

Vale of Glamorgan Schools -Pencoedtre High School

Preliminary Ecological Appraisal (PEA) and BREEAM Ecology Report

Bouygues UK

Project number: 60608204

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Quality information

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1. Executive Summary

AECOM was commissioned by Bouygues UK to complete a Preliminary Ecological Appraisal (PEA) and a BREEAM (2018) Land use and Ecology Assessment (Issues LE02, LE03, LE0 and LE05) of the site of the proposed Pencoedtre High School in Barry, South Wales (AECOM, 2018). The Phase 1 Habitat Survey, PEA and BREEAM assessment were undertaken in 2018.

The proposed Pencoedtre High School site ("the Site") is located on the former Bryn Hafren Comprehensive School Site in Barry, Wales, OS grid reference ST 11968 70283. The Site is located within a residential area on the northern outskirts of Barry.

The assessment is focussed towards specific BREEAM Land use and Ecology 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 Pencoedtre High School. The school will accommodate 1050 number 11-16 year old pupils and 200 number Sixth Form pupils. The development will include demolition of the existing Pencoedtre High School building, the construction of a new school building, new hard court facilities and enhanced sports pitch provision, car parking and areas of landscaping. Works will commence in February 2020.

The proposed site plan layout and landscaping plan: drawing number PHS-HLM-SW-ZZ-GA-L-0002 has been used for this assessment. A lighting plan has not yet been provided. This PEA and BREEAM Report will be used to inform the final detailed design of the proposed development.

The pre-development habitats at the Site are dominated by amenity grassland, hardstanding and buildings, with areas of semi-improved grassland, poor semi-improved grassland, ephemeral short perennial, broadleaved plantation woodland, broadleaved semi-natural woodland, intact species-poor hedgerows, defunct species poor hedgerows, hedgerows with trees, dense scrub, rows of trees standalone trees and fences (Figure 1).

Within the Site boundary there is potential for common generalist invertebrates, breeding birds, foraging and commuting bats, and hedgehog.

The proposed Site plan layout and landscaping plan: drawing number PHS-HLM-SW-ZZ-GA-L-0002 shows that the existing ephemeral short perennial, semi-improved grassland, introduced shrub, and buildings will be completely removed. Standalone trees, rows of trees, and amenity grassland will be partially retained. Broadleaved plantation woodland, dense scrub, poor semi-improved grassland and all on-Site hedgerows will be retained.

Without mitigation there is potential for retained features to be damaged during construction. Without mitigation there is potential for habitat loss, injury and killing and disturbance (including external lighting disturbance) to affect Protected and Priority Species using the Site. Without mitigation, there is potential for light spill onto adjacent habitats including a Site of Importance for Nature Conservation (SINC) and Plantation on Ancient Woodland Site (PAWS). Recommendations for mitigation have been provided to avoid and reduce impacts on retained habitats and Protected Species using the Site.

Bat roost surveys were undertaken in 2018 (AECOM, 2018). No bat roosts were identified. No further bat roost surveys are required. Bat activity surveys will not be required if all boundary features are retained and there is no light spill onto boundary features. If boundary features are removed, severed or lighting does not avoid light spill onto these features, further surveys will be required.

The 'before development' BREEAM LE04 calculations are based on the Phase 1 Habitat Survey. 'Post development' calculations are based on the proposed site plan layout and landscaping plan: drawing number PHS-HLM-SW-00-GA-L-0002. This Report can be used to guide Site design to achieve credits under BREEAM Issues LE03, LE04 and LE05.

Vale of Glamorgan Schools - Pencoedtre High PEA and $\mbox{BREEAM LE}-\mbox{Version 2}$

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Summary of Potential BREEAM Issues and Credits

Issue	Total available credits	Credits likely achievable under current landscaping proposals*
LE02	3	3
LE03	3	1
LE04	5	2
LE05	2	2
LE Total	13	8*

* 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) Bats – Surveys and Mitigation; and	1) Improving Grassland Diversity;	6) Sensory Garden/Planting;
2) Breeding Birds – Mitigation.	2) Swale Creation;	7) Hedgehog Habitat; or
	3) Invertebrate Houses and/or Insect Walls;	8) Green Corridors.
	4) Bird and Bat Boxes;	
	5) Kitchen Garden;	

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

2. Introduction

2.1 Introduction

In 2018, AECOM was commissioned by Vale of Glamorgan Council to undertake a Preliminary Ecological Appraisal (PEA) and a BREEAM (2014) Land use and Ecology Assessment (Issues LE02, LE03, LE0 and LE05) of the site of the proposed Pencoedtre High School Site in Barry, South Wales (AECOM, 2018). The Phase 1 Habitat Survey, PEA and BREEAM assessment were undertaken in 2018.

Since the initial PEA and BREEAM report, the contract for development of the Site has been awarded to Bouygues UK in 2019. The proposed development has been updated and the scheme is now being submitted under BREEAM 2018 Criteria for Wales. This report assesses the potential impacts of the change in Site design and the BREEAM Land Use and Ecology Issues have been assessed in line with 2018 Criteria.

Version 1 of this Report was issued based on Drawing PHS-HLM-SW-00-GA-L-0001. Recalculations of BREEAM credits and potential impacts have been undertaken in September 2019 to reflect an updated proposed site layout and landscaping plan Drawing PHS-HLM-SW-00-GA-L-0002. This Report is Version 2. In order to deliver the PEA, a desk study and an Extended Phase 1 Habitat Survey were undertaken by an appropriately experienced ecologist, to identify ecological features within the proposed development site and the wider potential zone of influence of the proposed development. The potential zone of influence was defined with reference to the project description provided by Bouygues UK as shown on Figure 1. Additional details are provided in Section 3: Methodology.

The BREEAM assessment is focussed towards specific BREEAM Land use and Ecology 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).

2.2 Site Location and Description

The proposed Pencoedtre High School site ("the Site") is located on the former Bryn Hafren Comprehensive School Site in Barry Wales, OS grid reference ST 11968 70283. The Site is located within a residential area on the northern outskirts of Barry.

The Site is dominated by amenity grassland, hardstanding and buildings with other areas of semi-improved grassland, poor semi-improved grassland, ephemeral short perennial, broadleaved plantation woodland, broadleaved semi-natural woodland, intact species poor hedgerows, defunct species-poor hedgerows, hedgerows with trees, dense scrub, rows of trees standalone trees and fences (Figure 1).

2.3 Proposed Development

The proposed development is for a new build project to replace the existing Pencoedtre High School. The school will accommodate 1050 number 11-16 year old pupils and 200 number Sixth Form pupils. The development will include demolition of the existing Pencoedtre High School building, the construction of a new school building, new hard court facilities and enhanced sports pitch provision, car parking and areas of landscaping. Works will commence in February 2020.

The proposed site plan layout and landscaping plan: drawing number PHS-HLM-SW-ZZ-GA-L-0002 has been used for this assessment. A lighting pan has not been provided at this stage. This PEA and BREEAM Report will be used to inform the final detailed design of the proposed development.

2.4 Objectives

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 in the vicinity of the Site;
- To identify any known records of Protected, notable or scarce species in the vicinity of the Site;

- To record and map the main habitats and features of ecological interest;
- To assess the ecological value of the Site and the surrounding area;
- To assess ecological impacts including potential change in diversity;
- To outline requirements for further surveys, if required; and,
- To make suggestions for mitigation, compensation and enhancement of the natural features identified on the Site.

The purpose of this report is to inform the design of the proposed development 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. High level recommendations are made regarding potential options for the avoidance, mitigation or compensation of the potential impacts of the proposed development (where known) on the identified ecological receptors, and of potential enhancements to the biodiversity and ecosystem services.

2.5 Wildlife Legislation and Planning Policy

2.5.1 Wildlife Legislation

There are several different acts of legislation and regulations which refer to the protection of wildlife. These are summarised in Appendix B. In particular, the legislation relating to possible protected species on site is outlined. This is a brief 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 is potentially relevant to the proposed development:

- The Wildlife and Countryside Act (WCA) 1981 (as amended);
- The Countryside and Rights of Way (CRoW) Act 2000;
- The Conservation of Habitats and Species and Planning (Various Amendments) (England and Wales) Regulations 2018;
- Environment (Wales) Act 2016; and,
- The Protection of Badgers Act 1992.

The above legislation has been considered when planning and undertaking this PEA, 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.

2.5.2 National Planning Policy

2.5.2.1 Planning Policy Wales (9th Ed. November 2016)

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

Chapter 5, Conserving and Improving the Natural Heritage and the Coast, outlines Welsh Government's objectives for the conservation and improvement of natural heritage. The relevant measures in place to conserve landscape and biodiversity include:

- Statutory designations;
- Non-statutory designations;
- LANDMAP Information System (LANDMAP describes and evaluates aspects of the landscape and provides the basis of a consistent Wales-wide approach to landscape assessment);
- Development plans and the conservation and improvement of the natural heritage;
- Development management and the conservation and improvement of the natural heritage;

- Development management and statutory designations;
- Trees and woods; and,
- Protected Species.

Paragraph 5.3.10 states that "potential SPAs and candidate SACs (included in the list sent to the European Commission) should be treated in the same way as classified SPAs and designated SACs. Sites which the UK and the European Commission have agreed as Sites of Community Importance and which are to be designated as SACs attract the same legal protection as if they had already been designated. The same considerations should, as a matter of policy, be applied to listed Ramsar sites".

Paragraph 5.2.9 states that "Local planning authorities should seek to protect trees, groups of trees and areas of woodland where they have natural heritage value or contribute to the character or amenity of a particular locality. Ancient and semi-natural woodlands are irreplaceable habitats of high biodiversity value which should be protected from development that would result in significant damage."

Paragraph 5.5.4 states that "For all planning applications likely to result in disturbance or harm to a protected species or likely to have a significant adverse effect on sites of more than local importance, or on a designated area, local planning authorities should seek the advice of Natural Resources Wales and should always consult them before granting permission".

2.5.2.2 Technical Advice Note 5 (TAN5) Nature Conservation and Planning (September 2009)

The Planning Policy Wales (PPW) is supplemented by a series of Technical Advice Notes. 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.

2.5.3 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 Vale of Glamorgan Council are detailed in the following document:

• Vale of Glamorgan Local Development Plan 2011-2026, Local Development Plan Written Statement. June 2017.

Appendix C provides a summary of relevant local planning policies. For the precise wording of each specific policy please refer back 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.

2.5.4 Quality Assurance

This survey and subsequent report was 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 establishing and maintaining our certification to the

international standards BS EN ISO 9001:2015 and 14001:2015 and BS OH SAS 18001:2007. 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 are members of (at the appropriate level) the Chartered Institute of Ecology and Environmental Management (CIEEM) and follow their code of professional conduct (CIEEM, 2017b) when undertaking ecological work.

3. Methodology

3.1 Preliminary Ecological Appraisal

3.1.1 Desk Study

The desk study was undertaken in May 2018. 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:

- Internationally and nationally designated sites, up to 2 km from the Site boundary using the Multi Agency Geographic Information for the Countryside (MAGIC) website (www.magic.gov.uk);
- Locally designated sites, up to 2 km from the Site boundary using South East Wales Biodiversity Record Centre (SEWBReC);
- Protected and Priority Species records up to 2 km from the Site boundary, using SEWBReC;
- Special Areas of Conservation (SAC) and Sites of Special Scientific Interest (SSSI) designated for bats within a 10 km radius of the Site boundary in accordance with Bat Conservation Trust (Collins, 2016) recommendations;
- Section 7 list of Species and Habitats of Principal Importance for Conservation of Biological Diversity in Wales;
- 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 Ancient Woodland Inventory Data; (NRW 2011);
- Tree Protection Orders (TPO) from Vale of Glamorgan Council;
- Local/county recorders for birds, bats, reptile and amphibians, and the County Ecologist were contacted for local records or knowledge about the project area; and,
- Aerial photographs and Ordnance Survey (OS) maps were reviewed to identify features of ecological interest surrounding the Site including ponds within 500 m, nearby areas of ecological interest and features connecting these habitats (e.g. hedgerows, watercourses, railway lines).

3.1.2 Extended Phase 1 Habitat Survey

A Phase 1 Habitat Survey (JNCC, 2010) of the Site was undertaken by two Suitably Qualified Ecologists (BSc, MCIEEM) of AECOM on 08 May 2018.

The survey involved a site walkover and preliminary assessment of habitats, land use and ecological features. 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 Site were recorded. Evidence of any Invasive Non-Native Species (INNS) of plant subject to legal controls was recorded.

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 noted to aid in the determination of the zone of influence.

3.1.3 Assessment of Bat Habitat Suitability

During the Phase 1 Habitat Survey, where access allowed, trees and buildings throughout the Site were classified into categories dependent on the presence of features suitable as bat roost habitat. This was conducted via an external appraisal from the ground using binoculars where necessary. Table 3.1 provides descriptions of the categories for buildings and trees.

Habitats on Site were classified into categories dependent on the presence of features suitable for bats to commute and forage. Table 3.2 provides descriptions for commuting and foraging habitats.

Table 3.1: Tree and Building Bat Roost Suitability Categories

Roost Suitability	Descriptions for Buildings	Descriptions for Trees
Known or Confirmed	Confirmed signs of bat presence/ occupation (droppings, oily staining around entry points, insect remains, odour, scratching) and actual bat presence.	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 potential 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. Can include structures with points of access to the interior of the building and poorly maintained fabric providing ready access points for bats into structures, but at the same time not draughty. Structures of traditional stone, brick or timber construction. Structures with large (>20cm) roof timbers with mortice joints, cracks and holes. Structures of pre or early 20 th century construction. Structures with large complicated and/or uncluttered roof spaces providing unobstructed flying spaces. Structures with weather boarding and/or hanging tiles with gaps. Structures with accessible south facing roofs. Structures with proximity to good foraging habitat such as woodland, wetland, water and /or good hedgerows.	A tree with one or more potential roost sites that are obviously suitable for use by larger numbers of bats on a more regular basis and potential 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.
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. Can include structures with some potential to support roosting bats, but fewer features than a high risk building. Features may include areas suitable for crevice dwelling and/or access points into structures. Some proximity to foraging habitat.	A tree with one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions and surrounding habitat but unlikely to support a roost of high conservation status.
Low	A structure with one or more potential roost sites that could be used by individual bats opportunistically. However these potential roost sites do not provide enough space, shelter protection, appropriate conditions and/or suitable habitat to be used on a regular basis or by large numbers of bats (i.e. unlikely to be suitable for maternity or hibernation).	Tree of sufficient size and age to contain potential roost features but with none seen from the ground or features seen have only very limited roosting potential.

Roost Suitability	Descriptions for Buildings	Descriptions for Trees
Negligible	No features suitable for roosting bats. Can include structures constructed from unsuitable materials e.g. prefabricated with steel and sheet material. Structure is draughty, light and cool buildings with no roosting opportunities. High levels of regular disturbance including external and/or internal lighting. Building is isolated from areas of foraging habitat.	Trees with no potential to support bats.

Source: Category descriptions drawn from Collins, 2016 and Mitchell-Jones, 2004 to be applied using professional judgement

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 commuting bats 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 commuting 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 commuting bats such as a gappy hedgerow or un-vegetated stream, but isolated, i.e. not very well connected to the surrounding landscape by other habitat. Suitable, but isolated habitat that could be used by small number of foraging bats such as a lone tree (not in a parkland situation) or a patch of scrub.
Negligible	Negligible habitat features on site likely to be used by commuting or forging bats.

Table 3.2: Commuting and Foraging Habitat Suitability Categories

Source: Category descriptions drawn from Collins, 2016 to be applied using professional judgement

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3.2 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.

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 This can be used where the pre-development habitats are below the set size threshold and no habitats present that are assigned a high level of distinctiveness. Route 2 may be used where desired.

The 'full methodology' has been used for Issues LE02 – LE05 for this assessment because the pre-development habitats within the Site total more than 0.05 hectares.

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 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.

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

The Land Use and Ecology Issues are summarised in Table 2.3 below and more detail is provided in Appendix A.

BREEAM Issue	Description of Criteria	Number of Credits Available (Route 2)	Comments	
	Survey and evaluation	1	Total available credits: 3	
LE02: Identifying and Understanding the Risks and Opportunities for the Project	Determining the ecological outcomes for the site	1	The second and third credits under LEO2 are only achievable once the previous	
	Exemplary criteria	1	credits have been achieved.	
	Planning, liaison and implementation	1	Total available credits: 3	
LE03*: Managing Negative Impacts on Ecology	Managing negative impacts of the project (limitation or	Up to 2	be achieved if LE02 has been achieved.	
	compensation)		The second and third credits under LE03 are only achievable once the first credit has been achieved.	
	Liaison, implementation and data	1	Total available credits: 5	
LE04*: Change and Enhancement of Ecological Value	Change and enhancement of ecology	Up to 3	Credits within LEO4 can only be achieved if Criteria 2 and 3 under LEO3 have been	
	Exemplary criteria	1	achieved.	

Table 3.3: Summary of Land Use and Ecology BREEAM Issues

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LE05*: Long Term Ecology Management and Maintenance	Planning, monitoring managemen maintenance	liaison, and t	data, review and	1	Total available credits: 2 Credits within LE05 can only be achieved if Criteria 2 and 3 under LE03 have been
	Landscape managemen developmen	and t plan (or t	ecology similar)	1	achieved, and at least one credit under LE 04 for 'Change and Enhancement of Ecology' has been awarded.

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

3.4 Limitations

3.4.1 Desk Study and Phase 1 Habitat Survey

Biological records can be received from a wide variety of sources and may or may not be comprehensive and accurate. However, if assessed in conjunction with a Phase 1 Habitat survey, they 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 between May 2018 and June 2019 and is based on the conditions encountered and the information available during the said period of 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 Site boundary was altered after undertaking the Phase 1 Habitat Survey. An additional area in the west of the Site, along the entrance road, was subsequently included. This area was mapped using aerial photography, Site photographs and Site knowledge. Buildings 6, 7 8 and 9 were not assessed, as they were outside the boundary provided at the time of the Phase 1 Habitat Survey. These buildings will not be impacted by the proposed works so this is not considered to be a significant limitation.

This report is based on data gathered in 2018 during the desk study and Phase 1 Habitat Survey. Due to the limited ecological complexity of the Site and its continued use and management it is unlikely that Site conditions have changed. This is not considered to be a limitation of this report.

There were no further limitations to the Phase 1 Habitat Survey and BREEAM assessment.

3.4.2 BREEAM Land Use and Ecology Issues LE02 – LE05

The BREEAM Land use and Ecology 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 the SQE.

Calculations for 'after development' have been provisionally calculated using the proposed site layout and landscaping plan: drawing number PHS-HLM-SW-ZZ-GA-L-0002. A further calculation may need to be undertaken once a detailed development and landscaping plan for the Site has been produced. A lighting plan has not been provided at this stage. This report can be used to guide Site design and to help achieve credits under LEO4.

4. Baseline Conditions

4.1 Desk Study Results

The designated habitats, sites and features within proximity to the Site are listed in Table 4.1 below.

Table 4.1: Desk Study Results

Designation / Feature	Description		
Designated Sites within 2 km	Fferm Walters SSSI		
of Site boundary	Distance and Direction: 0.17 km south west		
	Description: Fferm Walters is of special interest for its exceptionally large area of species-rich neutral grassland, most of which has a particularly calcicolous nature and is one of the rarest types of grassland in Wales. Part of this grassland is undergoing restoration. The grassland is associated with woodland, hedgerows and scrub and smaller areas of damp grassland. Several uncommon plants occur at Fferm Walters. Spiny restharrow Ononis spinosa; meadow barley Hordeum brachyantherum and pepper-saxifrage Silaum silaus are plants of southern lowland Britain which, in Wales, are most common in the Vale of Glamorgan. A small population of parsley water-dropwort Oenanthe lachenalii is present in the damp grassland (NRW, 2015).		
	Coedydd Y Barri/ Barry Woodland SSSI		
	Distance and Direction: comprised of 14 separate sites, closest located 0.2 km east		
	Description: Coedydd Y Barri/Barry Woodlands is of special interest for its semi-natural broadleaved woodland.		
	The site comprises a series of fourteen separate woodland blocks, some of which are connected by hedgerows. They are in two groups, about 3 km apart, centred on Pencoedtre Wood and Middleton Wood, on the northern and western outskirts of Barry, in the Vale of Glamorgan. Most of the woodlands are on gently sloping ground at an altitude of between 30 m and 70 m and associated with clayey, often waterlogged, moderately base rich lowland soils that in Wales are almost entirely restricted to the Vale of Glamorgan. Long-established woodland on this particular soil-type gives rise to ash-dominated woodland that supports a rich ground flora. This series of woodlands is the best example of this habitat in Wales (CCW, 2007).		
Locally Designated Sites	Land North of Port News Site of Importance for Nature Conservation (SINC)		
within 2 km of Site boundary	Distance and Direction: 0.02 km north Description: Semi-natural broadleaved woodland on an ancient woodland site (Vale of Glamorgan Council, 2013).		
	North West of Pencoetre Wood SINC		
	Distance and Direction: 0.2 km north		
	Description: Semi-natural broadleaved woodland, part of ancient woodland site (Vale of Glamorgan Council, 2013).		
	West of Pencoetre Wood SINC		
	Distance and Direction: 0.2 km north		
	Description: Small pond supporting tail nerb vegetation (vale of Glamorgan Council, 2013).		
	Cwm Talwg Woodland LNR		
	Distance and Direction: 0.25 km north		
	Description: 2.85 hectares of mature deciduous woods (Vale of Glamorgan Council, undated).		
	Land West of Windrush SINC		
	Distance and Direction: 0.3 km north		
	Description: Species rich fen meadow (Vale of Glamorgan Council, 2013).		
	Field at Merthyr Dyfan SINC Distance and Direction: 0.8 km south west		

Designation / Feature	Description
	Description: Series of small fields supporting a mosaic of species-moderate and species-rich semi improved neutral grassland and scrub (Vale of Glamorgan Council, 2013).
	Brvnhill SINC
	Distance and Direction: 1.1 km west
	Description: Semi-natural broadleaved woodland (Vale of Glamorgan Council, 2013).
	Goldsland Farm Pond SINC
	Distance and Direction: 1.1 km north
	Description: Pond with dense tall swamp (Vale of Glamorgan Council, 2013).
	Bears Wood SINC
	Distance and Direction: 1.2 km north
	Description: Ancient semi-natural broadleaved woodland (Vale of Glamorgan Council, 2013).
	Land at Nant Bryhill SINC
	Distance and Direction: 1.5 km west
	Description : Series of species-rich purple moorgrass and rush pastures with tall herb and swamp vegetation (Vale of Glamorgan Council, 2013).
	Goldsland Wood SINC
	Distance and Direction: 1.5 km north
	Description: Ancient semi-natural broadleaved woodland (Vale of Glamorgan Council, 2013).
	Coed Ysgubor-Goch SINC
	Distance and Direction: 1.5 km north east
	Description: Series of semi-natural broadleaved woodlands, predominantly on ancient woodland sites (Vale of Glamorgan Council, 2013).
	Wenvoe Wood SINC
	Distance and Direction: 1.7 km north
	Description: Ancient semi-natural broadleaved woodland (Vale of Glamorgan Council, 2013).
	East of Dyffryn Spring SINC
	Distance and Direction: 1.8 km north west
	Description: Predominantly ancient semi-natural broadleaved woodland (Vale of Glamorgan Council, 2013).
	North of Highlight Farm SINC
	Distance and Direction: 2.0 km west
	Description: Three ponds supporting diverse emergent and aquatic flora, tall swamp vegetation and reedbed (Vale of Glamorgan Council, 2013).
	Walter Farm SINC
	Distance and Direction: 2.0 km south west
	Description: Series of species-rich neutral grasslands, locally damp, with large anthills (Vale of Glamorgan Council, 2013).
	Cadoxton Wetlands SINC
	Distance and Direction: 2.0 km south east
	Description: Site supports a mosaic of ponds, reedbeds, tall herb swamp, grassland, scrub and scattered trees and supports a range of Section 42 species including wintering bittern Botaurus stellaris (Vale of Glamorgan Council, 2013).
Designated Sites within 10	There are no designated sites for bats within 10 km of the Site boundary.

km designated for bats

Designation / Feature	Description
Protected and Priority Species Records from the last 10 years within 2 km	 The following recent (last 10 years) species have been recorded within 2 km of the Site boundary: Plants: Bluebell Hyacinthoides non-scripta. Invertebrates: Brown banded carder bee Bombus humilis, shrill carder bee Bombus sylvarum. Amphiblans: Common frog Rana temporaria, common toad Bufo bufo. Reptiles: Slow-worm Anguis fragilis (nearest record 770 m south). Birds: Barn owl Tyto alba, bittern Botaurus stellaris, bullfinch Pyrrhula pyrrhula, Cetti's warbler Cettia cetti, dunnock Prunella modularis, fieldfare Turdus pilaris, house sparrow Passer domesticus, kestrel Falco tinnunculus, linnet Linaria cannabina, marsh tit poecile palustris, peregrine Falco peregrinus, redwing Turdus philomelos, starling Sturnus vulgaris, yellowhammer Emberiza citrinella. Bats: Brown long-eared bat Plecotus auritus (single record of injured bat 1.8 km west), common pipistrelle bat Pipistrellus pipistrellus (nearest record 1.5 km east. Two roosts 2.1 km north and 1.8 km east), whiskered bat Myotis mystacinus (nearest record 680 m south, injured bat), noctule bat Nyctalus noctula (nearest record 2 km south), soprano pipistrelle bat Pipistrelle bat Pipistrellus (nearest record 1.6 km north in woodland adjacent to Nant Brynhill), hedgehog Erinaceus europaeus (nearest record 1.4 km east)
Priority Habitats and Species – Section 7 List	The full list of Section 7 Habitats and Species of Principle Importance in Wales has been reviewed. Those priority habitats present on site and priority species with potential to be on Site are listed in Table 4.2 and Table 4.3 respectively.
Surrounding Land Use	The Site is located in Barry. To the north of the Site Boundary is Port Road (A4050), beyond Port Road are scattered woodland blocks dominated by coniferous plantation woodland, areas of marshy grassland and a crematorium. Further north are fields linked by hedgerows and a golf course. Nant Brynhill watercourse is located 480 m north. To the east of the Site are school playing fields (within the current boundary of the Girl's School) and residential buildings. Beyond these, north-east, is Pencoedtre Wood SINC (part of Barry Woodlands SSSI) which extends east dissected by the A4231 road. To the south of the Site is a block of woodland and Barry Rugby Football sports pitches. A watercourse Ffynnon Pencotry is located in the woodlands 40 m from the Site Boundary. Further south are the residential areas of Merthyr Dyfan, Cadoxton and Colcot. To the west are residential areas of Colcot and west of the A4050 extends into improved grassland fields with hedgerows and scattered woodland,
Ancient Woodland	6.51 Ha of PAWS is located to the north of the Site separated from the Site by Port Road (A4050). This area includes Land North of Port News SINC. There is no ASNW, RAWS or PAWS within the Site Boundary.
Tree Protection Orders (TPO)	 Trees with a TPO designation are present adjacent to but outside of the Site boundary along the south western and northern boundaries: 14 Corsican pine and 2 lime trees have a TPO along Merthyr Drafen Road 0.02 km south west of the Site boundary. A woodland with several TPO is located to north of the Site, separated from the Site by Port Road (A4050). These trees form part of Land North of Port News SINC.
Ponds within 500m	There are 7 ponds within 500 m of the Site: Ponds 1 to 7 are all-located in the grounds of a crematorium to the north of the Site separated from the Site by Port Road (A4050). Ponds are located 250 m, 285 m, 295 m, 295 m, 300 m, 320 m, 325 m north and north east. Ponds are located in grassland with woodland to the north and east.
Council Ecologist and Local Specialist Recorders	The County Ecologist responded stating all records are submitted to SEWBReC. The county bird recorder responded stating all records are submitted to SEWBReC. The local Amphibian and Reptile Group responded stating that all records are submitted to SEWBReC The local Bat Group were contacted, no response has been received to date.

4.2 Extended Phase 1 Habitat Survey

4.3 Habitats

The habitats present within the Site boundary and their descriptions are shown in Table 4.2. A plan of the Site showing the location and distribution of these habitats is shown in Figure 1.

Table 4.2: Phase 1 Habitats and Descriptions

Habitat	Description	Section 7 Habitat
Broadleaved Woodland - Semi-Natural	Strip of woodland along, but outside of the southern boundary (Appendix B: Photograph 8 and 10). This woodland extends further south beyond the Site Boundary. This habitat has not been accounted for in the BREEAM Assessment but is mentioned here in relation to the Zone of Influence Species include hawthorn Crataegus monogyna, blackthorn Prunus spinosa, ivy Hedera helix, lords and ladies Arum maculatum, elder Sambucus nigra, bramble Rubus fruticosus, field maple Acer campestre, hazel Corylus avellana, nettle Urtica diocia, spindle Euonymus europaeus, male fern Dryopteris filix-mas, wood avens Geum urbanum, lesser celandine Ranunculus ficaria, meadow sweet Filipendula ulmaria and bush vetchling Lathyrus ornatus.	Yes
Broadleaved Woodland - Plantation	Strip of woodland along the north west boundary of the Site. The understorey is amenity grassland, as described below. There was no woodland ground flora. (Appendix D Photograph 37). Species include ash Fraxinus excelsior, rowan Sorbus aucuparia, bastard service tree Sorbus domestica, downy birch Betula pubescens, oak sp. Quercus sp, alder Alnus glutinosa and lime Tilia x europaea.	No
Row of Broadleaved Trees	A row of broadleaved trees is located around the roundabout in the west of the Site (Appendix D: Photograph 4). Species include mountain ash Sorbus aucuparia, cherry Prunus sp., willow Salix sp. and beech Fagus sylvatica. Rows of broadleaved trees are located along the strip of amenity grassland adjacent to the entrance road to the Site.	No
Standalone Trees	 Standalone trees are located in the west of the Site around the buildings and associated areas of hardstanding and amenity grassland (Appendix D: Photographs 5, 12 and 13). Tree 1 - willow, 5 m high, 0.4 m Diameter at Breast Height (DBH). Tree 2 - ash, 8 m high, 0.5 m DBH. Tree 3 - cluster of four trees, three silver birch Betula pendula and one ash, all above 8 m high and 0.5 m DBH. Tree 4 - cluster of four mountain ash, all 4 m high and 0.1 m DBH. Tree 5 - ornamental species, 8 m high, 0.3 m DBH. Tree 6 - birch, 7 m high, 0.3 m DBH. Tree 7 - cluster of four cherry, 7 m high, 0.4 m DBH. Tree 8 - field maple, 8 m high, 0.3 m DBH. Tree 10 - ash, 8 m high, 0.2 m DBH. Tree 11 - two mountain ash, 4 m high, 0.05 m DBH. Tree 12 - birch, 6 m high, 0.3 m DBH. Tree 13 - hawthorn, 6 m high, 0.3 m DBH. Tree 14 - silver birch, 11 m high, 0.35 m DBH. 	No
Dense Scrub	There is an area of scrub in the north west which is comprised of elder Sambucus nigra, hawthorn, blackthorn, willow sp., ivy, nettle, dock, willow herb Epibolium sp, lords and ladies, bramble, bindweed Convolvulus sp., hazel and wood spurge Euphorbia amygdaloides (Appendix D: Photograph 12).	No
Semi-Improved Neutral Grassland	Area of grassland located in the south of the Site (Appendix D: Photograph 6 and 15). The area is frequently managed by mowing so does not have a diverse structure or sward. Species include daisy Bellis perennis, creeping buttercup Ranunculus repens, sweet vernal grass Anthoxanthum odoratum,	No
Prepared for: Bouygues UK		

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Habitat	Description	Section 7 Habitat
	cat's ear Hypochaeris radicata, ribwort plantain Plantago lanceolata, field wood rush Luzula campestris, red clover Trifolium pratense, common birdsfoot trefoil Lotus corniculatus, selfheal Prunella vulgaris, black knapweed Centaurea nigra, yarrow Achillea millefolium, dandelion Taraxacum sp., marsh thistle Cirsium palustre , glaucas sedge Carex flacca, perennial rye grass Lolium perenne, dock sp. Rumex sp., bugle Ajuga reptans and cuckoo flower Cardamine pratensis.	
Poor Semi-Improved Grassland	Area in the west of the Site (Appendix D: Photograph 12). Species include daisy, creeping buttercup, ribwort plantain, selfheal, dandelion and perennial rye grass.	No
Amenity Grassland	Amenity grassland is located across the Site. Areas of amenity grassland include sports pitches, playing fields and amenity areas around buildings and parking (Appendix D: Photograph 1, 3, 4, 5, 8, 9 and 10). Species include daisy, perennial rye grass, creeping buttercup, Yorkshire fog Holcus lanatus, ribwort plantain, spear thistle Cirsium vulgare, dock sp., cat's ear, cocksfoot Dactylus glomerata and clover Trifolium sp The playing fields are dominated by perennial rye grass and clover. A culvert is located along the southern boundary within the area of amenity grassland. This was dry at the time of survey and fenced off (Appendix B: Photograph 16; Appendix C: Target Note 2).	No
Ephemeral Short Perennial	Strip of ephemeral short perennial around Building 3 and 4 (Appendix D: Photograph 2). Species include bristly ox tongue Helminthotheca echioides, daisy, clover, hedge bedstraw Galium mollugo, common mouseear Cerastium fontanum, unknown cabbage sp. Brassica sp., dandelion, Yorkshire fog, common ragwort Jacobaea vulgaris, scarlet pimpernel Anagallis arvensis, prickly sow thistle Sonchus asper, ground ivy Glechoma hederacea, black medick Medicago lupulina and bitter cress Cardamine sp. with patches of gravel.	No
Introduced Shrub	Ornamental planting on the junction entering the roundabout in the west of the Site (Appendix D: Photograph 7). Comprised of ornamental shrubs with hawthorn and silver birch trees and ash saplings.	No
Hedgerow Species Poor with Trees - Intact	Located along northern boundary of the Site. All trees have a DBH greater than 0.1 m (Appendix D: Photograph 11). Trees species include ornamental acer and ash. Hedgerow species include hawthorn, hazel and ash with a ground flora of ivy, nettle, bush vetch, cow parsley, cleavers, lords and ladies, bramble, black bryony Dioscorea communis, bristly ox tongue, false wood brome Brachypodium sylvaticum, meadow buttercup Ranunculus acris and bugle. Species poor hedgerows with trees are located along the western boundary (Appendix D: Photograph 10). Species include beech, silver birch, ornamental species, leylandii, hawthorn, ash and dog rose Rosa canina, with ground flora of ivy, bramble, and forget-me not Myosotis sp	Yes
Buildings	A description of each building and an assessment of suitability to support roosting bats is provided in Table 3.5.	No
Hardstanding	Areas of hardstanding including roads, parking areas, foot paths, and sports pitches are located across the Site. There are courtyards within Building 1 (Appendix E: Target Notes 3-7; Appendix D Photographs 19-23 and 25). These include ornamental planting, gravelled areas, hardstanding, sheds and shrub and tree planting.	No

4.4 Protected or Priority Species

The potential for Protected and Priority Species in habitats on Site is discussed in Table 4.3.

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 E.

Table 4.3: Protected and Priority Species Potential

Species/ Species Group	Associated habitat	Description	Section 7 Species
Reptiles	N/A	Reptiles are considered likely absent from the Site. There are no suitable habitats within the site boundary with potential to support reptiles. The Site is dominated by hardstanding and heavily managed amenity grassland.	N/A
Breeding Birds	Broadleaved semi natural woodland, broadleaved plantation woodland, dense scrub, introduced shrub, row of broadleaved trees, hedgerows, buildings.	The Site provides a range of nesting opportunities for common passerine species, such as hedgerows, scrub, woodland and trees. Nesting gulls were observed on the flat roof of Building 1 (Appendix C: Target Note 1).	Yes
Bats	Broadleaved semi natural woodland, broadleaved plantation woodland, dense scrub, semi- improved neutral grassland, poor semi- improved grassland, row of broadleaved trees, hedgerows, buildings.	The Site is assessed as having 'Moderate' suitability to support foraging and commuting bats. Hedgerows and rows of trees along the boundaries of the Site provide suitable commuting habitats for bats. The Site is well connected to the surrounding landscape by rows of trees, hedgerows and blocks of woodland which extend from the Site and connect it to surrounding woodland and other suitable bat habitats in the wider landscape. Habitats on Site provide suitable foraging habitats for bats. An assessment of the suitability of buildings on Site to support roosting bats is provided in Table 4.5.	Yes
Hedgehog	Broadleaved semi natural woodland, broadleaved plantation woodland, dense scrub, semi- improved neutral grassland, poor semi- improved grassland, , hedgerows.	Semi-improved grassland, poor semi-improved grassland, woodland, scrub, and hedgerows provide potential foraging habitat for hedgehog. Hedgerows, woodland and scrub provide shelter for hedgehog and connect the Site with the surrounding landscape.	Yes
Dormouse	N/A	Dormouse are considered likely absent from the Site due to lack of suitable habitats to support regularly occurring populations within the Site boundary. Dormouse records were not returned from the LERC within 2 km of the Site. None of the woodland SINC or SSSI designations adjacent to the Site, and within 2 km, mention dormouse. Dormouse are considered likely absent from the Site and not considered further.	Yes
Other Mammals	Semi-improved grassland	A mammal trail was recorded crossing the semi-improved grassland in the south of the Site (Appendix B: Photographs 15 and 17; Appendix C: Target Note 7-10). These could be from badger or fox. No other signs were recorded to confirm species, there were no hairs or scats seen. No badger records were returned within 2 km by the LERC. The mammal track indicates that the Site is used for commuting only. Badger setts or fox dens could be located outside of the Site, within the adjacent woodland, south-east of the Site.	No

4.5 Invasive Non-Native Species Subject to Legal Controls

No Invasive Non-Native Species (INNS) were recorded within the Site Boundary.

4.6 Bat Roost Assessment

Features suitable for supporting roosting bats were assessed during the site visit and are listed in Table 4.4. The locations of suitable roost features are shown on Figure 1.

Table 4.4 Features Assessed as Having Suitability to Support Roosting Bats

Feature	Description	Bat Roost Suitability Category
Building 1	 <u>Prelim Assessment</u>: Main building. Brick and steel frame building with flat roof, plastic facia boards and metal panelling around the windows. Overall in good condition. There are some features present with the potential to support roosting bats. Plastic facia not flush with brick creating a 3-4 cm gap giving access to the flat roof void. There are no cobwebs between the gap. No bat droppings seen on floor or wall (Appendix D: Photograph 29; Appendix E: Target Note 11). This feature has Moderate suitability for roosting bats. Gap under edge of facia by window. No cobwebs between the gap. One bat dropping observed on plastic white sack, due to its location this could be indicative of a roost near the window or just of bats flying within the courtyard (Appendix D: Photographs 26-27; Appendix E: Target Note 12). This feature has Moderate suitability for roosting bats. Barge board collapsed and breaking away above door. Gap covered by cobwebs so unlikely to be accessed recently by bats. Emergency lighting below and flood lights nearby reduce the suitability of this feature (Appendix D: Photograph 31; Appendix C: Target Note 13). This feature has Low suitability for roosting bats. Gap at edge of metal work, not sealed creating a 5x5cm gap. Gap covered by cobwebs so unlikely to the accessed recently by bats. Lighting nearby reduces the suitability for roosting bats. Gap at edge of bitumen felt filled with orange foam (Appendix E: Target Note 15). This feature has Negligible suitability for roosting bats. Gap at edge of bitumen felt filled with orange foam (Appendix E: Target Note 15). This feature has Negligible suitability for roosting bats. Gap at edge of bitumen felt filled with orange foam (Appendix E: Target Note 15). This feature has Negligible suitability for roosting bats. Gap at edge of bitumen felt filled with orange foam (Appendix E: Target Note 15). This feature has Negligible suitability for roosting bats. 	Prelim Assessment: Moderate Following Bat emergence/entry surveys: Negligible – No Roost
Building 2	Prelim Assessment: Portacabin with wooden facia board and flat felt roof (Appendix D: Photograph 33, 34). There is a gap behind the facia board around the north, east and west face, this creates possible access point into the felt roof. The building is suitable to support occasional bats roosting opportunistically but is unlikely to regularly support bats or support a roost of conservation concern. <u>Bat emergence/entry surveys</u> : Undertaken in by AECOM in 2018 (AECOM 2018b). No bats recorded exiting/entering. Building is not a bat roost.	Prelim Assessment: Low Following Bat emergence/entry surveys: No Roost
Building 3	 Prelim Assessment: Portacabin with wooden facia board and flat felt roof (Appendix B: Photograph 35). There is a gap behind the facia board around the south, east and west face, this creates possible access point into the felt roof. There is a gap on one corner where the wood is damaged and layers have separated on both the wall and felt roof. The building is suitable to support occasional bats roosting opportunistically but is unlikely to regularly support bats or support a roost of conservation concern. Bat emergence/entry surveys: Undertaken in by AECOM in 2018 (AECOM 2018b). No bats recorded exiting/entering. Building is not a bat roost. 	Prelim Assessment: Low Following Bat emergence/entry surveys: No Roost
Building 4	Portacabin with flat metal roof in good condition (appendix B: Photograph 36). No features present which are suitable to support roosting bats.	Negligible
Building 5	Residential building located outside of Site boundary adjacent to the Site. Brick building with pitched tiled roof and hanging tiles. Features include gappy hanging tiles and roof tiles and there is a gap at the edge of the roof where it joins the wall.	Moderate

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Feature	Description	Bat Roost Suitability Category
	The building has several features suitable to support roosting bats but is unlikely to support a roost of conservation concern. There will be no works on or adjacent to this building and so further assessment is not required.	
Buildings 6, 7, 8 and 9	These buildings were not assessed during the Phase 1 Habitat Survey as they are outside the Site boundary. There will however be no works on or adjacent to these buildings and so further assessment is not required.	Not Assessed
Bat Tree 1	10 m high, 0.3 m DBH ash with dense ivy cover. No visible features but ivy may be hiding features. Tree is of a size and age suitable for supporting bats.	Low
Bat Tree 2	11 m high, 0.3 m DBH ash with dense ivy cover. No visible features but ivy may be hiding features. Tree is of a size and age suitable for supporting bats.	Low

4.7 Zone of Influence

BREEAM defines the zone of influence 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 surrounding the Site were noted when undertaking the Phase 1 Survey and as part of the desk study (see Table 4.1). The zone of influence includes the following features:

- A block of woodland located to the east of the Site bordering the south-east boundary;
- A culvert located along the southern boundary (Figure 1: TN2) which connects to a watercourse within the woodland block;
- Land North of Port News SINC and an area designated as PAWS located 0.02 km north of the Site separated from the Site by Port Road;
- Buildings adjacent to the western boundary and along the school entrance. This is because poor lighting may impact any suitable roost features in these buildings and,
- Trees with TPOs located outside of the Site near the southern and western boundaries.

5. Ecological Constraints and Potential Impacts

The drawing number PHS-HLM-SW-ZZ-GA-L-0002 (see Figure 2) has been used to inform the assessment of potential impacts below. The potential impacts of the proposed access track, site compound, site car park and material storage areas outside of the Site boundary to the south of the Site have been considered (Figure 3), this is outside of the BREEAM Assessment.

If the proposed design changes, the assessment of potential impacts will need to be reassessed.

The constraints and potential impacts listed here do not include consideration of further surveys which have been recommended in Section 6. The results of further surveys may change the likely potential impacts.

5.1 Development Proposal

The proposed development is for a new build project to replace the existing Pencoedtre High School. The school will accommodate 1050 number 11-16 year old pupils and 200 number Sixth Form pupils. The development will include demolition of the existing Pencoedtre High School building, the construction of a new school building, new hard court facilities and enhanced sports pitch provision, car parking and areas of landscaping. The current landscaping plan includes orchard planting and an allotment in the southwest corner of the Site, biodiversity planting along the boundaries, embankment and shrub planting, ornamental planting and multipurpose lawn areas. Works will commence in February 2020.

During the works there will be a Site access road, site car park, topsoil storage and site compound located in the Barry RFC field to the south of the Site. There will be partial removal of hedgerow which is outside of Site boundary (approximately 20 m will be removed and replanted after works) to connect the Entrance route from Barry RFC to the Exit via the current school access (one way system).

5.2 Designated Nature Conservation Sites

5.2.1 Internationally and Nationally and Designated Sites

There are no internationally designated sites within 2 km of the Site Boundary.

There are two SSSIs located within 2 km of the Site Boundary. These are both designated for habitats, the closest site is 170 m from the Site Boundary. The proposed works are unlikely to have any impact on these Sites due to the distance from the development and nature of the proposed works (i.e. no chemicals or gases being released) and no pollution pathways between the Site and the SSSIs.

5.2.2 Sites of Importance for Nature Conservation (SINC)

There are seventeen SINCs within 2 km of the Site Boundary, the nearest is 20 m from the Site Boundary. Land North of Port News SINC is located adjacent to the northern boundary of the Site separated from the Site by Port Road. If lighting of the sports pitches is poorly designed there is potential for light spill onto the SINC which will have a negative impact on any species using the site including bats, birds, hedgehogs and badgers.

The development is unlikely to have any direct impact on any further SINCs due to the distance or separation from the Site and the nature of the development (i.e. no chemicals or gases being released) and no pollution pathways between the Site and the SINCs.

5.2.3 Areas That Would Meet the Criteria of a SINC

None of the habitats on Site meet the criteria of a SINC based on Welsh Biodiversity Partnership guidelines (WBP, 2008).

5.3 Ancient Woodland

An area of PAWS is located 20 m from the northern Site boundary separated from the Site by the A4050 Port Road. The development is unlikely to have any direct impact on the PAWS due to the separation of the Site by the A4050 road, absence of pollution pathways and nature of the works.

Works along the northern boundary of the Site comprise the creation of a new sports pitch. The external lighting of the sports pitch, if poorly designed, could spill onto the PAWS. This would negatively impact its value to biodiversity.

5.4 Tree Preservation Orders

Trees designated with a TPO are present adjacent to but outside of the Site along the south west and northern boundaries.

Trees designated with a TPO in the woodland to the north of the Site, outside the boundary, are to be retained; these are separated from the Site by the A4050 Port Road so there will be no direct impact on these trees. Works along the northern boundary of the Site comprise the creation of a new sports pitch. The external lighting of the sports pitch, if poorly designed, could spill onto TPO trees.

Tree along the western boundary are to be retained. There will be no impact on these trees.

5.5 Habitats

5.5.1 Broadleaved Woodland - Semi-Natural

Lighting plans are currently unavailable; if there is light spill onto the woodland outside of the Site boundary) this will have a negative impact, as light spill could result in sensitive species avoiding the habitat resulting in the severance of habitat connections and reducing connectivity with the surrounding landscape.

During construction, if there is tracking of vehicles, site compounds or material storage areas near the habitat or ground breaking works such as new pipelines there is potential for impacts on retained trees (outside of the Site boundary) through root compaction by machinery tracking over the root zone or damage to trees by knocking off or damaging limbs. At present, a grassed sports pitch will be located adjacent to the retained woodland, no new development is proposed within the Root Protection Zones of the retained trees.

5.5.2 Broadleaved Woodland – Plantation

Under the current proposals (drawing number PHS-HLM-SW-ZZ-GA-L-0002 (issued 22/08/2019), the area of plantation woodland will not be removed, but the proposed grassland track will extend adjacent to and possible below the tree canopies.

Lighting plans are currently unavailable; if there is light spill onto the retained woodland then there will be a negative impact on species using this habitat. The woodland provides connectivity across the Site and links it to the surrounding landscape.

Lighting of this area of woodland will have a negative impact on any species using this habitat. Light spill could result in sensitive species avoiding the habitat resulting in through severance of habitat connections and reducing connectivity with the surrounding landscape.

During construction, if there is tracking of vehicles, site compounds or material storage areas near the habitat or ground breaking works such as new pipelines there is potential for impacts on retained trees through root compaction by machinery tracking over the root zone or damage to trees by knocking off or damaging limbs. At present, a grassed sports pitch will be located adjacent to the retained woodland, no new development is proposed near this habitat.

During operation, pruning of limbs overhanging the sports track will be required.

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5.5.3 Row of Broadleaved Trees

Under the current proposals (drawing number PHS-HLM-SW-ZZ-GA-L-0002 (issued 22/08/2019), there will be partial removal of rows of trees along the entrance road in the west. The row of trees around the roundabout will be retained.

Lighting plans are currently unavailable, if light spill falls onto rows of trees then this will have a negative impact on species using these features for nocturnal foraging and commuting.

During construction, if there is tracking of vehicles, site compounds or material storage areas near this habitat or ground breaking works such as new pipelines there is potential for impacts on retained trees through root compaction by machinery tracking over the root zone or damage to trees by knocking off or damaging limbs. At present, a grassed sports pitch will be located adjacent to the retained trees, no new development is proposed near this habitat.

5.5.4 Standalone Trees

Under the current proposals (drawing number PHS-HLM-SW-ZZ-GA-L-0002 (issued 22/08/2019), there will be loss of some standalone trees. However, tree planting will be included in the new school design and some trees will be retained on Site and further trees are available in the wider landscape. Removal of trees will have a low site-level impact and a negligible impact at the local level.

During construction, if there is tracking of vehicles, site compounds or material storage areas near this habitat or ground breaking works such as new pipelines there is potential for impacts on retained trees through root compaction by machinery tracking over the root zone or damage to trees by knocking off or damaging limbs.

5.5.5 Dense Scrub

Under the current proposals (drawing number PHS-HLM-SW-ZZ-GA-L-0002 (issued 22/08/2019), the area of scrub will be retained.

The strip of scrub runs along the boundary and connects to broadleaved plantation woodland providing a connectivity across the Site. Lighting plans are currently unavailable, if light spill falls onto scrub then this will have a negative impact on any species using this feature for nocturnal foraging and commuting.

During construction, if there is tracking of vehicles or ground breaking works such as new pipelines there is potential for impacts on retained habitats through root compaction by machinery tracking over the root zone or damage to scrub by knocking off or damaging limbs. At present, no new development is proposed near this habitat.

5.5.6 Semi-Improved Neutral Grassland

Under the current proposals (drawing number PHS-HLM-SW-ZZ-GA-L-0002 (issued 22/08/2019) and Site Logistics Plan (Figure 3) it is likely all existing semi-improved grassland will be removed or permanently damaged during construction. The area of semi-improved grassland in the south west corner will be used for material storage and an access track will be created along the western boundary. This will require removal or permanent damage of semi-improved grassland.

The proposed new school building is located within the area of semi-improved grassland. The area occupying the new building will be completely lost. There will be reprofiling of land along the eastern boundary resulting in loss or permanent damage to semi-improved grassland. The remaining areas of semi-improved grassland surrounding the building and adjacent to the material storage area will likely be lost or damaged during construction by tracking of vehicles and ground breaking works.

Post construction the area in the south west corner will be re-instated as an orchard and allotment and biodiversity planting will be undertaken along the eastern boundary where the area has been re-profiled. Sustainable Drainage Solutions (SuDS) will be created in the area to the south of the new school building.

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5.5.7 Poor Semi-Improved Grassland

Under the current proposals (drawing number PHS-HLM-SW-00-GA-L-000 (issued 22/08/2019), the area of poor semi-improved grassland will be retained. During construction there is potential for damage to retained grassland by vehicles tracking over grassland.

5.5.8 Amenity Grassland

Under the current proposals (drawing number PHS-HLM-SW-ZZ-GA-L-0002 (issued 22/08/2019), there will be partial removal of amenity grassland where new artificial sports pitches, buildings and hardstanding are located. The athletics track and amenity grassland along the boundaries will be retained.

Amenity grassland is typically of low ecological value and is widely available in the surrounding landscape. Permanent removal of a proportion of this habitat for the new sports pitches and athletics track will have a low site-level impact and a negligible impact at the local level.

Amenity grassland adjacent to boundaries and along the entrance drive may be retained. However, during construction there is potential for damage to some of the retained amenity grassland by vehicles tracking over grassland.

5.5.9 Ephemeral Short Perennial

Under the current proposals (drawing number PHS-HLM-SW-ZZ-GA-L-0002 (issued 22/08/2019), Buildings 2 and 3 will be demolished and the adjacent ephemeral short perennial habitat will be removed. This is a proportionately small area with limited ecological value due to its size and location. The loss of this area will not have a significant ecological impact.

5.5.10 Introduced Shrub

Under the current proposals (drawing number PHS-HLM-SW-ZZ-GA-L-0002 (issued 22/08/2019),introduced shrub will be removed. This is a proportionately small area with limited ecological value due to its size and location. The loss of this area will not have a significant ecological impact.

5.5.11 Hedgerow Species Poor with Trees

Under the current proposals (drawing number PHS-HLM-SW-ZZ-GA-L-0002 (issued 22/08/2019), all hedgerows will be retained. Lighting plans are currently unknown; if light spill falls onto hedgerows then this will have a negative impact on species using these features for foraging and commuting. During construction there is potential for impacts on retained hedgerows through root compaction by machinery tracking over the root zone or damage to trees by knocking off or damaging limbs. A works access track will be located adjacent to the western boundary in the south of the Site, this runs adjacent to a section of hedgerow. There is potential for damage of the hedgerow caused by root compaction caused by tracking of heavy vehicles and machinery.

5.5.12 Buildings

Under the current proposals (drawing number PHS-HLM-SW-ZZ-GA-L-0002 (issued 22/08/2019), all buildings within the Site (except where specified above) will be demolished and a new building built on existing semi-improved grassland. This will have a negative impact on any species currently using the buildings including roof nesting gulls.

5.5.13 Hard Standing

Areas of hardstanding will be partially retained but may be replaced following construction works. Hardstanding has no ecological value. Decreases in hardstanding will benefit biodiversity. Increases in hardstanding will negatively impact biodiversity.

5.5.14 Habitats Adjacent to but Outside of the Site Boundary

Approximately 20 m of hedgerow adjacent to the southern boundary will be removed when creating the works access track. Amenity grassland within the Barry RFC field will be removed to create a parking area, site compound, access track and topsoil store. These habitats will be reinstated following construction.

5.6 Protected or Notable Species

5.6.1 Breeding Birds

All buildings will be demolished. Nesting gulls were recorded on the roof of Building 1. If demolition works are undertaken during the nesting bird season (1st March through to end September) then this will impact on nesting gulls using the roof through damage and destruction of active nests and potential killing or injury of breeding birds.

In the long term, there will be a new building which will provide replacement habitat for nesting gulls so there will be no long-term loss in available nesting habitat.

Loss of rows of trees and standalone trees will result in habitat loss for breeding birds. Alternative nesting opportunities are available on Site and in the wider landscape so this will have a low impact at site level only. If vegetation clearance is undertaken during the nesting bird season (1st March through to end September) then this will impact on nesting birds resulting in potential damage and destruction of active nests and potential killing or injury of breeding birds.

External lighting has not yet been confirmed, if rows of trees, woodland, hedgerows or standalone trees are illuminated, this will have a negative impact on birds nesting in these areas during the breeding season due to disturbance and increased risk of predation. In the long-term there is potential for birds to stop using lit areas to nest, resulting in nesting habitat loss

5.6.2 Bats

5.6.2.1 Roosting

Buildings 1 -4 will be demolished during construction. Bat surveys were undertaken by AECOM in 2018 (AECOM 2018b) on Buildings 1-3. Buildings 1-3 do not support roosting bats, Building 4 is unsuitable to support roosting bats. There will be no loss, damage or destruction of bat roosts.

Bat Tree 1 and 2 have Low suitability to support roosting bats. These will be retained. There is potential for light spill onto Bat Tree 1 and 2 and retained Buildings 6-9 within the Site and buildings along the western boundary. This will have a negative impact on any bats using these features for roosting.

5.6.2.2 Habitat Loss

There will be removal of semi-improved grassland, some standalone trees, rows of trees, and amenity grassland; all other habitats suitable to support foraging and commuting bats will be retained. There will be a loss of foraging habitat at Site level. Habitat with similar or greater value to foraging bats is available in the wider landscape so there will be a negligible impact at the local level.

All boundary features within the Site boundary will be retained. 20 m of hedgerow adjacent to the southern boundary will be lost so there will be severance of a commuting corridor. This will be re-instated post development so this impact will only be temporary.

5.6.2.3 External Lighting and Vegetated Corridors

External lighting has not yet been confirmed, if the vegetated site boundaries, including rows of trees, woodland, hedgerows or standalone trees are lit, this will have a negative impact on bats using these features for commuting or foraging.

5.6.3 Hedgehog

There will be removal of semi-improved grassland and partial removal rows of trees and amenity grassland but all other habitats suitable to support hedgehogs will be retained. Available foraging habitat for hedgehog at the Site

will be greatly reduced. However, foraging habitat of similar or greater value to hedgehog is available within the wider landscape, therefore habitat loss will have a low site-level impact and a negligible impact at the local level.

All other boundary features within the Site are to be retained. 20 m of hedgerow adjacent to the southern boundary will be lost so there will be severance of a commuting corridor. This will be re-instated post development so this impact will be temporary.

External lighting has not yet been confirmed, if rows of trees, woodland, hedgerows or standalone trees are lit, this will have a negative impact on hedgehogs using these features for commuting or foraging.

During construction there is potential for entrapment of hedgehogs if excavations left open overnight.

5.6.4 Badger

A mammal track was noted within semi-improved grassland in the south of the Site (Figure 1: TN 8-10). It could not be determined if it was a badger or fox trail because no species specific signs were seen. The adjacent woodland to the east of the Site is has suitability for badger setts or fox dens. Land within the Site boundary is used for commuting.

Unmitigated ground breaking works within 30 m of a badger sett could cause disturbance to setts or sett collapse. The proposed building footprint is approx. 20 m from the Site boundary, and adjacent woodland. Due to the influence of human disturbance, it is considered unlikely that a badger sett would be within 10 m outside of the boundary fence, as this boundary has the school entrance footpath and would be used every week day, at least twice a day by school pupils. If present within the woodland, it is considered likely that any badger sett would be further into the woodland, and away from the school. Ground breaking works on Site are likely to be over 30 m from any potential badger sett, and therefore badger setts are unlikely to be impacted by the proposed works.

Any excavation left open overnight have the potential to entrap commuting mammals.

6. Further Surveys and Recommendations for Mitigation

6.1 Further Surveys

6.1.1 Bat Surveys

6.1.1.1 Bat Roosts Emergence/Re-entry Surveys

Bat surveys were undertaken on Buildings 1, 2 and 3 by AECOM in 2018 (AECOM 2018). No bat roosts were recorded.

No further surveys are required on trees assessed as having Low suitability to support roosting bats as these will be retained.

No further bat surveys are required.

6.1.1.2 Bat Activity Surveys

No linear features within the Site boundary are being severed. Light spill has the potential to impact on boundary features and bats using these features.

It is recommended that external lighting is designed to avoid light spill onto boundary features including rows of trees, hedgerows and woodland edges. If light spill can be avoided, no surveys for bat activity will be required.

If external lighting will not be designed to avoid impacts in the first instance, then activity surveys will be required. The Site has been assessed as having Moderate suitability to support foraging and commuting bats. A walked transect around the Site will be undertaken once per month between April and October and static detectors deployed for 5 days per month between April and October.

If the surveys find that bats are using these features, which is likely, then mitigation will be required. This will include the need to avoid light spill onto the linear features used by bats. It is recommended that external lighting is designed to avoid light spill in the first instance.

Approximately 20 m of hedgerow adjacent to the southern boundary will be removed. Potential impacts to commuting bats within the Site will be managed by mitigation as detailed in Section 6.2.

6.2 Recommendations for Mitigation

The mitigation hierarchy has been considered and implemented when designing the new development. The ecological constraints at the Site have been considered at an early stage and much of the mitigation has been included by design. Recommendations for mitigation are discussed in combination with LEO4. A summary is provided below.

Mitigation Hierarchy:

- 1. Enhance positive impacts and opportunities;
- 2. Avoidance Alternative site or technology, or timing to eliminate impact;
- 3. Minimise Actions during design construction and operation to minimise or eliminate impacts; and,
- 4. Compensation Used as last resort to offset impacts.

6.2.1 Designated Sites

Lighting should be designed to avoid light spill onto adjacent habitats in particular woodland to the north of the Site which is designated as a SINC.

6.2.2 Habitats

Retain areas of natural habitat where possible. At this Site, retaining and enhancing current habitats will be of greater value to wildlife than creating new areas of green space.

All retained habitats should be protected during construction to avoid damage to these features. Hedgerows and trees should be fenced off to avoid and reduce the impacts of direct damage or trampling and root compaction during construction by vehicles and people. Tracking of vehicles over retained habitats should be avoided. Where possible, vehicles should be kept on existing areas of hardstanding. The Site access track should be located at least 2 m from adjacent hedgerows.

Landscaping at the Site should be designed to include locally native species suitable for the area (i.e. shade, sun, soil type). Recommendations to enhance habitats on Site are provided in Section 10 LE04.

There is currently no vegetated boundary feature or fence along the eastern Site boundary, as the redline boundary cuts across the amenity grassland. A green corridor should be created along this boundary to provide habitat for wildlife and connectivity across the Site and with the surrounding area. Planting should be of locally native hedgerow species, with occasional native standard trees. A native species rich seed mix, suitable for the location (such as a woodland mix or verge mix) should be used at the base, to create a 'field margin' of at least 3m from the base of the hedgerow. This should be kept 'dark' and light spill onto the features should be avoided, to maximise its benefits.

A Landscape Habitat Management Plan (LHMP) will be produced as part of BREEAM LE05 which will help avoid and reduce any impacts from habitat loss or management during operation.

6.2.3 Species

6.2.3.1 Breeding Birds

The current plans include demolition of buildings suitable to support nesting gulls and removal of vegetation suitable to support nesting passerines. To protect breeding birds all demolition works and vegetation clearance should be undertaken outside of the breeding bird season (works completed between 1st September and end February).

If works must be undertaken during the breeding bird season an ecologist must be consulted, a nesting bird check must be undertaken a maximum of 48 hrs prior to works commencing. If breeding birds are present then a 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. A buffer must be applied adjacent to these areas to avoid damage or disturbance of nests during the breeding bird season (1 March-1 September). Lighting of these areas should be avoided.

The mitigation for breeding birds is covered as a 'mandatory requirement' in Section 9.2 LE04.

6.2.3.2 Bats and Lighting

The lighting plan has not been confirmed.

The following recommendations in line with the BCT, 2009, BCT, 2014 and Gunnell et. al., 2012, best practice guidance should be incorporated into any new lighting scheme at the Site:

- Light spill onto any new bat boxes must be avoided;
- In the first instance, external lighting should be designed to avoid light spill onto boundary features including rows of trees, hedgerows and woodland edges; and
- Light spill onto sensitive areas such as the Site boundaries and retained woodland and scrub which have the potential to be used by commuting and foraging bats and trees suitable to support roosting bats should be limited to levels of 3 Lux or less.

Suggestions for mitigating external lighting and achieving the lighting recommendations above are outlined in the ILP Guidance Note (ILP, 2018) and best practice guidance (BCT, 2009, BCT 2014 and 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 (2005);
- 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 <2700Kelvin) should be adopted to reduce blue light component.
- Eliminate bare lamps and any upward pointing light;
- The spread of light should be at or near the horizontal. Flat cut off lanterns are best;
- Use narrow spectrum lamps. Using lamps with the lowest UV output possible, avoid white and blue spectrums of light;
- Lights should peak higher than 550 nm or use glass lanterns to filter UV light;
- Reduce the height of lighting columns;
- Direct lighting to where needed and avoid spillage e.g. direct lighting towards the building front/foot path and design the luminaire appropriately, including the use of shields to avoid spillage behind the lamps onto adjacent habitats. Footways could, for example, be lit using bollards to keep the light below the tree canopy;
- Street lights can be located so that rear shields face the adjacent habitats or optics selected that stop back light thereby directing light into the task area, avoiding spill onto adjacent habitats.
- Where new lighting is proposed, use lighting modelling programs to indicate where the light spill will occur;
- Any external security lighting should be set to motion sensors and short (1 min) timers;
- Limit the times that the lights are on, to provide some dark periods;
- Avoid using reflective surfaces under lights; and
- Do not use a lamp greater than 150W for security lighting.

This will increase the value of the Site for a number of other nocturnal species, as well as for bats.

6.2.3.3 Bats and Hedgerows

Where the hedgerow is being removed (adjacent to the Site along the southern boundary) mitigation should be undertaken to avoid impacts on commuting bats. A Heras fence gate should be installed and closed each evening. This will be woven with vegetation or backed with hessian sacking to create an artificial boundary and maintain connectivity for commuting bats. Lighting or light spill onto this feature must be avoided. The hedgerow must be re-instated following completion of the works and enhancement planting should be undertaken along retained connected hedgerows.

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6.2.3.4 Hedgehog

Lighting should be controlled along woodland edge, hedgerows and rows of trees as detailed above in relation to bats.

Excavations should be covered over night or ramps installed so trapped hedgehogs can escape.

6.2.3.5 Badgers

Works within 30 m of a badger sett will be avoided.

Lighting should be avoided and minimised along the Site boundary and onto retained woodland and scrub as detailed above in relation to bats.

Excavations should be fenced off, covered over night or ramps installed so trapped badgers (or other animals) can escape.

6.2.4 Pollution Control during Construction

Pollution control measures as required Guidance for Pollution Prevention (GPPs) and where these have not been replaced the Environment Agencies Pollution Prevention Guidelines (PPGs) will be implemented in order to avoid and minimise adverse effects of pollution and runoff on designated sites and surrounding environment. This will be implemented via the Site Construction Management Plan (CMP).

As of the 17 December 2015 all Pollution Prevention Guidance 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 in order to deal with pollution incidents efficiently.

In order to avoid potential pollution effects to the sites during construction, all refuelling and servicing of vehicles will be carried out within a designated area with an impermeable base. To prevent spillages, refuelling will be carried out by pumping through a trigger delivery nozzle. Fuel, oil and other potential contaminants will be stored within bunded tanks to 110% of the volume stored and only the minimum quantity required will be stored on site. The designated area will be maintained in a secure and clean manner. An adequate quantity of oil absorbent material will be stored on site and spillages cleared up immediately. All construction equipment will be maintained in good working order and checked regularly for spillages/leaks.

Concrete will either be imported from a local batching plant or a concrete batching plant will be established on site. The final choice will depend on the chosen contractor, the availability of local supply and the time of year. If concrete is to be batched on site, appropriate containment and clean-up measures and procedures will be put in place that are in accordance with industry standards. Particular care will be taken when pouring concrete at foundations, following specific method statements to ensure there is no spillage risk or contamination of soils and vegetation.

6.3 Recommendations for Enhancements

The National Planning Policy Framework (February, 2019) and the Environment (Wales) Act 2016, requires that developments enhance biodiversity, as well as just mitigating impacts.

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

6.3.1 Improving Grassland Diversity

A different management regime will be completed for areas of grassland which are not used for sports and play areas.

New areas of grassland could be planted and managed to enhance species diversity. These areas should be mown three times a year (April, August and once during winter). http://wildseed.co.uk/page/management-of-meadows-and-grassland has more details on how to manage species-rich grasslands

It has been assumed that the top soil will be derived from on Site. The seed mixes used should be appropriate for the subsoil type used and need to be approved by the SQE prior to use. Areas should 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).

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, 2007), available online.

This could be calculated as part of the change in ecological value to the Site as part of LEO4 and will provide habitat for invertebrates, birds, foraging bats and hedgehogs.

Leave grassland edges adjacent to hedgerows unmown to create corridors of suitable habitat for hedgehogs.

6.3.2 Swale Creation

Swales could be created around parking areas, this can be considered in line with the Sustainable Drainage System (SuDS) scheme which based on the current landscaping plan includes SuDS features to the south and east of the new school building. Mini swales could be introduced within the car parking areas (at the ends of parking bays, for example). Swales provide areas for wildlife whilst managing rainwater and runoff. The swale should be seeded or planted with native species. Seed mixes such as EG8 (7 species), EM8 (24 species) or EM8F (17 species) should be used where soils are seasonally or occasionally wet.

As well as enhancing the biodiversity on Site, the swale could be used in conjunction with an information board to inform building users of the SuDS in place and raise awareness of water management.

The ground staff or contractors should be instructed to avoid the use of any artificial pesticides, herbicides and fertilisers. Non residual alternatives suitable for use near water should be used if required.

This could be calculated as part of the change in ecological value to the Site as part of LEO4 and will provide habitat for invertebrates, nesting birds and foraging bats.

6.3.3 Insect Habitats

An insect wall, insect boxes or bee banks could be included in the landscape design to provide shelter and hibernating habitat for a range of insects. These should be installed in areas adjacent to species rich habitats. Aspect will depend on which species are to be targeted.

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 (Carlton, 2015; Macivor & Packer, 2015).
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It is recommended that properly designed insect houses are used, such as those available from Nurturing Nature (<u>http://nurturing-nature.co.uk/wild-bee-nest-boxes/</u> rather than those available from garden centres which often are not suitable for insect species found in the UK. There are two designs to choose from for bumblebees and solitary bees, each suitable for supporting the requirements of their intended hosts.

Alternatively a bee bank could be built within the wildlife area in the southern corner of the Site 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 should be in a sunny location sheltered from the weather and be orientated to face south or south east. A crescent shape allows bees to make use of varying microclimates. The surrounding areas of habitat should provide a rich nectar and pollen source so should 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 can be stacked in the wildlife area in the southern corner of the Site. 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

The success of the invertebrate habitats should be monitored. Use could be monitored by a local invertebrate group and/or by students as part of an outdoor-based learning session, observing invertebrates leaving or returning to the wall; or during the yearly cleanout operations. The results of the surveys should be held on file and submitted to local records centre.

Full instructions for the management of the boxes will be provided by the manufacturer and will require cleaning out by identifying at the end of the summer any cells that remain in a walled-up condition from the previous year because no young bees emerged. The contents of these cells will be dead and should be removed and destroyed.

6.3.4 Bird and Bat Boxes

Bird Nest Boxes

At least five bird boxes should be installed on trees along the boundaries or included within the new building design. Boxes suitable for swifts and house sparrows would be suitable for use on buildings 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 close 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. Advise 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 should be appropriately located at least 4 m above ground level, and out of reach of predators. Bird boxes should not be positioned to face south in order to avoid hot sun.

In addition, it is possible to install bird box cameras with links to computers within the school. This allows pupils to track the development of chicks from egg to fledgling without disturbing the resident birds.

Bat Roost Boxes

It is recommended that bat boxes are included in the development design. Although not a legal requirement at this Site, the addition of bat boxes will increase roosting opportunities in the local area and have a positive impact on biodiversity at Site and local level. Pipistrelle foraging and commuting activity was recorded during the bat roost surveys.

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 or refurbished buildings. The choice of bat box should be suitable for crevice dwelling species.

Encouraging these species onto a site also provides an interesting educational opportunity. If bats are present, local bat groups or local ecological companies may be willing to lead talks and walks in the school grounds, involving staff, student and the wider community.

All new roost provision should be situated away from light spill, with clear flight paths towards corridors and foraging suitable to be used by bats. Advice from a suitable qualified ecologist should be sought when drawing up the specifications for bat roosts and locations. Bat boxes should 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 south east and south west to provide a range of microclimate options.

6.3.5 Kitchen Garden

An area within the school grounds has been designed to be used as a kitchen garden under the current landscape plan (orchard planting and allotment). The garden would include a mix of vegetables, herbs, fruit trees and other flowering plants which will attract insects to the area. The practicalities of maintaining the garden could be undertaken by an 'Eco Club' or by a rotation of PSHE classes. The concept of producing locally sourced healthy food could be used in many lessons from health to sustainable development and the produce could be used in home economics and even the school canteen.

Species could include aromatic herbs such as thyme, rosemary, mint, sage and chives; fruit trees such as native apple and plum trees; vegetables such as squashes, lettuces, peas, beans, carrots and parsnips; and flowering plants such as marigold, geranium and lavender.

This could be calculated as part of the change in ecological value to the Site as part of LEO4 and will provide habitat for invertebrates, foraging birds and foraging bats.

6.3.6 Sensory Garden

An area designated for seating could incorporate a range of native scented plants to stimulate and soothe the senses whilst also providing habitat for wildlife, most notably pollinating invertebrates such as butterflies, bees and hoverflies using plants such as lavender, honeysuckle, rosemary, mint, thyme and wild garlic.

The emphasis should be on plant species native to the UK to be beneficial for pollinating insects. Butterflies and moths are both aesthetically interesting and useful, often being brightly coloured and important pollinators. Butterflies and moths need plants both for food and as host plants to complete their lifecycle. They are often particularly attracted to brightly coloured or highly scented flowers, making planting that is good for butterflies attractive to humans too.

Gunnell et.al. 2012, Landscaping and urban design for bats and biodiversity (free to download online) has planting lists which are beneficial for invertebrates and are often scented with attractive flowers or forms. Using such species in planting, especially in proximal or linked areas, is likely to increase the value of a Site for butterflies and moths. Note that not all of the plant will be suitable for all soil types. Planting should be chosen based on the ability of the species to thrive in the local conditions.

This could be calculated as part of the change in ecological value to the Site as part of LEO4 and will provide habitat for invertebrates, foraging birds and foraging bats.

6.3.7 Hedgehog Habitat

Habitats on Site currently have potential to support hedgehog. Habitats could be enhanced and new provisions provided for hedgehogs to shelter. This would include provision of at least 3 log piles, leaf piles and 3 purpose built or ready-made purchased hedgehog houses. Guidance on building hedgehog houses is provided by the Wildlife Trust, this 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 adjacent to suitable hedgehog habitats including hedgerows and woodland and can be advised by an ecologist. Habitats for hedgehogs could be enhanced by leaving strips of grassland unmown around the edges and adjacent to suitable areas of habitat including hedgerows

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and woodland. Hedgehog highways can be created by making holes in fences to allow hedgehogs to move between habitats. This would require agreement with adjacent land owners.

6.3.8 Green Corridors

There is currently no vegetated boundary feature or fence along the eastern Site boundary, as the redline boundary cuts across the amenity grassland. A green corridor should be created along this boundary to provide habitat for wildlife and connectivity across the Site and within the surrounding area. Planting will be of hedgerow species, with occasional native standard trees. Planting will be a diverse mixture of locally native species of value to wildlife including plants which provide fruits, nuts or berries. A native species rich seed mix, suitable for the location (such as a woodland mix or verge mix) should be used at the base, to create a 'field margin' of at least 3m at from the base of the hedgerow. This should be kept 'dark' and light spill onto the features should be avoided, to maximise its benefits.

Generally, any landscape planting proposed, should seek to create green corridors which provide new connectivity across or around the Site for species such as birds, bats, invertebrates and species such as hedgehogs. New planting which provides connectivity from any new bat or bird boxes to the boundary features will be important.

Other boundary features including the hedgerow adjacent to the southern boundary could be enhanced to increase their value to commuting and foraging animals. This could be through the addition of new plants into gaps.

This could be calculated as part of the change in ecological value to the Site as part of LE04.

6.4 Ecosystem Resilience (Section 2 Environment (Wales) Act 2016)

Small, isolated populations of species are far more vulnerable to extinction than populations that can disperse and interbreed with other populations. The effects of climate change are likely to increase local extinctions among small isolated populations. It is important to maintain and enhance ecological networks of semi-natural habitats that have a high degree of connectivity.

The landscaping at the Site should be designed to promote local landscape connectivity and create a mosaic of habitats on Site.

Green corridors should be retained and enhanced where possible and external light spill onto these corridors should be avoided.

Any planting should be of native species suitable to the local context and in relation to climate change; they are likely to remain to be locally suitable within the next 25 to 50 years.

7. BREEAM Landscape and Ecology Assessment

Opportunities for BREEAM Credits and Ecological Enhancement are discussed within Sections 8, 9, 10 and 11 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.

The BREEAM methodology is provided in Appendix A.

7.1.1 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 7.1 Ecological Credits Available Based on the Current Development Plan

Issue	e Total available Credits I current l	
LE02	3	3*
LE03	3	1**
LEO4	5	2*
LE05	2	2**
LE Total	13	8

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. At this stage the second credit is not achievable, but with significant changes to the landscaping could be available.

⁺ LE04 Achieving the first credit is dependent on recommendations being implemented by the client/contractor. At this stage the other Credits cannot be achieved without changes to the post development landscape plan.

⁺⁺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.

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

8.1 Survey and Evaluation (1 Credit)

- Criteria 4 A SQE was appointed in May 2018 to undertake a Phase 1 Habitat Survey and prepare a PEA report. A SQE has reviewed and approved the Phase 1 Habitat Survey and PEA report. The information in the PEA report will be used to help inform the detailed design of the proposed development.
- Criteria 5 A SQE has undertaken a Phase 1 Habitat Survey and has produced a PEA report which includes the baseline data and considers the zone of influence. This has been reviewed and approved by an SQE.
- Criteria 5a, 5b and 5c The PEA includes an assessment of the potential impacts of a proposed development on ecological receptors within the Site and zone of influence (if applicable); and makes recommendations for ecological enhancement of the Site post-development. This is detailed in Sections 4, 5 and 6 of this Report.
- Criteria 6 The PEA will be shared with the project team and will be used to inform Site preparation design and construction works.

This credit can be awarded.

8.2 Determining the Ecological Outcomes for the Site (1 Credit)

- Criteria 7 Criteria 4 6 under Survey and Evaluation have been achieved.
- Criteria 8 The SQE has 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 4 of this Report.
- Criteria 9 The SQE has identified measures early on 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 Preliminary Ecology Appraisal (CIEEM, 2018). This is detailed in Section 6 of this Report.
- Criteria 10 The optimal outcome for the Site must be selected after liaising with stakeholders and project team. For this Site the optimal outcome will be:
 - Negligible impacts on adjacent habitats including SINCs, ancient woodland and TPOs;
 - No killing, injury or damage, destruction to breeding sites of any Protected or Priority species;
 - Creation, retention and enhancement of green corridors and boundaries connecting the Site to the surrounding landscape;
 - Creation, retention and enhancement of a mosaic of natural habitats across the Site. These will
 include a range of plants suitable for pollinating insects;
 - Creation, retention and enhancement of habitats for nesting birds, foraging, commuting and roosting bats and foraging, commuting and hibernating sites for hedgehogs;
 - Mitigation of lighting to reduce impacts on nocturnal species and encourage use of the Site by nocturnal species;
 - Ongoing management of the Site to benefit biodiversity.

This credit can be awarded. Recommendations for mitigation and enhancement must be followed to achieve this credit.

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8.3 Exemplary Level Criteria (1 Credit)

To achieve this credit the following must be achieved:

- Criteria 11- Criteria 8 10 must be achieved to enable this Exemplary Level Criteria Credit to be available.
- Criteria 12 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 (further detail in Appendix A).
- Criteria 13 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 on the determination of the credits achieved under HE 07, Pol 03 and Pol 05.

This credit is available.

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9. BREEAM LE03 Managing Negative Impacts on Ecology

9.1 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:

• Criteria 1: LE02 must be achieved.

One credit under LE02 can be achieved; therefore, credits under LE03 are available.

9.2 Planning, Liaison, Implementation and Data (1 Credit)

- Criteria 3 Potential impacts of the proposed development, including construction works have been assessed and Recommendations and Mitigation have been made with regard to Protected and Priority Species on Site. This is detailed in Section 5 and 6 of this Report.
- Criteria 2 The SQE has the role and responsibility of defining the potential negative impacts on ecology. This is provided in Section 5 of this report. Recommendations for further surveys, enhancement and mitigation have been made by the SQE. This is provided in Section 5 of this Report. The Project Manager is responsible for informing the design team of ecological constraints 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.
- Criteria 4 The SQE has proposed solutions and measures (avoidance and mitigation) to be implemented during Site preparation and construction works as part of the PEA. These solutions will be passed on to the project team via submission of this report. These are detailed in Section 6 of this Report.

This credit is achievable, once Criteria 2 and 4 are met.

9.3 Managing Negative Impacts of the Project (up to 2 Credits)

- Criteria 7 Criteria 2 4 must be achieved to enable these two credits to be available
- Criteria 8: Negative impacts from Site preparation and construction works will be managed according to the hierarchy and either:
 - Criteria 8a: No overall loss of ecological value has occurred under LE04 (2 credits),
 - OR
 - Criteria 8b: The loss of ecological value has been minimised under LEO4 (1 Credit).

Recommendations to avoid and minimise ecological impacts have been made in Sections 5 and 6 of this Report.

The credits under Criteria 8a cannot be achieved. There will be a net loss in ecological value under LE04. It is possible, that this credit could be achieved with significant alterations to the landscaping – see Criteria 6b under LE04.

The credit under Criteria 8b cannot be achieved under the current plan. It is possible, that this credit could be achieved with significant alterations to the landscaping.

10. BREEAM LE04: Change and Enhancement of Ecological Value

10.1 Prerequisite – Managing Negative Impacts on Ecology

To make the credits under LEO4 available the following prerequisite criteria must be achieved:

• Criteria 1: Under LE03 Criteria 2 – 3 must have been achieved.

Criteria 2 and 3 under LE03 can be achieved in regard to the SQE. This credit under LE03 can be available when the client has committed to achieving Criteria 2 under LE03.

It is considered likely that this prerequisite can be achieved; therefore, credits under LEO4 are discussed below.

10.2 Liaison, Implementation and Data Collation (1 Credit)

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

- Criteria 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 zone of influence.

Green corridors/boundaries, scattered trees, scrub, and plantation woodland will be retained as discussed in Section 5 and 6 of this Report. A list of suggested enhancements to be made <u>on Site</u> is provided in Section 6.

• Criteria 5: The data collected as part of the ecological surveys will be submitted to the Local Environmental Records Centre (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 selected biodiversity enhancements.

10.3 Change and Enhancement of Ecology (up to 3 Credits)

• Criteria 6: Up to three credits can be awarded based on the calculation of the change in ecological Biodiversity Units as result of the 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 105-109).

Tables 10.1 – 10.6, below show the Biodiversity Unit calculations for 'habitat areas' using the landscaping plan (drawing number PHS-HLM-SW-ZZ-GA-L-0002 (issued 22/08/2019).

Tables 10.7 – 10.11 below show the Biodiversity Unit calculations for 'linear (foliage) habitats' using the landscaping plan (drawing number PHS-HLM-SW-ZZ-GA-L-0002 (issued 22/08/2019).

There are no watercourses on Site and as such no Biodiversity Unit calculations have been undertaken for habitat watercourses.

The Percentage Change in Area Biodiversity Units = 77%

The Percentage Change in Linear Biodiversity Units = 93%

The linear percentage change must be assessed in conjunction with the area percentage change and the lowest percentage change from the two used to inform the BREEAM credits available.

The Percentage Change in Biodiversity Units is between 75% and 94% Therefore, one credit can be awarded.

The achievement of this credit will require collaboration between the SQE, stakeholders, project managers, and the design team (including architects and landscape architects. <u>Suggestions for achieving additional credits are:</u>

- Enhance retained existing habitats where possible. The Plantation broadleaved woodland could be enhanced by encouraging ground flora diversity through management and planting native woodland ground flora species.
- Areas of new soft landscaping amenity and planting should use locally native species and be managed to increase biodiversity value by introducing a sympathetic management regime which would involve less frequent cutting.
- Underplant to Orchard with shade-tolerant species rich grassland mix to maximise the Biodiversity Area.
- Including species rich grassland/forb mixes, tolerant of pond margins (wet or semi-wet conditions) within the swales, to maximise the Biodiversity Area. Any planting should be of native species of benefit to wildlife.
- Include linear tree and hedgerow planting in the landscape design;
- Include enhancement recommendations provided in Section 6.3.

The credit under Criteria 6a can be achieved based on the current plan.

The credits under Criteria 6b and 6c cannot be achieved based on the current plan.

It is possible these credits may be achieved if recommendations for enhancement are included in the final design.

A rework of calculations will be required when the final planting schedule/design is issued.

10.4 Exemplary Level Criteria

• Criteria 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. The credit is awarded as follows:

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- Criteria 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). This credit is not currently achievable at this Site.

Table 10.1: Total Post Development Area Biodiversity Units Calculation Formula

Calculation	Values
Total Post-Dev Area Biodiversity Units for the Development (G)	127399.25
G = (B - D) + (E+F)	
Where:	
B = Total Pre-Dev Area Biodiversity Units	163584.16
D = Total Post-Dev Area Biodiversity Units Lost Due to Development	91023.58
E = Post-Dev Area Biodiversity Units Created Due to Development	54838.67
F =Post-Dev Area Biodiversity Units Enhanced Due to Development	0.00
Percentage Change in Biodiversity Units = (G ÷ B) x 100	77%

Table 10.2: Area -Based Biodiversity Units Pre Development (B)

Parcel Number	Habitat Type	Distinctiveness	Condition	Area (ha or m2)	Biodiversity Units
1	Broadleaved Woodland - Plantation	Medium	Poor	2764.6	11058.4
2	Dense Scrub	Medium	Moderate	45.03	360.24
3	Semi-Improved Neutral Grassland	Medium	Poor	15,795.80	63183.2
4	Poor Semi-Improved Grassland	Low	Poor	104.26	208.52
5	Amenity Grassland	Low	Poor	44,173.00	88346
6	Ephemeral Short Perennial	Low	Poor	178	356
7	Introduced Shrub	Low	Poor	35.9	71.8
8	Buildings	Hard Standing or Building	Hard Standing or Building	6549.5	0
9	Hard Standing	Hard Standing or Building	Hard Standing or Building	14524.7	0
TOTAL	-	-	-	84170.79	163584.16

Table 10.3: Area-Based Habitat Loss (D)

Parcel Number	Habitat Type	Distinctiveness	Condition	Area (ha or m2)	Biodiversity Units
1	Broadleaved Woodland - Plantation	Medium	Poor	0	0
2	Dense Scrub	Medium	Moderate	0	0
3	Semi-Improved Neutral Grassland	Medium	Poor	15,795.80	63183.2
4	Poor Semi-Improved Grassland	Low	Poor	0	0
5	Amenity Grassland	Low	Poor	13706.29	27412.58
6	Ephemeral Short Perennial	Low	Poor	178	356
7	Introduced Shrub	Low	Poor	35.9	71.8
8	Buildings	Hard Standing or Building	Hard Standing or Building	6549.5	0
9	Hard Standing	Hard Standing or Building	Hard Standing or Building	-4479.21	0
TOTAL	-	-	-	31786.28	91023.58

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Table 10.4: Area-Based Habitat Created (E)

Parcel Number	Habitat Type	Distinctiveness	Conditior	n Area (ha or	m2) Delivery I	Risk Temporal F	Risk Spatial Risk	Biodiversity Units
11	Allotment	Low	Poor	400.45	Medium	2	Within 500m of the area of loss or in same ecological network	491.59
12	New turf sports pitch	Low	Poor	4108	Low	1	Within 500m of the area of loss or in same ecological network	7969.52
13	Embankment Wildlfower an Shrub Planting	d Medium	Moderate	372	Low	2	Within 500m of the area of loss or in same ecological network	2767.68
14	Ornamental	Low	Moderate	866	Low	2	Within 500m of the area of loss or in same ecological network	3221.52
15	Multi purpose lawn	Low	Poor	4654	Low	1	Within 500m of the area of loss or in same ecological network	9028.76
16	Biodiversity Habitat Area (includes Orchard)	Medium	Moderate	4215	Low	2	Within 500m of the area of loss or in same ecological network	31359.60
TOTAL				14615.45				54838.67
Table 10.5: Ar	ea Biodiversity Units – H	abitat Enhanced (F)						
Pre Dev Parcel Number	Pre Dev Di Biodiversity Units	stinctiveness Con	dition	Area Enhanced (ha or m2)	Delivery Risk	Temporal Risk	Spatial Risk	Biodiversity Units due to Enhancement

NIL

NIL

Table 10.6: Total Post Development Area Biodiversity Units

Pre Development Area Biodiversity Units	Area Based Units Lost	Area Based Units (Creation)	Area Based Units (Enhancement)	Total Post Development Area Biodiversity Units	Biodiversity Unit Score
163584.16	91023.58	54838.67	0.00	127399.25	77%

Table 10.7: Linear Habitats - Percentage Change in Biodiversity Units

Calculation	Values
Total Post-D Linear Biodiversity Units for the Development (G)	1213.6
G = (B - D) + F	
Where:	
B = Total Pre-D Linear Biodiversity Units	1299.1
D = Total Post-D Linear Biodiversity Units Lost Due To Development	85.5
F = Total Post-D Linear Biodiversity Units Created and/or Enhanced Due to Development	0
Percentage Change in Linear Biodiversity Units = (G ÷ B)	93%

Table 10.8: Linear-Based (Foliage) Biodiversity Units Pre Development (B)

Parcel Number	Habitat Type	Length (m)	Condition	Biodiversity Units
1	Row of Broadleaved Trees	232.7	Good	698.1
2	Hedgerow Species Poor with Trees	601	Poor	601
TOTAL	-	833.7	-	1299.1

Table 10.9: Linear-Based (Foliage) Habitat Loss (D)

Parcel Number	Habitat Type	Length (m)	Condition	Biodiversity Units
1	Row of Broadleaved Trees	28.5	Good	85.5
2	Hedgerow Species Poor with Trees	0	Poor	0
TOTAL		28.5		85.5

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Table 10.10: Linear-Based (Foliage) Habitat Created or Enhanced (F)

Parcel Number	Habitat Type	Length	Biodiversity Units
NIL	NIL	NIL	NIL
TOTAL		0	NIL

Table 10.11: Total Post Development Linear (Foliage) Biodiversity Units

Pre Development Linear (Foliage) Biodiversity Units	Linear (Foliage) Units Lost	Linear (Foliage) Based Units Created and/or Enhanced	Total Post Development Linear (Foliage) Biodiversity Units	Biodiversity Unit Score
1299.1	85.5	0	1213.6	93%

11. BREEAM LE05: Long Term Ecology Management and Maintenance

11.1 Prerequisite – Roles and Responsibilities, implementation, Statutory Obligations

To make the credits under LE05 available the following prerequisite criteria must be achieved:

- The client or contractor has confirmed that compliance is being monitored against all relevant UK, EU and international standards relating to the ecology of the site.
- Criteria 2-3 in LEO3 have been achieved and at least one credit under LEO4 for 'Change and Enhancement of Ecology' has been awarded.

Criteria 2 and 3 under LE03 will likely be achieved in regard to the SQE. The credits under LE05 can be available when the client has committed to achieving Criteria 2 under LE03. The first credit under LE04 'Change and Enhancement of Ecology' can be achieved under the current design proposals.

It is possible under the current design proposals that these prerequisites can be achieved and therefore the credits under LE05 can be made available. The LE05 Criteria 3, 4, 5 and 6 are provided below.

11.2 Planning, Liaison, Data, Monitoring and Review Management and Maintenance (1 Credit)

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

- Criteria 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 LE 03 & LE 04 are implemented.
 - 3.b Develop and review management and maintenance solutions, actions or measures.
- Criteria 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 zone of influence.
 - 4.e Maintaining the site in line with the 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 LE 02, LE 03 and LE 04.
- Criteria 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.

It is possible that this credit will be achievable, once the client commits to implementing the Criteria above and meets the requirements for the prerequisites in relation to LE03 and 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.

11.3 Landscape and Ecology Management Plan Development (1 Credit)

Criteria 6: Landscape and ecology management plan (LEMP), or equivalent, is developed in accordance with BS 42020:2013 Section 11.1, 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 development life.

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

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

6.e Clearly defined and allocated roles and responsibilities.

Criteria 7: The landscape and management plan or similar is updated as appropriate to support maintenance of the ecological value of the Site.

Although it is possible to produce a full 5-year LEMP at the Design Stage, the document may need substantial revision by the Post Construction 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 5-year LEMP once the landscaping plan has been finalised. The LEMP will be produced in accordance with BS 42020:2013 Section 11.1 and a suggested format is included in Appendix G.

It is possible that this credit will be achievable, once the Client and meets the requirements for the prerequisites in relation to LE03 and LE04.

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Figure 1: Phase 1 Habitat Map



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Project Title:

PENCOEDTRE HIGH SCHOOL

Client:

BOUYGUES UK

LEGEND

	Site Boundary - Phase 1 Survey Boundary
ullet	Target Notes
•	Trees
Bat Ro	ost Potential for Buildings
\land	Medium Potential
\land	Low Potential
	Negligible
Bat Ro	ost Potential for Trees
\bigstar	Low Potential
Phase	1 Habitat Areas
	Broadleaved woodland - plantation
\mathbf{X}	Dense/Continuous scrub
SI	Semi-improved - neutral grassland
~~	Poor semi-improved grassland
^	Amenity grassland - cultivated land
Хx	Ephemeral/short - cultivated land
$\times\!\!\times\!\!\times$	Introduced shrub - cultivated land
	Buildings
	Hard Standing

Copyright:

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AECOM Internal Project No:

60571312

Drawing Title:

PHASE 1 HABITAT PLAN

Scale	at A3:	1:1,500
		,

Drawing No:			Rev:
FIGURE 1			001
Drawn:	Chk'd:	App'd:	Date:

Figure 2: Site Landscaping Plan



Check all dimensions on site. Do not scale from this drawing Report any discrepancies and omissions to HLM Architects This Drawing is Copyright

Notes

	LANDSCAPE SITE PLAN KEY
	Site Boundary
+84.000 EX	Existing Levels
+84.000 P	Proposed Levels
	HARD LANDSCAPE
	Existing Hard Standing To be retained and made good (if required)
	Proposed Vehicle Grade Asphalt Paving Vehicle Grade Asphalt Paving to access road- To match existing
	Proposed Porous Pedestrian Grade Concrete Asphalt Paving To MUGA area
	Proposed Permeable Concrete block Paving Vehicle Grade Permeable Paving for the car park
	Proposed Permeable Concrete block Paving Pedestrian Grade Permeable Paving with Fire and Services access
	Proposed Porous Resin Bound Gravel
	Proposed External Steps With Handrail
	Proposed Retaining Wall
	Outdoor Dining Tables and Benches



SOFT LANDSCAPE **Existing tree** To be retained.

Proposed Tree

Proposed Grove Fruit Tree Planting Area

Existing Soft Landscape To be retained and made good (if required)

Proposed Sport Pitch with Line Marker Turf surface to be refurbished or made good (if required). Proposed Embankment & Shrub Planting The embankment to steep slope will be tufted with a mix of native shrubs and wildflowers providing biodiversity and low maintenance

Proposed ornamental planting Low maintenance ornamental planting and grasses to school entrance and rain garden for aesthetic value.

Proposed multi-purpose lawn area

Proposed Biodiversity Habitat Areas Biodiversity Native Shrub & Wildflower meadow planting with low maintenance.

Proposed All Weather Hockey Pitch

P04S1MUGA SIZE & CYCLE UPDATED ISSUE FORP03S3REVISED ISSUE FORP02S3REVISED ISSUE FORP01S3PRELIMINARY ISSUE	LOCATION CHANGE CO-ORDINATION COMMENT COMMENT FOR COMMENT	07.08.2019 22.07.2019 11.07.2019 04.07.2019	BT BT HV BT	AS MT BT MT
Rev Sbty Description		Date	By	Chk
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Client				
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Morgan Arcade The Hayes Cardiff CF10 1AF

Figure 3: Site Access Plan

Site Logistics



LE04: Change and Enhancement of Ecological Value

Prerequisite - Managing Negative Impacts on Ecology:

- 9. Criteria 2-3 in LE 03 have been achieved.
- 10. The client or contractor confirms compliance is monitored against all relevant UK, EU or international legislation relating to the ecology of the site.

Liaison, Implementation and Data collation (One Credit)

- 11. 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:
 - a. On site, and where this is not feasible,
 - b. Off site within the zone of influence.
- 12. Data collated are provided to the local environmental records centres nearest to, or relevant for, the site.

Change and Enhancement of Ecology (up to Three Credits)

- 13. Up to three credits are awarded based on the calculation of the change in ecological value occurring as a result of the project. This must be calculated in accordance with the process set out in GN36 BREEAM, CEEQUAL and HQM Ecology Calculation Methodology Route 2. Credits are awarded as follows:
 - a. Minimising loss of ecological value (one credit percentage score of 75-94)
 - b. No net loss of ecological value (two credits percentage score of 95-104)
 - c. Net gain of ecological value (three credits percentage score of 105-109)

Exemplary Level Criteria

To achieve one exemplary performance credit:

- 14. 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. The credit is awarded as follows:
 - a. Significant net gain of ecological value (percentage score of 110 or above)

Calculation of Biodiversity Units Methodology

The methodology requires the calculation of Biodiversity Units for both Linear and Area Based Habitats impacted by a project and is carried out Pre and Post Development.

The methodology is based on three main attributes:

- i. the area or length of habitats (dependent on their type),
- ii. their condition and,
- iii. their distinctiveness.

These attributes are assigned numerical values to allow Biodiversity Units to be calculated for each habitat type. The number of Biodiversity Units can then be compared before and after the development to determine a change and so give an indication of the change in overall ecological value.

The methodology is split into a full approach and a simplified approach. The simplified approach can only be used for developments with low level risks to ecological value and biodiversity.

There are two options as follows:

- 15. 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.
- 16. Simplified methodology This can be used where the pre-development habitats are below the set size threshold and no habitats present that are assigned a high level of distinctiveness. Route 2 may be used where desired

Calculation of Biodiversity Units

Condition

Condition is calculated by using the BREEAM guidance GN36 - BREEAM, CEEQUAL and HQM Ecology Calculation Methodology (BREEAM, 2018b) and Natural England's' Higher Level Stewardship Farm Environment Plan (FEP) Manual (NE, 2010).

Table A1 defines the condition levels.

Table A1: Habitat Condition Bands and Scores

Condition Band	Condition Score	Criteria for Assigning Condition
Good	3	Any habitat which passes all the FEP criteria
Moderate	2	Any habitat which fails one FEP criterion
Poor	1	Any habitat which fails two or more FEP criteria

Where an FEP condition assessment is not possible and the condition cannot be based on local relevant data (such as surveys on other similar habitats within the Development Footprint) the condition of the habitats should be assumed to be moderate, giving a condition score of 2, unless there is other evidence that the habitat is of good condition, such as the presence of species of principal importance. If a different methodology is used the SQE should set out why it has been used and provide evidence to demonstrate why that methodology is more appropriate.

When the habitat present is not covered by the Farm Environment Plan (FEP) condition assessment methodology (NE,2010) the Default Condition Assessment should be used (see Table A2 below). If some of the criteria are not relevant for the habitat being assessed the SQE should use their expert judgement to select the appropriate criteria.

Criterion	Commonly Used Habitat Condition Assessment Criteria in the FEP
1	A diverse age range
2	A diverse species mix
3	Diverse structure variety/diverse form
4	Presence of protected species
5	None or a limited presence of invasive species
6	No or limited damage for example by machinery

Table A2: Default Condition Assessment

Distinctiveness

Distinctiveness is calculated using Appendix C of the BREEAM guidance GN36 - BREEAM, CEEQUAL and HQM Ecology Calculation Methodology (BREEAM, 2018b)

In line with the guidance, the following steps are required to calculate Pre Development Biodiversity Units:

Score each habitat for distinctiveness

- Score each habitat for distinctiveness as high (6), medium (4) or low (2) (see Table A3). For hedgerows and watercourses assume distinctiveness is high,
- Assess the condition of the habitat using the methodology described in Natural England's Farm Environment Plan (FEP) Manual (NE, 2010). Score each habitat for condition as good (3), moderate (2) or poor (1). Please note that if a different methodology is used its use needs to be justified within the report,
- Measure the area (in hectares or square metres) or length (in metres) of the habitat (ensuring the same unit is used throughout the assessment).

Table A3: Habitat Distinctiveness Bands and Scores

Distinctiveness Band	Distinctiveness Score	Habitat Types Included
High	6	Habitats of Principal Importance i.e. those which meet the criteria to qualify as Habitats of Principal Importance (JNCC 2011) as they are not included in the assessment. This excludes ancient woodland and other habitats which are irreplaceable.
Medium	4	Other semi-natural habitats that do not fall within the scope of Habitats of Principal Importance definitions, i.e. all other areas of woodland (e.g. mixed woodland), other grassland (e.g. semi- improved grasslands), uncultivated field margins, road verge and railway embankments (excluding those that are intensively managed).
Low	2	Improved grassland, arable fields (excluding any uncultivated margins), built up areas, domestic gardens, regularly disturbed bare ground (e.g. quarry floor, landfill sites etc.), verges associated with transport corridors.

Habitat distinctiveness is a measure of biodiversity that has regard for the number and variety of species found there (richness and diversity), how rare the species are, and how many species the habitat supports that are not common elsewhere.

For the purpose of the BREEAM family assessments habitat distinctiveness is scored against a three category scale (high, medium and low) as detailed in Table A3. Broadly, all Habitats of Principal Importance will be assigned high distinctiveness, other habitats which are not Habitats of Principal Importance will be assigned medium distinctiveness and any habitats which have been intensively managed such as improved grassland or arable pasture will be assigned low distinctiveness.

LE05: Long Term Ecology Management and Maintenance

Prerequisite - Roles and Responsibilities, Implementation and Statutory Obligations

- 17. The client or contractor has confirmed that compliance is being monitored against all relevant UK, EU and international standards relating to the ecology of the site.
- 18. Criteria 2-3 in LE 03 have been achieved, and at least one credit under LE 04 for 'Change and Enhancement of Ecology' has been awarded.

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

- 19. The project team liaise and collaborate with representative stakeholders, taking into consideration data collated and shared, on solutions and measures implemented to:
 - a. Monitor and review the effectiveness with which the plans for LE 03 & LE 04 are implemented
 - b. develop and review management and maintenance solutions, actions or measures.
- 20. In support of the above and to help ensure their continued relevance over the period of the project the following should be considered:
 - a. Monitoring and reporting of the ecological outcomes for site implemented at the design and construction stage
 - b. Monitoring and reporting of outcomes and successes from the project
 - c. Arrangements for the ongoing management of landscape and habitat connected to the project (on and, where relevant, off site)
 - d. Maintaining the ecological value of the site and its relationship or connection to its zone of influence
 - e. Maintaining the site in line with the any sustainability linked activities, e.g. ecosystems benefits (LE 02).
 - f. Remedial or other management actions are carried out which relate to those identified in LE 02, LE 03 and LE 04.
- 21. 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.

Landscape and Ecology Management Plan (or similar) Development (One Credit)

- 22. Landscape and ecology management plan, or equivalent, is developed in accordance with BS 42020:2013 Section 11.1(BSI, 2013) covering as a minimum the first five years after project completion and includes:
 - a. Actions and responsibilities, prior to handover, to give to relevant individuals
 - b. The ecological value and condition of the site over the development life.
 - c. Identification of opportunities for ongoing alignment with activities external to the development project and which supports the aims of BREEAM's Strategic Ecology Framework
 - d. Identification and guidance to trigger appropriate remedial actions to address previously unforeseen impacts
 - e. Clearly defined and allocated roles and responsibilities.
- 23. The landscape and management plan or similar is updated as appropriate to support maintenance of the ecological value of the site.

Methodology

Tenant/occupier/building manager

This information pack should include the following content, as appropriate:

- a) Details of the ecological value within the property boundary (e.g. public and private gardens, green roofs), common areas (e.g. communal garden), and the surrounding area (e.g. public recreational space).
- b) The benefits of the ecological value to the occupants and the broader community.
- c) Guidance on how the occupants can make the most of the local ecology and contribute to its management, (e.g. planting ecologically appropriate species in their property), as well as things that should be avoided doing (e.g. disrupting wildlife corridors);
- d) Highlight relevant actions that can be taken to enhance value within the property that is owned or occupied to help ensure its ongoing management and maintenance.
- e) Contact details for those responsible for the management and maintenance of the local ecology and sources of local information on biodiversity and ecological management including management companies and local wildlife trusts.

Data collation and application in throughout the project lifecycle

In addition to the data collated during LE 02, data collated during assessment of this issue should be shared with the project team to inform decisions relating to the site preparation, design or construction works.

Appendix B : Wildlife Legislation

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 listed in the Annexes of the Habitats Directive (further information regarding the Habitats Directive is set out in more detail in the table below). 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 classified in accordance with Article 4 of the Birds Directive information regarding the Birds Directive is set out in more detail in the table below).
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
Designation	Brief Description
------------------------	---
	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.

Legislation – Protected Species

In addition to habitats, a number of 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 Countryside and Rights of Way Act, the Wildlife and Countryside Act 1981 (as amended), The Protection of Badgers Act 1992 and the Conservation of Habitats and Species Regulations 2018 are the main legislative framework for protection of wild animals in the UK. Schedule 1 of the Wildlife and Countryside Act 1981 (as amended) covers birds, Schedule 5 covers other animals and Schedule 8 covers plants.

Species including bats, otters and great crested newts are listed under Schedule 2 of the Conservation of Habitats and Species Regulations 2018. 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).

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 2018 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
The Habitats Directive	The Habitats Directive 1992 (Directive 92/43/EEC sets out the legal framework requiring EU member states to protect 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) is set out within Article 6 of the Directive. The Directive is transposed into UK law through the Conservation of Habitats and Species Regulations 2018) (the "Habitats Regulations") and the Wildlife & Countryside Act 1981 (as amended).
The Birds Directive	The Directive on the Conservation of Wild Birds (Directive 2009/147/EC (the codified version of Council Directive 79/409/EEC as amended)) provides a framework for the protection, management and control of all species of naturally occurring wild birds in the European territory of Member States, including the UK. The provisions of the Birds Directive are transposed into UK law by the Conservation of Habitats and Species Regulations, 2018 and the Wildlife & Countryside Act 1981 (as amended).
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).

Designation	Brief Description
	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 (Reynoutria japonica), Himalayan balsam (Impatiens glandulifera), montbretia (Crocosmia x crocosmiiflora), 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.
Protection of Badgers Act 1992	The Protection of Badgers Act 1992 makes it an offence to wilfully take, kill, injure or ill-treat a badger, possess a dead badger or any part of a badger. Sett interference includes damaging or destroying a sett, obstructing access to a sett, and disturbing a badger whilst it is occupying a sett. The Act defines a badger sett as 'any structure or place, which displays signs indicating the current use by a badger' and Natural England takes this definition to include seasonally used setts.
	Work that may disturb badgers or their setts is illegal without a development licence from the relevant statutory body (in this case Natural Resources Wales).

Designation	Brief Description
The Hedgerow Regulations 1997	The Hedgerow Regulations (1997) make provision for the protection of important hedgerows in England and Wales. The regulations affect hedgerows which are 20m or more in length, or connected at both ends to another hedgerow of any length.
	They relate to hedgerows which are on, or adjoining land used for the following purposes: agriculture or forestry; the breeding or keeping of horses, ponies or donkeys; common land; village greens; and SSSIs (They do not include hedges that are attached to, or marking the boundaries of a private house.
	It is an offence to intentionally or recklessly remove or cause or permit another person to remove a hedgerow or intentionally or recklessly remove, or cause or permit another person to remove, a hedgerow which is the subject of a hedgerow retention notice.

Appendix C : Local Planning Policy

Local Planning Policy

The Vale of Glamorgan Local Development Plan (LDP) 2011-2026 provides the local planning policy framework for the Vale of Glamorgan and was adopted by the Council on 28th June 2017.

The Plan sets out the vision, objectives, strategy and policies for managing development in the Vale of Glamorgan, and contains a number of local planning policies and makes provision for the use of land for the purposes of housing, employment, retailing, recreation, transport, tourism, minerals, waste, and community uses. It also seeks to identify the infrastructure that will be required to meet the growth anticipated in the Vale of Glamorgan up to 2026, and provides a monitoring framework for assessing the effectiveness of the Plan.

Policies referring to nature conservation are outlined below. Full details can be found in Vale of Glamorgan Local Development Plan 2011-2026, Local Development Plan-Written Statement June 2017.

Policy	Details
Policy SP10 – Built and Natural Environment	Details Development proposals must preserve and where appropriate enhance the rich and diverse built and natural environment and heritage of the Vale of Glamorgan including: 1. The architectural and / or historic qualities of buildings or conservation areas, including locally listed buildings: 2. Historic landscapes, parks and gardens; 3. Special landscape areas; 4. The Glamorgan Heritage Coast; 5. Sites designated for their local, national and European nature conservation importance; and 6. Important archaeological and geological features. The Vale of Glamorgan's natural and built environmental qualities significantly contribute to its identity and also provide valuable local recreation and tourism opportunities. These assets include areas recognised as being of European, national and local importance, including the Vale of Glamorgan's coastline which includes the Glamorgan Heritage Coast designation and the Severn Estuary Special Protection Area. Policy SP10 emphasises the need to protect the Vale of Glamorgan's natural and built environmental assets and reinforces that sensitive design and choice of location of new development can have a positive effect on the Vale of Glamorgan's built and natural heritage. Similarly, new development will be required to minimise its impact on natural systems, landscapes, species and habitats and, where appropriate, provide opportunities for the creation of new habitats or the sensitive enhancement of existing habitats.
	statutory and local), conservation areas, scheduled monuments and historic landscapes, parks and gardens that exist. It should be noted that statutory listed buildings are also covered under Policy MD8 and are subject to separate legislation. In addition, it recognises the importance of preserving and enhancing the natural environment, principally the countryside and the coast, which have significant landscape and nature conservation value.
Policy MG17 – Special Landscape Areas	The following areas are designated as special landscape areas: 1. Castle Upon Alun; 2. Upper & Lower Thaw Valley; 3. Ely Valley & ridge slopes; 4. Nant Llancarfan; 5. Dyffryn basin & ridge slopes; 6. Cwrt-yr-Ala basin. Within the special landscape areas identified above, development proposals will be permitted where it is demonstrated they would cause no unacceptable harm to the important landscape character of the area.

Policy	Details
	Special Landscape Areas (SLA) have been designated to protect areas of the Vale of Glamorgan that are considered to be important for their geological, natural, visual, historic or cultural significance. These areas have been identified through the utilisation of a methodology devised by the former Countryside Council for Wales (now Natural Resources Wales) in collaboration with a consortium of local authorities in South East Wales, which uses LANDMAP data. The process allows information about the landscape to be gathered, organised and evaluated into a nationally consistent, quality assured data set.
	Details of the identified SLAs are contained within the Vale of Glamorgan Designation of Special Landscape Areas Background Paper (2013).
	The designation of SLAs is not intended to prevent development but to ensure that where development is acceptable careful consideration is given to the design elements of the proposal such as the siting, orientation, layout and landscaping, to ensure that the special qualities and characteristics for which the SLAs have been designated are protected.
	Development proposals within SLAs will be required to fully consider the impact of the proposal on the SLA through the submission of a Landscape and Visual Impact Assessment (LVIA). A LVIA will be required for any development that is likely to have a significant impact upon landscape character, or have a significant visual effect within the wider landscape (by virtue of its size or prominence or degree of impact on the locality) and will be prepared in accordance with the latest Landscape Institute and the Institute of Environmental Management and Assessment guidelines. Where applicable, this should form a key element of a planning application's design and access statement and should demonstrate that the proposal has been designed to remove or reduce any unacceptable impacts on the qualities for which the SLA has been designated. Any cumulative impacts that the proposal may have in relation to existing or planned proposals in the locality should also be considered. This is particularly the case for wind turbines or large structures and large-scale proposals such as solar farms. The level of detail required in each landscape impact assessment should be commensurate with the scale of the proposal.
Policy MG18 – Green Wedges	Green wedges have been identified to prevent the coalescence of settlements and to retain the openness of land at the following locations:
	1. Between Dinas Powys, Penarth and Llandough;
	2. North West of Sully;
	3. North of Wenvoe;
	4. South of Bridgend;
	5. Between Barry and Rhoose;
	6. South Penarth to Sully; and
	7. Between Rhoose and Aberthaw.
	Within these areas development which prejudices the open nature of the land will not be permitted.
	Land on the urban fringe particularly around the key, service and primary settlements within the South East Zone is vulnerable to speculative development that can blur the boundaries between settlement edges and the open countryside. Unchecked this development would result in the incremental loss of open land and ultimately lead to the coalescence of settlements with a resultant detrimental impact upon agriculture, the landscape and the amenity value of land.
	While other policies of the LDP seek to prevent inappropriate development within the open countryside it is considered that the areas defined by the green wedges are more vulnerable and susceptible to change and require additional protection. Therefore, within the areas defined by the green wedges there will be a presumption against inappropriate development20 which would contribute to urban coalescence, prejudice the open nature of the land, or have an adverse impact upon the setting of an urban area. In applying this protection, however, it is recognised that individual or small groups of dwellings exist within the designations and that activities such as agriculture, forestry and recreation, occur. Consequently, development associated with existing uses will be limited to minor structures which are strictly ancillary to existing uses. Details of each of the designations are contained within the Green Wedge Background Paper (2013).

Policy	Details
Policy MG19 – Site and Species of European Importance	 Development proposals likely to have a significant effect on a European site, when considered alone or in combination with other projects or plans will only be permitted where: 1. The proposal is directly connected with or necessary for the protection, enhancement and positive management of the site for conservation purpose; or 2. The proposal will not adversely affect the integrity of the site; 3. There is no alternative solution; 4. There are reasons of overriding public interest; and 5. Appropriate compensatory measures are secured.
	 Development proposals likely to have an adverse effect on a European protected species will only be permitted where: 1. There are reasons of overriding public interest; 2. There is no satisfactory alternative; and 3. The action authorised will not be detrimental to the maintenance of the population of the species concerned at a favourable conservation status in their natural range.
	Internationally designated sites comprise Special Areas of Conservation (SAC), Special Protection Areas (SPA) and Ramsar Sites. The Vale of Glamorgan has 2 international sites: - Dunraven Bay (SAC) and Severn Estuary (SAC, SPA, Ramsar) and is directly adjacent to the Kenfig SAC in the County Borough of Bridgend. The locations of the European sites are shown on the Constraints Map.
	Any development proposals that are likely to affect European designated sites or European Protected Species (EPS) will be determined in accordance with national planning policy set out in Planning Policy Wales and Technical Advice Note 5: Nature Conservation and Planning (2009) and relevant case law.
	In accordance with the Conservation of Habitats and Species Regulations 2010 (as amended), any development proposals that has the potential for adverse impact on the integrity of a European site will be subject to a Habitats Regulations Assessment.
	Prior to implementing any consent that may be granted which may affect species of European importance, developers will need to secure a derogation from Natural Resources Wales under the Conservation of Habitats and Species Regulations 2010 (as amended), the 'Habitats Regulations.
MG20 – Nationally Protected Sites and Species	 Development likely to have an adverse effect either directly or indirectly on the conservation value of a site of special scientific interest will only be permitted where it is demonstrated that: 1. There is no suitable alternative to the proposed development; and 2. It can be demonstrated that the benefits from the development clearly outweigh the special interest of the site; and 3. Appropriate compensatory measures are secured; or 4. The proposal contributes to the protection, enhancement or positive management of the site.
	 Development proposals likely to affect protected species will only be permitted where it is demonstrated that: 1. The population range and distribution of the species will not be adversely impacted; 2. There is no suitable alternative to the proposed development; 3. The benefits of the development clearly outweigh the adverse impacts on the protected species; and 4. Appropriate avoidance, mitigation and compensation measures are provided. For the purposes of the policy, nationally designated sites include Sites of Special Scientific Interest (SSSI). Within the Vale of Glamorgan there are 28 SSSI and these are detailed in Appendix 2 and their locations are shown on the Constraints Map. Protected species are those detailed within the Wildlife and Countryside Act 1981 (as amended) and species specific legislation e.g. the Protection of Badgers Act 1992.

Policy	Details
	The presence of a protected species is a material consideration in the determination of planning applications. When assessing any development proposal which if carried out would be likely to result in harm to a protected species or its habitat, the Council will be guided by advice received from Natural Resources Wales.
	There will always be a presumption against development which is likely to harm a protected site or species. However, there may also be instances when the importance of a development proposal will outweigh the conservation value, either temporarily or permanently to a SSSI / protected species and in such instances, the objective will always be to ensure that the nature conservation value of the site or protected species is preserved and where possible enhanced.
	Where development is permitted, appropriate conditions or agreed planning obligations will be used to secure adequate compensation or mitigation measures
Policy MG21 – Sites of Importance for Nature Conservation, Regionally Important Geological and Geomorphological Sites and Priority Habitats and Species	Development proposals likely to have an adverse impact on sites of importance for nature conservation or priority habitats and species will only be permitted where it can be demonstrated that: 1. The need for the development clearly outweighs the nature conservation value of the site; 2. Adverse impacts on nature conservation and geological features can be avoided; 3. Appropriate and proportionate mitigation and compensation measures can be provided; and 4. The development conserves and where possible enhances biodiversity interests. Sites of Importance for Nature Conservation (SINC) are identified to protect areas of high wildlife value at a local level. Regionally Important Geological and Geomorphological Sites are locally designated sites of local, national and regional importance for geodiversity (geology and geomorphology).
	Priority Habitats and Species for Conservation are identified in the Environment (Wales) Act 2016 Section 7. Species or habitats are important wildlife features, are rare or declining and are not protected by primary legislation.
	Development which is likely to have an adverse impact on SINCs, RIGS or Priority Habitats and Species will be required to demonstrate that every effort has been made to avoid and mitigate any adverse impacts and that the need for the development outweighs the nature conservation or geological value. Where on site mitigation is not possible or sufficient to prevent any adverse impact then off-site compensation will be required. Off-site compensation will be secured through planning conditions or Section 106 agreements as appropriate.
	The Council will produce Supplementary Planning Guidance on 'Biodiversity and Development' to support these policies and provide advice for developers on the Council's approach to biodiversity issues.

Appendix D : Photographs





Project number: 60608204











Appendix E : Target Notes for Phase 1 Habitat Map

Target Note	Description
1	Nesting gull on roof of building.
2	Culvert. Fenced and dry.
3	Internal courtyard with ornamental and native shrubs and trees.
4	Internal courtyard with hardstanding, gravel, ornamental leylandii and silver birch.
5	Internal courtyard with steps and hardstanding and wooden shed with pitched felt roof.
6	Internal courtyard with ornamental planting, two silver birch, gravel and wooden decking.
7	Internal courtyard with gravel, wooden shed and ornamental sapling.
8	Mammal trail. No signs of badger.
9	Mammal trail. No signs of badger.
10	Mammal trail. No signs of badger.
11	Bat feature. See Table 3.5.
12	Bat feature. See Table 3.5.
13	Bat feature. See Table 3.5.
14	Bat feature. See Table 3.5.
15	Bat feature. See Table 3.5.
16	Bat feature. See Table 3.5.
17	Bat feature. See Table 3.5.

Appendix F : Staff Pen Portraits

Lisbeth Nash BSc (Hons) MCIEEM

Principal Ecologist

Lisbeth is a Principal Ecologist over 10 years of field work and consultancy experience. She is responsible for the day to day management of the ecology team in the south west including resourcing, project delivery and technical input. Lisbeth 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. Lisbeth 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. Lisbeth has completed successful European Protected Species Licence applications for bats and dormice and has undertaken supervision of works 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. Lisbeth 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. Lisbeth is a bat survey licence holder (handling) Wales and a great crested newt survey licence holder – England and Wales. She is a Member of the Chartered Institute of Ecology and Environmental Management.

Ursula Jones BSc (Hons) MCIEEM

Senior Ecologist

Ursula is a Senior Ecologist with nine years of consultancy experience and over ten years experience in the field of botany and habitat survey. Ursula holds a First Class Honours in Environmental Conservation from the Swansea Metropolitan University. She has conducted numerous botanical and habitat surveys (including Phase, NVC, 1, Common Standards Monitoring, IHS and RHS) across the range of UK habitats and abroad, and has expertise in mapping and GIS (ArcMap). She has experience in protected species surveys for bats, reptiles, great crested newts, nesting birds, water voles, otters, badgers and dormice, and has produced numerous Phase 1 and Phase 2 written reports, several ecology chapters and appendices for Environmental Statements, a number of Habitat Regulations Assessments screening reports, as well as several CfSH and BREEAM assessments. She is a Member of the Chartered Institute of Ecology and Environmental Management.

Lucy Foster BSc (Hons) ACIEEM

Ecologist

Lucy is an Ecologist with seven years of consultancy experience. Lucy holds a First Class Honours Degree in Ecology from Cardiff University. Lucy is experienced in undertaking Phase I Habitat Surveys, bat surveys (manual and automated), bat roost assessments, protected species surveys including otter, water vole, badger, pine marten, reptile, red squirrel and Scottish wildcat, Habitat Suitability Index (HSI) assessments for great crested newts, and ornithology surveys (including vantage point surveys and raptor and wader walkover surveys). Lucy is competent in the use of Analook to analyse bat calls, ArcGIS to map data from field work, use of handheld GIS devices (Trimbles) to record observation in the field, and Excel to manage large databases. She has experience producing a wide range of reports for a range of clients including Phase I Habitat Reports, Habitat Management Plans, ornithology chapters for EIA and Phase II survey reports for badgers, otters, water vole, reptiles and bats.

Appendix G : Landscape Habitat Management Plan - 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

- 3.1. Management Protocol
 - 3.1.1. Records
 - 3.1.2. Biodiversity Action Plan
 - 3.1.3. Habitat management
 - 3.1.4. Species management
- 3.2. Monitoring

4. Organisational Management

- 4.1. Partnerships
- 4.2. Access and Informal Recreation
- 4.3 Funding Resources and Mechanisms

5. Annual Work Programme

- 5.1. Year One Work Programme
- 6. References