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Preliminary Daytime Bat Roost Assessment

PROPOSED PEDESTRIAN RAIL LINK THROUGH CARLOW COLLEGE Co. CARLOW

2024

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DATE:	20 th March 2024	REVIEWED:	Martin O’Looney, BSc.

TABLE OF CONTENTS

1.0	INTRODUCTION.....	3
2.0	PLANNING CONTEXT	3
3.0	METHODOLOGY	4
3.1	DESKTOP INFORMATION	4
3.2	FIELD SURVEYS METHODOLOGY	5
3.3	BAT SURVEY.....	5
4.0	DESCRIPTION OF PROPOSED DEVELOPMENT AND EXISTING SITE.....	7
4.1	PROPOSED DEVELOPMENT.....	7
4.2	EXISTING ENVIRONMENT	9
5.0	RESULTS	11
	TREES AND BUILDINGS TO BE RETAINED.....	13
	TREES TO BE REMOVED	17
6.0	ARTIFICIAL LIGHTING.....	17
7.0	RECOMMENDATIONS.....	19
8.0	CONCLUSION	20
9.0	REFERENCES.....	21
	APPENDIX A PROPOSED SITE LAYOUT	24
	&	24
	TREE REMOVAL PLAN	24
	&	24
	LIGHTING PLAN.....	24

1.0 INTRODUCTION

This Preliminary Daytime Bat Roost Assessment Report has been prepared by Panther Ecology Ltd. to accompany an application for planning permission by Carlow County Council, for a proposed pedestrian link through Carlow College and all services associated with the development at Co. Carlow.

A preliminary daytime bat assessment was undertaken on the 30th January 2024 by Ms Paula Farrell who has a BSc in Wildlife Biology from Munster Technological University (formerly IT Tralee) and has experience in elasmobranch, amphibian, bird, invertebrate and floral surveys. This survey was supervised by Martin O’Looney who has a BSc Degree in Environmental Science and Technology from Atlantic Technological University Sligo (formerly IT Sligo) and over 10 years’ experience in environmental consultancy and environmental impact assessment.

The completion of this report comprised of a review of the proposed development, a site assessment and a desk study of the information on bats within the vicinity of the development for the potential impacts.

2.0 PLANNING CONTEXT

Following legislation and policies are relevant to the proposed development and biodiversity:

- The Wildlife Act is the primary piece of Irish legislation providing for the protection and conservation of wildlife and provides for the control of specific activities which could adversely affect wildlife, for example the regulation of hunting and wildlife trading. Under the Wildlife Act, all bird species, 22 other fauna species and 86 flora species in Ireland are afforded protected status. The Wildlife Act, 1976 allows for the designation of specific areas of ecological value such as Statutory Nature Reserves and Refuges for Fauna. The Wildlife (Amendment) Act, 2000 provides for greater protection and conservation of wildlife and also provides for the designation and statutory protection of Natural Heritage Areas (NHA). European Communities (Birds and Natural Habitats) Regulations, 2011 (S.I. No. 477 of 2011) and (Amendment) Regulations, 2015 (S.I. No. 355 of 2015), transposing the Habitats Directive 92/43/EEC (as amended) and Birds Directive 2009/147/EC.
- The Flora (Protection) (S.I. No. 235 of 2022). This order provides statutory protection to flora listed in Section 21 of the Wildlife Act, 1976 and Wildlife (Amendment) Act, 2000. Under the Order, it is illegal to wilfully cut, uproot or damage the listed species or interfere in any way with their habitats.
- Biodiversity Plan 2017-2021. Ireland’s third National Biodiversity Plan 2017–2021, identifies actions towards understanding and protecting biodiversity with a vision that, *“biodiversity and ecosystems in Ireland are conserved and restored, delivering benefits essential for all sectors of society and that Ireland contributes to efforts to halt the loss of biodiversity and the degradation of ecosystems in the EU and globally”*.
- National Biodiversity Data Centre All-Ireland Pollinator Plan 2021-2025. This plan has six objectives (i) Making farmland pollinator friendly, (ii) Making public land pollinator friendly, (iii) Making private land pollinator friendly, (iv) All-Ireland

**PRELIMINARY DAYTIME BAT ROOST ASSESSMENT
PEDESTRIAN RAIL LINK THROUGH CARLOW COLLEGE**

Honeybee Strategy, (v) Conserving rare pollinators (vi) Strategic coordination of the Plan.

- Carlow County Council Development Plan 2022-2028. Under these development plans must include mandatory objectives for the conservation of natural heritage and for the conservation of European sites.

3.0 METHODOLOGY

This Preliminary Bat Survey has been carried with reference to the following guidelines:

- Ecological Guidance for Local Authorities and Developers (Scott Cawley, 2013)
- NRA (2010) *Guidelines for Assessment of Ecological Impacts of National Road Schemes* (National Roads Authority)
- Commission Notice “Managing Natura 2000 sites The provisions of Article 6 of the Habitats Directive 92/43/EEC. European Commission, 21.11.2018
- CIEEM (2018) *Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine version 1.2*. Chartered Institute of Ecology and Environmental Management, Winchester.
- *Guidelines for the Treatment of Bats during the Construction of National Road Schemes* (NRA, 2006c);
- *Bat Mitigation Guidelines for Ireland* (Kelleher and Marnell, 2006);
- *Bats and Lighting– Guidance Notes for Planners, Engineers, Architects and Developers* (Bat Conservation Ireland, 2010);
- *Bats and Lighting in the UK – Bats and the Built Environment Series* (Institute of Lighting Professionals, September 2018)
- *Guidance Notes for the Reduction of Obtrusive Light GN01-21* (Institute of Lighting Professionals, 2021).

3.1 DESKTOP INFORMATION

Every effort has been made to provide an accurate assessment of the situation pertaining to the site. However, an ecological survey can only assess a site at a particular time and is limited by various factors such as the season, timing of the survey, climatic conditions and species behaviour. Ecological surveys are therefore snapshots in time and should not be regarded as a complete study. Direct observations or evidence of protected species is not always recorded during ecological surveys. However, this does not indicate that the species is absent from the site. To ensure any limitations encountered did not significantly impact upon the findings of the ecological assessments, the ecological surveys undertaken also assessed the potential of the habitats to support protected species, and cognisance has been taken of available online baseline data (e.g. fauna records from the NBDC, online review of published NPWS records regarding protected / threatened species, review of published BCI records, previous surveys undertaken by Wildlife Surveys) and a precautionary approach taken.

Desktop research was carried out to gather information on the ecology of the site in relation to potential bat roosting habitats for the proposed development at Carlow Town, Co. Carlow.

**PRELIMINARY DAYTIME BAT ROOST ASSESSMENT
PEDESTRIAN RAIL LINK THROUGH CARLOW COLLEGE**

Biological records from the National Biodiversity Data Centre (NBDC) for the site and surrounding area (10km grid square/tetrad) were reviewed and account taken of bat species including within the area.

3.2 Field Surveys Methodology

A site assessment was undertaken on the 30th January 2024 for a preliminary daytime bat roost assessment, as outlined in Table 3.1 below. This comprised of a survey of the proposed construction area to facilitate the proposed development.

Table 3.1: Ecological Surveys

SURVEY	STUDY AREA	SURVEY DATES
Preliminary Day Time Bat Roost Assessment	Complete Proposed Construction area	30 th January 2024

3.3 BAT SURVEY

Areas within the site with the potential to support bat roosts and / or foraging / commuting routes, and which have the potential to be impacted upon by the proposed development were the main focus of the surveys outlined below.

The aims of the bat survey are to collect robust data following good practice guidelines to allow an assessment of the potential impacts of the proposed project on local bat populations. To facilitate the design of control measures, enhancement, and monitoring strategies for local bat populations recorded. Provide information to enable robust decisions with definitive outcomes that aid in the conservation of local bat populations. Depending on the type of site or habitats contained within the survey can concentrate on areas of suspected or potential bat roots such as buildings (with accessible features) and trees with cracks and crevices as noted below. This survey is done to determine if the building/tree is a bat roost. Transect surveys are carried out by walking the site with a bat detector to determine the level and type of bat activity at a site. Other more detailed surveys are carried out if a bat roost is suspected and if knowledge on the type of roost is required to determine the best conservation methods.

All bat species are listed in Annex IV of the Habitats Directive while the Lesser Horseshoe (*Rhinolophus hipposideros*) is afforded additional protection through its inclusion on Annex II of the EU Habitats Directive. As a result, SACs have been designated for this species throughout its European range, including in Ireland.

It is an offence under Section 23 of the Wildlife Act and under Section 51 of Habitat Regulations, 2011 to kill a bat or to damage or destroy the breeding or resting place of any bat species. Under the Habitat Regulations, 2011 actions that intentionally or unintentionally harm, damage or destroy a bat or its roosting site are considered to be an offence. According to Section 54(2) of the Habitats Regulations 2011, a derogation licence to disturb bats or the breeding or resting places may be granted ‘where there is no satisfactory alternative, and the derogation is not detrimental to the maintenance of the populations of the species to which the Habitats Directive relates at a favourable conservation status in their natural range. The assessment comprised of an external inspection of trees to identify potential roost features (PRFs) and evidence of bat activity. Any cracks or crevices were further inspected visually

PRELIMINARY DAYTIME BAT ROOST ASSESSMENT PEDESTRIAN RAIL LINK THROUGH CARLOW COLLEGE

with the aid of a strong torch to look for bat droppings, urine staining, grease marks (oily secretions from glands present on stonework) and claw marks. The criteria used to categorise the PRFs or suitability of trees as a potential roost are summarised in the table below, based upon the guidelines by Collins (2016) and Hundt (2012).

Examples of such features include;

- Natural holes;
- Cracks/splits in major limbs;
- Loose bark; and,
- Hollows/cavities.

Climbing trees to look for roosts, using appropriate equipment and safety precautions, is a possible approach for small numbers of trees with a high probability of bats, but the results of radiotracking studies of some species suggest that bats may use cracks or crevices that are far from obvious Kelleher & Marnell, (2006).

Furthermore, as a signatory to the EUROBATS Agreement (Agreement on the Conservation of Populations of European Bats, 1994), Ireland is required to protect their habitats and important feeding areas from damage or disturbance. All Irish bat species are listed in Appendix II of the Bern Convention (1979), as species requiring protection.

The IUCN Red List categories and criteria are used as an easily understood system for classifying species by their risk of global extinction (IUCN 2012). Irish bats have most recently been categorised in the updated IUCN red list of terrestrial mammals in Ireland. All bats normally occurring on the island are listed as “Least Concern” (Nelson et al., 2019). The status of the Greater Horseshoe Bat (*Rhinolophus ferrumequinum*) is not yet determined in Ireland as only one record has been confirmed.

Assessment of Bat Roost Potential

A daytime assessment of individual trees and hedgerows within the proposed development site potentially affected by the proposed development was undertaken on the 13th of September 2023. The assessment comprised of an external inspection of trees to identify potential roost features (PRFs) and evidence of bat activity, using close focusing binoculars. The criteria used to categorise the PRFs or suitability of trees and buildings as a potential roost are summarised in the table below, based upon the guidelines by Collins (2016) and Hundt (2012).

The great majority of roosts are used only seasonally, so there is usually some period when bats are not present. Although there are differences between species, maternity sites are generally occupied between May and September and hibernation sites between October and March, depending on the weather. A hibernation site will have a constant cool temperature and humidity. The majority of bat species do not hibernate in trees with the exception of Leisler’s bat (*Nyctalus leisleri*) noted as “probably tree cavities” and Brown long-eared bat (*Plecotus auratus*) “tree holes”. The probability of bats roosting in a tree decreases in coniferous plantations with no specimen trees and young trees with simple growth form and little damage (Kelleher & Marnell, 2006). Where bats are found, either individually or in groups in the winter months will have a constant cool temperature and humidity.

**PRELIMINARY DAYTIME BAT ROOST ASSESSMENT
PEDESTRIAN RAIL LINK THROUGH CARLOW COLLEGE**

Table 3.2: Bat Roost Potential Categories

CATEGORY	DESCRIPTION
High Trees / buildings that are suitable for use by large numbers of bats on a regular basis	<p>Features include holes, cracks or crevices that extend or appear to extend back to cavities suitable for bats. In buildings, examples include eaves, barge boards, gable ends and corners of adjoining beams, ridge and hanging tiles, behind roofing felt or within cavity walls. In trees, examples include hollows and cavities, rot holes, cracks/splits and flaking or raised bark which could provide roosting opportunities. Any ivy cover is sufficiently well-established and matted so as to create potential crevices beneath.</p> <p>Further survey work would be required to determine whether or not bats are present, and if so, the species present. Appropriate mitigation and potential licencing requirements may then be determined.</p>
Moderate Moderate potential is assigned to trees / structures with potential to support bat roosts but supports fewer features than a high potential building / tree and is unlikely to support a roost of high conservation value.	<p>From the ground, building / tree appears to have features (e.g. holes, cavities, cracks or dense ivy cover) that may extend back into a cavity. However, owing to the characteristics of the feature, they are deemed to be sub-optimal for roosting bats.</p> <p>Further survey work would be required to determine whether or not bats are present, and if so, the species present. Appropriate mitigation and potential licencing requirements may then be determined.</p>
Low Low potential is assigned to structures and trees with features that could support individual bats opportunistically.	<p>If no features are visible, but owing to the size, age and/or structure, hidden features, sub-optimal for roosting bats, may occur that only an elevated inspection may reveal. In respect of ivy cover, this is not dense (i.e. providing PRF in itself) but may mask presence of PRF features.</p> <p>Further survey work may be required for buildings only or works may proceed using reasonable precautions (e.g. controlled working methods, under license or supervision of a bat worker).</p>
Negligible	Trees have no potential for bat roost.

4.0 DESCRIPTION OF PROPOSED DEVELOPMENT AND EXISTING SITE

4.1 PROPOSED DEVELOPMENT

The proposed development is for a new pedestrian link through Carlow College to Carlow rail and all services associated with the development at Carlow College, Co. Carlow.

The proposed development includes upgrading an existing footpath, new lighting, new entrance, a new footpath linking to existing footpaths and an extension to an existing carpark. Much of the existing vegetation and trees within the development site will be retained where possible with the exception of those of poor condition and to facilitate the proposed development. Where possible, trees of poor quality will be cut to the stump to allow for regrowth. This includes the following trees with tag number 1665 (Birch), 1667 (Birch), 1295 (White Willow), 1278

PRELIMINARY DAYTIME BAT ROOST ASSESSMENT PEDESTRIAN RAIL LINK THROUGH CARLOW COLLEGE

(Sycamore) and the complete removal of 1296 (Horse Chestnut), 1272, 1273, 1274, 1275 (Grey Poplar) and T 5 (Birch). The trees to be removed will be replaced with a native tree species.

The site is accessed via the via College Street (L4025) to the west, the Dublin Road (R888) to the north and Saint Joseph's Road (L4012) to the east. Landscaping will incorporate a mix of native and non-native non-invasive species throughout its design. This includes low perennial planting of grasses, Giant Hyssop (*Agastache Foeniculum*), Red Spider (*Zinnia tenuifolia*), Gentian Sage (*Salvia Patens*), *Hylotelephium 'Matrona'* and Squirrel's Tail (*Lagarus ovatus*).

Other than new proposed lighting, no additional construction works will be required at the entrance of Carlow College along the L4025. Surface water comprised of rainwater runoff from the new path crossing an existing carpark (refer to site layout out) will be directed to the existing drainage network. This will be in line with typical drainage network standards. Surface water from the existing footpath that is to be upgraded and the new footpath along the boundary of St. Josephs School will percolate to ground. Surface water from the new extended carpark and new entrance adjacent St. Catherine's Community Centre will be directed to the existing drainage network. The new overlaid pathway will be elevated to allow surface water to be directed to the existing sports pitch. A new curb may be installed as part of these works and will be spaced to allow water through. See Appendix A for site layout.

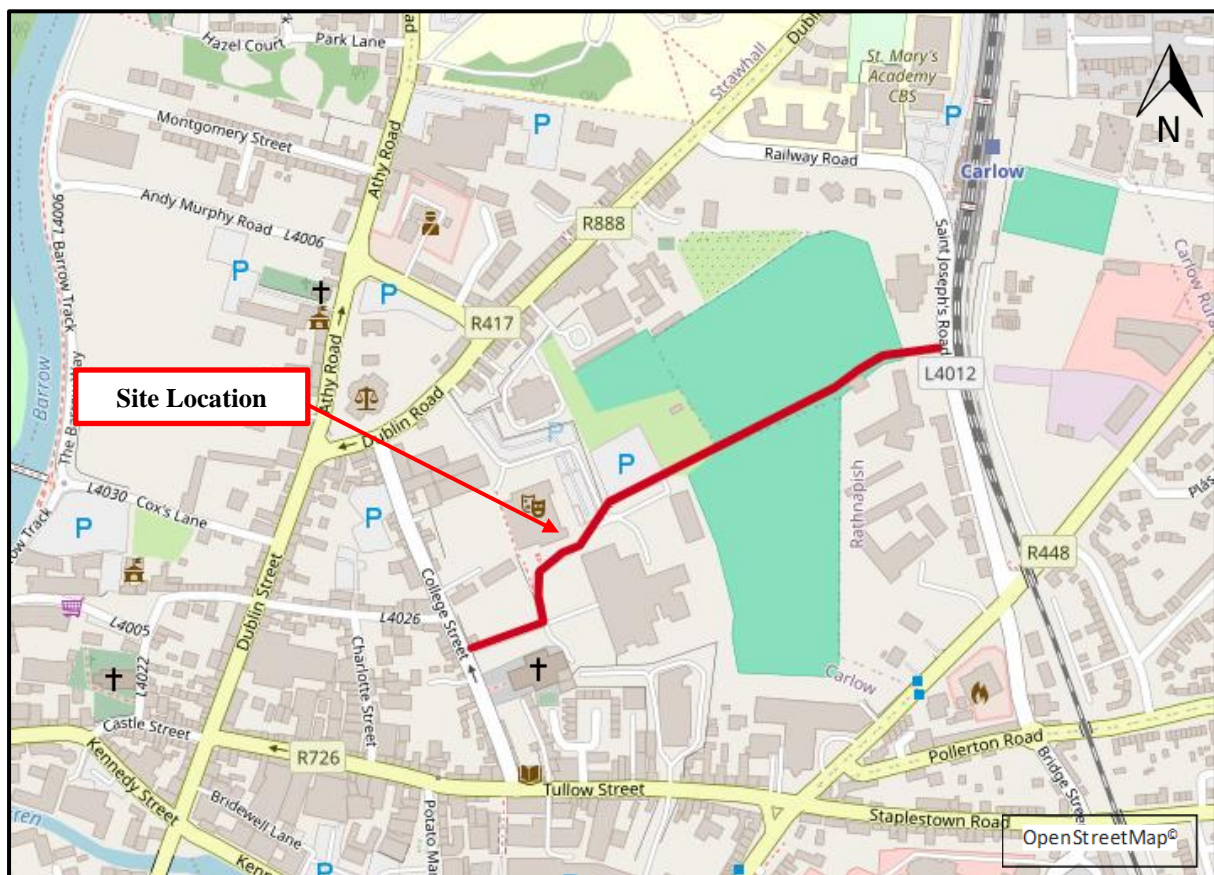


Figure 3: Location of Development at Co. Carlow

**PRELIMINARY DAYTIME BAT ROOST ASSESSMENT
PEDESTRIAN RAIL LINK THROUGH CARLOW COLLEGE**

4.2 EXISTING ENVIRONMENT

A site visit was conducted on the 30th January 2024 to assess bat roost potential habitats i.e. outside of buildings, trees and hedgerows along the immediate construction route. A full habitat assessment and classification was undertaken as part of the accompanying Appropriate Assessment Report (Document Ref: AA_10114). See Appendix C for additional Photo Log of site during site assessments.

Treelines (WL2)

This habitat was found mostly to the eastern portion of the proposed construction area adjacent the sports field at Carlow College, within the grounds of Carlow College and at St. Catherines Community Centre. The species composition comprised of young and mature species which includes Birch (*Betula* spp.), Oak (*Quercus* spp.), Lime (*Tilia* spp.), Ash (*Fraxinus* spp.), Elder (*Sambucus* spp.), Maple (*Acer* spp.), Hazel (*Corylus avellana*), Sycamore (*Acer pseudoplatanus*), Poplar (*Populus* spp.), Willow (*Salix* spp.), Wild Cherry (*Prunus avium*), Horse Chestnut (*Aesculus hippocastanum*), Birch (*Betula* spp.) and Beech (*Fagus* spp.).



Figure 4.1.1 Treeline (WL2)

Scattered trees and parkland (WD5)

Scattered trees habitat is found throughout the area but predominantly to the south-west near the L4025 and within the grounds of St. Leo's College. Species include Ash (*Fraxinus* spp.), Birch (*Betula* spp.) and Scots Pine (*Pinus sylvestris*).

PRELIMINARY DAYTIME BAT ROOST ASSESSMENT
PEDESTRIAN RAIL LINK THROUGH CARLOW COLLEGE



Figure 4.1.2 Scattered trees and parkland (WD5)

Hedgerow WL1

This habitat forms the western boundary of the proposed construction area to the east. Species include Euonymus, Barberry (*Berberis* spp.) and Privet (*Ligustrum* spp.).



Figure 4.1.3 Hedgerow (WL1)

Buildings and artificial surfaces (BL3)

Buildings and artificial surfaces (BL3) habitat is located throughout the proposed development which includes hardcore surfaces, paved areas, buildings and walled boundaries.

**PRELIMINARY DAYTIME BAT ROOST ASSESSMENT
PEDESTRIAN RAIL LINK THROUGH CARLOW COLLEGE**



Figure 4.1.4 Buildings and artificial surfaces (BL3)

Table 4.1 Habitats surveyed for potential daytime bat roost assessment

HABITAT CLASSIFICATION HIERARCHY		
LEVEL 1	LEVEL 2	LEVEL 3
B – Cultivated and built land	BL – Built land	BL3 – Buildings and artificial surfaces
W – Woodland and scrub	WL – Linear woodland/scrub	WL1 – Hedgerow
		WL2 - Treeline

5.0 RESULTS

5.1 Desk Based Review

The development site is located outside of the current distribution, current range and favourable reference range of Lesser Horseshoe Bat (*Rhinolophus hipposideros*) [1303]. The proposed development is inside the current range but outside the current distribution for the Nathusius' Pipistrelle (*Pipistrellus nathusii*) [1317] but within current distribution, current range and favourable reference range of Soprano Pipistrelle (*Pipistrellus pygmaeus*) [5009], Daubenton's Bat (*Myotis daubentonii*) [1314], Brown long-eared Bat (*Plecotus auratus*) [1326], Leisler's Bat (*Nyctalus leisleri*) [1331], Natterer's Bat (*Myotis nattereri*) [1322] and Common pipistrelle (*Pipistrellus pipistrellus*) [1309]. The proposed development is within the current distribution, the current range but outside the current distribution and favourable reference range for the Whiskered Bat (*Myotis mystacinus*) [1330] (NPWS, 2019c).

The NPWS's National Lesser Horseshoe Bat Roost Database was consulted (January 2024) with regards any roost records for Lesser Horseshoe Bat (*Rhinolophus hipposideros*). The Lesser Horseshoe Bat is mainly confined to the west of Ireland, with the NPWS database indicating that the nearest record for this bat is located approximately 108km to the west of the development site near Lisnagry.

**PRELIMINARY DAYTIME BAT ROOST ASSESSMENT
PEDESTRIAN RAIL LINK THROUGH CARLOW COLLEGE**

Table 5.1 NBDC has records for bats within the 10km square (Tetrads S77) at the proposed development.

NBDC RECORDS FOR BATS	
SPECIES	TETRAD (10KM)
Brown Long-eared Bat (<i>Plecotus auritus</i>)	S77
Daubenton's Bat (<i>Myotis daubentoniid</i>)	S77
Leisler's Bat/Lesser Noctule (<i>Nyctalus leisleri</i>)	S77
Natterer's Bat (<i>Myotis nattereri</i>)	S77
Soprano Pipistrelle (<i>Pipistrellus pygmaeus</i>)	S77
Common pipistrelle (<i>Pipistrellus pipistrellus</i>)	S77

The proposed development is situated within S77I (NBDC 2km square). See below.

Table 5.2 NBDC has records for bats within the 2km square (Tetrads S77I) at the proposed development.

NBDC RECORDS FOR BATS	
SPECIES	TETRAD (2KM)
Brown Long-eared Bat (<i>Plecotus auritus</i>)	S77I
Daubenton's Bat (<i>Myotis daubentoniid</i>)	S77I
Common pipistrelle (<i>Pipistrellus pipistrellus</i>)	S77I

In addition, Bat Conservation Ireland's habitat suitability index available to view on the NBDC online mapping portal, classifies the landscape, within which the site is located, as having a medium habitat suitability for bats, with a score of 32.22 for the development site and surrounding landscape. The maps are a visualisation of the results of the analyses based on a 'habitat suitability' index. The index ranges from 0 to 100 with 0 being least favourable and 100 most favourable for bats. The maps are constructed using spatial units of the OSI National Grid. The index presented is for all species combined, in addition to the individual species' indices (Lundy et al., 2011).

Table 5.3 Bat habitat suitability index for the proposed development site

BAT HABITAT SUITABILITY INDEX	
SPECIES	INDEX
Soprano Pipistrelle (<i>Pipistrellus pygmaeus</i>)	36
Brown long-eared Bat (<i>Plecotus auritus</i>)	52
Common pipistrelle (<i>Pipistrellus pipistrellus</i>)	44
Lesser Horseshoe Bat (<i>Rhinolophus hipposideros</i>)	0
Lesser Noctule (<i>Nyctalus leisleri</i>)	41
Whiskered Bat (<i>Myotis mystacinus</i>)	38
Daubenton's Bat (<i>Myotis daubentoniid</i>)	29
Nathusius's Pipistrelle (<i>Pipistrellus nathusii</i>)	14
Natterer's Bat (<i>Myotis nattereri</i>)	36

5.2 In Field Results

5.2.1 Preliminary Daytime Bat Roost Assessment

TREES AND BUILDINGS TO BE RETAINED

A survey was conducted by Panther Ecology Ltd on the 30th January 2024 to assess existing treelines, hedgerows and the outside of buildings along the proposed route for potential bat roost habitats. The results are below;



Figure 5.1: Building at Carlow College entrance along the L4025 – low bat roost potential – to stay

This building is located to the west of the proposed development adjacent the College Street entrance. It had an intact roof with no obvious cracks or crevices on the external walls or connecting to the roof. The windows and doors are sealed. There is potential for bats to access via the tiled roof however, an extensive search of the roof was not undertaken, rather just observed through binoculars. There will be no construction works to this building as part of the proposed development. The nearest works will be for the installation of new lighting.

A number of trees onsite are considered as having negligible bat roost potential. Some of the mature trees due to age, the presence of Ivy cover and presence of crevices were considered as having low to moderate bat roost potential. Details are below.

PRELIMINARY DAYTIME BAT ROOST ASSESSMENT
PEDESTRIAN RAIL LINK THROUGH CARLOW COLLEGE



Figure: 5.2 (i)



Figure: 5.2 (ii)



Figure: 5.2 (iii)

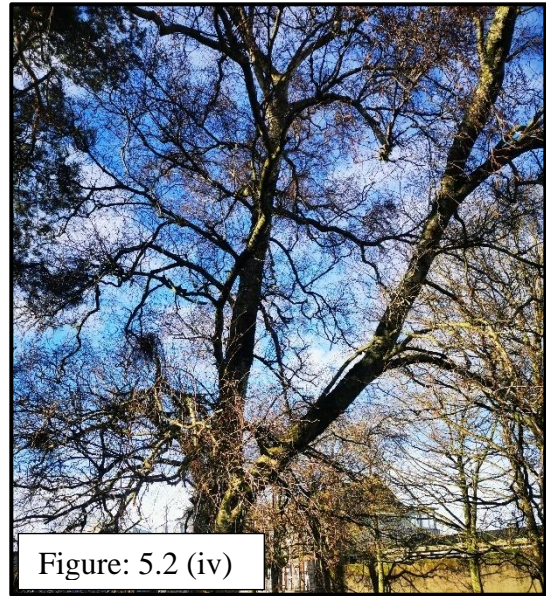


Figure: 5.2 (iv)



Figure: 5.2 (v)

PRELIMINARY DAYTIME BAT ROOST ASSESSMENT
PEDESTRIAN RAIL LINK THROUGH CARLOW COLLEGE

Figure 5.2 (i) Treeline with negligible bat roost potential – to stay (ii) Oak – some Ivy cover, no obvious crevices with negligible bat roost potential – to stay. (iii) Scots Pine along area for new proposed lighting – some areas show bark peelback with low bat roost potential – to stay. (iv) Birch along area for new proposed lighting – some hollows present but not deep with low bat roost potential – to stay. (v) Treeline (left side) consisting of twelve individual trees with negligible to low bat roost potential – to stay except for one Birch tree which will be cut leave 2.5m stump.

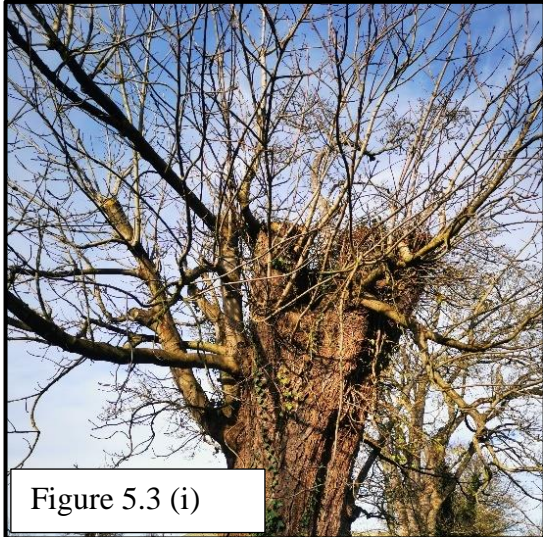


Figure 5.3 (i)



Figure 5.3 (ii)



Figure: 5.3 (iii)



Figure 5.3 (iv)



Figure 5.3 (v)



Figure 5.3 (vi)

PRELIMINARY DAYTIME BAT ROOST ASSESSMENT
PEDESTRIAN RAIL LINK THROUGH CARLOW COLLEGE

Figure 5.3 (i) Sycamore with low/moderate bat roost potential. This tree has been topped – to stay (ii) Hedgerow and treeline (comprised of three Norway Maples) with negligible bat roost potential but may be used by commuting bats (iii) Treeline at carpark with negligible bat roost potential – to stay (iv) Treeline comprised of young Oak with negligible bat roost potential – one tree may be removed (v) Partial treeline located within grounds of St. Leo’s with negligible to low bat roost potential – all to stay (left in picture) (vi) Scattered trees in St. Leo’s sports grounds with negligible bat roost potential – to stay.

A treeline (WL2) located along the existing pathway adjacent the sports ground at Carlow College was assessed for bat roost potential. The trees range from negligible to moderate bat roost potential. Those considered having bat roost potential are included below (figure 5.4).



Figure 5.4 (i) Treeline along existing pathway adjacent the sports ground at Carlow College – some trees to be removed (left in picture). The trees vary from negligible to moderate bat roost potential. They are as follows; (ii) Willow with some cover of dead Ivy. No obvious crevices – low bat roost potential – to be coppiced (iii) Sycamore tree with low bat roost potential – to stay (v) Sycamore at

**PRELIMINARY DAYTIME BAT ROOST ASSESSMENT
PEDESTRIAN RAIL LINK THROUGH CARLOW COLLEGE**

junction of Carlow College and St. Leo’s College grounds where pathways will join with low bat roost potential – to stay. (vi) Large Maple tree at St. Catherine’s Community Centre. A crevice was observed within the trunk although there was no cover of Ivy - Moderate bat roost potential – to stay.

TREES TO BE REMOVED

While the majority of the existing habitats and trees will be retained onsite, some trees will be removed to facilitate the development and as per the Arboricultural Report. Tree removal will only be undertaken where there is no alternative. Those removed will be replaced with native tree species. The construction of the pathways will navigate around existing trees for the most part. The trees to be removed are shown below.

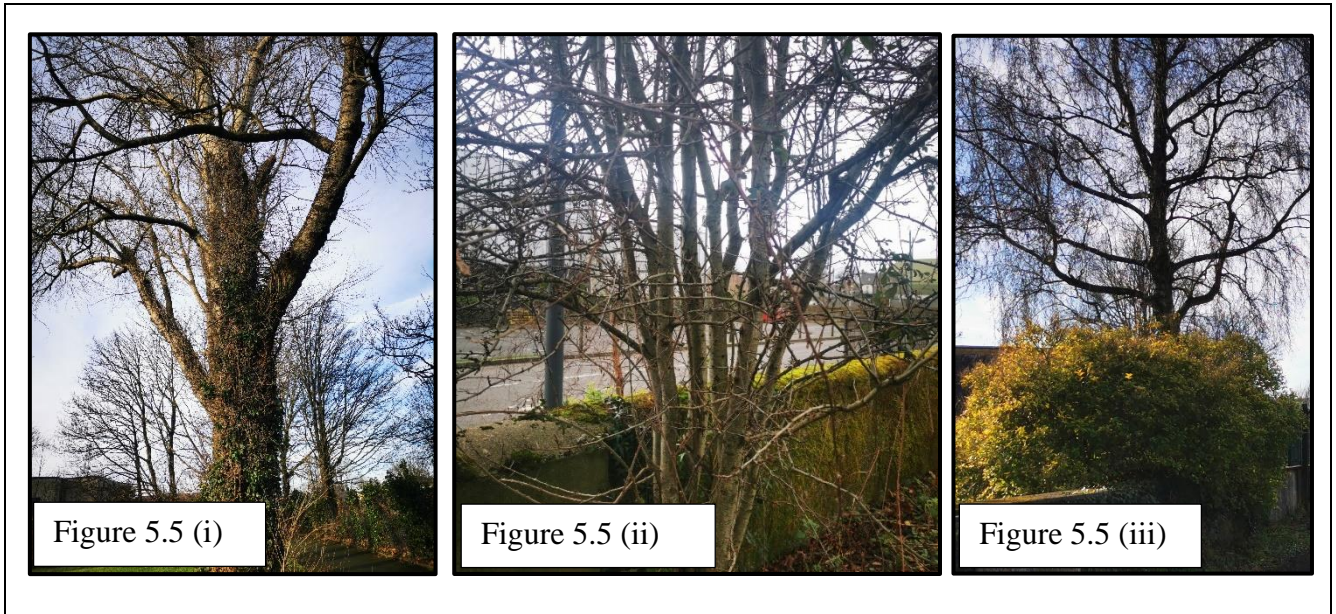


Figure 5.5 (i) Poplar with some cover of Ivy and some cavities – low to moderate bat roost potential – to be removed (ii) Hawthorn with negligible bat roost potential – to be removed (iii) Birch tree with negligible bat roost potential – potentially to be removed

Table 5.5: Ecological Value of Species of the Proposed Development

SPECIES	SPECIES RATING	RATIONALE
Bats	Local importance, higher value	Yes. The hedgerows / trees within the proposed development could be used by bats for commuting and roosting.

6.0 Artificial lighting

Artificial lighting during the construction and operational phases has the potential to negatively impact upon bat species, as illumination can impact upon their roosting sites, commuting routes and foraging areas. Occupation of roosts in trees by bats may be very transient and there is limited potential that trees in the footprint of the proposed site could be used occasionally as roosting or resting places by individual/small numbers of bats. The roosting potential of the majority of trees within the proposed construction area is considered low with their removal (if

**PRELIMINARY DAYTIME BAT ROOST ASSESSMENT
PEDESTRIAN RAIL LINK THROUGH CARLOW COLLEGE**

required) during the construction phase to be outside the maternity season for bats (May – September). The following mitigation measures will be employed during the operational and construction phases to ensure no impact upon nocturnal species.

Artificial Lighting during construction phase;

- Construction works in the hours of darkness, when bats are active (April – October), would be kept to a minimum;
- Lighting of hedgerows / treelines will be avoided where possible;
- Should lighting be required during construction works, it will be of a low height (without compromising safe working conditions) to ensure minimal light spill. Where possible and where practicable to do so, timers or motion sensors would be used;
- Directional lighting would be used where possible, by use of louvres or shields fitted to the lighting;

White light emitting diode (LED) will be used where possible, which is considered to be low impact in comparison to other lighting types

Artificial Lighting during operational phase;

A Lighting plan has been designed by Signify during the operational phase of the proposed development. It incorporates the use of five types of luminaires, 21 No. Type A, 10 No. Type B, 11 No. Type C, 6 No Type D and 2 No. Type E. Luminaires 22 C to 30 C will be installed along the pedestrian route adjacent to the existing sports field within Carlow College. These luminaires are approximately 1m in height providing low level lighting away from the tree canopy. Luminaires 32B to 39B will be installed along the new pathways within the grounds of St. Leo's College. These luminaires are approximately 6 to 6.5m in height. As there are no trees along this section, it is not anticipate that there would be an impact to bats. Luminaires 45 D to 47D will be located along the new vehicular and pedestrian entrance off the St. Joseph's Road. These luminaires are approximately 6m in height and will be directed away from any nearby trees. Luminaires 18A to 21A will be installed along the entrance from College Street to the west. They will be approximately 6.5m in heigh and will replace the existing luminaires in this area. The luminaires will be installed away from the existing trees to the south of the pathway.

This proposed lighting plan would ensure that there will minimum impact on nocturnal fauna such as bats. Luminaires should feature peak wavelengths higher than 550nm to avoid the component of light most disturbing to bats (Stone, 2012).

The following recommendations should also be considered;

- Lighting of hedgerows / treelines would be avoided using directional lighting;
- Carparks and site entrance lighting would be angled away from hedgerows and treelines;
- The use of specialist bollard or low-level downward directional luminaires to retain darkness above can be considered;

**PRELIMINARY DAYTIME BAT ROOST ASSESSMENT
PEDESTRIAN RAIL LINK THROUGH CARLOW COLLEGE**

- All lanterns calculated at 0° tilt
- Lighting would be of low height where possible, to minimise light spill;
- Where possible and practicable to do so, timers or motion sensors would be used;
- White LED or amber coloured LED outdoor lighting would be used where possible, which is considered to be low impact in comparison to other lighting types;
- All luminaires should lack UV elements when manufactured. Metal halide, fluorescent sources should not be used;
- Dark buffer zones can be used to separate habitats or features from lighting by forming a dark perimeter around them;
- Light spill into the surrounding habitats such as the treeline to the west, and watercourses to the south and west is minimal;

7.0 Bat Protection Measures

- No chemicals will be used within the development zone and will not be used in near treelines and hedgerows or drainage ditches;
- Construction works will be undertaken during day time hours so as to limit any potential impact to protected nocturnal species;
- The planting of substantial landscape features integrated to the wider network of green corridors such as hedgerows, woodland and scrub, preferably native species;
- Bats rely on linear habitats such as hedges to fly through the landscape. The preservation of existing hedgerows and trees will provide connectivity throughout the site and surrounding area;
- Maintaining an unmanaged buffer zone along treelines/hedgerows such as scrub or tall grasses would provide habitat for invertebrates for bats to feed on;
- See Bat Conservation Ireland Guidelines on hedgerow management for bats. <https://www.batconservationireland.org/wp-content/uploads/2022/07/Managing-Hedgerows-for-Bats.pdf>
- If works should take place beside any trees that will remain as part of the landscape plan, then a buffer zone would be applied onsite as per Tree Survey requirements (see Arboricultural Report report by Veon);
- Where possible, vegetation removal works will be scheduled outside of the 1st of March to the 31st of August period, so as not to disturb nesting bird species;
- A bat survey of activity should be carried out during active season for bats to determine if and what species of bats are active at the site;
- Felled trees should be left for 48 hours, to allow for any potential bats to escape.
- A derogation licence would be required from the National Parks and Wildlife Service (NPWS) if bats are found.

Residual Impacts

**PRELIMINARY DAYTIME BAT ROOST ASSESSMENT
PEDESTRIAN RAIL LINK THROUGH CARLOW COLLEGE**

Removal of trees habitats and loss of foraging and commuting habitat will be a minor local impact. With the majority of treeline and hedgerows to remain intact.

The installation of sympathetic lighting in the vicinity of new and existing hedgerows/treelines will enable these landscape features to be used by bats, post construction.

8.0 Conclusion

Developments have the potential to impact upon biodiversity and protected species such as bats through the destruction and loss of habitat via removal of trees and disturbance via light pollution. Given the connectivity to existing treelines, hedgerows and mature trees within the grounds of Carlow College, it is probable that bats are within the vicinity. The proposed development could potentially offer suitable habitat for roosting bats given the network of trees.

The construction phase of the development will result in the upgrading of existing pathways, proposed new pathways, lighting and an extension to an existing carpark. The construction works will mostly take place on modified buildings and artificial surfaces habitat (i.e.. pathways and hard surfaces) however, the works may come in close proximity to some mature trees considered as having bat roost potential. Only where required and where no alternative can be found, will any trees be removed.

The preliminary bat roost assessment determined that much of the existing trees along the proposed construction area are considered as having negligible to low bat roost potential.

A majority of the existing trees will be retained except for the removal of some trees to facilitate the proposed development and as per the Arboricultural Report due to poor quality. Trees to be removed will be replaced with new native species where possible while other trees of poor quality will be cut to the stump and allowed to regenerate. The trees to be removed or cut are of negligible to low bat roost potential except for four mature Poplars (*Populus* spp.) located adjacent to the sports field. The following trees will be cut leaving 2.5m of a stump and allowed to regenerate; 1665 (Birch), 1667 (Birch), 1295 (White Willow), 1278 (Sycamore), all of which have negligible to low bat roost potential. The following trees are to be completely removed and replaced where possible with new native species;. 1296 (Horse Chestnut), 1272, 1273, 1274, 1275 (Grey Poplar) and T5 (Birch). The mature grey Poplars are considered as having low to moderate bat roost potential based on size, age and ivy cover, While the Ivy cover is not extensive, it may conceal crevices etc. The removal and cutting of trees onsite could have an impact on birds or bats within the area however, this impact would be minor at most. Given the limited tree removal proposed, it is not anticipated that the proposed development would have any likely significant impacts on protected species. In addition, the proposed development will include new hedgerows and planters throughout.

The desktop-based review revealed six bat species having been recorded within the 10km tetrad S77, which the proposed development is located within

The proposed lighting plan will take cognisance of the existing trees onsite and potential for bats within the immediate vicinity. According to the lighting plan prepared by Signify, luminaires will be directed away from trees and of low level allowing for dark buffer zones.

**PRELIMINARY DAYTIME BAT ROOST ASSESSMENT
PEDESTRIAN RAIL LINK THROUGH CARLOW COLLEGE**

With the combination of the proposed lighting plan and recommendations within this report, it is not anticipated that the proposed development would have any impact on nocturnal species such as bats during the operational and construction phase.

Prior to the removal of cutting of any trees, a bat emergence/re-entry (dawn/dusk) survey will be undertaken. This should be carried out during optimum survey conditions.

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**PRELIMINARY DAYTIME BAT ROOST ASSESSMENT
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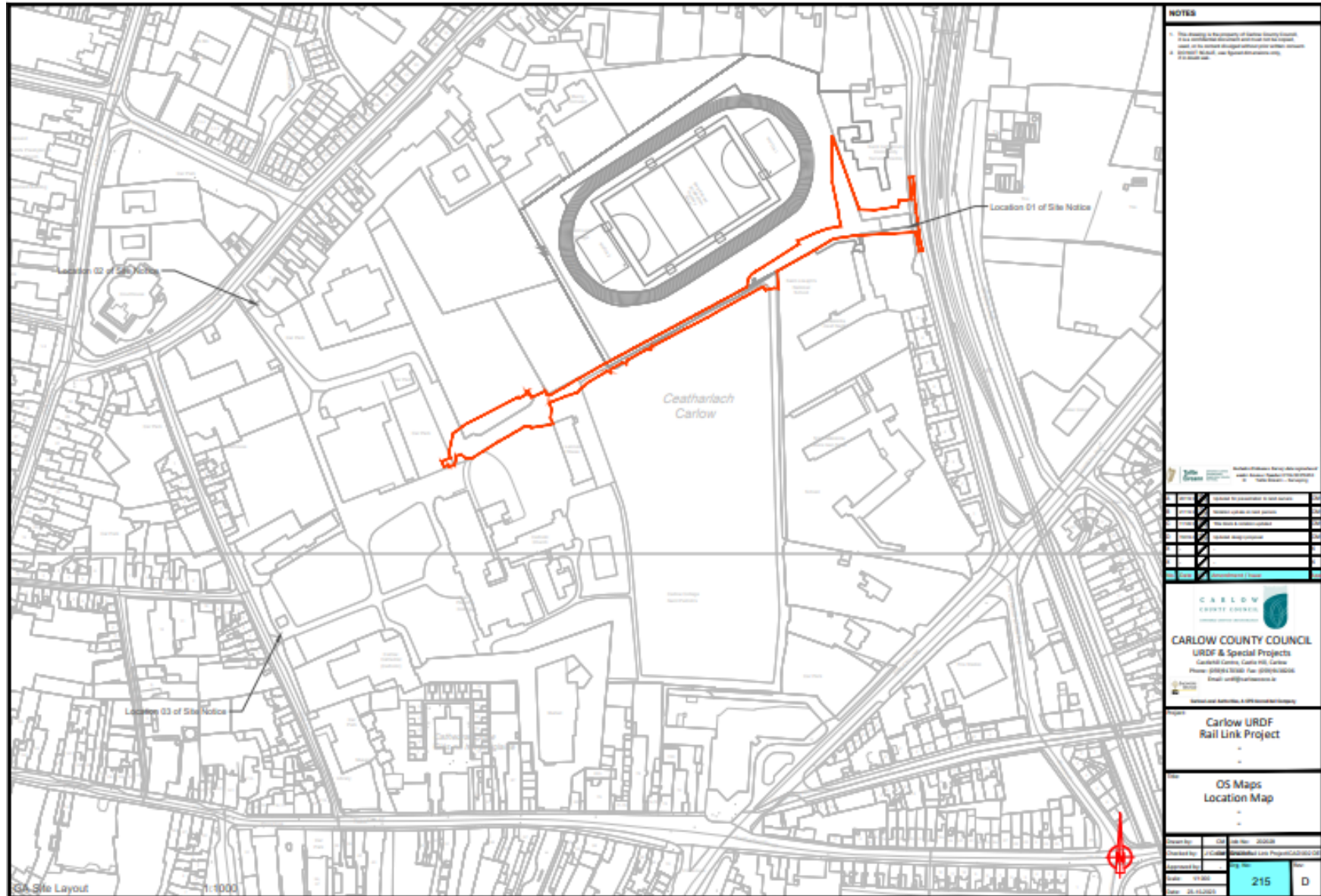
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APPENDIX A
PROPOSED SITE LAYOUT
&
TREE REMOVAL PLAN
&
LIGHTING PLAN

**PRELIMINARY DAYTIME BAT ROOST ASSESSMENT
PEDESTRIAN RAIL LINK THROUGH CARLOW COLLEGE**



NOTES

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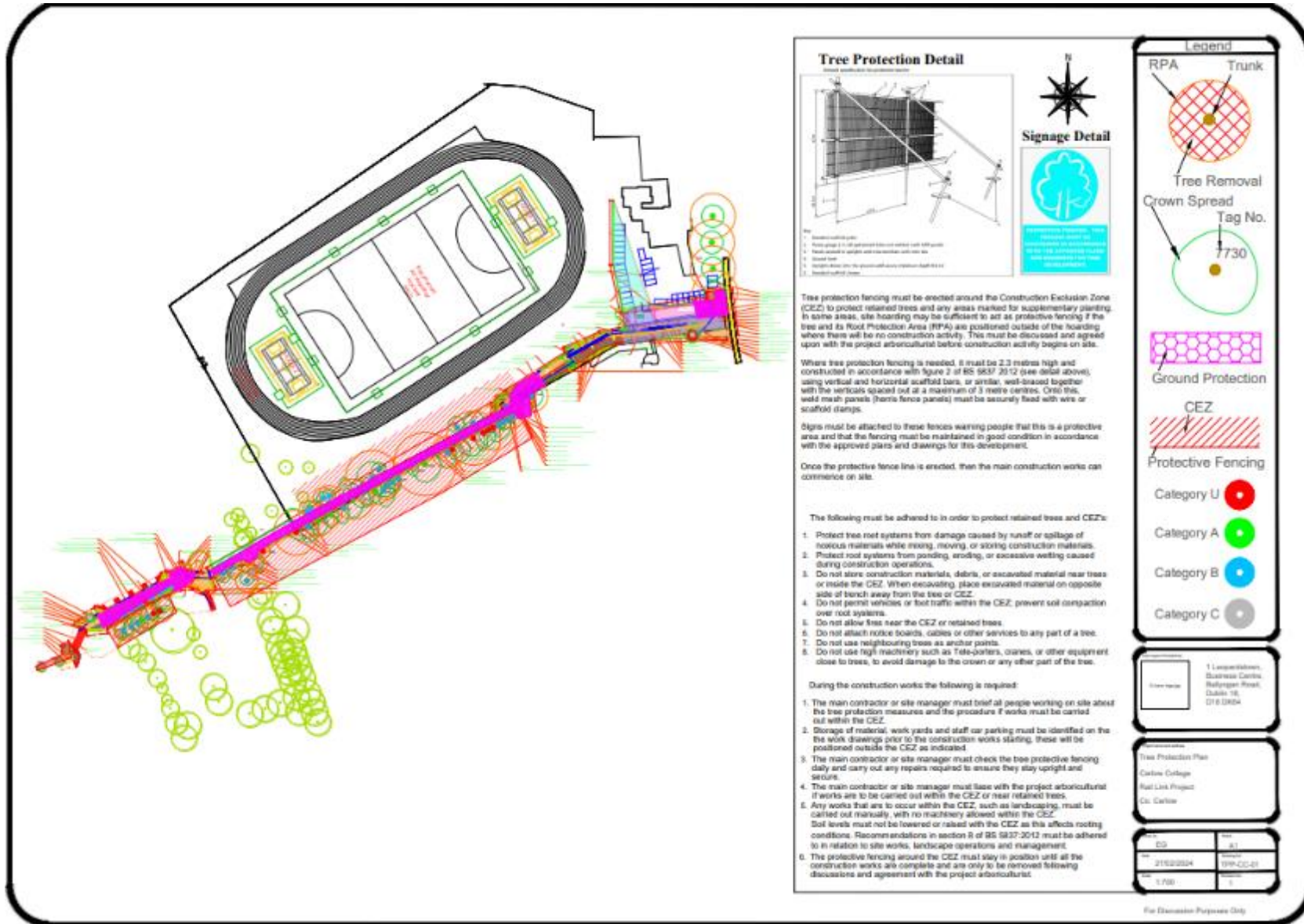
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Carlow URDF Rail Link Project

OS Maps Location Map

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