Plasyfelin Primary School PEA and BREEAM Report

Caerphilly County Borough Council

Project number: 60717337

November 2023

Delivering a better world

Quality Information

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Executive Summary

AECOM was instructed by Caerphilly County Borough Council (hereafter the 'client') to undertake a Preliminary Ecological Appraisal (PEA) and a Building Research Establishment Environmental Assessment Method (BREEAM) Land Use and Ecology (LE) assessment (Issues LE02, LE03, LE04 and LE05) of the land of the proposed new Plasyfelin Primary School in Caerphilly, South Wales (hereafter referred to as 'the Site').

The proposed new Plasyfelin Primary School (hereafter referred to as the 'Proposed Development') is located in the centre of Caerphilly, central Ordnance Survey National Grid Reference (OS NGR) ST 15258 87754. The Site is located between residential and recreational areas, and a woodland.

The assessment is focussed towards specific BREEAM LE Issues LE02, LE03, LE04 and LE05. The assessment includes a desk study and an extended Phase 1 Habitat survey. The assessment has been undertaken using BREEAM 2018 Criteria for Wales (BREEAM, 2018a).

The Proposed Development is for a new build project to replace the existing Plasyfelin Primary School which is currently located within the same Site. The Proposed Development is still in its early stages, with no Site layout confirmed, but plans include a main school building, hard and soft play areas, a Multi-Use Games Area (MUGA), car parking, and a new access road.

The Site was dominated by buildings, hardstanding, and amenity grassland with two blocks of broadleaved semi-natural woodland, lines of trees, scattered tree and scrub, poor semi-improved grassland, standing water, ephemeral-short perennial vegetation, intact species-poor hedge, bare ground, and artificial surfaces (astroturf, wet pour, and wooden decking) also present. The Site boundary was marked by fences and walls.

Habitats in the Zone of Influence (within 10 m of the Site boundary; ZoI) included broadleaved semi-natural woodland, a scattered tree, dense/continuous scrub, amenity grassland, running water, hardstanding, and residential complexes (houses, hardstanding, and gardens).

Within the Site boundary there was potential for common generalist and Priority invertebrates, great crested newt (GCN) *Triturus cristatus*, common toad *Bufo bufo*, common lizard *Zootoca vivipara*, slow-worm *Anguis fragilis*, breeding birds, roosting, foraging and commuting bats, dormouse *Muscardinus avellanarius*, and hedgehog *Erinaceus europaeus*. Within the ZoI, there is potential for these species as well as migratory fish, white-clawed crayfish *Austropotamobius pallipes,* badger *Meles meles*, and otter *Lutra lutra*.

Without mitigation there is potential for:

- Retained features to be damaged during construction;
- Habitat loss, injury and killing and disturbance (including external lighting disturbance) to impact Protected and Priority species using the Site and ZoI; and,
- Pollution, including noise, and light spill onto adjacent and retained habitats including the Nant yr Aber River Site of Importance for Nature Conservation (SINC). Recommendations for mitigation have been provided to avoid and reduce impacts on retained habitats and Protected and Priority species using the Site.

The 'before development' BREEAM LE04 calculations are based on the extended Phase 1 Habitat survey. 'Post development' calculations were not possible as no preliminary Site plan layout was available at the time of writing. This report can be used to guide Site design to achieve credits under BREEAM Issues LE03, LE04 and LE05.

Summary of Potential BREEAM Issues and Credits

Issue	Total Available Credits	Credits Likely Achievable
LE02	3	3
LE03	3	3
LE04	5	5
LE05	2	2
LE Total	13	13

* Achieving credits is dependent on recommendations being implemented by the client/contractor. Achieving these may be dependent on meeting the prerequisite Criteria.

Credits will be confirmed once a detailed Site plan including final landscape design has been issued.

As per BREEAM guidance, mandatory recommendations are requirements for compliance with UK and EU legislation (Appendix A). Additional recommendations outline further measures which could be included to maximise the ecological value of the Site. These are:

Mandatory 'Legal' Requirements	Additional Recommendations	
1) Further Surveys Including GCN eDNA survey; Bat Inspection, Emergence and Activity; Badger; and, Otter. 2) Pollution and Surface Water Control; 3) External Lighting Sensitive to Wildlife; 4) Protection of Retained Habitat; and, 4) Mitigation for Protected Species Including Pre-Works Checks, Watching Briefs and Directional Removal of Habitat.	1) Species-rich Grassland; 2) Green Roof/Living Wall; 3) Green Corridors; 4) Insect Walls/Boxes/Bricks, Bee Banks or Log Piles;	5) Bird Boxes; 6) Bat Boxes; 7) Dormouse boxes; and, 5) Hedgehog Habitat

The Executive Summary is not a substitute for the full report. Refer to the full text for further detail.

1. Introduction

1.1 Introduction

AECOM was instructed by Caerphilly County Borough Council (CCBC, hereafter the 'client') to undertake a Preliminary Ecological Appraisal (PEA) and a Building Research Establishment Environmental Assessment Method (BREEAM) Land Use and Ecology (LE) assessment (Issues LE02, LE03, LE04 and LE05) of the land of the proposed new Plasyfelin Primary School in Caerphilly, South Wales (hereafter referred to as the 'Site'). The central ordnance survey national grid reference for the Site is ST 15258 87754 and the Site boundary is shown on Figure 1.

The PEA was instructed to identify whether there are known or potential ecological features (nature conservation designations, Protected and Priority habitats and species) that may constrain or influence the design and implementation of the Proposed Development. The approach applied when undertaking this PEA pays due regard to the *Guidelines for Preliminary Ecological Appraisal* published by the Chartered Institute of Ecology and Environmental Management (CIEEM) (CIEEM, 2017). The PEA addresses relevant wildlife legislation and planning policy as summarised in this report.

To deliver the PEA, a desk study, an extended Phase 1 Habitat survey, and a Preliminary Roost Assessment (PRA) were undertaken by appropriately experienced ecologists, to identify ecological features within the Site and the wider potential Zone of Influence (ZoI), which extends 10 m from the Site boundary.

The BREEAM assessment is focussed towards specific BREEAM LE Credits LE02, LE03, LE04 and LE05. The assessment includes a desk study and an extended Phase 1 Habitat survey. The assessment has been undertaken using BREEAM 2018 criteria for Wales (BREEAM, 2018a).

1.2 Site Location and Description

The proposed new Plasyfelin Primary School (hereafter referred to as the 'Proposed Development') is located in the centre of Caerphilly, central Ordnance Survey National Grid Reference (OS NGR) ST 15258 87754. The Site is located between residential areas to the west and south, recreational buildings to the east, and a broadleaved woodland to the north.

The Site contained a complex of school buildings with hard standing used for car parking, walkways, and hard play surfaces. This complex was bordered by predominantly amenity grassland with scattered broadleaved and coniferous trees. Also on Site are wood chip and wet pour surfaced areas, utilised for soft play, and broadleaved semi-natural woodlands which are used for forest schools. The Site is demarcated predominantly by metal palisade fencing with walls and wooden fencing also in place on the southern boundary. Occasional scattered and dense scrub is present along the boundaries. Habitats in the ZoI include amenity grassland, residential areas (buildings and gardens), broadleaved semi-natural woodland, and running water (Nant yr Aber to the east). See Figure 1 for the distribution of the habitats.

1.3 Proposed Development

The Proposed Development is a new build project to replace the existing Plasyfelin Primary School within the same Site boundary. The Proposed Development will be built mainly within the amenity grassland to the east of the Site. No landscape design has yet been developed for the Proposed Development though a preferred option has been conceptualised via design team meetings (AECOM, 2023; Figure 2). The draft preferred option shows the following elements will potentially be included within the design:

- A main school building to the southwest of the Site, to include classrooms, a main hall, a small hall, a kitchen, and administration rooms;
- Two hard play areas adjacent to the east and south of the main school building;
- One soft play area to the north of the main school building;
- Two Multi-Use Game Areas (MUGA) in the centre and north of the Site;
- One hardstanding parking area in the centre of the Site; and,
- A service yard in the southwest corner of the school.

The grassland to the east of the Site will be retained for soft play, and the pond and adjacent grassland will be retained as a habitat area.

The broadleaved semi-natural woodland blocks on Site to the northwest and southeast will not be removed for the Proposed Development as communicated from the client.

A lighting plan has not yet been designed, though it is unlikely to contain floodlighting as communicated from Caerphilly County Borough Council.

This PEA and BREEAM report will be used to inform the final detailed design of the Proposed Development.

1.4 Objectives

1.4.1 PEA

This report is based on the findings of an extended Phase 1 Habitat survey and ecological desk study. The objectives of the report are to:

- Identify any designated nature conservation sites on or within proximity to the Site;
- Identify any known records of Protected or Priority species within proximity to the Site;
- Identify and categorise the main habitats and features of ecological interest present within the Site;
- Appraise the potential for Protected or Priority species of fauna and flora;
- Identify Potential Roosting Features (PRFs) suitable to support roosting bats, where required;
- Identify the requirement for further habitat and/or Protected species surveys;
- Make recommendations to avoid and mitigate ecological impacts as well as opportunities for biodiversity enhancements on and within proximity to the Site;
- Make recommendations relating to European Protected Species Mitigation Licence (EPSML) application (if required); and,
- Provide a map showing the Phase 1 Habitats on the Site, the location of PRFs for bats and any additional features of ecological interest.

The purpose of this report is to inform the design of the Proposed Development and to support the submission of a planning application. The report identifies the scope of further work (where necessary) that would be required to support a planning application.

1.4.2 BREEAM

This report is based on the pre-development findings of the extended Phase 1 Habitat survey (Figure 1) and the preferred post-development option that has been conceptualised in design team meetings (AECOM, 2023) as shown in Figure 2.

The objectives of this report are to:

- Undertake a BREEAM Ecology assessment, focused towards specific BREEAM LE Issues LE02, LE03, LE04 and LE05; and,
- Provide recommendations to guide the soft landscaping Site design to achieve credits under BREEAM Issues LE03, LE04 and LE05.

1.5 Wildlife Legislation and Planning Policy

1.5.1 Wildlife Legislation

There are several different acts of legislation and regulations which refer to the protection of wildlife. These are summarised in Appendix A. In particular, the legislation relating to possible Protected and Priority species on the Site is outlined. This is a summary of the legislation and is not to be regarded as a definitive legal opinion. When dealing with individual cases, the client is advised to consult the full texts of the relevant legislation and obtain further legal advice.

The following wildlife legislation potentially relevant to the Proposed Development includes:

- The Conservation of Habitats and Species Regulations 2017 (as amended);
- The Wildlife and Countryside Act (WCA) 1981 (as amended);
- Convention of Biological Diversity 1992;
- Protection of Badgers Act 1992;
- The Countryside and Rights of Way (CroW) Act 2000; and,
- Environment (Wales) Act 2016.

The above legislation has been considered when planning and undertaking this PEA and BREEAM assessment, when identifying potential constraints to the Proposed Development, and when making recommendations for further survey, design options and mitigation. Compliance with legislation may require the attainment of relevant Protected species licences prior to the implementation of the Proposed Development.

1.5.2 National Planning Policy

1.5.2.1 Planning Policy Wales (11th Ed. February 2021)

Planning Policy Wales (PPW) sets out the land use planning policies of Welsh Government (Welsh Government, 2021).

It is supplemented by a series of Technical Advice Notes (TANs), Welsh Government Circulars, and policy clarification and update letters, which together with PPW provide the national planning policy framework for Wales.

Chapter 6. Distinctive and Natural Places outlines Welsh Government's objectives for the environmental and cultural components of placemaking. These components are complementary to those of the Active and Social and Productive and Enterprising themes and collectively the three themes come together to contribute towards the national sustainable placemaking outcomes.

Section 6.4 addresses Biodiversity and Ecological Networks. The policy includes the duties and requirements set out in Section 6 the Environment Wales Act (2016) and pays due regard to the State of Natural Resources Report (Natural Resources Wales (NRW), 2016) by taking all reasonable steps to maintain and enhance biodiversity. There is a focus on ecosystem services and the benefits of protecting and enhancing biodiversity. The relevant measures in place to conserve landscape and biodiversity include:

- Statutory designations;
- Non-statutory designations;
- Maintaining and enhancing biodiversity;
- Ecosystem resilience and connectivity of ecological networks; and,

Protection and consideration of Protected and Priority species and habitats.

Sections relevant to this PEA and BREEAM assessment are detailed below.

Paragraph 6.4.5 states that Planning authorities must seek to maintain and enhance biodiversity in the exercise of their functions. This means development should not cause any significant loss of habitats or populations of species, locally or nationally and must provide a net benefit for biodiversity.

Paragraph 6.4.15 states that Statutorily Designated Sites must be protected from damage and deterioration, with their important features conserved and enhanced by appropriate management.

Paragraph 6.4.19 states that sites which have been formally proposed as Special Protection Areas (SPAs), Special Areas of Conservation (SACs) but which are not yet subject to legal protection under the Habitats Regulations, should be treated within the planning system in the same way as if they were legally designated. The same considerations should, as a matter of policy, be applied to proposed Ramsar sites.

Paragraph 6.4.20 states that Non-statutory Designated Sites should be given adequate protection. Before authorising development likely to damage a local wildlife designation, planning authorities should give notice of the proposed operation to the County Ecologist and third sector environmental organisations.

Paragraph 6.4.21 states that Planning Authorities must follow a stepwise approach to maintain and enhance biodiversity and build resilient ecological networks by ensuring that any adverse environmental effects are firstly

avoided, then minimized, mitigated, and as a last resort compensated for; enhancement must be secured wherever possible.

Paragraph 6.4.22 states that the presence of a species protected under European or UK legislation, or under Section 7 of the Environment (Wales) Act 2016 is a material consideration when a 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 and to ensure that the range and population of the species is sustained.

Paragraph 6.4.25 states that Planning authorities should protect trees, hedges, groups of trees and areas of woodland where they have ecological value, contribute to the character or amenity of a particular locality, or perform a beneficial and identified green infrastructure function.

Paragraph 6.4.26 states that Ancient Woodland and semi-natural woodlands and individual ancient, veteran and heritage trees should be afforded protection from development which would result in their loss or deterioration unless there are significant and clearly defined public benefits.

Paragraph 6.4.27 states that the protection and planting of trees and hedges should be delivered, where appropriate, through locally specific strategies and policies, through imposing conditions when granting planning permission, and/or by making Tree Preservation Orders (TPOs).

1.5.2.2 Updates to Chapter 6 Planning Policy Wales (11th October 2023)

On 11th October 2023, a letter, with an accompanying annex, was sent to the heads of planning at local authorities (Welsh Government, 2023ab) outlining key updates to Chapter 6 of Planning Policy Wales. These updates were to be applied with immediate effect and will be integrated into version 12 of Planning Policy Wales. The main updates are summarised as follows:

- Green Infrastructure: stronger emphasis on taking a proactive approach to green infrastructure covering cross boundary considerations, identifying key outputs of green infrastructure assessments, the submission of proportionate green infrastructure statements with planning applications, and signposting Building with Nature standards;
- Net Benefit for Biodiversity and the Step-wise Approach: further clarity is provided on securing net benefit for biodiversity through the application of the step-wise approach, including the acknowledgement of off-site compensation measures as a last resort, and, the need to consider enhancement and long-term management at each step. The use of the green infrastructure statement as a means of demonstrating the stepwise approach is made explicit. A simplified diagram of the policy approach has been developed (which will be further refined in the consolidated version of Planning Policy Wales version 12). The importance of strategic collaboration to identify and capture larger scale opportunities for securing a net benefit for biodiversity is recognised;
- Protection for Sites of Special Scientific Interest (SSSIs) strengthened approach to the protection of SSSIs, with increased clarity on the position for site management and exemptions for minor development necessary to maintain a 'living landscape'. Other development is considered unacceptable as a matter of principle. Exceptionally, a planned approach may be appropriate where necessary safeguards can be secured through a development plan; and,
- Trees and Woodlands: closer alignment with the stepwise approach, along with promoting new planting as part of development based on securing the right tree in the right place.

1.5.2.3 TAN 5 Nature Conservation and Planning (September 2009)

The PPW is supplemented by a series of TANs. TAN 5 provides guidance on how the land use planning system should contribute to protecting and enhancing biodiversity and geological conservation. It provides advice on areas including the key principles of positive planning for nature conservation, nature conservation in Local Development Plans and development management procedures. It also provides advice on development affecting designated sites and habitats, in addition to Protected or Priority habitats and species.

Key principles include that the town and country planning system in Wales should integrate nature conservation into all planning decisions; that the town and country planning system should look for development to provide a net benefit for biodiversity conservation with no significant loss of habitats or populations of species, locally or nationally and that they should ensure that the UK's international and national obligations for site, species and habitat protection are fully met in all planning decisions.

1.5.3 Local Planning Policy

Local Development Plans (LDPs) must be produced by every Local Planning Authority in Wales. Any development proposal will be tested against the policies within the LDP. The LDPs follow the planning guidance provide in PPW, including biodiversity and natural heritage policies. These include protecting designated Sites and other areas of importance for biodiversity conservation; safeguarding Protected species and Priority species, including those listed in local biodiversity action plans and retaining, creating, and enhancing features of importance for biodiversity conservation where appropriate.

Relevant local planning policies for CCBC are detailed in the following document:

- CCBC Local Development Plan 2010 – 2021 (CCBC, 2010). Adopted November 2010. Once finalised and adopted, the Replacement LDP 2021-2035 will replace the existing LDP as the Statutory Development Plan for the County Borough; and,
- Caerphilly Biodiversity Action Plan (CCBC, 2002)

Appendix A provides a summary of relevant local planning policies. For the precise wording of each specific policy please refer to the source document. This planning policy has been considered when assessing potential ecological constraints and opportunities identified by the desk study and field surveys; and, when assessing requirements for further survey, design options and ecological mitigation.

1.5.4 Quality Assurance

This survey and subsequent report were undertaken in line with AECOM's Integrated Management System (IMS). Our IMS places great emphasis on professionalism, technical excellence, quality, environmental and Health and Safety management. All staff members are committed to maintaining our certification to the international standards BS EN ISO 9001:2015 and ISO 14001:2015 and BS ISO 45001 2018. In addition, our IMS requires careful selection and monitoring of the performance of all sub consultants and contractors.

All AECOM Ecologists who worked on this project follow the CIEEM code of professional conduct (CIEEM, 2022) when undertaking ecological work.

2. Methodology

2.1 PEA

2.1.1 Desk Study

The objectives of the desk study were to review the existing information available in the public domain concerning species and habitats to identify the following:

- Nationally designated sites, up to 2 km from the Site, and internationally designated sites, up to 5 km from the Site, using the Multi Agency Geographic Information for the Countryside (MAGIC) website (www.magic.gov.uk);
- Local non statutory sites, up to 2 km from the Site using the South East Wales Biodiversity Records Centre (SEWBReC);
- Protected and Priority species records up to 2 km from the Site, using the SEWBReC;
- SAC and SSSIs designated for bats within a 10 km radius of the Site in accordance with Bat Conservation Trust (BCT) (Collins, 2023) recommendations;
- Section 7 species and habitats of Principal Importance for Conservation in Wales (Environment (Wales) Act 2016)(Priority species and habitats);
- Ancient semi-natural woodland (ASNW), plantation on ancient woodland Site (PAWS), restored ancient woodland site (RAWS) or ancient woodland site of unknown category (AWSU) within or adjacent to the Site boundary using Forestry Commission Wales 2021 Ancient Woodland Inventory data set downloaded from the DataMapWales website (Welsh Government, 2023);
- TPOs and Conservation Areas via the CCBC interactive map (CCBC, 2023); and
- Features of ecological interest surrounding the Site including ponds within 500 m, nearby areas of ecological interest, and features connecting these habitats (hedges, watercourses, railway lines). To achieve this, aerial photographs and Ordnance Survey (OS) maps were reviewed.

The county ecologist was also contacted for local records or knowledge about the project area.

2.1.2 Extended Phase 1 Habitat Survey

A Phase 1 Habitat Survey (Joint Nature Conservation Committee (JNCC), 2010) of the Site was undertaken by two experienced AECOM ecologists on 25 and 26 September 2023.

The survey involved a Site walkover and preliminary assessment of habitats, land use and ecological features within the Site boundary and the ZoI (10 m from the Site boundary). The main habitats present were recorded using standard Phase 1 Habitat Survey methodology as described in the Handbook for Phase 1 Habitat Survey: A Technique for Environmental Audit (JNCC, 2010). The plant species defining the habitat types on the Site were recorded. The abundance of the plant species was recorded using the DAFOR scale (D=Dominant; A=Abundant; F=Frequent; O=Occasional; R=Rare). This is a subjective system open to different interpretations and quantifiable using basic principles, however it is a simple and effective way of collecting useful data. Evidence of any Invasive Non-Native Plant Species (INNPS) subject to legal controls was recorded if present.

The Phase 1 Habitat Survey was ‘Extended’ by including a desk study, as described above, and an assessment of the potential for the Site to support Protected or Priority species in order to identify potential ecological constraints and to guide recommendations for further surveys.

Habitat outside of, but adjacent to, the Site boundary was also examined to aid the assessment of impacts of the Proposed Development on the ZoI. Habitats outside of the Site boundary were only recorded on Figure 1 if they were deemed a potential constraint to the Proposed Development.

2.1.3 Bat Roost Survey

2.1.3.1 PRA

During the Extended Phase 1 Habitat Survey, a PRA was undertaken of buildings/structures and trees within the Site and the ZoI via an external appraisal from the ground using binoculars and a high-powered torch where necessary. Trees were classified into categories dependent on the presence of features suitable to support roosting bats. **Error! Reference source not found.** provides descriptions of the bat roost suitability categories for buildings/structures. Table 2-2 provides descriptions of the bat roost suitability categories for trees.

Table 2-1 Buildings/Structures– Bat Roost Suitability Categories

Roost Suitability	Description of Buildings/Structures
Known or Confirmed	Confirmed signs of bat presence/ occupation (droppings, oily staining around entry points, insect remains, odour, scratching) and actual bat presence.
High	A structure with one or more potential roost sites that are obviously suitable for use by larger numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions (e. g. temperature, humidity, height above ground level, light levels or levels of disturbance) and surrounding habitat. These structures have the potential to support high conservation status roosts e.g. maternity or classic cool/stable hibernation site.
Moderate	A structure with one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions (e. g. temperature, humidity, height above ground level, light levels or levels of disturbance) and surrounding habitat but unlikely to support a roost of high conservation status (with respect to roost type only, such as maternity and hibernation – the categorisation described in this table is made irrespective of species conservation static, which is established after presence is confirmed).
Low	A structure with one or more potential roost sites that could be used by individual bats opportunistically at any time of year. However, these potential roost sites do not provide enough space, shelter, protection, appropriate conditions and/or suitable surrounding habitat to be used on a regular basis or by large numbers of bats (i. e. unlikely to be suitable for maternity and not a classic cool/stable hibernation site, but could be used by individual hibernating bats).
Negligible	No obvious habitat features on site likely to be used by roosting bats; however, a small element of uncertainty remains as bats can use small and apparently unsuitable features on occasion.
None	No habitat features on site likely to be used by any roosting bats at any time of the year (i.e. a complete absence of crevices/suitable shelter at all ground/underground levels).

Source: Category descriptions drawn from Collins (2023) and Reason, P.F and Wray, S (2023) to be applied using professional judgement

Table 2-2 Trees– Bat Roost Suitability Categories

Roost Suitability	Descriptions for Trees
None	Either no PRFs in the tree or highly unlikely to be any.
FAR	Further assessment required to establish if PRFs are present in the tree.
PRF*	A tree with at least one PRF present.

**There are two categories for PRFs: PRF-I which is only suitable for individual bats or very small number of bats, and PRF-M which is suitable for multiple bats and may therefore be used by a maternity colony. Ground level assessments may only be able to identify PRFs without these further categorisations*.
Source: Category descriptions drawn from Collins (2023) and Reason, P.F. and Wray, S (2023) to be applied using professional judgement

2.1.3.2 Commuting and Foraging Habitat Suitability

The habitats within the Site were classified into a category dependent on the presence of features suitable to support commuting and foraging bats. Table 2-3 provides descriptions of habitat suitability categories for commuting and foraging bats.

Table 2-3 Commuting and Foraging Habitat Suitability Categories

Commuting and Foraging Suitability	Descriptions
High	Continuous, high-quality habitat that is well connected to the wider landscape that is likely to be used regularly by bats for flight-paths such as river valleys, streams, hedgerows, lines of trees and woodland edge. High-quality habitat that is well connected to the wider landscape that is likely to be used regularly by foraging bats such as broadleaved woodland, tree-lined watercourses and grazed parkland. Site is close to and connected to known roosts.
Moderate	Continuous habitat connected to the wider landscape that could be used by bats for flight-paths such as lines of trees and scrub or linked back gardens. Habitat that is connected to the wider landscape that could be used by bats for foraging such as trees, scrub, grassland or water.
Low	Habitat that could be used by small numbers of bats as flight-paths such as a gappy hedgerow or unvegetated stream, but isolated, i.e. not very well connected to the surrounding landscape by other habitat.

Commuting and Foraging Suitability	Descriptions
	Suitable, but isolated habitat that could be used by small numbers of foraging bats such as a lone tree (not in a parkland situation) or a patch of scrub.
Negligible	No obvious habitat features on Site likely to be used as flight-paths or by foraging bats; however, a small element of uncertainty remains in order to account for non-standard bat behaviour.
None	No habitat features on Site likely to be used by any commuting or foraging bats at any time of the year (i.e. no habitats that provide continuous lines of shade/protection or flight-lines, or generate/shelter insect populations available to foraging bats).

Source: Category descriptions drawn from Collins (2023) to be applied using professional judgement

2.2 BREEAM Assessment

The Technical Guidance from Land Use and Ecology – BREEAM New Construction 2018 (Wales) (BREEAM, 2018a) was used for this report.

Assessment Route 2 (for sites where complex ecological systems are likely to be present) has been used for Issues LE02 to LE05 for this Site. As such, biodiversity units, used to compare the biodiversity pre- and post- development, were calculated using methodology outlined in the 'GN36 BREEAM, CEEQUAL and HQM Ecology Calculation Methodology – Route 2' (BREEAM, 2018b).

There are two options within Assessment Route 2:

1. *Full methodology* – This must be used where the pre-development habitats are above the set size threshold of 0.05 hectares in total or include habitats that are assigned as high distinctiveness.
2. *Simplified methodology* – For use where the pre-development habitats are below the set size threshold and no habitats are present which are assigned a high level of distinctiveness.

The 'full methodology' has been used for Issues LE02 – LE05 for this assessment because the pre-development habitats within the Site totals 1.4 ha.

The assessment of Issues LE02 – LE05 has been informed by the results of the Extended Phase 1 Habitat Survey. During the Site visit target notes (TN) were made of features of ecological value or with the potential to support legally Protected species. Recommendations for Site protection and mitigation were based on these observations. In addition, conditions on Site were used to provide recommendations for enhancing Site ecology.

2.2.1 BREEAM Issues LE02 – LE05 Land Use and Ecology Criteria.

The LE Issues are summarised in Table 2-4 below and more detail is provided in Technical Guidance from Land Use and Ecology – BREEAM New Construction 2018 (Wales) (BREEAM, 2018a).

Table 2-4 Summary of LE BREEAM Issues

BREEAM Issue	Description of Criteria	Number of Credits Available (Route 2)	Comments
LE02: Identifying and Understanding the Risks and Opportunities for the Project	Survey and evaluation	1	Total available credits: 3 The second and third credits under LE02 are only achievable once the previous credits have been achieved.
	Determining the ecological outcomes for the Site	1	
	Exemplary criteria	1	
LE03*: Managing Negative Impacts on Ecology	Planning, liaison and implementation	1	Total available credits: 3 Credits within LE03 can only be achieved if LE02 has been achieved. The second and third credits under LE03 are only achievable once the first credit has been achieved.
	Managing negative impacts of the project (limitation or compensation)	Up to 2	
LE04*: Change and Enhancement of Ecological Value	Liaison, implementation and data	1	Total available credits: 5 Credits within LE04 can only be achieved if Criteria 2 and 3 under LE03 have been achieved.
	Change and enhancement of ecology	Up to 3	
	Exemplary criteria	1	

LE05*: Long Term Ecology Management and Maintenance	Planning, liaison, data, monitoring and review management and maintenance	1	Total available credits: 2 Credits within LE05 can only be achieved if Criteria 2 and 3 under LE03 have been achieved, and at least one credit under LE 04 for 'Change and Enhancement of Ecology' has been awarded.
	Landscape and ecology management plan (or similar) development	1	

Credits available cannot be achieved for Issues LE03 – to LE05, unless credits from the previous criteria have been achieved.

2.3 Limitations

2.3.1 Desk Study and Extended Phase 1 Habitat Survey

Biological records can be received from a wide variety of sources and may or may not be comprehensive and accurate: Information obtained from a desk study is dependent upon people and organisations having made and submitted records for the area of interest. As such, a lack of records for a particular habitats or species does not necessarily mean that the habitats or species do not occur in the study area. Likewise, the presence of records for particular habitats and species does not automatically mean that these still occur within the area of interest or are relevant in the context of the Proposed Development. However, if assessed in conjunction with an extended Phase 1 Habitat survey, biological records can contribute to a robust ecological assessment of a site.

Where any conclusions and recommendations contained in this report are based upon information provided by others, it has been assumed that all relevant information provided by those parties is accurate. Any such information obtained by AECOM has not been independently verified by AECOM, unless otherwise stated in the report. AECOM accepts no liability for any inaccurate conclusions, assumptions or actions taken resulting from any inaccurate information supplied to AECOM from others.

The methodology adopted and the sources of information used by AECOM in providing its services are outlined in this report. The work described in this report was conducted in September and November 2023 and is based on the conditions encountered and the information available during this time. The scope of this report and the services are accordingly factually limited by these circumstances. AECOM disclaim any undertaking or obligation to advise any person of any change in any matter affecting the report, which may come or be brought to AECOM's attention after the date of the report.

The residential areas in the ZoI to the northwest and south could not be accessed as they are private properties. As such, they could not be assessed for ecological constraints. The likelihood of ecological constraints being present in the residential areas is unlikely as they are modern build houses surrounded, as judged from aerial imagery, by amenity grassland and hardstanding. Furthermore, walls and fences separating the residential areas from the Site are flush with the ground to limit connectivity of any ecological constraints to the Site as well as impacts from the Proposed Development such as pollution. In addition, the northern aspects of the houses adjacent to the southern boundary (the homes most likely to be affected by light spill) were appraised for bat roosting suitability from within the Site and were assessed as having no suitability. Furthermore, as they are private residences, precautionary working methods to limit impacts of noise, vibration, pollution, lighting etc. will likely be incorporated into the construction and operational phase to further limit impacts to any ecological constraints in the residential areas. Therefore, having no access to residential areas is not deemed a significant limitation.

The dense/continuous scrub to the east of the Site, within the ZoI, could not be examined fully, for example for badger setts, due to the density of the vegetation. This is deemed a significant limitation due to the scale of the Proposed Development which will likely impact the ZoI due to increased lighting and pollution. This limitation will be overcome by undertaking a more thorough survey for badger and otter during the winter months when the vegetation will have died back.

As the Proposed Development is still in its early design stage, the potential impacts, mitigation, and enhancement recommendations may be subject to change upon review of the final design.

2.3.2 BREEAM LE Issues LE02 – LE05

The BREEAM LE assessment outlined in this report is based on the information provided by the client available at the time of writing. Any changes to the Site design could significantly affect the conclusions of this assessment.

Achievement of the credits will require a commitment by the client and/or contractors to implement the recommendations outlined in this report, and post-construction verification that implementation of the recommendations has been completed by a Suitably Qualified Ecologist (SQE).

Calculations for 'after development' were not possible as no landscape drawing was available at the time of writing. The calculation will need to be undertaken once a detailed Proposed Development and landscaping plan for the Site have been produced. This report can be used to guide Site design and to help achieve credits under LE04.

3. Baseline Conditions

3.1 Desk Study Results

The designated habitats, sites, and features within proximity to the Proposed Development are listed in Table 3-1.

Table 3-1 Desk Study Results

Designation / Feature	Description
Nationally Designated Sites Within 2 km	There is one nationally designated site within 2 km of the Site boundary. **Gwaun Gledyr SSSI** **Distance and Direction:** Approximately 1.4 km west, separated by urban areas. **Description:** The 28.3 ha SSSI is of special interest for its extensive area of marshy grassland and smaller area of neutral grassland. These habitats are also associated with smaller areas of acid flush, wet heath, acid grassland and scrub. Broadleaved woodland also forms a significant percentage of the SSSI, often as overgrown field boundaries. Generally, this is dominated by purple moor-grass *Molinia caerulea*, with other grasses such as velvet bent *Agrostis canina* and sweet vernal-grass *Anthoxanthum odoratum*, together with tormentil *Potentilla erecta*, carnation sedge *Carex panicea* and often devil's-bit scabious *Succisa pratensis*. Gwaun Gledyr includes the following UK Biodiversity Action Plan Priority habitats: Purple moor-grass and rush pasture; Lowland dry acid grassland; Lowland meadow; Lowland Heathland. (Countryside Council for Wales (CCW), 2009).
Internationally Designated Sites Within 5 km	There is one internationally designated site within 5 km of the Site boundary. **Cardiff Beech Woods SAC** **Distance and Direction:** Approximately 3.5 km south, separated by urban areas of Caerphilly, with woodland blocks and fields closer to the SAC. **Description:** Designated for mixed woodland on base-rich soils associated with rocky slopes, and beech forests on neutral to rich soils (JNCC, 2004).
Locally Designated Sites Within 2 km	There are 11 Sites of Importance for Nature Conservation (SINC) within 2 km of the Site. All information regarding SINC was obtained via SEWBReC (2023) **Nant yr Aber River SINC** **Distance and Direction:** Approximately 0.01 km east of the Site, connected by broadleaved semi-natural woodland and dense/continuous scrub. **Description:** This SINC comprises almost the full length of the Nant yr Aber. This is just one of several tributaries that feed into the River Rhymney SINC. The water quality appears to be good with resident populations of bullhead *Cottio gobio* and brown trout *Salmo trutta*. The watercourse is used as regular migratory route by anadromous species including Atlantic salmon *Salmo salar*, Probable breeding otter, plus areas for foraging, laying up and territorial use. **River Rhymney SINC** **Distance and Direction:** Approximately 1.1 km northwest of the Site, connected by the Nant Yr Aber which flows south to north to connect with the River Rhymney. **Description:** This SINC comprises the full length of the River Rhymney. This is one of three main watercourses in the county borough and represents a significant linear wildlife corridor. Japanese knotweed *Reynoutria japonica* occurs alongside most of the river. Several native wild fish species have been recorded in the river, including Atlantic salmon, brown/sea trout, bullhead, grayling *Thymallus thymallus*, and European eel *Anguilla anguilla*. Otter has been recorded at various locations along the length of the river. Some areas have been noted as important for rare bryophytes, including *Jungermannia exertifolia* and *Marchantia polymorpha ssp montivagans*. **Cwm yr Aber, South of Abertridwr SINC** **Distance and Direction:** Approximately 1.1 km west of the Site, separated by urban areas. **Description:** This SINC includes approximately 1.5 km of woodland and grassland habitats adjacent to the Nant yr Aber stream. The woodland also includes ash *Fraxinus excelsior*, goat willow *Salix caprea*, sycamore *Acer pseudoplatanus* and hazel *Corylus avellana*, with semi-natural indicator species including wood sorrel *Oxalis acetosella*, wood anemone *Anemonoides nemorosa*, wood avens *Geum urbanum*, yellow archangel *Lamium galeobdolon*, and bluebell *Hyacinthoides non-scripta*. The SINC is likely to provide good foraging and roosting habitat for bats. The river and adjoining woodland are likely to be used by otters. The open areas are likely to support reptiles, especially the south-facing slopes. The woodland has potential to support hazel dormice *Muscardinus avellanarius* but all are potential values which have unconfirmed presence for these species.

Designation / Feature	Description

Coed y Brain, Penyrheol SINC

Distance and Direction: Approximately 1.1 km north of the Site, separated by urban areas.

Description: The northern part of this SINC comprises mature broadleaved woodland. The main canopy trees are oak *Quercus sp.*, beech *Fagus sylvatica*, hazel, holly *Ilex aquifolium*, and occasional larch *Larix decidua*. There is a tangled understorey of bramble *Rubus fruticosus agg.* and some bracken *Pteridium aquifolium*. The ground flora is generally sparse, but includes a number of semi-natural indicators, including bluebell, wood sorrel, pignut *Conopodium majus*, and wood sedge *Carex sylvatica*. 'Llanbradach Marsh' is a separate part of the SINC; it comprises a mix of swamp vegetation dominated by bulrush *Typha latifoli* and rushes, and wet scrub woodland. The woodland is likely to provide good foraging and roosting opportunities for bats. The woodland in the north of the SINC appears potentially suitable for dormice. The western fields with scattered bracken and scrub have potential to support reptiles. Llanbradach Marsh has potential to support valuable populations of amphibians (species within marsh not specified, though common toad and common frog *Rana temporaria* have been recorded generally within the SINC) and dragonflies and is a potential resting site for otters. It is also likely to be a valuable feeding site for bats. These are all potential values and have unconfirmed presence of these species.

Caerphilly/Machen Disused Railway, East of Trethomas SINC

Distance and Direction: Approximately 1.3 km east of the Site, separated by urban areas.

Description: This SINC comprises a series of disused railway lines that support a mix of scrub and rough grassland habitats. It also includes several areas of adjacent woodland, damp grassland, ponds and riverbank habitat. The woodland habitat includes remnants of semi-natural ancient woodland. Several ponds at ST176879 support a breeding population of great crested newt (GCN)*Triturus cristatus*. The disused railway is likely to provide valuable feeding habitat and flight lines for bats. The adjoining woodland is also likely to include feeding and roosting habitat for bats. Dormice are likely to occur in some woodland, as they are known to occur on adjacent land. The riverside woodland could potentially support resting or breeding sites for otters. The disused railway is likely to support reptiles, breeding birds and a high diversity of invertebrates. These are all potential values and have unconfirmed presence of these species.

Coed y Maerdy, East of Caerphilly SINC

Distance and Direction: Approximately 1.3 km east of the Site, separated by urban areas.

Description: The northern part of this SINC comprises small blocks of ancient, damp, broadleaved woodland and scrub. The adjacent field to the southwest supports a mosaic of semi-improved acid grassland, marshy grassland/flush, bracken, and scrub. The SINC is likely to have high value for foraging bats and the woodland may support roost sites. The tussocky wood, scrub and bracken margins are likely to support reptiles. The grassland is likely to support waxcap fungi *Hygrocybes spp.* (as are several adjacent fields). The woodland has potential to support dormice (although it may be too isolated from other sites which support this species). These are potential values and have unconfirmed presence of these species.

Gypsy Lane Wetland, South of Groeswen SINC

Distance and Direction: Approximately 1.4 km west of the Site, separated by urban areas.

Description: A series of damp fields, divided by a network of mature hedges and tree lines, mainly dominated by oak, beech, and willows *Salix spp*. The area also supports several small blocks of woodland and a number of small streams. The vegetation supports a diverse mix of grassland plants, including many marshy grassland indicator species. There is a presence of water vole *Arvicola amphibius*. The SINC is likely to support a high diversity of invertebrates and could potentially include the marsh fritillary butterfly *Euphydryas aurinia.* The range of habitats is likely to support a high diversity of breeding and wintering birds, and moths, potentially meeting SINC selection criteria for these groups. The area is likely to support good numbers of reptiles, particularly grass snake *Natrix helvetica.*The SINC is likely to provide good foraging and roosting habitat for bats. The well-connected woodlands and hedges have the potential to support dormice. These are potential values and have unconfirmed presence of these species.

Warren Drive Meadow, South of Caerphilly SINC

Distance and Direction: Approximately 1.6 km south of the Site, separated by urban areas.

Description: This SINC comprises two fields of semi-improved neutral grassland and disused quarry, which supports broadleaved woodland and scrub. The woodland is likely to be used by dormice (which are known to occur nearby). The woodland has potential to provide foraging and roosting habitat for bats. The grassland is likely to support grassland fungi. These are all potential values and have unconfirmed presence of these species.

Mynydd Dimlaith and Cwm-y-Bwch, South East of Llanbradach SINC

Distance and Direction: Approximately 1.7 km north of the Site, separated by urban areas.

Description: Mynydd Dimlaith is a hill covered mainly by bracken and birch *Betula sp.* scrub with small pockets of acid grassland. The lower parts of the hillsides support woodland with a canopy of oak and downy birch *Betula pubescens*. Dormouse records exist in hedgerows in the northern part of the SINC and this species is likely to occur in other suitable habitat within the SINC. The woodland areas and stream corridor are likely to provide good foraging and roosting opportunities for bats. The woodland beside the Rhymney is very likely to be used by otters. Badgers are likely to be present. The area of scrub and flower-rich grassland has high potential to support a high diversity of invertebrates, and probably also reptiles. The marshy grassland area supports abundant devil's-bit scabious and has potential to support marsh fritillary butterfly

Designation / Feature	Description
	(although it may be too small and isolated from other populations). These are potential values and have unconfirmed presence of these species. **Craigyfedw, Abertridwr SINC** **Distance and Direction:** Approximately 1.7 km northwest of the Site, separated by urban areas. **Description:** The largest part of this SINC is a southwest-facing valley side dominated by bracken and gorse *Ulex europaeus* scrub. Within this, there are patches of acid grassland and heath, and small stands of young birch woodland and bramble towards its lower slopes. Several disused quarries beside the stream support acid grassland and patchy heath. The stream corridor is likely to provide good foraging opportunities for bats but is an unconfirmed feature. The quarries may provide potential roost sites but is unconfirmed. The SINC is very likely to support reptiles, particularly in the tussocky grassland areas in the north. The marshy grassland in the north has potential to support a good diversity of invertebrates including small pearl-bordered fritillary butterfly *Boloria selene* (as violets *Viola spp.* Are locally abundant) **Caerphilly Common, South of Caerphilly SINC** **Distance and Direction:** Approximately 1.8 km south of the Site, separated by urban areas. **Description:** An unenclosed area of common land supporting a diverse mix of habitats. Bracken is abundant and in many areas it grades into birch woodland. Areas of acid grassland and heath are present. Presence of four species of reptiles (adder *Vipera berus*, grass snake, slow-worm *Anguis fragilis*, and common lizard *Zootoca vivipara*). Presence of uncommon liverwort *Nardia geoscyphus.* The SINC is likely to be a valuable feeding area for bats and may also include roosting sites. The SINC is likely to support dormice and great crested newts, which both occur nearby. The habitats have potential to support breeding nightjars *Caprimulgus europaeus* (and many other bird species). These are potential values and have unconfirmed presence of these species.
Statutory Sites Within 10 km Designated for Bats	There are two SSSIs designated for bats within 10 km of the Site boundary. **Ruperra Castle & Woodlands SSSI** **Distance and Direction:** Approximately 7 km east of the Site, separated by the urban area of eastern Caerphilly with fields and woodland blocks closer to the SSSI. **Description:** The SSSI is of special interest as the only known nursery roost for the greater horseshoe bat *Rhinolophus ferrumequinum* in the Mid and South Glamorgan Area. The building known as the generator block is used by the greater horseshoe bats to give birth and raise their young between spring and autumn. The old castle cellar is used by some of the greater horseshoe bats and by a small number of lesser horseshoe bats *Rhinolophus hipposideros* as a hibernation roost during the winter. Coed Craig Ruperra, the woodland area to the north of the roost, is well used by the bats for foraging and commuting to more distant feeding and roosting areas. (CCW,2011) **Garth Wood SSSI** **Distance and Direction:** Approximately 7 km south of the Site, separated by urban area of southern Caerphilly with fields and woodland blocks closer to the SSSI. **Description:** The SSSI is dominated by broadleaved semi-natural woodland. There is a range of woodland communities, composed of locally native species, such as beech, ash, and English oak *Quercus robur*. Lesser horseshoe bats have been recorded in Lesser Garth Cave in Garth Wood and both lesser horseshoe bats and greater horseshoe bats have been recorded in or close to the SSSI. (CCW, 2001; RSPB, 2023).
Protected and Priority, and INNPS Species Records from the Last 10 Years Within 2 km	**Plants:** N/A **Invertebrates:** • **Bees:** Brown-banded carder bee *Bombus humilis* (approximately 1.2 km northeast) • **Butterflies:** Dingy skipper *Erynnis tages* (approximately 1.6 km north)*;* small pearl-bordered fritillary (approximately 1.7 km west) • **Moths:** Cinnabar *Tyria jacobaeae* (approximately 0.7 km southwest); dark-barred twin-spot carpet *Xanthorhoe ferrugata* (approximately 1 km east); buff ermine *Spilosoma lutea* (approximately 1.25 km south); knot grass *Acronicta rumicis* (approximately 1.25 km south)*;* white ermine *Spilosoma lubricipeda* (approximately 1.25 km south); brindled beauty *Lycia hirtaria* (approximately 1.3 km south); dot moth *Melanchra persicariae* (approximately 1.3 km south); dusky thorn *Ennomos fuscantaria* (approximately 1.3 km south)*;* green-brindled crescent *Allophyes oxyacanthae* (approximately 1.3 km south); rosy rustic *Hydraecia micacea* (approximately 1.3 km south); rustic *Hydraecia micacea*; (approximately 1.3 km south); small phoenix *Ecliptopera silaceta* (approximately 1.3 km south)*;* heath rustic *Xestia agathina* (approximately 1.7 km southwest); mottled rustic *Caradrina morpheus* (approximately 1.7 km southwest); beaded chestnut *Agrocola lychnidis* (approximately 1.7 km southwest); spinach *Eulithis mellinata* (approximately 1.7 km southwest); flounced chestnut *Anchoscelis helvola* (approximately 1.75 km southwest); mullein wave *Scopula marginepunctata* (approximately 1.75 km southwest). **Fish:** No fish were recorded within 2 km of the Site. **Amphibians:** One record of common toad *Bufo bufo,* approximately 1 km southeast from the Site. There is no connectivity between this record and the Site with housing situated between them. **Reptiles:** One record of adder, approximately 0.5 km south in Piccadilly Square. Connectivity is restricted between this record and the Site due to housing and Pontygwindy Road. Three records of common lizard within 2 km of the Site, the closest recording approximately 0.9 km northeast of the Site. Four records of slow-worm within 2 km of the Site, the closest record approximately 1.3 km

Designation / Feature	Description
	northwest of the Site. One record of grass snake, approximately 1.8 km northeast of the Site. There is no connectivity between these records and the Site due to housing and roads present between. **Birds:** • **Schedule 1:** Black tern *Chlidonias niger* (approximately 0.2 km southeast); kingfisher *Alcedo atthis* (approximately 0.2 km southeast); Mediterranean gull *Ichthyaetus melanocephalus* (approximately 0.2 km southeast); peregrine falcon *Falco peregrinus* (approximately 0.2 km southeast); red kite *Milvus milvus* (approximately 0.2 km southeast); redwing *Turdus iliacus* (approximately 0.2 km southeast); fieldfare *Turdus pilaris* (approximately 0.7 km southwest); brambling *Fringilla montifringilla* (approximately 1.2 km south); firecrest *Regulus ignicapilla* (approximately 1.2 km southeast); goshawk *Accipiter gentilis* (approximately 1.2 km north); osprey *Pandion haliaetus* (approximately 1.2 km south); hobby *Falco 21ibernic* (approximately 1.3 km northeast); little gull *Hydrocoloeus minutus* (approximately 1.3 km northeast); long-tailed duck *Clangula hyemalis* (approximately 1.8 km southwest). • **Non-Schedule 1 Birds:** Black-headed gull *Chroicocephalus ridibundus* (approximately 0.2 km southeast); bullfinch *Pyrrhula pyrrhula* (approximately 0.2 km southeast); crossbill *Loxia curvirostra* (approximately 0.2 km southeast); cuckoo *Cuculus canorus* (approximately 0.2 km southeast); dark-bellied brent goose *Branta bernicla bernicla* (approximately 0.2 km southeast); dunnock *Prunella modularis* (approximately 0.2 km southeast); herring gull *Larus argentatus* (approximately 0.2 km southeast); house sparrow *Passer domesticus* (approximately 0.2 km southeast); linnet *Linaria cannabina* (approximately 0.2 km southeast); reed bunting *Emberiza schoeniclus* (approximately 0.2 km southeast); starling *Sturnus vulgaris* (approximately 0.2 km southwest); song thrush *Turdus philomelos* (approximately 0.2 km southeast); kestrel *Falco tinnuculus* (approximately 0.65 km southwest); lesser redpoll *Acanthis cabaret* (approximately 0.7 km southwest); tree pipit *Anthus trivialis* (approximately 0.7 km northeast); skylark *Alauda arvensis* (approximately 0.7 km north); hawfinch *Coccothraustes coccothraustes* (approximately 0.95 km northwest); spotted flycatcher *Muscicapa striata* (approximately 0.95 km northwest); **Bats:** • **Roosts**: Sixteen records of bat roosts within 2 km of the Site, the closest being common pipistrelle *Pipistrellus pipistrellus* approximately 0.2 km east of the Site. This record is located within Ysgol Gyfun Rhymni Y Gwyndy School adjacent to the Site, and is likely a summer roost. There is connectivity between this record and the Site via the grassland and woodland area within the east of the Site. A large maternity roost of 67 common pipistrelles, approximately 1.3 km southeast from the Site within the Castle Park housing area. Connectivity is limited to the Site due to dense housing and roads; Daubenton's bat *Myotis daubentonii*roost (likely summer only), approximately 0.4 km east from the Site. This record has limited connectivity to the Site via the B4263 road, and the tree and scrub lined rail line that runs between this record and the Site; Nathusius' pipistrelle *Pipistrellus nathusii* roost (likely summer roost) approximately 0.5 km south from the Site, adjacent to the Castle grounds with limited connectivity via the B4263 road and housing; summer roosts of brown long-eared bat *Plecotus auritus,* soprano pipistrelle *Pipistrellus pygmaeus*, and greater horseshoe bat approximately 1.5 km south from the Site within the Castle Park housing area, with limited connectivity due to the dense urban area of Caerphilly. • **Foraging/Commuting:** Seventy records of bat activity were returned within 2 km of the Site. The following species were recorded: brown long-eared bat, common pipistrelle, Daubenton's bat, lesser horseshoe bat, myotis bat species *Myotis sp.*, Natterer's bat *Myotis nattereri*, noctule *Nyctalus noctula* soprano pipistrelle. The closest being common pipistrelle, noctule and soprano pipistrelle approximately 0.1 km south from the Site within Celyn Grove housing estate. **Other Mammals:** • **Otter** Two records of otter within 2 km of the Site, closest approximately 1.2 km northeast from the Site. There is no connectivity between this record and the Site due to housing and roads. • **Badger:** Four records of badger within 2 km of the Site, closest approximately 1.3 km southeast from the Site. There is no connectivity between this record and the Site due to housing and roads. • **Dormouse:** One record of dormouse approximately 1.9 km east from the Site. There is no connectivity between this record and the Site due to dense housing within Lansbury Park and Castle Park estates. • **Hedgehog:** Seventy records of hedgehog *Erinaceus europaeus* within 2 km of the Site, closest approximately 0.1 km south from the Site within the Celyn Grove housing estate. There is limited connectivity between this record and the Site as roads, housing and a fence line lies between both. **INNPS:** Himalayan balsam *Impatiens glandulifera* (approximately 0.2 km southeast); Japanese knotweed (approximately 0.4 km south); cotoneaster species *Cotoneaster sp.*(approximately 0.75 km south); montbretia *Crocosmia pottsii x aurea = C. x crocosmiiflora* (approximately 1.2 km north); three-cornered garlic *Allium triquetum* (approximately 1.95 km southwest).
Priority Habitats and Species – Section 7 List	The full list of Section 7 Habitats and Species of Principal Importance in Wales has been reviewed. Priority habitats present on the Site and Priority species with potential to be on the Site are listed in Table 3-2 and Table 3-3 respectively.
Surrounding Land Use	The Site is located 500 m north of Caerphilly Castle. The Site is a 2.6 ha complex of multiple single-storey, flat-roofed, modular buildings with a large playing field and small section of woodland included in the Site. A 3 ha woodland is north of the Site through the metal boundary fencing of the school. Nant yr Aber stream runs along the eastern boundary and curved along the southern boundary of the Site and through the housing estate to the south of the school past the boundary fencing. Lewis Drive Road runs along the western edge of the Site with housing further west. The rail line is 230 m west of the Site which has tree and scrub habitat lining the rail line banking. Caerphilly Mountain is a large area of fields and woodland situated 2 km south of the Site.

Designation / Feature	Description
Ancient Woodland	There is no ancient woodland within or adjacent to the Site boundary.
Trees with a TPO	There are no TPOs within or adjacent to the Site boundary.
Waterbodies on Site and within 500 m	There are four waterbodies (two ponds, one stream and one lake) within the Site and 500 m of the Site boundary: **Waterbody 1:** A pond present in the northeast corner of the Site, approximately 18 m^2 (Appendix B: Photograph 1). The pond is fenced off from the amenity grassland on Site by a wooden fence, and is linked to Nant yr Aber, approximately 10 m east by dense scrub and amenity grassland. **Waterbody 2:** Nant yr Aber (Figure 1 and Appendix C: Target Note (TN) 1) flows south to north, approximately 10 m east of the eastern boundary of the Site at its closest point, connected by broadleaved semi-natural woodland and dense scrub. Nant yr Aber connects to Rhymney River approximately 1.8 km northeast. **Waterbody 3:** Pond approximately 0.2 km south of the Site, and approximately 50 m^2. The pond sits within amenity grassland surrounded by a line of trees. The pond is separated from the Site by residential areas. **Waterbody 4:** Lake approximately 0.5 km southeast of the Site, and approximately 63,000 m^2. The lake is separated from the Site by residential areas.
County Ecologist	The County Ecologist was contacted but, at the time of writing, no response has been received.

3.2 Extended Phase 1 Survey

3.2.1 Habitats

The habitats present within the Site boundary and their descriptions are shown in Table 3-2. A plan of the Site showing the location and distribution of these habitats is shown in Figure 1.

Habitats within the ZoI included broadleaved semi-natural woodland, a scattered tree, dense/continuous scrub, amenity grassland, running water (Nant yr Aber; Figure 1 and Appendix C: TN 1), hardstanding, and residential complexes (houses, hardstanding, and gardens). Features recorded in the ZoI that are potential ecological constraints include:

- Presence of broadleaved semi-natural woodland which is a Section 7 Priority habitat: 'lowland mixed deciduous woodland' (Appendix B: Photographs 2 and 3);
- Four trees that were assessed as having PRFs which are summarised in Table 3-5 in Section 3.5.1;
- Nant Yr Aber River SINC which lies approximately 5 m east of the eastern Site boundary at its closest point (Figure 1 and Appendix C: TN 1); and,
- Presence of Japanese knotweed, Himalayan balsam and montbretia to the north and east. See Section 3.4 for details.

Table 3-2 Phase 1 Habitats and Descriptions

Habitat	Description	Section 7 Habitat
Broadleaved Semi-natural Woodland	Two areas of broadleaved semi-natural woodland were present on Site. The first area was recorded in the northwest of the Site against the western Site boundary (Appendix B: Photograph 4). Within the canopy, a willow species and silver birch *Betula pendula* were frequent, hawthorn *Crataegus monogyna* and a cherry species *Prunus sp.* were occasional, and sessile oak *Quercus petrea* was rare. The sub-canopy was not well developed with holly, sycamore, dogwood *Cornus sanguinea*, and hazel occasional, and one instance of an unknown, but not Schedule 9, cotoneaster species *Cotoneaster sp.* In the field layer, bramble was occasional, and ribwort plantain *Plantago lanceolata* and a sedge *Carex sp* were rare. In the ground layer, Atlantic ivy *Hedera hibernica* was occasional. Two brash piles of branches and leaves were piled against the eastern boundary of the broadleaved semi-natural woodland, each approximately 2 by 1 m (Figure 1 and Appendix C: TNs 2 and 3). Four trees were marked with silver tags, though these were not present on the CCBC's interactive map for TPOs (silver birch with tag 03114; holly with tag 03115; sessile oak with tag 03116; and cherry with tag 03117). The broadleaved semi-natural woodland is cordoned off from use by wooden fencing though children still occasionally utilised the habitat as witnessed by the surveyors on Site. Many well-worn paths ran through the broadleaved semi-natural woodland, and decaying logs arranged for sitting and to mark paths were present. Handmade invertebrate refugia (bamboo sticks in mugs) were hanging from several branches. The second was recorded in the southwest corner of the Site (Appendix B: Photograph 5) The canopy contained abundant ash, and an approximately even mix of frequent rowan *Sorbus aucuparia*, field maple *Acer campestre*, silver birch, alder *Alnus glutinosa*, sycamore, and English oak. Two ash trees were marked with silver tags though these were not present on the CCBC's interactive map for TPOs (tags 03048 and 03120). In the sub-canopy, there was frequent hazel, sycamore, ash, hawthorn, rowan, oak species *Quercus sp.*, occasional elder *Sambucus nigra*, and rare horse chestnut *Aeculus hippocastanum,* Norway maple *Acer platinoides,* and a non-Schedule 9 cotoneaster species. In the field layer, wood avens *Geum urbanum* was rare, and herb Robert *Geranium robertianum,* ground elder *Aegopodium podagraria*, dandelion *Taraxacum sp.*, bramble, and enchanter's nightshade *Circaea lutetiana*, alongside very young hawthorn, holly, and hazel saplings, were occasional. In the ground layer, ivy was occasional. Within the broadleaved semi-natural woodland were two young plants of Japanese knotweed approximately 30 cm tall growing through ivy (Figure 1 and Appendix C: TNs 4 and 5; Appendix B: Photograph 6). The broadleaved semi-natural woodland was in regularly use as a forest school with narrow well-worn paths running through it. One path led to a small sitting area of dead, decaying logs.	Yes
Line of Trees	In the northeast corner of the Site, between a pond and a metal palisade fence, was an approximately 15 m line of five trees (Appendix B: Photograph 7) with one ash, one hazel, one oak, and one hawthorn with an understorey of occasional bramble, hazel and holly whips, ivy, and Japanese aralia *Fatsia japonica.*	No
Scattered Trees	There were 38 scattered trees across the Site. Ten trees, consisting of two field maples, two sycamores, two silver birches, two cherries (one with a tree tag 03112 which is not present on the CCBC's interactive map for TPOs), a rowan, and a willow species stood within the amenity grassland to the west of the Site (Appendix B:	No

Habitat	Description	Section 7 Habitat
	Photograph 8). A small area of dense bramble was recorded under one of the field maples (Figure 1 and Appendix C: TN 6). Nine trees, consisting of a mixture of apple *Malus sp*., cherry, and blackthorn, were present to the south of Building 8 (see Buildings). Eight trees, consisting of three cherries, two Scot's pines *Pinus sylvestris*, two sycamores (one with a tree tag 03131 which is not present on the CCBC's interactive map for TPOs), and a silver birch, stood within amenity grassland to the north of the Site (Appendix B: Photograph 9). Five trees, consisting of three silver birches, an oak, and a willow species, stood within amenity grassland to the south of the Site. Two trees, a silver birch, and a willow species, stood in the southwest corner of the Site within amenity grassland and scattered scrub, respectively. One cherry species stood within amenity grassland to the north of Building 1 (see Buildings). One willow species stood on the northeast corner of Building 6 (see Buildings) on hardstanding. One hazel tree stood on bare ground within an allotment area south of the car park (see Hardstanding). One blackthorn *Prunus spinosa* stood in the northeast corner of the Site. For an assessment of the bat roost suitability of these trees, see Section 3.5.	
Scattered Scrub	Scattered scrub was spread occasionally across the Site. A block of scattered scrub lay along the north boundary of the Site (Appendix B: Photograph 10). Bramble dominates the dense/continuous scrub with bracken *Pteridium aquifolium,* and holly, ash, hazel, and cherry whips occasional. One small block of scattered scrub was recorded in the northwest corner of the Site (Appendix B: Photograph 11) with multiple young sycamore trees on bare ground with rare horsetails *Equisetum sp*. A loose brash pile of branches was present at the base of the sycamore trees (Figure 1 and Appendix C: TN 7). Four scattered scrub plants, consisting of two barberry shrubs *Barberris sp,*, a blackthorn, and a cypress *Cupressaceae sp.* stood within ephemeral/perennial vegetation and bare ground adjacent to the west of Building 9 (see Buildings) (Appendix B: Photograph 12). One small conifer stood within the amenity grassland in front of the school. Two small blocks of cypress scrub fringed with grass and herb species lay adjacent to the north of Building 1 (see Buildings) (Appendix B: Photograph 13). The grass and herb species present were abundant perennial rye *Lolium perenne*, and frequent to occasional field speedwell *Veronica persica*, ribwort plantain, dandelion, a spurge *Euphorbia sp*, a sowthistle *Sonchus sp*, a geranium *Geranium sp*, wavy bittercress *Cardamine flexuosa*, and a willowherb *Epilobium sp*.. A small oak sapling was recorded next to the blackthorn tree in the northeast corner of the Site. A line of scattered scrub lay along the southwest boundary of the Site, dominated by bramble with occasional fuschia *Fuschia sp.*, butterfly-bush *Buddleia daviddi*, and rare wood avens (Appendix B: Photograph 14). Four clumps of montbretia were present within this line (Figure 1 and Appendix C: TNs 8 and 9; Appendix B: Photograph 15). A line of dogwood and young apple trees bordered the north and east boundaries of an allotment area near the centre of the Site. A line of frequent bracken and bramble with occasional hazel and ivy was recorded along the east boundary of the Site. Three large clumps of pendulous sedge *Carex pendula* stood within 2 m of this line of scrub. In the southwest corner of a courtyard of the main school building (B9 to B11) was a small area of scattered scrub of butterfly-bush, bracken, and common nettle *Urtica dioica* on bare ground (Figure 1 and Appendix C: TN 10).	No
Poor Semi-improved Grassland	In the northeast corner of the Site, adjacent to the eastern boundary and continuous with the adjacent amenity grassland to the west (demarcated by a shallow embankment), was poor semi-improved grassland (Appendix B: Photograph 16). Common bent *Agrostis capillaris* and red fescue *Festuca rubra* were abundant. Yorkshire fog *Holcus lanatus*, yarrow *Achillea millefolium*, dandelion, lesser bird's foot trefoil *Lotus corniculatus*, and common cat's-ear *Hypochaeris radicata* were frequent to occasional. Perennial rye and red clover *Trifolium pratense* were rare. Within the poor semi-improved grassland was a 1.5 m by 40 cm patch of devil's bit scabious (Figure 1 and Appendix C: TN 11). On the eastern boundary, by the fence line, was an approximately two by one metre mature stand of Japanese knotweed (Figure 1 and Appendix C: TN 12; Appendix B: Photograph 17). Towards the southern end of the poor semi-improved grassland, vegetation from the adjacent broadleaved semi-natural woodland was encroaching through the fence line, including bramble, holly, and hazel. The poor semi-improved grassland was not recently mown with a sward height greater than 20 cm high with frequent patches reaching between 40 to 50 cm in height. This poor semi-improved was likely mown less frequently due to the presence of, approximately 15, very young whips in guards including rowan, silver birch, English oak, hazel, and cherry.	No
Standing Water	A pond was present in the northeast corner of the Site, approximately 10 m^2 (Appendix B: Photograph 1). The pond is fenced off from the amenity grassland on Site by a wooden fence (wooden fence is to west and south of pond only), and is linked to Nant yr Aber (Figure 1 and	No

Habitat	Description	Section 7 Habitat
	Appendix C: TN 1), approximately 10 m east by broadleaved semi-natural woodland and amenity grassland.	
Amenity Grassland	Amenity grassland was the dominant habitat across the Site and was divided into four sections. In the northwest corner of the Site, intersected by a hardstanding path leading to the school buildings, was an area of amenity grassland with scattered trees and scrub (Appendix B: Photograph 8). Creeping buttercup *Ranunculus repens* and perennial rye were abundant. White clover *Trifolium repens*, dandelion, and red fescue were frequent. Ribwort plantain, common mouse ear *Cerastium fontanum*, Yorkshire fog, and cock's foot *Dactylis glomerata* were occasional. Yarrow, a dock (likely broadleaved *Rumex obtusifolius*), greater plantain *Plantago major*, daisy *Bellis perennis*, wood avens, ivy, selfheal *Prunella vulgaris*, and a sedge *Carex sp.* were rare. On the boundary between the electrical building and the amenity grassland (Building 12; see Buildings), were rare occurrences of tutsan *Hypericum androsaemum,* greater willowherb *Epilobium hirsutum*, silverweed *Potentilla anserina*, a horsetail, and herb Robert. To the north of this first area of amenity grassland was an approximately 10 by 6 m area where the sward height was at least 20 cm high (Figure 1 and Appendix C: TN 13) with more abundant cock's foot, frequent false oat grass *Arrhenatherum elatis*, occasional tufted hair grass *Deschampia cespitosa*, silverweed, and potentially common reed *Phragmites australis*, and rare horsetails. The area with a higher sward hair was likely protected from less frequent mowing due to the presence of approximately 20 whips of rowan and silver birch. In the southwest of the Site, a second area of amenity grassland bordered the Site boundary and was intersected by paths of hardstanding (Appendix B: Photograph 14). This amenity grassland was less diverse than the one in the northwest. Perennial rye and Yorkshire fog were abundant. Creeping buttercup, white clover, dandelion, broadleaved dock, and red fescue were frequent. Silverweed was occasional. Yarrow, selfheal, a willowherb, and clustered dock *Rumex conglomeratus* were rare, with a geranium species rare on the edges of the paths only. To the east of the Site, bordering the northern, and part of the eastern and southern, boundary of the Site was a large third area of amenity grassland, intersected by a couple of hardstanding paths (Appendix B: Photograph 2). Perennial rye and Yorkshire fog were abundant. Creeping buttercup, greater plantain, ribwort plantain, yarrow, dandelion, white clover, common mouse ear, common bent, and common catsear were frequent to occasional. Common knapweed *Centaurea nigra* and ragwort *Senecio vulgaris* were rare. To the west of the amenity grassland, near the centre of the Site were two approximately 4 by 4 m areas of ornamental shrub, one with an unknown plant species surrounded by patio stones (Figure 1 and Appendix C: TN 14) and one with four rosemary *Salvia rosmarinus* bushes and a rose plant *Rosaceae* (Figure 1 and Appendix C: TN 15). To the southwest of this area of amenity grassland was a polythene tunnel with an allotment area to the northeast of it (Figure 1 and Appendix C: TN 16). On the eastern boundary of the Site, adjacent to the palisade metal fence was an approximately 3 by 15 m stand of mature Japanese knotweed (Figure 1 and Appendix C: TN 17; Appendix B: Photograph 18). In the area of hardstanding to the north of the Site (see hardstanding) was a narrow strip of amenity grassland. Perennial rye was abundant with frequent to occasional dandelion, yarrow, greater plantain, silverweed, and white clover. Daisy and cock's foot were rare. The sward height for all sections of amenity grassland was generally less than 10 cm and uniform, suggesting regular mowing. All but the first area of amenity grassland were used as play areas.	No
Ephemeral-Short Perennial	Two small areas of ephemeral-short perennial vegetation lay to the west of the Site. The first area was adjacent to the southwest corner of the western broadleaved semi-natural woodland and a hardstanding footpath (Appendix B: Photograph 1). The area was bare soil with frequent dandelion, ivy, wood avens, and bramble growing over it. Holly, hawthorn, and hazel were growing through the fence and over part of the ephemeral-short perennial vegetation from the adjacent broadleaved semi-natural woodland. The second area lay five metres west of Building 9 (see Buildings) adjacent to the intact species-poor hedge (Appendix B: Photograph 12). The ground was soil loosely covered by stone gravel with frequent dandelion, a willowherb, and wood avens. A barberry tree and montbretia (Figure 1 and Appendix C: TN 18; Appendix B: Photograph 12) was growing in this area.	No
Intact Species-poor Hedge	An intact species-poor hedge was recorded adjacent to the west of Building 9 (see Buildings) consisting of abundant Mexican orange *Choisya sp.*, a frequent unknown copper shrub, rare holly and an unknown, but non-Schedule 9, cotoneaster (Appendix B: Photograph 20).	No
Wall	Approximately 27 m of the southern boundary of the Site was demarcated by a small section of concrete wall, approximately 1.8 m tall, and cinder block walls, approximately 1.6 m tall (Appendix B: Photograph 21). Both were flush with the ground with no gaps.	No
Fence	Palisade fencing bordered all but approximately 100 m of the southern boundary of the Site, and extended partly into the south of the Site to cordon off two separate play areas (Appendix B: Photograph 22). A further palisade fence separated the car park (see Hardstanding) from an orchard and play area in the centre of the Site. The palisade metal fence was approximately 160 cm tall with horizontal gaps between the bars, which ran to the ground, approximately 10 cm wide. The gap at the bottom of the fence was approximately 10 cm high. Surrounding the broadleaved semi-natural woodland to the northwest was a wooden fence approximately 140 cm high which was flush with the ground. There were a few minor gaps	No

Habitat	Description	Section 7 Habitat
	where the wooden slats had moved away and one gap that may have been purposefully constructed as a hedgehog highway route. Surrounding the pond area to the west and south was a wooden fence approximately 1.3 m high with no gaps on the ground or through the fence, except for the gate which had a gap beneath it approximately 20 cm high. In the southeast corner, there was a wooden fence approximately 1.7 m with no gaps that separated the neighbouring garden. A stiff chicken wire fence supported by steel, vertical bars, with a cinder block wall behind it (see Wall), ran north to south on the boundary at the south end of the Site. It was approximately 1.6 m tall with a 10 cm gap at the base. Within the west of the Site were metal fences approximately 120 cm high with horizontal gaps between the bars approximately 10 cm wide. They had a 3 cm gap from ground. The fences sectioned off an infant's astroturf play area and play area for younger students to the west of the Site, as well as demarcating a pedestrian walkway to the south of the car park (see Hardstanding).	
Buildings	There were 12 buildings (B) across the Site, seven forming the infant school area (B1 to B7), and four forming the main school area. One building was the electrical substation in the northwest corner of the Site. For the infant school area, four buildings (B2 to B5) are connected to form one complex, and for, the main school building, three sections were connected to form one complex (B9 to B11). The buildings for each complex have been separated out to more clearly describe the different areas of each complex, including the presence of PRFs (see Section 3.5). Forming the infant school area were: • B1 to the southeast of the Site. A standalone building (Appendix B: Photograph 23). B1 was a single storey cabin type building with a flat metal roof, fascia, and walls. B1 was approximately 3.5 m high. • B2 to the southeast of the Site, one of four buildings (B2 to B5) that formed a connected complex that formed part of the infant school area of the Site (Appendix B: Photograph 24). B2 was a single storey building with a flat felted roof, and wooden panels on the walls. Chip board material ran along the top of the walls. B2 was approximately 3.5 m high. • B3 to the north of the connected complex of buildings (B2 to B5) (Appendix B: Photograph 25). B3 was similar in construction to B2 but seemed to have a metal roof instead of a felted one. • B4 adjacent to the north of B3, part of the connected complex of buildings (B2 to B5) (Appendix B: Photograph 26). B4 was a single storey building with a flat, likely metal roof, and wooden boarded fascia running down the sides of the walls. B4 was approximately 4.5 m high. • B5 to the east and south of the connected complex of buildings (B2 to B5) (Appendix B: Photograph 27). B5 was similar in construction to B4 but was larger in width and length. • B6 to the south of the Site, south of the connected complex of buildings (B2 to B5) a standalone building (Appendix B: Photograph 28). B6 was a single storey building with a felted roof and pebbledash walls. B6 was approximately 3.5 m high. • B7, similar in construction to B6 but stood to the south of the Site, and northeast of the main connected complex (B2 to B5) (Appendix B: Photograph 29). Forming the main school building were: • B8 south of the centre of the Site and similar in construction to B6 and B8 (Appendix B: Photograph 30). • B9 formed the west and northern part of the main school building complex (B9 to B11) Appendix B: Photograph 31). B9 was similar in construction to B3. • B10 within the centre and south of the connected and adjacent buildings that formed the main school building (B9 to B11) (Appendix B: Photograph 32). B10 had a flat felted roof which curved over the sides as fascia. B10 had wooden board and pebble dashed concrete panel walls. • B11 stood to the west of the connected and adjacent building that formed the main school building (B9 to B11) (Appendix B: Photograph 33). B11 was similar in construction to B10. • B12 in the northwest of the Site was a green metal walled electrical building approximately 4 by 3 m wide and 2.5 m high (Appendix B: Photograph 11). Six vents were spaced on the bottom and top of wall on north and south side. For an assessment of the bat roost suitability of the buildings, see Section 3.5.	No
Bare Ground	There were seven areas of bare ground recorded across the Site. Along the northern boundary, there was bare ground under the overhanging canopy of the broadleaved semi-natural woodland from the ZoI. Some bramble and other rose species were encroaching from the fence line.	No

Habitat	Description	Section 7 Habitat
	Within the northern section of the amenity grassland there are two areas of wood chipping with wooden play equipment (Appendix B: Photograph 9). A third area of wood chipping with a wooden play equipment was recorded to the south of the Site. West of the western broadleaved semi-natural woodland, there was a gravelled area with a plastic roofed wooden shelter likely used for bicycles. To the west of B9, between the ephemeral-short perennial vegetation and the intact species-poor hedge there was bare soil with leaf litter and a few encroaching shrubs over it. To the east of B3 was an allotment area with bare soil with leaf litter and a raised bed. Some scattered scrub, including dogwood, was encroaching over it.	
Hardstanding	Hardstanding surrounded the majority of the buildings on Site and formed a courtyard in the centre of the complex for the infant school area (B2 to B5) (Appendix B: Photographs 12 and 13). Further hardstanding formed a car park and footpaths to the west of the Site. A path also ran through the areas of amenity grassland in the south of the Site.	No
Other Habitat – Astroturf	Astroturf with scattered play items was recorded to the west of Building 1 (see Buildings) being used as a children's play area.	No
Other Habitat – Wet Pour	Wet pour surfacing was being used as part of a children's play area south of Building 7 (see Buildings).	No
Other Habitat – Wooden Decking	Surrounding the pond to the west and south was wooden decking (Appendix B: Photograph 1). This area was used by staff and students with buckets and nets present on it.	No

3.3 Protected and Priority Species

Details of Protected and Priority species recorded or with potential to be present on the Site, with justification, are listed in **Error! Reference source not found.**. A plan of the Site showing the location and distribution of features with potential for Protected or Priority species is shown in Figure 1. Target Notes of Protected species evidence, or features that have potential to support Protected species are shown in Figure 1 and Appendix C.

Table 3-3 Protected and Priority Species Potential

Species/ Species Group	Associated Habitat	Description	Section 7 Species on/ Likely to be on Site	Section 7 Species on/ Likely to be in the ZoI
Plants	On Site: Broadleaved semi-natural woodland In ZoI: Broadleaved semi-natural woodland	SEWBReC returned no records of Protected and Priority plant species within 2 km of the Site. No Protected or Priority plants were identified on Site or within the ZoI during the field survey. Protected and Priority plant species are considered likely absent from the Site.	No	No
Invertebrates	On Site: Broadleaved Semi-natural Woodland; Line of Trees; Scattered Trees; Scattered Scrub; Pond; Poor Semi-improved Grassland; Amenity Grassland In ZoI: Broadleaved Semi-natural Woodland; Dense/Continuous Scrub; Running Water; Amenity Grassland	SEWBReC returned 21 species of Protected or Priority invertebrates within 2 km of the Site. There is suitable habitat on Site to support Protected and Priority invertebrates: the broadleaved semi-natural woodlands, and potentially the line of, and scattered, trees on Site may support beaded chestnut; brindled beauty; buff ermine; dark-barred twin-spot carpet; dot moth; dusky thorn; flounced chestnut; and green brindled crescent. The poor semi-improved grassland and amenity grassland may support beaded chestnut; buff ermine; dark-barred twin-spot carpet; knot grass; rosy rustic; and, white ermine, with support from the scattered scrub for some species. It is likely the presence of the pond on Site may also benefit some Protected and Priority invertebrates. Due to their small size, the regular mowing of the amenity grassland, and limited connectivity to similar habitats, especially good quality grasslands, the suitable habitats are considered sub-optimal to support these Protected and Priority species. There is no suitable habitat on Site or within the ZoI for: brown-banded carder bee; dingy skipper; small pearl-bordered fritillary; cinnabar; heath	Yes – see list within description	Yes – see list within description

Species/ Species Group	Associated Habitat	Description	Section 7 Species on/ Likely to be on Site	Section 7 Species on/ Likely to be in the ZoI
		rustic; mottled rustic; mullein wave; rustic; small phoenix; and spinach. Devil's bit scabious (Figure 1 and Appendix C: TN 11) was identified in the poor semi-improved grassland in the northeast of the Site which is the larval food plant for marsh fritillary, which is a Section 7 species and is fully protected under the WCA 1981. Nant yr Aber (Figure 1 and Appendix C: TN 1) may provide suitable habitat for white-clawed crayfish *Austropotamobius pallipes* with rocks available as refuges on the stream bed and riffling of the water present. However the food availability within, and water quality of, Nant yr Aber is not known. Both of these factors, among others, are important for white-clawed crayfish. No evidence of Protected or Priority invertebrates was identified on Site or within the ZoI during the field survey. There is generally sub-optimal habitat to support Protected and Priority invertebrates, especially the amenity grassland, though Protected and Priority invertebrates may be present in low numbers.		
Fish	On Site: Standing Water In ZoI: Running Water	SEWBReC returned no records of fish within 2 km of the Site. The pond on Site is not connected to the nearby Nant yr Aber and no fish were observed in the pond. In the ZoI, Nant yr Aber (Figure 1 and Appendix C: TN 1) to the east of the Site provides suitable habitat for Priority and Protected fish with bullhead, brown trout, and Atlantic salmon listed in its designation as a SINC (SEWBReC, 2023). No Protected or Priority fish were identified on Site or within the ZoI during the field survey. Protected and Priority fish species are considered likely absent from the Site, but likely present in the ZoI.	No	Yes
Amphibians	On Site: Broadleaved Semi-natural Woodland; Poor Semi-Improved Grassland; Standing Water ZoI: Broadleaved Semi-natural Woodland; Dense/Continuous Scrub; Running Water	SEWBReC returned one record of common toad within 2 km of the Site, which is not connected to the Site. The broadleaved semi-natural woodland on Site, particularly to the southwest which has connectivity to the pond and Nant yr Aber, has suitability for common toads. The presence of dead wood within the broadleaved semi-natural woodland provides refugia for amphibians. There was suitable breeding habitat for amphibians, notably common toad, on Site with the pond in the northeast corner of the Site. The Site has connectivity to suitable terrestrial habitat for amphibians including the tussocky poor semi-improved grassland to the west and south via a gap in the wooden fence surrounding the pond, and to broadleaved semi-natural woodland to the north and east via gaps in the palisade fencing. A habitat suitability index (HSI) assessment for GCN was carried out on the pond with results shown in Appendix D. The HSI assessment assessed the pond as having a below average suitability for GCN with a score of 0.57. Given the below average suitability of the pond, the frequent disturbance of the pond by staff and students, and the lack of recent records of GCN within 2 km, GCN are unlikely to be present in the pond. Further surveys would be required to consider them absent. In the ZoI, to the north and east of the Site, there was broadleaved semi-natural woodland with connectivity to the pond. The broadleaved semi-	Yes	Yes

Species/ Species Group	Associated Habitat	Description	Section 7 Species on/ Likely to be on Site	Section 7 Species on/ Likely to be in the ZoI
		natural woodland and dense/continuous scrub to the east of the Site also connects Nant yr Aber to habitats on Site, where amphibians may be present. No evidence of Protected or Priority amphibians was identified on Site during the field survey. Common toads are considered likely present in small numbers on Site and in the ZoI.		
Reptiles	On Site: Broadleaved Semi-Natural Woodland; Poor Semi-Improved Grassland; Amenity Grassland. ZoI: Broadleaved Semi-Natural Woodland; Amenity grassland.	SEWBReC returned records of adder, common lizard, slow-worm, and grass snake within 2 km of the Site. There is very limited to no connectivity between these records and the Site. Tussocky areas of amenity grassland (Figure 1 and Appendix C: TN 13), the poor semi-improved grassland, and the broadleaved semi-natural woodland, with its refugia of dead wood and brash piles (Figure 1 and Appendix C: TNs 2 and 3) may provide suitable habitats for slow-worm and common lizard on the Site. However, due to the lack of connectivity to records, the small area of suitable habitat on Site, and the regular disturbance by students and staff, the habitats on Site are sub-optimal for reptiles and likely support only a very small number of slow-worm and common lizard. The broadleaved semi-natural woodland and amenity grassland in the ZoI may provide sub-optimal habitat for slow-worm and common lizard, though this habitat likely suffers less disturbance than the habitats on Site. The Site and ZoI are unlikely to support adder, which prefer open woodlands and heathlands, or grass snake, which requires taller herbaceous vegetation around waterbodies. No evidence of reptiles was identified on Site during the field survey. Common lizard and slow-worm may be present on the Site and ZoI in very small numbers due to the sub-optimal habitat.	Yes	Yes
Breeding Birds	On Site: Broadleaved Semi-natural Woodland; Line of Trees; Scattered Trees; Intact Species-poor Hedge; Buildings ZoI: Broadleaved Semi-natural Woodland; Scattered Trees; Dense/Continuous Scrub; Buildings (residential complexes)	SEWBReC returned records of 32 bird species, 14 of which are Schedule 1, within 2 km of the Site. There was suitable habitat within the Site and ZoI for common passerine species of breeding bird. Suitable habitats included the broadleaved semi-natural woodland, the line of trees, scattered trees, intact species-poor hedge, and the buildings. Birds seen on Site include blackbirds *Turdus merula*, crows *Corvus corone*, house sparrows, magpies *Pica pica*, jackdaws *Corvus monedula*, herring gull, and wood pigeons *Columba palumbus*. The habitats on the Site were unlikely to support breeding Schedule 1 bird species as no suitable habitat for breeding was present on Site or in the ZoI, or the habitat was too small, too frequently disturbed, or not connected to adequate foraging habitat. There is potential for common passerines to breed within the Site and the ZoI.	Yes	Yes
Roosting Bats	On Site: Broadleaved Semi-Natural Woodland; Scattered Trees; Buildings In ZoI: Broadleaved Semi-Natural Woodland; Scattered Trees	See Section 3.5 for PRA.	Yes	Yes

Species/ Species Group	Associated Habitat	Description	Section 7 Species on/ Likely to be on Site	Section 7 Species on/ Likely to be in the ZoI
Foraging and Commuting Bats	On Site: Broadleaved Semi-natural Woodland; Line of Trees; Scattered Trees; Standing Water In ZoI: Broadleaved Semi-Natural Woodland; Running Water	See Section 3.6 for bat foraging and commuting habitat assessment.	Yes	Yes
Dormouse	On Site: Broadleaved Semi-natural Woodland ZoI: Broadleaved Semi-natural Woodland; Dense/Continuous Scrub	SEWBReC returned one record of dormouse approximately 1.9 km east of the Site, with no connectivity to the Site. The broadleaved semi-natural woodland in the southeast corner of the Site provides good habitat for dormouse with its diversity of tree species and developed understorey providing a range of food sources for dormouse. The broadleaved semi-natural woodland is connected to good habitat for dormouse in the ZoI (see below). The suitability of the broadleaved semi-natural woodland for dormouse is reduced by its use as a forest school by staff and students, but this seemed to be predominantly to the south of the woodland. Other habitats on Site do not provide suitable habitat for dormouse due to their lack of connectivity to other suitable habitat, for example the intact species-poor hedge, the lack of a well-developed understorey in the case of the northwest broadleaved semi-natural woodland, and low density of the scattered scrub. The broadleaved semi-natural woodland and dense/continuous scrub to the north and east of the Site likely provide suitable habitat for dormouse and are connected to similar habitat in the wider landscape, though is the woodland and scrub cut through an area dominated by urban development. The broadleaved semi-natural woodland in the ZoI had a more developed understorey and contained hazel, sessile oak, hawthorn, sycamore, elder, and bramble which would provide a range of food sources for dormouse. The dense/continuous scrub was very thick and dominated by bramble to provide another food source and area for shelter. The broadleaved semi-natural woodland to the north of the Site contained hazel, sycamore, oak, and bramble to provide food resources for dormouse, but had a poor understorey, dominated in places by Himalayan balsam. Therefore, it has sub-optimal suitability for dormouse. No evidence of dormouse was identified on the Site during the field survey. Dormouse may be present in the southeast broadleaved semi-natural woodland on Site and the ZoI, as well as the dense/continuous scrub.	Yes	Yes
Badger	On Site: Broadleaved Semi-natural Woodland; Amenity Grassland; Poor Semi-Improved Grassland. ZoI: Broadleaved Semi-natural Woodland; Amenity Grassland.	SEWBReC returned four records of badger within 2 km of the Site with no connectivity to the Site. The broadleaved semi-natural woodland, amenity grassland, and poor semi-improved grassland provide suitable foraging and commuting habitat for badger, though they are unlikely to access the Site due to the presence of fences and walls around the perimeter of the Site, which are closed at night. As no suitable habitat for sett building (no earth banks and frequent disturbance by staff and students) was present within the Site, and habitat of similar quality for foraging and commuting was present in the ZoI and wider landscape, it is	No	Yes

Species/ Species Group	Associated Habitat	Description	Section 7 Species on/ Likely to be on Site	Section 7 Species on/ Likely to be in the ZoI
		unlikely badger would attempt to dig under the fences and walls to access the Site. In the ZoI, the broadleaved semi-natural woodland and dense/continuous scrub provided suitable foraging and commuting habitat, and potentially sett building habitat (see Limitations). No evidence of badger was identified on the Site or within the ZoI during the field survey. There is potential for breeding, foraging, and commuting badger to be present within the ZoI, but not the Site.		
Otter	On Site: N/A ZoI: Broadleaved Semi-Natural Woodland; Dense/Continuous Scrub; Running Water	SEWBReC returned two records of otter within 2 km of the Site, with no connectivity to the Site. There was no suitable habitat within the Site due to the lack of suitable waterbodies, dense vegetation cover, frequent disturbance by staff and students, and fences which prevented access to the Site. In the ZoI, the Nant yr Aber River SINC to the east of the Site was noted to have suitable habitat for breeding, foraging, and resting otter with connectivity to the River Rhymney SINC which had confirmed sightings of otter (SEWBReC, 2023). The broadleaved semi-natural woodland and dense/continuous scrub adjacent to the west of Nant Yr Aber may provide suitable holt building and resting locations, though the vegetation was too dense in places to confirm. No evidence of otter was identified on the Site during the field survey. Otter are considered absent from the Site, but may utilise Nant Yr Aber for commuting in the ZoI.	No	Yes
Water Vole	On Site: N/A ZoI: Running Water	SEWBReC returned no records of water vole within 2 km of the Site. There was no suitable habitat within the Site as the pond was surrounded by wooden decking and shallow ground with a line of trees, which provided no opportunities for burrow building or foraging. The frequent disturbance by staff and students also made the pond unsuitable for water vole. In the ZoI, the Nant yr Aber River SINC to the east of the Site provided poor aquatic habitat for water vole due to the lack of vegetation. Furthermore, the banks did not have tall, herbaceous vegetation along them to provide opportunities for foraging and shelter. No evidence of water vole was identified on the Site during the field survey. Water vole are considered likely absent from the Site and ZoI.	No	No

Species/ Species Group	Associated Habitat	Description	Section 7 Species on/ Likely to be on Site	Section 7 Species on/ Likely to be in the ZoI
Hedgehog	On Site: Broadleaved Semi-natural Woodland; Scattered Scrub; Poor Semi-improved Grassland; Amenity Grassland ZoI: Broadleaved Semi-natural Woodland; Dense/Continuous Scrub; Amenity Grassland	SEWBReC returned 70 records of hedgehog within 2 km of the Site, with the closest record being within 0.1 km connected via urban areas. Broadleaved semi-natural woodland, dense/continuous scrub, scattered scrub, poor semi-improved grassland, and amenity grassland within the Site and ZoI provided suitable habitat for foraging and commuting hedgehog. The gaps under and through the fences around part of the Site were sufficient for hedgehogs to commute under. Within the Site, brash piles (Figure 1 and Appendix C: TNs 2, 3 and 7) were also present to provide sheltering opportunities for hedgehog. A staff member informed surveyors that hedgehogs have been seen utilising the grassland and hardstanding in the north of the Site. No evidence of hedgehogs was identified on the Site during the field survey. Hedgehogs are confirmed to be using the Site and will be using the ZoI as well.	Yes	Yes

3.4 INNPS Subject to Legal Controls

Three INNPS listed on Schedule 9 of the WCA were identified on the Site and in the ZoI and are summarised in Table 3-4.

Table 3-4 INNPS Recorded on Site and in the ZoI

INNPS	Site/ZoI	TN	Description	Photograph
Montbretia	Site	8	Three clumps of montbretia growing within 3 m of each other within scrub on southern boundary of the Site.	15
		9	One clump of montbretia growing under the canopy of a willow on southern boundary of the Site.	NA
		18	A patch of montbretia approximately 1.5 by 1 m growing through gravel covered soil to the west of Building 9.	12
Montbretia	ZoI	19	A patch of montbretia approximately 3 by 2 m large growing on bare soil within broadleaved semi-natural woodland approximately 8 m north of the Site.	NA
		20	A patch of montbretia approximately 2 by 1 m large growing on bare soil within broadleaved semi-natural woodland approximately 10 m north of the Site.	NA
Japanese knotweed	Site	4	One sapling growing through ivy within the broadleaved semi-natural woodland in the southeast of the Site.	NA
		5	One sapling growing through leaf litter within the broadleaved semi-natural woodland in the southeast of the Site.	6
		12	A mature stand approximately 2 by 1 m growing on eastern Site boundary within poor semi-improved grassland.	17
		17	A mature stand approximately 15 by 3 m large on eastern Site boundary growing through amenity grassland.	18
Japanese knotweed	ZoI	21	One sapling growing through leaf litter in broadleaved semi-natural woodland approximately 3 m north of the northeast corner of the Site, connected by broadleaved semi-natural woodland.	NA
		22	A stand approximately 3 by 4 m growing in broadleaved semi-natural woodland approximately 3 m east of the Site, connected by broadleaved semi-natural woodland.	NA
		23	At least two plants approximately 1 m high within 1.5 m of each other growing within broadleaved semi-natural woodland approximately 4 m east of the Site connected by broadleaved semi-natural woodland.	NA
		24	A stand approximately 3 by 4 m growing in dense/continuous scrub approximately 3 m east of the Site, connected by dense/continuous scrub.	NA
Himalayan balsam	ZoI	25	Two large stands of approximately 5 m north of the Site within broadleaved semi-natural woodland 5 m from fence. Stands are approximately 1 by 8 m and 10 by 8 m and dominate the understorey in this part of the broadleaved semi-natural woodland.	31
		26	A stand approximately 2 by 3 m approximately 10 m north of the northeast corner of the Site within the broadleaved semi-natural woodland, connected by broadleaved semi-natural woodland.	NA
		27	A single mature plant approximately 6 m east of the northeast of the Site growing between rocks on the western bank of the Nant yr Aber, connected by broadleaved semi-natural woodland.	32
		28	Two mature plants approximately 6 m east of the Site growing between ivy on the western bank of the Nant yr Aber, connected by broadleaved semi-natural woodland.	NA
		29	Two mature plants approximately 6 m east of the Site growing between ivy on the western bank of the Nant yr Aber, connected by broadleaved semi-natural woodland.	NA
		30	Approximately 20 mature plants approximately 5 m east of the Site growing through understorey on the western bank of the Nant yr Aber, connected by broadleaved semi-natural woodland.	33
		31	At least seven mature plants approximately 4 m east of the Site growing between ivy on the western bank of the Nant yr Aber, connected by broadleaved semi-natural woodland.	NA
		32	At least seven mature plants approximately 4 m east of the northeast of the Site growing between grasses and scrub on the western bank of the Nant yr Aber, connected by broadleaved semi-natural woodland.	NA

INNPS	Site/ZoI	TN	Description	Photograph
		33	At least four mature plants approximately 4 m east of the northeast of the Site growing between grasses and scrub on the western bank of the Nant yr Aber, connected by broadleaved semi-natural woodland.	NA
		34	A stand approximately 4 by 15 m growing in dense/continuous scrub approximately 3 m east of the Site on the western bank of the Nant Yr Aber, connected by dense/continuous scrub.	NA

3.5 Bat Roost Assessment

3.5.1 PRA

There were buildings on Site, and trees on Site and in the ZoI, with suitability to support roosting bats. The locations of the buildings and trees assessed as having features suitable to support roosting bats are shown as PRFs and Bat Trees on Figure 1. A description of the PRFs on the buildings is provided in Table 3-5, and of the PRFs on the trees is provided in Table 3-6.

Table 3-5 Building Features Assessed as Having Suitability to Support Roosting Bats

Building No.	PRF Reference (Figure 1)	Description	Bat Roost Suitability Category
2	F2a	PRF was on the north face of B2, approximately 2 m above the ground and was a gap, approximately 3 cm wide and 80 cm long (Appendix B: Photograph 34). Entrance to gap extended into the roof void which could support multiple bats in summer. It was unlikely to be used for hibernating bats due to the metal roof which will not insulate heat well in the winter.	Moderate
3	F3a	PRF was on the north face of B3, approximately 3 m above the ground, and was a gap under the metal roof near the northeast corner of B3, approximately 4 cm wide and 10 cm long (Appendix B: Photographs 35 and 36). The gap could extend into the roof void to support multiple bats in summer. It was unlikely to be used for hibernating bats due to the metal roof which will not insulate heat well in the winter. Suitability of PRF to support roosting bats was diminished due to presence of a floodlight on the northwest corner of B3 (Figure 1 and Appendix C: TN 35; Appendix B: Photograph 37) and by how cluttered the drop zone is with branches.	Low
5	F5a	PRF was on the west face of B5, approximately 3 m above the ground, and was a gap between the top of the wooden door frame and the wooden fascia chip board (Appendix B: Photograph 38 and 39). The gap was approximately 4 cm wide and 1.5 m long. The depth of the gap was unknown but was unlikely to support more than a few bats in the summer.	Low
8	F8a	PRF was on the west face of B8, approximately 2.5 m above the ground, and was a gap behind the fascia/vent, approximately 3 cm wide and 60 cm long (Appendix B: Photograph 40 and 41). The gap extends upwards, approximately 20 cm (and possibly further), and possibly into the building between the fascia and the panelled wall. PRF is likely only suitable for summer roosts.	Low
11	F11a	PRF was on northern face of B12, approximately 2.5 m above the ground, and was a hole in the corner of the roof near metal shutters (Appendix B: Photograph 42 and 43). The hole was approximately 4 by 4 cm and extends into the roof void (depth unknown). The hole could extend horizontally across the wooden roof cladding to support multiple bats in the summer.	Low
11	F11b	PRF was on the corner between the northern face of B11 and the eastern face of B10, approximately 2.5 m above the ground, and was a gap in the corner of a wooden wall and window adjacent to end of a soffit board (Appendix B: Photograph 42 and 44). The gap was approximately 2 cm wide and 7 cm long. The gap depth was unknown but extends upwards. There were dusty cobwebs inside the gap to indicate it had not been used recently. The gap was likely to support an individual or very few bats in the summer.	Low

Table 3-6 Tree Features Assessed as Having Suitability to Support Roosting Bats

Bat Tree (Figure 1)	Site/ZoI	Description	Bat Roost Suitability Category
1	Site	A large field maple in the amenity grassland to the northwest with a diameter at breast height (DBH) of 1 m and a height of 8 m, with bramble around the base (Appendix B: Photograph 45). Tree 1 had one PRF with space for one to two summer roosting bats. The PRF was a split in the bark approximately 4 m above the ground on the northeast face on one of the central stems (Appendix B: Photograph 46). The gap was approximately 3 cm wide and 15 cm long. The gap had a wedge-shaped cavity behind split and peeling bark. There was a cluttered drop zone beneath the gap from vegetation. The tree had no suitability for hibernation roosts.	PRF
2	Site	A willow in the amenity grassland to the northwest with a DBH of 1.2 m and a height of 12 m (Appendix B: Photograph 47). The tree was labelled with a tree tag 03108. It had two PRFs: the first PRF was approximately 3 m above the ground on the southeast face and was a 1.2 m long vertical split in the trunk extending upwards and downwards (Appendix B: Photograph 48). The split was approximately 10 cm wide at its widest point with little shelter from rain and wind; the second PRF was approximately 5 m above the ground on the southeast face (Appendix B: Photograph 49). The PRF was a callous approximately 5 cm wide and 70 cm long, which may extend further into the branch. The tree had no suitability for hibernation roosts.	PRF
3	Site	A silver birch with a DBH of 35 cm and a height of 14 m (Appendix B: Photograph 50). The tree was within the broadleaved semi-natural woodland in the southeast corner of the Site and was near a seating area with logs. The PRF was a small blackened cavity approximately 9 m above the ground on the northwest face (Appendix B: Photograph 51). The cavity was approximately 4 cm wide and 4 cm long and was below a thin branch that extended vertically upwards. The cavity potentially extended under the branch, so it was difficult to see from the ground. Potentially suitable to support an individual bat in the summer.	PRF
4	Site	A silver birch with a DBH of 35 cm and a height of 15 m (Appendix B: Photographs 52). The tree was within the broadleaved semi-natural woodland in the southeast corner of the Site, approximately 3 m from the eastern Site boundary and near a path through the woodland. No PRFs were seen, but thick ivy coverage may have obscured features on the trunk.	FAR
5	ZoI	A silver birch with a DBH of 40 cm and a height of 12 m (Appendix B: Photographs 53). The tree was within the broadleaved semi-natural woodland approximately 6 m north of the northern Site boundary. The PRF was a split in a stem on the northeast face, with callousing around it, approximately 5 m above the ground (Appendix B: Photograph 54). At its widest, the split was approximately 10 cm across. The split may extend upwards and downwards into the stem. The split likely had suitability to support a small number of bats in the summer, with no hibernation suitability as it was too exposed to the elements.	PRF
6	ZoI	A multi-stemmed cherry with a DBH of 1.2 m and a height of 10 m (Appendix B: Photograph 55). The tree was located in the garden of a house to the northwest of the Site, approximately 4 m west of the western broadleaved semi-natural woodland on Site. The PRF was a cavity within the main trunk approximately 5 m high on the east face (Appendix B: Photograph 55). The cavity possibly extended horizontally inwards to provide space for a few summer roosting bats. The tree had no hibernation suitability.	PRF

3.6 Commuting and Foraging Habitat Assessment

SEWBReC returned records of bat activity and roosts within 2 km of the Site. The closest roost record was a summer bat roost of a single common pipistrelle located approximately 0.2 km east of the Site, connected to the Site by grassland and woodland. A maternity roost of 67 common pipistrelles was recorded approximately 1.3 km southeast of the Site, but connectivity is limited by urban areas. The closest bat foraging record is of common pipistrelle, noctule, and soprano pipistrelle approximately 0.1 km south, connected to the Site by urban areas. The following SINCs within 2 km, though separated by urban areas, have good foraging, commuting and/or roosting opportunities for bats: Coed y Brain, Penyrheol; Caerphilly/Machen Disused Railway, East of Trethomas; Coed y Maerdy, East of Caerphilly; Gypsy Lane Wetland, South of Groeswen; Warren Drive Meadow, South of Caerphilly; Mynydd Dimlaith and Cwm-y-Bwch, South East of Llanbradach; Craigyfedw, Abertridwr; and, Caerphilly Common, South of Caerphilly (SEWBReC, 2023). The Ruperra Castle and Woodlands SSSI and Garth Wood SSSI approximately 7 km east and south, respectively, are designated for greater horseshoe bat and lesser horseshoe bat (CCW, 2001; CCW, RSPB, 2023). There are no internationally designated sites for bats within 10 km of the Site. The Site is within the Core Sustenance Zone (CSZ) (BCT, 2020) of common pipistrelle, soprano pipistrelle, Nathusius' pipistrelle, Daubenton's bat, and brown long-eared bat. The Site is outside the CSZ (BCT, 2020) for greater horseshoe bat and lesser horseshoe bat.

Overall, the habitats on Site are unlikely to provide a significant foraging resource for nearby roosts and foraging bats as it is dominated by buildings, hardstanding, and amenity grassland which will not promote an abundant invertebrate population. The poor semi-improved grassland and broadleaved semi-natural woodland on Site will provide some foraging resource, but this is likely to be minor due to small size of these habitats and the availability of habitats with likely higher foraging potential for bats in the wider landscape.

The habitats on the Site have been assessed as having Moderate suitability to support commuting and foraging bats due to the boundary habitats to the north, east, and potentially, but less likely, the northwest. While the Site lacks continuous scrub, hedgerows, and trees to aid commuting, the Site is immediately bordered to the north and east by broadleaved semi-natural woodland. This broadleaved semi-natural woodland in the ZoI is adjacent to the southeast broadleaved semi-natural woodland, and within 20 m of the northwest broadleaved semi-natural woodland, on Site. The broadleaved semi-natural woodland in the ZoI connects to a woodland corridor leading north and the vegetated corridor of the Nant yr Aber (Figure 1 and Appendix C: TN 1). The Nant yr Aber connects to the River Rhymney approximately 1.8 km northeast, and flows under the Rhymney Railway Line approximately 0.2 km west of the Site. Both the River Rhymney and the railway line are vegetated by woodland and scrub, as judged from aerial imagery, and lead out to the wider landscape with suitable habitat for commuting and foraging bats. While likely to only be used by non-light adverse bat species, like pipistrelles, due to the street lighting of the residential area, linked back gardens connect the Site to the railway line. From the west, the scattered trees in the west of the Site give some connectivity between the western urban area and railway line to the northwest broadleaved semi-natural woodland on Site and further north. The north and east boundaries of the Site are unlit which will facilitate use by commuting bats.

3.7 ZoI

BREEAM defines the ZoI as '*Areas of land or water bodies impacted by the site undergoing assessment. These areas can be adjacent to the site or can be areas that are dependent on the site but not physically linked, including areas downstream from a site. Areas within the zone of influence can be negatively affected by changes on an assessment site but they also provide further opportunity to maximise enhancement activities.'*

The habitats within 10 m of the Site were noted when undertaking the Phase 1 Habitat Survey and as part of the desk study (see **Error! Reference source not found.**1). The ZoI includes the following features:

- Presence of broadleaved semi-natural woodland which is a Section 7 Priority habitat: 'lowland mixed deciduous woodland';
- Four trees assessed as having PRFs which are summarised in Table 3-5 in Section 3.5.1;
- Nant Yr Aber which lies approximately 10 m east of the eastern Site boundary at its closest point (Figure 1 and Appendix C: TN 1) and is a SINC hydrologically connected to the River Rhymney SINC. Both SINCs support populations of Priority and Protected fish (Section 7: European eel, Atlantic salmon, and brown/sea trout. Annex II: Atlantic salmon, and bullhead). The River Rhymney SINC also supports otter; and,
- Presence of Japanese knotweed, Himalayan balsam and montbretia to the north and east. See Section 3.4 for details.

4. Ecological Constraints and Potential Impacts

Relevant ecological features that may represent constraints to the Proposed Development, or that provide opportunities to deliver ecological enhancement in accordance with planning policy, are identified in Sections 4 and 5 of this report and shown on Figure 1.

4.1 Designated Nature Conservation Sites

4.1.1 International Nature Conservation Sites

Cardiff Beech Woods SAC is located 3.5 km south of the Site. The SAC is designated for mixed woodland on base-rich soils associated with rocky slopes, and beech forests on neutral to rich soils (JNCC, 2004). The Proposed Development will have no impact on the SAC, due to its distance from the Site. There are no hydrological links and no pollution pathways between the Site and the SAC.

4.1.2 National Nature Conservation Sites

Gwaun Gledyr SSSI is located 1.4 km west of the Site. The SSSI is designated for its marshy grassland, neutral grassland and contains UK Biodiversity Action Plan Priority habitats: purple moor-grass and rush pasture; lowland dry acid grassland; lowland meadow; and, lowland Heathland (CCW, 2009).. The Proposed Development will have no impact on this SSSI, due to its distance from the Site. There are no hydrological links and no pollution pathways between the Site and the SSSI.

There are two SSSIs designated for bats within 10 km of the Site. The Proposed Development will have no impact on these SSSIs due to their distance from the Site (both approximately 7 km from the Site). There are no hydrological links and no pollution pathways between the Site and the SSSIs.

4.1.3 Local Nature Conservation Sites

There are 11 SINCs within 2 km of the Site. The closest SINC, Nant yr Aber River, is approximately 10 m east of the Site and is designated for its use as a migratory route by Priority fish: bullhead, brown trout, and Atlantic salmon (SEWBReC, 2023). Breeding otter is also likely to be utilising the SINC (SEWBReC, 2023). The Proposed Development has potential to impact the Nant yr Aber River SINC through pollution, including chemicals, noise, and light, which in turn could negatively impact the Priority and Protected species utilising it, especially migratory fish, and otter.

Furthermore, the Nant yr Aber River SINC connects to the River Rhymney SINC approximately 1.8 km northeast (downstream). The River Rhymney SINC is designated as a significant wildlife corridor with native Priority fish species like bullhead, brown trout, Atlantic salmon, European eel, and otter utilising the SINC (SEWBReC, 2023). Some areas have been noted as important for rare bryophytes, including *Jungermannia exertifolia* and *Marchantia polymorpha ssp montivagans* (SEWBReC, 2023). As the River Rhymney SINC is hydrologically linked to the Nant yr Aber River SINC, there is potential for the Proposed Development to impact the River Rhymney SINC should a major pollution event occur.

The Proposed Development will have no impact on the remaining SINCs, due to their distance from the Site of the Proposed Development. There are no hydrological links and no pollution pathways between the Site and the remaining SINCs.

4.2 Ancient Woodland

There is no ancient woodland within or adjacent to the Site boundary, so this habitat will not be impacted by the Proposed Development.

4.3 TPOs

There are no TPOs within or adjacent to the Site boundary, so none will be impacted by the Proposed Development.

4.4 Habitats

4.4.1 Broadleaved Semi-Natural Woodland

The two blocks of broadleaved semi-natural woodland will not be removed for the Proposed Development as confirmed via communication with the client.

There is potential for the retained broadleaved semi-natural woodland block to be damaged during construction due to root compaction caused by tracking of vehicles or storage of materials on the root protection area (RPA) or from knocking off/damaging overhanging limbs. This damage may impact the trees' abilities to absorb water and nutrients and increase the risk of disease and pollution entering the trees, potentially resulting in a poor condition or even death of the retained trees. Pollution may also harm the retained trees.

4.4.2 Line of Trees

The Proposed Development will likely not require the removal of the line of trees. As the line of trees borders the north and east of the pond, which will also likely remain, it is unlikely their RPA will extend into the potential footprint of the Proposed Development where they may suffer from compaction or damage from any ground disturbance. However, due to its proximity to the Site, there is potential for the line of trees to be impacted by pollution. Though the spread of pollution will be reduced by the presence of a wooden fence around the pond area, pollution could still reach the line of trees through the gaps in the palisade fence that forms the north boundary of the Site, and via the broadleaved semi-natural woodland in the ZoI to the north, in the case of a major pollution event.

4.4.3 Scattered Trees

The Proposed Development will likely require the removal of an unknown number of scattered trees including potentially the hazel adjacent to Building 3, and several of the trees lining the path through the amenity grassland in the northwest of the Site. There is potential for the remaining scattered trees to be damaged during construction due to root compaction caused by tracking of vehicles or storage of materials in the RPA or from knocking off/damaging overhanging limbs. This damage may impact the trees' abilities to absorb water and nutrients and increase the risk of disease and pollution entering the trees, potentially resulting in a poor condition or even death. Pollution may also harm the retained trees.

4.4.4 Scattered Scrub

The Proposed Development will likely require the removal of some of the scattered scrub across the Site, including the line of scattered scrub by Building 3 and along the southwest boundary of the Site. There is potential for the remaining scattered scrub to be impacted by pollution.

4.4.5 Poor Semi-Improved Grassland

The Proposed Development will likely require the retention of the poor semi-improved grassland. Due to its proximity to the Proposed Development, the retained poor semi-improved grassland has potential to be impacted by pollution to reduce its condition. Similar habitats of equal or greater value are limited in the surrounding landscape especially as many grasslands, as judged from aerial imagery, likely undergo regular mowing. Therefore, retention of the poor semi-improved grassland will Be of continued benefit to biodiversity.

4.4.6 Standing Water

The Proposed Development will not likely require removal of the pond. Due to its proximity to the Proposed Development, there is potential for the pond to be impacted by pollution to reduce its water quality. Though reduced by the presence of a wooden fence around the pond area, the pollution could still reach the pond through the gaps in the palisade fence that form the north boundary of the Site, and via the broadleaved semi-natural woodland in the ZoI to the north, in the case of a major pollution event.

4.4.7 Amenity Grassland

The Proposed Development will require the partial removal of the amenity grassland to the east and southwest of the Site. Due to its proximity to the Proposed Development, the retained amenity grassland has potential to be impacted by pollution to reduce its condition. Similar habitats of equal or greater value are limited in the surrounding landscape. Therefore, removal of part of the amenity grassland will reduce the availability of such habitat in the surrounding landscape.

4.4.8 Ephemeral-Short Perennial

The Proposed Development will likely require the removal of ephemeral-short perennial vegetation. The ephemeral-short perennial vegetation has very limited ecological value so there will be no impact from its loss.

4.4.9 Intact Species-Poor Hedge

The intact species-poor hedges will likely be removed for the Proposed Development. As the intact species-poor hedge is very short, isolated, and contains non-native species, there will be no impact from its loss.

4.4.10 Wall

The Proposed Development will require the retention of the walls, as they are associated with private residences. The walls have no ecological value so there will be no impact from their retention.

4.4.11 Fence

The Proposed Development will likely require the removal and replacement of the fences which are not on the boundary of the Site. The fences have no ecological value so there will be no impact from their loss.

4.4.12 Buildings

The Proposed Development will require the removal of all buildings from the Site, following the construction of the new school to the east of the Site. The buildings have suitability to support roosting bats and nesting birds, so these species will have less opportunities to roost and nest following their demolition. However, as the new school buildings will be constructed before the demolition of the current school buildings, and as bat and bird boxes are recommended to be included in the new build, there will likely be minimal impact from the loss of the buildings.

4.4.13 Bare Ground

The Proposed Development will require the removal of bare ground. The bare ground has no ecological value so there will be no impact from its loss.

4.4.14 Hardstanding

The Proposed Development will require the removal of hardstanding. The hardstanding has no ecological value so there will be no impact from its loss.

4.4.15 Astroturf, Wet Pour, and Wooden Decking

The Proposed Development will require the removal of the astroturf and wet pour, but not the wooden decking which surrounds the pond The astroturf and wet pour have no ecological value so there will be no impact from their loss.

4.5 Protected or Priority Species

4.5.1 Invertebrates

Eleven Priority invertebrate species, returned from SEWBReC, (all moths; see Section 3.3) have the potential to be found on Site and in the ZoI, particularly the broadleaved semi-natural woodland, line of trees, scattered trees, poor semi-improved grassland, and amenity grassland. Nant yr Aber (Figure 1 and Appendix C: TN 1) in the ZoI has potential to support white-clawed crayfish.

It is likely that part of the amenity grassland and a few scattered trees will be removed, which risks injuring and killing, and reducing the availability of habitat suitable to support Priority invertebrates. Pollution from the Proposed Development, especially chemical spills, and fumes may also indirectly injure and kill Priority invertebrates on Site and in the ZoI. Light spill from the construction and operational phase of the Proposed Development may also indirectly impact invertebrates, including white-clawed crayfish if they are present in Nant yr Aber River SINC, by, for example, interrupting their circadian rhythms and making them more visible to predators.

In the absence of mitigation, these invertebrates could be impacted by vegetation clearance and pollution from the Proposed Development.

4.5.2 Fish

Priority and Protected fish (bullhead, brown trout, and Atlantic salmon (and potentially other migratory fish)) have the potential to be utilising the Nant yr Aber River SINC (Figure 1 and Appendix C: TN 1) within the ZoI to the east of the Site.

Fish within the Nant yr Aber River SINC will not be directly impacted by the Proposed Development. However, pollution, especially chemical spillages, may indirectly impact the Nant yr Aber River SINC to poison (injure and kill) Priority and Protected fish, and degrade their habitat. Light spill from the construction and operational phase of the Proposed Development may also indirectly impact the Nant yr Aber River SINC to degrade its habitat, especially for nocturnal fish. Furthermore, if piling or any other activities with significant vibration is required during the construction phase, fish have potential to be impacted by vibration which may impeded migration and/or spawning.

4.5.3 GCN and Common Toad

There is a small possibility that GCN are also on Site within the pond and adjacent habitat, including the broadleaved semi-natural woodland and poor semi-improved grassland.

Common toad are likely present on Site, especially in and near the pond and poor semi-improved grassland. They may also be present in the broadleaved semi-natural woodland on Site and the ZoI, as well as the dense/continuous scrub and Nant yr Aber River SINC in the ZoI.

As such, GCN and common toad could be impacted by any pollution events from the Proposed Development. These actions may result in the injury and/or killing of GCN and common toad. Furthermore, GCN and common toad are nocturnal and may also be indirectly impacted by light spill from the construction and operational phase of the Proposed Development.

4.5.4 Common Lizard and Slow-Worm

There is small possibility that common lizards and slow-worms are present on Site, predominantly in the tussocky areas of the poor semi-improved grassland but also in the broadleaved semi-natural woodland and amenity grassland. They may also be present in the broadleaved semi-natural woodland and amenity grassland in the ZoI.

As such, common reptile species could be impacted by vegetation clearance of the amenity grassland, which may injure or kill common lizards and slow-worms, as well as by a pollution event from the Proposed Development should it spread on Site and into the ZoI.

4.5.5 Breeding Birds

Breeding birds have the potential to be present within the broadleaved semi-natural woodland, line of trees, scattered trees, intact species-poor hedge, and on the buildings on Site, and within the broadleaved semi-natural woodland, scattered trees, dense/continuous scrub, and buildings in the ZoI.

The Proposed Development could impact breeding birds should works proceed during the breeding bird season (between March and September inclusive), by disturbing or destroying active nests, eggs, or chicks during any vegetation clearance, or through noise, additional lighting, vibration, or pollution from the Proposed Development.

4.5.6 Roosting Bats

There are buildings and trees on Site, and trees in the ZoI, with suitability to support roosting bats. Therefore, roosting bats are considered likely present on Site and therefore may be impacted.

There are six PRFs within the school buildings, one with Moderate (Figure 1: F2a), and five with Low (Figure 1: F3a, F5a, F8a, F11a, and F11b) suitability for roosting bats (see Section 3.5.1). There are three trees on Site, (Figure 1: Bat Trees 1 to 3) and two trees in the ZoI, with PRFs (Figure 1: Bat Trees 5 and 6). One tree on Site has will require further assessment for roosting bats if it will be impacted by the Proposed Development (Figure 1: Bat Tree 4). As all buildings will be demolished, there is risk of destroying a bat roost within the buildings and/or injuring and/or killing bats. Several scattered trees are likely to be removed from Site; therefore, there is potential for destroying a bat roost within Bat Tree 1 and/or 2 (Figure 1) and/or injuring and/or killing bats within the roosts.

Trees in the broadleaved semi-natural woodland, the ZoI and an unknown number of scattered trees on Site, will not be removed as part of the Proposed Development. However due to the scale of the Proposed Development, there is the potential for the Proposed Development to disturb roosting bats from lighting, noise, and vibration during construction, and from lighting post-development (final lighting plan unconfirmed).

4.5.7 Foraging and Commuting Bats

The Site has Moderate suitability to support foraging and commuting bats. As the timing of the Proposed Development is unknown, there is potential to disturb foraging and commuting bats through noise, additional lighting, vibration and/or pollution.

There will likely be no removal of boundary features commuting corridors and connectivity with the surrounding landscape will be retained. There will be no loss or direct severance of commuting features as the key habitats for commuting bats (broadleaved semi-natural woodland, dense/continuous scrub, and running water) on Site and in the ZoI will not be removed.

The lighting plan for the Proposed Development has not yet been confirmed. In the absence of mitigation, there is potential to disturb light-averse foraging and commuting bats should boundary features or newly created roost

provisions (See Section 5.2) on Site and within the ZoI be lit or light spill onto these features occur as a result of the lighting plan.

4.5.8 Dormouse

Dormouse has the potential to be present within the broadleaved semi-natural woodland trees on Site and within the ZoI, as well as within the dense/continuous scrub in the ZoI to the east of the Site, which are suitable to support nesting, foraging and commuting dormouse.

In the absence of mitigation there is potential for impacts from vegetation management, additional lighting, noise, vibration, and pollution. These impacts may disturb, injure and/or kill dormouse.

4.5.9 Badger

Breeding, foraging, and commuting badger may utilise the broadleaved semi-natural woodland and amenity grassland in the ZoI. Badger are unlikely to be utilising the Site so they will not be directly impacted by the Proposed Development.

As such, badger has the potential to be indirectly impacted by additional lighting, noise, vibration, and/or pollution. These impacts may disturb, injure and/or kill badger.

No setts were found on Site or in ZoI, though the dense/continuous scrub in the ZoI to the east of the Site could not be thoroughly examined (see Limitations). There is potential for sett building habitat to be present in the broadleaved semi-natural woodland within the ZoI to the north of the Site. Therefore, there is a risk of disturbing, damaging, or destroying a badger sett during the Proposed Development.

4.5.10 Otter

Foraging and commuting otter have the potential to utilise the Nant yr Aber River SINC (Figure 1 and Appendix C: TN 1) and the adjacent habitats in the ZoI. Otter are unlikely to be utilising the Site so they are unlikely to be directly impacted by the Proposed Development.

As such, otter has the potential to be indirectly impacted by additional lighting, noise, vibration, and/or pollution. These impacts may disturb, injure and/or kill otter.

4.5.11 Hedgehog

Hedgehog is utilising the hardstanding and amenity grassland on Site, and as such will likely be using the broadleaved semi-natural woodland, scattered scrub, and poor semi-improved grassland, as well as the brash piles on Site. They will likely be utilising the broadleaved semi-natural woodland and dense/continuous scrub, as well as the urban area, in the ZoI.

As such, hedgehog has the potential to be impacted by; loss of commuting and foraging habitat, especially as grassland is not widespread in the wider landscape; by falling into any excavations left open overnight; and, any additional lighting used during the construction and operational phases of the Proposed Development. Additionally, hedgehog could be impacted by a pollution event from the Proposed Development should it spread on Site and into the ZoI to injure and/or kill hedgehog.

4.6 INNPS

Two INNPS species were identified on Site (montbretia and Japanese knotweed) and three INNPS species (montbretia, Japanese knotweed, and Himalayan balsam) were identified in the ZoI. As such, the Proposed Development has potential to spread INNPS through, for example, tracking of machinery and personnel.

5. Further Surveys and Requirements for Mitigation

5.1 Further Surveys

The following further surveys are recommended:

- eDNA survey for GCN in the pond between mid-April and late-June;
- Two dusk emergence surveys and/or endoscopic inspections between May and September, with at least one between May and August, on Building 2 with a PRF of Moderate suitability for roosting bats (Building 2);
- One dusk emergence survey or endoscopic inspection between May and August on each building with PRFs with Low suitability for roosting bats (Buildings 3, 5, 8, and 11);
- At least one endoscopic inspection of PRFs will be required on any bat trees on Site and/or in the ZoI which will be impacted by the Proposed Development. Further inspections will only be required for bat trees where impacts cannot be mitigated by precautionary working methods (PWM); for example if a tree requires felling or will experience unmitigated light spill from the construction and/or operational phase of the Proposed Development. This will depend on the final design of the Proposed Development;
- Bat activity surveys (Site boundaries to north and east):
  - It is recommended that external lighting is designed to avoid light spill onto boundary features including the broadleaved semi-natural woodland, dense scrub, and Nant yr Aber. If light spill can be avoided, no surveys for bat activity will be required. Removal/severance of boundary features is not proposed in the development design. If external lighting will not be designed to avoid impacts in the first instance, then activity surveys will be required. If the surveys find that bats are using these features, which is highly likely, then mitigation will be required. This will include the need to avoid light spill onto the linear features used by bats. Therefore, as per the above, it is recommended that external lighting is designed to avoid light spill in the first instance, to avoid the requirement of bat activity surveys. If surveys are required, as the Site has Moderate suitability to support foraging and commuting bats, the following will need to be undertaken:
  - Seasonal night-time bat walkovers (three surveys total, with one in April/May, one in June/July/August, and one in September/October). It should be noted, as per BCT survey guidance (Collins, 2023), that if these seasonal night-time bat walkovers, or the results of the static detector surveys (below), reveal activity of interest that requires more observation on Site, further night-time bat walkovers may be required; and,
  - Static detector deployment (two statics, one on northern boundary and one on eastern boundary, per month between April to October, inclusive);
- Badger survey (walkover of habitats 30 m from Site boundary to identify badger field signs, particularly setts). It is recommended this survey is conducted in winter when the vegetation will have died back; and,
- Otter survey (100 m upstream and downstream of the Nant yr Aber and suitable habitat 30 m from Site boundary).

As the Proposed Development is still in its early stages, further surveys may be required if the initial designs change.

Results from these further surveys will inform and/or supersede the recommendations for mitigation and enhancement outlined in Sections 5 and 6.

5.2 Requirements for Mitigation

The mitigation hierarchy has been considered and should be implemented when designing the Proposed Development. A summary is provided below.

Mitigation Hierarchy:

1. Avoidance – Seek options that avoid harm to ecological features (for example, by locating on an alternative site or use of technology, or timing to eliminate impact);
2. Mitigation – Negative effects should be avoided or minimised through mitigation measures, either through the design of the project or subsequent measures that can be guaranteed – for example, through a condition or planning obligation;

3. Compensation – Used as last resort to offset impacts; and,
4. Enhancement – Seek to provide net benefits for biodiversity over and above requirements for avoidance, mitigation, or compensation.

5.2.1 Pollution Control During Construction

Pollution control measures as required in the Guidance for Pollution Prevention (GPPs; NetRegs, 2022) and, where these have not been replaced, the Environment Agencies Pollution Prevention Guidelines (PPGs), will be implemented to avoid and minimise adverse effects of pollution and runoff on the surrounding environment.

As of the 17 December 2015 all PPG Documents published by the UK environment agencies were withdrawn. Although they provide useful advice on the management of construction to avoid, minimise and reduce environmental impacts, they should not be relied upon to provide accurate details of the current legal and regulatory requirements and processes. They are referred to in this document alongside other current guidance and in the context of scheme and Site-specific mitigation measures.

Measures will be employed to ensure that dust is minimised during the construction works. Measures will be in place to deal with pollution incidents efficiently including the use of plant nappies, spill kits and personnel trained to use them.

5.2.2 Control of Surface Water During Construction and Operation

The Proposed Development must be designed to control the rate and quality of surface water runoff. Consideration should be given for a system to capture and treat surface water without the need to discharge to watercourses. This is especially necessary given the proximity of the pond and Nant Yr Aber with potential to support breeding amphibians, otter, and/or Protected and Priority fish.

5.2.3 External Lighting

The following recommendations in line with best practice guidance (ILP, 2023) should be incorporated into any new lighting scheme at the Site:

- Light spill onto any new wildlife boxes (see Section 6) must be avoided;
- In the first instance, external lighting must be designed to avoid light spill onto boundary features including woodland edges and Nant yr Aber; and,
- If light spill onto Site boundaries cannot be avoided, this should be limited to levels of 3 Lux or less. If presence of lesser horseshoe bats are confirmed during the activity surveys, light levels on the Site boundaries will likely have to be at or below 0.2 lux on the horizontal plane, and at or below 0.4 lux on the vertical plane as this species is especially light averse.

Suggestions for mitigating external lighting and achieving the lighting recommendations above are outlined in the ILP Bats and Lighting Guidance Note (ILP, 2023) and best practice guidance (Gunnell *et al,* 2012). These include:

- Only light areas which need to be lit and use the minimal level of lighting required to comply with guidance such as Institute of Lighting Engineers Guidance Notes for the Reduction of Obtrusive Light (2021).
- Avoid aesthetic lighting which has no other function, and up lighting of trees and buildings.
- Use the lowest level of illumination required for purpose.
- Where lighting is proposed, use lighting modelling programs to indicate where the light spill will occur.
- 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, low intensity, good colour rendition and dimming capability.
- A warm white spectrum (ideally <2700 Kelvin) should be adopted to reduce blue light component; Avoid neutral white, cool white and blue spectrums of light.
- Light sources should feature peak wavelengths higher than 550 nm to avoid the component of light most disturbing to bats (Stone, 2012).
- Internal luminaires can be recessed (as opposed to using a pendant fitting) 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.
- 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.
- 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.
- Where 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.
- 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.

It is recommended that an ecologist collaborates with an experienced nocturnal wildlife lighting specialist on the lighting plan to ensure guidance regarding bats and lighting are met.

These recommendations will also increase the value of the Site for other nocturnal species, including badger and hedgehog, as well as for bats.

5.2.4 Broadleaved Semi-Natural Woodland

To prevent damage to the mature trees within the broadleaved semi-natural woodland on Site and in the ZoI, tracking of vehicles or storage of materials should not occur within the RPA of the trees (equal to 12 times the radius of a tree's diameter).

5.2.5 Line of Trees

To prevent damage to the mature trees within the line of trees on Site, tracking of vehicles or storage of materials should not occur within the RPA of the trees.

5.2.6 Scattered Trees

To compensate for the loss of scattered trees on Site, at least three times the number of trees felled should be planted, preferably on Site.

To prevent damage to the retained mature scattered trees on Site, tracking of vehicles or storage of materials should not occur within the RPA of the trees.

5.2.7 Scattered Scrub

To compensate for the loss of scattered scrub on Site, new species rich grass, hedge, and/or tree planting is recommended to be incorporated into the Proposed Development to have an overall beneficial impact on biodiversity levels within the Site.

5.2.8 Poor Semi-Improved Grassland

Retained poor semi-improved grassland on Site should be protected during construction to avoid damage; no tracking of vehicles or storage of materials should occur on the poor semi-improved grassland.

5.2.9 Standing Water

During construction, the pond must be fenced off from the works area and no material or machinery must be stored in its vicinity to reduce the chance of it becoming polluted.

5.2.10 Amenity Grassland

To compensate for the loss of amenity grassland on Site, new species rich planting and/or a green roof/living wall is recommended to be incorporated into the Proposed Development to have an overall beneficial impact on biodiversity levels within the Site.

Any retained amenity grassland on Site should be protected during construction to avoid damage; no tracking of vehicles or storage of materials should occur on the amenity grassland.

5.2.11 Ephemeral-Short Perennial

To compensate for the loss of ephemeral-short perennial vegetation on Site, new species rich grassland planting and/or a green roof/living wall is recommended to be incorporated into the Proposed Development to have an overall beneficial impact on biodiversity levels within the Site.

5.2.12 Intact Species-Poor Hedge

To compensate for the loss of the intact species-poor hedge on Site, a new species rich hedge and/or a green corridor is recommended to be incorporated into the Proposed Development to have an overall beneficial impact on biodiversity levels within the Site.

5.2.13 Fences

Any new fences on Site should have suitably sized gaps to allow the movement of common toad, common lizard, slow-worms, and hedgehogs across the Site. For hedgehogs, the recommended gap size is 13 by 13 cm (Hedgehog Street, 2023) which would be suitable for all species.

5.2.14 Invertebrates

Mitigation for broadleaved semi-natural woodland, lines of trees, scattered trees, scattered scrub, poor semi-improved grassland, the pond, and amenity grassland as outlined in Sections 5.2.4 to 5.2.10.

Grassland and scrub should be cleared in the summer in a directional manner, so that any invertebrates are active and able to be pushed towards retained habitats.

Throughout the Proposed Development, light spill must be avoided on retained habitat suitable for invertebrates, including the Nant yr Aber.

5.2.15 Fish

If activities involving significant vibration are required which will impact the Nant yr Aber River SINC and its resident and migratory fish species, these activities must not be undertaken between the beginning of September and 15 May inclusive. This period covers the migratory fish embargo period (15 October to 15 May inclusive), which has been extended in this case to include how brown trout and Atlantic salmon can migrate and spawn in September, and the spawning period of bullhead (February to April).

Throughout the Proposed Development, light spill must be avoided on the Nant yr Aber.

5.2.16 GCN and Common Toad

Mitigation for broadleaved semi-natural woodland, poor semi-improved grassland, and the pond as outlined in Sections 5.2.4, 5.2.8 and, 5.2.9.

Additional mitigation for GCN may be required following the further survey requirement in Section 5.1.

5.2.17 Common Lizard and Slow-Worm

Mitigation for broadleaved semi-natural woodland, poor semi-improved grassland, and amenity grassland as outlined in Sections 5.2.4, 5.2.8 and, 5.2.10.

Grassland should be cleared between April and September, when temperatures are consistently above 10°C, in a directional manner, so that any common lizards and slow-worms are active and pushed towards retained grassland habitats to the east of the Site and in the ZoI.

If soil stripping of grassland or removal of the brash piles is required, a technical oversight watching brief by an ecologist required in order to identify and rescue any common lizards and slow-worms during the works. Any common lizards and slow-worms discovered will be moved to retained grassland habitat to the east of the Site and in the ZoI.

5.2.18 Breeding Birds

The Proposed Development will likely require removal of several scattered trees, the majority of scattered scrub, and species-poor intact hedge on Site which are suitable to support breeding birds. To protect breeding birds, any vegetation clearance should be undertaken outside of the breeding bird season where possible (works completed between October and February inclusive).

If any vegetation clearance or construction of the Proposed Development is to begin during the breeding bird season (March-September inclusive), for example the clearing of scattered scrub under mitigation for invertebrates, an ecologist must be consulted; a breeding bird check must be undertaken immediately prior to the Proposed Development commencing. If breeding birds are present, then a species-specific buffer must be applied around the nest site and left undisturbed until chicks have fledged. This can take up to 8 weeks.

Disturbance close to vegetated areas suitable to support breeding birds must be avoided during the breeding bird season. If a nest is subsequently discovered during the construction phase of the Proposed Development, a species-specific buffer must be applied to avoid damage or disturbance of nests.

5.2.19 Bats

Trees with PRFs which are to be retained must not be exposed to light spill exceeding 3 Lux and a dark corridor must lead from them to either the north or eastern boundaries of the Site to ensure no roosting bats are disturbed by light.

Additional mitigation for bats may be required following the further survey requirement in Section 5.1.

5.2.20 Dormouse

A pre-works check for dormouse is required within the broadleaved semi-natural woodland to the southwest of the Site. This will involve a search for dormouse and their field signs, including nests, through the understorey. The pre-works check must occur immediately prior to the commencement of the Proposed Development.

If a dormouse is found, any aspect of the Proposed Development that may indirectly impact the dormouse must not proceed. A EPSML may be required in discussion with NRW to allow those aspects of the Proposed Development to proceed.

5.2.21 Badger

Excavations should be covered overnight, or ramps installed so trapped badgers can escape.

No additional mitigation is currently required. This may be updated following the further survey requirement in Section 5.1.

5.2.22 Otter

No additional mitigation is currently required. This may be updated following the further survey requirement in Section 5.1.

5.2.23 Hedgehog

Prior to any vegetation clearance of the scrub and removal of brash piles, these habitats should be checked for sheltering hedgehog to avoid injuring or killing hedgehogs. If a hedgehog is discovered, they should be moved to a safe location prior to the Proposed Development starting.

Excavations should be covered overnight, or ramps installed so trapped hedgehogs can escape.

Any fences - refurbished, replaced, or newly installed - should have gaps at their bases, at least 13 by 13 cm (Hedgehog Street, 2023), for hedgehog to facilitate commuting through the Proposed Development.

5.2.24 INNPS

Prior to the works commencing, it is strongly recommended that all INNPS on Site are removed to prevent further spread and eradicate risk of spreading these INNPS off Site during the Proposed Development, which is an offence under the WCA 1981. The procedure for INNPS removal can be detailed in an INNPS Management Plan.

6. Recommendations for Enhancements

The National Planning Policy Framework for Wales (February 2021) and the Environment (Wales) Act 2016, requires that developments enhance biodiversity, as well as just mitigating impacts. These will also need to be considered and included in the development design wherever possible as part of the BREEAM Ecology assessment.

Recommendations have been made to make the most of proposed landscape planting on Site to benefit biodiversity.

6.1 Species-Rich Grassland

Retained and new areas of grassland could be planted and managed to enhance species diversity. These areas must be mown once a year after species have flowered and set their seed. The timing of this mowing will depend on the species present and weather conditions.

http://wildseed.co.uk/page/management-of-meadows-and-grassland has more details on how to manage species-rich grasslands. Arisings must be removed following cutting.

It has been assumed that the topsoil will be derived from on the Site. The seed mixes used must be appropriate for the subsoil type used and need to be approved by a SQE prior to use. For species-rich grassland, nutrient poor soil is essential for its success. Areas must be sown with a diverse lawn mix such as:

- Emorsgate General Purpose Meadow Mixture EM2 (18 species) (www.wildseed.co.uk); or,
- Germinal (formally British Seed Houses) WFG20 Eco Species Rich Lawn (34 species) (https://www.germinal.com).

The grassland must be managed with no pesticides, herbicides, or fertilisers for the benefit of wildlife.

For more information including flower colour, benefits to wildlife and soil type for various species see Wildflower Meadows: How to Create One in Your Garden (Natural England, 2017), available online.

6.2 Green Living Roof and/or Living Wall

Incorporate a ‘green’ or ’living’ roof and/or wall into the design of the new buildings to provide benefit to wildlife.

Green roofs and walls come in various forms and have numerous benefits including thermal and acoustic insulation and protection of roof surfaces, as well as aesthetic and ecological benefits.

The final specification for the green roof or green wall should be checked by a structural engineer before implementation.

6.3 Green Corridors

Any landscape planting proposed must seek to create or enhance ‘green corridors’ which provide new connectivity across or around the Site to help wildlife move through the local landscape such as birds, bats, and invertebrates. The green corridors must be created/enhanced along the Site boundaries to facilitate connectivity to the wider landscape. The green corridors must also facilitate connectivity from new bat roost (6.6) and bird breeding (6.5) provision on Site to the wider landscape. Green corridors can include lines of trees and hedges.

The planting scheme of new features must be of locally sourced native species of benefit to wildlife and should include tree species. Gunnell *et al.* (2012) ‘Landscape and Urban Design’ (free to download) has suggested planting lists which are of benefit to invertebrates.

6.4 Insect Habitats

At least two of a combination of insect walls, insect boxes, bee banks and dead wood piles could be included in the landscape design to provide shelter and hibernating habitat for a range of insects. These must be installed in areas adjacent to suitable habitat like the broadleaved semi-natural woodland. Eco-bricks could also be installed within the new buildings.

The insect wall must be carefully designed and maintained, since poorly designed and maintained insect houses or walls can kill off the insects designed to inhabit them through parasites and mould. It is recommended that properly designed insect houses are used, such as those available from Nurturing Nature (http://nurturing-

nature.co.uk/wild-bee-nest-boxes/) rather than those available from garden centres which often are not suitable for insect species found in the UK.

Alternatively, a bee bank could be built using excess spoil created during the works. The bee bank provides warm, sheltered, patches of bare ground where solitary bees can nest. The bee bank must be in a sunny location sheltered from the weather and be orientated to face south or southeast. A crescent shape allows bees to make use of varying microclimates. The surrounding areas of habitat must provide a rich nectar and pollen source so must be planted with wildflowers or native shrub planting. Advice on creating and maintaining a bee bank is provided here: https://www.buglife.org.uk/creating-a-bee-bank

Dead wood piles are of benefit to beetles, spiders, woodlice, centipedes, ants, and earthworms. Logs could be stacked in associated with the swale. Burying some logs will create a range of suitable habitats. Advice on creating a dead wood pile is provided here:

https://www.buglife.org.uk/sites/default/files/Deadwood%20for%20beetles_0.pdf

Full instructions for the management of the insect walls or boxes will be provided by the manufacturer.

The planting scheme of new features should be of locally sourced native species of benefit to wildlife. Gunnell *et al*. (2012) 'Landscape and Urban Design' (free to download) has suggested planting lists which are of benefit to invertebrates.

6.5 Hibernacula for Reptile and Amphibians

Log piles, brash piles, and rock piles must be placed in and/or adjacent to suitable reptile and amphibian habitats, including the pond and species-rich grasslands, which can be advised by an ecologist. Log and brash piles will also benefit hedgehogs.

Gaps must be left under fences (i.e. not flush with the ground) to facilitate the movement of reptiles and amphibians across the Site.

6.6 Bird Boxes

It is recommended that at least three bird boxes are incorporated into the building design and at least two boxes are installed on the trees on Site.

Boxes suitable for swift and house sparrow would be suitable on the building, as habitat suitable for these species is often lost in modern building design.

Swift Conservation provides advice on design and location of swift boxes, available at http://www.swift-conservation.org/Nestboxes%26Attraction.htm. The RSPB provides advice on sparrow nest box design and fitting available from https://www.rspb.org.uk/get-involved/activities/give-nature-a-home-in-your-garden/garden-activities/createasparrowstreet/. Sparrows are communal nesters so benefit from having several boxes in proximity or adjoining boxes.

A range of boxes for passerine species would be suitable to use on trees including small boxes, large boxes, boxes with holes entrances or open fronted boxes. Advice on box design and locating boxes is provided by the British Trust of Ornithology https://www.bto.org/about-birds/nnbw/make-a-nest-box.

Bird boxes must be appropriately located at least 4 m above ground level, and out of reach of predators. Bird boxes must not be positioned to face south, to avoid hot sun.

6.7 Bat Boxes

It is recommended that at least two bat boxes are included in the new building design. The addition of bat boxes will increase bat roosting opportunities in the local area and have a positive impact on biodiversity at the Site and local level.

Biodiversity for Low and Zero Carbon Buildings: A Technical Guide for New Builds (Williams, 2010) suggests various ways of including a roost void compliant with Building Regulations within a variety of modern structures.

Products such as cavity bat boxes, bat bricks and bat tiles could also be utilised to match external fabrics. Alternatively, roost space could be provided by fitting pre-made bat boxes to the external face of the new building. The choice of bat box must be suitable for crevice dwelling species.

All new roost provision must be situated away from light spill, with clear flight paths towards corridors and foraging suitable to be used by bats, especially the broadleaved semi-natural woodland and Nant yr Aber on the eastern

and northern Site boundaries. Advice from a suitable qualified ecologist must be sought when drawing up the specifications for bat roosts and locations. Bat boxes must be positioned at least 4 m above ground level to protect any resident bats from disturbance or predation by domestic pets. Each box can be positioned with a different orientation between southeast and southwest to provide a range of microclimate options.

6.8 Dormouse Boxes

Dormouse boxes, such as those available through Natural History Book Service (NHBS) (https://www.nhbs.com/standard-dormouse-nest-box) could be installed within the southwest broadleaved semi-natural woodland to encourage the use of the Site by dormouse.

The dormouse boxes must be positioned approximately 2.5 m above ground, to reduce the risk of disturbance by staff and students, on mature trees, with the hole facing inwards to reduce occupation by birds. The dormouse boxes should be installed in parts of the broadleaved semi-natural woodland that experience less frequent disturbance by staff and students such as by the Site boundary and areas away from seating for the forest school.

6.9 Hedgehog Houses

Habitats could be enhanced, and new provisions provided for hedgehogs to shelter. This would include provision of at least two log piles, leaf piles and/or purpose-built or ready-made purchased hedgehog house. Guidance on building hedgehog houses is provided by the Wildlife Trust, which could be incorporated into a design technology project https://www.wildlifetrusts.org/sites/default/files/2018-05/Hedgehogsml.jpg.

Log piles, leaf piles and hedgehog houses should be placed in and/or adjacent to suitable hedgehog habitats, including broadleaved semi-natural woodland and species-rich grasslands, which can be advised by an ecologist. Log and brash piles will also benefit reptiles and amphibians.

Habitats for hedgehogs could be enhanced by leaving strips of grassland unmown around the edges of the Site and adjacent to suitable areas of habitat including broadleaved semi-natural woodland.

New fences on and around the Site should have gaps underneath them to allow hedgehogs to commute on and off-Site.

7. Ecosystem Resilience (Section 2 Environment (Wales) Act 2016)

The Environment (Wales) Act 2016 states a duty to maintain and enhance biodiversity as well as to promote the resilience of ecosystems. As such, it is vital that new developments ensure new and existing habitats are resilient to pressures and changes from the variety of threats to biodiversity, including the fragmentation of habitats and climate change. This will allow habitats to persist in the long term for the benefit of biodiversity and people. Examples of how new and existing habitats can be made more resilient include:

- Planting native species suitable to the local context and in relation to climate change. This way they are likely to remain to be locally suitable within the next 25 to 50 years;
- Designing the landscaping at the Site to promote local landscape connectivity and create a mosaic of habitats on the Site where feasible. This includes creating green corridors where possible and minimising external light spill onto these corridors; and,
- Increasing the number of species present on Site. More biodiverse habitats are generally more resilient to change.

8. BREEAM Landscape and Ecology Assessment

Opportunities for BREEAM Credits and Ecological Enhancement are discussed within Sections 9, 10, 11 and 12 along with recommendations for the mitigation and protection of legally protected species within the Site.

The BREEAM Issues covered by these sections are LE02, LE03, LE04 and LE05. The potential for gaining credits under each Issue is discussed.

8.1.1 Summary of BREEAM Credits

The following table summarise the potential credits considered to be achievable. Achieving these credits will require the client and contractors to implement the report's recommendations. Liaison between ecologists and the architects will also be required.

Table 8-1 Ecological Credits Available Based on the Current Development Plan

Issue	Total Available	Credits Likely Achievable
LE02	3	3*
LE03	3	3**
LE04	5	5^{+}
LE05	2	2^{++}
LE Total	13	13

Notes:

* LE02 Achieving the first and second credits is dependent on recommendations being implemented by the client/contractor. Achieving the third credit is dependent on the determination of the criteria under HE 07, Pol 03 and Pol 05.

** LE03 Achieving the first credit is dependent on recommendations being implemented by the client/contractor. As the design is still in its early stages, the credit under Criterion 8a is achievable and will depend on the recommendations for enhancement being implemented, in particular the inclusion of new habitats such as species-rich grassland or a green roof/living wall.

$^{+}$ LE04 Achieving the first credit is dependent on recommendations being implemented by the client/contractor. At the design is in its early stages, it is possible to achieve significant net gain of ecological value especially with the inclusion of new and/or species-rich habitats to compensate for loss of habitats and to increase the green infrastructure on Site.

$^{++}$LE05 Commitment is required from the client/contractor to meet the prerequisites under LE05. It is likely that the two credits under LE05 will be achievable.

Credits will be confirmed once a detailed Site plan including final landscape design has been issued.

9. BREEAM LE02: Identifying and Understanding the Risks and Opportunities for the Project

9.1 Survey and Evaluation (One Credit)

- Criterion 3: Two ecologists were appointed in September 2023 to undertake a Phase 1 Habitat Survey and prepare a PEA report (Section 1 to 7). A SQE has reviewed and verified the Phase 1 Habitat Survey and PEA report (Appendix E). The information in the PEA report was used to help inform the detailed design of the Proposed Development.
- Criterion 4: Two ecologists have undertaken a Phase 1 Habitat Survey resulting in the PEA report which includes the baseline data and considers the ZoI. This has been reviewed and verified by SQEs (Appendix E).

Criteria 5a, 5b and 5c: The PEA report includes an assessment of the potential impacts of the Proposed Development (AECOM (2023); see Figure 2) on ecological receptors within the Site; and makes recommendations for ecological enhancement of the Site post-development. The PEA report has been shared with the project team and will be used to inform Site preparation, design and construction works.

This credit can be awarded.

9.2 Determining the Ecological Outcomes for the Site (One Credit)

- Criterion 6: Criteria 3 – 5 under Survey and Evaluation have been achieved.
- Criterion 7: SQEs have, and will continue to, liaise, and collaborate with the design team and County Ecologist to identify the optimal ecological outcome for the Site. These actions are detailed in Section 5 and 6 of this report.
  - The SQEs identified measures early in the project process to influence the ecological outcome of the Site as part of the PEA and paid due regard to the Mitigation Hierarchy in the CIEEM guidelines for PEA (CIEEM, 2017). This is detailed in Section 5 and 6 of this report.
  - The optimal outcome for the Site has been recommended in the PEA (Sections 5 and 6) which was passed to the project team through this report. For this Site the optimal outcome is recommended to be:
    - Further surveys of the specific habitats/species to inform the Proposed Development (see Section 5.1 for details; required mitigation);
    - Pollution and surface water control during construction and/or operation (required mitigation);
    - External lighting design that is sensitive to the surroundings and promotes ‘darker’ areas for wildlife (required mitigation);
    - Protection of retained habitat, including the RPA of the broadleaved semi-natural woodland (required mitigation);
    - Works that may cause significant vibration to reach Nant yr Aber, for example piling, must not be undertaken between the beginning of September and 15 May inclusive;
    - Directional removal of grassland and scrub in the summer to encourage invertebrates, common lizard, and slow-worm to move towards retained habitats (required mitigation);
    - Pre-works checks for dormouse, and hedgehog (required mitigation);
    - Watching brief for common lizard and slow-worm if soil stripping of grassland is required, and for hedgehog when dismantling brash piles (required mitigation);
    - Avoidance of works during the breeding bird season where possible, or a pre-works check for birds and application of a protective species-specific buffer if not (required mitigation);
    - Removal of INNPS, preferably, prior to the Proposed Development (required mitigation):
    - Planting of species-rich grassland (required enhancement);
    - Incorporation of a green roof and/or living wall into the new building (required enhancement);
    - Planting/enhancing green corridors, which could include line of trees and hedgerows along presently unvegetated boundaries of the Site (required enhancement);

- Installation of at least two insect walls and/or boxes, bee banks and/or dead wood piles (recommended enhancement);
- Installation of at least three bird boxes on the new buildings and adjacent/new trees to benefit common passerine species (recommended enhancement);
- Installation of at least two bat boxes within the new buildings (recommended enhancement);
- Installation of at least two dormouse nest boxes within the southwestern broadleaved semi-natural woodland on Site (recommended enhancement);
- Installation of at least two log piles, leaf piles and/or purpose built/ready-made hedgehog houses (recommended enhancement); and,
- Ongoing management of the Site to benefit biodiversity.

It is likely this credit can be awarded. All mitigation measures and recommendations for enhancement must be followed to achieve this credit. Mitigation measures and recommendations may change following results from further surveys.

9.3 Exemplary Level Criteria (One Credit)

To achieve this credit the following must be achieved:

- Criterion 8: Criterion 7 must be achieved to enable this Exemplary Level Criteria Credit to be available;
- Criterion 9: Wider Site sustainability-related activities and the potential for ecosystem related benefits should be considered, including as a minimum landscape, health and wellbeing, resilience, infrastructure, and community and end user involvement; and,
- Criterion 10 - Achievement of the credits of the following assessment issues:
  - HE 07 Safe and Healthy Surroundings (both credits);
  - Pol 03 Flood and Surface Water Management: achieve credits for ‘Surface water run-off’, and ‘Minimising watercourse pollution’; and,
  - Pol 05 Reduction of Noise Pollution.

The achievement of the Exemplary Level Criteria Credit will require input from the SQE into the detailed design. It will be determined once the detailed design has been confirmed and on the determination of the credits achieved under HE 07, Pol 03 and Pol 05.

This credit is potentially available, dependent on the fulfilment of Criteria 9 and 10.

10. BREEAM LE03 Managing Negative Impacts on Ecology

10.1 Prerequisite – Identification and Understanding the Risks and Opportunities for the Site

To make the credits under LE03 available the following prerequisite Criteria must be achieved:

- Criterion 1: LE02 must be achieved.

At least one credit under LE02 can be achieved; therefore, credits under LE03 are available.

10.2 Planning, Liaison, Implementation and Data (One Credit)

- Criterion 2: SQEs have the role and responsibility of defining the potential negative impacts on ecology. This is provided in the PEA report (Sections 1 to 7). Recommendations for further surveys, mitigation, and enhancements made by SQEs are provided in the PEA report (Sections 5 and 6) and are summarised in Section 9.2. The Project Manager is responsible for informing the design team of ecological features at an early enough stage to influence the Preparation and Brief of Concept Design. This will be determined by the Project Manager and the BREEAM Assessor.
- Criterion 3: Potential impacts of the Proposed Development, including construction works, have been assessed and requirements for mitigation ad recommendations for enhancement have been made with regard to Protected and Priority species on Site. This is detailed in provided in the PEA report (Sections 5 and 6) and is summarised in Section 9.2.
- Criterion 4: SQEs have proposed solutions and measures (avoidance and mitigation) to be implemented during Site preparation and construction works as part of the PEA report. These solutions were passed on to the project team via submission of this report. These are summarised in Section 9.2.

This credit can be awarded.

10.3 Managing Negative Impacts of the Project (up to Two Credits)

To achieve this credit the following must be achieved:

- Criterion 7: Criteria 2 – 4 must be achieved to enable these two credits to be available.
- Criterion 8: Negative impacts from Site preparation and construction works will be managed according to the hierarchy and either:
  - Criterion 8a: No overall loss of ecological value has occurred under LE04 (2 credits),
  - OR
  - Criterion 8b: The loss of ecological value has been minimised under LE04 (1 Credit).

Recommendations to avoid and minimise ecological impacts are provided in the PEA report (Sections 1 to 7) and are summarised in Section 9.2.

As the design is still in its very early stages (AECOM, 2023), it is possible that both credits under Criterion 8a can be achieved, especially as the Site is dominated by buildings, hardstanding, and amenity grassland. This will depend on the recommendations for enhancement being implemented, in particular the inclusion of new habitats such as species-rich grassland.

11. BREEAM LE04: Change and Enhancement of Ecological Value

11.1 Prerequisite – Managing Negative Impacts on Ecology

To make the credits under LE04 available the following prerequisite criteria must be achieved:

- Criterion 1: Under LE03, Criterion 8 must have been achieved.

As the design is still in the early stages, it is possible that at least one Criterion 8 credit under LE03 can be achieved.

- Criterion 2: The client or contractor confirms compliance is monitored against all relevant UK, EU or international legislation relating to the ecology of the Site.

The meeting of statutory obligations by the client or contractor underpins the awarding of the credits under LE02 and subsequent credits. Statutory obligations have been met to make this credit under LE04 available.

It is considered likely that these prerequisites can be achieved once the client commits to implementing the required mitigation and the majority of the recommendations for enhancements as summarised in Section 9.2; therefore, credits under LE04 are discussed below.

11.2 Liaison, Implementation and Data Collation (One Credit)

This credit can be achieved when the client has committed to achieving the following:

- Criterion 4: The project team, liaising and collaborating with representative stakeholders and taking into consideration data collated and shared, have implemented the solutions and measures selected in a way that enhances ecological value in the following order:
  - On Site, and where this is not feasible,
  - Off site within the ZoI.

A list of recommended enhancements to be made are provided in the PEA report (Section 6).

- Criterion 5: The data collected as part of the ecological surveys will be submitted to SEWBReC by the SQE at the end of the Project. Data submitted will be limited to records of Protected or Priority species only.

This credit is achievable once the client commits to implement the biodiversity recommendations for mitigation and enhancement as summarised in Section 9.2.

11.3 Change and Enhancement of Ecology (up to Three Credits)

- Criteria 6: Up to three credits can be awarded dependent on the calculation of the change in ecological Biodiversity Units as result of the Proposed Development.

Credits are awarded as follows:

- Criteria 6.a Minimising loss of ecological value (one credit - percentage score of 75-94);
- Criteria 6.b No net loss of ecological value (two credits - percentage score of 95-104); and,
- Criteria 6.c Net gain of ecological value (three credits - percentage score of greater than 105).

Tables 11.1 – 11.2 below show the Biodiversity Unit calculations (BREEAM UK, 2018b) for ‘habitat areas’.

Tables 11.3 – 11.4 below show the Biodiversity Unit calculations for ‘linear (foliage) habitats’.

These tables use the Phase 1 Habitat survey map (Figure 1). However, as no preliminary Site layout is currently available, it is not possible to calculate post-development Biodiversity units. As such no Percentage Change in Area and Linear Biodiversity Units have been calculated.

There are no watercourses habitats on Site and as such no Biodiversity Unit calculations (BREEAM UK, 2018b) have been undertaken for watercourses.

As the design is still in the early stages, it is feasible to achieve all three credits under Criterion 6c with the inclusion of new and/or species-rich habitats, for example species-rich grassland and/or green roof/living wall. The achievement of this/these credit/s will require collaboration between the SQE, stakeholders, project managers, and the design team (including architects and landscape architects).

11.4 Exemplary Level Criteria

- Criterion 7: The change in ecological value occurring is calculated in accordance with the process set out in GN36 - BREEAM, CEEQUAL and HQM Ecology Calculation Methodology – Route 2 (BREEAM UK, 2018b). The credit is awarded as follows:
  - Criterion 7.a Significant net gain of ecological value (percentage score of 110 or above).

To achieve one Exemplary Level Criteria credit there must be a significant net gain of ecological value (percentage score of 110 or above).

As the design is still in the early stages, and the Site is currently dominated by buildings, hardstanding, and amenity grassland, it is feasible to achieve all three credits under Criterion 7a with the inclusion of new and/or species-rich habitats, for example species-rich grassland and/or green roof/living wall. The achievement of this/these credit/s will require collaboration between the SQE, stakeholders, project managers, and the design team (including architects and landscape architects).

Table 11-1 Total Pre-Development Area Biodiversity Units Calculation Formula

Calculation	Values
Total Post-Dev Area Biodiversity Units for the Proposed Development (G) **G = (B - D) + (E+F)** Where:	TBC*
B = Total Pre-Dev Area Biodiversity Units	44,253.70
D = Total Post-Dev Area Biodiversity Units Lost Due to Proposed Development	TBC*
E = Post-Dev Area Biodiversity Units Created Due to Proposed Development	TBC*
F = Post-Dev Area Biodiversity Units Enhanced Due to Proposed Development	TBC*
Percentage Change in Area Biodiversity Units = (G ÷ B) x 100	TBC*

*calculations could not be completed as no detailed post-development plan was available at the time of writing.

Table 11-2 Area-Based Biodiversity Units Pre-Development (B)

Parcel Number	Habitat Type	Distinctiveness	Condition	Area (m^2)	Biodiversity Units
1	Broadleaved semi-natural woodland	Medium	Moderate	1182.50	9460.00
2	Scattered trees	Medium	Moderate	186.60	1492.80
3	Scattered scrub	Low	Poor	298.69	597.38
4	Poor semi-improved grassland	Low	Poor	1080.75	2161.50
5	Standing water	High	Moderate	26.59	319.08
6	Amenity grassland	Low	Poor	14137.37	28,274.74
7	Ephemeral-short perennial	Low	Poor	23.99	47.98
8	Buildings	NA	NA	2868.76	0
9	Bare ground	Low	Poor	950.11	1900.22
10	Hardstanding	NA	NA	5160.31	0
11	Other habitat – astroturf, wet pour, and wooden decking	NA	NA	178.36	0
TOTAL				26,094.03	44,253.70

Table 11-3 Linear Habitats - Percentage Change in Biodiversity Units

Calculation	Values
Total Post-D Linear Biodiversity Units for the Development (G) **G = (B - D) + F** Where:	TBC*
B = Total Pre-D Linear Biodiversity Units	118.60
D = Total Post-D Linear Biodiversity Units Lost Due to Development	TBC*
F = Total Post-D Linear Biodiversity Units Created and/or Enhanced Due to Development	TBC*
Percentage Change in Linear Biodiversity Units = (G ÷ B)	TBC*

*calculations could not be completed as no detailed post-development plan was available at the time of writing.

Table 11-4 Linear-Based (Foliage) Biodiversity Units Pre-Development (B)

Parcel Number	Habitat Type	Length (m)	Condition	Biodiversity Units
12	Line of Trees	17.00	Moderate	34.00
13	Intact Species-poor Hedge	10.10	Poor	10.10
14	Line of Scrub	74.50	Poor	74.50
TOTAL		**101.60**		**118.60**

12. BREEAM LE05: Long Term Ecology Management and Maintenance

12.1 Prerequisite – Roles and Responsibilities, implementation, Statutory Obligations

For the credits under LE05 to be available, the following prerequisite Criteria must first be achieved:

- Criterion 1: The client or contractor confirms that compliance is being monitored against all relevant UK, EU and international standards relating to the ecology of the Site.
- Criterion 2: Under LE03, criteria 2-3 have been achieved and at least one credit under LE04 for 'Change and Enhancement of Ecology' has been awarded.

Of the prerequisites, Criteria 1 and 2 can be achieved. The first credit under LE04 'Change and Enhancement of Ecology' can be achieved, and likely the remaining two credits under Criterion 6 as well once the client commits to implementing the majority of the recommended enhancements.

These prerequisites can likely be achieved and therefore the credits under LE05 can be made available. These are discussed below.

12.2 Planning, Liaison, Data, Monitoring and Review Management and Maintenance (One Credit)

This credit can be achieved when the client has committed to achieving the following:

- Criterion 3: The project team liaise and collaborate with representative stakeholders, taking into consideration data collated and shared, on solutions and measures implemented to:
  - 3.a Monitor and review the effectiveness with which the plans for LE03 and LE04 are implemented.
  - 3.b Develop and review management and maintenance solutions, actions, or measures.
- Criterion 4: In support of the above, and to help ensure their continued relevance over the period of the project, the following should be considered:
  - 4.a Monitoring and reporting of the ecological outcomes for Site implemented at the design and construction stage.
  - 4.b Monitoring and reporting of outcomes and successes from the project.
  - 4.c Arrangements for the ongoing management of landscape and habitat connected to the project (on and, where relevant, off-Site).
  - 4.d Maintaining the ecological value of the Site and its relationship or connection to its ZoI.
  - 4.e Maintaining the Site in line with any sustainability linked activities, e.g., ecosystems benefits (LE 02).
  - 4.f Remedial or other management actions are carried out which relate to those identified in LE02, LE03 and LE04.
- Criterion 5: As part of the tenant or building owner information supplied, include a section on Ecology and Biodiversity to inform the owner or occupant of local ecological features, value, and biodiversity on or near the Site.
- Criterion 6: The Landscape and Habitat Management Plan (LHMP) or similar is updated as appropriate to support maintenance of the ecological value of the Site.

It is possible that this credit will be achievable once the client commits to implementing the Criteria above, including the commitment to having a LHMP, and meets the requirements for the prerequisites in relation to LE04.

It is **important the client maintains good record keeping** throughout the project such as file notes, photos, Site diary, documents, email etc. to be able to be able to demonstrate that the measures have been completed.

12.3 Landscape and Habitat Management Plan Development (One Credit)

- Criterion 6: The LHMP, or equivalent, is developed in accordance with BS 42020:2013 Section 11.1 (BS, 2013), covering as a minimum the first five years after project completion and includes:

  6.a Actions and responsibilities, prior to handover, to give to relevant individuals.

  6.b The ecological value and condition of the Site over the Proposed Development life.

  6.c Identification of opportunities for ongoing alignment with activities external to the Proposed Development project and which supports the aims of BREEAM's Strategic Ecology Framework.

  6.d Identification and guidance to trigger appropriate remedial actions to address previously unforeseen impacts.

  6.e Clearly defined and allocated roles and responsibilities.

- Criterion 7: The LHMP or similar is updated as appropriate to support maintenance of the ecological value of the Site.

Although it is possible to produce a full five-year LHMP at the Design Stage, the document may need substantial revision by the operation stage (when it is handed over to the occupier). A more efficient method that is possible under the BREEAM process is to provide ‘a copy of the specification requiring the development of the plan and outlining the scope of its content’ at the Design Stage, followed by the full five-year LHMP once the landscaping plan has been finalised. The LHMP will be produced in accordance with BS 42020:2013 Section 11.1 (BS, 2013) and a suggested format is included in Appendix F.

This credit is achievable, when the client commits to having a LHMP and meets the requirements for the prerequisites in relation to LE04.

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Figure 1: Phase 1 Habitat Map

Revision: 0 Drawn: ID Checked: AM Approved: RB Date: 2023-11-22

AECOM

PROJECT

Plasyfelin Primary School

CLIENT

Caerphilly County Borough Council

CONSULTANT

AECOM Limited
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LEGEND

- Site Boundary
- Zone of Influence Boundary
- Target Note
- Scrub - scattered
- Broadleaved parkland/scattered trees
- Potential Roost Features
- Running water
- Intact hedge - species-poor
- Fence
- Wall
- Broadleaved woodland - semi-natural
- Scrub - dense/continuous
- SI Poor semi-improved grassland
- Standing water
- A Cultivated/disturbed land - amenity grassland
- Cultivated/disturbed land - ephemeral/short perennial
- Buildings
- Bare ground
- Hardstanding
- Astroturf
- Wetpour
- Wood decking
- No Access

NOTES

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ISSUE PURPOSE

FINAL

PROJECT NUMBER

60717337

FIGURE TITLE

Plasyfelin Primary School: Phase 1 Habitat and Preliminary Roost Appraisal Map

FIGURE NUMBER

Figure 1

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Revision: 0 Drawn: ID Checked: AM Approved: RB Date: 2023-11-22

AECOM

PROJECT

Plasyfelin Primary School

CLIENT

Caerphilly County Borough Council

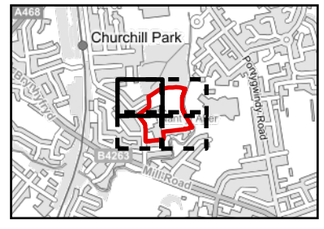
CONSULTANT

AECOM Limited
Portwall Place, Portwall Lane
Bristol BS1 6NA
www.aecom.com

LEGEND

- Site Boundary
- Zone of Influence Boundary
- Target Note
- Scrub - scattered
- Broadleaved parkland/scattered trees
- Potential Roost Features
- Intact hedge - species-poor
- Fence
- Broadleaved woodland - semi-natural
- A — Cultivated/disturbed land - amenity grassland
- Cultivated/disturbed land - ephemeral/ short perennial
- Buildings
- Bare ground
- Hardstanding
- No Access

NOTES



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PROJECT NUMBER

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FIGURE TITLE

Plasyfelin Primary School: Phase 1 Habitat and Preliminary Roost Appraisal Map

FIGURE NUMBER

Figure 1a

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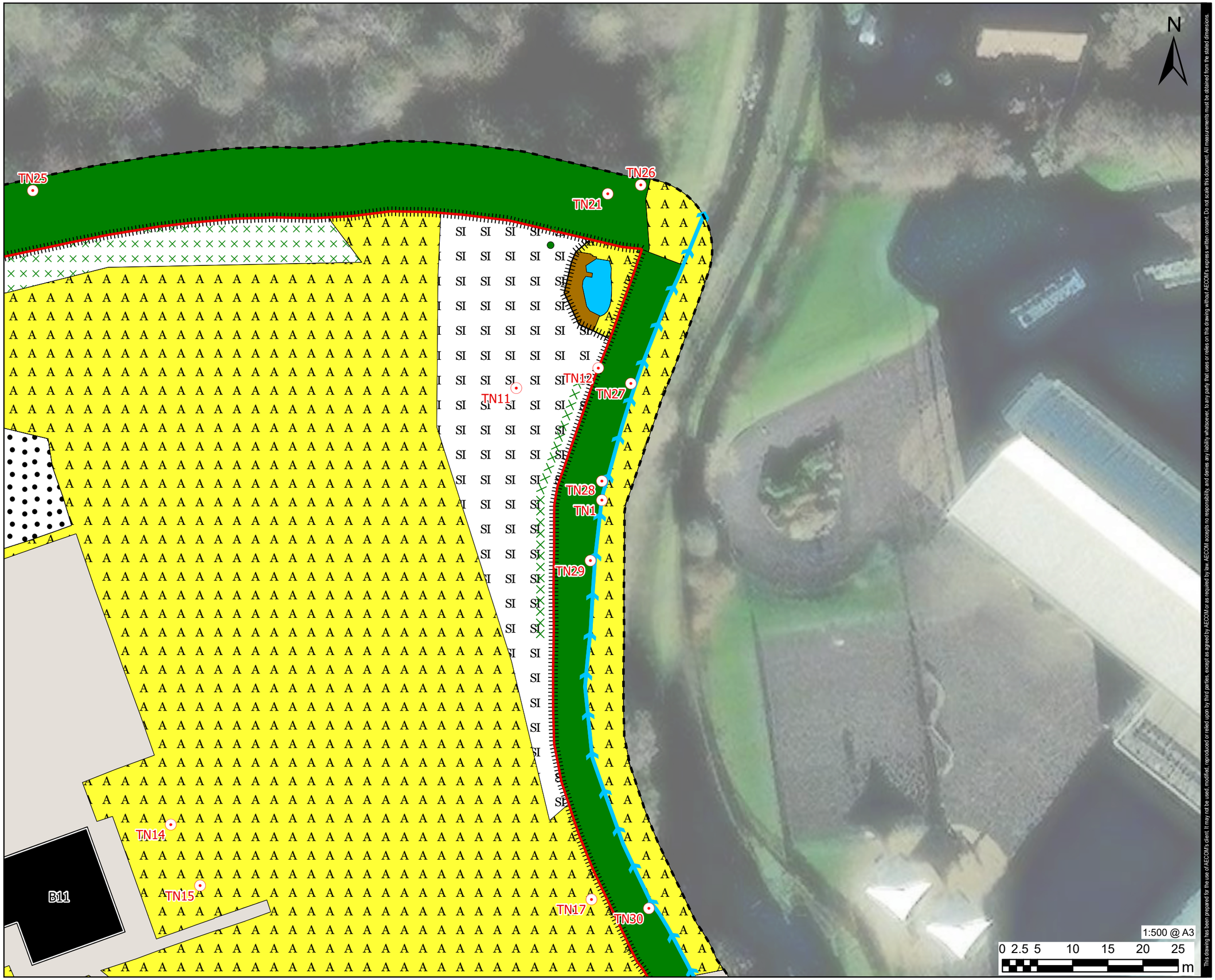

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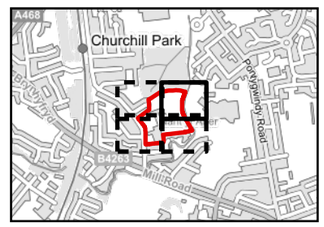
LEGEND

- Site Boundary
- Zone of Influence Boundary
- Target Note
- Scrub - scattered
- Broadleaved parkland/scattered trees
- Running water
- Fence
- Broadleaved woodland - semi-natural
- SI Poor semi-improved grassland
- Standing water
- A Cultivated/disturbed land - amenity grassland
- Buildings
- Bare ground
- Hardstanding
- Wood decking

NOTES



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FINAL

PROJECT NUMBER

60717337

FIGURE TITLE

Plasyfelin Primary School: Phase 1 Habitat and Preliminary Roost Appraisal Map

FIGURE NUMBER

Figure 1b

Revision: 0 Drawn: ID Checked: AM Approved: RB Date: 2023-11-22

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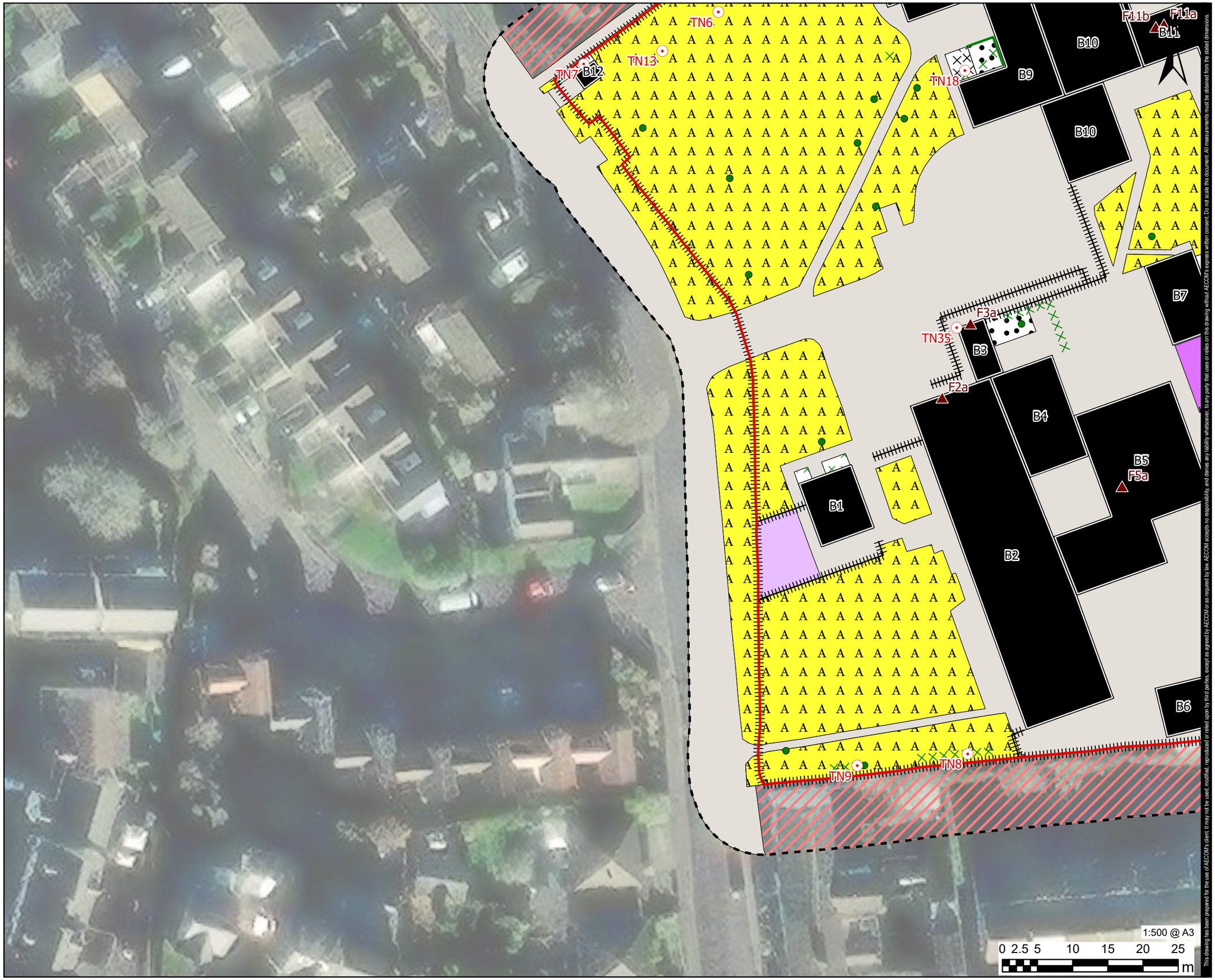

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Plasyfelin Primary School

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LEGEND

- Site Boundary
- Zone of Influence Boundary
- Target Note
- Scrub - scattered
- Broadleaved parkland/scattered trees
- Potential Roost Features
- Intact hedge - species-poor
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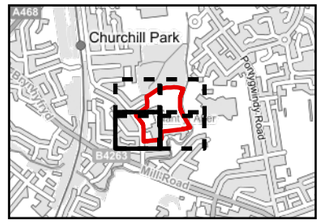
- Buildings
- Bare ground
- Hardstanding
- Astroturf
- Wetpour
- No Access

NOTES



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ISSUE PURPOSE

FINAL

PROJECT NUMBER

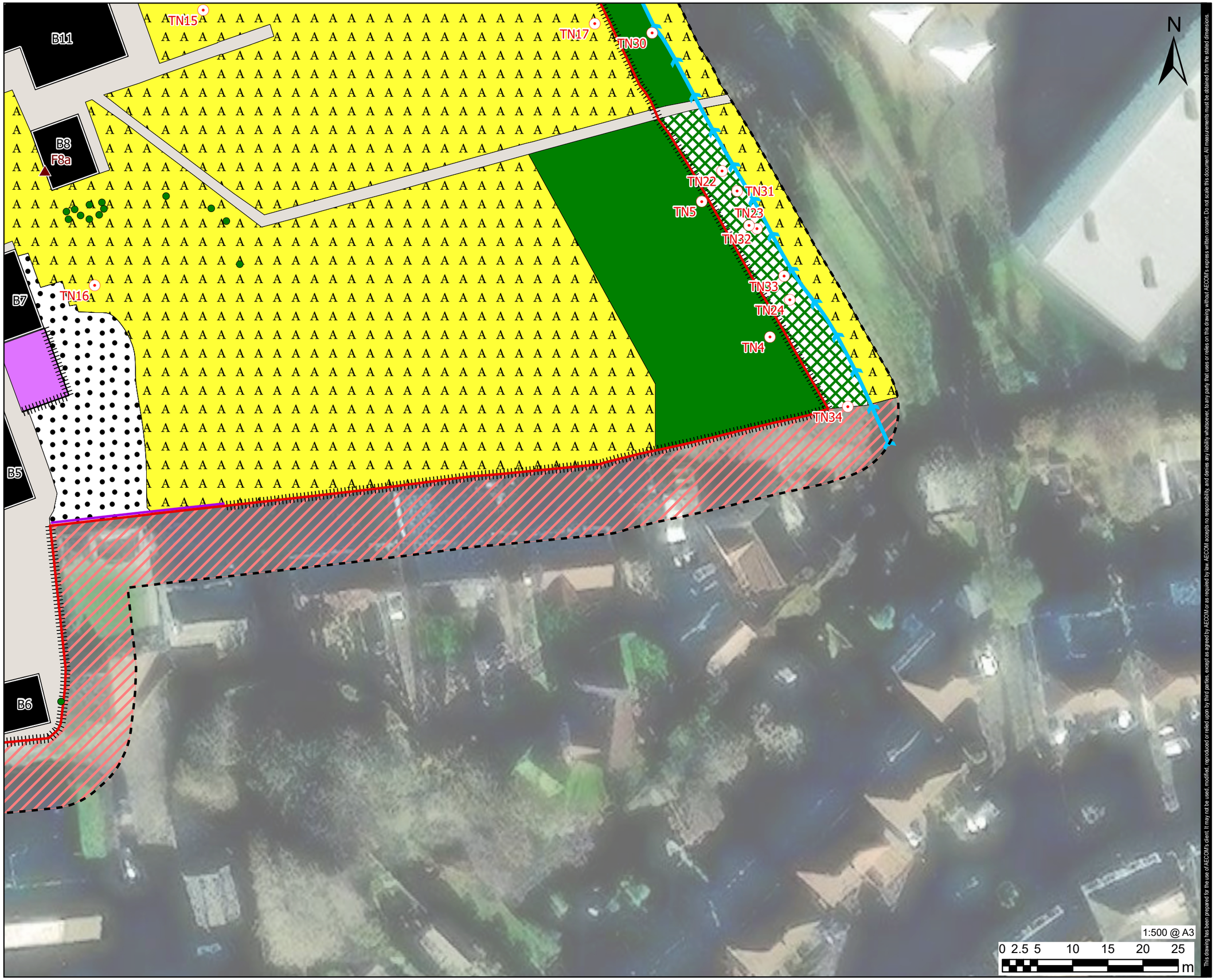
60717337

FIGURE TITLE

Plasyfelin Primary School: Phase 1 Habitat and Preliminary Roost Appraisal Map

FIGURE NUMBER

Figure 1c



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Plasyfelin Primary School

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Caerphilly County Borough Council

CONSULTANT

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Portwall Place, Portwall Lane
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www.aecom.com

LEGEND

- Site Boundary
- Zone of Influence Boundary
- Target Note
- Broadleaved parkland/scattered trees
- Potential Roost Features
- Running water
- Fence
- Wall
- Broadleaved woodland - semi-natural
- Scrub - dense/continuous
- Cultivated/disturbed land - amenity grassland
- Buildings
- Bare ground
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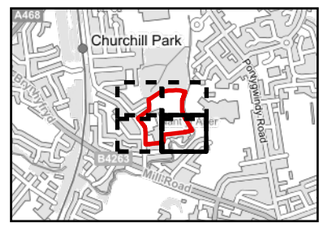
- No Access

NOTES



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FINAL

PROJECT NUMBER

60717337

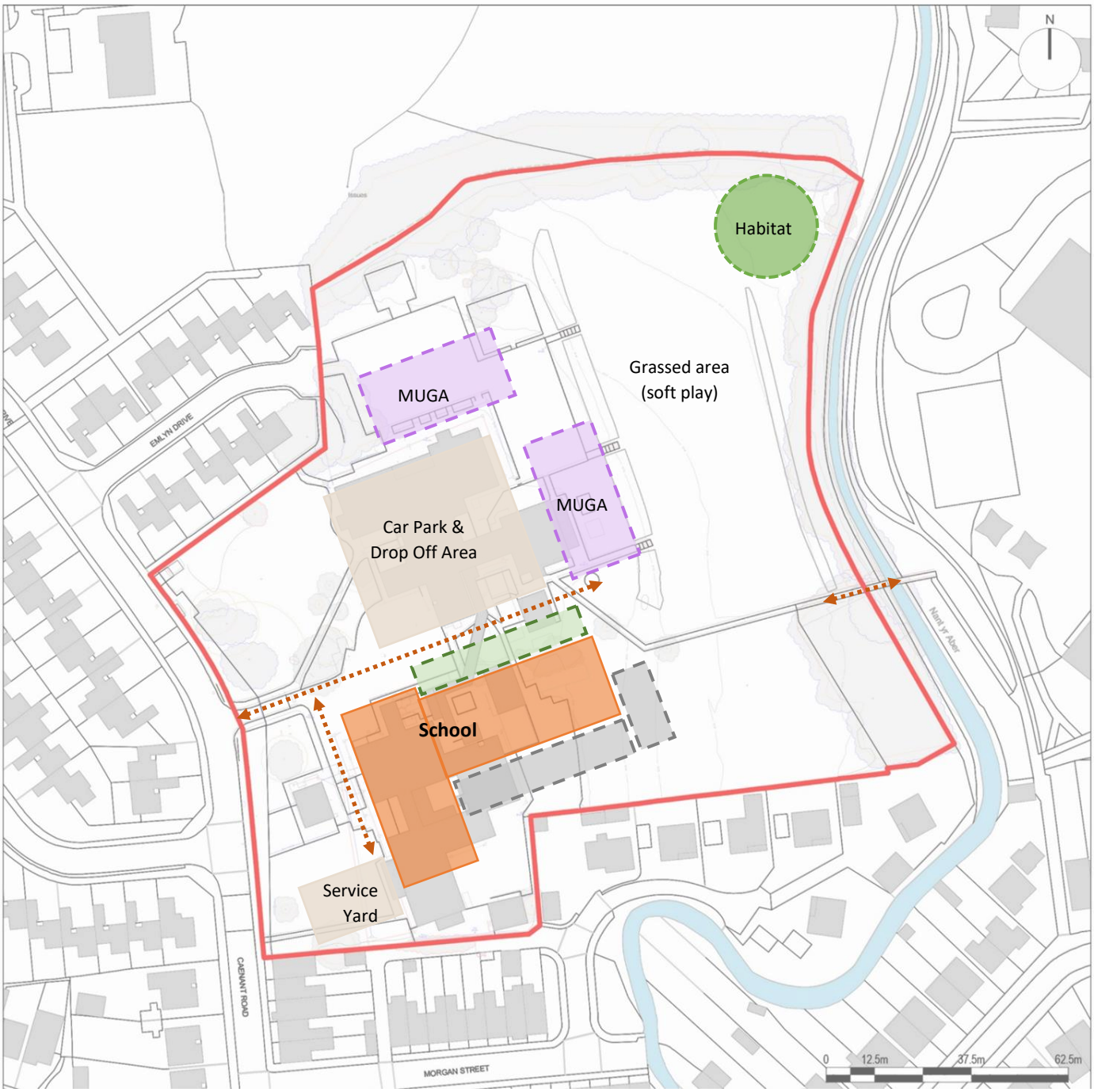
FIGURE TITLE

Plasyfelin Primary School: Phase 1 Habitat and Preliminary Roost Appraisal Map

FIGURE NUMBER

Figure 1d

Figure 2: Preferred Post-Development Design (AECOM, 2023)



Appendix A: Wildlife Legislation and Local Planning Policy

A.1 Legislation – Habitats

A variety of sites are designated in the UK, under Conventions, Directives and Regulations for their nature conservation importance and interest. The general aim of these designations is to conserve and protect ecological resources, as well as raising awareness and understanding. Other non-statutory sites are afforded some protection through local plans. The following outlines the most common statutory and non-statutory designations:

Designation	Brief Description
Special Areas of Conservation (SAC)	SACs are sites selected to conserve the natural habitat types and species of wild flora and fauna as stated in the Conservation of Habitats and Species Regulations. They are the best areas to represent the range and variety of habitats and species within the European Union (EU).
Special Protection Area (SPA)	SPAs are strictly protected sites for the most important habitats for rare and migratory birds within the EU.
Ramsar Sites	Ramsar Sites are wetlands of international importance. Ramsar Sites are protected, through the planning system, under the Wildlife and Countryside Act 1981 (as amended), and the Countryside and Rights of Way Act 2000 through their notification as SSSIs and through other regulatory systems addressing water, soil and air quality.
National Nature Reserve (NNR)	NNRs are nationally important areas of wildlife habitat and geological formations in Britain. NNRs are designated and protected under the National Parks and Access to the Countryside Act 1949 and the Wildlife and Countryside Act 1981 (as amended). They receive additional protection under the Countryside and Rights of Way Act 2000. They are managed for the benefit of nature conservation.
Site of Special Scientific Interest (SSSI)	A SSSI is a site of at least national importance for nature conservation designated under the Wildlife and Countryside Act 1981 (as amended) due to its special interest in terms of flora, fauna or geological or physiographical features. Protection afforded to SSSI's was strengthened by the Countryside and Rights of Way Act 2000. It should be noted that under the Countryside and Rights of Way Act 2000 owners of SSSIs must give Natural Resources Wales (NRW) written notice before they begin any of the operations listed in the notification as likely to damage the special interest features, or if they allow others to carry out these activities. None of the listed operations can be carried out without NRW's consent.
County Wildlife Site (Local site)	A County Wildlife Site is a non-statutory site designated by a local authority as being of local nature conservation value.
Ancient Woodland Inventory	Ancient Woodland is a term applied to woodlands which have existed from at least Medieval times to the present without ever having been cleared for uses other than wood or timber production. A convenient date used to separate ancient and secondary woodland is about the year 1600. In special circumstances semi-natural woods of post-1600 but pre-1900 origin are also included.
Wildlife Trust Reserve	These non-statutory sites are managed by the Wildlife Trusts with the purpose of conserving wildlife.

A.2 Legislation – Protected Species

In addition to habitats, several species have been afforded protection through international/European and national law. Other species are considered to contribute to our 'quality of life'. Although these species do not benefit from legal protection, they can be material considerations in the planning process. The table below outlines the key forms of protection afforded to species. The Conservation of Habitats and Species Regulations 2017 (as amended), the Wildlife and Countryside Act 1981 (as amended), Convention on Biological Diversity and the Countryside and Rights of Way Act 2000, and the Environment (Wales) Act 2016 are the main legislative framework for protection of wild animals in Wales, UK.

Species including bats, otters and great crested newts are listed under Schedule 2 of the Conservation of Habitats and Species Regulations 2017. Badgers are protected under their own Act: The Protection of Badgers Act 1992. Activities affecting protected species must usually be conducted under licence obtained from the appropriate body

(in Wales, this is Natural Resources Wales). Schedule 1 of the Wildlife and Countryside Act 1981 (as amended) covers birds, Schedule 5 covers other animals and Schedule 8 covers plants.

Developers must be able to show that all reasonable measures have been taken to ensure that protected species are not subject to disturbance. The habitats which regularly support the Conservation of Habitats and Species Regulations 2017 Schedule 2 species, the Wildlife and Countryside Act 1981 (as amended) Schedule 1 species and some Wildlife and Countryside Act 1981 (as amended) Schedule 5 species are also protected from disturbance and destruction. Again, all reasonable precautions should be taken to ensure that this does not happen. The Countryside and Rights of Way Act 2000 has strengthened enforcement powers and introduced a new offence of "reckless disturbance" that applies to both protected sites and species. The table below provides a summary of the relevant legislation with regards to protected and priority species.

Designation	Brief Description
Conservation of Habitats and Species Regulations, 2017 (as amended)	The Conservation of Habitats and Species Regulations 2017 are intended to remain in place for some time. This is due to the Government ceasing to have the power of consolidating regulations derived from EU law after the date of exit from the European Union. The Regulations are designed to transpose Council Directive 92/43/EEC, on the conservation of natural habitats and of wild fauna and flora (EC Habitats Directive), into national law. Additionally, they transpose elements of the EU Wild Birds Directive in England and Wales. The Conservation of Habitats and Species Regulations 2017 extend to England and Wales, including the adjacent territorial sea (12 nautical miles from the mean low-water mark of a coastal state), to a limited extent in Scotland in respect of reserved matters and Northern Ireland in respect of excepted matters. The Conservation of Habitats and Species Regulations 2017 protects habitat sites supporting vulnerable and protected species, as listed within the Directive. The need for an assessment of impacts on Natura 2000 sites (the collective name for European designated sites, including SPAs and SACs); and provides a framework for the protection, management and control of all species of naturally occurring wild birds in the European territory of EU Member States.
Wildlife and Countryside Act (1981) (as amended)	The Wildlife and Countryside Act 1981 (as amended) is the principal mechanism for the legislative protection of wildlife in Great Britain. This legislation is the means by which the Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention) and (partially) the Birds Directive and the Habitats Directive are implemented in the UK. The Countryside and Rights of Way Act 2000 has strengthened this legal protection (see below). A small number of plant species are listed under Schedule 9 of the Wildlife and Countryside Act 1981, as amended, which includes species such as Japanese knotweed, Himalayan balsam, montbretia, giant hogweed (*Heracleum mantegazzianum*) and some cotoneaster species (Cotoneaster sp.). It is illegal to plant or to cause these plants to grow in the wild, and legal disposal methods for vegetation and soil subject to disturbance or clearance from a site must be used.
Convention on Biological Diversity and the Countryside and Rights of Way Act 2000	The Countryside and Rights of Way Act 2000 provides a statutory framework for biodiversity conservation. The Act places a duty on Government Departments and the National Assembly for Wales to have regard for the conservation of biodiversity and maintain lists of species and habitats for which conservation steps should be taken or promoted, in accordance with the Convention on Biological Diversity. Schedule 9 of the Act amends SSSI provisions of the Wildlife and Countryside Act 1981, including provisions to change SSSIs and providing increased powers for their protection and management. The provisions extend powers for entering into management agreements; place a duty on public bodies to further the conservation and enhancement of SSSIs; increases penalties on conviction where the provisions are breached; and introduce a new offence whereby third parties can be convicted for damaging SSSIs. Schedule 12 of the Act amends the species provisions of the Wildlife and Countryside Act 1981, strengthening the legal protection for threatened species. The provisions make certain offences 'arrestable' and create a new offence of reckless disturbance. The UK Biodiversity Action Plan (BAP) was published in 1994, and was the UK Government's response to the Convention on Biological Diversity (CBD), which the UK signed up to in 1992. It provides the framework for fulfilling the UK's responsibilities towards the Convention on Biological Diversity. Conservation of biodiversity (the variety of life on earth) is an essential element of sustainable development.
Environment (Wales) Act 2016	The Environment (Wales) Act puts in place the legislation needed to plan and manage Wales' natural resources in a more proactive, sustainable and joined-up way. Part 1 relates to the sustainable management of natural resources. This ensures that the way in which the use of and the impacts on natural resources do not result in long term decline. The aim is to sustainably manage natural resources in a way and rate that meets the needs of present and current generations without compromising the needs of future generations. The Act also contains at section 7, a duty for the Welsh Ministers prepare and publish a list of the living organisms and types of habitat which in their opinion are of principal importance for the purpose of maintaining and enhancing biodiversity in relation to Wales. This section replaces the duty in section 42 of the NERC Act 2006.

A.3 Local Planning Policy

The table below provides a summary of relevant local planning policies found in the Caerphilly County Borough Council Local Development Plan (adopted November 2010). For the precise wording of each specific policy please refer back to the source document (Caerphilly County Borough Council, 2010).

Planning Policy	Purpose/Relevant Sections
SP10 Conservation of Natural Heritage	The council will protect, conserve, enhance and manage the natural heritage of the County Borough in consideration of all development proposals. The term 'natural heritage' incorporates biodiversity and landscape, as well as natural features including trees, woodlands, hedgerows, and rivers
CW4 Natural Heritage Protection	Development proposals that affect locally designated natural heritage features will only be permitted when they conserve and/or enhance the distinctive characteristics of the site. Development will only be enabled within or in close proximity to SINCs where they conserve the features of the designation, or where there is a great public need for the development. The level of potential harm to Natural Heritage will be assessed when considered the development proposal, taking into account mitigation, compensatory and restoration measures.
CW5 Protection of the Water Environment	Development proposals will only be permitted where they do not have an unacceptable adverse impact upon the water environment, and where they would not pose an unacceptable risk to the quality of controlled waters (including groundwater and surface water).
CW6 Trees, Woodland, and Hedgerow Protection	Development proposals on Sites containing trees, woodlands or hedgerows will only be permitted where: appropriate arboricultural surveys, if necessary, are undertaken and submitted; root systems are retained and protected; proposals have made all reasonable effort to maintain and integrate existing trees, woodland, and hedgerows; and where any lost trees, woodlands, hedgerows are replaced
NH3 Sites of Importance for Nature Conservation	Development will normally be permitted where it would not cause unacceptable harm to the particular features of a SINC. Where harm is unavoidable it should be minimised by effective mitigation measures to ensure that there is no reduction in the overall nature conservation value of the area or feature. Where this is not possible, compensation measures designed to conserve, enhance and manage locally distinctive natural habitats and species should be provided, including for example details of restoration and reclamation schemes.

The Caerphilly Biodiversity Action Plan is a material consideration in this report. It provides the framework for habitat and species conservation in Caerphilly County aimed at conservation, public, private and local community sectors. Its aim is to actively protect, conserve and enhance the biodiversity of Caerphilly county borough on a continuing basis. The Action Plan states specific action plans are in place for the following habitats and species, relevant to this PEA and BREEAM report:

- Rivers and Streams
- Amphibians
- Native Wild Fish
- Badger
- Bats
- Dormouse
- European Otter
- Slow-worm and Common Lizard

Please refer to the Caerphilly Biodiversity Action Plan and the associated Habitat Statements and Species Action Plans within for further details.

Appendix B: Site Photographs

Photograph 1: Pond in northeast corner of the Site surrounded by wooden decking.

Photograph 2: Broadleaved semi-natural woodland on eastern boundary of the Site in the ZoI. Amenity grassland lies to the left.

Photograph 3: Broadleaved semi-natural woodland north of the Site in the ZoI.

Photograph 4: Broadleaved semi-natural woodland on the western boundary of the Site.

Photograph 5: Broadleaved semi-natural woodland in the southeast corner of the Site.

Photograph 6: Example of young Japanese knotweed in broadleaved semi-natural woodland in the southeast corner of the Site (Figure 1 and Appendix C: TN 5).

Photograph 7: Line of trees in northeast corner of the Site.

Photograph 8: Example of scattered trees on Site within the amenity grassland to the west of the Site.

Photograph 9: Example of scattered trees on Site within the amenity grassland to the north of the Site with an area of wood chipping in the foreground.

Photograph 10: Block of scattered scrub along the northern boundary of the Site.

Photograph 11: Scattered scrub in northwest corner of the Site with Building 12 to the left.

Photograph 12: Ephemeral-short perennial vegetation with scattered scrub of a barberry tree and a cypress tree growing on it. Montbretia in the bottom righthand corner.

Photograph 13: Cypress scrub with grassland verge to the north of Building 1.

Photograph 14: Line of scattered scrub along southwest Site boundary. Amenity grassland to the left.

Photograph 15: Example of montbretia growing in scattered scrub in southwest corner of the Site. Figure 1 and Appendix C: TN 8.

Photograph 16: Poor semi-improved grassland in the northeast corner of the Site with whips in tree guards.

Photograph 17: Mature stand of Japanese knotweed on eastern boundary of the Site on the poor semi-improved grassland. Figure 1 and Appendix C: TN 12.

Photograph 18: Mature stand of Japanese knotweed on eastern boundary of the Site on amenity grassland. Figure 1 and Appendix C: TN 17.

Photograph 19: Ephemeral-short perennial vegetation adjacent to the southwest corner of the broadleaved semi-natural woodland to the west of the Site. Trees encroaching through fence.

Photograph 20: Intact species-poor hedge to the west of Building 9.

Photograph 21: Concrete and cinder block walls on south boundary of Site.

Photograph 22: Example of palisade fencing that surrounds most of the Site.

Photograph 23: Building 1.

Photograph 24: Building 2 to the right, Building 3 to the left, and Building 4 behind.

Photograph 25: Building 5.

Photograph 26: Building 6.

Photograph 27: Building 7.

Photograph 28: Building 8.

Photograph 29: Building 9 in front and Building 10 behind.

Photograph 30: Building 11.

Photograph 31: Two large stands of Himalayan balsam approximately 5 m north of the Site within broadleaved semi-natural woodland 5 m from fence (Figure 1 and Appendix C: TN 25).

Photograph 32: A single mature Himalayan balsam plant approximately 6 m east of the northeast of the Site growing between rocks on the western bank of the Nant yr Aber, connected by broadleaved semi-natural woodland. (Figure 1 and Appendix C: TN 27).

Photograph 33: Approximately 20 mature Himalayan balsam plants approximately 5 m east of the Site growing through understorey on the western bank of the Nant yr Aber, connected by broadleaved semi-natural woodland (Figure 1 and Appendix C: TN 30).

Photograph 34: A gap with Moderate suitability to support roosting bats on the north face of Building 2 above a doorway (Figure 1: F2a).

Photograph 35: Location of a gap under the metal roof in the northeast corner of Building 3 with Low suitability to support roosting bats (Figure 1: F3a).

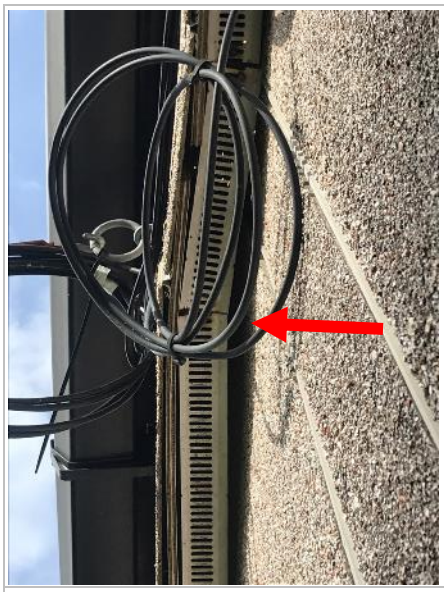
Photograph 36: A gap under the metal roof in the northeast corner of Building 3 with Low suitability to support roosting bats (Figure 1: F3a).

Photograph 37: A light on the northwest corner of Building 3 which reduces the suitability of PRF F3a to support roosting bats.

Photograph 38: Location of a gap between door frame and fascia chip board on west face of Building 5 with Low suitability to support roosting bats (Figure 1: F5a).

Photograph 39: A gap between the top of the wooden door frame and the wooden fascia chip board on is on the west face of Building 5 with Low suitability to support roosting bats (Figure 1: F5a).

Photograph 40: Location of a gap behind the fascia/vent on the west face of Building 8 approximately 2.5 m above the ground with Low suitability to support roosting bats (Figure 1: F8a).



Photograph 41: A gap behind the fascia/vent on the west face of Building 8 approximately 2.5 m above the ground with Low suitability to support roosting bats (Figure 1: F8a).

Photograph 42: Location of gaps on Building 11 with Low suitability to support roosting bats. F11a to the left and F11b to the right (Figure 1: F11a and F11b).

Photograph 43: A hole in the corner of the roof near metal shutters on northern face of Building 11 with Low suitability to support roosting bats (Figure 1: F11a).

Photograph 44: A gap in the corner between the northern face of Building 11 and the eastern face of Building 10, approximately 2.5 m above the ground and between the wooden wall and window adjacent to end of a soffit board (Figure 1: F11b).

Photograph 45: A large field maple in the amenity grassland to the northwest with a PRF (Figure 1: Bat Tree 1).

Photograph 46: PRF on the field maple in the amenity grassland to the northwest of the Site; PRF was a split in the bark approximately 4 m above the ground on the northeast face on one of the central stems (Figure 1: Bat Tree 1).

Photograph 47: A willow in the amenity grassland to the northwest with two PRFs (Figure 1: Bat Tree 2).

Photograph 48: One of the two PRFs on the willow within the amenity grassland to the northwest of the Site: the first PRF was approximately 3 m above the ground on the southeast face and was a 1.2 m long vertical split in the trunk extending upwards and downwards (Figure 1: Bat Tree 2).

Photograph 49: One of the two PRFs on the field maple within the amenity grassland to the northwest of the Site: the second PRF was a callous approximately 5 cm wide and 70 cm long on the southeast face, which may extend further into the branch (Figure 1: Bat Tree 2).

Photograph 50: A silver birch within the broadleaved semi-natural woodland in the southeast corner of the Site with a PRF (Figure 1: Bat Tree 3).

Photograph 51: PRF on a silver birch within the broadleaved semi-natural woodland in the southeast corner of the Site; PRF was a small blackened cavity approximately 9 m above the ground on the northwest face (Figure 1: Bat Tree 3).

Photograph 52: A silver birch within the broadleaved semi-natural woodland in the southeast corner of the Site with Negligible suitability for roosting bats; uncertainty remains due to the thick coverage of ivy which may obscure PRFs (Figure 1: Bat Tree 4).

	
Photograph 53: A silver birch within the broadleaved semi-natural woodland to the north of the Site with a PRF (Figure 1: Bat Tree 5).	**Photograph 54:** PRF on a silver birch within the broadleaved woodland to the north of the Site; PRF was a split in a stem on the northeast face, with callousing around it, approximately 5 m above the ground (Figure 1: Bat Tree 5).
	
Photograph 55: PRF on a multi-stemmed cherry within the ZoI: PRF was a cavity within the main trunk approximately 5 m high on the east face (Figure 1: Bat Tree 6).	

Appendix C: Target Notes

Target Note	Description
1	Nant yr Aber.
2	Brash pile approximately 2 by 1 m.
3	Brash pile approximately 2 by 1 m.
4	Japanese knotweed saplings approximately 30 cm growing through ivy.
5	Sapling of Japanese knotweed growing through leaf litter.
6	Dense bramble at base of a scattered field maple.
7	Loose brash pile behind electrical building (B12).
8	Three clumps of montbretia, two clumps approximately 40 by 40 cm and one clump 30 by 20 cm, within scrub within 3 m of each other.
9	One clump of montbretia under willow canopy, approximately 50 by 30 cm..
10	Scattered scrub of buddleia, bracken, and common nettle in bare ground corner of courtyard.
11	Approximately 1.5 m by 40 cm patch of devil's bit scabious.
12	An approximately 2 by 1 m mature stand of Japanese knotweed within the Site on the eastern Site boundary.
13	Area of taller grassland within amenity grassland with different composition of species.
14	Ornamental shrub of unknown species surrounded by patio stones.
15	Four rosemary bushes and a rose species in an area approximately 4 x 4 m.
16	Polythene tunnel with allotment area to the northeast.
17	Stand of mature Japanese knotweed approximately 15 by 3 m.
18	Patch of montbretia, approximately 1 by 1 m.
19	A patch of montbretia approximately 3 by 2 m large growing on bare soil within broadleaved semi-natural woodland north of the Site.
20	A patch of montbretia approximately 2 by 1 m large growing on bare soil within broadleaved semi-natural woodland north of the Site.
21	One Japanese knotweed sapling growing through leaf litter in broadleaved semi-natural woodland approximately 3 m north of the northeast corner of the Site.
22	A stand of mature Japanese knotweed approximately 3 by 4 m growing in broadleaved semi-natural woodland approximately 3 m east of the Site.
23	At least two plants of Japanese knotweed approximately 1 m high within 1.5 m of each other growing within broadleaved semi-natural woodland approximately 4 m east of the Site.
24	A stand of Japanese knotweed approximately 3 by 4 m growing in dense/continuous scrub approximately 3 m east of the Site.
25	Two large stands of Himalayan balsam approximately 5 m north of the Site within broadleaved semi-natural woodland 5 m outside of the fence. Stands are approximately 1 by 8 m and 10 by 8 m, and dominates the understorey in this part of the broadleaved semi-natural woodland.
26	A stand of Himalayan balsam approximately 2 by 3 m approximately 10 m north of the northeast corner of the Site within the broadleaved semi-natural woodland, connected by broadleaved semi-natural woodland.
27	A single mature Himalayan balsam plant approximately 6 m east of the northeast of the Site growing between rocks on the western bank of the Nant yr Aber, connected by broadleaved semi-natural woodland.
28	Two mature Himalayan balsam plants approximately 6 m east of the Site growing between ivy on the western bank of the Nant yr Aber, connected by broadleaved semi-natural woodland.
29	Two mature Himalayan balsam plants approximately 6 m east of the Site growing between ivy on the western bank of the Nant yr Aber, connected by broadleaved semi-natural woodland.
30	Approximately 20 mature Himalayan balsam plants approximately 5 m east of the Site growing through understorey on the western bank of the Nant yr Aber, connected by broadleaved semi-natural woodland.
31	At least seven Himalayan balsam mature plants approximately 4 m east of the Site growing between ivy on the western bank of the Nant yr Aber, connected by broadleaved semi-natural woodland.

Target Note	Description
32	At least seven mature Himalayan balsam plants approximately 4 m east of the northeast of the Site growing between grasses and scrub on the western bank of the Nant yr Aber, connected by broadleaved semi-natural woodland.
33	At least four mature Himalayan balsam plants approximately 4 m east of the northeast of the Site growing between grasses and scrub on the western bank of the Nant yr Aber, connected by broadleaved semi-natural woodland.
34	A stand of Himalayan balsam approximately 4 by 15 m growing in dense/continuous scrub approximately 3 m east of the Site on the western bank of the Nant Yr Aber, connected by dense/continuous scrub.
35	Floodlight on the northwest corner of Building 3.

Appendix D: HSI Assessment of Pond on Site

Criterion	Score	Reasoning
1-Geographic Location	0.5	Site is within southeast Wales.
2-Pond Area	0.05	Pond is approximately 18 m^2.
3-Permeance	0.9	Pond never dries.
4-Water Quality	0.67	Moderate invertebrate diversity as based on professional judgment.
5-Shade	1	Pond is 20% shaded by adjacent trees.
6-Waterfowl	1	There are no waterfowl.
7-Fish	1	There are no fish.
8-Pond Count	1	There are 14 ponds within 1 km of the Site though connectivity is limited due to urban areas.
9-Terrestrial Habitat	0.33	Poor terrestrial habitat surrounding the pond e.g., amenity grassland that offers limited opportunities for foraging and shelter.
10-Macrophyte	0.8	Approximately 50% macrophyte cover.

Appendix E: Suitably Qualified Ecologists-Staff Pen Portraits

Charlie Hobbs MCIEEM Principal Ecologist – AECOM Plymouth – SQE

Charlie Hobbs has national and international project experience, a good understanding of Ecological Impact Appraisals, Biodiversity Net Gain, Habitats Regulations Assessments and a range of environmental technical disciplines. Charlie has also assisted with noise, and water quality field surveys. Charlie has experience in the preparation of protected species licence applications, the development of mitigation strategies, and supervising site works.

Charlie Hobbs MCIEEM complies with the written definition of an SQE and has reviewed the PEA and BREEAM report.

Melanie Barnicott MCIEEM – Associate Ecologist – AECOM Plymouth – SQE

Melanie Barnicott has over 15 years' experience within ecological consultancy. Melanie has worked on a diverse and interesting range of projects both locally and internationally including many large-scale projects. Melanie's key skills include coordinating and resourcing the team, providing technical support for protected species and habitat surveys, writing and quality assurance of technical reports, and liaising with clients, planning authorities and consultees. Melanie has experience of undertaking surveys in a range of habitats and environments. She holds protected species licenses for dormice, GCN, bat (level 2) and barn owl.

Melanie Barnicott MCIEEM complies with the written definition of an SQE and has verified the PEA and BREEAM report.

Anna Davies MCIEEM – Associate Ecologist – AECOM Manchester – SQE

Anna Davies has over 13 years of field work and consultancy experience. She is responsible for the day-to-day management of the Manchester ecology team including resourcing, project delivery and technical input. Anna has experience in surveying for protected species including planning, resourcing and managing landscape scale surveys including landscape scale surveys for wind farm, road and pipeline schemes. Lisbeth is practised in ecological desk studies, Phase 1 habitat surveys, ecological site supervision and internal inspections of buildings and structures. Anna is experienced in assessing ecological impacts and preparing reports and assessment for successful planning submissions and has prepared scoping reports and chapters for Environmental Impact Assessment (EIA). She has experience of using remote sensing equipment and analysing bat sonograms using Analook Software. Anna has completed successful European Protected Species Licence applications for bats and GCN and has undertaken ecological watching briefs and post construction monitoring under licence. She has been involved in the mitigation and landscape design for a number of projects, developing ecological enhancements and protected species mitigation. Anna has been a Consultant Ecologist on a number of BREEAM and CfSH Assessments and has been involved with design teams for landscape and lighting designs. Anna is a bat survey licence holder in Wales and England and a great crested newt survey licence holder in England.. She is a Full Member of the Chartered Institute of Ecology and Environmental Management.

Anna Davies MCIEEM complies with the written definition of an SQE and has approved the PEA and BREEAM report. Anna Davies MCIEEM confirms the survey and report has been completed paying due regard to CIEEM and BREEAM guidance.

Appendix F: Landscape Habitat Management Plan – Suggested Scope of Contents

Site Description

- 1.1. Introduction
- 1.2. General Information
  - 1.2.1. Location
  - 1.2.2. Summary Description
  - 1.2.3. Land Tenure
  - 1.2.4. Map Coverage
  - 1.2.5. Photographic Coverage
- 1.3. Environmental Information
  - 1.3.1. Physical Information
  - 1.3.2. Biological Information
  - 1.3.3. Cultural Information
  - 1.3.4. Historic and Current management
  - 1.3.5. Ecological Relationships and Implications for Management

2. Evaluation and Objectives

- 2.1. Conservation Status of the Site
  - 2.1.1. Historic Nature Conservation
  - 2.1.2. Site Status
  - 2.1.3. Site Definition and Boundaries
- 2.2. Evaluation of Site Features
  - 2.2.1. Criteria for Evaluation
  - 2.2.2. The Site in the Wider Perspective and Implications for Management
  - 2.2.3. Specified Limits
  - 2.2.4. Ideal Management Objectives
- 2.3. Factors Influencing Management
  - 2.3.1. Natural Trends
  - 2.3.2. Man Induced Trends
  - 2.3.3. External Factors
  - 2.3.4. Legal and Non-legal Obligations

3. Prescriptions