retained trees and hedgerows using appropriate protection measures in accordance with BS 5837.
- Maintain connectivity along retained boundary vegetation throughout the construction phase.

6. Residual Impacts

Based Residual impacts are impacts that remain, once mitigation has been implemented or, impacts that cannot be mitigated. Provided that the mitigation measures outlined in Section 5, above, are implemented in full, it is not

expected that adverse effects on the population of lesser horseshoe bat for which the Killarney National Park, MacGillycuddy's Reeks and Caragh River Catchment SAC is selected, will arise. Thus, it is not expected that the construction and operation of the proposed Deer Park LRD will have adverse effects on the integrity of the SAC.

7. Appropriate Assessment Conclusion

Based on the results of the 2025 bat surveys, residual effects on lesser horseshoe bats are assessed as not significant, provided that the mitigation and best-practice measures outlined in Section 5 are fully implemented. Lesser horseshoe bat use the PDS primarily for foraging and commuting along boundary treelines and hedgerows, with negligible roosting value and limited use of the agricultural grassland interior. Boundary vegetation, particularly along the northern and northwestern site boundaries adjoining the golf course and associated green infrastructure, represents the principal ecological resource within the site for commuting and foraging bats. Retention of these features will maintain ecological connectivity and avoid any net change to established commuting routes and foraging behaviour. Where limited removal of vegetation is required to facilitate development, this should be offset through appropriate compensatory planting of native species to ensure continuity of habitat structure.

Provided that the proposed development is constructed and operated in accordance with the final design, and that all external lighting follows Bats and Artificial Lighting at Night: Guidance Note 08/23 (BCT, 2023), significant effects on lesser horseshoe bat are not anticipated. Sensitive lighting design, retention and enhancement of boundary vegetation, and precautionary protection of trees with potential roost features will ensure that the ecological functionality of the site for lesser horseshoe bat is maintained. With these measures in place, significant residual ecological effects on lesser horseshoe bat populations of the Killarney National Park, MacGillycuddy's Reeks and Caragh River Catchment SAC arising from either the construction or operational phases of the proposed development are unlikely to occur.

It has been objectively concluded, following an examination, analysis and evaluation of the relevant information, including in particular the nature of the predicted impacts from the proposed Deer Park LRD and with the implementation of the mitigation measures proposed, that the proposed Deer Park LRD will not adversely affect (either directly or indirectly) the integrity of any Natura 2000 site, either alone or in combination with other plans or projects, and there is no reasonable scientific doubt in relation to this conclusion.

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Appendix 1

Stages of Appropriate Assessment

Stage 1 - Screening

This is the first stage of the Appropriate Assessment process and is undertaken to determine the likelihood of significant direct and indirect effects on Natura 2000 sites, in light of their conservation objectives, because of a proposed project or plan, individually or in-combination with other plans or projects. It determines the need for a full Appropriate Assessment.

If it can be concluded that no significant direct and indirect impacts to Natura 2000 Sites are likely, in light of their conservation objectives, either individually or in-combination with other plans or projects, then the assessment can stop here. If not, it must proceed to Stage 2 for a more detailed assessment.

Stage 2 - Natura Impact Statement (NIS)

The second stage of the Appropriate Assessment process assesses the impact of the proposal (either alone or in combination with other projects or plans) on the integrity of the Natura 2000 Site(s) with respect to the conservation objectives of the site(s) and its ecological structure and function. This is a much more detailed assessment than Stage 1. A Natura Impact Statement containing a professional scientific examination of the proposal is required and includes any mitigation measures deemed necessary to avoid, reduce or offset negative impacts.

If the outcome of Stage 2 is negative i.e. adverse impacts to the Natura 2000 site(s) cannot be scientifically ruled out, despite mitigation, the plan or project should proceed to Stage 3 or be abandoned.

Stage 3 - Assessment of alternative solutions

A detailed assessment must be undertaken to determine whether alternative ways of achieving the objective of the project/plan exists.

Where no alternatives exist, the project/plan must proceed to Stage 4.

Stage 4 - Assessment where no alternative solutions exist and where adverse impacts remain

The final stage is the main derogation process examining whether there are imperative reasons of overriding public interest (IROPI) for allowing a plan or project to adversely affect a Natura 2000 Site where no less damaging solution exists.

Appendix 2

Bat Survey Report

MWP

Bat Assessment and Survey Report

Deerpark Large-scale Residential Development (LRD) at Ardshanavooly, Killarney, County Kerry

Ross-Park Residential HS Limited

February 2026

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Project No.	Doc. No.	Rev.	Date	Prepared By	Checked By	Approved By	Acceptance Code / Status
25123	25123-ZZ-ZZZ-RP-MWP-EN-6010	A	26/02/2026	Rob Beer	Hazel Dalton	Rob Beer	FINAL

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1. Summary

- A suite of bat surveys was conducted at the site of a proposed Residential Development at Deerpark, Killarney, Co. Kerry
- Surveys comprised of a bat foraging and commuting habitat suitability survey, preliminary roost assessment (PRA), passive automated bat (PAB) surveys, and night-time bat walkover surveys (NBW) undertaken between May and August 2025.
- The Proposed Development site comprises predominantly improved grassland of limited intrinsic ecological value, bounded by treelines and hedgerows which provide the principal habitat resource for commuting and foraging bats.
- A total of fifteen trees were subject to PRA. Three trees (T1, T6 and T7) were identified as having Moderate to High potential to support roosting bats due to the presence of features such as knot holes, splits and dense ivy cover. No confirmed roosts were identified during surveys.
- Static detector surveys recorded a bat assemblage typical of mixed agricultural and suburban edge habitats, dominated by common pipistrelle, with regular activity from soprano pipistrelle and Leisler's bat, and lower levels of activity from *Myotis* spp., brown long-eared bat and Nathusius' pipistrelle. Lesser horseshoe bat was recorded only at very low levels.
- Bat activity was largely concentrated along site boundary vegetation, particularly along treelines and hedgerows bordering semi-natural habitats to the north and north-west. The interior improved grassland supported comparatively low levels of activity and was used primarily for occasional commuting flights.
- The site is considered to be of Low to Moderate value for foraging and commuting bats at a local level. It does not represent core habitat for lesser horseshoe bat and does not support confirmed roosts.
- Provided that existing boundary vegetation is retained where possible, lighting is designed sensitively, and any trees with bat roost potential are subject to appropriate pre-construction checks where removal is required, the proposed development is unlikely to result in significant adverse effects on local bat populations.

2. Introduction

Malachy Walsh and Partners, Engineering and Environmental Consultants (MWP), was commissioned by Vision Contracting Ltd the 'Applicant', to undertake bat surveys at the location of a proposed Large Residential Development (LRD) at Deerpark, Killarney, Co. Kerry (hereafter referred as the 'Proposed Development').

See **Figure 1**, below for the location of the proposed development site. See **Figure 2**, below for proposed development site boundary.

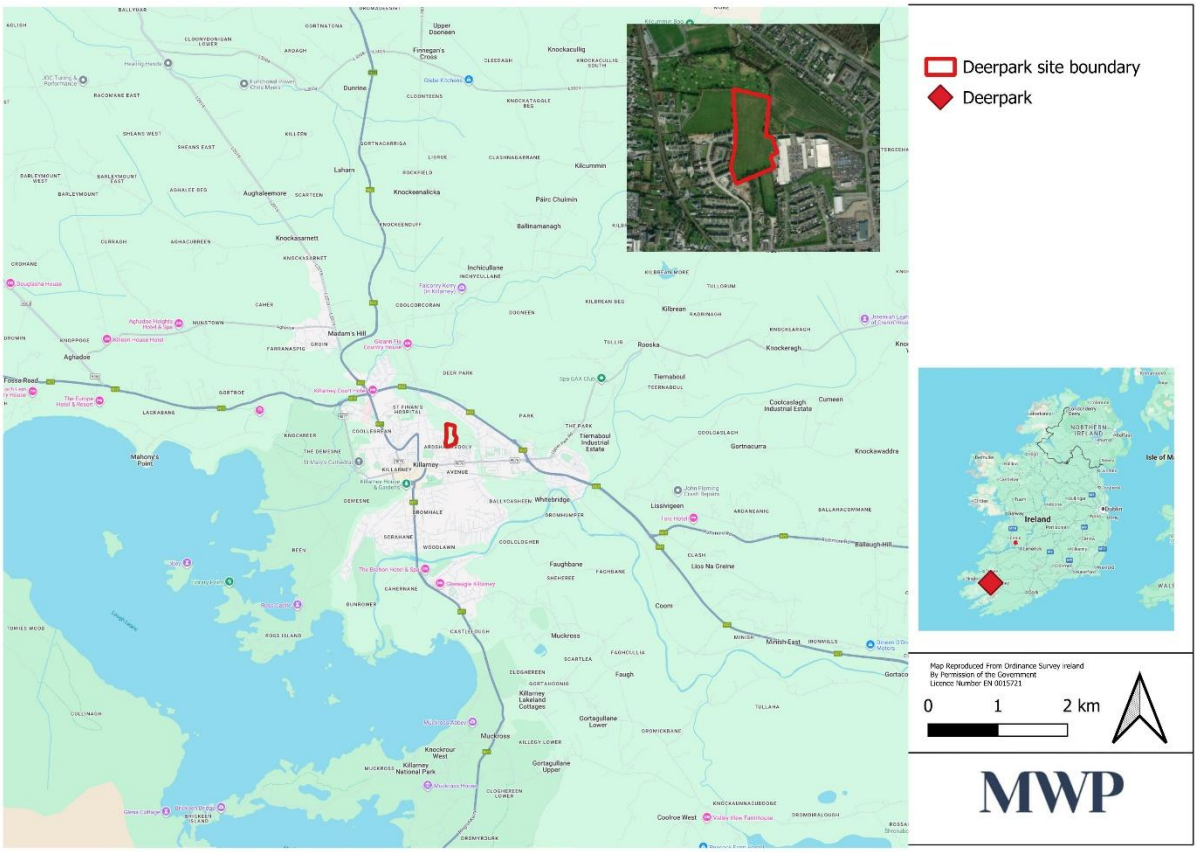


Figure 1: Approximate location of the proposed development site within County Kerry.



Figure 2: Proposed development site boundary.

2.1 Purpose of the Surveys and Report

The suite of bat surveys was undertaken at the proposed development site at Deerpark, Killarney, Co. Kerry, to identify which bat species occur within the site, to quantify their level of activity, and to assess the spatial and temporal distribution of this activity across the site. The surveys also aimed to identify any valuable roosting, foraging, or commuting habitat features that may be present within or adjacent to the proposed development area.

The main objectives of the bat surveys were as follows:

- To establish the type and level of bat activity occurring within the proposed development site in terms of the species present;
- To determine the spatial and temporal distribution of bat activity across the site;
- To assess the presence of any bat roosts or potential roosting features within trees, buildings, or other structures on site;
- To identify foraging and commuting habitat features of value to bats within the site and the surrounding landscape;
- To collect sufficient data to enable an assessment of the potential impacts of the proposed development on bats and to inform the design of appropriate mitigation, enhancement, and monitoring measures; and

- To provide sufficient information to the planning authority to assist in the consideration of the proposed development in accordance with relevant legislation and policy.

While a range of published survey guidelines were reviewed (refer to **Section 2.4**), the approach to survey design was tailored to the site-specific characteristics of the Deerpark development lands and the objectives outlined above. The results of the surveys, presented in **Section 6**, form the basis for the assessment of potential impacts on bat species and their habitats arising from the proposed residential development, as discussed in **Sections 7 and 8** of this report. Further details on survey design and methodology are provided in **Section 5**.

2.2 Statement of Competency

This report was authored by Rob Beer (BSC, MRSB). Rob is a Senior Ecologist with nine years full-time experience, since graduating in 2017. Rob has recently joined MWP and had previously been working in the UK. Rob is experienced in a range of standard and complex ecological surveys in accordance with British standards, including but not limited to, UK habitat classification surveys and JNCC Phase 1 surveys, Biodiversity Net Gain (BNG) metric and reporting, bat surveys (stages 1 & 2), reptile surveys, badger surveys, & great crested newt (GCN) surveys. Rob is a holder of a Natural England bat license level 2, a holder of a Natural England GCN license level 1 and has a FISC level 2 certificate. Rob also held a NPWS bat survey license (DER/BAT 2025-213) which was valid during the whole survey season conducted during 2025. Rob also has extensive experience with ecological clerk of works (EcOW) for a range of species across diverse project types, from small householder projects to large infrastructure projects such as rail and road schemes. This includes conducting supervisions and overseeing licenced works in relation to bat, badger and GCN. Rob has extensive experience in bat related work and historically volunteered with a number of different bat groups in the UK; this has enabled him to gain a vast amount of experience in all types of bat surveys and work. In addition to his experience with stage 1 and 2 surveys he has also been part of numerous hibernation roost surveys, and other roost counts/inspections where he is proficient in the use of endoscopes and hand netting, and the handling of bat species. Rob also undertook the bat sonogram analysis and compiled and tabulated data from the static surveys and NBW's undertaken.

Field work was conducted by Rob, Orla van der Noll (MSc., BSc.), Deirdre O'Brien (BSc), Fiona Mckenna (BSc), Maureen Kelliher (BSc) and Petr Dobes.

Orla is an Ecologist at MWP with experience in consultancy since 2021. She has completed numerous ecological reports including bat impact assessments, screening for AA reports, Natura Impact Statements (NIS), and EcIA reports for a range of projects across Ireland. Orla has strong ecological field survey skills, particularly in ornithology, bats and aquatics. In 2020 she qualified with a first-class honours master's degree in Marine Biology from Bangor University in Wales, after graduating from University College Cork in 2018 with a Bachelors (Hons) degree in Ecology and Environmental Biology. Orla has experience in bat related work including preliminary roosts assessments (PRAs), emergence surveys, night bat walkover (NBW) surveys, and sonogram analysis of bat data. Orla volunteered with the Vincent Wildlife trust (VWT) in 2024 conducting lesser horseshoe roost surveys in south Kerry and has experience as an ECoW during roof works at a maternity bat roost in 2021. She also holds a T-permit under the British Trust for Ornithology (BTO) ringing scheme in Ireland since January 2022. Orla is registered with the Chartered Institute of Ecology and Environmental Management (CIEEM) as a Qualifying member working towards an Associate membership.

Deirdre has been working with MWP since 2018. During that time, she has carried out field work which included invasive species survey's, bird surveys, freshwater macroinvertebrate sampling and identification, (sensu Q' value assessment), collection of water samples and assistance with freshwater pearl mussel survey. She has also gained experience in standard field survey methodologies including mammal surveying and habitat mapping. She has been formally trained in Stage 1 and Stage 2 freshwater pearl mussel Surveying (Dr. Evelyn Moorkens). She has

acquired experience in the completion of Appropriate Assessment (AA), Natura Impact Statement (NIS) and Ecological Impact Assessment (EcIA). She has experience with general ecological report writing and has helped complete numerous reports for bird survey work and is experienced in the collation of data and in field ecology survey techniques.

Fiona is an Ecologist working with MWP for over 6 years. Fiona graduated in 2019 from Munster Technological University – MTU (formerly Institute of Technology Tralee (IT Tralee)) after completing a degree in Wildlife Biology. She has completed numerous reports for Screening for Appropriate Assessment (AA), Natura Impact Statements (NIS), Ecological Impact Assessment (EcIA) and Biodiversity chapters for EIAR. She has also authored and contributed to a number of reports for ornithological and bat survey work. Fiona is experienced in the field and has conducted surveys in relation to birds, mammals and bats.

Maureen has over 2 years in ecological consultancy. She has authored and co-authored a number of dedicated protected species reports for terrestrial and aquatic species. In 2023 Maureen qualified with a Bachelor of Science (Honours) in Wildlife Biology from Munster Technological University (MTU). She was involved in data collection for the Environmental Protection Agency (EPA) biological monitoring of rivers in 2022 and 2024 as part of a Water Framework Directive (WFD) water quality monitoring programme. This included the identification of aquatic macroinvertebrates, phytobenthos sampling and preservation, and River Hydromorphology Assessment Technique (RHAT) surveys and was responsible for drafting the EPA River Assessment Value Report for Hydrometric Area 25 and 06. Maureen is an accredited Stage I and Stage II surveyor for freshwater pearl mussel *Margaritifera margaritifera* and white-clawed crayfish *Austropotamobius pallipes* and has relevant survey experience throughout Munster and Leinster, including electrofishing for salmonids *Salmo* spp. and lamprey *Lampetra* spp.

Petr, a graduate of Kerry College's Ecology program, has been a valuable member of MWP's Ecological team since May 2023. As a qualifying member of the CIEEM, he exhibits a deep commitment to environmental stewardship. Passionate about nature, Petr actively participates in Citizen Science projects, contributing to the monitoring of local wildlife and flora. He is a dedicated birdwatcher, conducting annual bird population surveys for both BirdWatch Ireland and the Irish Raptor Study Group. Petr has been formally trained in aquatic macroinvertebrate identification through the Freshwater Biological Association, Biological Water Quality Assessment using the Q-value method (Pascal Sweeney), and surveying techniques for white-clawed crayfish as well as Stage 1 and 2 freshwater pearl mussel surveys (also under Pascal Sweeney). Petr has also completed formal bat survey training with leading bat specialist Conor Kelleher.

This report was reviewed by Hazel Dalton (BSc., BBus.). Hazel is a Principal Ecologist with eleven years' experience with MWP since graduating with a first-class Honours Degree in *Wildlife Biology* from MTU in 2015. Hazel is experienced in ecological surveying and impact assessment for AA and EIAR. She has authored and contributed to numerous screening reports for AA, NIS and EcIA reports. Hazel is an experienced field ecologist with a diverse ecological survey profile including habitats and flora, mammals, bats and birds. She has held/holds National Parks and Wildlife Service (NPWS) Licences for small mammal trapping, tape lure/endoscope bird surveys, Kerry slug (*Geomalacus maculosus*) surveys, disturbance of bats/bat roosts, and photographing wild animals (badger and otter) at their resting/breeding places and bat surveys.

2.3 Scientific Nomenclature: Conventions

Species nomenclature follows the standard form of the common name, followed by the binomial, on the first instance of usage in the text or the first instance of usage in a table. Thereafter, for any subsequent usage, common names only are used.

2.4 Relevant Guidance Documents

The following guidance documents were referred to with regard to initial and on-going bat survey design throughout the survey period, and ecological evaluation, impact assessment and mitigation design with regard to bats:

- '*Bat surveys for Professional Ecologists: Good Practice Guidelines (4th edition)*'. Bat Conservation Trust, London. (Collins, 2023).
- '*Bats and Artificial Lighting at Night. Guidance Note 08/23*'. Bat Conservation Trust. (BCT, 2023)
- '*Bat mitigation guidelines for Ireland v2'*. Irish Wildlife Manuals, No. 134. National Parks and Wildlife Service. (Marnell, *et al*., 2022).
- '*Best Practice Guidelines for the Conservation of Bats in the Planning of National Road Schemes*'. (NRA, 2006)
- '*Guidelines for the Treatment of Bats During the Construction of National Road Schemes*'. (NRA, 2005)

3. Bat Ecology and Behaviour

3.1 Resident Species

There are nine resident bat species on the island of Ireland. These species are:

- Common pipistrelle (*Pipistrellus pipistrellus*).
- Soprano pipistrelle (*Pipistrellus pygmaeus*).
- Nathusius' pipistrelle (*Pipistrellus nathusii*).
- Brown long-eared bat (*Plecotus auritus*).
- Daubenton's bat (*Myotis daubentonii*).
- Leisler's bat (*Nyctalus leisleri*).
- Lesser horseshoe bat (*Rhinolophus hipposideros*).
- Natterer's bat (*Myotis nattereri*).
- Whiskered bat (*Myotis mystacinus*).

All species are insectivores, and all use a seasonal feeding strategy to help build fat reserves during the summer and autumn, before hibernation during winter - a time, generally, when insects are not available. Most species hunt their prey in flight, but some such as the lesser horseshoe bat or Daubenton's bat, glean their prey from surfaces of leaves or water on which the prey have alighted.

All species hibernate during winter and typically become active in late spring and early summer. As the days and nights warm up each species flies out to forage for insects, for progressively longer periods, at night. Around late June or early July, pregnant females give birth to a single offspring which feeds on its mother's milk for 6-7 weeks at which point it can fly and learns to echolocate and to catch its own prey.

Mating takes place from August onwards. However, the female engages in a behaviour known as delayed fertilisation whereby she retains the sperm of her mate throughout the winter months, thereby, delaying ovulation, fertilisation and pregnancy until spring the following year.

For individual species accounts please refer to **Appendix 1**.

3.2 Legal and Conservation Status of Bat Species in Ireland

All Irish bat species are protected under the Wildlife Acts 1976 to 2023[1] which protects rare species, including bats, and their roosts. All bat species are listed under Annex IV of the EU Habitats Directive[2]as species protected across their entire natural range. The lesser horseshoe bat is afforded an additional level of protection and is listed under Annex II as a species for which core areas of their habitat must be protected within the Natura 2000 network of protected sites. Under Regulation 51 of the European Communities (Birds and Natural Habitats) Regulations 2011-2021in regard to the animal species listed in Annex IV of the EU Habitats Directive, any person(s) who undertakes any of the following shall be guilty of an offence:

- deliberately captures or kills any specimen of these species in the wild,
- deliberately disturbs these species particularly during the period of breeding, rearing, hibernation, and/or migration,
- deliberately takes or destroys eggs of those species from the wild,
- damages or destroys a breeding site or resting place of such an animal, or
- keeps, transports, sells, exchanges, offers for sale, or offers for exchange any specimen of these species taken in the wild, other than those taken legally as referred to in Article 12(2) of the Habitats Directive.

Any works interfering with bats, and especially their roosts, may only be carried out under a Derogation Licence granted via the NPWS pursuant to Regulation 54 of the European Communities (Birds and Natural Habitats) Regulations 2011 (which transposed the EU Habitats Directive into Irish law).

Across Europe, bats are further protected under the Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention 1982), which, in relation to bats, exists to conserve all species and their habitats. The Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention 1979) was instigated to protect migrant species across all European boundaries. The Irish government has ratified both these conventions.

Under Article 11 of the EU Habitats Directive, each Member State is required to undertake surveillance of the conservation status of the natural habitats and species listed within the Annexes and, under Article 17, to report to the European Commission every six years on their status and the implementation of measures taken under the Directive.

Ireland submitted its most recent Article 17 conservation status assessments to the European Commission in 2025. The latest assessments indicate that the majority of Ireland's bat species are currently considered to be of favourable conservation status at a national level. Lesser horseshoe bat *Rhinolophus hipposideros* remains classified as unfavourable–inadequate, reflecting ongoing pressures relating primarily to roost availability and landscape connectivity.

[1] Collective citation for the following: Wildlife Act 1976 (no. 39 of 1976); Wildlife (Amendment) Act 2000 (no. 38 of 2000); Wildlife (Amendment) Act 2010 (no. 19 of 2010); Wildlife (Amendment) Act 2012 (no. 29 of 2012); Heritage Act 2018 (no. 15 of 2018), Part 3 and Planning, Heritage and Broadcasting (Amendment) Act 2021 (no.11 of 2021), Chapter 3.

[2] Council Directive 92/43/EEC

These national conservation status trends provide important legislative and ecological context for the assessment of bat populations at a local scale but do not replace the need for site-specific survey and evaluation. The most recent published conservation status assessments for Irish bat species (NPWS Article 17 reporting cycle, 2025) are summarised in Table 1 below; the trend in the Conservation Status for each is included.

Table 1: Overall assessment of conservation status for bat species resident in Ireland (NPWS, 2025)

Species	Conservation Status	Overall trend in Conservation Status
Brown long-eared bat	Favourable (FV)	Improving
Common pipistrelle	Favourable (FV)	Improving
Daubenton's bat	Favourable (FV)	Improving
Lesser horseshoe bat	Unfavourable-Inadequate (U1)	Deteriorating
Leisler's bat	Favourable (FV)	Improving
Nathusius' pipistrelle	Unknown (X)	N/A
Natterer's bat	Favourable (FV)	Stable
Soprano pipistrelle	Favourable (FV)	Improving
Whiskered bat	Favourable (FV)	Stable

3.3 Habitat Associations

During the summer, bats generally emerge from their roosts at dusk and, while foraging distances vary considerably between individual species, all are known to use several different foraging sites in the same night and to move between them to locate areas of high insect density.

The interplay between habitat mix, environmental conditions, topography, elevation, and availability of prey is a key determinant of whether a location is suitable for bats, as is the intervening distance between a location and the roost sites of species Each bat species has a strong preference for certain habitat types and will exhibit high levels of site fidelity by frequently returning to the same foraging sites night after night (Entwistle *et al.*, 2001), a trait that is reinforced over years or even decades via intergenerational learning within bat colonies. Juvenile bats can hunt independently within weeks of their birth and will, therefore, acquire knowledge of foraging site locations prior to their first hibernation period. Reliability of supply of prey biomass is foundational to each species' capacity to maintain populations at viable levels (see also Section 3.5, below).

Table 2, below, lists and ranks the importance of certain landscape features to bats for roosting/foraging and commuting (used to travel between other areas of importance). Table 3 lists the types of features commonly selected as roost sites, the species typically associated with each roost-type, and the relative frequency with which each species selects each feature.

Table 2: Landscape features and their ranks of importance to bat species[3]

Features of high importance	Features of medium importance	Features of low importance
Underground sites	Improved pastureland	Intensively farmed arable sites
Buildings with high bat roost potential	Drainage ditches	Dense urban areas, particularly artificially lit areas
Broadleaved woodland and scrub	Walls and fences	
River valleys	Minor roads (no hedges)	
Small field systems with low-intensity pasture	Exposed upland sites	
Treelines and hedgerows	Coniferous woodland	
Some bridges and structures		

Table 3: Species' associations with different roost types[4]

Species	Trees[5]		Buildings[6]		Underground[7]	
	Maternity	Hibernation	Maternity	Hibernation	Maternity	Hibernation
Lesser horseshoe bat	L	L	H	M	L	H
Daubenton's bat	M?	L?	M	L	M?	H
Whiskered bat	M?	M?	H	L	N	H
Natterer's bat	M?	M?	H	L	L	H
Nathusius' pipistrelle			H?			
Common pipistrelle	M	M	H	H	N	L
Soprano pipistrelle	M	M	H	H	N	L
Leisler's bat	M	M	H	L	N	N

[3] Adapted from the UK Department of Transport Interim Advice Note 116/08 Nature Conservation Advice in Relation to Bats

[4] Species associations with roost types [adapted from Kelleher *et al*. (2006) and Marnell *et al*., (2022)]. **N** – not recorded in recent times. **L** – low dependence; unusual but has been recorded. **M** – some usage recorded, though perhaps not the most important type of site. **H** – the most frequently recorded type of site for this species/activity.

[5] **Trees** – includes all types of crevice and hollows as well as bat-boxes attached to trees.

[6] **Buildings** – above-ground areas, with an emphasis on roof voids and other areas warmed by the sun.

[7] **Underground** – anywhere that provides cool humid conditions buffered against rapid temperature change. Includes caves, mines, tunnels, souterrains, fortifications, cellars, icehouses, limekilns, etc.

Species	Trees[5]		Buildings[6]		Underground[7]	
	Maternity	Hibernation	Maternity	Hibernation	Maternity	Hibernation
Brown long-eared bat	H	H	H	H	N	M

3.4 Distribution of Prey

At any location, the abundance of flying insects is heavily influenced by, inter alia, wind speed (Møller, 2013). Small insects generally tend to settle in areas with low wind speeds because control and manoeuvrability of flight are optimised where wind speeds are lower than the insect's flight speed (Pasek, 1988). Therefore, within any established foraging ground, existing windbreaks such as treelines, vegetated field - or roadside - boundaries, and woodland edges create sheltered corridors where concentrations of insects accumulate leeward of these windbreaks, particularly in comparison with adjacent unsheltered areas. Within these sheltered corridors the patterns of distribution will be affected by wind speed, angle of incidence of the wind, permeability of the windbreak, turbulence, vegetative composition, and source of insects (windbreak, local fields, upwind sites) (Pasek, 1988). Bats will know from experience and repetition where insects are likely to be more abundant and will return to these areas. As a result of these variables, bats can be unevenly distributed within any given area due to the influence of localised conditions even on small scales (de Jong & Ahlén, 1991).

3.5 Metabolic Constraints

Two fundamental behavioural characteristics impose a high metabolic cost on all bat species: flight and the use of acoustic signalling to navigate, hunt, and communicate. As true fliers rather than gliders, bats use flapping flight which is one of the most expensive activities in terms of metabolic cost (Winter & Von Helversen, 1998). In addition, the metabolic costs of acoustic signalling are approximately eight times that of a silent animal (Ophir *et al.*, 2010), and the cost of echolocation can be even higher. As a group, therefore, bats have evolved to favour minimal mass because of the energetic demands of flight, hunting, and communication and have developed behaviours that minimise other metabolic costs.

The wing of a bat resembles a modified human hand with a flexible skin membrane that extends between each long finger bone, and it is the many movable joints that make bats agile fliers. Due to their thin wing membrane, flying during daylight hours could be hazardous to bats and cause excessive heat absorption that results in dehydration and possible heat prostration. Nocturnality offers protection from the heat and helps bats maintain optimal body temperature and hydration. It also affords protection from aerial predators, most of which hunt during the day.

Even though they share the characteristics of all mammals - hair, regulated body temperature, the ability to bear live young, and to nurse them - bats are the only mammals to truly fly. Flying consumes so much energy that each female bat is only able to produce a single offspring each year, and a bat typically will need to consume about a third of its body weight in food per night. As insectivores, bats in Ireland feed on arthropods whose exoskeletons contain chitin, an energy-rich carbohydrate indigestible within atypical mammalian gastrointestinal tract. However, European vespertilionid bat species have evolved an enzymatic adaptation (acidic mammalian chitinase) which enables them to digest the chitin present in their primary source of food to optimize resource use and energy intake (Strobel *et al.*, 2013).

This high metabolic demand is a key determinant in the foraging strategies of all bat species. Speculative foraging carries too low a risk/reward ratio in that the metabolic costs of flight and echolocation are so high that bats will seek out locations that have previously rewarded energy cost inputs. This aspect of their behaviour is demonstrated by the previously mentioned high level of site loyalty exhibited by bat species and the repeated return to the same foraging sites night after night (Entwistle *et al*., 2001). In addition, because the cost of flight increases with decreasing body size, de Jong (1994 cited in Erickson & Adams, 2003) hypothesised that smaller bats with slower flight could be restricted from using habitats where insect abundance was low and long-distance foraging flights were required.

Differences in nightly activity levels can be due to climatic conditions, insect availability, or interspecies morphological differences. Cooler and windier nights tend to suppress the flight activity of bats (Anthony *et al*., 1981; O'Farrell, 1967; Stebbings, 1968; all cited in Erickson & Adams, 2003) by imposing thermoregulatory stress and by reducing the activity of their insect prey. Strong winds can also increase the cost of flight and can affect the net energy gain for foraging bats (Weimerskirch *et al*., 2012; cited in Møller, 2013).

3.6 Audio Signature

Bats have evolved to be nocturnally active and, therefore, use echolocation, a form of acoustic signalling, for sensing the environment and to orientate and forage at night. Echolocation involves the production of pulses of high-frequency sound, usually in the ultrasound range above 20 kHz, and the detection of the returning echoes with acutely sensitive ears. By comparing the outgoing pulse with the returning echoes — which are modified versions of the outgoing pulse — their brains can assemble dynamic images of the surroundings including the size, shape, distance, and motion of their prey - the location of which can be determined, in three dimensions, from its range and direction (Jones, 2005).

Each bat species uses echolocation in an individualised manner adapted to its preferred habitat and flight behaviour. Species that fly at higher altitudes emit signals over a long-range, i.e., long signals that sweep through a narrow spectrum, which enable them to retrieve information from further away. Conversely, species that hunt where obstacles are likely to be quite near, or that glean their prey from surfaces, such as Daubenton's bat and lesser horseshoe bat, do not need to emit intense pulses because of proximity.

3.7 Species Detectability using Acoustic Equipment

Due to the species usage of echolocation in an individualised manner the detectability of each depends mainly on two factors:

- the abundance of the species and its ubiquity in the area surveyed.
- the intensity of its echolocation signals.

As a result, the probability of acoustic detection varies from species to species, and this probability is also influenced by the acuity of the microphones in the units used for detection. Each species' intensity of emission is characterised in Error! Reference source not found. below; the detection range is also included.

Table 4: Intensity of emission and detection range ('open' to 'semi-open' environment)[8]

Intensity of emission	Species	Detection Range (m)
Very weak	Lesser horseshoe bat	5
	Whiskered bat	5
	Daubenton's bat	10
	Natterer's bat	15
Medium	Brown long-eared bat	20
	Common pipistrelle	25
	Nathusius' pipistrelle	25
	Soprano pipistrelle	25
Strong[9]	N/A	N/A
Very strong	Leisler's bat	80

4. Brief Description of the Proposed Works

The proposed development comprises a Large-Scale Residential Development (LRD) consisting of a total of 186 no. residential units and an ancillary crèche, together with associated infrastructure, landscaping, and site development works.

5. Methodology

5.1 Desk Study

A desk study was carried out to collate available information on the bat species likely to be present in the study area. This comprised a review of the following publications, datasets, and on-line resources:

- OSI Aerial photography and 1:50,000 mapping.
- NPWS website, map-viewer and datasets available on-line.
- Bat Conservation Ireland (BCIreland) publications, and website.
- The Bat Conservation Trust (BCT) publications and website.
- National Biodiversity Data Centre (NBDC) (on-line map-viewer).

[8] Adapted from Barataud (2020)

[9] No species in this category are resident in Ireland.

- Aerial imagery available at Google Earth, EPA Maps and Bing Maps.
- Other information sources and reports footnoted in the report.

5.1.1 Database Searches

NPWS Database and NBDC Database

The on-line dataset record distribution for known lesser horseshoe bat roosts retained by NPWS was checked for records of lesser horseshoe bat roosts in the area[10]. In addition, the NBDC on-line database for all Irish bat species was checked for records within a 10 km radius of the site.

Bat Habitat Suitability Index

The desk study included a preliminary assessment of the availability of landscape features of importance to bats within the study area or within the geographical area extending away from it, based on the NBDC online mapping tool which includes a Bat Habitat Suitability Index (BHSI) layer[11]. This layer is derived from an analysis of the habitat and landscape associations of Irish bats compiled in Lundy *et al*. (2011). The index evaluation ratings range from 0 to 100 with 100 indicating areas considered to comprise most favourable bat habitats and 0 indicating areas considered to comprise least favourable habitats for bats. Index evaluations are available for individual species, while an overall rating is also available for a particular area for bats generally (all species combined). Ratings are mapped on the NBDC map viewer to a 2.5 km grid square resolution.

These ratings, while not predictive, provide meaningful metrics that characterise the probable ecological value of an area to bats. They are an indicator as to the likelihood that different bat species are, or are not, likely to, typically, be a significant presence in an area. The BHSI ratings can, therefore, be used to indicate the probability that bats may use an area. The BHSI ratings for the area encompassing and extending away from the study area were reviewed. For results, please refer to Section 6.

5.2 Bat Foraging and Commuting Habitat Suitability Survey

As part of the initial site walkover, any linear habitat features, such as hedgerows and treelines, were described in terms of plant species occurring, overall condition and structure and degree of connectivity within the wider landscape, in relation to evaluating their potential suitability for foraging and commuting bats. Habitat features occurring were assigned a suitability rating ranging between 'negligible', 'low', 'moderate' or 'high', as per Collins (2023).

5.3 Preliminary Roost Assessment

A preliminary survey of trees on-site (no buildings and or structures were present on site) was undertaken to identify any actual or potential bat roosts which could be either directly or indirectly impacted by the proposal. The Preliminary Roost Assessment (PRA) was conducted on the 7th of May 2025 by an experienced MWP bat surveyor (Irish bat license number: DER/BAT 2025-213; Natural England bat survey licence number 2022-10295-CL18-BAT). The survey involved an inspection of any trees found within the study area, to identify features that

[10]https://www.npws.ie/maps-and-data/habitat-and-species-data

[11] https://maps.biodiversityireland.ie/Map

could support roosting bats, and/or identify any evidence of bat activity. Survey effort, methodology, and timings were in line with those recommended in Collins (2023).

The trees were assessed in accordance with current bat survey guidance (Collins, 2023) and involved surveyors visually inspecting the exterior surface of the trees from ground level using torches and binoculars, as well as the areas of ground in the immediate vicinity.

During the PRA survey the trees were inspected for actual or potential bat entry/exit points e.g. openings, cracks and crevices, actual or potential bat roosting locations, live bats or dead specimens, or any other evidence of old or recent bat usage, such as droppings, staining, feeding remains, etc.

The search covered potential roosting features (PRFs) and areas where bat droppings may collect. Signs indicating possible use by bats include

a. Scratches and staining around an entry point;

b. Bat droppings in, around or below an entry point;

c. Squeaking noises;

d. Flies around an entry point;

e. A distinctive smell of bats; and

f. Smoothing of surfaces around a cavity.

The criteria set out in Table 5 were used to classify the potential of the trees to support roosting bats.

Table 5: Classification criteria for bat roosting potential

Category	Description
Confirmed	Tree with features confirmed to be used by roosting bats either by historic records (verified appropriately), or evidence recorded during survey.
High	Tree with highly suitable features capable of supporting larger roosts, and/or multiple roost locations. Generally, these trees are located in proximity to highly suitable foraging/commuting habitat such that the presence of a roost is considered highly probable.
Moderate	Tree exhibiting features with definite bat roost suitability, but with only one or two suitable features suitable for larger roosts, or multiple features with the suitability to be used by individual/small numbers of bats. Surrounding area includes good quality foraging habitat for bats e.g. broadleaved woodland, tree-lined watercourses and grazed parkland such that the presence of a roost is considered probable.
Low	Tree with single, or few features capable of supporting individual/small numbers of bats e.g. external roosting features such as flaking bark or knot holes, in which bats are considered less likely to be present. Or a greater number or variety of features located in sub-optimal habitat such that bats would be less likely to use it e.g. isolated from foraging or commuting habitats.
Negligible	Tree with no suitable opportunities for roosting bats, or very few or minor features in an isolated/unsuitable location such that the presence of a roost is considered highly improbable. e.g. isolated from suitable foraging or commuting habitats.

On completion of the PRA, trees were categorised as having either 'negligible', 'low', 'moderate' or 'high' suitability for roosting bats, as per Collins (2023). The results of the PRA determined whether additional survey effort was required..

5.4 Nighttime Bat Walkover (NBW) Surveys

Nighttime bat walkover surveys were undertaken on the 15th of May, 16th of June, 24th of July and 26th of August 2025 to observe bat behaviour across the site, to supplement data captured with static detectors and enable a more in-depth analysis of bat activity across the site.

The NBW surveys involved surveyors walking along predetermined transect routes with stopping points at regular intervals (approximately every 200 - 250 meters), whilst observing and recording any bat activity observed and using hand-held recording units. Data was gathered on species type, the number of bats, flight direction, flight type, and perceived behavioural responses to existing habitat features such as waterways and/or tree lines.

Surveyors used bat detection equipment to record any bats occurring and were equipped with Wildlife Acoustics – Echo Meter Touch 2 software on Samsung tablets, Batlogger M2 handheld detectors as well as Night Fox night vision googles to assist in counting any individual bats observed.

As per Collins (2023), surveys commenced at 20 minutes before sunset and continued until approximately 1.5-2 hours after sunset.

5.5 Passive Automated Bat Surveys (PABS)

The Passive Automated Bat (PAB) surveys utilise static units (units deployed at fixed sampling locations (SPs)) to record bat actively remotely. In order to gather data, proportionate to the proposed works area, static detectors were deployed at three locations across the site (Figure 3) to ensure the maximum collection of data from a range of habitats.

Surveys were undertaken using Song Meter Mini Full Spectrum bio-acoustic recording units (static bat detectors) deployed at the pre-selected SPs to capture data on the level of bat activity at the site and its spatial and temporal distribution.

Full Spectrum (FS) detectors continuously record all frequencies, typically to a very high standard, retaining call structure details on the units to allow for later analysis. Since FS detectors record sounds at the full frequency, i.e., ultrasonic sounds are not converted to a lower frequency to make them audible, they can capture, and record sound in real-time at a high level of detail. The resulting sound files are very large, so these detectors use a triggering system to ensure that recordings are made only when sounds detected are above certain frequency and amplitude thresholds.

The units deployed were programmed to begin recording half an hour before sunset each evening and to continue until half an hour after dawn the next morning, in line with Collins (2023). Before deployment, the latitude, longitude, and time zone for each survey location was inputted to each unit, after which units then automatically determined the dawn and dusk times, thereby reducing the likelihood of operator error. Each unit has an omnidirectional microphone that detects bat ultrasonic calls. Calls emitted by bats that passed within the detecting range of the units, during the period of activation, were recorded and sound files stored on internal SD cards for later analysis. All units were deployed and collected during daytime hours.

Ground-level static surveys were undertaken at the proposed development site in May, June, July, and August 2025, over 5 nights of recording within each of those months.



Figure 3: Static detector location map

5.6 Sonogram Analysis of data recorded during PABs

Post PAB surveys, the sound files were downloaded from the SD cards and converted using proprietary software[12] to produce sonograms (graphs of the sound recorded). As each species has a unique audio signature, the sonograms or graphs can be used to distinguish between one species and another. All data files that were not generated by bats e.g. background environmental noise such as bird song or rain were eliminated via the use of specific software. Once an individual bat call was identified, the recording was automatically labelled using the software tools. During an audit of all data, all non-*Pipistrellus* calls were manually verified in line with the Collins (2023) guidelines.

Not every call emitted by a bat is the echolocation call that is characteristic of the species in question. Many bat species use differently structured echolocation calls, adapted to their habitat structure or foraging situation (Miller & Degn, 1981; Fenton, 1987; Rydell, 1990; Kalko, Schnitzler & Schnitzler, 1993; Jones, 1995; all cited in Pfalzer & Kusch, 2003). In addition to echolocation calls, bats use 'social' calls which are structurally different from echolocation calls. Pfalzer *et al*. (2003) categorises these into four types, as follows: squawk, trill (repeated), cheep (curved), and song (complex). While these can readily be attributed to bats, they cannot be used to differentiate between species. Using the specialised software, any calls that match the parameters outlined in the preceding sentences are automatically designated as 'unidentified' and are reported as such in this report. Counts of

[12] Kaleidoscope Pro Analysis Software.

sonograms of this category are shown in the various output tables in Section 6.2 and in Appendix 2 under the column heading 'NoID'.

5.7 Survey Limitations

Daytime Bat Walkover Survey

This type of survey provides a snapshot of the proposed development site at the time of the survey(s) only. Bats are a highly mobile species, and they can, and do turn-up from time to time unexpectedly. All care has been taken to ensure the results and recommendations are suitable within the context of the proposed development and survey data.

Nighttime Bat Walkover Surveys

This type of survey provides a snapshot in time only and ecologists can only be in one location at any given time and therefore activity in another part of the site could be missed. To limit this, several 'loops' of the walking route were conducted across the two-hour survey period. The use of night vision aids also ensured that there was more reliability in data gathering as opposed to the use of the human eye only in poor light.

PAB Surveys

Bats will typically fly over and back along short sections of habitat if prey is readily available, and use linear features to navigate through the landscape, to and from roosts, and within foraging sites. An individual bat making multiple passes within range of a static detector can therefore be the source of many recorded calls. Therefore, the number of calls recorded is not a direct measure of the number of individuals of a particular species present. The number of calls recorded is likely to be much greater than the number of bats that generated them.

Although acoustic surveys cannot be used to determine the absolute abundance of bats, since a given individual may be recorded multiple times, the number of calls recorded can however be used as a reliable proxy for the relative levels of bat activity for species recorded and therefore the relative abundance of species in an area at the time of survey.

A minor equipment issue occurred during the August 2025 survey period, where no data were recorded at Sampling Point 2 (SP2). This was not considered a significant limitation to the assessment, as:

- comprehensive datasets were successfully collected at the remaining sampling locations during the same survey period;
- these sampling points are situated within comparable habitat types and along the same network of boundary vegetation and treelines as SP2; and
- earlier survey months (May–July 2025) recorded full datasets across all sampling locations, providing robust temporal and spatial coverage of bat activity across the site.

Taken together, the overall dataset is considered sufficient to accurately characterise bat activity patterns at Deerpark, identify key commuting and foraging features, and support a reliable impact assessment.

6. Results

6.1 Desk Study

6.1.1 NPWS Database & NBDC Database

Following a review of NPWS's Geographic Information System (GIS) database for records of lesser horseshoe bat (LHB) roosts in the area,[13] multiple confirmed LHB roost records are present within a 2.5 km radius of the proposed development site. Exact roost coordinates are not provided, as these constitute sensitive ecological data and are withheld to protect the species from potential disturbance. Instead, records are reported at the 1 km grid-square level. While several occupied grid squares occur in proximity to the site, no confirmed recent roost records are located within the 1 km grid square in which the proposed development site is situated. Historical LHB records do exist within this grid square; however, these date from 1989 and therefore do not represent recent confirmed roosting activity within the immediate site area.

In addition, protected species records for hectad V99 were requested directly from the NBDC, and manual checks of the NBDC online database were undertaken for all Irish bat species within a 10 km radius of the site. The following table provides a summary of these results.

Table 6: Summary of NBDC bat data for all Irish bat species within a 2km radius of the site

Species	Number of Records	Year (most recent)	Location (closest)	Record type
Brown long-eared bat	9	2021	Approx. 250m west	In-flight
Common pipistrelle	43	2021	Approx. 250m west	In-flight
Daubenton's bat	88	2021	Approx. 250m north	In-flight
Leisler's bat	22	2021	Approx. 250m west	In-flight
Lesser Horseshoe	98	2014	Within the same 1km grid the site is within[14]	Unspecified
Natterer's bat	3	2019	Approx. 250m west	In-flight
Soprano pipistrelle	39	2022	Approx. 250m west	In-flight
Whiskered bat	2	2021	Approx. 1km north	In-flight

6.1.2 Bat Habitat Suitability Index (BHSI)

A review of the NBDC's Bat Habitat Suitability Index (BHSI)[15] available on-line determined that for the area encompassed within the proposed development site, and the lands extending away from it, the assigned BHSI rating for 'all bats' is 36.11 out of 100, based on the analysis of the habitat and landscape associations of Irish bats

[13] https://www.npws.ie/maps-and-data/habitat-and-species-data

[14] Due to record sensitivity exact locations aren't given

[15] The BHSI consists of Geographical Information (GIS) layers that are a research outcome of a study by Lundy et al. (2011) examining the relative importance of landscape and habitat associations across Ireland. The study analysed data contained in the Irish National Bat Database, maintained by Bat Conservation Ireland and the National Lesser Horseshoe Bat database maintained by National Parks and Wildlife Service. The analysis was done for all bat species that commonly occur in Ireland.

compiled in Lundy *et al.* (2011). The maximum rating given for any individual species is 52, with a minimum rating of 16 (see Table 7 below).

On the basis of the BHSI ratings assigned for all bats and for individual species, the proposed development site and surrounding lands are considered to be of low to moderate overall value for bats.

Table 7: BHSI Rating for 2.5 km grid square encompassing and extending away from the proposed development site (adapted from NBDC on-line)

Common name	Scientific name	BHSI Rating
All Bats	-	36.11
Brown long-eared bat	*Plecotus auritus*	52
Common pipistrelle	*Pipistrellus pipistrellus*	37
Daubenton's bat	*Myotis daubentonii*	29
Leisler's bat	*Nyctalus leisleri*	39
Lesser Horseshoe bat	*Rhinolophus hipposideros*	42
Nathusius's pipistrelle	*Pipistrellus nathusii*	16
Natterer's bat	*Myotis nattereri*	36
Soprano pipistrelle	*Pipistrellus pygmaeus*	39
Whiskered bat	*Myotis mystacinus*	35

6.2 Bat Foraging and Commuting Habitat Suitability Survey

A walkover survey of the Proposed Development site was undertaken to assess the suitability of on-site and adjacent habitats to support foraging and commuting bats, with reference to vegetation structure, linear features, landscape connectivity and proximity to known roosts. Habitat suitability was evaluated in accordance with Collins (2023).

The site comprises an area of improved grassland enclosed by treelines and intermittent hedgerow to the north and west, with a commercial unit and associated carpark immediately bordering the site to the south-east. The interior grassland field is open and exposed, offering limited foraging substrate and shelter, and is therefore considered to offer low-value foraging opportunities for bats. In contrast, the boundary treelines provide sheltered flight routes and edge habitats which represent the principal bat-relevant features of the site.

To the north and west, treelines extend and connect into the wider suburban landscape and link towards areas where confirmed lesser horseshoe bat (LHB) roost grid squares occur within Killarney. These boundaries are relatively sheltered and are likely to be used by commuting and foraging bats of several species, including light-averse taxa. The eastern boundary is more fragmented and interfaces with residential development and local road lighting, reducing its functional value for light-sensitive species. To the south, the site directly adjoins a retail complex and illuminated carpark, which offer negligible foraging potential and likely act as a barrier to nocturnal movement for species sensitive to artificial lighting.

When considered in the context of the wider landscape, the site is assessed as providing moderate overall suitability for foraging and commuting bats, with functional usage expected to be concentrated along tree-lined boundaries rather than across the open field interior. These observations informed the placement of subsequent

detectors and transects, with emphasis on capturing potential commuter routes along the northern and western boundaries and testing for possible LHB movement between these features and the wider suburban matrix.

6.3 Preliminary Roost Assessment

A Preliminary Roost Assessment (PRA) was undertaken to identify the presence or likelihood of bats roosting within features located inside the Proposed Development boundary, with particular focus on mature trees along the site perimeter. The assessment was informed by a daytime walkover survey, supported by aerial imagery and desk study data.

The Proposed Development site comprises predominantly improved grassland bounded by treelines and intermittent hedgerows, with no buildings present within the red line boundary. The eastern boundary of the site is immediately adjacent to existing commercial development, including large retail buildings, car parking areas and associated artificial lighting.

A total of 15 mature trees within the Proposed Development site were subject to PRA. Trees were assessed from ground level for features of relevance to roosting bats, including cracks, splits, cavities, knot holes, loose bark and ivy cover, as well as evidence of bat use such as droppings or staining.

The majority of trees assessed were considered to be of negligible to low suitability for roosting bats, typically comprising young to semi-mature specimens or trees with only minor or poorly developed features. No bat droppings, staining, feeding remains or other evidence of bat roosting was recorded during the survey.

Three trees were identified as having moderate to high suitability for roosting bats. These included:

- Tree 1, a mature ash (*Fraxinus excelsior*) with a number of knot holes and vertical splits;
- Tree 6, a mature oak (*Quercus* sp.) with well-developed knots and splits;
- Tree 7, a mature ash with several knot holes and dense ivy cover, which limited full visual inspection.

While these features are considered capable of supporting roosting bats, no evidence of current bat use was identified at the time of survey.

Overall, the site is considered to provide limited roosting opportunity, with potential largely restricted to a small number of mature boundary trees. Boundary treelines and hedgerows may provide localised foraging and commuting habitat; however, the site lies within a semi-urban context, with existing lighting and disturbance associated with adjacent commercial land uses, which is likely to reduce the suitability of the site for light-sensitive bat species.

At the time of assessment, no tree removal was confirmed; however, should works be proposed that could affect trees identified as having moderate to high roosting suitability, further survey or precautionary measures may be required in accordance with best practice guidance.

6.1 Nighttime Bat Walkover Survey (NBW)

Night-time bat walkover (NBW) surveys were undertaken at the Deerpark site during the 2025 bat activity season to observe bat behaviour across the site, supplement information gathered during the desk study and Preliminary Roost Assessment and provide an understanding of bat foraging and commuting activity within and adjacent to the Proposed Development site.

Surveys were carried out between May and August 2025 and followed a predefined transect route with a series of stopping points (SPs) distributed across the site and along boundary features. At each stopping point, surveyors paused to observe and record bat activity using hand-held acoustic detectors. Information recorded included

species (where identifiable), number of passes, flight direction, behaviour (commuting or foraging), and associations with habitat features such as treelines and hedgerows.

In accordance with Collins (2023), surveys commenced shortly before sunset and continued for approximately 1.5–2 hours after sunset. Weather conditions during surveys were suitable for bat activity, with surveys undertaken during dry conditions and low wind speeds.

Table 8: Summary of Night-time Bat Walkover survey results (May 2025)

Date & time	Weather at Start	Weather at End	Results
Date: **15th May 2025** **Start time: 21:05** **End time: 23:05** **Sunset: 21:25**	**Temp:** 19°C **Humidity:** 59% **Moon phase:** Waning Gibbous **Wind:** None **Cloud:** 10% **Precipitation:** Dry	**Temp:** 14°C **Humidity:** 77% **Wind:** None **Cloud:** 10% **Precipitation:** Dry	Soprano pipistrelle (**SP**) passes were recorded at 21:58 commuting east to west, and again at 22:02 at stopping point 2 where feeding behaviour was observed. Additional SP passes were recorded at 22:10 and 22:14 at stopping point 3, and at 22:38, 22:39 and 22:41 at stopping point 5. Common pipistrelle (**CP**) passes were recorded at 21:58 at stopping point 2. Further CP passes were recorded at 22:04 commuting north along a hedgerow and at 22:16 moving north along the same hedgerow. Additional CP passes were recorded at 22:38 at stopping point 3, 22:40 at stopping point 4, and at 22:52, 22:56, 22:58, 22:59 and 23:00 at stopping point 5. Leisler's bat (**L**) passes were heard and not seen at 22:35 and 22:55. Lesser horseshoe bat (**LHB**) passes were heard and not seen at 22:39 near stopping point 4 and again at 22:45 at stopping point 4.
Summary **Activity during the May survey was low to moderate, with passes of common pipistrelle, soprano pipistrelle and Leisler's bat recorded, along with a small number of lesser horseshoe bat passes.**			

Table 9: Summary of Night-time Bat Walkover survey results (June 2025)

Date & time	Weather at Start	Weather at End	Results
Date: **16th June 2025** **Start time: 21:42** **End time: 23:42** **Sunset: 22:02**	**Temp:** 16°C **Humidity:** 83% **Moon phase:** Waning Gibbous **Wind:** Light Breeze **Cloud:** 90% **Precipitation:** Dry	**Temp:** 15°C **Humidity:** 85% **Wind:** Light Breeze **Cloud:** 100% **Precipitation:** Dry	**L** passes were heard and not seen at 22:10 between stopping points 2 and 3 again at stopping point 4 at 22:28 and between stopping points 4 and 5 at 22:39, and lastly at stopping point 5 at 22:42. **SP** was heard and not seen at 22:30, with a number of feeding buzzes recorded at 22:35 between stopping points 4 and 5. **SP** feeding buzzes were recorded again at stopping point 5 at 22:41. **SP** was heard and not seen again at 23:33 at stopping point 5. **CP** was consistently heard from 22:16 at stopping point 3 until 23:35 at stopping point 5. During this time **CP** was both seen and heard feeding and commuting along boundary vegetation.
Summary			

Activity during the June survey increased compared to May and was dominated by common pipistrelle activity, which was consistently recorded along boundary vegetation throughout the survey period. Soprano pipistrelle activity was limited and localised, with feeding behaviour recorded between stopping points 4 and 5. Leisler's bat was recorded on several occasions, with passes heard across multiple stopping points.

Table 10: Summary of Night-time Bat Walkover survey results (July 2025)

Date & time	Weather at Start	Weather at End	Results
Date: **24th July 2025** **Start time: 21:10** **End time: 23:10** **Sunset: 21:30**	**Temp:** 18°C **Humidity:** 77% **Moon phase:** New moon **Wind:** Strong breeze **Cloud:** 100% **Precipitation:** Dry	**Temp:** 16°C **Humidity:** 87% **Wind:** Light breeze **Cloud:** 100% **Precipitation:** Dry	A single **L** pass was recorded at 22:11 at stopping point 1. **CP** passes were recorded at 21:59, 22:08, 22:09, 22:11, 22:13, 22:27 and 23:04. During these passes small amounts of commuting behaviour were observed along boundary vegetation headed northwards. These passes were recorded at stopping points 1,2 and 6
Summary Bat activity during the July survey was low and was dominated by common pipistrelle passes, which were recorded intermittently along boundary vegetation, primarily associated with commuting behaviour. A single Leisler's bat pass was recorded during the survey period.			

Table 11: Summary of Night-time Bat Walkover survey results (August 2025)

Date & time	Weather at Start	Weather at End	Results
Date: **26th August 2025** **Start time: 20:18** **End time: 22:18** **Sunset: 20:38**	**Temp:** 18°C **Humidity:** 52% **Moon phase:** Waxing Cresent **Wind:** Light breeze **Cloud:** 60% **Precipitation:** Dry	**Temp:** 16°C **Humidity:** 50% **Wind:** None **Cloud:** 60% **Precipitation:** Dry	**CP** passes were heard and not seen at 20:56, 21:00, 21:02, 21:10, 21:11, 21:20, 21:23, 21:24 and 21:27, between stopping points 3 to 6.
Summary Bat activity during the August survey was low and restricted to common pipistrelle. Activity occurred within the first 30 minutes of the survey period and was concentrated between stopping points 3 and 6 along boundary vegetation. No additional species were recorded, and no sustained foraging behaviour was observed.			



Figure 4: Transect route map

6.2 Passive Automated Bat Surveys (PABS)

Because an individual bat can be the source of more than one, or even many, calls, the numbers of calls recorded by the bio-acoustic units are not a direct measure of the numbers of any bat species. Bats will frequently fly over and back along short sections of habitat, if prey is readily available. Also, while foraging they use linear features to navigate through the landscape, to and from roosts, and within foraging sites. Therefore, the number of calls recorded is likely to be greater than the number of bats that generated them.

As outlined in Section 5.5, static units were deployed during the months of May, June, July, and August 2025, over 5 consecutive nights of optimum weather per month. A total of 12,202 bat passes were recorded over the deployment period.

Across all months, common pipistrelle was the most frequently recorded species, followed by Leisler's bat and soprano pipistrelle. All species recorded, with their combined total percentage passes, are as follows:

- Common pipistrelle 9,784 passes (80.19%)
- Leisler's bat 1,095 passes (8.97%)
- Soprano pipistrelle 1,002 passes (8.21%)
- *Myotis*. spp. 72 passes (0.59%)
- Brown long-eared bat – 94 passes (0.77%)
- Nathusius' pipistrelle – 23 passes (0.19%)
- Lesser horseshoe bat – 1 pass (0.01%)

In addition to the above, calls recorded which could not be attributed to a species and/or genus during the PAB surveys are as follows:

- Unidentified (NoID) – 131 passes (1.07%)

These totals reflect a species assemblage strongly dominated by common pipistrelle, with moderate levels of Leisler's and soprano pipistrelle activity and only occasional records of *Myotis* spp., brown long-eared bat and Nathusius' pipistrelle. Lesser horseshoe bat was recorded only once across the full deployment period, indicating that the site does not form part of a core foraging resource for this species and that activity within the site is negligible.

The species recorded are listed in Table 12, with the percentage of total bat passes per species outlined alongside the relevant BHSI ratings.

Table 12: Percentage of total bat calls recorded, categorised by species and with corresponding BHSI Ratings for the site

Species	% of total of all bat calls recorded	BHSI Rating (out of 100)
Common pipistrelle	80.19%	37
Leisler's bat	8.97%	39
Soprano pipistrelle	8.21%	39
Myotis species	0.59%	29–36*
Brown long-eared bat	0.77%	52
Nathusius' pipistrelle	0.19%	16
Lesser Horseshoe	0.01%	42

* *Myotis* spp. BHSI range reflects Daubenton's (29), Natterer's (36) and Whiskered bat (35), as calls were not resolved to species level

The BHSI ratings for the 2.5km grid square encompassing the Proposed Development site indicate an overall moderate suitability for bats (All Bats = 36.11). The activity recorded during static surveys broadly aligns with this landscape context, with dominance of common pipistrelle and moderate representation of soprano pipistrelle and Leisler's bat — species typically associated with mixed grassland, treelines and suburban edge habitats.

While brown long-eared bat has the highest individual BHSI rating (52), activity levels recorded on site were very low, suggesting that although the wider landscape may provide suitable habitat, the Proposed Development site itself does not represent a key resource for this species. Similarly, lesser horseshoe bat has a moderate BHSI rating (42), reflecting the broader Killarney landscape context; however, only a single pass was recorded across the full deployment period (0.01%), indicating negligible use of the site.

Overall, the static survey results confirm that the Proposed Development site supports a bat assemblage typical of semi-urban grassland and agricultural edge habitat, with activity strongly dominated by generalist pipistrelle species and only limited use by light-averse or woodland-associated taxa.

6.2.1 May 2025 Survey Results

6.2.1.1 Overview of levels of bat activity recorded

Bat species recorded at all sampling points across the May survey period, with their combined total percentage passes, are as follows:

- Common pipistrelle (75.20% = 1,443 passes)
- Soprano pipistrelle (12.82% = 246 passes)
- Leisler's bat (8.60% = 165 passes)
- Brown long-eared bat (1.62% = 31 passes)
- Nathusius' pipistrelle (0.68% = 13 passes)
- Species from the genus Myotis (0.36% = 7 passes)
- Lesser horseshoe bat (0.00% = 0 passes)

In addition to the above, calls recorded which could not be attributed to a species and/or genus during the May 2025 static surveys are as follows:

- Unidentified (0.73% = 14 passes)

A total of 1,919 bat passes were recorded during the May survey period across all static detector locations. Bat activity during this period was strongly dominated by common pipistrelle, with lower levels of activity from soprano pipistrelle and Leisler's bat. All other species were recorded only occasionally and at low levels.

6.2.1.2 Bat passes recorded at individual sampling points

The total numbers of bat passes recorded at each sampling point during the May 2025 survey period are shown below in Table 13. These are broken down by species or genus, and the calls for which a species or genus could not be attributed. Sampling points are ranked highest to lowest in terms of total calls recorded/level of activity. The total activity recorded at each sampling point as a percentage of the overall activity recorded during the May survey is also included.

Common pipistrelle was the most frequently recorded species at all sampling points (SPs). The highest number of calls attributable to this species at any one location occurred at SP1, where a total of 862 passes were recorded.

The highest overall level of activity was recorded at SP1 (59.67% of all calls recorded), followed by SP2 (37.36%); the lowest level of activity was recorded at SP3 (2.97%).

Cells highlighted yellow indicate the largest number of bat passes recorded at a sampling point for each species; the cell highlighted orange is the largest sampling point total over the survey period.

Table 13: Number of bat passes of each species recorded at each sampling point during the May 2025 survey

Sampling point	*Myotis* spp.	Leisler's bat	Nathusius' pipistrelle	Common pipistrelle	Soprano pipistrelle	Brown long-eared bat	Lesser Horseshoe	NoID	Total	Percentage %

SP1	2	95	6	862	154	19	0	7	1,145	59.67
SP2	5	50	7	550	87	12	0	6	717	37.36
SP3	0	20	0	31	5	0	0	1	57	2.97
Total	**7**	**165**	**13**	**1,443**	**246**	**31**	**0**	**14**	**1,919**	
%	**0.36**	**8.60**	**0.68**	**75.20**	**12.82**	**1.62**	**0.00**	**0.73**		

6.2.1.3 Nightly and hourly averages of bat passes

To determine the level of bat activity it is important to look at both nightly and hourly averages of bat calls recorded. The level of nightly/hourly bat activity was divided into three brackets, as outlined below:

- Low = <10 bat passes per night/hour;
- Medium = 10 – 49 bat passes per night/hour and,
- High = ≥50 bat passes per night/hour.

For each species and sampling point, both the average nightly and average hourly rates recorded are used in conjunction with one another to indicate the overall level of species activity at each SP location

6.2.1.4 Nightly averages of bat passes recorded at individual sampling points

Nightly average call rates indicate that common pipistrelle exhibited a High level of activity at SP1 and SP2, and a Low level of activity at SP3. This species was the most frequently recorded during the May deployment, indicating regular use of boundary vegetation and adjacent treeline habitat for both foraging and commuting. Activity was particularly elevated at SP1 and SP2, where well-established treeline and hedgerow features are present and provide suitable commuting and feeding corridors.

Soprano pipistrelle was also recorded at all sampling points, with activity ranging from Low at SP3 to Medium at SP1 and SP2, indicating occasional but consistent use of boundary vegetation for foraging and commuting across the site.

Leisler's bat activity was recorded at Medium levels at SP1 and SP2 and at Low levels at SP3. This pattern is consistent with the species' typical use of linear landscape features for commuting, with occasional foraging passes recorded along site boundaries.

Other species, including *Myotis* spp., brown long-eared bat, and Nathusius' pipistrelle, were detected at Low levels across the site, reflecting infrequent or transient use of the site for foraging or commuting. Lesser horseshoe bat was not recorded during the May static deployment period.

Overall, the May dataset indicates a bat assemblage dominated by pipistrelle species, supported by moderate levels of Leisler's bat activity and low, occasional detections of other species. Activity was concentrated along boundary vegetation and treeline features, with open grassland areas exhibiting comparatively low levels of use.

Please see **Table 14** below, where species have been ranked highest to lowest in terms of overall number of nightly passes recorded during May 2025. The average nightly rates of calls for each species are tabulated in **Appendix 2**.

Table 14: Overview of nightly individual species activity recorded in May 2025 with overall species activity rating assigned

Species	No. of SP locations with calls recorded	SP with highest total calls	SP with highest nightly total calls	Overall activity rating assigned / SP
Common pipistrelle	3/3	SP1	SP1	**SP1 & SP2** = High **SP3** = Low
Leisler's	3/3	SP1	SP1	**SP1 & SP2** = Medium **SP3** = Low
Soprano pipistrelle	3/3	SP1	SP1	**SP1 & SP2** = Medium **SP3** = Low
Brown long eared	3/3	SP1	SP1	**All SPs** = Low
***Myotis* spp.**	2/3	SP2	SP2	**SP1 & SP2** = Low **SP3** = Not detected
Nathusius' pipistrelle	2/3	SP2	SP2	**SP1 & SP2** = Low **SP3** = Not detected
Lesser Horseshoe	0/3	-	-	Not detected at any sampling point

6.2.1.5 Hourly averages of bat passes recorded at individual sampling points

Hourly average call rates during the May deployment show that bat activity was strongly dominated by common pipistrelle, which exhibited Medium levels of activity at SP1 and SP2 (34.48 and 22 passes per hour respectively) and Low levels at SP3 (1.24 passes per hour). This pattern reflects concentrated use of boundary vegetation at SP1 and SP2, with markedly lower activity at SP3.

Soprano pipistrelle was recorded at Low hourly averages across all sampling points (6.16, 3.48 and 0.2 passes per hour respectively), indicating occasional use of boundary features for foraging and commuting.

Leisler's bat was recorded at Low hourly rates at all sampling points (3.8, 2 and 0.8 passes per hour respectively), reflecting intermittent commuting behaviour rather than sustained foraging activity.

All other species, including *Myotis* spp., brown long-eared bat, and Nathusius' pipistrelle, were recorded at Low hourly averages only, consistent with infrequent or transient use of the site during this survey period. Lesser horseshoe bat was not recorded during the May static deployment.

Overall, the hourly dataset confirms a pipistrelle-dominated assemblage, with moderate activity concentrated at SP1 and SP2 and substantially lower levels recorded at SP3.

Please see **Table 15** below, where species have been ranked highest to lowest in terms of overall hourly passes recorded in May 2025. The average hourly rates of calls for each species are tabulated in **Appendix 2**.

Table 15: Overview of hourly individual species activity recorded in May 2025 with overall species activity rating assigned

Species	SP with highest hourly total calls	Overall activity rating assigned / SP
Common pipistrelle	SP1	SP1 & SP2 = Medium SP3 = Low
Leisler's	SP1	All SPs = Low
Soprano pipistrelle	SP1	All SPs = Low
Brown long eared	SP1	All SPs = Low
Myotis spp.	SP2	All SPs = Low
Nathusius' pipistrelle	SP2	All SPs = Low
Lesser Horseshoe	-	Not detected

6.2.2 June 2025 Survey Results

6.2.2.1 Overview of levels of bat activity recorded

Bat species recorded at all sampling points across the June survey period, with their combined total percentage passes, are as follows:

- Common pipistrelle (78.20% = 2,963 passes)
- Soprano pipistrelle (12.85% = 487 passes)
- Leisler's bat (6.57% = 249 passes)
- Nathusius' pipistrelle (1.58% = 60 passes)
- Species from the genus *Myotis* (0.29% = 11 passes)
- Brown long-eared bat (0.16% = 6 passes)
- Lesser horseshoe bat (0.03% = 1 passes)

In addition to the above, calls recorded which could not be attributed to a species and/or genus during the May 2025 static surveys are as follows:

- Unidentified (0.32% = 12 passes)

6.2.2.2 Bat passes recorded at individual sampling points

Bat activity during June was again dominated by pipistrelle species, with common pipistrelle representing the clear majority of all calls recorded. Across the survey period, common pipistrelle accounted for 78.20% (2,963 passes) of all detections, reflecting its widespread presence throughout the site.

Soprano pipistrelle constituted the second most frequently recorded species, contributing 12.85% (487 passes) overall, and was recorded at all sampling points. This indicates regular use of available boundary vegetation and linear features across the site for both commuting and foraging.

Leisler's bat was the third most frequently recorded species, contributing 6.57% (249 passes) overall. Levels recorded are consistent with moderate but broadly distributed use of the site for commuting and occasional foraging, particularly along established boundary vegetation.

Activity by other species was markedly lower. Nathusius' pipistrelle represented 1.58% (60 passes), while species from the genus *Myotis* comprised 0.29% (11 passes) and brown long-eared bat contributed 0.16% (6 passes), collectively reflecting low but recurring use of the site.

A single lesser horseshoe bat pass (0.03% = 1 pass) was recorded during the June deployment. This detection represents very low-level or transient activity only and does not indicate regular use of the site by this species.

A small number of unidentified calls were logged (0.32% = 12 passes), in line with expected rates for automated detector datasets where some signals cannot be confidently assigned to species or genus level.

Overall, the June dataset indicates that the bat assemblage remained strongly pipistrelle-dominated, with soprano pipistrelle and common pipistrelle forming the core of recorded activity, supported by moderate levels of Leisler's bat and low/occasional use by all other species.

Table 16: Number of bat passes of each species recorded at each sampling point during the June 2025 survey

Sampling point	*Myotis* spp.	Leisler's bat	Nathusius' pipistrelle	Common pipistrelle	Soprano pipistrelle	Brown long-eared bat	Lesser Horseshoe	NoID	Total	Percentage %
SP1	11	98	45	663	118	6	1	6	948	25.02
SP2	0	57	6	401	334	0	0	2	800	21.11
SP3	0	94	9	1,899	35	0	0	4	2,041	53.87
Total	**11**	**249**	**60**	**2,963**	**487**	**6**	**1**	**12**	**3,789**	
%	**0.29**	**6.57**	**1.58**	**78.20**	**12.85**	**0.16**	**0.03**	**0.32**		

6.2.2.3 Nightly averages of bat passes recorded at individual sampling points

Hourly average call rates recorded during the June deployment indicate that bat activity across the site was strongly dominated by common pipistrelle. This species exhibited High levels of activity at all sampling points, with particularly elevated hourly rates recorded at SP3 and SP1, and consistently high levels also recorded at SP2. This pattern indicates extensive use of site boundary vegetation and adjacent linear features for both foraging and commuting.

Soprano pipistrelle activity varied across the site but was locally significant. High levels of activity were recorded at SP2, where hourly averages exceeded the high-activity threshold, while Medium levels were recorded at SP1 and Low levels at SP3. This distribution suggests localised but regular use of certain boundary features for foraging and movement.

Leisler's bat activity was recorded at Medium levels across all sampling points, with the highest hourly averages occurring at SP1 and SP3. Activity levels are consistent with regular commuting behaviour and occasional foraging across the site, particularly along established linear vegetation.

Other species were recorded only at Low hourly activity levels. Nathusius' pipistrelle, *Myotis* spp., and brown long-eared bat were detected infrequently and at low average hourly rates, indicating occasional or transient use of the site rather than sustained activity. Lesser horseshoe bat was recorded at a Low level at SP1 only and was not detected at SP2 or SP3 during the June deployment, indicating very limited use of the site by this species.

Overall, the June hourly dataset confirms a bat assemblage dominated by pipistrelle activity across all sampling points, with moderate Leisler's bat use and low, sporadic activity by all other species. Spatial patterns of activity correspond closely with the distribution of boundary vegetation and treelines, which provide the principal foraging and commuting features within and immediately surrounding the site.

Please see **Table 17** below, where species have been ranked highest to lowest in terms of overall number of nightly passes recorded during June 2025. The average nightly rates of calls for each species are tabulated in **Appendix 2**.

Table 17: Overview of nightly individual species activity recorded in June 2025 with overall species activity rating assigned

Species	No. of SP locations with calls recorded	SP with highest total calls	SP with highest nightly total calls	Overall activity rating assigned / SP
Common pipistrelle	3/3	SP3	SP3	**All SPs** = High
Leisler's	3/3	SP1	SP1	**All SPs** = Medium
Soprano pipistrelle	3/3	SP2	SP2	**SP2** = High **SP1** = Medium **SP3** = Low
Brown long eared	1/3	SP1	SP1	**SP1** = Low **SP2 & SP3** = Not detected
Myotis spp.	1/3	SP1	SP1	**SP1** = Low **SP2 & SP3** = Not detected
Nathusius' pipistrelle	3/3	SP1	SP1	**All SPs** = Low
Lesser Horseshoe	1/3	SP1	SP1	**SP1** = Low **SP2 & SP3** = Not detected

6.2.2.4 Hourly averages of bat passes recorded at individual sampling points

Hourly average call rates recorded during the June deployment show that bat activity was strongly dominated by common pipistrelle across all sampling points. Hourly averages ranged from approximately 16.04 passes per hour at SP2, 26.52 at SP1, to 75.96 at SP3, equating to High activity at all sampling points, with particularly elevated activity recorded at SP3. This indicates frequent and sustained use of the site by this species throughout the survey period.

Soprano pipistrelle was also recorded at all sampling points, with hourly averages ranging from 1.4 to 13.36 passes per hour, representing Low activity at SP1 and SP3 and Medium activity at SP2. Activity levels indicate occasional but regular use of boundary vegetation for commuting and foraging.

Leisler's bat was recorded consistently across the site, with hourly averages between 2.28 and 3.92 passes per hour, representing Low activity across all sampling points and reflecting intermittent commuting and occasional foraging behaviour.

Other species were recorded only sporadically. Nathusius' pipistrelle occurred at low hourly averages across all sampling points, while *Myotis* spp. and brown long-eared bat were recorded only at SP1 and at low levels. Lesser horseshoe bat was recorded only at SP1 and at a very low hourly average. Where hourly values were zero, the species was not detected at that sampling point.

Overall, the June hourly dataset is characterised by high levels of common pipistrelle activity across the site, with low to moderate soprano pipistrelle activity and low levels of all other species, indicating that the site is used primarily by widespread generalist species for commuting and foraging.

Please see Table 18 below, where species have been ranked highest to lowest in terms of overall hourly passes recorded in June 2025. The average hourly rates of calls for each species are tabulated in Appendix 2.

Table 18: Overview of hourly individual species activity recorded in June 2025 with overall species activity rating assigned

Species	SP with highest hourly total calls	Overall activity rating assigned / SP
Common pipistrelle	SP3	All SPs = High
Leisler's	SP2	SP2 = Medium SP1 & SP3 = Low
Soprano pipistrelle	SP1	All SPs = Low
Brown long eared	SP1	SP1 = Low SP2 & SP3 = Not detected
Myotis spp.	SP1	SP1 = Low SP2 & SP3 = Not detected
Nathusius' pipistrelle	SP1	All SPs = Low
Lesser Horseshoe	SP1	SP1 = Low SP2 & SP3 = Not detected

6.2.3 July 2025 Survey Results

6.2.3.1 Overview of levels of bat activity recorded

Bat species recorded at all sampling points across the July survey period, with their combined total percentage passes, are as follows:

- Common pipistrelle (81.93% = 2,825 passes)
- Leisler's bat (12.24% = 422 passes)
- Soprano pipistrelle (4.00% = 138 passes)
- Species from the genus *Myotis* (0.93% = 32 passes)
- Brown long-eared bat (0.41% = 14 passes)
- Nathusius' pipistrelle (0.35% = 12 passes)
- Lesser horseshoe bat (0.00% = 0 passes)

In addition to the above, calls recorded which could not be attributed to species and/or genus during the July 2025 PAB surveys are as follows:

- Unidentified (0.15% = 5 passes)

The July dataset demonstrates a clear dominance of common pipistrelle activity across the site, accounting for over four-fifths of all bat passes recorded. Leisler's bat represented the second most frequently recorded species, with moderate levels of activity recorded across all sampling points. Soprano pipistrelle activity was lower but consistently present, indicating regular use of boundary habitats.

All other species were recorded only at low or occasional levels, reflecting intermittent use of the site for foraging and commuting. No lesser horseshoe bat passes were recorded during the July deployment.

Overall, the July dataset indicates a bat assemblage strongly dominated by common pipistrelle, with moderate Leisler's activity and low, occasional use of the site by all other species.

6.2.3.2 Bat passes recorded at individual sampling points

Bat activity during July was dominated by common pipistrelle across all sampling locations, accounting for 81.93% (2,825 passes) of all detections recorded during the survey period. Activity for this species was highest at SP1, followed by SP2, with lower but still notable activity at SP3.

Leisler's bat was the second most frequently recorded species, comprising 12.24% (422 passes) of the total dataset. Activity for this species was recorded at all sampling points, with highest levels at SP2 and SP1, and lower levels at SP3.

Soprano pipistrelle accounted for 4.00% (138 passes) and was recorded across all sampling points, with slightly higher activity at SP2 and SP1 relative to SP3.

All other species were recorded at low levels. *Myotis* spp. accounted for 0.93% (32 passes), brown long-eared bat for 0.41% (14 passes), and Nathusius' pipistrelle for 0.35% (12 passes). No lesser horseshoe bat passes were recorded during July.

Overall activity levels were highest at SP1 (47.74% of all calls recorded), followed by SP2 (33.03%), with the lowest activity recorded at SP3 (19.23%).

The total numbers of bat passes recorded at each sampling point during the July 2025 survey period are shown below in Table 19. Cells highlighted yellow indicate the largest number of bat passes recorded at a sampling point for each species; the cell highlighted orange represents the largest sampling point total over the survey period.

Table 19: Number of bat passes of each species recorded at each sampling point during the July 2025 survey

Sampling point	*Myotis* spp.	Leisler's bat	Nathusius' pipistrelle	Common pipistrelle	Soprano pipistrelle	Brown long-eared bat	Lesser Horseshoe	NoID	Total	Percentage %
SP1	8	159	1	1,428	45	4	0	1	1,646	47.74
SP2	9	165	10	892	53	6	0	4	1,139	33.03
SP3	15	98	1	505	40	4	0	0	663	19.23
Total	**32**	**422**	**17**	**2,825**	**138**	**14**	**0**	**5**	**3,448**	
%	**0.93**	**12.24**	**0.35**	**81.93**	**4.00**	**0.41**	**0.00**	**0.15**		

6.2.3.3 Nightly averages of bat passes recorded at individual sampling points

Nightly average call rates during the July deployment show that bat activity was strongly dominated by common pipistrelle across all sampling points. This species exhibited High levels of activity at SP1 and SP2 and High activity also at SP3, indicating frequent and widespread use of site boundary vegetation for foraging and commuting.

Leisler's bat activity was recorded at Medium levels across all sampling points, with highest nightly averages recorded at SP2 and SP1 and slightly lower but consistent activity at SP3. This pattern is consistent with regular commuting behaviour and occasional foraging across the site.

Soprano pipistrelle activity was recorded at Low levels across all sampling points, reflecting consistent but relatively limited use of the site relative to dominant pipistrelle species.

Other species including *Myotis* spp., brown long-eared bat, and Nathusius' pipistrelle were recorded only at Low nightly averages, indicating occasional or transient use of the site. Lesser horseshoe bat was not recorded during the July deployment.

Overall, nightly averages indicate a site dominated by high levels of common pipistrelle activity, with moderate Leisler's bat activity and low, occasional detections of all other species.

Please see Table20 below, where species have been ranked highest to lowest in terms of overall number of nightly passes recorded during July 2025. The average nightly rates of calls for each species are tabulated in Appendix 2.

Table 20: Overview of nightly individual species activity recorded in July 2025 with overall species activity rating assigned

Species	No. of SP locations with calls recorded	SP with highest total calls	SP with highest nightly total calls	Overall activity rating assigned / SP
Common pipistrelle	3/3	SP1	SP3	All SPs = High
Leisler's	3/3	SP2	SP1	All SPs = Medium
Soprano pipistrelle	3/3	SP2	SP2	All SPs = Low
Brown long eared	3/3	SP1	SP1	All SPs = Low
Myotis spp.	3/3	SP3	SP1	All SPs = Low
Nathusius' pipistrelle	3/3	SP2	SP1	All SPs = Low
Lesser Horseshoe	0/3	-	-	Not detected at any sampling point

6.2.3.4 Hourly averages of bat passes recorded at individual sampling points

Hourly average call rates recorded during the July deployment show that bat activity was again dominated by common pipistrelle across all sampling points. Hourly averages indicate High activity at all sampling points, with the highest levels recorded at SP1 and SP2 and slightly lower but still elevated activity at SP3.

Leisler's bat exhibited Medium hourly activity across all sampling points, with highest hourly averages at SP2 and SP1 and slightly lower levels at SP3.

Soprano pipistrelle was recorded at Low hourly averages across all sampling points, indicating occasional but consistent use of the site.

Myotis spp., brown long-eared bat and Nathusius' pipistrelle were recorded at Low hourly averages where present, reflecting infrequent activity. Lesser horseshoe bat was not detected during July.

Overall, the July hourly dataset is characterised by high levels of common pipistrelle activity across the site, moderate Leisler's bat activity and low or occasional detections of all other species.

Please see Table 21 below, where species have been ranked highest to lowest in terms of overall hourly passes recorded in July 2025. The average hourly rates of calls for each species are tabulated in Appendix 2.

Table 21: Overview of hourly individual species activity recorded in July 2025 with overall species activity rating assigned

Species	SP with highest hourly total calls	Overall activity rating assigned / SP
Common pipistrelle	SP1	All SPs = High
Leisler's	SP2	All SPs = Medium

Soprano pipistrelle	SP2	All SPs = Low
Brown long eared	SP2	All SPs = Low
Myotis spp.	SP3	All SPs = Low
Nathusius' pipistrelle	SP2	All SPs = Low
Lesser Horseshoe	-	Not detected at any sampling point

6.2.4 August 2025 Survey Results

6.2.4.1 Overview of levels of bat activity recorded

Bat species recorded across the active sampling points during the August survey period, with their combined total percentage passes, are as follows:

- Common pipistrelle (83.81% = 2,553 passes)
- Leisler's bat (8.50% = 259 passes)
- Soprano pipistrelle (4.30% = 131 passes)
- Brown long-eared bat (0.95% = 29 passes)
- Species from the genus *Myotis* (0.72% = 22 passes)
- Nathusius' pipistrelle (0.13% = 4 passes) and
- Lesser horseshoe bat (0.00% = 0 passes)

In addition to the above, calls recorded which could not be attributed to a species and/or genus during the August 2025 PAB surveys are as follows:

- Unidentified (1.58% = 48 passes)

Overall, the August dataset continued to be strongly dominated by common pipistrelle, with smaller contributions from Leisler's bat and soprano pipistrelle. All other species were recorded only at low or trace levels, reflecting limited or occasional use of the site by these species during this survey period.

6.2.4.2 Bat passes recorded at individual sampling points

Bat activity during August remained heavily dominated by common pipistrelle, which accounted for the clear majority of all passes recorded and was present at all active sampling locations. The highest overall levels of activity were recorded at SP1, followed by SP3, reflecting increased use of treeline and boundary habitats for foraging and commuting.

Leisler's bat represented the second most frequently recorded species overall and was recorded at all active sampling points, indicating moderate and consistent use of the site for commuting and occasional foraging. Soprano pipistrelle activity was also recorded at both sampling points, though at lower levels than common pipistrelle and Leisler's bat.

Other species were recorded only intermittently. Brown long-eared bat and *Myotis* spp. were detected at low levels, indicating occasional or transient use of the site. Nathusius' pipistrelle was recorded only rarely. No lesser horseshoe bat passes were recorded during the August deployment.

The total numbers of bat passes recorded at each sampling point during the August 2025 survey period are shown below in Table 22. Cells highlighted yellow indicate the largest number of bat passes recorded at a sampling point for each species; the cell highlighted orange indicates the highest sampling point total over the survey period.

Table 22: Number of bat passes of each species recorded at each sampling point during the August 2025 survey

Sampling point	*Myotis* spp.	Leisler's bat	Nathusius' pipistrelle	Common pipistrelle	Soprano pipistrelle	Brown long-eared bat	Lesser Horseshoe	NoID	Total	Percentage %
SP1	9	231	1	1,994	46	16	0	29	2,325	76.33
SP3	13	28	3	559	86	13	0	19	721	23.67
Total	**22**	**259**	**4**	**2,553**	**131**	**29**	**0**	**48**	**3,046**	
%	**0.72**	**8.50**	**0.13**	**83.81**	**4.30**	**0.95**	**0.00**	**1.58**		

6.2.4.3 Nightly averages of bat passes recorded at individual sampling points

Nightly average call rates recorded during the August deployment indicate that common pipistrelle exhibited High levels of activity at all active sampling points. This species was consistently the most frequently recorded and demonstrated widespread use of the site for foraging and commuting, particularly along treelines and boundary vegetation.

Leisler's bat was recorded at Medium levels at SP1 and Low levels at SP3, reflecting regular commuting activity with occasional foraging passes. Soprano pipistrelle activity was recorded at Low to Medium levels, with slightly higher use noted at SP3.

All other species, including *Myotis* spp., brown long-eared bat and Nathusius' pipistrelle, were recorded only at Low nightly averages where present. Lesser horseshoe bat was not recorded during the August deployment.

Overall, nightly activity patterns for August indicate a bat assemblage strongly dominated by common pipistrelle, supported by moderate Leisler's bat activity and low levels of use by all other species.

Please see Table 23 below, where species have been ranked highest to lowest in terms of overall number of nightly passes recorded during August 2025. The average nightly rates of calls for each species are tabulated in Appendix 2.

Table 23: Overview of nightly individual species activity recorded in August 2025 with overall species activity rating assigned

Species	No. of SP locations with calls recorded	SP with highest total calls	SP with highest nightly total calls	Overall activity rating assigned / SP
Common pipistrelle	2/2	SP1	SP3	**All SPs** = High
Leisler's	2/2	SP1	SP1	**SP3 =** Medium **SP1 =** Low
Soprano pipistrelle	2/2	SP3	SP2	**SP3 =** Medium **SP1 =** Low
Brown long eared	2/2	SP1	SP1	**All SPs** = Low
Myotis spp.	2/2	SP3	SP1	**All SPs** = Low
Nathusius' pipistrelle	2/2	SP3	SP1	**All SPs** = Low
Lesser Horseshoe	0/2	-	-	Not detected at any sampling point

6.2.4.4 Hourly averages of bat passes recorded at individual sampling points

Hourly average call rates recorded during the August deployment show that bat activity was again dominated by common pipistrelle across all active sampling points. Hourly averages exceeded the threshold for High activity at both SP1 and SP3, indicating sustained and frequent use of the site by this species throughout the survey period.

Leisler's bat exhibited Medium hourly activity at SP1 and Low activity at SP3, consistent with regular commuting behaviour and occasional foraging. Soprano pipistrelle was recorded at Low hourly averages across both sampling points.

All remaining species were recorded only at Low hourly averages where present. *Myotis* spp., brown long-eared bat and Nathusius' pipistrelle occurred sporadically, while lesser horseshoe bat was not recorded during this deployment.

Overall, the August hourly dataset reflects a species assemblage strongly dominated by common pipistrelle activity, with moderate Leisler's bat presence and low or occasional detections of other species.

Please see **Table 24** below, where species have been ranked highest to lowest in terms of overall hourly passes recorded in August 2025. The average hourly rates of calls for each species are tabulated in **Appendix 2**.

Table 24: Overview of hourly individual species activity recorded in August 2025 with overall species activity rating assigned

Species	SP with highest hourly total calls	Overall activity rating assigned / SP
Common pipistrelle	SP1	**All SPs** = High

Leisler's	SP1	**SP1 =** Medium **SP3 =** Low
Soprano pipistrelle	SP3	**All SPs** = Low
Brown long eared	SP1	**All SPs** = Low
Myotis spp.	SP3	**All SPs** = Low
Nathusius' pipistrelle	SP3	**All SPs** = Low
Lesser Horseshoe	-	Not detected at any sampling point

7. Discussion

7.1 Value of the Site for Foraging and Commuting Bats

Based on the findings of the bat surveys undertaken between May and August 2025, the Proposed Development site is considered to be of Low to Moderate value for foraging and commuting bats.

The site is dominated by improved grassland, which provides limited intrinsic foraging value for bats due to its low structural diversity and relatively low invertebrate abundance. As such, the interior of the site is generally of low suitability for foraging or commuting bats. However, linear boundary features, including treelines and sections of hedgerow, provide some connectivity and limited foraging opportunities, particularly along the northern and north-western boundaries where vegetation interfaces with established green infrastructure associated with the adjoining golf course and surrounding semi-natural areas.

Static detector and nocturnal walkover survey results indicate that bat activity across the site is dominated by common pipistrelle and soprano pipistrelle, with consistent levels of activity recorded along boundary vegetation. These species are highly adaptable and commonly associated with suburban and edge-of-settlement habitats. Leisler's bat was also recorded regularly, typically associated with commuting movements along linear features and occasional foraging activity. Activity by *Myotis* spp., brown long-eared bat and Nathusius' pipistrelle was recorded only at low levels, indicating occasional or transient use of the site.

Lesser horseshoe bat activity was recorded at very low levels across the survey period. This limited level of activity suggests that the site does not form part of core foraging habitat for the local population associated with the Killarney National Park, MacGillycuddy's Reeks and Caragh River Catchment SAC (000365), and that any use of the site is likely to be peripheral and opportunistic.

Spatial patterns in activity indicate that the most consistent use of the site by foraging and commuting bats is associated with vegetated boundaries adjoining the golf course and green infrastructure to the north and north-

west. In contrast, the eastern and south-eastern boundaries, which adjoin existing commercial and retail development, support comparatively lower levels of activity and provide limited connectivity for commuting bats.

Overall, the site supports a bat assemblage typical of improved grassland located within an urban edge-of-settlement context, characterised by dominance of generalist pipistrelle species and lower levels of activity by less urban-adaptable species. While boundary vegetation provides some localised foraging and commuting opportunities, the site does not represent habitat of high value at a local or wider landscape scale.

Accordingly, the Proposed Development site is considered to be of Low to Moderate value for foraging and commuting bats at a local level only.

7.2 Value of the Site for Roosting Bats

The Proposed Development site comprises predominantly improved grassland with boundary treelines and no buildings or structures present within the red line boundary. As such, roosting opportunities on-site are limited to trees along the site perimeter.

A total of 15 trees were assessed during the Preliminary Roost Assessment. The majority were categorised as having negligible to low suitability for roosting bats due to limited or poorly developed features. Three trees (Tree 1 – mature ash; Tree 6 – mature oak; Tree 7 – mature ash with dense ivy cover) were identified as having moderate to high suitability, based on the presence of knot holes, vertical splits and potential cavities capable of supporting roosting bats.

No evidence of bat roosting (e.g. droppings, staining, feeding remains or live bats) was recorded during the daytime assessment. Furthermore, Night-time Bat Walkover surveys did not record any emergence behaviour or repeated activity patterns indicative of a roost within the site boundary. While lesser horseshoe bat passes were recorded during the May survey, these were limited to brief commuting/foraging passes along boundary vegetation and do not indicate the presence of a roost within the site.

The surrounding landscape includes confirmed lesser horseshoe bat roost grid squares within the wider area; however, the site itself lies within a semi-urban context, immediately adjacent to retail development and associated artificial lighting. This reduces its suitability for supporting roosts of light-sensitive species, particularly lesser horseshoe bat.

On the basis of the PRA and activity survey results, the site is considered to be of low overall value for roosting bats, with potential limited to a small number of mature boundary trees. No confirmed roosts were identified within the Proposed Development boundary.

Should tree removal or works affecting trees of moderate suitability be proposed, precautionary measures and/or further survey effort may be required in accordance with best practice guidance (Collins, 2023).

8. Recommendations

The results of bat surveys undertaken in 2025 indicate that the site is used primarily by bats for foraging and commuting along boundary treelines and associated vegetation, with limited use of the interior improved grassland. No roosts were identified within the site during surveys, though a small number of trees were identified as having Low to Moderate bat roost potential. Based on these findings and the nature of the proposed development, the following recommendations and mitigation measures are advised.

8.1 Retention and Protection of Key Linear Features

Boundary vegetation, particularly along the northern and north-western site boundaries adjoining the golf course and associated green infrastructure, represents the principal ecological resource within the site for commuting and foraging bats. To prevent fragmentation of flight lines and maintain ecological functionality, the following measures are recommended:

- Retain existing boundary treelines and hedgerows wherever possible, particularly along the northern and north-western site boundaries.
- Where removal of sections of vegetation is unavoidable, implement compensatory planting using native species to maintain connectivity.
- Reinforce existing gaps in boundary vegetation with native broadleaf planting to maintain continuous linear features suitable for use by commuting bats.
- Any works in proximity to retained trees and hedgerows should follow tree protection guidelines (e.g. BS 5837).

Retention of these features will ensure continuity of established commuting routes and maintain current levels of bat activity across the site.

8.2 Compensatory Planting and Habitat Enhancement

Where tree or hedgerow vegetation removal is required as part of the development, compensatory planting should be undertaken to maintain ecological connectivity and foraging opportunities:

- Replace any removed trees or hedgerows with native broadleaf species such as oak, birch, rowan, hazel, hawthorn, blackthorn and willow.
- Establish continuous native hedgerow planting along new boundaries where existing vegetation cannot be retained.
- Incorporate a mix of tree, shrub and understorey planting to increase structural diversity and support invertebrate abundance for foraging bats.
- Manage newly planted areas without routine use of fertilisers or herbicides to encourage natural ground flora and invertebrate communities.

8.3 Lighting Design and Dark Corridors

Artificial lighting has the potential to impact bat activity, particularly along boundary vegetation used for commuting and foraging. To minimise impacts:

- All lighting should follow Bat Conservation Trust (BCT) Guidance Note 08/23: *Bats and Artificial Lighting at Night* (2023).
- Maintain dark corridors along retained boundary vegetation, particularly along the northern and north-western boundaries.
- Use full cut-off, low-intensity luminaires with warm colour temperatures (<2700K) where lighting is required.
- Direct lighting away from treelines, hedgerows and retained or newly planted ecological corridors.

- Avoid column lighting adjacent to boundary vegetation where possible; use low-level or directional lighting where illumination is required for safety.
- Implement lighting curfews, dimming or motion sensors where operationally feasible.

Sensitive lighting design will ensure that current bat activity patterns are maintained and that commuting routes remain functional.

8.4 Protection of Trees with Bat Roost Potential

A small number of trees within the site were identified as having Low to Moderate bat roost potential. While no roosts were confirmed during surveys, these features should be treated with precaution:

- Trees identified as having bat roost potential should be retained where possible.
- Where removal is required, pre-felling bat surveys should be undertaken by a suitably qualified bat ecologist.
- Pre-felling inspections should be timed appropriately and undertaken within 24–48 hours of removal.
- If a bat roost is identified, works must cease and consultation with NPWS undertaken to determine licensing requirements.
- Where no roosts are identified, felling should proceed using soft-felling techniques under ecological supervision.

8.5 Construction Phase Safeguards

To minimise disturbance to foraging and commuting bats during construction:

- Restrict night-time construction lighting and ensure any required lighting is directional and fully baffled.
- Avoid unnecessary lighting of retained boundary vegetation.
- Protect retained trees and hedgerows using appropriate protection measures in accordance with BS 5837.
- Maintain connectivity along retained boundary vegetation throughout the construction phase.

8.6 Summary

With retention of key boundary vegetation, implementation of sensitive lighting design and appropriate construction safeguards, the proposed development can proceed without significant adverse effects on the site's bat assemblage.

The site is of Low to Moderate value for foraging and commuting bats and does not support confirmed roosts. Provided that boundary connectivity and dark corridors are maintained, current patterns of bat activity are expected to persist post-development.

9. Conclusion

Based on the results of the 2025 bat surveys, residual effects on bats are assessed as not significant, provided that the mitigation and best-practice measures outlined in Section 8 are fully implemented. The site is used primarily for foraging and commuting along boundary treelines and hedgerows, with negligible roosting value and limited use of the improved grassland interior.

Boundary vegetation, particularly along the northern and north-western site boundaries adjoining the golf course and associated green infrastructure, represents the principal ecological resource within the site for commuting and foraging bats. Retention of these features will maintain ecological connectivity and avoid any net change to established commuting routes and foraging behaviour. Where limited removal of vegetation is required to facilitate development, this should be offset through appropriate native compensatory planting to ensure continuity of habitat structure.

Provided that the proposed development is constructed and operated in accordance with the final design, and that all external lighting follows Bat Conservation Trust (2023) Bats and Artificial Lighting at Night: Guidance Note 08/23, significant effects on bat species are not anticipated. Sensitive lighting design, retention and enhancement of boundary vegetation, and precautionary protection of trees with potential roost features will ensure that the ecological functionality of the site for bats is maintained.

With these measures in place, significant residual ecological effects on bats arising from either the construction or operational phases of the proposed development are unlikely to occur.

10. References

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Appendix 1

Irish bat species profiles

All are bats species found in Ireland are insectivores that feed on insects, and all use a seasonal feeding strategy to help build fat reserves during the summer and autumn, before their hibernation during winter - a time, generally, when insects are not available. Most hunt flying prey, but some species, e.g., lesser horseshoe bat or Daubenton's bat, glean their prey from surfaces of leaves or water on which the prey have alighted.

All species hibernate during winter and typically become active in late spring and early summer. As the days and nights warm up each species flies out to forage for insects, for progressively longer periods, at night. Around late June or early July, pregnant females give birth to a single offspring which feeds on its mother's milk for 6-7 weeks at which point it can fly and learns to echolocate and to catch its own prey. Mating takes place from August onwards; the female retains the sperm throughout the winter but does not ovulate and become pregnant until spring the following year. The onset of hibernation, which takes place from October/November onwards, begins once temperatures drop and insect prey abundance drops.

Common pipistrelle (*Pipistrellus pipistrellus*) – Peak call frequency 45kHz

The common pipistrelle is one of Irelands smallest and most common bat. Like all bat species found in Ireland they are nocturnal feeding on midges, moths and other flying insects that they find in the dark by using echolocation and can be found in both rural and urban areas. A single pipistrelle (weighing approximately 5-6 grams, the weight of a 1-euro coin) can consume as many as 3,000 of these insects in one night (BCI, 2024)[16], providing an ecosystem service as nature's pest control. Common pipistrelles emerge around 20 minutes after sunset and are fast flying species and tend to zig-zag whilst flying which helps them to catch their insect prey (UOB, 2024)[17] and usually fly approximately 5 to 10 meters from the ground (Russ, 1999)[18]. The common pipistrelle's distribution is widespread and is found throughout the island of Ireland (NBDC, 2024)[19]. The common pipistrelle frequents a large range of different habitats for foraging and roosting such as urban areas (often feeding around streetlights that their insect prey can be attracted to), woodlands, farmland, gardens, lakes, rivers, hedgerows and tree lines. Using the latter linear features to commute across the landscape. Common pipistrelles are known to be crevice dwellers and can fit through openings between 15mm and 20mm and are known to use new and old buildings in gaps and crevices between roof tile, brick work, behind panelling, shutters and eaves as well as roosting in bat boxes and trees throughout spring and summer (UOB, 2024). Maternity roosts tend to be found in close proximity to good foraging and commuting habitat such as improved grassland, built-up areas and close to water and hedgerows/tree lines. During the winter months whilst in hibernation common pipistrelles can be found to be roosting in trees and buildings, but rarely underground. The common pipistrelle's conservation status is currently found to be favourable and improving (NPWS, 2019)[20].

Soprano pipistrelle (*Pipistrellus pygmaeus*) Peak call frequency 55kHz

The soprano pipistrelle is also one of Irelands most common and smallest bat species and shares many traits with the common pipistrelle. The soprano pipistrelle's distribution is also widespread and is found throughout the

[16] Bat Conservation Ireland (BCI), 2024, *Common and Soprano Pipistrelle*, available from https://www.batconservationireland.org/irish-bats/species/common-and-soprano-pipistrelle accessed March 2024.

[17] University of Bristol (UOB), 2024, *Common Pipistrelle Pipistrellus pipistrellus biology,* available from https://www.bio.bris.ac.uk/research/bats/britishbats/batpages/commonpipi.htm accessed March 2024

[18] Jon Russ, 1999, *The bats of Britain and Ireland echolocation calls, sound analysis and species identification*

[19] National Biodiversity Data Centre (NBDC), 2024, *Common Pipistrelle Pipistrellus pipistrellus profile*, available from https://species.biodiversityireland.ie/profile.php?taxonId=119762#Taxonomy accessed March 2024.

[20] National Parks and Wildlife Service (NWPS), 2019, *The Status of EU Protected Habitats and Species in Ireland. Volume 1: Summary Overview. Unpublished NPWS report.*

island of Ireland (NBDC, 2024). The soprano pipistrelle is slightly smaller than the common pipistrelle, and its fur is reddish and is one colour from the roots to the tip and its skin is pale pink as opposed to the common pipistrelle's black skin, found on the ears and face (NBDC, 2024)[21]. A post-calcarial lobe is present on the tail membrane but a ridge between the nostrils distinguishes the Soprano from the Common pipistrelle, as well as a difference in the pattern of the elastic fibres within the wing membranes (BCI, 2024)[22]. Soprano pipistrelles also emerge around 20 minutes after sunset and too are a fast flying species. There is also overlap between the soprano and common pipistrelle is that they can be found in similar habitats with soprano pipistrelle's preferring lakes, rivers and riparian habitats (Vaughan *et al*., 1997)[23]. Soprano pipistrelles have overlap with the common pipistrelle in regards to roosting preferences. Soprano pipistrelles are also known to be crevice dwellers will roost in new and old buildings in gaps and crevices between roof tile, brick work, behind panelling, shutters and eaves as well as roosting in bat boxes and trees throughout spring and summer (UOB, 2024)[24]. Winter roosting preferences are also the same as common pipistrelle with roosting in trees and buildings and rarely underground. The soprano pipistrelle's conservation status is currently found to be favourable and improving (NPWS 2019).

Nathusius pipistrelle (*Pipistrellus nathusii*) Peak call frequency 38kHz (36-40khz)

The Nathusius pipistrelle is much rarer in Ireland than the common and soprano pipistrelles, its distribution is scarce and scattered across the island of Ireland but is potentially more widespread than the data would suggest, as this species could easily be confused with the other two resident species of pipistrelle (NBDC, 2024)[25]. Since its discovery in Ireland (circa 1996-1997), roosts of this species have recorded in Armagh, Derry, Down and Fermanagh and species records have been recorded in Cavan, Cork, Dublin, Kerry, Laois, Longford, Mayo, Meath, Waterford and Wicklow (NBDC, 2024). Nathusius pipistrelles emerge at early dusk, are fast flying species, and fly with deep wing beats (UOB, 2024)[26] and usually fly approximately 4 to 15 meters from the ground (Russ, 1999). Nathusius pipistrelles are mainly associated with woodland habitats from moist deciduous woodlands to dry coniferous forests (CI, 2024)[27]. Nathusius pipistrelles are also associated with wetlands, rivers and waterbodies (BCT, 2024)[28] but are known to forage within parks, farmland and woodland edges too (CI, 2024) and are found less often than the common and soprano pipistrelles in urban areas (UOB, 2024). They are known to roost in old

[21] National Biodiversity Data Centre (NBDC), 2024, *Soprano Pipistrelle Pipistrellus pygmaeus profile*, available from https://species.biodiversityireland.ie/profile.php?taxonId=119441&taxonGroupName=terrestrial%20mammal&taxonDesignationId=2#Taxonomy accessed March 2024

[22] Bat Conservation Ireland (BCI), 2024, *Common and Soprano Pipistrelle*, available from https://www.batconservationireland.org/irish-bats/species/common-and-soprano-pipistrelle accessed March 2024.

[23] Vaughan, N., Jones, G., & Harris, S. (1997). Habitat Use by Bats (Chiroptera) Assessed by Means of a Broad-Band Acoustic Method. *Journal of Applied Ecology*, *34*(3), 716–730.

[24] University of Bristol (UOB), 2024, *Soprano Pipistrelle Pipistrellus pygmaeus biology* https://www.bio.bris.ac.uk/research/bats/britishbats/batpages/sopranopipi.htm accessed March 2024

[25] National Biodiversity Data Centre (NBDC), 2024, *Nathusius Pipistrelle Pipistrellus nathusii profile*, available from https://species.biodiversityireland.ie/profile.php?taxonId=119466#Taxonomy accessed March 2024.

[26] University of Bristol (UOB), 2024, *Nathusius Pipistrelle Pipistrellus nathusii biology* available from https://www.bio.bris.ac.uk/research/bats/britishbats/batpages/nathusiuspipi.htm accessed March 2024.

[27] *Conserve Ireland (CI), 2024, Nathusius pipistrelle profile, available at https://www.conserveireland.com/mammals/nathusius_pipistrelle.php accessed March 2024*

[28] Bat Conservation Trust (BCT), 2024, *UK Bats: Nathusius Pipestrelle* available at https://www.bats.org.uk/about-bats/what-are-bats/uk-bats/nathusius-pipistrelle accessed March 2024.

buildings under soffit boards and roof tile, fissures in rocks and tree hollows and bat boxes (BCT, 2024). During the winter months Nathusius pipistrelles will roost in cracks in walls, trees, caves and sheltered cliff crevices (NBDC, 2024). The Nathusius pipistrelle's conservation status is currently unknown (NPWS 2019).

Brown long-eared bat (*Plecotus auritus*) Peak call frequency 35kHz (25-50khz)

The brown long eared bat (BLE) is medium sized bat and has distinctive long ears which can be up to three quarters of the size of its total head and body length (2.5cm) (CI, 2024)[29]. These large ears enable this species of bat to have extraordinary hearing abilities which help them to hunt especially when gleaning their prey from foliage (BCT, 2024)[30]. BLE are late emergers and prefer to leave their roosts in complete darkness and therefore emergence times can be up to an hour after sunset (Russ, 1999). As a void dwelling species of bat these bats can often be active and make short flights within a roosting area such as a loft before emergence, as agile flyers they are equipped to using confined spaces to fly in. Their flight is slow and fluttering often likened to that of a butterfly and fly low, usually close to vegetation (UOB, 2024)[31]. The BLE's distribution is widespread and can be found throughout the island of Ireland (NBDC, 2024)[32]. BLE prefer sheltered habitats such as valleys, parks and gardens and are also known to forage open deciduous and coniferous woodland and orchards (BCT, 2024). As mentioned, bats are typically void dwelling and will roost in older buildings, in lofts, barns, stables and tend to cluster along the central ridge beam or next to a chimney. Ble will also make use of trees and bat boxes (BCI, 2024)[33]. During the winter BLE can be found roosting in caves, tunnels, mines, ice houses and occasionally deep hollows of mature trees and buildings (BCT, 2024). The brown long eared bat's conservation status is currently found to be favourable and improving (NPWS 2019).

Daubenton's bat (Myotis daubentonii) Call frequency ranges from 35 to 85kHz (loudest at 45 to 50kHz)

Daubenton's bat is medium sized bat and is widely known as the water bat due to its strong association with water bodes and rivers (PTES, 2024)[34]. These bats are low and fast flying, and typically skim the waters surface to catch their prey and are known to use their ventral fur to collect water to drink (UOB, 2024)[35]. Emergence times of this species of bats ranges and there are even difference between times in males and females (Andrews Ecology,

[29] Conserve Ireland (CI), 2024, *Brown long eared profile*, available at https://www.conserveireland.com/mammals/brown-longeared-bat.php accessed March 2024

[30] Bat Conservation Trust (BCT), 2024, *UK Bats: Brown Long eared* available at https://www.bats.org.uk/about-bats/what-are-bats/uk-bats/brown-long-eared-bat accessed March 2024

[31] University of Bristol (UOB), 2024, *Brown long-eared bat Plecotus auritus biology* available from https://www.bio.bris.ac.uk/research/bats/britishbats/batpages/brownlongeared.htm accessed March 2024

[32] National Biodiversity Data Centre (NBDC), 2024, *Brown long-eared bat Plecotus auritus profile*, available from https://species.biodiversityireland.ie/profile.php?taxonId=119441&taxonGroupName=terrestrial%20mammal&taxonDesignationId=2#Taxonomy accessed March 2024

[33] Bat Conservation Ireland (BCI), 2024, *Brown long eared bat,* available from https://www.batconservationireland.org/irish-bats/species/brown-long-eared-bat accessed March 2024.

[34] People's Trust for Endangered Species (PTES), 2024, *Daubenton's Bat: Facts and Figures* https://ptes.org/get-informed/facts-figures/daubentons-bat/ accessed March 2024

[35] University of Bristol (UOB), 2024, *Daubenton's bat Myotis daubentonii biology* available from https://www.bio.bris.ac.uk/research/bats/britishbats/batpages/daubentons.htm accessed March 2024

2017)[36] with data suggesting that some females leave the roost earlier than the males. On average the emergence time for this species is 84 minutes after sunset (UOB, 2024). Daubenton's bat distribution is widespread and can be found throughout the island of Ireland (NBDC, 2024)[37]. Although this species is heavily associated with water ways and water bodies, preferring to feed on its prey over calm slow-moving water they are often also found foraging along woodland rides and edges and are less common in urban areas. Roosting preferences include caves, mines, tunnels, trees, ice houses but rarely new building types (BCT, 2024)[38]. These species are often recorded as sharing roosting habitats with other species of bats such as natterers, pipistrelles and brown long eared (UOB, 2024). Daubenton's bat roosting preferences differ very little over the year regardless of season (BCT, 2024). Daubenton's bat conservation status is currently found to be favourable and improving (NPWS 2019).

Leisler's bat (Nyctalus leisleri) Peak call frequency 25kHz (15 to 45kHz)

The Leisler's bat is Irelands biggest species with a combined head and body of approximately 54-64mm (NBDC, 2024)[39]. The Leisler's is a high-flying species (10-70m from ground level (Russ, 1999) and also one of the earliest to emerge from its roosts. Typically emerging at sunset or even before it, their activity is closely linked to temperature (Russ at al, 2002)[40]. Although rarer in Britian and the rest of Europe Leisler's are widely distributed across Ireland (BCI, 2024)[41]. Leisler's bats are primarily a woodland species but will occupy parklands and urban areas that can provide all of their habitat requirements (CI, 2024)[42]. Preferring open habitats, rivers lakes and woodlands, and unlike other bat species do not need to use linear features to navigate the landscape (UOB, 2024)[43]. Often associated with woodlands they can be found to roost within tree holes and deep cavities and sometimes bat boxes. The Leisler's bat is also known to roost in buildings, both old and new, within lofts, between tiles and underfelt, under ridge tiles, above large soffit boards, behind hanging tiles, behind window shutters and in disused chimneys (UOB, 2024). During the winter months they can be found roosting within deep hollows of mature trees and crevices in buildings (BCT, 2024)[44]. Leisler's bat conservation status is currently found to be favourable and improving (NPWS 2019).

[36] Andrews ecology Ltd, (2019), *A review of empirical data in respect of emergence and return times reported for the UK's 17 Native Bat Species*, available from http://battreehabitatkey.co.uk/wp-content/uploads/2017/06/AEcol-REVIEW-OF-EMERGENCE-AND-RETURN-EMPIRICAL-DATA-2017-Ver.-4.pdf accessed March 2024.

[37] National Biodiversity Data Centre (NBDC), 2024, *Daubenton's bat Myotis daubentonii profile*, available from https://maps.biodiversityireland.ie/Dataset/128/Survey/268 accessed March 2024

[38] Bat Conservation Ireland (BCI), 2024, *Daubenton's bat,* available from https://www.bats.org.uk/about-bats/what-are-bats/uk-bats/daubentons-bat accessed March 2024

[39] National Biodiversity Data Centre (NBDC), 2024, *Leisler's bat Nyctalus leisleri profile*, available from https://species.biodiversityireland.ie/profile.php?taxonId=119464 accessed March 2024.

[40] Russ et al., (2003), *Seasonal patterns in activity and habitat use by bats (Pipistrellus spp. and Nyctalus leisleri) in Northern Ireland, determined using a driven transect*, Journal of Zoology 259. 289-299.

[41] Bat Conservation Ireland (BCI), 2024, *Leisler's bat* https://www.batconservationireland.org/irish-bats/species/leislers-bat accessed March 2024.

[42] Conserve Ireland (CI), 2024, *Leisler's bat profile*, available at https://www.conserveireland.com/mammals/leislers_bat.php accessed March 2024.

[43] University of Bristol (UOB), 2024, *Leisler's bat Nyctalus leisleri* available at https://www.bio.bris.ac.uk/research/bats/britishbats/batpages/leislers.htm accessed accessed March 2024.

[44] Bat Conservation Trust (BCT), 2024, *UK Bats: Leisler's bat,* available at https://www.bats.org.uk/about-bats/what-are-bats/uk-bats/leislers-bat accessed March 2024.

Lesser horseshoe bat (Rhinolophus hipposideros) Peak call frequency 110kHz (109-115khz)

The lesser horseshoe bat (LHB) is one of Ireland's smallest bat species with a combined head and body of approximately 35-44mm (CI, 2024)[45]. Its name comes from its unique and complex noseleaf shape which resembles a horseshoe shape and helps this species of bat to echolocate (BCT, 2024)[46] and is distinguished from the greater horseshoe by size, as the lesser horseshoe is smaller and has a smaller forearm length (UOB, 2024)[47]. The LHB emerges anywhere from 30 minutes to 60 minutes after sunset (UOB, 2024) and generally flies low and is extremely agile (Russ, 1999) meaning it can hunt for prey between vegetation and or hedgerows (CI, 2024) but are an extremely light sensitive species and is not typically found in well-lit areas. The lesser horseshoe is restricted in its distribution to the west of Ireland and is mainly found in Mayo, Galway, Clare, Limerick, Kerry and Cork (BCI,2024)[48] . LHB are associated with foraging in habitats such as sheltered valleys, woodland edge, pasture and wetlands, mixed woodlands and hedgerows (UOB, 2024). LHB were originally cave dwellers and will still use this sort of habitat along with tunnels, mines, and cellars for roosting when hibernating during the winter months (BCT, 2024). They can be found roosting within the warmer months in old buildings, rural buildings such as barns and stables and outhouses (BCI,2024). The lesser horseshoe bat's conservation status is currently found to be Inadequate and declining (NPWS 2019).

Natterer's bat (Myotis nattereri) Peak call frequency 50kHz (35-80khz)

The Natterer's bat is a medium sized bat with moderately long ears (NBDC, 2024)[49]. Its broad wings allow for agile, low and slow flight (UOB, 2024)[50] which gives them the ability to hover and also enables them to hunt their prey whilst in flight and by gleaning them from vegetation and are even able to catch spiders from their webs (BCI, 2024)[51]. Natterer's tend to be late emergers with an average emergence time of 75 minutes after sunset (Duvergé, P. L, et al., 2000)[52]. Natterer's are slightly rarer in Ireland than Britian and the rest of Europe but can still be found across the island of Ireland with fewer recorded in the south west than the rest of the isle (NBDC, 2024). A study in the early nineties showed that in the west of Ireland this species typically gleaned its prey from vegetation rather than catching it in flight due to the type of insects available to this species of bat in that part of the country

[45] Conserve Ireland (CI), 2024, *Lesser Horseshoe bat profile*, available at https://www.conserveireland.com/mammals/lesser_horseshoe_bat.php accessed March 2024

[46] Bat Conservation Trust (BCT), 2024, *UK Bats: Lesser Horseshoe bat,* available at https://www.bats.org.uk/about-bats/what-are-bats/uk-bats/lesser-horsehoe accessed March 2024

[47] University of Bristol (UOB), 2024, *Lesser Horseshoe bat Rhinolophus hipposideros*, available at https://www.bio.bris.ac.uk/research/bats/britishbats/batpages/lesserhorseshoe.htm accessed March 2024.

[48] Bat Conservation Ireland (BCI), 2024, *Lesser Horseshoe Bat*, available at https://www.batconservationireland.org/irish-bats/species/lesser-horseshoe-bat accessed March 2024.

[49] National Biodiversity Data Centre (NBDC), 2024, Natterer's bat Myotis nattereri: profile, available at https://species.biodiversityireland.ie/profile.php?taxonId=119463 accessed March 2024.

[50] University of Bristol (UOB), 2024, *Natterer's bat Myotis nattereri* available at https://www.bio.bris.ac.uk/research/bats/britishbats/batpages/leislers.htm accessed March 2024.

[51] Bat Conservation Ireland (BCI), 2024, *Natterer's bat* https://www.batconservationireland.org/irish-bats/species/natterers-bat accessed March 2024.

[52] Duvergé, P. L., Jones, G., Rydell, J., & Ransome, R. D. (2000). *Functional Significance of Emergence Timing in Bats*. Ecography, *23*(1), 32–40.

(Sheil *et al.*,1991)[53]. The Natterer's bat is associated with woodland habitats both deciduous and coniferous and will use tree lines and hedgerow as a way of commuting (BCT, 2024)[54]. This species of bat will also hunt low over open water and but typically hunts higher than the Daubenton's Bat (NBDC, 2024). These bats can also be found to forage in urban areas, parkland, and over agricultural land (CI, 2024)[55]. Natterer's will roost in trees, bat boxes, old stone buildings like barns and churches as well as structures such as tunnels, caves, mines and under bridges (BCT, 2024). During the winter months they can be found hibernating in underground structures like tunnels, mines and caves, and are also known to share their roosting spaces with other species of bat such as the brown long eared and Daubenton's (NBDC, 2024). Natterer's bat conservation status is currently found to be favourable and stable (NPWS 2019).

Whiskered bat (Myotis mystacinus) Call frequency ranges from 32 to 89kHz (loudest at 45kHz)

The whiskered bat is a small bat and is found to be rarer in Ireland's, although widespread across Britian and the rest of Europe (BCT,2024)[56]. The whiskered bat is also Europe's smallest myotis bat species and is related to the other myotis species found in Ireland; the Daubenton's bat and the Natterer's bat (BCI, 2024). As mentioned, this species is not common although can be found across Ireland, its distribution is disjointed (NPWS 2019). This could also be a reflection of the difficulty of separating their echolocation calls from other myotis species as typically identification in-hand ultimately confirms the species type (BCT,2024). The whiskered bat will on average emerge from the roost within 30 minutes of sunset (Jones & Rydell, 1994)[57]. The whiskered bat is a medium to fast, agile flyer and usually flies approximately 20m above ground level (UOB, 2024)[58]. The whiskered bat can be found foraging in habitats such as open meadows and woodland that are often found in close proximity to waterbodies (BCI, 2024).[59] Summer roosting habitat includes buildings, within loft spaces and eaves, between roof tile and hanging tiles and soffits, under bridges and hollows within mature trees (BCT,2024). Winter hibernation sites will include underground structures, such as caves, mines, and tunnels (CI, 2024)[60] The whiskered bat conservation status is currently found to be favourable and stable (NPWS 2019).

[53] Sheil. C. B., McAney. C. M., & Fairley. J. S, (1991), *Analysis of the diet of Natterer's bat Myotis nattereri and the common long-eared bat Plecotus auritus in the West of Ireland*, 223(2), 299-305. Justor

[54] Bat Conservation Trust (BCT), 2024, *UK Bats: Natterer's bat,* available at https://www.bats.org.uk/about-bats/what-are-bats/uk-bats/natterers-bat accessed March 2024.

[55] Conserve Ireland (CI), 2024, *Natterer's bat profile*, available at https://www.conserveireland.com/mammals/natterers_bat.php accessed March 2024.

[56] Bat Conservation Trust (BCT), 2024, *UK Bats: Whiskered bat Myotis mystacinus*, available at https://www.bats.org.uk/about-bats/what-are-bats/uk-bats/whiskered-bat accessed March 2024.

[57] Jones, G., & Rydell, J. (1994). *Foraging strategy and predation risk as factors influencing emergence time in echolocating bats*, 346(1318), The Royal Society

[58] University of Bristol (UOB), 2024, *Whiskered bat Myotis mystacinus* available at https://www.bio.bris.ac.uk/research/bats/britishbats/batpages/whiskered.htm accessed March 2024.

[59] Bat Conservation Ireland (BCI), 2024, *Whiskered bat,* available at https://www.batconservationireland.org/irish-bats/species/whiskered-bat accessed March 2024.

[60] Conserve Ireland (CI), 2024, *Whiskered bat profile*, available at https://www.conserveireland.com/mammals/whiskered_bat.php accessed March 2024.

Appendix 2

Data Tables

Bat passes of each species recorded at each sampling point

Number of bat passes of each species recorded at each sampling point during May 2025

SP	Myotis.spp	Leisler's bat	Nat pipistrelle	Common pipistrelle	Soprano pipistrelle	Brown long-eared bat	Lesser Horseshoe	NoID	Total	%
1	2	95	6	862	154	19	0	7	1145	59.67
2	5	50	7	550	87	12	0	6	717	37.36
3	0	20	0	31	5	0	0	1	57	2.97
TOTAL	7	165	13	1443	246	31	0	14	1919	
%	0.36	8.60	0.68	75.20	12.82	1.62	0.00	0.73		

Number of bat passes of each species recorded at each sampling point during June 2025

SP	Myotis.spp	Leisler's bat	Nat pipistrelle	Common pipistrelle	Soprano pipistrelle	Brown long-eared bat	Lesser Horseshoe	NoID	Total	%
1	11	98	45	663	118	6	1	6	948	25.02
2	0	57	6	401	334	0	0	2	800	21.11
3	0	94	9	1899	35	0	0	4	2041	53.87
TOTAL	11	249	60	2963	487	6	1	12	3789	
%	0.29	6.57	1.58	78.20	12.85	0.16	0.03	0.32		

Number of bat passes of each species recorded at each sampling point during July 2025

SP	Myotis.spp	Leisler's bat	Nat pipistrelle	Common pipistrelle	Soprano pipistrelle	Brown long-eared bat	Lesser Horseshoe	NoID	Total	%
1	8	159	1	1428	45	4	0	1	1646	47.74
2	9	165	10	892	53	6	0	4	1139	33.03
3	15	98	1	505	40	4	0	0	663	19.23
TOTAL	32	422	12	2825	138	14	0	5	3448	
%	0.93	12.24	0.35	81.93	4.00	0.41	0.00	0.15		

Number of bat passes of each species recorded at each sampling point during August 2025

SP	Myotis.spp	Leisler's bat	Nat pipistrelle	Common pipistrelle	Soprano pipistrelle	Brown long-eared bat	Lesser Horseshoe	NoID	Total	%
1	9	231	1	1994	45	16	0	29	2325	76.33
2									0	0.00
3	13	28	3	559	86	13	0	19	721	23.67
TOTAL	22	259	4	2553	131	29	0	48	3046	
%	0.72	8.50	0.13	83.81	4.30	0.95	0.00	1.58		

Nightly/hourly average passes per species

- Low = <10 bat passes per night/hour;
- Medium = 10 – 49 bat passes per night/hour and,
- High = ≥50 bat passes per night/hour.

Nightly average passes

Nightly average passes for each sampling point during May 2025

SP1

	Myotis.spp	Leisler's bat	PIPNAT	Common pipistrelle	Soprano pipistrelle	Brown long-eared bat	Lesser horseshoe	NoID
	2	95	6	862	154	19	0	7
Average over 10 nights	0.4	19	1.2	172.4	30.8	3.8	0	1.4

SP2

	Myotis.spp	Leisler's bat	PIPNAT	Common pipistrelle	Soprano pipistrelle	Brown long-eared bat	Lesser horseshoe	NoID
	5	50	7	550	87	12	0	6
Average over 10 nights	1	10	1.4	110	17.4	2.4	0	1.2

SP3

	Myotis.spp	Leisler's bat	PIPNAT	Common pipistrelle	Soprano pipistrelle	Brown long-eared bat	Lesser horseshoe	NoID
	0	20	0	31	5	0	0	1
Average over 10 nights	0	4	0	6.2	1	0	0	0.2

Nightly average passes for each sampling point during June 2025

SP1

	Myotis.spp	Leisler's bat	PIPNAT	Common pipistrelle	Soprano pipistrelle	Brown long-eared bat	Lesser horseshoe	NoID
	11	98	45	663	118	6	1	6
Average over 10 nights	2.2	19.6	9	132.6	23.6	1.2	0.2	1.2

SP2

	Myotis.spp	Leisler's bat	PIPNAT	Common pipistrelle	Soprano pipistrelle	Brown long-eared bat	Lesser horseshoe	NoID
	0	57	6	401	334	0	0	2
Average over 10 nights	0	11.4	1.2	80.2	66.8	0	0	0.4

SP3

	Myotis.spp	Leisler's bat	PIPNAT	Common pipistrelle	Soprano pipistrelle	Brown long-eared bat	Lesser horseshoe	NoID
	0	94	9	1899	35	0	0	4
Average over 10 nights	0	18.8	1.8	379.8	7	0	0	0.8

Nightly average passes for each sampling point during July 2025

SP1

	Myotis.spp	Leisler's bat	PIPNAT	Common pipistrelle	Soprano pipistrelle	Brown long-eared bat	Lesser horseshoe	NoID
	8	159	1	1428	45	4	0	1
Average over 10 nights	1.6	31.8	0.2	285.6	9	0.8	0	0.2

SP2

	Myotis.spp	Leisler's bat	PIPNAT	Common pipistrelle	Soprano pipistrelle	Brown long-eared bat	Lesser horseshoe	NoID
	9	165	10	892	53	6	0	4
Average over 10 nights	1.8	33	2	178.4	10.6	1.2	0	0.8

SP3

	Myotis.spp	Leisler's bat	PIPNAT	Common pipistrelle	Soprano pipistrelle	Brown long-eared bat	Lesser horseshoe	NoID
	15	98	1	505	40	4	0	0
Average over 10 nights	3	19.6	0.2	101	8	0.8	0	0

Nightly average passes for each sampling point during August 2025

SP1

	Myotis.spp	Leisler's bat	PIPNAT	Common pipistrelle	Soprano pipistrelle	Brown long-eared bat	Lesser horseshoe	NoID
	9	231	1	1994	45	16	0	29
Average over 10 nights	1.8	46.2	0.2	398.8	9	3.2	0	5.8

SP2

	Myotis.spp	Leisler's bat	PIPNAT	Common pipistrelle	Soprano pipistrelle	Brown long-eared bat	Lesser horseshoe	NoID
Average over 10 nights	0	0	0	0	0	0	0	0

SP3

	Myotis.spp	Leisler's bat	PIPNAT	Common pipistrelle	Soprano pipistrelle	Brown long-eared bat	Lesser horseshoe	NoID
	13	28	3	559	86	13	0	19
Average over 10 nights	2.6	5.6	0.6	111.8	17.2	2.6	0	3.8

Hourly average passes

Hourly average passes for each sampling point during May 2025

SP1

	Myotis.spp	Leisler's bat	PIPNAT	Common pipistrelle	Soprano pipistrelle	Brown long-eared bat	Lesser horseshoe	NoID
	0.4	19	1.2	172.4	30.8	3.8	0	1.4
Average over 10 nights	0.08	3.8	0.24	34.48	6.16	0.76	0	0.28

SP2

	Myotis.spp	Leisler's bat	PIPNAT	Common pipistrelle	Soprano pipistrelle	Brown long-eared bat	Lesser horseshoe	NoID
	1	10	1.4	110	17.4	2.4	0	1.2
Average over 10 nights	0.2	2	0.28	22	3.48	0.48	0	0.24

SP3

	Myotis.spp	Leisler's bat	PIPNAT	Common pipistrelle	Soprano pipistrelle	Brown long-eared bat	Lesser horseshoe	NoID
	0	4	0	6.2	1	0	0	0.2
Average over 10 nights	0	0.8	0	1.24	0.2	0	0	0.04

Hourly average passes for each sampling point during June 2025

SP1

	Myotis.spp	Leisler's bat	PIPNAT	Common pipistrelle	Soprano pipistrelle	Brown long-eared bat	Lesser horseshoe	NoID
	2.2	19.6	9	132.6	23.6	1.2	0.2	1.2
Average over 10 nights	0.44	3.92	1.8	26.52	4.72	0.24	0.04	0.24

SP2

	Myotis.spp	Leisler's bat	PIPNAT	Common pipistrelle	Soprano pipistrelle	Brown long-eared bat	Lesser horseshoe	NoID
	0	11.4	1.2	80.2	66.8	0	0	0.4
Average over 10 nights	0	2.28	0.24	16.04	13.36	0	0	0.08

SP3

	Myotis.spp	Leisler's bat	PIPNAT	Common pipistrelle	Soprano pipistrelle	Brown long-eared bat	Lesser horseshoe	NoID
	0	18.8	1.8	379.8	7	0	0	0.8
Average over 10 nights	0	3.76	0.36	75.96	1.4	0	0	0.16

Hourly average passes for each sampling point during July 2025

SP1

	Myotis.spp	Leisler's bat	PIPNAT	Common pipistrelle	Soprano pipistrelle	Brown long-eared bat	Lesser horseshoe	NoID
	1.6	31.8	0.2	285.6	9	0.8	0	0.2
Average over 10 nights	0.32	6.36	0.04	57.12	1.8	0.16	0	0.04

SP2

	Myotis.spp	Leisler's bat	PIPNAT	Common pipistrelle	Soprano pipistrelle	Brown long-eared bat	Lesser horseshoe	NoID
	1.8	33	2	178.4	10.6	1.2	0	0.8
Average over 10 nights	0.36	6.6	0.4	35.68	2.12	0.24	0	0.16

SP3

	Myotis.spp	Leisler's bat	PIPNAT	Common pipistrelle	Soprano pipistrelle	Brown long-eared bat	Lesser horseshoe	NoID
	3	19.6	0.2	101	8	0.8	0	0
Average over 10 nights	0.6	3.92	0.04	20.2	1.6	0.16	0	0

Hourly average passes for each sampling point during August 2025

SP1

	Myotis.spp	Leisler's bat	PIPNAT	Common pipistrelle	Soprano pipistrelle	Brown long-eared bat	Lesser horseshoe	NoID
	1.8	46.2	0.2	398.8	9	3.2	0	5.8
Average over 10 nights	0.36	9.24	0.04	79.76	1.8	0.64	0	1.16

SP2

	Myotis.spp	Leisler's bat	PIPNAT	Common pipistrelle	Soprano pipistrelle	Brown long-eared bat	Lesser horseshoe	NoID
Average over 10 nights	0	0	0	0	0	0	0	0

SP3

	Myotis.spp	Leisler's bat	PIPNAT	Common pipistrelle	Soprano pipistrelle	Brown long-eared bat	Lesser horseshoe	NoID
	2.6	5.6	0.6	111.8	17.2	2.6	0	3.8
Average over 10 nights	0.52	1.12	0.12	22.36	3.44	0.52	0	0.76

Appendix 3

Drawings

Notes:

- Please refer to the Landscape Proposal prepared by CSR for public realm, external boundary treatment, and open space information.
- Please refer to accompanying drawings and reports prepared by MWP for additional Engineering details etc.

Legend:

SA - Semi-Detached A

SB - Semi-Detached B

SC - Semi-Detached C

SD - Semi-Detached D

SE - Semi-Detached E

SF - Semi-Detached F

MA - Mews A

MA - Mews B

MA - Mews C

TA - Townhouse A

TB - Townhouse B

TC - Townhouse C

TD - Townhouse D

TE - Townhouse E

TF - Townhouse F

TG - Townhouse G

TH - Townhouse H

TI - Townhouse I

Rear gardens

Concrete footpath

Shared surface

Below ground attenuation area

Proposed nature play/exploring path with concrete stepping stones and grass mounding

Existing vegetation to be retained,protected and bolstered (refer to arboricultural report)

Proposed dropped kerb

Proposed picnic area

Concrete flushed kerb

Grass matting for fire tender access / turning

POTENIAL PEDESTRIAN LINK

ADJACENT ARDSHANAVOOLY LRD CURRENTLY IN PLANNING PROCESS (KCC REF: 26/60718)

0.082 HA PUBLIC OPEN SPACE

PLAZA

PLAZA

POTENTIAL VEHICULAR CONNECTION

Proposed seating area

Proposed seating, concrete bench with steel frame

Proposed ornamental screening hedge

Amenity grass lawn

Proposed raised table to engineers specifications

Urban rain gardens for water attenuation

Sailin Ro

SAILL ARDÁN

RIDGE

Ceide Spris

ES

ADJACENT SCHEME CURRENTLY UNDER CONSTRUCTION (KCC REF: 24/320)

0.14 HA PUBLIC OPEN SPACE

0.15 HA PUBLIC OPEN SPACE

AREA TO BE LANDSCAPED UNTIL EXTENT OF STRATEGIC LINKS PROJECT ROAD JUNCTION IS COMPLETE.

STRATEGIC LINKS PROJECT ROAD LAYOUT

Existing Wayleave in Yellow

0.03 HA C.O.S

PEDESTRIAN ACCESS TO DEERPARK RETAIL PARK TO BE PROVIDED TO EXISTING ROAD UNTIL STRATEGIC LINKS PROJECT ROAD JUNCTION IS COMPLETE.

APARTMENT BLOCK A

APARTMENT BLOCK B

CRÈCHE 175.1m²

CRÈCHE PLAY AREA

0.02 HA C.O.S

BIN AND BIKE STORE PROVIDED FOR CRECHE

CRECHE PARKING AND DROP-OFF SPACES OUTLINED IN MAGENTA

TEMPORARY ENTRANCE TO SCHEME TO BE REMOVED AND LANDSCAPED ONCE STRATEGIC LINKS PROJECT ROAD JUNCTION IS COMPLETE.

SITE ENTRANCE

DEERPARK RETAIL PARK

ARDSHANAVOOLY

Notes:

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Drawing Notes:

Key:

Red Line indicates Site Boundary

Unit Breakdown:

4-Bed Front-Entry Semi-Detached	13
4-Bed Side-Entry Semi-Detached	05
4-Bed Front-Entry Townhouse Type 1	06
4-Bed Front-Entry Townhouse Type 2	06
4-Bed Side-Entry Townhouse Type 1	01
4-Bed Side-Entry Townhouse Type 2	03
3-Bed Front-Entry Semi-Detached	24
3-Bed Side-Entry Semi-Detached	06
3-Bed Townhouse Type 1	27
3-Bed Townhouse Type 2	07
3-Bed Townhouse Type 3	03
2- Bed Mews Houses	19
Total houses	**120**
Apartment Block A (4 storeys)	
1-Bed Apartment	20
2-Bed Apartment	19
Apartment Block B (4 storeys)	
1-Bed Apartment	16
2-Bed Apartment	13
Combined **Total**	**188**

Overall Site Area = 3.8 Ha
Net Site Area = 3.5 Ha
Net Density = 53.7 Ha
Public Open Space = 0.372 Ha (10.6%)

Issues & Revisions

Rev.	Date	Drwn	Details of Issue / Revision
P1-S-5	04.02.2026	IT	ISSUED FOR INFORMATION
P3-S-0	24.02.2026	KL	ISSUED FOR PLANNING
P3-S-0	18.05.2026	MP	ISSUED FOR INFORMATION
P3-S-0	30.07.2026	MP	ISSUED FOR INFORMATION
P3-S-0	24.08.2026	MP	ISSUED FOR INFORMATION
P3-S-0	15.09.2026	MP	ISSUED FOR PLANNING

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Client Details:
Ross-Park Residential HS Limited

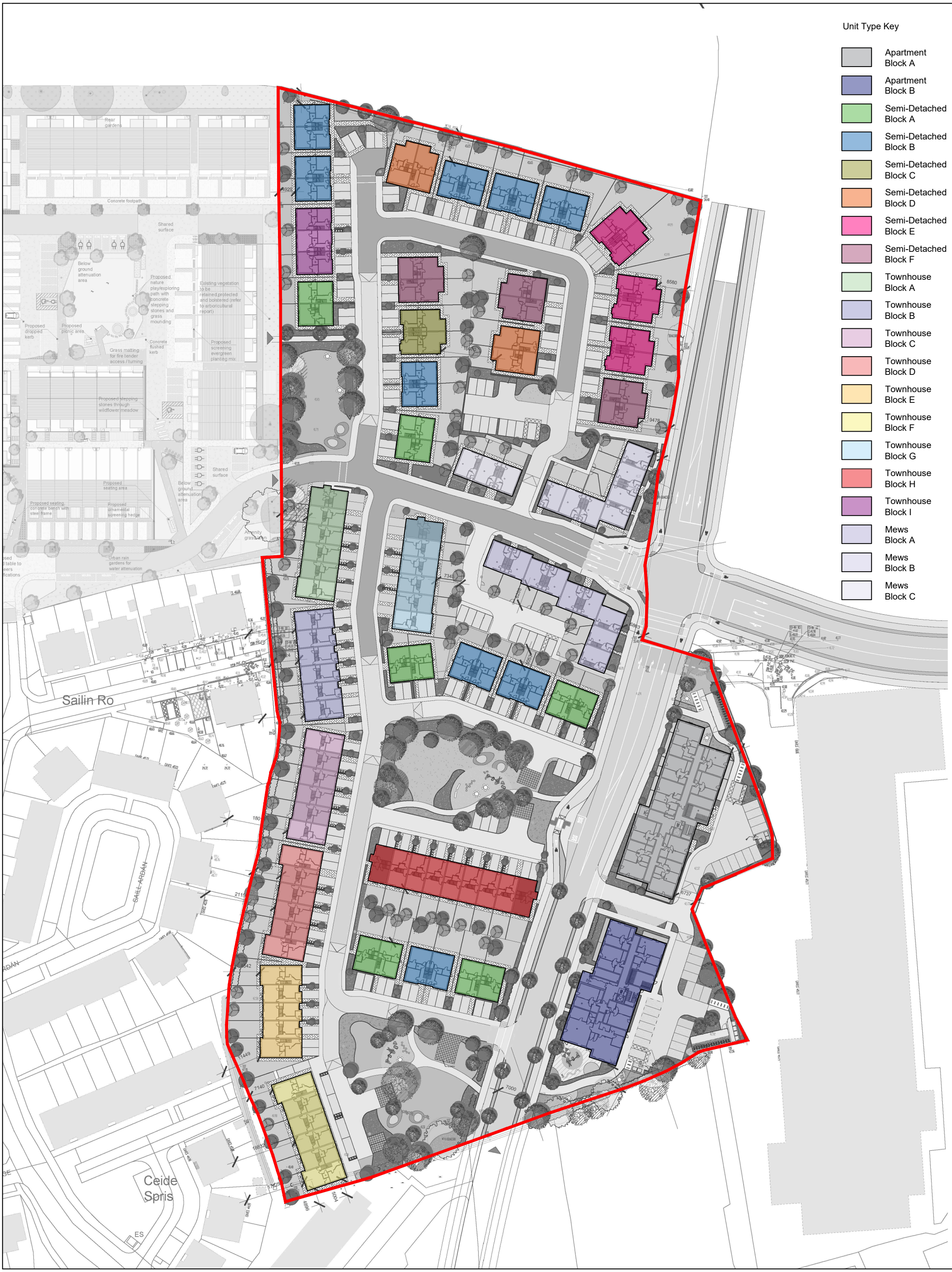
Project Details:
Deer Park LRD
Off Park Road, Ardshanavooly (Townland), Kilarney, Co. Kerry

Drawing Title:
Proposed Site Layout Plan

Job No.	Sheet Size:	Scale @A1:	Status	Purpose of Issue
P24-126C	A1_Portrait	1 : 500	**P3**	**PLANNING**

Issue Date:	Drawn By:	Reviewed By:	Project - System - Spatial Zone - Level - Type - Originator - Role - Number	Revision
15/09/2026	MP	PM	**DPK-06-SW-XXX-DR-RAU-AR-1000**	**P3-S-0**

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Drawing Notes:

N

Issues & Revisions

Rev.	Date	Drwn	Details of Issue / Revision
P1-S-5	04.02.2026	IT	ISSUED FOR INFORMATION
P3-S-0	24.02.2026	KL	ISSUED FOR PLANNING
P3-S-0	18.05.2026	MP	ISSUED FOR INFORMATION
P3-S-0	09.07.2026	MP	ISSUED FOR INFORMATION
P3-S-0	14.09.2026	MP	ISSUED FOR PLANNING

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Client Details:
Ross-Park Residential HS Limited

Project Details:
Deer Park LRD
Off Park Road, Ardshanavooly (Townland), Kilarney, Co. Kerry

Drawing Title:
Unit Type Key Plan

Job No.	Sheet Size:	Scale @A1:	Status	Purpose of Issue
P24-126C	A3_Portrait	1 : 1000	P3	Planning

Issue Date:	Drawn By:	Reviewed By:	Project - System - Spatial Zone - Level - Type - Originator - Role - Number	Revision
14/09/2026	MP	PM	DPK-06-SW-XXX-DR-RAU-AR-0103	P3-S-0

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PLAZA
PLAZA
EV PARKING
EV PARKING
ACCESSIBLE SPACE
BIN STAGING AREA
85
84
SF
FFL=42.555
FFL=42.555
83
82
81
80
79
78
77
MC
MB
74
75
76
FFL=41.665
FFL=41.665
FFL=41.665
FFL=42.465
FFL=42.240
FFL=42.015
FFL=42.015
FFL=41.565
FFL=41.565
FFL=41.565
42.276m
42.401m
42.388m
42.303m
42.028m
42.164m
41.551m
41.426m
41.533m
41.398m
41.359m
41.458m
41.391m
41.708m
REMOVABLE BOLLARDS PROVIDED TO PREVENT UNAUTHORISED VEHICULAR ACCESS
AREA TO BE LANDSCAPED UNTIL EXTENT OF STRATEGIC LINKS PROJECT ROAD JUNCTION IS COMPLETE.
STRATEGIC LINKS PROJECT ROAD LAYOUT
41.473m
41.698m
Existing Wayleave in Yellow
0.03 HA C.O.S
PEDESTRIAN ACCESS TO DEERPARK RETAIL PARK TO BE PROVIDED TO EXISTING ROAD UNTIL STRATEGIC LINKS PROJECT ROAD JUNCTION IS COMPLETE.
BIKE STORE
BIKE STORE
BIKE STORE
42.046m
42.289m
42.05
41.90
41.98
41.97
41.91
41.86
41.94
41.84
41.81
42.04
42.24
42.20
42.29
65
66
67
68
69
70
71
MA
FFL=41.565
FFL=41.565
FFL=41.565
FFL=41.565
FFL=41.565
FFL=41.565
FFL=42.015
41.265m
41.479m
72
73
FFL=42.240
FFL=42.465
56
55
54
53
52
51
SB
SB
SA
FFL=41.470
FFL=41.470
FFL=41.795
FFL=41.795
FFL=42.295
FFL=42.295
41.122m
40.997m
41.974m
42.323m
0.14 HA PUBLIC OPEN SPACE
VISITOR
VISITOR
VISITOR
VISITOR
VISITOR
VISITOR
42.399m
121-159
APARTMENT BLOCK A
FFL=42.625
FFL=42.625
FFL=42.625
FFL=42.625
FFL=42.625
FFL=42.625
FFL=42.625
FFL=42.625
FFL=42.625
11 NO. SPACES
BIN STORE
BIN STAGING
EV PARKING
EV PARKING
EV PARKING
EV PARKING
42.561m
42.530m
42.155m
42.538m
42.606m
42.781m
42.468m
42.523m
42.549m
42.674m
42.770m
160-188
APARTMENT BLOCK B
FFL=42.770
FFL=42.770
FFL=42.770
FFL=42.770
42.466m
42.541m
42.703m
TH
45
46
47
48
49
50
FFL=41.485
FFL=41.710
FFL=41.935
FFL=42.160
FFL=42.385
FFL=42.610
41.260m
SB
SA
38
37
36
FFL=42.070
FFL=42.360
FFL=42.360
42.070m
REMOVABLE BOLLARDS PROVIDED TO PREVENT UNAUTHORIZED VEHICULAR ACCESS
DEERPARK RETAIL PARK
EAVES 4M/7
EAVES 4M/7
EAVES 3M/6

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Drawing Notes:

N

NOTE:
LANDSCAPED SECTION AND REMOVABLE BOLLARDS TO BE PROVIDED TO PREVENT UNAUTHORISED VEHICULAR ACCESS UNTIL EXTENT OF INNER RELIEF ROAD IS COMPLETE.

ONCE STRATEGIC LINKS PROJECT ROAD IS COMPLETE, BOLLARDS AND LANDSCAPED AREAS WILL BE REMOVED TO FACILITATE CONNECTION.

Issues & Revisions

Rev.	Date	Drwn	Details of Issue / Revision
P3-S-0	14.09.2026	MP	ISSUED FOR PLANNING

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Client Details:
Ross-Park Residential HS Limited

Project Details:
Deer Park LRD
Off Park Road, Ardshanavooly (Townland), Kilarney, Co. Kerry

Drawing Title:
Temporary Strategic Links Project Road Layout

Job No.	Sheet Size:	Scale @A1:	Status	Purpose of Issue
P24-126C	A3_Portrait	1 : 500	P3	Planning

Issue Date:	Drawn By:	Reviewed By:	Project - System - Spatial Zone - Level - Type - Originator - Role - Number	Revision
15/09/2026	MP	PM	DPK-06-SW-XXX-DR-RAU-AR-0107	P3-S-0

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Appendix 4

Outdoor Lighting Report

DATE: **2 September 2026**

DESIGNER: **WB**

PROJECT No: **OP60661LSS23038 Deerpark Development, Killarney**

PROJECT NAME: **OP60661LSS23038 Deerpark Development, Killarney**

Designed to BS5489

- Spine Road: Category, P3
1.5lux minimum illuminance & between 7.50-11.25lux average illuminance

- Minor Road: Category, P4
1lux minimum illuminance & between 5-7.5lux average illuminance

Outdoor Lighting Report

This design has been prepared in accordance with the HEA/HEMSA Guidance Note - CDM2015 Regulations, Issue 1.1 dated 09/04/15 - Procedure 2 for an outline design. The information in this report does not account for installation considerations, site conditions or provide any form of risk assessment. Urbis' design service is advisory only and it is the responsibility of the recipient of this information to verify that the design is suitable for the intended application. No account is taken for the blocking effect caused by buildings, trees etc. The calculation shown assumes that the whole area considered is in the same plane.

PREPARED BY:

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Lime Tree Way
Chineham
Basingstoke
RG23 8GG
Tel. 01256 354446
www.urbis-schreder.com
designrequest@urbis-schreder.com

Layout Report

General Data

Dimensions in Metres Angles in Degrees

Calculation Grids

ID	Grid Name	X	Y	X' Length	Y' Length	X' Spacing	Y' Spacing
1	Grid 1 - Minor Roads - P4	497101.00	591097.52	186.00	334.34	1.50	1.50
2	Grid 2 - Pine Road - P3	497183.00	591113.00	28.18	182.81	1.48	1.50
3	Grid 3 - Parking	497188.36	591329.31	24.91	16.18	1.47	1.47

Luminaires

Luminaire A Data

Supplier	Schreder
Type	AXIA 3.1 5296 Integrated lenses Rear louvers 16 OSLON SQUARE
Lamp(s)	16 OSLON SQUARE GIANT@160mA WW 727 230V 1x04-16-057 - DRIVER_
LampFlux(klm)/Colour	0.89 2700K/70
File Name	AXIA 3.1 5296 16 OSLON SQUARE GIANT Drv 160mA WW 727 9W 457602 Integrate...
Maintenance Factor	0.81
Imax70,80,90(cd/klm)	1285.9, 28.2, 0.0
No. in Project	3

Luminaire B Data

Supplier	Schreder
Type	AXIA 3.1 5267 Integrated lenses Rear louvers 16 OSLON SQUARE
Lamp(s)	16 OSLON SQUARE GIANT@550mA WW 727 230V 1x01-11-814 - DRIVER_
LampFlux(klm)/Colour	2.54 2700K/70
File Name	AXIA 3.1 5267 16 OSLON SQUARE GIANT Drv 550mA WW 727 28W 457672 Integrat...
Maintenance Factor	0.81
Imax70,80,90(cd/klm)	1281.8, 174.5, 0.0
No. in Project	9

Luminaire C Data

Supplier	Schreder
Type	AXIA 3.1 5266 Integrated lenses Rear louvers 16 OSLON SQUARE
Lamp(s)	16 OSLON SQUARE GIANT@380mA WW 727 230V 1x04-16-057 - DRIVER_
LampFlux(klm)/Colour	2.04 2700K/70
File Name	AXIA 3.1 5266 16 OSLON SQUARE GIANT Drv 380mA WW 727 19W 457662 Integrat...
Maintenance Factor	0.81
Imax70,80,90(cd/klm)	1216.3, 169.4, 0.0
No. in Project	25

Luminaire E Data

Supplier	Schreder
Type	AXIA 3.2 5267 Integrated lenses Rear louvers 32 OSLON SQUARE
Lamp(s)	32 OSLON SQUARE GIANT@720mA WW 727 230V 1x02-58-000 - DRIVER_
LampFlux(klm)/Colour	6.81 2700K/70
File Name	AXIA 3.2 5267 32 OSLON SQUARE GIANT Drv 720mA WW 727 71W 478662 Integrat...
Maintenance Factor	0.89
Imax70,80,90(cd/klm)	1154.2, 141.4, 0.0
No. in Project	6

Layout

ID	Type	X	Y	Height	Angle	Tilt	Cant	Out-reach	Target X	Target Y	Target Z
1	B	497160.70	591120.28	6.00	196.00	0.00	0.00	0.50			
2	C	497152.76	591143.64	6.00	180.00	0.00	0.00	0.50			
3	C	497156.31	591180.19	6.00	170.00	0.00	0.00	0.50			
4	C	497161.92	591162.06	6.00	254.00	0.00	0.00	0.50			
5	E	497207.74	591176.35	8.00	343.00	0.00	0.00	0.50			
6	E	497190.41	591118.91	8.00	345.00	0.00	0.00	0.50			
7	C	497191.11	591155.45	6.00	254.00	0.00	0.00	0.50			
8	C	497161.84	591209.92	6.00	171.00	0.00	0.00	0.50			

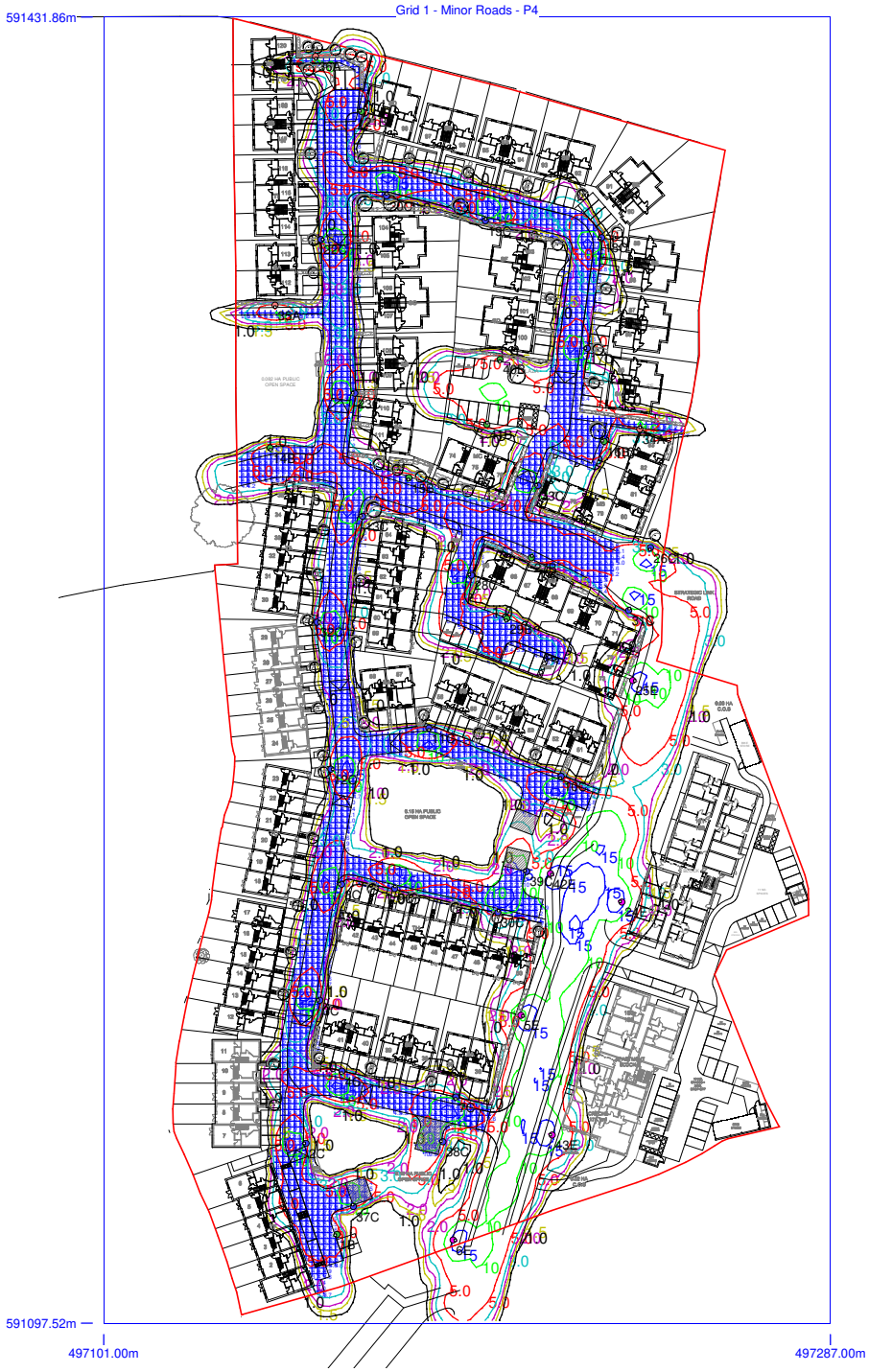
9750431440

Layout Continued

ID	Type	X	Y	Height	Angle	Tilt	Cant	Out-reach	Target X	Target Y	Target Z
9	C	497175.44	591208.84	6.00	77.00	0.00	0.00	0.50			
10	C	497218.00	591237.57	6.00	247.00	0.00	0.00	0.50			
11	C	497184.19	591249.90	6.00	267.00	0.00	0.00	0.50			
12	C	497159.09	591239.35	6.00	2.00	0.00	0.00	0.50			
13	C	497167.21	591304.08	6.00	162.00	0.00	0.00	0.50			
14	B	497143.60	591321.59	6.00	280.00	0.00	0.00	0.50			
15	B	497179.08	591313.94	6.00	251.00	0.00	0.00	0.50			
16	B	497229.01	591323.28	6.00	163.00	0.00	0.00	0.50			
17	C	497224.71	591347.07	6.00	175.00	0.00	0.00	0.50			
18	C	497228.38	591375.42	6.00	203.00	0.00	0.00	0.50			
19	C	497198.60	591379.67	6.00	76.00	0.00	0.00	0.50			
20	C	497173.32	591386.09	6.00	85.00	0.00	0.00	0.50			
21	B	497166.95	591407.68	6.00	163.00	0.00	0.00	0.50			
22	C	497156.50	591374.93	6.00	359.00	0.00	0.00	0.50			
23	C	497165.22	591335.59	6.00	175.00	0.00	0.00	0.50			
24	E	497233.57	591205.38	8.00	165.00	0.00	0.00	0.50			
25	E	497236.36	591262.08	8.00	344.00	0.00	0.00	0.50			
26	C	497240.89	591296.04	6.00	251.00	0.00	0.00	0.50			
27	B	497210.37	591293.51	6.00	72.00	0.00	0.00	0.50			
28	C	497195.06	591289.01	6.00	167.00	0.00	0.00	0.50			
29	B	497204.10	591277.94	6.00	250.00	0.00	0.00	0.50			
30	C	497201.84	591202.69	6.00	75.00	0.00	0.00	0.50			
31	C	497235.27	591279.96	6.00	64.00	0.00	0.00	0.50			
32	C	497155.62	591276.99	6.00	358.00	0.00	0.00	0.50			
33	C	497212.12	591311.91	6.00	158.00	0.00	0.00	0.50			
34	A	497238.13	591326.38	6.00	81.00	0.00	0.00	0.50			
35	A	497144.80	591358.13	6.00	270.00	0.00	0.00	0.50			
36	A	497155.23	591421.80	6.00	271.00	0.00	0.00	0.50			
37	C	497164.86	591127.41	6.00	108.00	0.00	0.00	0.50			
38	C	497187.77	591144.03	6.00	168.00	0.00	0.00	0.50			
39	C	497209.24	591213.24	6.00	167.00	0.00	0.00	0.50			
40	B	497202.38	591344.24	6.00	259.00	0.00	0.00	0.50			
41	B	497199.01	591327.53	6.00	82.00	0.00	0.00	0.50			
42	E	497215.25	591212.65	8.00	334.00	0.00	0.00	0.50			
43	E	497215.78	591145.72	8.00	165.00	0.00	0.00	0.50			

Horizontal Illuminance (lux)

Grid 1 - Minor Roads - P4



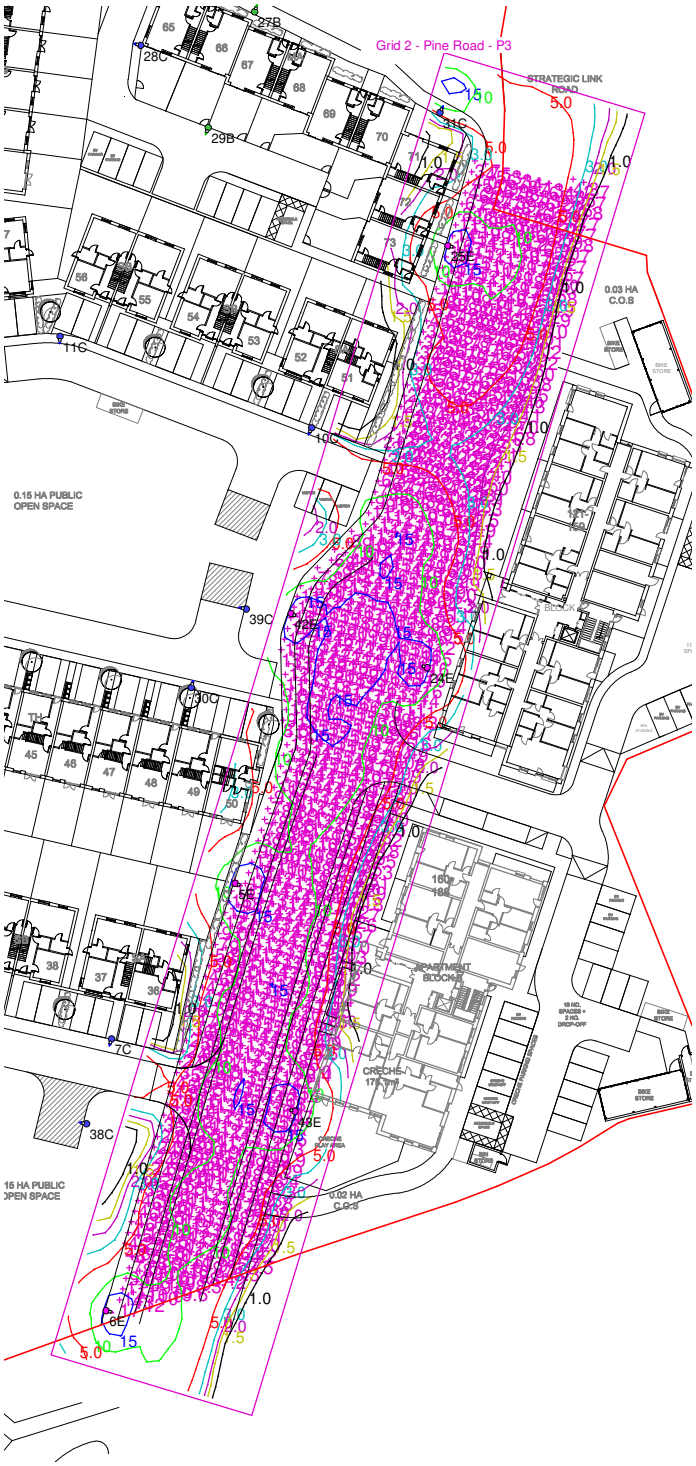
Results

Eav	6.00
Emin	1.07
Emax	21.50
Emin/Emax	0.05
Emin/Eav	0.18

9750431440

Horizontal Illuminance (lux)

Grid 2 - Pine Road - P3



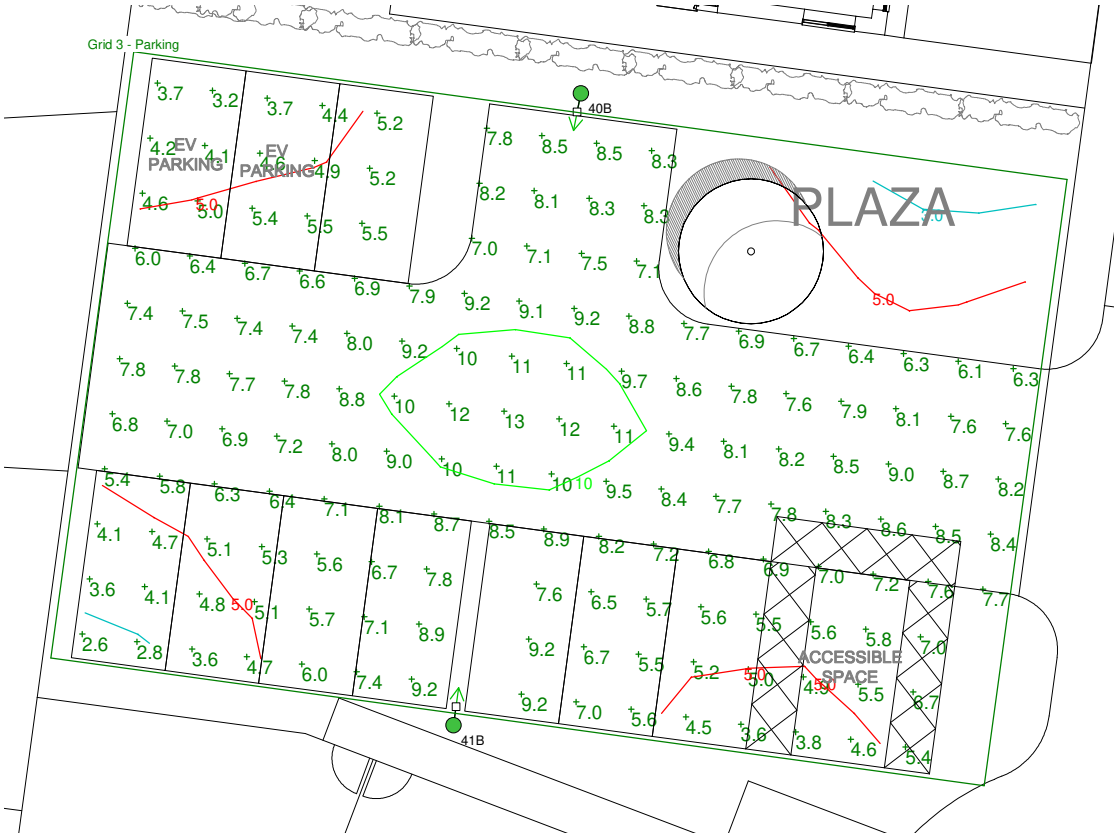
Results

Eav	9.52
Emin	1.60
Emax	21.22
Emin/Emax	0.08
Emin/Eav	0.17

9750431440

Horizontal Illuminance (lux)

Grid 3 - Parking



Results

Eav	7.09
Emin	2.59
Emax	13.13
Emin/Emax	0.20
Emin/Eav	0.37

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