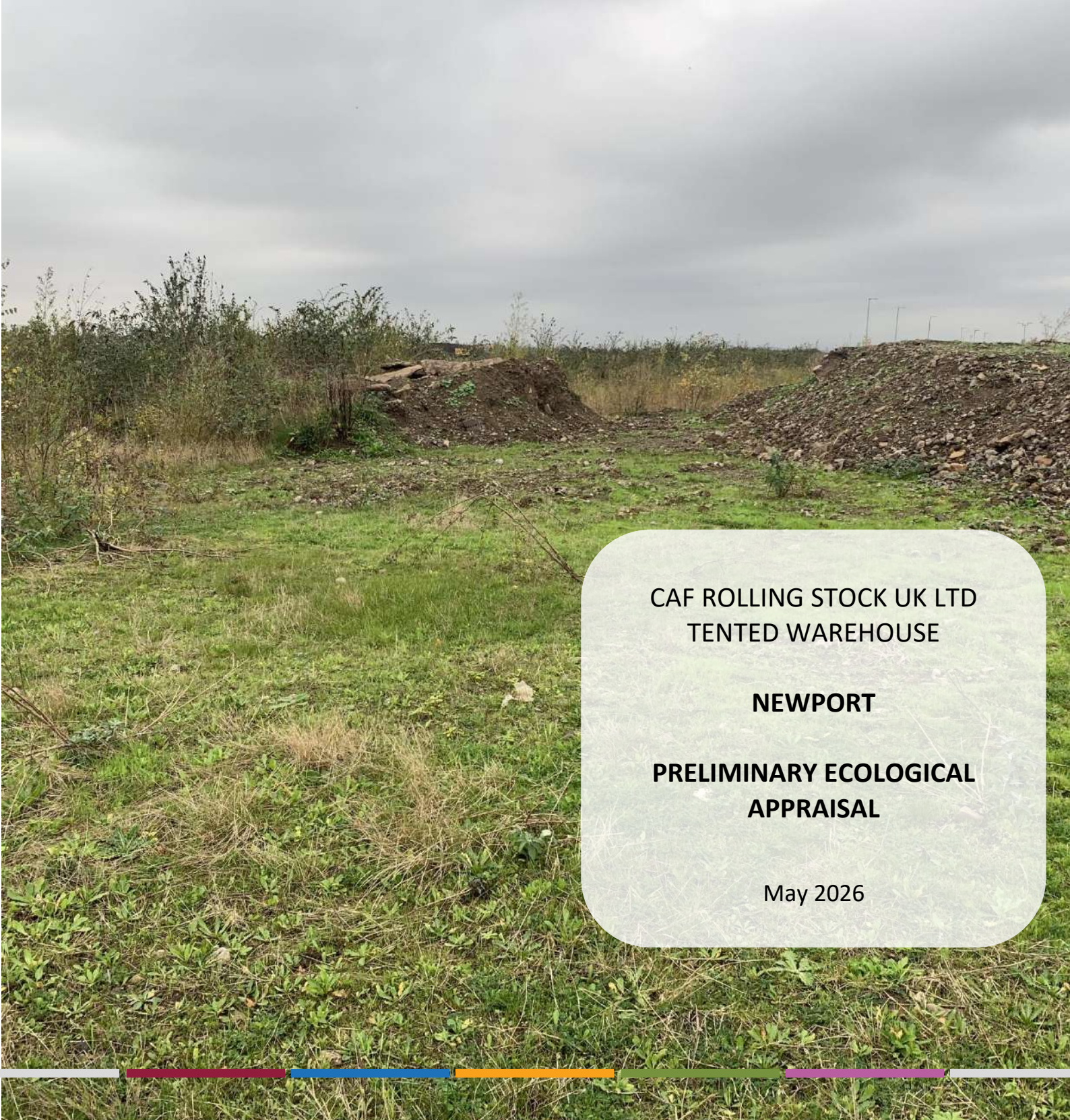




CAF ROLLING STOCK UK LTD
TENTED WAREHOUSE

NEWPORT

**PRELIMINARY ECOLOGICAL
APPRAISAL**

May 2026



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SUMMARY

Soltys Brewster Ecology were commissioned by CAF Rolling Stock UK Ltd to undertake a preliminary ecological appraisal of a parcel of land located within the CAF Rolling Stock manufacturing facility situated in Newport. The site, (central grid reference: ST 37111 87080), is approx. 1.2 ha in size and proposed for the development of warehousing and storage, including open sided and tented storage, office provision, car parking, and vehicle movements. A desk study and Extended Phase 1 Habitat Survey was undertaken at the proposed site in November 2025, to establish the current ecological baseline conditions and identify any constraints or opportunities associated with the proposal.

Desk based consultation confirmed that the proposed site does not hold any statutory or non-statutory designations for nature conservation. 2no. non-statutory designated sites were located within 1km, with Monk's Ditch SINC and Dockwell Wood SINC located approx. 434m and 873m to the north-west respectively. However, neither site is expected to be impacted by the proposed scheme and were not considered of particular ecological relevance. There are also a number of Ancient Woodland sites found within the 1km search radius, although none were considered of any ecological relevance to the proposed works given their physical separation from the site. The desk study also returned a list of records for protected fauna and flora within 1km of the application site. This included foraging/commuting records for at least 6no. different bat species, including a roost record within 200m of the site boundary, as well as an extensive list of protected/priority bird species. A number of records for Otter, Water Vole and Badger were found within the search radius and were predominantly associated with Monk's Ditch to the west and the woodland corridor along Barn Reen to the north. The desk study also revealed a small list of amphibian, common reptile, vascular plant, and invertebrate species recorded within 1km of the site.

An Extended Phase 1 Habitat survey undertaken in November 2025 identified a limited range of common habitats present at the site, including dense scrub, poor semi-improved grassland, a spoil heap (soil and stones), ephemeral / short perennial vegetation, and bare ground. The habitats on site have the potential to support foraging/commuting bats, Otter, and Badger, as well as nesting birds and common terrestrial phase amphibians. Habitats of greater ecological importance were noted adjacent to the site boundary in the form of a vegetated artificial drainage channel (reen) that would have the potential to support protected/priority species such as Water Vole and Otter.

No further surveys are required, although a suite of avoidance, mitigation and enhancement opportunities at the site has been identified and discussed in the current report.

1.0 INTRODUCTION

- 1.1 Soltys Brewster Ecology (SBE) were commissioned by CAF Rolling Stock UK Ltd to undertake a preliminary ecological appraisal of a parcel of land (hereafter referred to as 'the site') located within the CAF Rolling Stock manufacturing facility situated in Newport. The site (central grid reference: ST 37111 87080), approximately 1.2 ha in size, is proposed for the development of warehousing and storage, including open sided and tented storage, office provision, car parking, and vehicle movements (Concept Area 3 as indicated on the plan in Appendix I). To inform the planning application a survey to establish the ecological baseline conditions was required.
- 1.2 The proposed site is located along the southern boundary of the property and predominantly consist of naturally regenerated grassland and scrub vegetation, with a small unvegetated area of bare ground at the western extent used for overflow car parking. The northern and western boundaries of the site are bordered by access roads, car parking areas, and a large industrial warehouse. On the other hand, the southern and eastern boundary of the site sits immediately adjacent to an artificial drainage channel (referred to as a 'reen') that is hydrologically connected to Monk's Ditch, an artificial watercourse located approx. 150m to the west. A plan showing the site location and the proposed development layout for a tented warehouse facility is included in Appendix I.
- 1.3 The current report presents the findings of a desk study and Extended Phase 1 Habitat survey undertaken at the proposed site in November 2025. The report describes the existing ecological conditions at the site and identifies any potential ecological constraints/opportunities associated with the proposed development and the areas proposed for mitigation/enhancement within the ownership of CAF Rolling Stock UK Ltd.

2.0 METHODOLOGY

- 2.1 In order to establish the baseline ecological conditions at the proposed site a combination of desk-based consultation and Extended Phase 1 Habitat survey were undertaken in November 2025.

Desk study

- 2.2 The desk study involved consultation with South East Wales Biodiversity Records Centre (SEWBReC) to identify any records of rare, protected or notable flora and fauna within a radius of 1km (extended to 2km for bats as per the Bat Conservation Trust's good practice guidelines) extending from the central point of the site (see Appendix II). The search criteria also included information relating to the location and citation details (where available) for any sites designated for their nature conservation interest such as Sites of Special Scientific Interest (SSSIs), Special Areas of Conservations (SACs) or Sites of Importance for Nature Conservation (SINCs).

Extended Phase 1 Habitat Survey

- 2.3 The fieldwork was undertaken on 6th November 2025 by a suitably experienced ecologist¹ and followed standard Phase 1 Habitat Survey protocol (JNCC, 2010) as amended by the Institute of Environmental Assessment (1995). All habitats within and immediately adjacent to the proposed site boundary were classified and mapped as accurately as possible. Habitats considered to have potential to support rare, protected or otherwise notable species of flora and fauna were noted, as were any direct signs of these species (e.g. Eurasian Badger *Meles meles* setts and dung-pits). Incidental observations of birds on or flying over the site were also recorded and any incidence of invasive weed species (e.g. Japanese Knotweed *Fallopia japonica*) noted. A map of habitats within the site boundary was produced (see Appendix III) and target notes were used to identify features of ecological interest. Where possible, habitats were cross-referenced to any relevant important UK or Wales priority habitats as identified under Section 7 of the Environment Act (Wales) 2016.

¹ Associate Member of the Chartered Institute of Ecology & Environmental Management (CIEEM) with experience undertaking habitat and protected species surveys

- 2.4 During the field survey any trees at the proposed site were assessed for their potential to support roosting bats and were categorised in relation to the bat roosting features (BCT, 2023). The categories are as follows:
- **PRF-I** – Potential Roost Feature (PRF) is only suitable for individual bats or very small numbers of bats either due to their size or lack of suitable surrounding habitats;
 - **PRF-M** - PRF is suitable for multiple bats and may therefore be used by a maternity colony;
 - **Negligible** – Negligible habitat features on site likely to be used by roosting bat.

Survey Constraints

- 2.5 No survey constraints were encountered that were considered to affect the overall appraisal of the site. The site work was undertaken in November when some plant species may no longer be visible although the autumn 2025 period was very mild without any significant frosts or cold spells.

3.0 RESULTS

Desk Study

SEWBrEC Records

- 3.1 Consultation with SEWBrEC confirmed that the application site is not situated within or adjacent to any statutory sites designated for nature conservation nor are any such sites found within a 1km radius.
- 3.2 The desk identified 2no. non-statutory designated sites within 1km, with Monk's Ditch SINC, a minor watercourse designated for supporting Otter *Lutra lutra*, located approx. 434m to the north-west and Dockwell Wood SINC designated for its Ancient Semi-Natural Woodland located approx. 873m to the north-west. Due to its location and physical separation from the site, Dockwell Wood SINC is not considered to be of ecological relevance to the proposed scheme. On the other hand, although Monk's Ditch SINC is located upstream of the application site and is therefore not expected to be affected by the proposals, an artificial drainage channel (reen) located directly adjacent to the site boundary is physically connected to a non-designated section of Monk's Ditch, providing a direct hydrological link and good habitat connectivity for wildlife, particularly foraging/commuting Otter.
- 3.3 Also found within search radius are several sites listed under the Ancient Woodland Inventory 2021, with 3no. Ancient Semi Natural Woodland (ASNW) sites, 2no. Plantation on Ancient Woodland Sites (PAWS), and 1no. Restored Ancient Woodland Site located within 1km, with the nearest record belonging to a ASNW located approx. 650m to the north-east. However, none are anticipated to be impacted by the proposed works. The site is situated within an NRW Lowland Wetland Area, although no such habitats are located within or immediately adjacent to the site. Furthermore, the site is located within 1km of 2no. NRW Priority Areas for PAWS, located approx. 950m to the north-east, which are considered to be outside of the zone of influence of the proposed scheme.
- 3.4 The desk study also revealed a number of protected species records associated with the local area. This included 31no. records of foraging/commuting or roosting bat species within a 2km radius. Species recorded include Common Pipistrelle *Pipistrellus pipistrellus*, Soprano Pipistrelle *Pipistrellus pygmaeus*, Serotine *Eptesicus serotinus*, Noctule *Nyctalus noctula*, Brown Long-eared *Plecotus auritus* and Lesser Horseshoe *Rhinolophus hipposideros*. Of these, 14no. records are located within approx. 350m of the site and are associated with a woodland corridor along Barn Reen located directly north of the property (150m from of the application site), including a record of a bat roost (unconfirmed species) within 200m of the site boundary.

- 3.5 Other records of protected or priority mammal species include 15no. records for Water Vole *Arvicola amphibius* (associated with Barn Reen located approx. 150m to the north and Monk's Ditch approx. 155m to the west), 5no. records for Otter (predominantly associated with Monk's Ditch SINC), 10no. records for Hazel Dormouse *Muscardinus avellanarius* (4no. of which were associated with the woodland corridor along Barn Reen 150m to the north), 5no records of Badger *Meles meles*, 2no. records for Weasel *Mustela nivalis*, and 1no. record for Water Shrew *Neomys fodiens*.
- 3.6 The desk study identified records for 5no. amphibian species within a 1km radius, including 3no. records for Great Crested Newt *Triturus cristatus* (associated with a pond located approx. 1.1km to the south-west), 10no. records for Smooth Newt *Lissotriton vulgaris*, 2no. records for Palmate Newt *Lissotriton helveticus*, 5no. records for Common Frog *Rana temporaria*, and 3no. records for Common Toad *Bufo bufo*. Records for reptile species include 3no. records for Grass Snake *Natrix Helvetica* and 2no. records for Slow-worm *Anguis fragilis*. No records were directly associated with the site or immediately adjacent areas.
- 3.7 The data search included a large number of records for protected and priority listed bird species within 1km of the proposed site. These included records of Kingfisher *Alcedo atthis*, Cetti's Warbler *Cettia cetti*, Little Ringed Plover *Charadrius dubius*, Marsh Harrier *Circus aeruginosus*, Hen Harrier *Circus cyaneus*, Merlin *Falco columbarius*, Peregrine *Falco peregrinus*, Red Kite *Milvus milvus*, Black Redstart *Phoenicurus ochruros*, Green Sandpiper *Tringa ochropus*, Redwing *Turdus iliacus*, Fieldfare *Turdus pilaris* and Barn Owl *Tyto alba*, all of which are protected under Schedule 1 of the Wildlife and Countryside Act (1981) (as amended). Other priority listed bird species, as listed under Section 7 of the Environment Act (Wales) 2016 recorded within the 1km search radius include Lesser Redpoll *Acanthis cabaret*, Skylark *Alauda arvensis*, Ringed Plover *Charadrius hiaticula*, Black-headed Gull *Chroicocephalus ridibundus*, Reed Bunting *Emberiza schoenichus*, Kestrel *Falco tinnunculus*, Herring Gull *Larus argentatus*, Linnet *Linaria cannabina* Grasshopper Warbler *Locustella naevia*, House Sparrow *Passer domesticus*, Dunnock *Prunella modularis*, Bullfinch *Pyrrhula pyrrhula*, Starling *Sturnus vulgaris*, Song Thrush *Turdus philomelos*, Lapwing *Vanellus Vanellus*, with historical records of Cuckoo *Cuculus canorus*, Lesser Spotted Woodpecker *Dendrocopus minor* and Spotted Flycatcher *Muscicapa striata*.
- 3.8 A small number of priority invertebrate species listed under Section 7 of the Environment Act (Wales) 2016 were found within 1km of the site, including Brown-banded Carder Bee *Bombus humilis*, Shrill Carder Bee *Bombus sylvarum*, Latticed Heath *Chiasmia clathrata*, Ghost Moth *Hepialus humuli*, Buff Ermine *Spilosoma lutea*, Small Emerald *Hemistola chrysoprasaria* with historical records of Cinnabar *Tyria jacobaeae* and

Large Wainscot *Rhizodra lutos*. No records were directly associated with the site or immediately adjacent areas.

- 3.9 A small number of records for Category 1 plant species were returned within a 1km radius of the site, including 7no. records for Bluebell *Hyacinthoides non-scripta* and 2no. records for Tubular Water-dropwort *Oenanthe fistulosa*. No records were directly associated with the site or immediately adjacent areas.
- 3.10 A small number of records relating to invasive species listed under Schedule 9 of the Wildlife and Countryside Act (1981) (as amended) were identified within 1km of the site including Egyptian Goose *Alopochen aegyptiaca*, Canada Goose *Branta canadensis* and Himalayan Balsam *Impatiens glandulifera*. In addition, there were also several records of other species that are considered invasive but not listed under Schedule 9 such as Butterfly Bush *Buddleja davidii*, White Stonecrop *Sedum album*, New Zealand Willowherb *Epilobium brunnescens*, Jenkins' Spire Snail *Potamopyrgus antipodarum*, Least Duckweed *Lemna minuta*, Large-flowered Waterweed *Egeria densa*, Spanish Bluebell *Hyacinthoides hispanica*, Nuttalls Waterweed *Elodea nuttallii*, and Portugal Laurel *Prunus lusitanica*.

EXTENDED PHASE 1 HABITAT SURVEY

- 3.11 The distribution and extent of habitats recorded in November 2025 at the proposed site are illustrated on the Extended Phase 1 Habitat plan with accompanying target notes in Appendix III. The proposed site supports a limited range of naturally regenerated habitats as described below consistent with its current use as temporary storage and parking area for the existing facility immediately to the north. No priority habitats were identified within or immediately adjacent to the proposed works area. The site was not considered to meet the description of Open Mosaic on Previously Developed Land (OMH) as it is still in temporary/irregular use and the habitats at the site appear to have recently formed in response to this level of use (i.e. irregular site clearance, material storage, car parking, etc.). Furthermore, the habitats at the site do not meet the required species diversity to be considered for SINC selection for OMH, with only 11-12 indicator species identified during the site survey.³ These ephemeral habitats at the site were considered of ecological value in a site context and mitigation/enhancement measures are recommended in Section 5.

³ SINC criteria described by (Wales Biodiversity Partnership, 2008) indicate that 20 indicator species should be present for SINC consideration.

Dense Scrub

3.12 Areas of dense scrub are located along the northern and eastern boundaries of the site (see Plate 1). This habitat appears to have recently formed over cleared ground and is predominantly composed of early successional tree species typically associated with moist soils, including Grey Willow *Salix cinerea*, Goat Willow *Salix caprea*, White Willow *Salix alba*, Downy Birch *Betula pubescens*, Silver Birch *Betula pendula*, White Poplar *Populus alba*, and Common Aspen *Populus tremula*, with Butterfly Bush *Buddleja davidii* present to a lesser extent. All trees were saplings or juveniles, with no mature trees present. Small patches of vegetation dominated by Common Reed *Phragmites australis* characteristic of tall ruderal communities were occasionally present throughout this habitat (see Plate 2). The ground layer was characteristic of adjacent ephemeral /short perennial vegetation and poor semi-improved grassland habitats, with species including Creeping Bent *Agrostis stolonifera*, Cock's-foot *Dactylis glomerata*, Fescue *Festuca* sp., Broadleaf Plantain *Plantago major*, Ribwort Plantain *Plantago lanceolata*, Coltsfoot *Tussilago farfara*, Hemp Agrimony *Eupatorium cannabinum*, Common Reed, Black Medick *Medicago lupulina*, Horsetweed *Erigeron canadensis*, Spear Thistle *Cirsium vulgare*, Creeping Thistle *Cirsium arvense*, Hammer Sedge *Carex hirta*, Bristy Oxtongue *Helminthotheca echinoides*, Fringed Willowherb *Epilobium ciliatum*, White Clover *Trifolium repens*, Common Fleabane *Pulicaria dysenterica*, Oxeye Daisy *Leucanthemum vulgare*, and Common Yarrow *Achillea millefolium*.

Plate 1 – Naturally regenerated dense scrub habitat.



Plate 2 – Small patch of tall ruderal vegetation within dense scrub habitat.



Poor Semi-Improved Grassland

3.13 Two areas of poor semi-improved grassland are located along the southern and northern site boundaries (see Plate 3). Both areas of grassland possess a low diversity of common species, including Creeping Bent (dominant), Fescue, Cock's-foot, White Clover, Broadleaf Plantain, Ribwort Plantain, Common Dandelion, Black Medick, Oxeye Daisy, Creeping Thistle, and Spear Thistle, with Common Reed, Coltsfoot, Hemp Agrimony, Horseweed, Bristly Oxtongue, Hammer Sedge, Fringed Willowherb, Common Fleabane, Grey Willow (saplings), Goat Willow (saplings), and Butterfly Bush present to a lesser extent and predominantly distributed around habitat margins.

Plate 3 – Poor semi-improved grassland at the north-west of the site.



Artificial Spoil

- 3.14 An area of artificial spoil comprised of a large pile of earth with a combination of small and large stones is located at the east of the site (see Plate 4 on the following page and TN 1 in Appendix III). The material pile measures approx. 1.5-2m in height, has been placed on plastic sheeting and appears to have been stored at the site for an extended period of time, with a variety of early successional plant species present characteristic of ephemeral / short perennial vegetation. Species include Bristly Oxtongue, Common Dandelion *Taraxacum officinale agg.*, Common Yarrow, Cranesbill *Geranium sp.*, Speedwell *Veronica sp.*, Creeping Thistle, Cocks-foot, Ribwort Plantain, Mustard *Brassica sp.*, and Black Medick.

Plate 4 – Large pile of material (spoil) stored at the site.



- 3.15 Ephemeral / short perennial vegetation surrounds the spoil heap at the east of the site (see Plate 5). Species include Oxeye Daisy, Coltsfoot, Hammer Sedge, Water Figwort *Scrophularia oblongifolia*, Bristly Oxtongue, Fescue, Cock's-foot, Creeping Bent, Black Medick, Common Yarrow, Creeping Thistle, Common Reed, Hemp Agrimony, and Spear Thistle, with Butterfly Bush, White Poplar (saplings), White Willow (saplings), Grey Willow (saplings), Downy Birch, (saplings), and Goat willow (saplings) occasionally present and predominantly distributed around habitat margins.

Plate 5 – Ephemeral / Short Perennial vegetation.



Bare Ground

- 3.16 An area of bare ground is located at the east of the site and is currently used as an overflow car parking area resulting in notably compact ground (see Plate 6). Occasional plant species can be found growing from cracks in the compacted soil, as well as at habitat margins, including Cock's-foot, Fescue, Bristly Oxtongue, Common Dandelion, Butterfly Bush, Ribwort Plantain, Horsetweed, Smooth Hawksbeard *Crepis capillaris*, Oxeye Daisy, and Coltsfoot.

Plate 6 – Bare ground used for overflow car parking.



Invasive Species

- 3.17 Butterfly Bush *Buddleja davidii* was noted growing abundantly throughout and adjacent to the site. Although this species is not listed as invasive under Schedule 9 of the Wildlife & Countryside Act 1981 (as amended), it is known to spread rapidly and outcompete native species at the expense of local biodiversity.

Fauna

- 3.18 In the course of the surveys, a search of field signs for protected or notable species was undertaken and the potential of those habitats to support those species concerned. In the context of this report, these species meet any of the following criteria:

- Species protected by British or international law;
- Priority species included on Section 7 (Environment Act, Wales);
- Nationally rare or nationally scarce species;
- Species of Conservation Concern (e.g. JNCC Red List, RSPB/BTO Red or Amber Lists);

Bats

- 3.19 The habitats present within and adjacent to the proposed development boundary and the areas proposed for mitigation/enhancement were considered unsuitable for supporting roosting bats. However, the dense scrub, ornamental hedgerows and poor semi-improved grassland habitats at the site are considered suitable to support foraging and commuting bat species at least on an occasional/irregular basis. Furthermore, the artificial drainage channel (reen) directly adjacent to the southern and eastern site boundaries is well vegetated and provides a high-quality linear feature for use by foraging and commuting bat populations in the local area.

Otter and Water Vole

- 3.20 A number of records were identified for both Otter and Water vole within the 1km search radius and were associated with Barn Reen located approx. 150m to the north and Monk's Ditch approx. 155m to the west. Although no habitats considered suitable to support these species were located within the site boundary, with only dense scrub suitable for occasional use by commuting Otter present, the artificial drainage channel (reen) located directly adjacent to the southern and eastern site boundaries is considered suitable (see TN 2 in Appendix III). The reen is heavily vegetated, predominantly by Common Reed (a common foodplant for Water Vole), has clear, slow-moving water approx. 0.8m in depth, and has suitable bank substrate and structure to support burrowing. Furthermore, the reen has a direct hydrological link to

Monk's Ditch to the west. Therefore, the reen is considered suitable to support Water Vole, as well as foraging/commuting Otter.

- 3.21 During the site survey, a search for field signs for Otter (footprints, spraints, feeding remains, etc.) and Water Vole (burrows, latrines, feeding stations, etc.) was undertaken along the inner bank of the reen. No evidence indicative of use by either species was identified, however, the presence of dense riparian and marginal vegetation concealed much of the banks and a thorough survey effort was not possible. Therefore, the presence of Water Vole within the reen could not be ruled out and use of the reen and vegetated habitats within the site by commuting Otter at least on an occasional basis could not be precluded.

Hazel Dormouse

- 3.22 The habitats within and adjacent to the site boundary were considered unsuitable for supporting Hazel Dormouse. Therefore, the presence of this species within or directly adjacent to the site is considered unlikely and no specific measures regarding this species will be required.

Badger

- 3.23 No evidence indicative of use by Badger was identified within or adjacent to the site boundary. However, the dense scrub and grassland habitats within the site boundary were considered suitable to support foraging/commuting Badger at least on an occasional basis.

Herptiles (Reptiles & Amphibians)

- 3.24 Although the dense scrub and poor semi-improved grassland within the site boundary were considered suitable to support common reptile species, these habitats appear to have recently formed through natural regeneration following site clearance. In addition, little habitat suitable for use by reptiles is present within the surrounding industrial landscape and the property itself is separated from the surrounding area by the reen. Furthermore, the site is situated directly adjacent to a busy industrial warehouse resulting in high levels of disturbance. Therefore, reptile species are considered to be likely absent from the site and are not considered further within this report, although the adjacent reen may provide suitable foraging/commuting habitat for Grass Snake.
- 3.25 During the desk study, 3no. records of Great Crested Newt (GCN) associated with a waterbody located approx. 1.1km to the south-west were identified, along with records of common amphibian species in the local area, including Smooth Newt, Palmate Newt, Common Frog and Common Toad. There are no waterbodies located within the site boundary considered suitable to support breeding amphibians.

However, the artificial drainage channel (reen) located directly adjacent to the southern and eastern site boundary is vegetated, slow-flowing and holds water throughout the year, and is therefore considered capable of supporting common amphibian species (see TN 2 in Appendix III). However, numerous small fish were observed within the reen during the site survey and its suitability to support GCN was consequently assessed as low due to the presence of predator species. Therefore, GCN are not considered a constraint to the proposed works and are not discussed further within this report.

Birds

3.26 During the survey a number of birds were seen/heard in and around the proposed site including Robin, Jackdaw, and Blue Tit. The dense scrub habitat at the site appears to have recently established but may already offer suitable nesting opportunities for smaller species of arboreal nesting bird. Furthermore, its suitability to supporting nesting is likely to increase as the scrub continues to mature and develop. Additionally, the mature non-native hedgerows to the north and west of the site have the potential to support nesting birds. The artificial drainage channel (reen) located directly adjacent to the southern and eastern site boundaries is heavily vegetated by Common Reed, which forms dense patches of ruderal vegetation within the water channel (see Plate 10 below and TN 2 in Appendix III). This habitat may provide suitable nesting opportunity for reedbed specialists such as Reed Warbler *Acrocephalus scirpaceus* and Reed Bunting (the latter of which has been recorded within 100m of the site boundary), as well as generalists such as Cetti's Warbler which has been recorded within the local area.

Plate 10 – Dense patches of Common Reed within the adjacent reen.



POLICIES AND PLANS

4.1 The following local and national planning policy relating to nature conservation and biodiversity are considered of relevance to the site.

Planning Policy Wales (2024)

4.2 This document (Edition 12) sets out the land use planning policies of the Welsh Government with Chapter 6 dealing with Distinctive and Natural places which covers Biodiversity and Ecological Networks. The advice contained within PPW is supplemented for some subjects by Technical Advice Notes (TAN's), with TAN 5 addressing Nature Conservation.

4.3 TAN 5 identifies a number of key principles, which the town and country planning system in Wales should consider. Those relevant are detailed below:

- Work to achieve nature conservation objectives through a partnership between local planning authorities, Natural Resources Wales (NRW), voluntary organisations, developers, landowners and other key stakeholders;
- Integrate nature conservation into all planning decisions looking for development to deliver social, economic and environmental objectives together over time;
- Ensure that the UK's international obligations for site, species and habitat protection are fully met in all planning decisions;
- Look for development to provide a net benefit for biodiversity conservation with no significant loss of habitats or populations of species, locally or nationally;
- Promoting approaches to development which create new opportunities to enhance biodiversity, prevent biodiversity losses, or compensate for losses where damage is unavoidable. Minimising or reversing the fragmentation of habitats and improving habitat connectivity through the promotion of wildlife corridors;
- Local planning authorities should seek to protect trees, groups of trees and areas of woodland where they have natural heritage value or contribute to the character or amenity of a particular locality;
- The presence of a species protected under European or UK legislation is a material consideration when a local planning authority is considering a development proposal which, if carried out, would be likely to result in disturbance or harm to the species or its habitat.

Updates to PPW Chapter 6: Distinctive and Natural Places (October 2023)

- 4.4 An updated version of PPW: Chapter 6 was published with immediate effect on 11th October 2023 in a published letter to Local Authorities from Julie James AS/MS – Minister for Climate Change⁴. These changes have now been incorporated as part of the latest edition (February 2024) of PPW. The new guidance provides an update on Net Benefit for Biodiversity and the Step-wise Approach, with extracts considered of relevance to the development site provided below: Maintaining and Enhancing Biodiversity
- 4.5 Planning authorities must follow a step- wise approach to maintain and enhance biodiversity, build resilient ecological networks and deliver net benefits for biodiversity by ensuring that any adverse environmental effects are firstly avoided, then minimized, mitigated, and as a last resort compensated for. Enhancement must be secured by delivering a biodiversity benefit primarily on site or immediately adjacent to the site, over and above that required to mitigate or compensate for any negative impact.
- 4.6 All development must deliver a net benefit for biodiversity and ecosystem resilience from the baseline state (proportionate to the scale and nature of the development proposed). Even if the biodiversity value has been maintained, there must still be a pro-active process to look for and secure enhancement through the design and implementation of the development.

Environment Act (Wales) 2016

- 4.7 Part 1 of the Environment Act Wales came into force in May 2016 and sets out the approach to planning and managing natural resources at a national and local level with a general purpose linked to statutory 'principles of sustainable management of natural resources' defined within the Act.

Section 6 - Biodiversity and resilience of ecosystems duty

- 4.8 Section 6 of the Act places a duty on public authorities to 'seek to maintain and enhance biodiversity' so far as it is consistent with the proper exercise of those functions. In so doing, public authorities must also seek to 'promote the resilience of ecosystems'

Section 7 - Biodiversity lists and duty to take steps to maintain and enhance biodiversity

- 4.9 This section lists living organisms and types of habitat in Wales which are considered of key significance to maintaining and enhancing biodiversity in relation to Wales. The Welsh Ministers are required to take all reasonable steps to maintain and enhance the living organisms and types of habitat included in any list published under this section and encourage others to take such steps.

Local Planning Policy

Newport Local Development Plan 2011-2026

- 4.7 Newport County Council adopted the Local Development Plan (LDP) in 2011 for Newport. This plan will guide development in Newport until 2026. Policies within the current LDP relating to Environmental spaces and the natural environment which are considered relevant to the proposed development include:

CE3 Environmental Spaces and Corridors

In and adjoining the urban and village areas, and in areas identified for comprehensive development, sites having existing importance for their visual qualities, as wildlife habitats or for recreational or amenity purposes, will be safeguarded as “environmental spaces and corridors”. Development in these spaces will be permitted only where: i) the existing or potential environmental qualities of the site will be improved or complemented; ii) there is no adverse impact on international, European, national, regional or local nature conservation interest; iii) there is not a loss, without appropriate replacement, of a recreational, open space, or amenity resource for the immediate locality unless it can be demonstrated that there is an excess of provision or facilities can be enhanced through development of a small part of the site. Proposals to enhance or improve existing environmental space provision will be encouraged where practicable. Additional provision will be sought in areas where a deficit has been identified.

CE8 Locally Designated Nature Conservation and Geological Sites

Proposals affecting locally designated sites will only be permitted where: i) there would be no overall loss of the nature conservation resource for which the site has been designated; ii) there would be no significant adverse effect on the geological interest of the site; iii) appropriate mitigation or compensatory measures can be achieved.

5.0 CONCLUSIONS AND RECOMMENDATIONS

- 5.1 The Extended Phase 1 Habitat survey identified a limited range of habitats at the proposed site, including dense scrub, poor semi-improved grassland, ephemeral / short perennial vegetation, artificial spoil, and bare ground. The dense scrub and poor semi-improved grassland habitats were considered of ecological value in the context of the site only, with other habitats considered to be of little or no ecological significance. Habitats of greater ecological interest were noted directly adjacent to the site in the form of a heavily vegetated artificial drainage channel (reen), although this habitat is outside the scope of the proposals and is clearly separated from the site by an earth bund located along the southern and eastern site boundaries. The proposed layout for a tented warehouse (Appendix I) lies entirely within the earth bund boundary and would not result in any habitat loss along the reen corridor. However, based on current site conditions and the proposed works, the following avoidance, mitigation and enhancement measures would be considered appropriate given the nature of the habitats at the application site.

Bats

- 5.2 The vegetated corridor of the adjacent artificial drainage channel (reen) is considered likely to support a range of foraging and commuting bat species. Although this feature is outside the scope of the proposals, it may be vulnerable to indirect impacts, particularly light spillover as a result of the proposed scheme. It is recommended that the design of any site lighting (if required) should seek to reduce artificial light spill onto these retained features. These habitat features should be maintained as dark corridors (e.g. lux level increases minimised to at or below 1.0 lux) for use by bats and other nocturnal wildlife (e.g. Otter and Badger). Any security lighting fitted to the new warehouse should be sensor activated (e.g. by movement) and not left switched on overnight. See lighting guidance note produced by BCT & ILP (2023) for advice on how to mitigate for impacts of artificial lighting on bats (Appendix IV).

Nesting Birds

- 5.3 All vegetation clearance works required to facilitate the proposed scheme should be scheduled to avoid bird nesting season (typically March – August inclusive). If this is not possible, works should be preceded by a physical/visual check for any active nests by an ecologist or suitably experienced contractor. If an active nest is identified, it must be left in place and undisturbed with an appropriate buffer until all chicks have fledged and the nest is no longer in use.
- 5.4 Due to the presence of suitable nesting habitat within the adjacent artificial drainage channel (reen), no disturbing works should take place within 5m of the southern and eastern site boundary during bird nesting

season (March – August inclusive) to avoid potential impacts to nesting birds within reedbeds. If this is not possible, works should be preceded by a physical/visual check for any active nests by an ecologist or suitably experienced contractor. If an active nest is identified, it must be left in place and undisturbed with an appropriate buffer (buffer size is species dependant) until all chicks have fledged and the nest is no longer in use.

Badger and Otter

- 5.5 The vegetated corridor of the reen is considered suitable to support occasional use by foraging/commuting Badger and Otter, therefore, occasional use of the site by these species could not be precluded. As such, it is recommended that during the construction phase of the proposed scheme, any excavations are covered overnight, or a means of escape provided (e.g. rough sawn timber board of 300mm width placed at an angle of $\leq 45^\circ$) to minimise the risk to Badger, Otter or any other small mammals that may become trapped (e.g. Hedgehog).

Herpetofauna (Reptiles & Amphibians)

- 5.6 The large pile of spoil (soil and stones) at the east of the site is likely to be located within the development footprint and subject to removal (TN 1 in Appendix III). Although the site is assessed as unlikely to support reptiles or amphibians, this feature is considered to offer potential hibernation habitat. As a precaution, it is recommended that this feature is removed outside the main hibernation period (i.e. works undertaken between mid-March and September) under an ecological watching brief. This will minimise the risk of disturbing any common reptiles or amphibians that might, albeit unlikely, be using the feature for hibernation, as these species are particularly vulnerable to harm during this period. In the unlikely event that animals were found, they could be transferred by hand to the adjacent reen corridor.

Adjacent Watercourse (Reen)

- 5.7 Although no development is proposed within the corridor of the adjacent artificial drainage channel (reen), the proposed scheme is to be constructed adjacent to the watercourse. Therefore, the watercourse and its downstream habitats (e.g. Monk's Ditch watercourse) are vulnerable to indirect impacts associated with the proposals, such as surface water run off during the construction or operation of the proposed scheme. Risk from indirect impacts could be controlled by an environmental management plan. This could set out measures to avoid the risk of pollutants entering the watercourse and information on the drainage design for the completed scheme and could be controlled by a suitably worded planning condition.

Other mitigation measures and enhancements

- 5.8 Any future landscape plans should aim to include native shrub or flowering plant species or those with a known benefit to local biodiversity. The managed grass area (as shown on Appendix I) to the north of the proposed tented warehouse could be allowed to revegetate and be managed as a brownfield site (bare ground, scattered scrub, perennial vegetation etc.) with the area clearly marked out and no access for plant machinery or for use as storage for development materials – the plans in Appendix I indicate that this area will be clearly fenced off from the warehouse facility although access will be required for future scrub management. The proposed management of this area could be controlled via a suitable worded planning condition, with the overall aim of limiting dominance by scrub or other single habitat type (e.g. ruderal vegetation).
- 5.9 The inclusion of bat and bird boxes onto new buildings is recommended, however the current design indicates that the building would be unsuitable to support such enhancements, therefore it is recommended that House Sparrow boxes (up to 2no) be installed on the on the current reception building with 2no. bat boxes provided to the south eastern or south western corner of the existing main facility building .

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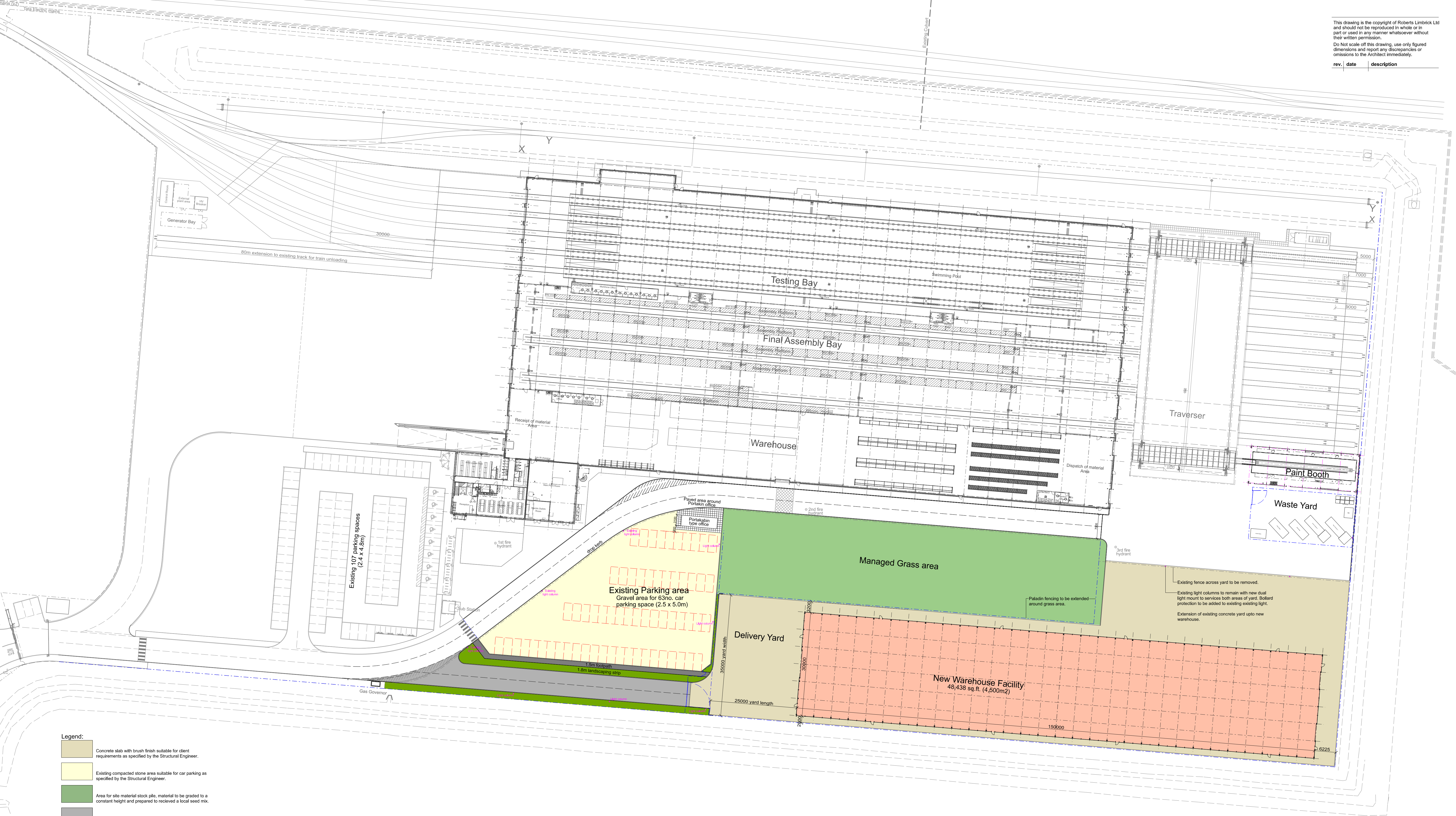
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APPENDIX I SITE LOCATION PLAN & PROPOSED LAYOUT

Concept 3: Warehousing and storage



- Proposed location of warehouse and storage development
- Combination of:
 - Open sided storage
 - Tented storage
 - Office provision
 - Carparking
 - Goods-inwards
 - Vehicle movements

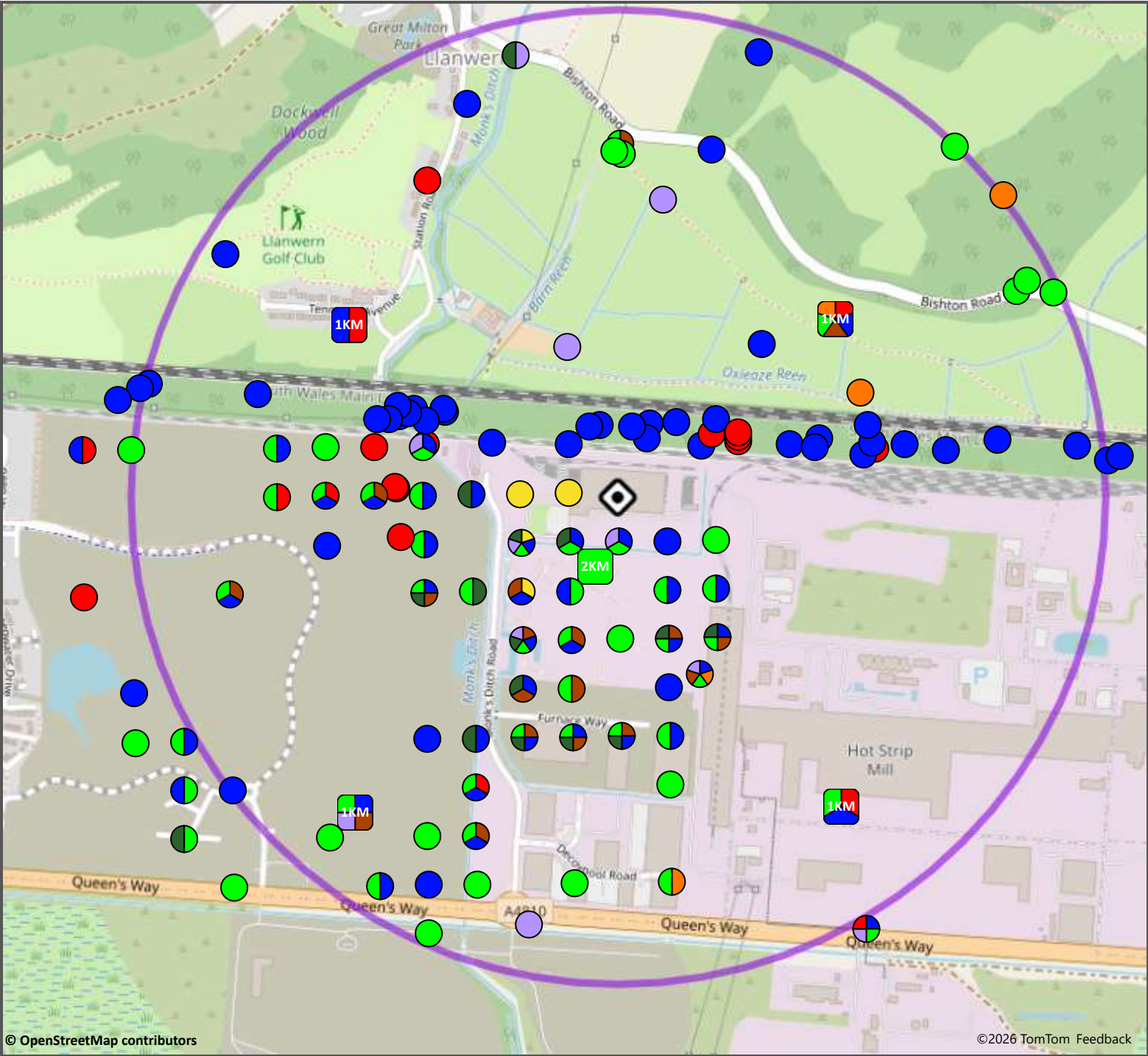


- Legend:
- Concrete slab with brush finish suitable for client requirements as specified by the Structural Engineer.
 - Existing compacted stone area suitable for car parking as specified by the Structural Engineer.
 - Area for site material stock pile, material to be graded to a constant height and prepared to received a local seed mix.
 - Extension of tarmac estate road as specified by the Structural Engineer.
 - Area for landscaping either side of access road to match elsewhere.
 - New paladin fencing around site boundary to match existing.

Proposed External Finishes

Indicative Vehicle Manoeuvring Layout

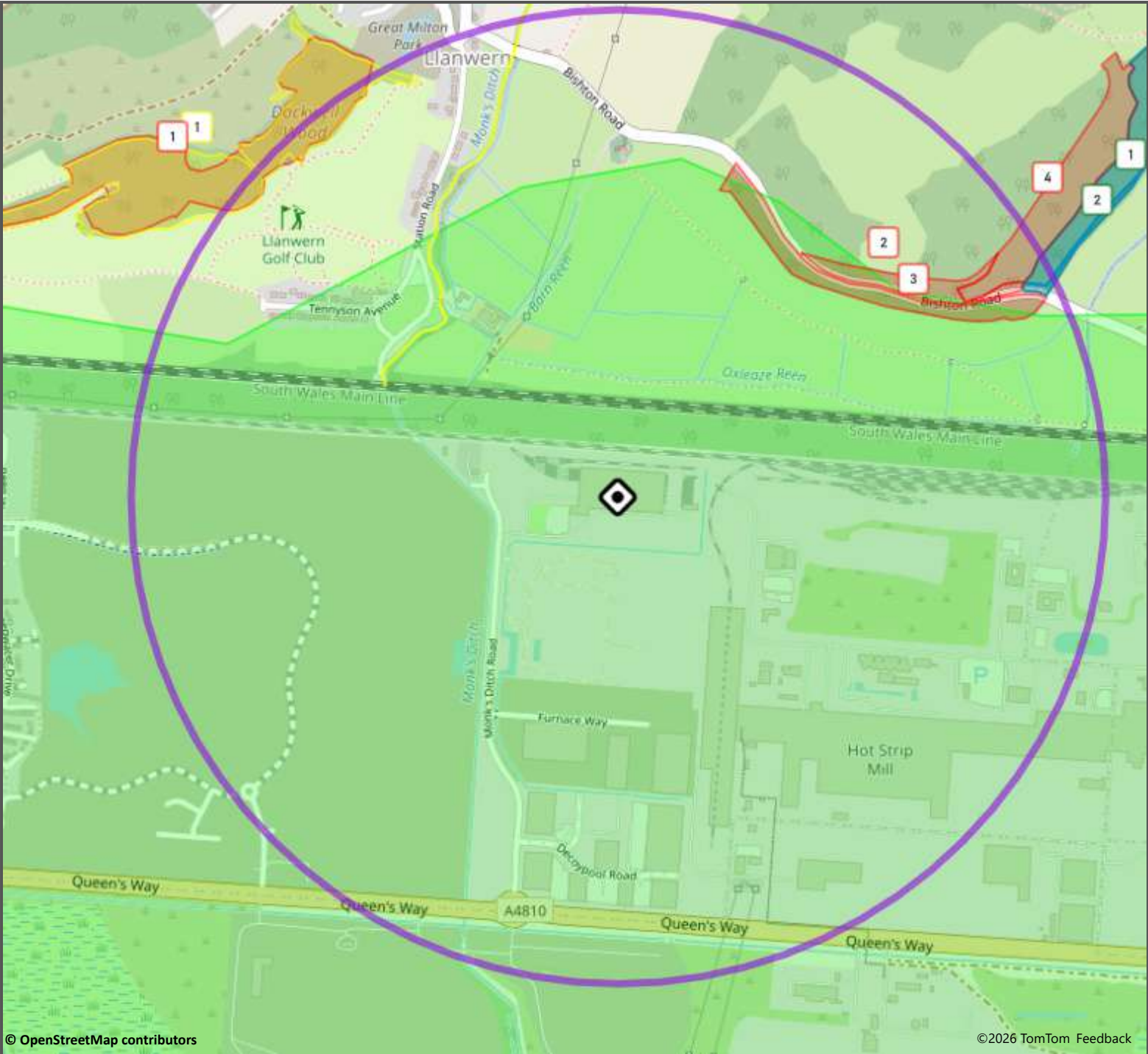
APPENDIX II SEWBREC DESK STUDY RECORDS



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- Search Location
- Search Buffer (0m)
- Search Buffer (1000m)

- Bees, Wasps, Ants & Sawflies
- Birds
- Butterflies & Moths
- Higher Plants
- Lower Plants
- Mammals
- Other Invertebrates
- Reptiles & Amphibians

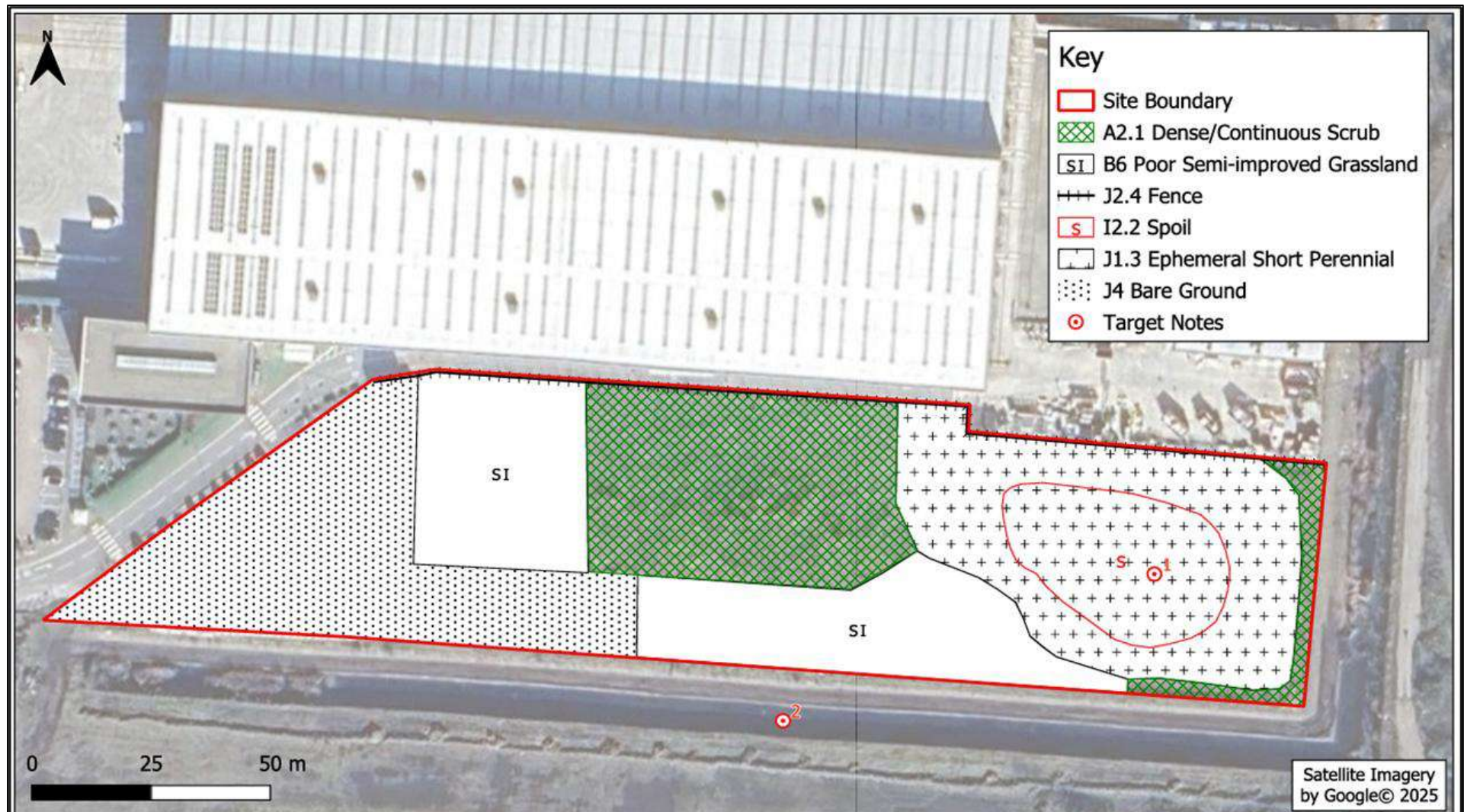


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- Search Location
- Search Buffer (0m)
- Search Buffer (1000m)

- AWL1
- AWL3
- NRW_PA_LW
- NRW_PA_WP
- SINC_ADO

APPENDIX III EXTENDED PHASE 1 HABITAT SURVEY PLAN AND TARGET NOTES



Satellite Imagery
by Google© 2025

CAF Rolling Stock Ltd

Concept 3 - Warehousing and Storage

Extended Phase 1 Habitat Plan

E25137801/DR02

LD

MW

02 December 2025

PRELIMINARY	PLANNING	DESIGN	TENDER	CONSTRUCTION
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Target Notes for Extended Phase 1 Habitat Plan	
SITE NAME	CAF Rail, Concept 3 – Warehousing and Storage
DATE	06 November 2025
PURPOSE OF VISIT	Extended Phase 1 habitat survey of site and immediate adjacent areas to inform an application for planning permission.
General	The site comprises areas of dense scrub, poor semi-improved grassland, ephemeral / short perennial vegetation, a spoil heap, and bare ground used for overflow car parking. The site is bordered to the north by security fencing and an active industrial warehouse, to the west by access roads and car parking areas, and to the south and east by an artificial drainage channel (reen). Butterfly Bush <i>Buddleja davidii</i> was noted growing abundantly throughout the site and immediately adjacent areas.
Target Note 1	An area of artificial spoil comprised of a large pile of earth with a combination of small and large stones is located at the east of the site. The material pile measures approx. 1.5-2m in height, has been placed on plastic sheeting and appears to have been stored at the site for an extended period of time, with a variety of early successional plant species present characteristic of ephemeral / short perennial vegetation. The presence of larger stones within the spoil heap may provide appropriate hibernation opportunities for common reptile and amphibian species using the site. 
Target Note 2	An artificial drainage channel (reen) is located immediately adjacent to the southern and eastern site boundaries. The reen is heavily vegetated by native riparian and marginal species (predominantly Common Reed) has clear, slow-moving water (approx. 0.8m in depth at the time of the survey but holds water throughout the year), and has suitable bank substrate and structure to support burrowing species (e.g. Water Vole), although evidence of no such species was identified during the site survey. A walkover survey was conducted along the inner bank of the reen during the site visit. During this, numerous small fish (likely Common Minnow <i>Phoxinus Phoxinus</i>) were observed within the channel, along with a range of aquatic invertebrate species. No evidence of use by Water Vole or Otter was identified, although much of the banks were concealed by dense marginal and emergent vegetation. Dense patches of Common Reed within the channel may provide nesting opportunity to reedbed specialist bird species (e.g. Reed Bunting and Reed Warbler).



APPENDIX IV BATS AND ARTIFICIAL LIGHTING IN THE UK GUIDANCE NOTE

The following is an extract from the Bat Conservation Trust and Institution of Lighting Professionals (2023) guidance note on Bats, Lighting and the Mitigation Hierarchy. Section 4 contains advice on how to mitigate for the impacts of artificial lighting on bats. Full citation:

Bat Conservation Trust & Institution of Lighting Professionals (2023) *Bats and Artificial lighting at Night Guidelines. Guidance Note 08/23*. Bat Conservation Trust, London.

4. Bats, lighting and the mitigation hierarchy

Introduction

- 4.1 This chapter provides a process for considering the impact on bats as part of a proposed lighting scheme or new development incorporating night-time lighting. It contains a toolkit of techniques which can be used on any site, whether a small domestic project or larger mixed-use, commercial or infrastructure development. It also provides best practice advice for the design of a lighting scheme, for both lighting professionals and other users who may be less familiar with the terminology and theory.
- 4.2 Under the Agent of Change principle within national planning policy, those seeking to introduce a new plan or project are also responsible for the management of its impact. Therefore, it is crucial that the impacts of obtrusive lighting are mitigated or avoided altogether. While this chapter focuses on how potential lighting impacts on bats can be identified, avoided and mitigated, opportunities for ecological betterment beyond maintaining the status quo should be pursued wherever possible. Doing so would not only fulfil our responsibilities under this principle but contribute to Biodiversity Net Gain in line with legislation.^{xlix} Further information on Biodiversity Net Gain can be found here: <https://cieem.net/i-am/current-projects/biodiversity-net-gain/>
- 4.3 Effective avoidance and mitigation of lighting impacts on bats relies on close collaboration from the outset between multiple disciplines. Depending on the specific challenges this will almost certainly involve ecologists working alongside architects and/or engineers; however, lighting professionals and landscape architects should be approached when recommended by your ecologist. This should be done at as early a stage as possible, in order to ensure the proposed lighting strategy is acceptable to all disciplines, mitigation is effective and is not in breach of legislation. In this way, delays to approval/adoption and unforeseen costs or liability can be avoided.
- 4.4 The stepwise process and key follow-up actions are outlined in the flowchart overleaf see figure 3 and followed throughout the Chapter. The questions in the flowchart should be asked in good time to allow any necessary bat survey information to be gathered in advance of lighting design, or fixing a scheme design.
- 4.5 It should be noted that the measures discussed in this document relate only to the specific impacts of lighting upon retained or newly created bat habitat features, on or adjacent to the site. If loss or damage to roosting, foraging or commuting habitat is likely to be caused by other aspects of the development, separate ecological advice will likely be necessary in order to avoid, mitigate or compensate for this legally and/or in line with ecological planning policies.

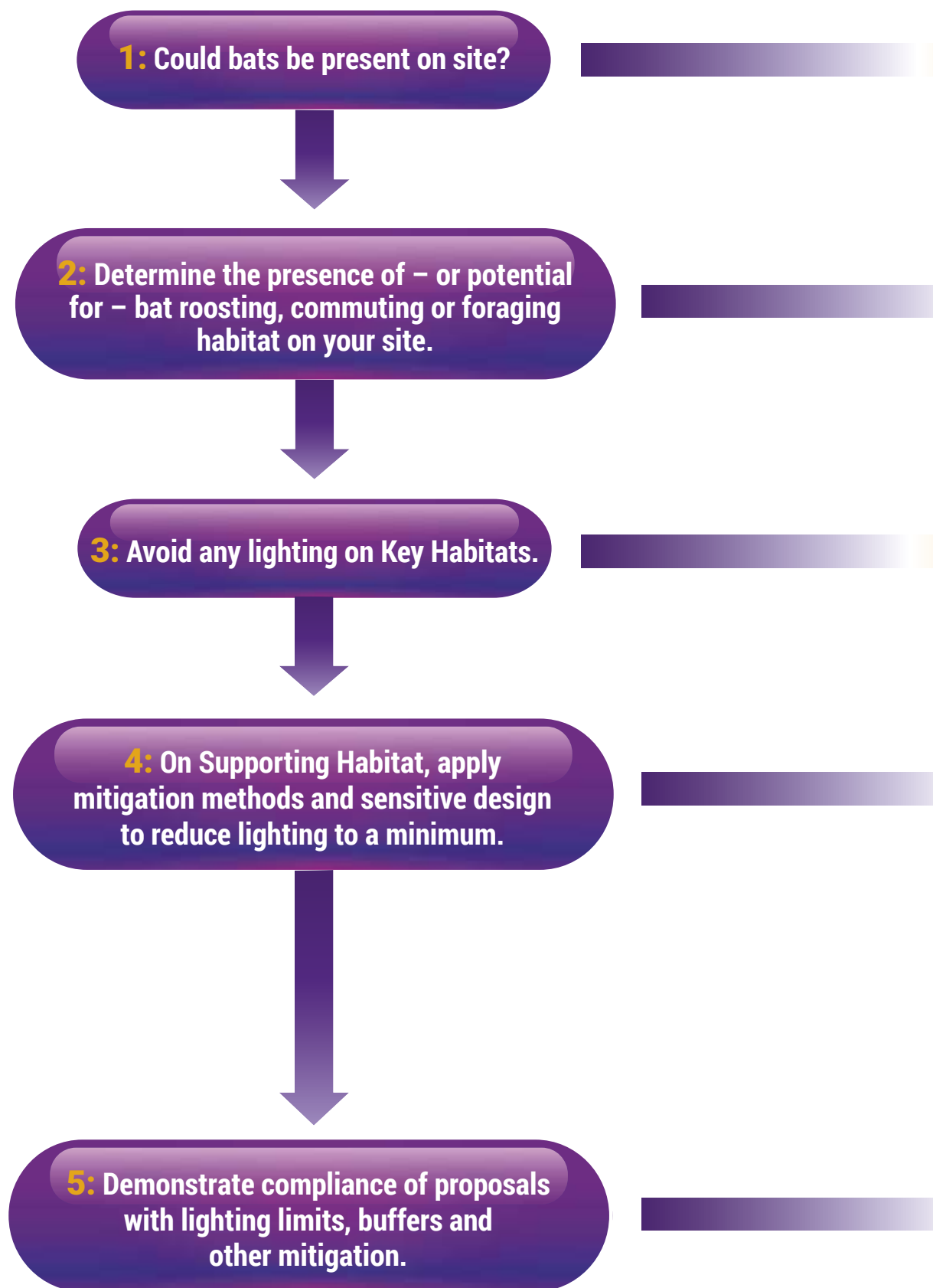




Figure 3. Ecology process for lighting.

Step 1: Could bats be present on site?

- 4.6 If there is no ecological data for your site, an ecologist should be contacted at the earliest opportunity to advise on an initial survey and any potential follow-on surveys. This information should be collected as early as possible in the design process, and certainly before lighting is being specified, so as to avoid the need for costly revisions.
- 4.7 If any of the following habitats occur on site, and are adjacent to or connected with any of these habitats on or off site, it is possible that proposed lighting may impact local bat populations (please note this list is indicative and advice should be sought from an ecological consultant):
- Woodland, individual mature trees or lines of trees
 - Hedgerows and scrub
 - Ponds, lakes and other wetland
 - Ditches, streams, canals and rivers
 - Infrequently managed grassland, or parks, gardens and Public Open Space
 - Buildings - Especially, **but not limited to**, those in disrepair or built pre 1970s
 - Gravel pits, quarries, cliff faces, caves and rock outcrops
 - Any building or habitat known to support protected species
 - Any additional scenarios as advised by your Local Planning Authority (LPA)
- 4.8 If you are unsure about whether bats may be impacted by your project, and an ecologist has not yet been consulted, sources of information on the presence of bats within the vicinity of your site include the following.
- Local Environmental Records Centres (LERC) - Will provide third-party records of protected and notable species for a fee. Search <http://www.alerc.org.uk/> for more information
 - The Wildlife Assessment Check is a free online tool designed by the Partnership for Biodiversity in Planning to support small-to-medium scale developments by helping identify whether ecological advice should be sought prior to submitting a planning application. The WAC is available online at www.biodiversityinplanning.org/wildlife-assessment-check/
 - National Biodiversity Network Atlas - Provides a resource of third-party ecological records searchable online at <https://nbnatlas.org> - typically this is less complete than LERC data. Please note: Some datasets are only accessible on a non-commercial basis, while most can be used for any purpose, provided the original source is credited
 - Local Authority Planning Portal - Most local planning authorities have a searchable online facility detailing recent planning applications. These may have been accompanied by ecological survey reports containing information on bat roosts and habitats

- Defra's MAGIC map - Provides an online searchable GIS database including details of recent European Protected Species licences, and details of any protected sites designated for bat conservation
- 4.9 The professional directory at the website of the Chartered Institute of Ecology and Environmental Management (www.cieem.net) provides details of ecologists in your area with the relevant skills/experience. The early involvement of a professional ecologist can minimise the likelihood of delays at the planning stage (if applicable) and ensure your project is compliant with conservation and planning legislation and policy.

Step 2: Determine the presence of/potential for bat roosts or habitat and evaluate their importance

- 4.10 Once a potential risk to bats has been identified, the ecologist will visit the site in order to record the habitats and features present, and evaluate their potential importance to bats. Additionally, they should consider the likelihood that bats could be affected by lighting both on and immediately off site. This survey may also include daytime building and tree inspections, and the deployment of automated bat detectors. On the basis of these inspections, further evening surveys may be recommended, either to determine the presence or likely absence of bats within buildings and/or trees, or to assess the use of the habitats by bats by means of a walked survey. Such surveys may be undertaken at different times during the active season (May - September) and should also involve the use of automated bat detectors left on site for a period of several days. The surveys should be carried out observing the recommendations within the Bat Conservation Trust's Bat Surveys for Professional Ecologists: Good Practice Guidelines (Collins, 2016), and the Interim Guidance Note: Use of Night Vision Aids for Bat Emergence Surveys (BCT, May 2022), or as superseded.
- 4.11 The resulting report will detail the relative conservation importance of each habitat feature to bats, including the roost-supporting potential of any built structures or trees. The ecologist's evaluation of the individual features will depend on the specific combination of contributing factors about the site, including:
- The conservation status of species likely to be present
 - Geographic location
 - Type of bat activity likely (breeding, hibernating, night roosting, foraging etc.)
 - Habitat quality
 - Habitat connectivity off-site
 - The presence of nearby bat populations or protected sites for bats (usually identified in a desk study)

- 4.12 The evaluation will enable the ecologist to determine the presence of any Key Habitats or Supporting Habitats for bats. The whereabouts of these habitats should be set out on a plan of the site or as an Ecological Constraints and Opportunities Plan (ECOP), see Case Study 3. The bat habitat plan/ECOP and report can then be used to help guide the design of the lighting strategy (see next steps) as well as the wider project.
- 4.13 Key Habitats are those which are considered essential for the function and stability of local bat populations, while Supporting Habitats may be of lesser significance or usage. Habitats falling within neither category are considered to be of negligible or very low importance to bats.
- 4.14 Examples of Key Habitats include:
- Roosting and swarming sites for all species and their associated flightpaths and commuting habitat
 - Foraging or commuting habitat for highly light-averse species (greater and lesser horseshoe bats, some *Myotis* bats, barbastelle bats and all long-eared bats) or nationally/locally rare species
 - Foraging or commuting habitat supporting relatively large numbers of bats or high activity rates as assessed through survey
 - Any habitat otherwise assessed by the ecologist as being of elevated importance in maintaining the 'favourable conservation status' of the bat population using it

Step 3: Avoid lighting on any Key Habitats

- 4.15 An adverse impact from illumination onto a Key Habitat feature is likely to have a significant effect on the bats using it. Therefore, an absence of artificial illumination and glare acting upon both the feature and an appropriately sized buffer zone is most often the only acceptable solution. An ecologist will be best placed to set the size of such a buffer zone according to the species present and the level of usage, and these can be tens of metres if unattenuated light spill or glare from local sources is predicted. The input of a lighting professional should be sought when determining the distances of light spill from new sources and likelihood of glare. It is recommended that proposals are communicated by them to the Principal Designer and the Highways Designer, (if applicable) as in some circumstances these decisions may influence highway function (e.g. visibility departures). Further information on demonstrating an absence of illumination within proposals via lux/illuminance contour plans is provided in Step 5.
- 4.16 As detailed in Section 2.1, there is no legal duty requiring any place to be lit. British Standards and other policy documents allow for deviation from their own guidance where there are significant ecological/environmental reasons for doing so. It is acknowledged that in certain situations lighting is critical in maintaining safety, such as some industrial sites with 24hr operation, or in high-risk security situations. Nevertheless, these are not exempt from

the statutory protection afforded to bats, their roosts and commuting routes directly associated with roosts, and good design principles recommended under industrial documents such as the Institution of Lighting Professionals' GN01: The Reduction of Obtrusive Light remain best practice. However, in the public realm, while lighting can increase the perception of safety and security, measurable, objective benefits on safety and security are less well established. Consequently, lighting design should be holistic, taking into consideration the relevant British Standards or local policies concerning lighting but, through a risk assessment-style process, be able to fully take into account the presence of protected species and the likely adoption of mitigation approaches through proper engagement with local communities (see Case Study 4).

- 4.17 Completely avoiding any lighting conflicts in the first place is advantageous, because proposals would be automatically compliant with the relevant wildlife legislation and planning policy, and costly, time-consuming additional surveys, mitigation and post-development monitoring would be avoided. Furthermore, LPAs are likely to favour applications where steps have been taken to avoid such conflicts.
- 4.18 Sources of lighting which can have the potential to disturb bats are not limited to roadside, footpath or security lighting, but can also include light spill via windows, permanent but sporadically operated lighting such as sports floodlighting, and in some cases car headlights. It is important to note that these situations often comprise many complex variables, and light emission is often difficult to predict or model accurately.
- 4.19 A competent lighting professional should be involved in the design of proposals as soon as potential impacts (including from glare) are identified by the ecologist, in order to avoid planning difficulties, or late-stage design revision. The lighting professional will be able to make recommendations about placement of luminaires tailored to the project.

Glare

- 4.20 Glare (extremely high contrast between a source of light and the surrounding darkness - linked to the 'intensity' of a luminaire) may additionally affect bats over a greater distance than the area directly lit by a luminaire. Glare impacts on bats and other wildlife should be considered on the site alongside best practice advice on reducing obtrusive light (see ILP GN01).

Highways

- 4.21 Where highways lighting schemes are to be designed by the LPA, the ecology officer (or planning officer) should be consulted on the presence of important bat constraints, determined in Step 2, which may impact the design of the lighting scheme in order to ensure compliance with wildlife legislation.

LPA-specific guidance

- 4.22 Some LPAs have Supplementary Planning Documents (SPD) or other guidance concerning the management of potential development impacts on particular species of bats, or in relation to certain protected sites, such as Special Areas of Conservation (SACs). These should be consulted for particular advice concerning lighting. For example, the North Somerset and Mendip Bats SAC Guidance on Development SPD provides a methodology for calculating the specification of compensatory habitat required to off-set certain development impacts on the bat population of the SAC. In it, retained or created habitats that are subject to lighting above certain lux levels, are considered to be lost to development, with implications for compensation requirements¹.

Environmental Impact Assessment (EIA)

- 4.23 For plans and projects subject to the Environmental Impact Assessment (EIA) Regulations screening process, it is important for LPAs to understand the nature of mitigation measures at this relatively early stage. Under current EIA Regulations, schemes planning to avoid likely significant effects on the environment through either embedded design measures, such as sensitive site configuration or strategic land/building usage etc., or by other robust mitigation, may be exempt from EIA and therefore less costly. However, the over-reliance on conditions to effect environmental mitigation may be open to legal challenge.

Step 4: On Supporting Habitat, apply mitigation methods and sensitive design to reduce lighting to a minimum

- 4.24 Supporting Habitats may be less frequently used by bats compared to Key Habitats, or support fewer, or more light-opportunistic species. Consequently, a balance between a reduced lighting level appropriate to the ecological importance of each feature and species, and the lighting objectives for that area will need to be achieved.
- 4.25 It is important to reiterate the legal protection from disturbance that bats receive under the Wildlife and Countryside Act 1981, as amended. Where the risk of offences originating from lighting is sufficiently high, it may be best to apply the avoidance approach in Step 3. (see Case Study 5).
- 4.26 Advice from an ecologist and lighting professional will be essential in finding the right approach for the site according to their evaluation. The following are techniques which have been successfully used on projects to limit lighting impacts on bats, and are often used in combination for best results.

¹ <https://n-somerset.gov.uk/sites/default/files/2020-03/North%20Somerset%20and%20Mendip%20Bats%20SAC%20guidance%20supplementary%20planning%20document.pdf>

Dark buffers and concentric zonation

- 4.27 A buffer zone subdivided to into smaller zones of increasing illuminance limit further away from the Supporting Habitat would ensure light levels (illuminance - measured in lux) do not exceed certain defined limits. This has the effect of a gradual decrease in lighting from the developed zone, rather than a distinct cut-off, which may provide useable area for the project which also limits lighting impacts on less sensitive species, or less well-used habitat.
- 4.28 The ecologist (in collaboration with a lighting professional) can help determine the most appropriate buffer widths and illuminance limits according to the value of that habitat to bats. Figure 4 gives an example of a multi-zoned approach which includes Key Habitat (Zone A) which would receive no ALAN, and Supporting Habitat (Zones B and C) which would act as a 'light attenuation zone', but remain within the public realm, and so receive reduced light levels.

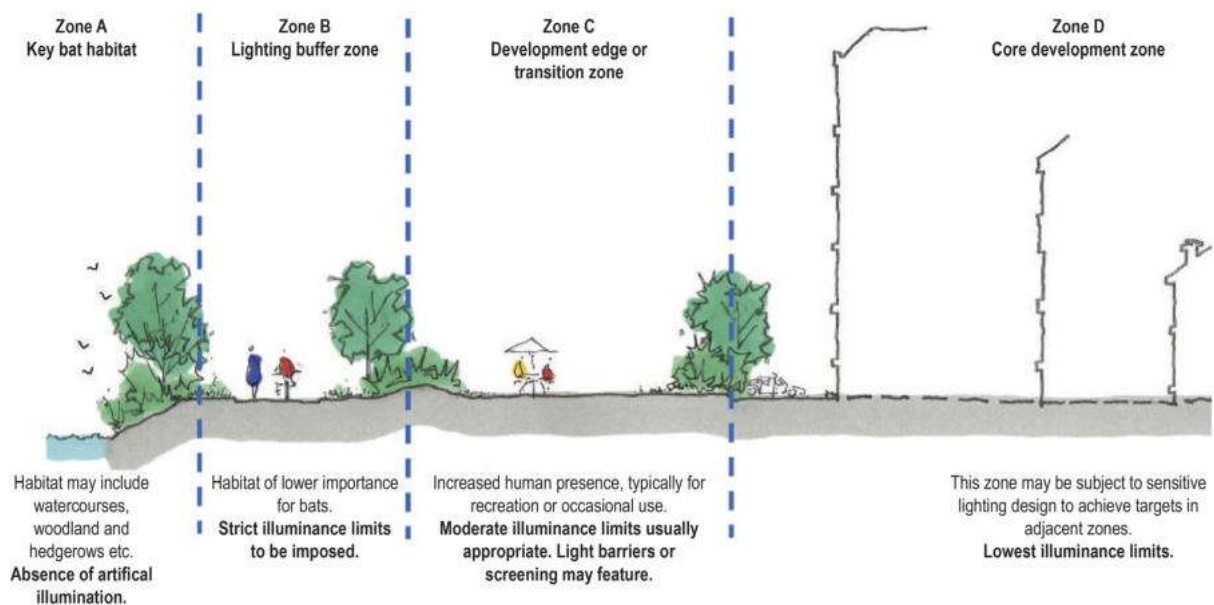


Figure 4. Example of illuminance limit zonation.

Appropriate luminaire specifications

- 4.29 Light sources, lamps, LEDs and their fittings come in a myriad of different specifications which a lighting professional can help to select. However, the following should be considered when choosing luminaires and their potential impact on Key Habitats and features:
- All luminaires should lack UV elements when manufactured. Metal halide, compact fluorescent sources should not be used
 - LED luminaires should be used where possible due to their sharp cut-off, lower intensity, good colour rendition and dimming capability
 - A warm white light source (2700Kelvin or lower) should be adopted to reduce blue light component

- Light sources should feature peak wavelengths higher than 550nm to avoid the component of light most disturbing to bats (Stone, 2012)
- Internal luminaires can be recessed (as opposed to using a pendant fitting - See Figure 5) where installed in proximity to windows to reduce glare and light spill
- Waymarking inground markers (low output with cowls or similar to minimise upward light spill) to delineate path edges (see Case Study 1)
- Column heights should be carefully considered to minimise light spill and glare visibility. This should be balanced with the potential for increased numbers of columns and upward light reflectance as with bollards
- Only luminaires with a negligible or zero Upward Light Ratio, and with good optical control, should be considered - See ILP GN01
- Luminaires should always be mounted horizontally, with no light output above 90° and/or no upward tilt
- Where appropriate, external security lighting should be set on motion-sensors and set to as short a possible a timer as the risk assessment will allow. For most general residential purposes, a 1 or 2 minute timer is likely to be appropriate
- Use of a Central Management System (CMS) with additional web-enabled devices to light on demand
- Use of motion sensors for local authority street lighting may not be feasible unless the authority has the potential for smart metering through a CMS
- The use of bollard or low-level downward-directional luminaires is strongly discouraged. This is due to a considerable range of issues, such as unacceptable glare, poor illumination efficiency, unacceptable upward light output, increased upward light scatter from surfaces and poor facial recognition which makes them unsuitable for most sites. Therefore, they should only be considered in specific cases where the lighting professional and project manager are able to resolve these issues. See Case Study 6
- Only if all other options have been explored, accessories such as baffles, hoods or louvres can be used to reduce light spill and direct it only to where it is needed. However, due to the lensing and fine cut-off control of the beam inherent in modern LED luminaires, the effect of cowls and baffles is often far less than anticipated and so should not be relied upon solely

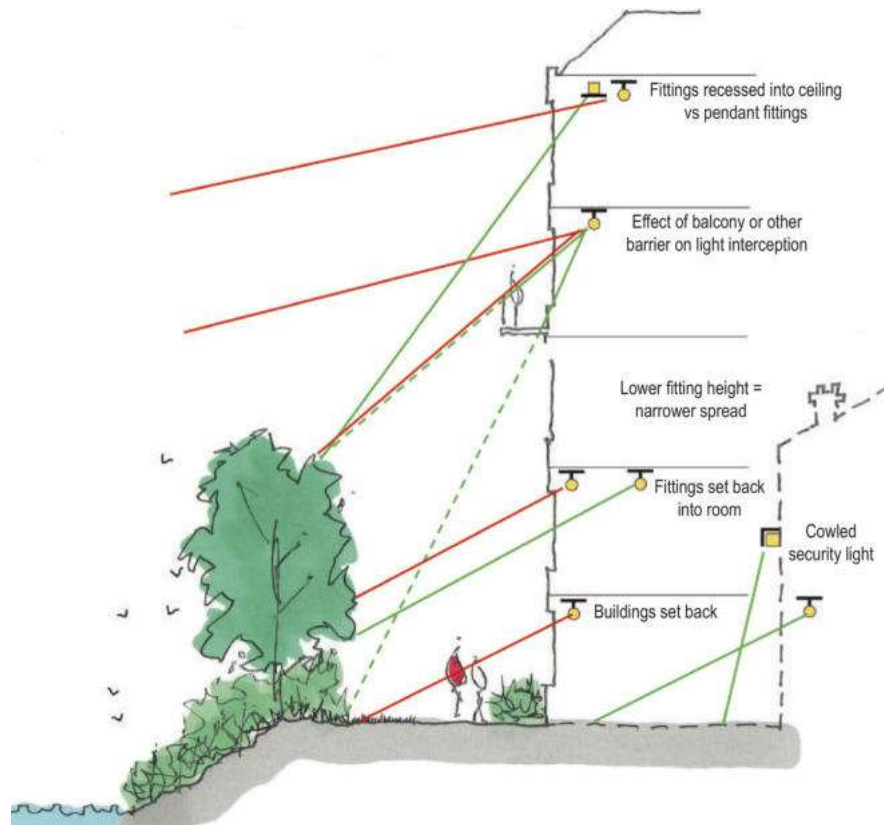


Figure 5. Internal lighting mitigation options.

Sensitive site configuration

4.30 The location, orientation and height of newly built structures, and hard standing, relative to each other can have a considerable impact on light spill. Small changes in terms of the placement of footpaths, open space and windows can all help to achieve a better outcome in terms of minimising light spill onto Key Habitats and features.

- Key or Supporting Habitat is often located alongside, or to the rear of buildings, on new developments. In this case, the removal or reduction of windows can be the most effective way to permanently limit light spill, potentially alongside the internal reconfiguration of the building, to ensure high-use spaces are not as impacted by loss of natural light
- It may be possible to include Key or Supporting Habitat into unlit public open space such as parks. However, avoid including into residential gardens, as uncontrolled and inappropriate lighting may be introduced by residents following occupation
- It is often considered better for a residential scheme to specify good quality downward-directional external light fittings for security, and/or at the front entrance, on short PIR timers, rather than risk the imposition of poor quality and poorly controlled lighting at a later date
- Buildings, walls and hard landscaping may be sited and designed so as to block light spill from reaching habitats and features

- Paved surfaces should not be located within Key Habitat or buffer zones, unless they form part of unlit public open space
- Taller buildings may be best located toward the centre of the site, or sufficiently set back from Key Habitats, to minimise the effect of their light spill
- Column mounted luminaires can be located so that the rear shields are adjacent to habitats, or narrow optics selected that direct light into the task area where needed

Physical screening

- 4.31 Light spill can be successfully screened through landscaping and the installation of walls and fences, or even banks and bunds (See Figure 6). In order to ensure that fencing makes a long-term contribution, it is recommended that it is supported on concrete or metal posts. Fencing can also be over planted with hedgerow species or climbing plants to soften its appearance and provide a vegetated feature which bats can use for navigation or foraging.
- 4.32 The planting of substantial landscape features integrated to the wider network of green corridors such as hedgerows, woodland and scrub would make a long-term positive contribution to the overall connectivity of bat habitat and light attenuation. It would also contribute to any local Nature Recovery and Green Infrastructure policies and help achieve obligatory Biodiversity Net Gain targets. A landscape architect can be appointed to collaborate with the ecologist on maximising these natural light screening opportunities.
- 4.33 It should be noted that newly planted vegetation (trees, shrubs and scrub) is unlikely to adequately contribute to light attenuation upon Key Habitats for a number of years, until it is well established. Sufficient maintenance to achieve this is also likely to be required. Consequently, this approach is best suited to the planting of dense, mature or translocated vegetation. In some cases, it is appropriate to install temporary fencing, or other barrier, to provide the desired physical screening effects until the vegetation is determined to be sufficiently established.
- 4.34 Given the fact that planting may be removed, die back or inadequately replaced over time, it should never be relied on as the sole means of attenuating light spill.

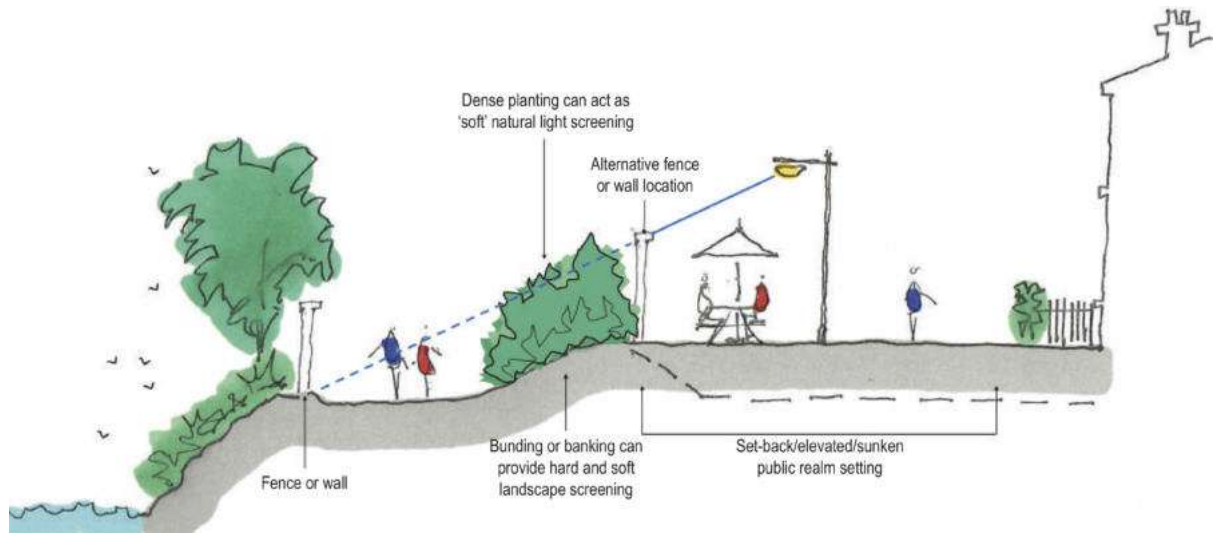


Figure 6. Examples of physical light screening options.

Dimming and part-night lighting

- 4.35 Depending on the pattern of bat activity across the Supporting Habitat identified by the ecologist, it may be appropriate for an element of on-site lighting to be controlled by dimming or switching either diurnally, seasonally, or according to human activity (light on demand). This is known as Part-Night Lighting (PNL). It is important to state that PNL is not likely to be appropriate where Key Habitats are at risk, especially as PNL often results in lighting when bats are most active.
- 4.36 A Central Management System (CMS) can be specified by the lighting engineer to dim or turn off individual or groups of luminaires when not in use or during less busy times. Dimming can be precisely controlled, with dimming states often being as low as 10 or 20%. However, due to the electrical difficulties of maintaining a dimming state of under 10%, luminaires should be set to off below this point.
- 4.37 Lighting could be set to a low output state by default, to turn up to a pre-determined output in response to a trigger, and be combined with a timeclock or photocell to further add an element of seasonal or diurnal control. For example, Passive Infrared (PIR), Artificial Intelligence enabled cameras, on demand controls, or pressure sensors may be used to trigger lights to come on or dim in response to movements, either by vehicles (for example at car parks or industrial loading bays) or by pedestrians (for example a footpath leading from residential development through an area of Supporting Habitat). The timeclock or photocell could ensure that this response only occurs during a set window of hours after sunset and before sunrise, or during certain months.
- 4.38 Where some trigger is used to temporarily modify lighting states, it will be necessary to specify the timed trigger window during which the response is maintained beyond the last triggering activity. For most typical residential purposes, 1-2 minutes is likely to be sufficient, however risk assessments must

be performed in line with BS5489-1. The proposed system of lighting control will be determined by the outcome of the risk assessment. Where used in locations which receive distinct busy periods, such as cycle paths used by commuters, care will be needed to ensure lighting responds adequately to permit safe usage, but avoids both over-illumination and potentially disruptive dimming states of lighting groups.

- 4.39 Alternative lighting designed for subtle waymarking, rather than illumination, may be more appropriate, such as very low-wattage, ground-level luminaires (photo 4). This lighting option can have a number of additional benefits such as a reduced risk of vandalism, lower carbon footprint during manufacture and fitting and no requirement for cabling. However, it should be noted that these systems depend on regular maintenance and a long-term



*Photo 4: Waymarkers installed on a multi-user path in Worcester.
Image credit: Cody Levine.*

- commitment for them to be successful, as well as a clear view of the sky for solar-powered options. Due to this, proposals and potential planning conditions should be considered in liaison with maintenance teams, to ensure success (and any handover of assets) post install. See Case Study 1 for further information.
- 4.40 Part-Night Lighting should be designed with input from an ecologist as it may still produce unacceptably high light levels when active or dimmed. Part-Night Lighting is not usually appropriate where lights are undimmed during key bat activity times, as derived from bat survey data or within riparian habitats (see research chapter 1.27). Research has indicated that impacts upon commuting bats are still prevalent where lighting is dimmed during the middle of the night at a time when illumination for humans' use is less necessary (Azam et. al., 2015) thus this approach should not always be seen as a solution, unless backed up by robust ecological survey and assessment of nightly bat activity. In this case, designing areas to be lit to avoid retained Key Habitat, or the provision of sufficient alternative dark corridors, may be the only solution.

Glazing treatments on buildings

- 4.41 As mentioned, glazing should be restricted and reduced wherever the ecologist and lighting professional determine there to be a likely significant effect upon bats' Key Habitat and associated features.
- 4.42 Where Supporting Habitat is present, glazing treatments such as tinted, frosted or low transmission glazing treatments are not generally considered suitable ways of fully mitigating light spill. In the case of frosted or 'frit' glazing, windows typically remain luminous surfaces in their own right, defeating the objective of reducing lighting impacts. Although promisingly named, low-transmission glazing (glazing with a lower visible light transmittance) often makes only a very small difference to light spill in practice - a window's fundamental objective is to transmit light!
- 4.43 Automatic blinds should be discouraged as their longevity depends on regular maintenance and successful routine operation by the occupant. Such blinds are generally only suited to commercial situations where maintenance can be incorporated into the long-term regime routine for the building.
- 4.44 Depending on the height of the building and windows, and therefore predicted light spill, glazing treatments or window design restrictions may not be required on all storeys. This effect can be more accurately determined by a lighting professional.

Creation of alternative valuable bat habitat on site

- 4.45 The provision of new, additional or alternative bat flightpaths, commuting or foraging habitat is encouraged and could result in appropriate compensation for any such habitat being lost to the development. The ecologist will be able to suggest and design such alternative habitats, although particular consideration should be given as to its connectivity to other features, the species to be used, the lag time required for a habitat to sufficiently establish and the provision for its ongoing protection and maintenance.
- 4.46 As almost all new development will be required to result in at least 10% Biodiversity Net Gain (BNG), opportunities to improve habitat connectivity for bats should always be considered. Further to the 10 principles at the core of BNG, the implementation of sensitively sited habitat features for bats would be a clear contribution to 'additionality'. Particularly when considering achieving BNG off-site, assessment should be made of the impacts of altering the type and proportion of bat-suitable habitats, both within and beyond the site, upon the potential Core Sustenance Zone of any maternity roosts which use them.²

² <https://cdn.bats.org.uk/uploads/pdf/Bat-Species-Core-Sustenance-Zones-and-Habitats-for-Biodiversity-Net-Gain.pdf>

Step 5: Demonstrate compliance with illuminance (lux) limits and buffers within proposals and, where appropriate, the operational scheme

- 4.47 Once it has been determined through the above process how Key and Supporting Habitats will be protected, or impacts on them mitigated or compensated for, it will be necessary to demonstrate how this will be achieved. For a planning application, this information is increasingly required prior to determination in order for the LPA to make an informed decision and discharge statutory duties towards protected species legislation and policies. This is most likely to be the case for 'Full' planning applications. For 'Outline', phased or complex applications, this information is, at times, deemed a 'Reserved Matter', for which detail will normally follow at a later date before final consent is granted, or in the discharging of reserved matters. Incidences include EIAs and should be made prior to determination. It is appropriate for a pre-commencement planning condition to be imposed on a consented application which would require that an ecologically sensitive lighting plan is prepared, or is achievable.
- 4.48 In all cases where impacts from lighting on bats are possible, the LPA will require some form of documentation to be produced by the lighting engineer, either in collaboration with the ecologist, or working to the constraints set out within the bat habitat plan/ECOP (see Step 2), in order to demonstrate compliance. Usually, this will take the form of a 'Lighting Strategy', 'Lighting Design' or 'Lighting Impact Assessment', depending on the level of detail in the application. A Lighting Strategy may simply set out the agreed lighting parameters, objectives and likely mitigation requirements (e.g. unlit zones and any other bat mitigation), together with a plan. A Lighting Design/Impact Assessment would provide finalised details, consisting of a plan to show modelled illuminance from all proposed (and existing, where necessary) light sources, taking into account all site configuration, physical screening and glazing measures adopted. It would usually be accompanied by an explanatory document detailing the specification of each luminaire, as well as all assessment assumptions made and any other rationale for lighting mitigation, such as recessed light fittings or part-night lighting.
- 4.49 In the case of Outline or phased applications, the precise detail of architectural materials, glazing, landscaping etc. might not be known at the time of submission, therefore a Lighting Strategy may be the most appropriate document to provide. As described above, the bat mitigation objectives derived from the ecologist's bat habitat plan/ECOP should be referenced. It is worth being aware of the potential for matters such as highways (incorporating highways-specific lighting needs) to be fixed at Outline consent stage, which can make the resolution of bat mitigation requirements at a later stage challenging. This highlights the importance of inter-discipline collaboration and early communication of ecological constraints.
- 4.50 In the case of small or simple planning applications, where significant impacts upon bats from lighting are of a low likelihood, the production of a full Lighting Design package may be disproportionately costly and time-consuming. It may therefore be appropriate to provide a simplified document produced between

the ecologist and lighting engineer, setting out design decisions undertaken and the likely achievability of the recommendations within the ECOP according to the lighting engineer's professional judgment.

Lighting contour plans

- 4.51 A horizontal illuminance contour plan can be prepared by a suitably experienced and competent lighting professional (Member of the Institution of Lighting Professionals (ILP), Chartered Institution of Building Services Engineers (CIBSE), Society of Light and Lighting (SLL) or similar to ensure competency) using an appropriate software package to model 'Day 1', extent of light spill from the proposed, retained and, possibly, existing luminaires. The various buffer zone widths and illuminance limits which may have been agreed can then be overlaid to determine if any further mitigation is necessary. In some circumstances, a vertical illuminance contour plot may be necessary to demonstrate the light in sensitive areas, such as entrances to roosts or the Key Habitat associated with it (see Appendix).
- 4.52 Such calculations and documentation would enable the LPA ecologist to fully assess impacts and compliance.
- 4.53 Because illuminance contour plots and plans may need to be understood and examined by non-lighting professionals, such as architects and local planning authority ecologists, the following should be observed when producing or assessing illuminance contour plans, to ensure the correct information is displayed.
 - A calculation showing output of luminaires to be expected at 'Day 1' of operation should be included, where the luminaire and/or scheme Maintenance Factor is set to 1. Schemes using Constant Light Output (CLO) luminaires should also be calculated using 'Day 1' output
 - Where deemed necessary by a lighting professional, models should be issued so that all luminaires (i.e. internal and external, or between different phases/plots) can be assessed and each should be set to the maximum output anticipated to be used in normal operation on site (i.e. no dimming where dimming is not anticipated during normal operation)
 - Where dimming, PIR, or variable illuminance states are to be used, an individual set of calculation results should accompany each of these states
 - A horizontal calculation plane representing levels of illuminance at ground level should always be used
 - Vertical calculation planes should be used wherever appropriate, for example along the site-facing aspects of a hedgerow or façade of buildings containing roosts, to show the illumination directly upon the vertical faces of the feature. Vertical planes can also show a cross-sectional view within open space (however, they will only face one direction.) Vertical planes will enable a visualisation of the effects of illumination at the various heights at which different bat species fly. An ecologist can

advise on the most appropriate dimensions to use according to the likely locations of bat flight around the site's habitats

- The contours (and/or coloured numbers) for 0.2, 0.5, 1, 5, and 10 lux must be clearly shown, as well as appropriate contours for values above these
- Each illuminance/lux contour plan should be accompanied by a table showing their minimum and maximum illuminance/lux values
- Where buildings are proposed in proximity to key features or habitats, plots should also model the contribution of light spill through nearby windows, making assumptions as to internal luminaire specification, internal lighting levels, and visible light transmittance of windows. It should be assumed that blinds or curtains are absent or fully open. Assumptions will need to be made as to the internal luminaire specification and levels of illuminance likely to occur on 'Day 1' of operation. These assumptions should be clearly stated and guided by the building/room type and discussions between architect, client and lighting professional. Consideration may also need to be given to the site topography, and differences in ground levels between key features and lit areas or buildings. It is acknowledged that in many circumstances, only a 'best effort' can be made in terms of accuracy of these calculations as it is often not possible to account for all 'real world' conditions and variables which influence light. Note that evidence-based professional judgement is needed to assess whether light from windows should undergo a full assessment, dependent on factors such as the distance between light source and critical habitats
- Modelled plots should not include any light attenuation factor from new or existing planting, due to the lag time between planting and establishment and the risk of damage, removal or failure of vegetation. This may result in difficulties in the long-term achievement of the screening effect and hamper any post-construction compliance surveys
- The illuminance contour plots should be accompanied by an explanatory note from the lighting professional to list where, in their opinion, sources of glare acting upon the key habitats and features may occur, and what has been done/can be done to reduce their impacts

4.54 **N.B.** It is acknowledged that, especially for vertical calculation planes, very low levels of light (<0.5 lux) may occur even at considerable distances from the source if there is little intervening attenuation. It is therefore very difficult to demonstrate 'complete darkness' or a 'complete absence of illumination' on vertical planes where some form of lighting is proposed on site, despite efforts to reduce them as far as possible and where horizontal plane illuminance levels are zero. Consequently, where 'complete darkness' on a feature or buffer is required, it may be appropriate to consider this to be where illuminance is at or below 0.2 lux on the horizontal plane, and at or below 0.4 lux on the vertical plane. These figures are still lower than what may be expected on a moonlit night and are in line with research findings for the illuminance found at hedgerows used by lesser horseshoe bats, a species well known for its light averse behaviour. ^{xvi}

Baseline and post-completion light monitoring surveys

- 4.55 Baseline, pre-development lighting surveys may be useful where existing on or off-site lighting is suspected to be acting on Key and Supporting Habitats and features, and so may prevent the agreed or modelled illuminance limits being achieved. This data can then be used to help isolate which luminaires might need to be removed, or where screening should be implemented, or establish a new illuminance limit reduced below existing levels. For example, where baseline surveys establish that on or off-site lighting illuminates potential Key Habitat, improvements could be made by installing a tall perimeter fence adjacent to the habitat, and alterations to the siting and specification of new lighting, to avoid further illumination.
- 4.56 Baseline lighting surveys must be carried out by a suitably qualified competent person with the correct equipment. As a minimum, readings should be taken at ground level on the horizontal plane (to give illuminance hitting the ground), and in at least one direction on the vertical plane at between either 1.5m or 2m above ground (to replicate the likely location of bats using the feature or site). The orientation should be perpendicular to the dominant light sources, or perpendicular to the surface/edge of the feature in question (such as a wall or hedgerow), in order to produce a 'worst case' reading. Further measurements at other orientations may prove beneficial in capturing influence of all luminaires in proximity to the feature, or principal directions of flight used by bats. This should be discussed with the ecologist.
- 4.57 Baseline measurements should be taken systematically across the site or features in question, with time, date and time of sunset also recorded. They will need to be repeated at intervals to sample across the site or feature, either in a grid or linear transect, as appropriate. The lighting professional will be able to recommend the most appropriate grid spacing.
- 4.58 Measurements should always be taken in the absence of moonlight, either on nights of a new moon or heavy cloud, to avoid artificially raising the baseline. As an alternative, moonlight can be measured at a place where no artificial light is likely to affect the reading.
- 4.59 As all illuminance level contours will be produced from modelled luminaires at 100% output, baseline measurements should, wherever practicable, be taken with all lights on and undimmed, and with blinds or screens over windows removed. Cowls and other fittings on luminaires can remain in place.
- 4.60 Where possible, measurements should be taken during the spring and summer, when vegetation is mostly in leaf, in order to accurately represent the baseline during the principal active season for bats, and to avoid artificially raising the baseline.
- 4.61 The topography of the immediate surrounding landscape should be considered in order to determine the potential for increased or decreased light spill beyond the site.

Post-construction/operational phase compliance-checking

- 4.62 Post-completion lighting surveys are often required where planning permission has been obtained on the condition that the proposed lighting levels are checked to confirm they are in fact achieved on site, and test that the lighting specification (including luminaire heights, design and presence of shielding etc.) is as proposed.
- 4.63 All lighting surveys should be conducted by a suitably qualified competent person. They should be conducted using the same measurement criteria and lighting states used in the preparation of the illuminance contour plots and/or baseline surveys, as discussed above. It may be necessary to conduct multiple repeats over different illumination states, or other conditions specific to the project.
- 4.64 Depending on the potential for residual impacts on bats, and the scale of the proposed scheme, it is often appropriate to factor in bat monitoring surveys. These should have the aim of confirming an absence of significant changes in bat presence, species assemblage or behaviour between lit and unlit areas, compared to baseline results. Results should always be reported to the LPA as per any such planning condition. A 'Statement of Conformity' or similar report should be prepared in order to provide an assessment of compliance by the lighting professional, and a discussion of any remedial measures which are likely to be required in order to achieve compliance. Any limitations or notable conditions such as deviation from the desired lighting state, or use of blinds/barriers should be clearly reported. Ongoing monitoring schedules can also be set, especially where compliance is contingent on automated lighting and dimming systems, or on physical screening solutions.

Conclusion

- 4.65 **In summary**, the importance of integrating avoidance measures (as per the first step of the mitigation hierarchy) into developmental design, cannot be overemphasised. Retaining ecologically functional 'dark corridors' and Key Habitats for bats within schemes (in preference to seeking lighting mitigation strategies), avoids costly and time-consuming additional surveys, mitigation and post-development monitoring. Furthermore, LPAs are likely to favour applications where steps have been taken to avoid such conflicts. This master-planning work needs to be informed by robust ecological survey data and lighting assessments, carried out by the relevant experts at the earliest opportunity in the project. Ultimately, light levels should always be designed to minimise potential environmental impact, and maximise the potential of habitat and species enhancement work, through multidisciplinary working and evidence-based new, or retrofit, scheme design.