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Marine & Environmental Consultancy

Bat Fauna Impact Assessment for a proposed large-scale residential development at former Central Mental Hospital, Dundrum Road, Dublin 14

9th September 2024

Prepared by: Bryan Deegan of Altemar Ltd.
On behalf of: Land Development Agency

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Document Control Sheet			
Client	Land Development Agency		
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Report	Bat Fauna Assessment		
Date	9th September 2024		
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Summary

Structure:	The subject site consists of a number of treelines, hedgerows, open grassland, car park spaces, community garden, and structures facilitating the Central Mental Hospital. The site is currently in use. Buildings are brightly lit with security lighting.
Location:	Dundrum Road, Dublin 14.
Bat species present:	Common pipistrelle (roosting), Soprano pipistrelle & Leisler (roosting)
Proposed work:	Residential development.
Impact on bats:	Consultation has taken place in relation to the potential impact of lighting on foraging. The proposed lighting has been modified to allow for foraging activity to continue on site. A pre-construction survey of buildings and trees will be carried out. A derogation licence will be required for the felling of two trees associated with the bat roosts on site. A derogation licence will be required for the lighting disturbance of a bat roost on site. The presence of new buildings on site will alter the local environment but, foraging will continue on site. The impact is deemed to be low adverse/negative/long term/not significant.
Survey by:	Bryan Deegan, Frank Spellman, Emma Peters & Gayle O'Farrell
Survey date:	13th August 2020, 21st August 2020, 10th August 2021 & 12th October 2021, 25th May 2023, 13th June 2023, 1st February 2024 (internal), 28th May 2024 and 8th July 2024.

Receiving Environment

Background

The subject site is in the immediate setting and curtilage of a number of proposed protected structures, namely the 'Asylum' (RPS No. 2072), the 'Catholic Chapel' (RPS No. 2071) and the 'Hospital Building' (RPS No. 2073). The development will consist of the demolition of existing structures associated with the existing use (3,736 sq m), including:

- Single storey former swimming pool / sports hall and admissions unit (2,750 sq m);
- Two storey redbrick building (305 sq m);
- Single storey ancillary and temporary structures including portacabins (677 sq m);
- Removal of existing internal sub-divisions/ fencing, including removal of security fence at Dundrum Road entrance;
- Demolition of section of porch and glazed screens at Gate Lodge building (4 sq m);
- Removal of walls adjacent to Main Hospital Building;
- Alterations and removal of section of wall to Walled Garden.

The development will also consist of alterations and partial demolition of the perimeter wall, including:

- Alterations and removal of section of perimeter wall adjacent to Rosemount Green (south);
- Formation of a new opening in perimeter wall at Annaville Grove to provide a pedestrian and cyclist access;
- Alterations and removal of sections of wall adjacent to Dundrum Road (including removal of existing gates and entrance canopy), including reduction in height of section, widening of existing vehicular access, and provision of a new vehicle, cyclist and pedestrian access;
- Alterations and removal of section of perimeter wall adjacent to Mulvey Park to provide a pedestrian and cyclist access.

The development with a total gross floor area of c. 94,019 sq m (c. 93,941 sq m excluding retained existing buildings), will consist of 934 no. residential units comprising:

- 926 no. apartments (consisting of 342 no. one bedroom units; 98 no. two bedroom (3 person) units; 352 no. two bedroom (4 person) units; and 134 no. three bedroom units) arranged in 9 blocks (Blocks 02-10) ranging between 2 and 8 storeys in height (with a lower ground floor to Block 02 and Block 10), together with private (balconies and private terraces) and communal amenity open space provision (including courtyards) and ancillary residential facilities;
- 6 no. three bedroom duplex apartments located at Block 02, together with private balconies and terraces.
- 2 no. 5 bedroom Assisted Living Units and private rear gardens located at Block 02.

The development will also consist of 4,341 sq m of non-residential uses, comprising:

- Change of use and renovation of existing single storey Gate Lodge building (former reception/staff area) to provide a café unit (78 sq m);
- 1 no restaurant unit (266 sq m) located at ground floor level at Block 03;
- 3 no. retail units (1,160 sq m) located at ground floor level at Blocks 03 and 07;
- 1 no. medical unit (288 sq m) located at ground floor level at Block 02;
- A new childcare facility (710 sq m) and associated outdoor play area located at lower ground and ground floor level at Block 10;
- A management suite (123 sq m) located at ground floor level at Block 10; and
- A new community centre facility, including a multi-purpose hall, changing rooms, meeting rooms, storage and associated facilities (1,716 sq m) located at ground and first floor level at Block 06.

Vehicular access to the site will be from a new signalised access off Dundrum Road to the south of the existing access and the existing access of Dundrum Road will be retained for emergency vehicle, pedestrian and cyclist access only. The development will also consist of the provision of public open space and related play areas; hard and soft landscaping including internal roads, cycle and pedestrian routes, active travel routes for cyclists and

pedestrians, pathways and boundary treatments, street furniture, wetland features, part-basement, car parking (524 no. spaces in total, including car sharing and accessible spaces); motorcycle parking; electric vehicle charging points; bicycle parking (long and short stay spaces including stands); ESB substations, piped infrastructural services and connections (including connection into existing surface water sewer in St. Columbanus Road); ducting; plant (including external plant for Air Source Heat Pumps and associated internal heating plantrooms); waste management provision; SuDS measures (including green roofs, blue roofs, bio-retention areas); attenuation tanks; sustainability measures (including solar panels); signage; public lighting; any making good works to perimeter wall and all site development and excavation works above and below ground.

Note: The c.9.7ha site area referred to above includes c0.1ha on the Dundrum Road principally associated with the new signalised junction. Construction of the development involves the following principal elements:

- Demolition of the existing buildings, excluding structures to be retained.
- Removal of sections of the perimeter wall.
- Site strip. Earthworks associated with the construction of the buildings and roads in the development.
- Construction of new buildings – apartments, the community facility & ancillary buildings.
- Construction of roads, footpaths & hard/soft landscaping.
- Buried site services installation. New foul pumping stations. Connection to public services.
- Works to the Dundrum Road along the site boundary, including modifying the existing site entrance and construction a new road entrance.

The proposed site outline, location, and tree constraints, impact and protection plans are demonstrated in figures 1 – 4.

Lighting

A Public Lighting Report has been prepared by EDC- Mechanical & Electrical Consulting Engineers to accompany this planning application. The Public lighting layout is demonstrated in figure 5. Discussions took place with the engineers and Altemar to provide bat foraging areas with reduced light spill and low-level light fittings and bollards. This report outlines the following proposed lighting layout report and horizontal illuminance (lux) for the subject site. Lighting is compliant with bat lighting guidelines and is set to 3000°K. As part of the design process areas of the site were purposely not lit as designed in mitigation for bats. These areas include the walled garden and other large open space areas.

Luminaires

Luminaire A Data

Supplier	Thorn
Type	PLU O LED 18L35 WST BP CL1 D76 L730
Lamp(s)	LED_PLU2_WST_1697 21W
LampFlux(klm)/Colour	1.40 3000/70
File Name	96265499_(STD).LDT
Maintenance Factor	0.83
Imax70,80,90(cd/klm)	933.3, 24.0, 0.0
No. in Project	69

Luminaire B Data

Supplier	Thorn
Type	PLU O LED 18L50 WST BP CL1 D76 L730
Lamp(s)	LED_PLU2_WST_2312 30W
LampFlux(klm)/Colour	2.31 3000/70
File Name	96265513_(STD).LDT
Maintenance Factor	0.83
Imax70,80,90(cd/klm)	933.6, 24.0, 0.0
No. in Project	45

Luminaire C Data

Supplier	Thorn
Type	PLU O 18L105 NST BPSW CL1 D60 L730
Lamp(s)	LED_PLRL_NST_4290 63W
LampFlux(klm)/Colour	4.29 3000/70
File Name	96272352_(STD).LDT
Maintenance Factor	0.83
Imax70,80,90(cd/klm)	1035.7, 26.4, 0.0
No. in Project	12

Luminaire D Data

Supplier	Thorn
Type	PLU O LED 18L35 WST BP CL1 D76 L730
Lamp(s)	LED_PLU2_WST_1697 21W
LampFlux(klm)/Colour	1.20 3000/70
File Name	96265499_(STD).LDT
Maintenance Factor	0.83
Imax70,80,90(cd/klm)	933.3, 24.0, 0.0
No. in Project	57

Results

Eav	6.13
Emin	1.40
Emax	19.28
Emin/Emax	0.07
Emin/Eav	0.23

Arborist

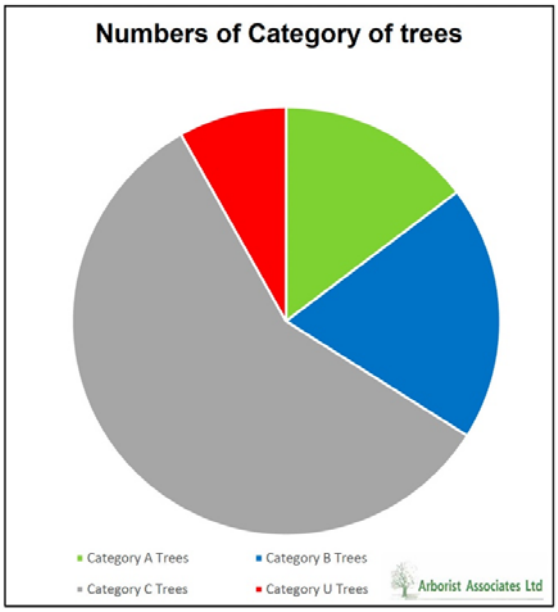
An Arboricultural Impact Assessment and Method Statements report has been prepared by Arborist Associates Ltd. to accompany this planning application. The report summarises the Arboricultural characteristics of the subject site:

'There is a good diverse mix of tree species within these grounds and these range in age from those that form part of the earlier planting which include some of the larger and more prominent tree species such as Limes, Horse Chestnut, Cedars, Wellingtonia, and Pines and a diverse mix of tree species that have been added to the open lawn areas over the years and this has helped to greatly improve the age class range and species diversity within the grounds which will help to secure the tree cover for the long-term..

Within the site area, 305 No. Trees have been tagged with reference numbers with 2No.Tree, 2 No. Tree Lines, 16 No. Hedges, 1No.Shrub Belt and 1No.Fruit Orchard numbered numerically."

Category Grade:

- Category U- 25 Trees
- Category A- 45 Trees
- Category B- 59 Trees
- Category C- 178 Trees + 2 Tree Lines + 16 Hedges + 1 Shrub Belt + 1 Fruit Orchard.



In relation to Impact Assessment, the report states the following:

"*This section of the document is designed to assess the impact of the proposed development layout on the tree vegetation within this site area and to look at the necessary measures that will need to be undertaken to help retain the trees shown for retention free from adverse impacts for the duration of the construction period.*
On drawing No.CMH002, I have identified the tree vegetation to be removed to facilitate this development and management with a 'Red' crown spread and those to be retained to form part of the long-term tree cover on these grounds with a 'Green' hatched crown spread.
Drawing No.CMH003 has been developed from this as a tree protection plan with the trees to be retained shown with 'Green' crown spreads and the protective fencing/ work exclusion zones shown using an 'Orange line and Hatching'. These tree protection fences and other tree protection measures will need to be put in place at the start of the works and be maintained in place until all works are completed. This fencing is to protect the root zones and crown spreads of the trees and to ensure their successful integration into the completed development of these grounds.
The comments made within this impact assessment study are based on my understanding of the proposed development and what is required to allow for its construction."

The proposed tree constraints plan, impact and protection plan, and tree removal plan are demonstrated in figures 3 – 5.

Figure 1. *Site outline*

Figure 2. *Proposed site outline and ownership boundary.*

Figure 3. *Tree constraints plan.*

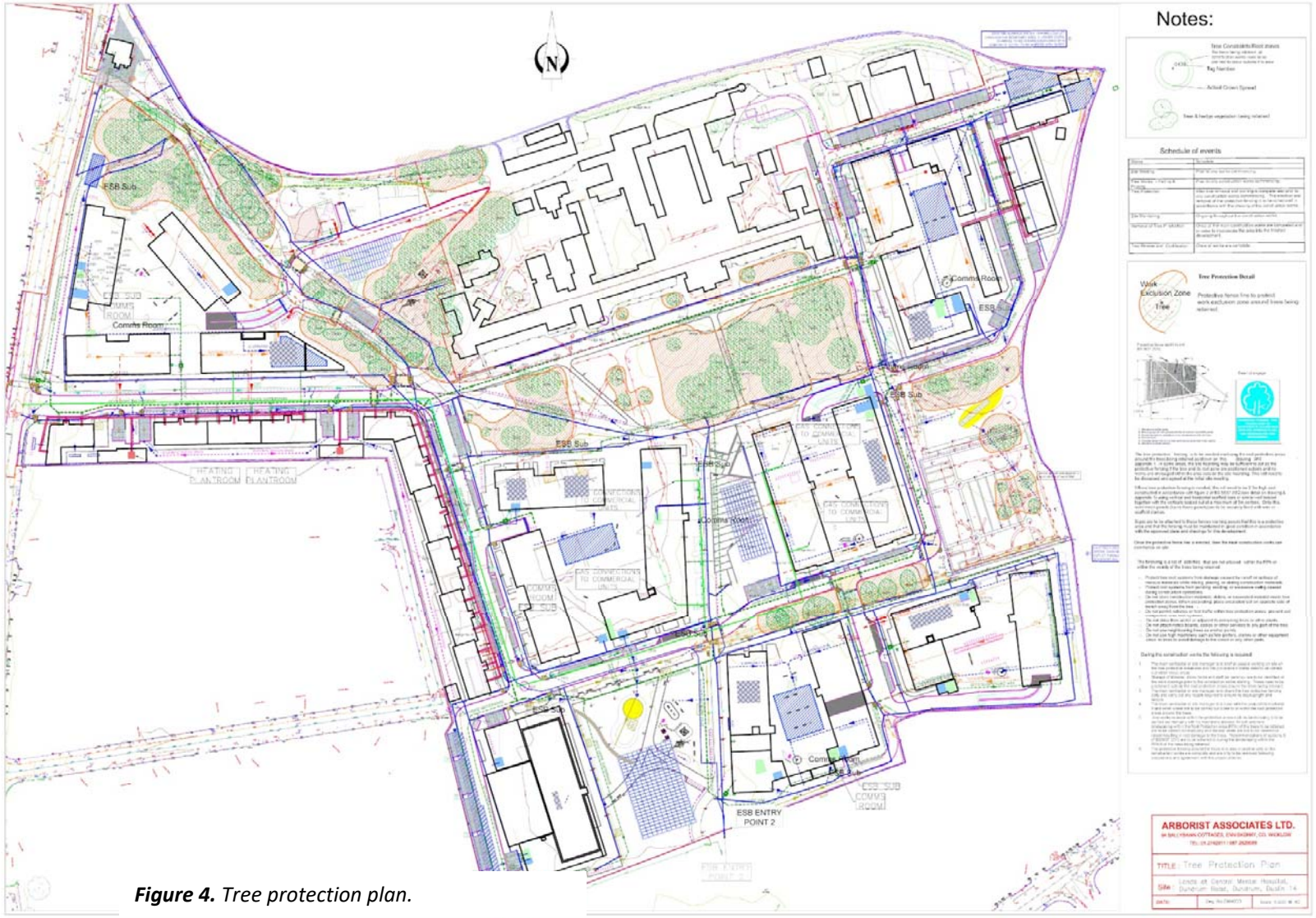


Figure 4. *Tree protection plan.*

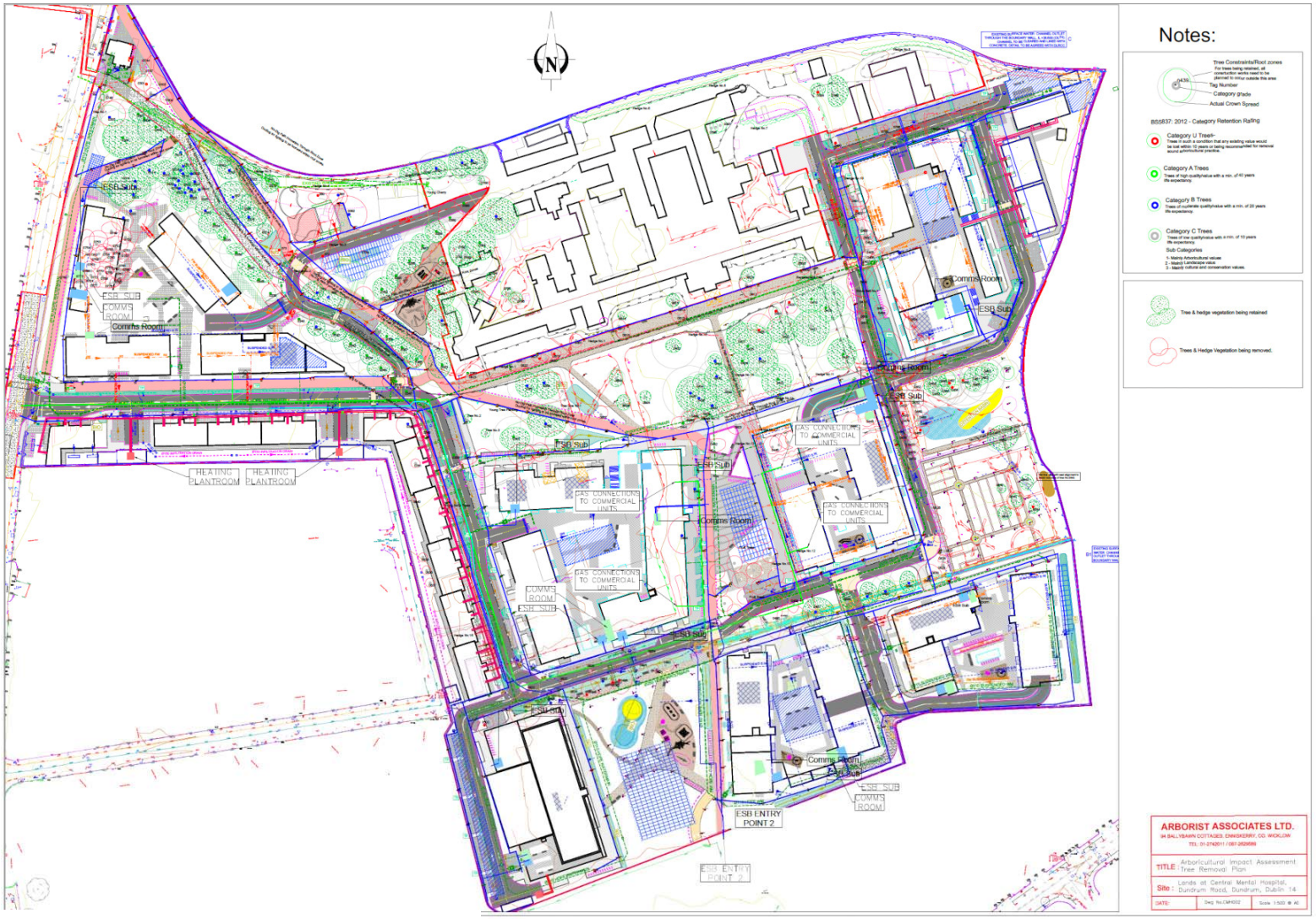


Figure 5. *Tree removal plan.*

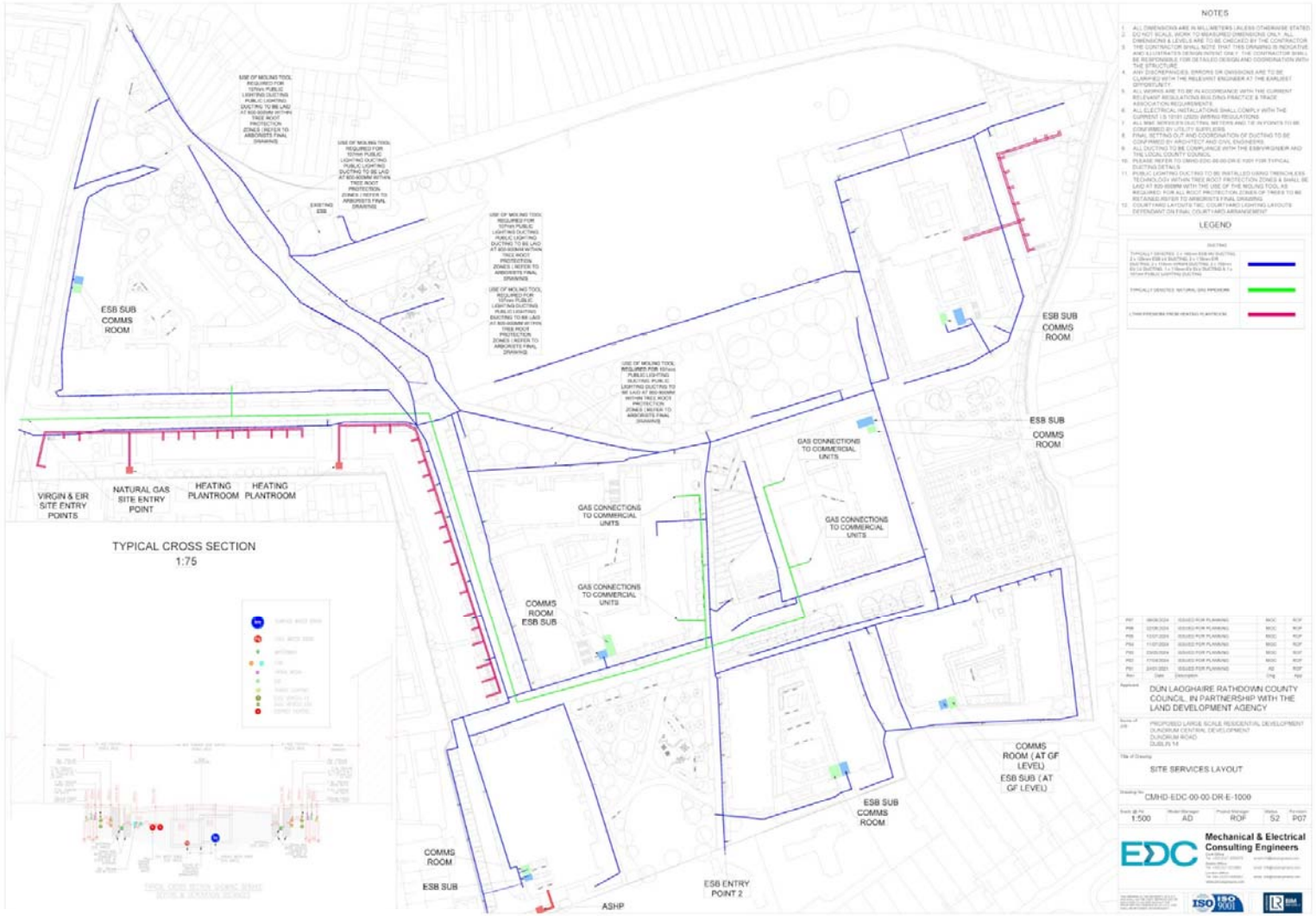


Figure 6. *Public Lighting layout plan.*

Figure 7. *Landscape plan.*

Competency of Assessor

This report has been prepared by Bryan Deegan MSc, BSc (MCIEEM). Bryan has over 30 years of experience providing ecological consultancy services in Ireland. He has extensive experience in carrying out a wide range of bat surveys including dusk emergence, dawn re-entry and static detector surveys. He also has extensive experience reducing the potential impact of projects that involve external lighting on Bats. Bryan trained with Conor Kelleher author of the Bat Mitigation Guidelines for Ireland (Marnell et. al (2022)) and Bryan is currently providing bat ecology (impact assessment and enhancement) services to Dun Laoghaire Rathdown County Council primarily on the Shanganagh Park Masterplan. The desk and field surveys were carried out having regard to the guidance: Bat Surveys for Professional Ecologists – Good Practice Guidelines 3rd Edition (Collins, J. (Ed.) 2016) and Marnell *et al.* (2022), Bat Mitigation Guidelines for Ireland.

Legislative Context

Wildlife Act 1976 (as amended by, inter alia, the Wildlife (Amendment) Act 2000).

Bats in Ireland are protected by the Wildlife (Amendment) Act 2000. Based on this legislation it is an offence to wilfully interfere with or destroy the breeding or resting place of any species of bat. Under this legislation it is 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. "*

Habitats Directive- Council Directive 92/43/EEC 1992 on the conservation of natural habitats and of wild fauna and flora has been transposed into Irish Law, including, via, *inter alia*, the European Communities (Birds and Natural Habitats) Regulations 2011 (as amended). See Art.73 of the 2011 Regulations which revokes the 1997 Regulations.

Annex II of the Council Directive 92/43/EEC 1992 on the conservation of natural habitats and of wild fauna and flora (EC Habitats Directive) lists animal and plant species of Community interest, the conservation of which requires the designation of Special Areas of Conservation (SACs); Annex IV lists animal and plant species of Community interest in need of strict protection. All bat species in Ireland are listed on Annex IV of the Directive, while the Lesser Horseshoe Bat (*Rhinolophus hipposideros*) is protected under Annex II which related to the designation of Special Areas of Conservation for a species.

Under the European Communities (Birds and Natural Habitats) Regulations 2011 (as amended), all bat species are listed under the First Schedule and, pursuant to, *inter alia*, Part 6 and Regulation 51, it is an offence to:

- Deliberately capture or kill a bat;
- Deliberately disturb a bat particularly during the period of breeding, hibernating or migrating;
- Damage or destroy a breeding site or resting place of a bat;
- Keep, sell, transport, exchange, offer for sale or offer for exchange any bat taken in the wild.

Bat survey

This report presents the results of handheld emergent and detector surveys (13th August 2020, 21st August 2020, 10th August 2021, 12th October 2021), three static detector surveys and building inspection surveys undertaken by Bryan Deegan (MCIEEM) over 2020 and 2021. Three static detector surveys were also carried out. Surveys were also carried out on the 25th of May 2023, 13th June 2023, 1st February 2024 (internal), 28th May 2024 and 8th July 2024. Each of the buildings present on site in addition to the main former Central Mental Hospital building were examined for signs of bat roosting and foraging. Bat detector and emergent detector survey used an Echo Meter Touch 2 Pro in addition to a *Batbox Duet* heterodyne/frequency division detector to determine bat activity. In addition, an Anabat Express Passive Bat Detector was used for the static detector surveys.

Survey methodology

As outlined in Marnell et al. 2022 '*The presence of a large maternity roost can normally be determined on a single visit at any time of year, provided that the entire structure is accessible and that any signs of bats have not been removed by others. However, most roosts are less obvious. A visit during the summer or autumn has the advantage that bats may be seen or heard. Buildings (which for this definition exclude cellars and other underground structures) are rarely used for hibernation alone, so droppings deposited by active bats provide the best clues. Roosts of species which habitually enter roof voids are probably the easiest to detect as the droppings will normally be readily visible. Roosts of crevice-dwelling species may require careful searching and, in some situations, the opening up of otherwise inaccessible areas. If this is not possible, best judgement might have to be used and a precautionary approach adopted. Roosts used by a small number of bats, as opposed to large maternity sites, can be particularly difficult to detect and may require extensive searching backed up by bat detector surveys (including static detectors) or emergence counts.'* In relation to the factors influencing survey results the guidelines outlines the following *'During the winter, bats will move around to find sites that present the optimum environmental conditions for their age, sex and bodyweight and some species will only be found in underground sites when the weather is particularly cold. During the summer, bats may be reluctant to leave their roost during heavy rain or when the temperature is unseasonably low, so exit counts should record the conditions under which they were made. Similarly, there may be times when females with young do not emerge at all or emerge only briefly and return while other bats are still emerging thus confusing the count. Within roosts, bats will move around according to the temperature and may or may not be visible on any particular visit. Bats also react to disturbance, so a survey the day after a disturbance event, may give a misleading picture of roost usage.'*

The survey involved the methodologies outlined in Collins (2016) which included the roost inspection methodologies i.e. external methodology outlined in section 5.2.4.1 and the internal survey outlines in section 5.2.4.2 of the guidelines. In addition, the methodologies for Presence absence surveys (Section 7) was carried out for dust emergent surveys.'

As outlined in Collins (2016) 'The bat active period is generally considered to be between April and October inclusive (although the season is likely to be shorter in northern latitudes). However, because bats wake up during mild conditions, bat activity can also be recorded during winter months.'

Survey Results

Trees as potential bat roosts.

The survey on 21st August 2020 and 8th July 2024 highlighted trees utilised by bats as roosts were noted on site. In relation to bat roosting potential, the site comprised of buildings, large fields surrounded by mature hedgerows and treelines. Two bat roosts were noted in two separate Horse Chestnut Trees. Both of these trees are to be felled as part of the proposal.

Emergent/detector surveys.

Emergent /detector surveys were carried out on the 13th August 2020, 21st August 2020, 10th August 2021, 12th October 2021), three static detector surveys and building inspection surveys undertaken by Bryan Deegan (MCIEEM) over 2020 and 2021. Surveys were also carried out on the 25th May 2023, 13th June 2023, 28th May 2024 and 8th July 2024. The survey on the 8th July 2024 involved four ecologists.

The detector surveys were undertaken within the active bat season and the transects covered the entire site multiple times during the night. Weather conditions were optimal with temperatures greater than $10^{O}C$.

As outlined in Collins (2016) in relation to weather conditions '*The aim should be to carry out surveys in conditions that are close to optimal (sunset temperature 10°C or above, no rain or strong wind.), particularly when only one survey is planned…. Where surveys are carried out when the temperature at sunset is below 10°C should be justified by the ecologist and the effect on bat behaviour considered.*' There were no constraints in relation to the survey carried out. All areas of the site were accessible. Weather conditions were optimal for the emergent surveys.

At dusk, a bat detector survey was carried out onsite using a*n Echo meter touch 2 Pro* detector to determine bat activity. Bats were identified by their ultrasonic calls coupled with behavioural and flight observations. The weather conditions were ideal for bat surveying for the emergent survey.

Detector survey

Bat activity was relatively low in 2020 & 2021 (Figure 7) and was concentrated in the darker areas of the site away from the brightly lit buildings. It should be noted that during these surveys the Central Mental Hospital was a fully operational facility with lights on all buildings and in car parking areas. However, in 2023 and in 2024 (Figure 8) lighting was on the main buildings on site with the exception of the Gardner's compound in the northeast corner (outside the proposed development area). Lighting also ceased in the main car park area. As a result of reduced lighting and potentially a lack of management on site bat activity on site appeared to increase in 2023 and 2024. Three species were noted foraging on site:

- Common pipistrelle (*Pipistrellus pipistrellus*)
- Soprano pipistrelle (*Pipistrellus pygmaeus*)
- Lesser Noctule (*Nyctalus leisleri*)

No evidence of bat activity was noted in the buildings on site and no bats were noted emerging from onsite buildings in 2020, 2021 and 2023. However, in 2024 three common pipistrelle bats were noted emerging from the Gardner's compound (outside the proposed development site). In relation to trees on site, a single Leisler's bat was observed bat was emerging from a Horse Chestnut (Tree 0401) on the eastern section of the site in 2020 and a single common pipistrelle was noted emerging from an adjacent Horse Chestnut in 2024. Foraging activity Common pipistrelle (*Pipistrellus pipistrellus*), Soprano pipistrelle (*Pipistrellus pygmaeus*), Lesser Noctule (*Nyctalus leisleri*) were also noted on site. The removal of the trees on site will result in a loss of foraging areas and two bat roosts.

Figure 8. Bat activity on site (2021-2022). Location of static defectors (circle). Orange circle (bat roost), Yellow line- Sorpano pipistrelle, orange line-common pipistrelle and blue line Leisler's bat.

Figure 9. Bat activity on site. Location of static defectors (circle). Orange circle (bat roost), Yellow line- Sorpano pipistrelle, orange line-common pipistrelle and blue line Leisler's bat

Bat Assessment Findings

Review of local bat records

The review of existing bat records (sourced from Bat Conservation Ireland's National Bat Records Database) within a 2km^2 grid (Reference grid O12U) encompassing the study area reveals that three of the nine known Irish species have been observed locally (Table 1). The National Biodiversity Data Centre's online viewer was consulted in order to determine whether there have been recorded bat sightings in the wider area. This is visually represented in Figures 8 - 11. The following species were noted in the wider area: Brown Long-eared Bat (*Plecotus auritus*), Daubenton's Bat (Myotis daubentonii), Natterer's Bat (*Myotis nattereri*), Whiskered Bat (*Myotis mystacinus*), Lesser Noctule (*Nyctalus leisleri)*, Soprano Pipistrelle (*Pipistrellus pygmaeus*), and Pipistrelle (*Pipistrellus pipstrellus sensu lato*) (Soprano and common pipistrelle aggregate) (Figures 6 - 9).

Table 1. *Bat species recorded within Reference Grid O12U*

Species name	Record count	Date of last record
Lesser Noctule (*Nyctalus leisleri*)	2	04/09/2003
Pipistrelle (*Pipistrellus pipistrellus sensu lato*)	3	15/04/2011
Soprano Pipistrelle (*Pipistrellus pygmaeus*)	3	15/04/2011

Figure 10. Daubenton's Bat (*Myotis daubentonii*) (purple), Brown Long-eared Bat (*Plecotus auritus*), and both Daubenton's Bat and Brown Long-eared Bat (orange) (Source NBDC) (Site – red circle)

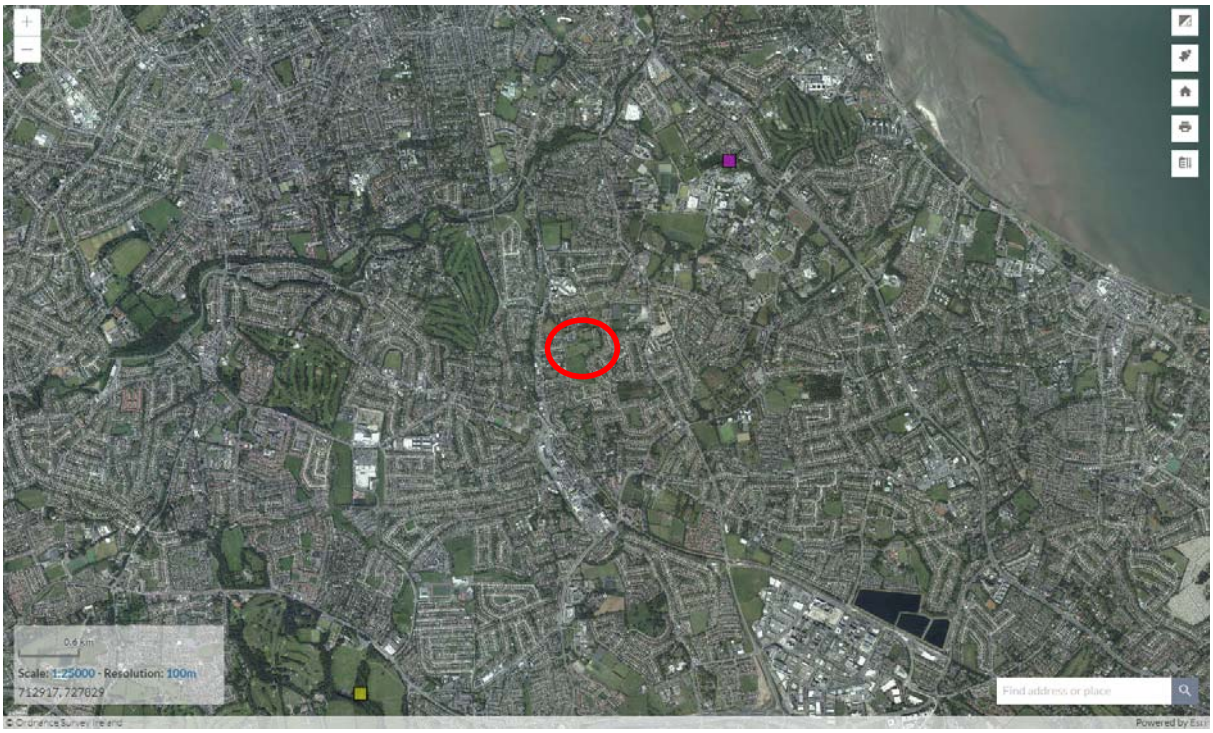


Figure 11. Natterer's Bat (*Myotis nattereri*) (purple) and Whiskered Bat (*Myotis mystacinus*) (yellow) (Source NBDC) (Site- Red circle)

Figure 12. Lesser Noctule (*Nyctalus leisleri*) (yellow) (Source NBDC) (Site – Red circle)

Figure 13. Pipistrelle (*Pipistrellus pipistrellus sensu lato*) (yellow) (Species aggregate), Soprano Pipistrelle (*Pipistrellus pygmaeus*) (purple), and both Pipistrelle and Soprano Pipistrelle (orange) (Source NBDC) (Site – red circle

Specifically, NBDC records show sightings of bat species in locations that are in close proximity to the subject site:

1. Soprano Pipistrelle (*Pipistrellus pygmaeus)* in grid reference O176292. Recorded on 15/04/2011 and located 160m East of the subject site.
2. Pipistrelle (*Pipistrellus pipistrellus sensu lato)* in grid reference O176292. Recorded on 15/04/2011 and located 160m East of the subject site.

Detector survey

Bat activity was relatively low. As seen in Figure 12, bat activity on site was concentrated in the darker areas of the site away from the brightly lit buildings. Three species were noted foraging on site:

- Common pipistrelle (*Pipistrellus pipistrellus*)
- Soprano pipistrelle (*Pipistrellus pygmaeus*)
- Lesser Noctule (*Nyctalus leisleri*)

No evidence of bat activity was noted in the main buildings on site during the internal inspections. In 2024, during two emergent surveys, three bats were noted emerging from the Gardener's compound building to the north of the site; however, this is not within the proposed development site. Prior to 2024 this part of the site was brightly lit with night time security lighting. A single Leisler's bat was observed bat was emerging from a Horse Chestnut (Tree 0401) on the eastern section of the site in 2020 and a single common pipistrelle was observed emerging from an adjacent Horse Chestnut (Tree 0457/0458) in 2024. Foraging activity Common pipistrelle (*Pipistrellus pipistrellus*), Soprano pipistrelle (*Pipistrellus pygmaeus*), Lesser Noctule (*Nyctalus leisleri*) were also noted on site. The removal of the trees on site will result in a loss of foraging areas and a potential loss in bat roosts.

Potential Impact of the development on Bats

No bats emerging from onsite main hospital buildings were observed. A bat root of three common pipistrelles is located in the Gardener's compound buildings (outside of the proposed development site). Foraging activity was relatively low across the site. The site is brightly lit with security lighting. However, construction lighting could reduce foraging on site. Trees on site have the potential for bat roosting and two bat roosts were noted within two separate Horse Chestnut trees. The removal of large trees on site will result in the loss of at least two bat roosts in addition to reducing the sites foraging potential. However, in proximity to the existing buildings on site lighting will be reduced from current levels of floodlighting and it would be expected that bats would continue to forage on site particularly in the darker open space areas including the walled garden area where no lighting is proposed and a detention basin will be present proximate to a treeline, which would attract insects and form a strong foraging area.

Mitigation Measures

A pre-construction inspection of trees to be felled will be carried out. A derogation licence will be acquired for the Horse Chestnut trees (Tree 0401 and Tree 0457/0458) and additional trees if bat roosts are present (Application Attached in Appendix 8.6.1). Th derogation licence will also be required due to disturbance of the bat roost from lighting proximate to the Gardener's compound buildings. Light spill from the public lighting has been designed to be sensitive to bats and bat foraging and will follow the Bat Conservation Ireland "Bats & Lighting Guidance Notes for: Planners, engineers, architects and developers (December 2010). Landscaping has also been designed to include bat friendly plants including trees and climbers to attract insects. An orchard will be planted on site to offset the loss of the existing orchard. The project ecologist will ensure that lighting during construction is not directed towards trees on site. A panel blocking an existing opening on the darkside of the gardener's compound will be modified to allow bats to enter/exit the building. A post construction assessment of the light spill on site will be carried to ensure conformity with the low light levels predicted from the light spill analysis. Ten bat boxes will be placed on site.

Predicted Residual Impact of Planned Development on Bats

No bats were roosting in any main hospital buildings on site. Two bat roosts within two different Horse Chestnut trees will be lost. Lighting could potentially impact on an existing roost adjacent to the site. Foraging activity within the darker areas of the site may be reduced due to the presence new buildings and lighting. It would be expected that with a sensitive light strategy foraging activity in the vicinity of the existing buildings on site would increase, due to the reduction in harsh the security lighting. A pre-construction, inspection will be carried out on onsite trees with bat roosting potential, that are to be removed. The proposed development will result in a long term/low adverse/not significant/negative impacts on bats.

References

Collins, J. (ed.) (2016). *Bat Surveys for Professional Ecologists: Good Practice Guidelines* (3rd edn). The Bat Conservation Trust, London. ISBN-13 978-1-872745-96-1

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