Vale of Glamorgan Schools - Ysgol Gymraeg Bro Morgannwg

Preliminary Ecological Appraisal and BREEAM Ecology Report

Vale of Glamorgan Council

July 2018

Quality information

Prepared by	Checked by	Approved by
CM	**LF**	**LN**
CM Ecologist	CM Ecologist	LN Principal Ecologist

Revision History

Revision	Revision date	Details	Authorized	Name	Position

Prepared for:

Vale of Glamorgan Council

Prepared by:

AECOM Limited
1 Callaghan Square
Cardiff CF10 5BT
United Kingdom

T: +44 29 2067 4600
aecom.com

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Executive Summary

AECOM was commissioned by Vale of Glamorgan Council to undertake a Preliminary Ecological Appraisal (PEA) and a BREEAM Assessment of the Ysgol Gymraeg Morgannwg School (the Site), Barry, South Wales.

The 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 2014 criteria.

The Site is located in Barry, South Wales, OS Grid Reference ST10606 69022. The Site is located within a residential area on the northern outskirts of Barry.

The proposed development (Initial Master Planning Concept AR-900003, Lawary Architects Limited, 30/05/2018) includes the creation of a new games court, 3G sports pitch, bus drop off area, a new reception/entrance, a new teaching/sports block, and the creation of a new access road from the west. AECOM understand that there is a refurbishment element, which may include replacing/ renewing roofs and the addition of cladding. The final details of the refurbishment have not yet been finalised.

The majority of the Site comprises of amenity grassland, hardstanding and buildings with areas of broadleaved plantation woodland, dense and scattered scrub, introduced shrub, rows of trees, standalone trees, semi-improved and poor semi-improved grassland, standing water, species-poor hedgerows with trees, intact species poor hedgerow, defunct species-poor hedgerow and fences

Within the Site Boundary there is potential for generalist invertebrates, breeding birds, foraging, commuting and roosting bats and hedgehogs. The proposed works (Initial Master Planning Concept AR-900003, Lawary Architects Limited, 30/05/2018) will require partial removal of the; broadleaved plantation woodland, amenity grassland, scattered scrub, standalone trees and hardstanding. Rows of trees and hedgerows will be retained, however without mitigation there is potential for retained features to be damaged during construction. There is potential for works to impact species using the Site through habitat loss and disturbance including lighting. Recommendations for mitigation have been provided to avoid and reduce impacts on retained habitats and species using the Site.

Buildings have been assessed as having features suitable to support roosting bats. Bat surveys are required prior to refurbishment and construction of buildings. A European Protected Species License (EPSL) will be required if roosting bats are present and if works will impact on roosts.

The 'before development' LE03 calculation is based on the Phase 1 Habitat plan. Calculations for 'after development' have not been calculated at this stage in the absence of a detailed development plan. The report can be used to guide Site design to achieve LE03 Credits.

As per BREEAM guidance, 'legal' 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. All of the Legal recommendations need to be completed as well as at least 6 of the 8 additional requirements to achieve the first credit under LE04. Liaison between ecologists and the architects will be required to achieve these. Some of the additional recommendations will increase species count and can count towards LE03.

<u>Mandatory Requirements</u>

1. Ancient Woodland avoidance
2. Reptiles – Surveys and Mitigation;
3. Bats – Surveys and Mitigation; and,
4. Breeding Birds – Mitigation.

Additional Recommendations

1. Improving Grassland Diversity;
2. Swale Creation;
3. Invertebrate Houses and/or Insect Walls;
4. Bird and Bat Boxes;
5. Kitchen Garden;
6. Sensory Garden Creation;
7. Hedgehog Habitat Creation/Enhancement; and,
8. Green Corridors.

Summary of Potential BREEAM Credits

Credit	Total available	Credits achievable under current landscaping proposals
LE02	2	1*
LE03	2	TBC**
LE04*	2	2*
LE05*	2	2*
LE Total	**8**	**5***

*Achieving this credit is dependent on recommendations being implemented by the client/contractor.

**LE03 will be confirmed once a detailed site plan including landscape design has been issued.

The executive summary is not a substitute for the full report. Refer to the full text for further detail

1. Introduction

1.1 Introduction

AECOM was commissioned by Vale of Glamorgan Council to undertake a Preliminary Ecological Appraisal (PEA) of the site of the proposed refurbishment and development of Ysgol Gymraeg Bro Morgannwg School in Barry, South Wales. The 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 2014 criteria.

The Ysgol Gymraeg Bro Morgannwg site ("the Site") is located in Barry, South Wales OS grid reference ST10606 69022. To the north of the Site are the Barry Comprehensive School playing fields with the school grounds further north (development plans are proposed at Barry Comprehensive School which will be renamed Whitmore High School). To the east of the Site is Barry Hospital. Residential areas are located to the south and west and further east beyond the hospital.

The 'before development' LE03 calculation is based on the Phase 1 Habitat plan (Figure 1).

The development Site currently comprises buildings, hardstanding, broadleaved plantation woodland, rows of trees, standalone trees, dense scrub, scattered scrub, semi-improved grassland, poor semi-improved grassland, introduced shrub, amenity grassland and standing water (ornamental pond) (Figure 1).

1.2 Proposed Development

The proposed development (Initial Master Planning Concept AR-900003, Lawary Architects Limited, 30/05/2018) shown on Figure 2, includes the creation of a new games court, 3G sports pitch, bus drop off area, a new reception/entrance, a new teaching/sports block, and the creation of a new access road from the west.

AECOM understand that there is a refurbishment element, which may include replacing/ renewing roofs and the addition of cladding. The final details of the refurbishment have not yet been decided.

1.3 Objectives

This report is based on the findings of a 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 proposed development 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 (LE02);
- To assess ecological impacts including potential change in diversity (LE03 & LE04);
- 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 (LE03, LE04 & LE05).

1.4 Legislation

There are several different acts of legislation and regulations which refer to the protection of wildlife. These are summarised in Appendix A. In particular, the legislation relating to possible protected 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.

1.5 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 14001:2004 and BS OHSAS 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 PEA are members of (at the appropriate level) the Chartered Institute of Ecology and Environmental Management (CIEEM) and follow their code of professional conduct (CIEEM, 2017) when undertaking ecological work.

2. Methodology

2.1 Preliminary Ecological Appraisal

2.1.1 Desk Study

The objectives of the desk study are 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 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 using Local Environmental Record Centre (LERC) records and via per communications with the Vale of Glamorgan County Ecologist;
- Protected and Priority Species records and records of locally designated sites up to 2 km from the Site, using South East Wales Biodiversity Record Centre (SEWBReC);
- Special Areas of Conservation (SACs) and Sites of Special Scientific Interest (SSSIs) designated for bats within a 10 km radius of the Site 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 (NRW, 2015a);
- Ponds within 500 m from the Site, using MAGIC and online aerial maps;
- Tree Protection Orders (TPO's) 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 500m, nearby areas of ecological interest and features connecting these habitats (hedgerows, watercourses, railway lines).

2.1.2 Extended Phase 1 Habitat Survey

A Phase 1 Habitat Survey (JNCC, 2010) of the Site was undertaken by two Suitability Qualified Ecologists (SQEs) (BSc, MCIEEM and GradCIEEM) of AECOM on 9th 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.

2.1.3 Assessment of Bat Potential

During the Phase 1 Habitat Survey, subject to access, A Preliminary Ground Level Roost Assessment of trees, buildings and structures within and adjacent to the Site was completed. This assessment was

undertaken by two experienced ecologists, one of which holds a NRW bat licence on 9th May 2018. 2018.

Trees, buildings and structures 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 and a high powered torch. Table 2.1 provides descriptions of the categories for buildings, structures and trees.

Habitats on Site were classified into categories dependent on the presence of features suitable for bats to commute and forage. Table 2.2 provides descriptions for commuting and foraging habitats.

Table 2.1Building and Tree Bat Roost Suitability Categories

Roost Suitability	Descriptions for Buildings/Structures	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 20th 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	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/Structures	Descriptions for Trees
	be suitable for maternity or hibernation).	
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

Table 2.2 Commuting and Foraging Habitat Suitability Categories

Commuting and Foraging Suitability	Descriptions
High	Continuous high-quality habitat that is well connected to the wider landscape that is likely to be used regularly by 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 foraging bats.

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

2.2 BREEAM Assessment

The Land Use and Ecology BREEAM (2014) criteria were used for this report. The assessment of these criteria 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 (LE02). Recommendations for Site protection and mitigation were based on these observations (LE03, LE05). In addition, conditions on Site were used to provide recommendations on enhancing Site ecology (LE04). Species lists of native plants in different vegetation plots were made and this information was used for the change in ecological value calculations (LE03, LE04). The credit criteria are detailed below and summarised in Table 2.3.

2.2.1 LE02 Ecological Value of Site and Protection of Ecological Features

This issue is split into two parts:

- Ecological value of Site (1 credit); and,
- Protection of ecological features (1 credit).

The aim of the first credit is to encourage development on land that has a limited value to wildlife and to protect existing ecological features from substantial damage during Site preparation and completion of construction work.

One credit is available where evidence is provided to demonstrate that the construction zone is defined as land of low ecological value and any existing features of ecological interest are fully protected from damage during Site preparation and construction works.

Land of low ecological value is defined through:

- Use of the BREEAM checklist A4, or
- A Suitably Qualified Ecologist (SQE) who has identified the land as being of "low ecological value" within an ecological assessment report based on a site survey.

A second credit is available where evidence is provided to demonstrate existing features of ecological value within the assessment zone are adequately protected from damage during clearance, Site preparation and construction activities in line with BS42020: 2013. In all cases, the principal contractor is required to implement ecological protection recommended by the SQE, prior to any preliminary Site construction or preparation works (e.g. clearing of the Site or erection of temporary site facilities).

2.2.2 LE03 Minimising Impact on Existing Site Ecology

The aim is to minimise the ecological impact of a building development project on existing Site ecology. The change in ecological value is calculated using the formula below which also takes in to account the area of the Site, the size of the area used for planting and the number of different species within it.

Two credits are available where evidence is provided to demonstrate the change in ecological value of the Site is equal to or greater than zero plant species, i.e. no negative change, using the methods outlined in either (a) or (b) below:

a. Determine the following information and input this data in to the BREEAM LE 03/LE 04 calculator:
    i. The broad habitat type(s) that define the landscape of the assessed Site in its existing pre-developed state and proposed state
    ii. Area (m^2) of the existing and proposed broad habitat types.

OR

b. Where a SQE has been appointed and, based on their Site survey, they confirm the following and either the assessor or ecologist inputs this data in to the BREEAM LE 03/LE 04 calculator:
    i. The broad habitat types that define the landscape of the assessed Site in its existing pre-developed state and proposed state.
    ii. Area (m^2) of the existing and proposed broad habitat plot types.
    iii. Average total taxon (plant species) richness within each habitat type.

One credit is available where evidence is provided to demonstrate that the change in ecological value of the Site is less than zero but equal to or greater than minus nine plant species i.e. a minimal change, use the methods outlined in either (a) or (b) above.

$$Species_{\text{Before Development}} \frac{\sum_{1}^{n}(\text{Area plot type } N \text{ x Species plot type } N)}{\text{Total site area}}$$

$$Species_{\text{After Development}} \frac{\sum_{1}^{m}(\text{Area plot type } M \text{ x Species plot type } M)}{\text{Total site area}}$$

Species Change = Species After Development – Species Before Development

Where:

N = total number of types of plots before development

M = total number of types of plots after development

2.2.3 LE04 Enhancing Site Ecology

The aim of the LE04 credits is to recognise and encourage actions taken to maintain and enhance the ecological value of the Site as a result of development and is split into two parts:

- Ecologist's report and recommendations (1 credit)
- Increase in ecological value (1 credit)

One credit is available where evidence is provided to demonstrate that the design team (or client) has:

- A SQE has been appointed by the client or their project representative by the end of the Preparation and Brief stage to advise on enhancing the ecology of the Site at an early stage.
- The SQE has provided an Ecology Report with appropriate recommendations for the enhancement of the Site's ecology at Concept Design stage. The report is based on a Site visit/survey by the SQE.
- The early stage advice and recommendations of the Ecology Report for the enhancement of Site ecology have been, or will be, implemented in the final design and build.

A second credit is available when in addition to the criteria of the first credit have been met and where evidence is provided to demonstrate:

- The recommendations of the Ecology Report for the enhancement of Site ecology have been implemented in the final design and build, and the SQE confirms that this will result in an increase in ecological value of the Site, with an increase of six plant species or greater.
- The increase in plant species has been calculated using the BREEAM LE 03/LE 04 calculator, using actual plant species numbers.

2.2.4 LE05 Long Term Impact on Biodiversity

This credit aims to minimise the long term impact of the development on the Site and surrounding area's biodiversity.

One credit is available where evidence is provided to demonstrate that the client has committed to achieving the following and at least two of the additional measures.

A second credit is available where evidence is provided to demonstrate that the client has committed to achieving the following and at least four of the additional measures.

- A SQE has been appointed prior to commencement of activities on-site and they confirm that all relevant UK and EU legislation relating to the protection and enhancement of ecology has been complied with during the design and construction process.
- Where a landscape and habitat management plan, appropriate to the Site, is produced covering at least the first five years after project completion in accordance with BS 42020:2013 Section 11.1. This is to be handed over to the building owner/occupants for use by the grounds maintenance staff.
- Where additional measures to improve the assessed Site's long term biodiversity are adopted.

Additional Measures

1. The principal contractor is required to nominate a 'Biodiversity Champion' with the authority to influence Site activities and ensure that detrimental impacts on Site biodiversity are minimised in line with the recommendations of a Suitably Qualified Ecologist.
2. The principal contractor is required to train all relevant site work-force on how to protect the Site ecology during the project. Specific training should be carried out for all the site work-force to ensure they are aware of how to avoid damaging Site ecology. Training should be based on the findings and recommendations for protection of ecological features highlighted within a report prepared by a suitably qualified ecologist.
3. The principal contractor is required to record actions taken to protect biodiversity and monitor their effectiveness throughout key stages of the construction process. The requirement commits the principal contractor to make such records available where publicly requested.
4. Where a new ecologically valuable habitat, appropriate to the local area, is created. This includes habitat that supports nationally, regionally or locally important biodiversity, and/or which is nationally, regionally or locally important itself; including any habitat listed in the UK Biodiversity Action Plan (BAP), Local BAP, those protected within statutory sites (e.g. SSSIs) or those within non-statutory sites identified in local plans.
5. Where flora and/or fauna exist on Site, the contractor programmes site works to minimise disturbance to wildlife. For example, site preparation, ground works and landscaping have been or will be scheduled at an appropriate time of year to minimise disturbance to wildlife. Timing of works may have a significant impact on, for example, breeding birds, flowering plants, seed germination, amphibians etc. Actions such as phased clearance of vegetation may help to mitigate ecological impacts. This additional requirement will be achieved where a clear plan has been produced detailing how activities will be timed to avoid any impact on Site biodiversity in line with the recommendations of a suitably qualified ecologist.

Table 2.3 Summary of Credit Criteria

LE Credit	Credits Number	Credit Criteria
LE02 – Ecological value of Site AND Protection of ecological features	1	Where evidence provided demonstrates that the Site's construction zone is defined as land of low ecological value.
	2	Where evidence provided demonstrates that all existing features of ecological value will be fully protected from damage during Site preparation and construction works.
LE03 – Mitigating ecological impact	1	Where evidence provided demonstrates that the change in the Site's existing ecological value, as a result of development is less than zero but equal to or greater than minus nine plant species i.e. a minimal change.
	2	Where evidence provided demonstrates that the change in the Site's existing ecological value, as a result of development, is equal to or greater than zero plant species, i.e. no negative change
LE04 – Enhancing Site ecology	1	Where the design team (or client) has appointed a suitably qualified ecologist to advise and report on enhancing and protecting the ecological value of the Site; and implemented the professional's recommendations for general enhancement and protection of Site ecology.
	2	Where the conditions of the criteria under the first credit have been met and there is a positive increase in the ecological value of the Site of 6 species or greater.
LE05 – Long term impact on biodiversity	1	Where a SQE has been appointed prior to commencement of activities on-site and they confirm that all relevant UK and EU legislation has been complied, where a landscape and habitat management plan is produced, and the client has committed to achieving at least two of the additional measures.
	2	Where a SQE has been appointed prior to commencement of activities on-site and they confirm that all relevant UK and EU legislation has been complied, where a landscape and habitat management plan is produced, and the client has committed to achieving at least four of the additional measures.

2.3 Limitations

2.3.1 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 2018 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 north and west side of Building 2 was not accessible, and only part of the west side of Building 2 was viewed. There was no access to Building 3, and it was not possible to view the west or north face. Despite this limitation, it is considered that the most appropriate bat roost suitability category has been applied.

There was no direct access into the Courtyard 2 area, however this area was viewed through a window and therefore this is not deemed to be a significant limitation.

There is an area of amenity grassland to the north and west of Building 2 (the private garden) that could not be accessed and has been mapped from aerial photography (Figure 1: Target Note 9). Due to the likely limited value of this amenity/garden habitat, this is not deemed to be a significant limitation.

The strip of broadleaved plantation woodland to the north of Building 2 could not be accessed and has been mapped using aerial photography (Figure 1: Target Note 10). This habitat is connected to an adjacent area of broadleaved plantation woodland that has been accessed and species listed, the same species have been used to undertake the species count in this area. This is not deemed to be a significant limitation.

2.3.2 BREEAM

The assessment of BREEAM credits 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 conclusions of the 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.

The 'before development' BREEAM LE03 calculation is based on the Phase 1 Habitat plan (Figure1). Calculations for 'after development' have not been calculated at this stage in the absence of a detailed development plan. The report can be used to guide Site design to achieve LE03 Credits.

3. Baseline Conditions

3.1 Desk Study Results

The designated habitats, sites and features within proximity to the Site are listed in Table 3.1 below

Table 3.1 Desk Study Results

Designation/ Feature	Description
Designated Sites within 2 km	**Fferm Walters SSSI** **Distance and Direction**: 10 m west (separated from the Site by A4226 Road) **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, 2015b). **Coedydd Y Barri/ Barry Woodland SSSI** **Distance and Direction**: comprised of 14 separate sites, closest located 0.6 km west **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). **Cliff Wood - Golden Stairs SSSI** **Distance and Direction**: 1.9 km south **Description**: The best example of a mixed woodland in South Glamorgan which has a canopy of pedunculate oak, ash, maple and yew. The interesting, ungrazed ground flora and wooded cliff areas includes Purple Gromwell Lithospermum purpurocaeruleum which is restricted to a very small number of sites in the county (CCW, 1983).
Locally Designated Sites within 2 km	There is one county park, two Local Nature Reserves (LNRs) and 14 Sites of Importance for Nature Conservation (SINCs) within 2 km of the Site. The Descriptions of the SINCs have been taken directly from the Identification of SINCs and Priority Habitats Vale of Glamorgan Local Development Plan 2011-2026 (Vale of Glamorgan, 2013).

Porthkerry Country Park

Distance and Direction: 1 km south-west

Description: Includes Cliff Wood - Golden Stairs LNR, North East of Knock Man Down Wood SINC and North Cwm Barri SINC. Porthkerry Country Park consists of 220 acres of woods and meadowland in a sheltered valley leading to a pebble beach and spectacular cliffs.

Cwm Talwg Woodlands LNR

Distance and Direction: Comprising four separate areas, the closest of which is located approximately 15 m from part of the western Site boundary.

Description: .Mature deciduous woodland.

Cliff Wood – Golden Stairs LNR

Distance and Direction: 1.9 km south-west

Description: This LNR forms part of Cliff Wood - Golden Stairs SSSI.

Walters Farm SINC No. 336

Distance and Direction: 10 m west, separated from the Site by the A4226 Road.

Description: Series of species-rich neutral grasslands, locally damp, with large anthills. SINC site selection criteria: H5:1 lowland meadows.

Fields at Merthyr Dyfan SINC No. 289

Distance and Direction: 0.5 km east

Description: Series of small fields supporting a mosaic of species-moderate and species-rich semi-improved neutral grassland and scrub. SINC site selection criteria: H5:1 lowland meadows and H16 mosaic habitats.

Brynhill SINC No. 288

Distance and Direction: 0.6 km north-east

Description: Semi-natural broadleaved woodland. SINC site selection criteria: H1:3 native woodlands

West of Barry College SINC No. 285

Distance and Direction: 0.6 km west

Description: Species-rich neutral grassland. SINC site selection criteria: H5:1 lowland meadows.

North West of Welsh Hawking Centre SINC No. 284

Distance and Direction: 0.8 km north-west

Description: Ancient semi-natural broadleaved woodland. SINC site selection criteria: H1:3 native woodlands.

North of Highlight Farm SINC No. 286

Distance and Direction: Comprising three separate areas, the closest of these is located 1 km north-west

Description: Three ponds supporting diverse emergent and aquatic flora, tall swamp vegetation and reedbed. SINC site selection criteria: H9:4 reedbed, H13:2 ponds and H16 mosaic habitats.

Gladstone Road Pond SINC No. 15

Distance and Direction: 1 km south-east

Description: Pond supporting exceptional (100+) breeding population of smooth newts. SINC site selection criteria: S3 amphibians.

	North East of Knock Man Down Wood SINC No. 332 **Distance and Direction**: 1 km south-west **Description**: Large area of predominantly ancient semi-natural broadleaved woodland. SINC site selection criteria: H1:3 native woodlands. **Land at Nant Bryhill SINC No. 287** **Distance and Direction**: 1.2 km north **Description**: Series of species-rich purple moorgrass and rush pastures with tall herb and swamp vegetation. SINC site selection criteria: H9:3 purple moorgrass and rush pastures and H9:4 reedbed. **North Cwm Barri SINC No. 335** **Distance and Direction**: 1.2 km south-west **Description**: Ancient semi-natural broadleaved woodland and semi-natural broadleaved woodland, part on an ancient woodland site. SINC site selection criteria: H1:3 native woodlands. **South of Cwm Ciddy Farm SINC No. 333** **Distance and Direction**: 1.4 km south-west **Description**: Species-moderate neutral grassland. SINC site selection criteria: H5:1 lowland meadows. **Bears Wood SINC No. 150** **Distance and Direction**: 1.6 km north-east **Description**: Ancient semi-natural broadleaved woodland. SINC site selection criteria: H1:3 native woodlands. **Land North of Port News SINC No. 290** **Distance and Direction**: 1.7 km north-east **Description**: Semi-natural broadleaved woodland on an ancient woodland site. SINC site selection criteria: H1:3 native woodlands. **Sutton Wood SINC No. 283** **Distance and Direction**: 1.8 km north-west **Description**: Semi-natural broadleaved woodland on an ancient woodland site. SINC site selection criteria: H1:3 native woodlands.
Designated Sites for bats within 10km	There are no designated sites for bats within 10km.
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: **Plants**: Bluebell Hyacinthoides non-scripta. **Invertebrates**: Brown-banded carder-bee Bombus humilis. **Fish:** European eel Anguilla Anguilla. **Amphibians**: Common toad bufo bufo, smooth newt Lissotriton vulgaris and common frog Rana temporaria. **Reptiles**: Slow-worm Anguis fragilis (records to the south, east and west of the Site within 2 km) and common lizard Zootoca vivipara (one record from approximately 1.8km west of the Site). **Birds**: Skylark Alauda arvensis, kingfisher Alcedo atthis, purple sandpiper Calidris maritima, nightjar Caprimulgus europaeus, ringed plover Charadrius hiaticula, black-headed gull Chroicocephalus ridibundus, reed bunting Emberiza schoeniclus, kestrel Falco tinnunculus, great northern diver Gavia immer, Mediterranean gull Larus melanocephalus, bar-tailed godwit Limosa lapponica, linnet Linaria cannabina, common scoter Melanitta nigra, spotted flycatcher Muscicapa striata, curlew Numenius arquata, whimbrel Numenius phaeopus, house sparrow Passer domesticus, black redstart Phoenicurus

	ochruros, dunnock Prunella modularis, bullfinch Pyrrhula pyrrhula, starling Sturnus vulgaris, redwing Turdus iliacus, song thrush Turdus philomelos, fieldfare Turdus pilaris, barn owl Tyto alba and lapwing Vanellus vanellus. **Bats**: Whiskered Myotis mystacinus (nearest record 1.0 km east), common pipistrelle Pipistrellus pipistrellus (including one activity record returned from within the Site), pipistrelle species Pipistrellus pipistrellus agg (roost record 2.0 km west)., brown long-eared Plecotus auritus (nearest record 0.1 km north), lesser horseshoe Rhinolophus hipposideros (confidential roost record approximately 3.4 km north of the Site). **Other Mammals**: Brown hare Lepus europaeus, hazel dormouse Muscardinus avellanarius (one record returned approximately 0.9 km to the west, separated from the Site by a housing estate), west European hedgehog Erinaceus europaeus (nearest record 0.5 km south), and polecat Mustela putorius.
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 3.2 and Table 3.3 respectively.
Surrounding Land Use	The Site is located in Barry. To the north of the Site are the Barry Comprehensive School playing fields with the school grounds further north. Further north is the residential area of Colcot beyond which is a golf club with grassland and scattered woodland which extends into farmland beyond linked by hedgerows. To the east of the Site is Barry Hospital. Further east are residential areas with some scattered parkland and greenspace including a recreational park, a cemetery and allotments located east of Colcot Road. To the south of the Site are residential areas. Industrial buildings are located further to the south towards Barry Docks. To the west of the Site is the outskirts of Colcot. Beyond the residential areas are fields and scattered woodland blocks linked by hedgerows.
Ancient Woodland	2.76 Ha of ASNW is located approximately 15 m from the western Site boundary and forms the Cwm Talwg Woodlands LNR. There is no ASNW, RAWS or PAWs within the Site boundary.
Tree Protection Orders (TPOs)	There are no TPOs within or adjacent to the Site boundary.
Ponds within 500 m	There are two ponds within the Site boundary. There are no further visible ponds located within 500 m.
Council Ecologist and Local Specialist Recorders	The County Ecologist responded stating all records are submitted to SEWBReC. The County Bird Reorder 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.

3.2 Extended Phase 1 Habitat Survey

3.2.1 Habitats

The habitats present within the Site boundary and their descriptions are shown in Table 3.2. A plan of the Site showing the location and distribution of these habitats is shown in Figure 1.

Table 3.2 Phase 1 Habitats and Descriptions

Habitat	Description	Section 7 Habitat
Broadleaved Woodland - Plantation	There are two areas of broadleaved plantation woodland on Site. There is strip of broadleaved plantation forming the northern Site boundary. Wood species include : field maple Acer campestre, hawthorn Crataegus monogyna, ash Fraxinus excelsior, silver birch Betula pendula, sycamore Acer pseudoplatanus, rowan Sorbus aucuparia, hazel Corylus avellana, spindle Euonymus europaea, guelder-rose Viburnum opulus, dogwood Cornus sp., oak species Quercus sp., cherry species Prunus sp., and apple Malus sp. Ground flora includes: bramble Rubus fruticosus agg., ivy Hedera helix alexanders Smyrnium olusatrum, bindweed Convolvulus sp., cleavers Galium aparine, willowherb species Epilobium sp, cow parsley Anthriscus sylvestris, ground ivy Glechoma hederacea, lesser celandine Ficaria verna, crane's-bill Geranium sp., woundwort Stachys sylvatica, wood avens Geum urbanum, ragwort Jacobaea vulgaris, nettle Urtica dioica, silverweed Potentilla anserina, ribwort plantain Plantago lanceolata, common vetch Vicia sativa, A further strip of broadleaved plantation woodland along the south-west Site boundary, bordering adjacent houses. Species include: pedunculate oak Quercus robur, sycamore, ash, ornamental birch, hawthorn, ivy, and lords and ladies Arum maculatum (Appendix B: Photograph 7). **Species Count: 31.**	No
Dense Scrub	There are several areas of dense scrub across the Site. There is an area of dense scrub located in the north-east of the Site adjacent to Building 1. This area is dominated by bramble with some nettle. An area of dense scrub is located within the east of the Site, forming the eastern Site boundary adjacent to the car park. Woody species include: blackthorn Prunus spinosa, elder Sambucus nigra, sycamore, hawthorn, hazel, oak saplings. Ground flora includes common vetch, bramble, dandelion Taraxacum sp., bristly ox tongue Helminthotheca echioides, cock's foot Dactylis glomerata, Yorkshire fog Holcus lanatus, cleavers, ivy, nettle, lesser celandine, lords and ladies, willowherb species, ragwort, thistle species Cirsium sp., creeping cinquefoil Potentilla reptans, ribwort plantain, geranium species, ivy-leaved speedwell Veronica hederifolia, daisy Bellis perennis, goat willow Salix caprea, bird's foot trefoil Lotus corniculatus, broad-leaved dock Rumex obtusifolius, common mouse-ear Cerastium fontanum and corn salad Valerianella locusta (Appendix B: Photograph 1). An area of dense scrub forms part of the western Site boundary. Bramble is dominant with willowherb species, hard rush Juncus inflexus, cock's foot, lesser celandine, cleavers, willow species, rose species rosa	No

	sp., glaucous sedge carex flacca and blackthorn. There is an area of the scrub in the corner of the playing field in west of the Site. Species include, bramble, willowherb species, cleavers, cuckoo flower Cardamine pratensis and invasive non-native species Japanese rose Rosa rugosa. **Species Count: 33**	
Scattered Scrub	There are three areas of scattered scrub habitat within the Site. There is a strip of scattered bramble scrub adjacent to the semi-improved grassland along the south east Site boundary. There is scattered scrub on the embankments around the tennis/netball courts. Species include bramble, nettle, buddleia Buddleja davidii, willowherb species, thistle species, field maple, dock species, ragwort, wavy haired bitter-cress Cardamine flexuosa, cow parsley, cuckoo flower, ivy-leaved speedwell, ground-ivy, blackthorn, chives Allium schoenoprasum and hawthorn (Appendix B: Photograph 8). An area of scattered scrub is located, adjacent to the plantation woodland in the north of the Site. Species include ash saplings, geranium species, cinquefoil, clover species, herb Robert, bird's foot trefoil, ribwort plantain, willowherb species, dandelion, perennial rye grass Lolium perenne, bramble, ragwort and black medic Medicago lupulina (Appendix B: Photograph 10). **Species Count: 26**	No
Row of Trees - Broadleaved	There is a row of sycamore trees within the area of dense scrub in the east of the Site. There is a row of silver birch trees located in the south of the Site and forming part of the southern Site boundary. **Species Count: 2**	No
Row of Trees - Coniferous	There is a row of leylandii trees Cupressus × leylandii at the western end of the north Site boundary. **Species Count: 0**	No
Standalone Trees	There are 34 standalone trees within the Site boundary: • Trees 1 – 4: Norway maple Acer platanoides trees with a height of 6 m and a Diameter at Breast Height (DBH) of 0.2 m located in the south-east of the Site (Appendix B: Photograph 5); • Tree 5: Norway maple with a height of 6 m and a DBH of 0.1 m located within the east of the Site; • Trees 6 and 7: Sliver birch trees with a height of 5 m and a DBH of 0.1 m; • Tree 8: Silver birch with a height of 4 m and a DBH of 0.1 m; • Tree 9: Silver birch with a height of 3 m and a DBH of 0.1 m; • Trees 10 and 11: Two cherry trees with a height of 3 m and a DBH of less than 0.1 m; • Trees 12 and 13: Two birch trees with a height of 5 m and a DBH of 0.1 m; • Tree 14: Norway maple with a height of 5 m and a DBH of less than 0.1 m; • Tree 15: Norway maple with a height of 5 m and a DBH of less than	No

	0.1 m; • Tree 16: Norway maple with a height of 5 m and a DBH of less than 0.1 m; • Tree 17: Norway maple with a height of 5 m and a DBH of less than 0.1 m; • Tree 18: Pedunculate oak with a height of 12 m and DBH of 1.5 m. • Tree 19: Birch with a height of 5 m and a DBH of 0.1 m; • Tree 20: Birch with a height of 4 m and a DBH of less than 0.1 m; • Tree 21: Conifer with a height of 12 m and a DBH of 1 m, • Tree 22: Bastard service Sorbus thuringiaca with a height of 4 m and a DBH of 0.1 m; • Trees 23 and 24: Bastard service with a height of 5 m and a DBH of 0.1 m; • Tree 25: Rowan with a height of 5 m and a DBH of 0.1 m; • Trees 26 and 27: Apple with a height of 4 m and a DBH of less than 0.1m with ornamental shrubs at the base of the trees; • Tree 28: Birch with a height of 4 m and a DBH of 0.1 m; • Trees 29 – 34: Cherry trees with a height of 3 m and a DBH of 0.1 m. **Species Count: 7**	
Semi-Improved Grassland	There is one area of semi-improved grassland in the south-east corner of the Site. Species include common vetch, red clover, cuckoo flower, Yorkshire fog, creeping bent Agrostis stolonifera, creeping cinquefoil, cock's foot, broad-leaved dock, perennial rye grass, rough meadow grass Poa trivialis, bindweed Convolvulus sp., bird's foot trefoil, common mouse-ear, thistle species, knapweed Cebtaurea nigra, nettle, yarrow, ribwort plantain, ragwort with some horsetail Equisetum sp. and soft rush Juncus effuses in a damp area near to the western side of the car park (Appendix B: Photograph 2). **Species Count: 21**	No
Poor Semi-Improved Grassland	There is an area of poor semi-improved grassland in the south corner of the Site. This area is shaded by adjacent trees. Species include cock's foot, dandelion, woundwort, broad-leaved dock, horsetail, scattered bramble, cleavers, lesser celandine and nettle. There were some sapling tree planted near the fence in this area which included elm species Ulmus sp., horse chestnut Aesculus hippocastanum, ash, and osier Salix viminalis saplings, (Appendix B: Photograph 6). **Species Count: 13**	No
Standing Water	There are two ponds within the Site: Pond 1: A lined pond within Courtyard 1. Ornamental goldfish were present within the pond. The pond has two layers of mesh over the top of the pond which would inhibit access by birds, mammals and amphibians (Appendix A: Target Note 7, Appendix B: Photographs 12 and 13). The pond is isolated within the courtyard and of limited value to wildlife, with the exception of invertebrates. Pond 2: This is located within Courtyard 2. It is surrounded by introduced shrubs, hardstanding and Buildings. . The pond did not have a mesh covering unlike Pond 1, so would be accessible to birds. There was no direct access to this courtyard and pond and the area was viewed through a window. (Appendix A: Target Note 8, Appendix B: Photograph 15). Unless amphibians have been introduced to the courtyard, the pond is isolated within the courtyard and inaccessible so	Yes, but ponds on Site unlikely to qualify as S7 habitat quality

	is of limited value to amphibians and mammal, but would be accessible to birds and invertebrates. **Species Count: 0**	
Hedgerow with Trees – Species Poor	There is one species-poor hedgerow with trees, located in the south-east corner of the Site adjacent to the semi improved grassland. Species include hawthorn and sycamore species. **Species Count: 2**	Yes
Defunct Hedgerow – Species Poor	There is one species-poor defunct hedgerow located adjacent to the plantation woodland, along the south-west Site boundary. Species include hawthorn, hazel, bramble, field maple, holly Ilex aquifolium, blackthorn, currant species Ribes sp., cherry, introduced shrub species, Wilson's honeysuckle Lonicera nitida with a ground flora of horsetail, willowherb species, nettle, wood avens, wood spurge Euphorbia amygdaloides, cleavers, hybrid bluebell Hyacinthoides × massartiana and geranium species (Appendix B: Photograph 7). **Species Count: 17**	Yes
Amenity Grassland	The Site is dominated by amenity grassland currently being used as playing fields with further smaller areas of amenity grassland. Species include: bedstraw Galium sp., daisy, dandelion, creeping buttercup Ranunuclus repens, red clover, Yorkshire fog, perennial rye grass, ribwort plantain, thistle species, black medic, ivy-leaved speedwell, chive Allium sp, cuckoo flower, cock's foot, field wood-rush Luzula campestris, common mouse-ear, bistort Persicaria bistorta, yarrow Achillea millefolium, creeping cinquefoil, self-heal Prunella vulgaris, bugle Ajuga reptans and red clover Trifolium pratense (Appendix B: Photographs 4, 5, 6, 9, 11, 12). There is an area of amenity grassland to the north and west of Building 2 (the private garden of Building 2) that could not be accessed and has been mapped from aerial photography (Appendix A: Target Note 9). **Species Count: 22**	No
Introduced Shrub	There are several areas of ornamental introduced shrub planting Introduced shrub species are located within Courtyard 2. Other species located within Courtyard 2 include larch tree Larix decidua, fig Ficus sp., Wilson's honeysuckle, lilac Syringa sp. and birds of paradise flower Strelitzia sp. (Appendix B: Photographs 14, 15 and 16). Further areas of introduced shrub ornamental planting are located across the Site. Species include rosemary Rosmarinus officinalis and lavender species Lavandula sp. **Species Count: 0**	No
Bare Ground (Hardstanding)	Areas of hardstanding are located around the Site. These comprise parking areas, sports courts, playgrounds, courtyards and walkways. The hardstanding has no ecological value. Appendix B: Photographs: 1, 3, 5, 8, 9 **Species Count: 0**	No
Buildings	There are a total of 14 buildings located throughout the Site comprising	No

	school buildings, the caretaker's house and a garage. Descriptions of buildings and an assessment of their potential to support nesting birds is provide in Section 3.3 and roosting bats are provided in Table 3.5. **Species Count: 0**	
Fence	There are several fences across the Site, these include metal railings and wooden fences (Appendix B: Photographs 6). The wooden fence located along the south -west boundary has ivy, clematis species Clematis sp. and bramble growing over it from adjacent gardens located outside of the Site boundary (Appendix B: Photograph 11). **Species Count 0:**	No

3.2.2 Protected and/or Priority Species

Details of Protected and/or Priority Species recorded on Site are shown in Table 3.3. 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 C.

Table 3.3 Protected and/or Priority Species Potential

Species/ Species Group	Associated Habitat	Description	Section 7 Species
Invertebrates	Broadleaved woodland, rows of trees, standalone trees, hedgerows, dense and scattered scrub, semi-improved grassland, poor semi-improved grassland, amenity grassland, introduced shrub and standing water.	The Site provides a range of habitats suitable for supporting common terrestrial and aquatic invertebrates. A record of a brown-banded carder bee was returned from the LRC. However this species requires large fairly tall open flower-rich grassland (Buglife, 2010) and this habitat type is absent from the Site and therefore the Site is considered unlikely to support the brown-banded carder bee. The Site is not considered likely to support Protected Or Priority invertebrates.	Yes, but unlikely at this Site.
Reptiles	Semi-improved grassland and dense and scattered scrub.	There is potential for reptiles within the only semi-improved grassland on site in the south-east corner of the Site. This area is small, but backs onto adjacent gardens and reptile species such as slow-worm may utilise this area on Site and adjacent gardens, if they are present locally. The scrub habitats that connect to the semi-improved grassland provide some refuge and a vegetated corridor for connectivity. The LERC returned records of slow-worm to the south, east and west of the Site within 2 km and one record of common lizard approximately 1.8km west of the Site.	Yes
Breeding Birds	Broadleaved woodland, rows of trees, standalone trees, hedgerows, dense and scattered scrub, semi-improved and poor semi-improved grassland, introduced shrub and buildings.	Broadleaved woodland, dense and scattered scrub, and the introduced shrub within Courtyard 2 provide foraging and nesting opportunities for birds. Semi-improved grassland, and poor semi-improved grassland provide some foraging opportunities for birds, these habitats will not support ground nesting birds due to their limited size and high levels of disturbance. During the Phase 1 Habitat survey lesser black back gulls Larus fuscus were observed nesting on the roofs of	Yes

		Buildings 6, 8 and 11 (Appendix A: Target Notes 4-6, Appendix B: Photographs 35, 36, 37 and 38). A great tit was observed nesting in a knothole of an ash tree (Table 3.5: Tree 2).	
Bats	Broadleaved woodland, rows of trees, standalone trees, hedgerows dense and scattered scrub, semi-improved and poor semi-improved grassland and buildings.	The Site is assessed as having 'Moderate' potential to support foraging and commuting bats which is defined as '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.' Buildings and Trees on site have features suitable for roosting bats. These are listed in Table 3.5	Yes
European Hedgehog	Broadleaved woodland, rows of trees, hedgerows, dense and scattered scrub, semi-improved and poor semi-improved grassland, and amenity grassland.	The mosaic of habitats on Site have potential to support hedgehog. The broadleaved woodland, hedgerows and dense scrub habitats have the potential to support sheltering and nesting opportunities for hedgehog.	

3.3 Invasive Non-Native Plant Species Subject to Legal Controls

The following invasive non-native plant species are listed on Schedule 9 of the Wildlife and Countryside Act 1981 making it an offence to cause the spread of these species in the wild.

Table 3.4 Invasive Non-Native Species on Site

Species	Invasive Species Point	Description
Japanese rose	1	Japanese rose was identified growing within an area of dense scrub in the west of the Site
Montbretia	2	Montbretia was identified growing along the edge of the amenity grassland in the west of the Site, growing under from adjacent gardens.
Montbretia	3	Montbretia plants were identified growing within Courtyard 2.

3.4 Bat Roost Assessment

Features suitable for supporting roosting bats were assessed during the Site visit and are shown in Table 3.5. The locations of potential roosts are shown on Figure 1.

Table 3.5 Features Assessed as Having Potential to Support Roosting Bats

Feature	Description	Bat Roost Potential Category
Building 1 – Stiwdio Berfformio/ Music Room	Single story building with a concrete panel construction and flat metal roof. It has an extension with a render construction with pitched metal roof and metal facia boards (Appendix B: Photograph 23) No features were identified with the potential to support roosting bats.	Negligible
Building 2 – Caretaker's Bungalow	Single story building of brick construction with a pitched tiled roof and wooden bargeboards, facia and soffits. There are features present suitable to support roosting bats. There are two gaps underneath the roof tiles on the north-east corner. There is one gap underneath the tiles on the south-east corner. There is a raised ridge tile adjacent to the chimney on the south side of the roof which has the potential to provide access to the ridge line. There is a hole in the soffit on the north-west side Appendix B: Photographs 24, 25 and 26). The north and west side of the building could not be fully accessed.	Low
Building 3 - Garage	A single story garage of brick construction with a flat metal roof. There is a door on the south face and a window on the east face, so is likely to be light inside during the daytime. It was not possible to view the west or north face of this building. No features were identified on the accessible faces with the potential to support roosting bats.	Negligible
Building 4 – Yr Atriwm	A single story building of red brick construction with a flat roof including skylights and no facia (Appendix B: Photographs 27 and 28). No features were identified with the potential to support roosting bats.	Negligible
Building 5	A single story building of brick and render construction, with a flat roof and plastic facia and soffits. There is a feature present suitable to support roosting bats. There is a missing brick where the end wall meets the soffit between Buildings 4 and 5 on the west side. This gap has the potential to extend into the cavity wall if one if present on this building (Appendix B: Photographs 29 and 30).	Low
Building 6	A double story building with a glass and metal atrium and attached brick construction, with plastic bargeboards, soffits	Low

Feature	Description	Bat Roost Potential Category
	and facias and a shallow pitched metal roof. There are features present suitable to support roosting bats. There is a gap in the soffit box leading to a space in the soffit behind on the north-west face and there is a gap behind the flashing above an entrance way on the south face (Appendix B: Photographs 31, 32 and 33).	
Building 7	A double story building of brick with wood panelling. Construction with a flat roof and no facia boards. (Appendix B: Photograph 34). No features were identified with the potential to support roosting bats.	Negligible
Building 8	A triple story building of brick construction with a pitched metal roof and plastic facias. (Appendix B: Photographs 35 and 36). No features were identified with the potential to support roosting bats.	Negligible
Building 9	A single story building of brick and render construction with a flat roof and plastic facias (Appendix B: Photograph28). No features were identified with the potential to support roosting bats.	Negligible
Building 10	A double story building with a single story on the eastern face. The building is of a brick construction with a flat roof. There are features present suitable to support roosting bats. There is a missing brick on the north-west corner, five missing brick on the west face where the flat roof meets the wall, a few bricks missing on the south-west corner, and a missing brick on the south-east corner. All these features have the potential to lead into a cavity wall if one is present (Appendix B: Photographs 39, 40, 41, 42, 43, 44 and 45).	Moderate
Building 11	A double story building of brick and steel frame construction and a pitched metal roof with plastic bargeboards, facias and soffits (Appendix B: Photographs 37, 38 and 45). No features were identified with the potential to support roosting bats.	Negligible
Building 12	A single story building of brick construction with a flat metal roof. There are features present suitable to support roosting bats. There is a gap on the south-east corner of the building and a gap which was clear of cobwebs, next to a missing brick blocked with wood. Both of these features have the potential to provide access to the cavity wall if one is present (Appendix B: Photographs 46, 47, 48 and 49).	Low

Feature	Description	Bat Roost Potential Category
Building 13	A single story building of brick construction with a flat roof and some plastic facias (Appendix B: Photograph 50). No features were identified with the potential to support roosting bats.	Negligible
Building 14	A newly built (within the last two years) primary school building of brick and metal cladding construction with pitched metal and sloping flat roofs No features were identified with the potential to support roosting bats.	Negligible
Tree 1	A pedunculate oak with a height of 12m and a DBH of 1.5m. Features of interest include a natural knothole on a limb. No other features were identified (Appendix B: Photograph 17 and 18).	Low
Tree 2	An ash 12 m in height with a DBH of 1.5m. Features of interest include a knothole which extends into a large cavity behind. A further hole near the base of the tree reveals that the majority of the tree is hollow. (Appendix B: Photographs 19, 20 and 21). A great tit was observed using the knothole feature for nesting. These features are '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'.	High

3.5 Site Valuation According to BREEAM

The Site has the potential to support roosting bats, foraging and commuting bats, breeding birds and hedgehogs.

It is concluded that there are features of ecological importance present within the Site as defined by the BREEAM Ecology Checklist and a SQE.

4. Potential Impacts

4.1 Development Proposal

Potential impacts are based on the current proposals, as outlined in the Master Plan (AR-900003 Initial Master Planning Concept, Lawary Architects Limited, 30/05/2018). This is attached in Figure 2. At this stage the location for the building extension and any refurbishment works has not yet been finalised.

If the Master Plan is updated or changed, the assessment of impacts must be revised to establish any changes to potential impacts on designated sites, habitats or protected species.

4.2 Designated Sites

4.2.1 Internationally and Nationally Designated Site s

There are no internationally designated conservation sites within 2km of the Site. The development will have no impact on internationally designated conservation sites.

There are three SSSIs located approximately 10 m west, 0.6 km west and 1.9 km south from Site. These are designated for important habitats.

If lighting in the south west of the Site is poorly designed there is potential for light spill from the Site onto Fferm Walters SSSI. This will have a negative impact on any species using the site including bats, birds, hedgehogs and badgers.

The development will have no impact on any other nationally designated sites due to the distance from the development Site and the nature of the development i.e. no chemicals or gases being released and no pollution pathways.

4.2.2 Locally Designated Sites

There is one Country Park, two LNRs and 14 SINCs within 2 km of the Site. These are all designated for their habitats except for Gladstone Road Pond SINC which is designated for smooth newts.

Cwm Talwg Woodlands LNR includes four separate areas, the closest of which is located approximately 15 m from the western Site boundary. If external lighting is poorly designed there is potential for light spill from the Site onto Cwm Talwg Woodlands LNR, which would impact on its ecological value.

The current proposals do not show any ground breaking works within proximity to the LNR, so negative impacts on the roost protection zones of the trees within the LNR are unlikely. Should ground breaking works such as new cables, pipes or tracking of vehicles be required, within the root protection zones, , this could negatively impact the trees. In the first instance, avoidance of the root protection zones will avoid this impact.

Under the current proposals, the development will not have an impact on the other LNRs, Country Park or SINCs due to the distance from the development Site and the nature of the development i.e. no chemicals or gases being released and no pollution pathways.

4.2.3 Ancient Woodland

2.76 Ha of ASNW is located approximately 15 m from the western Site boundary and forms the Cwm Talwg Woodlands LNR. Impacts on the Ancient Woodland from external lighting and root compaction are discussed under Cwm Talwg LNR, above.

4.3 Habitats

4.3.1 Broadleaved Plantation Woodland

Based on the current proposals, part of the broadleaved plantation woodland on the north boundary will be removed to facilitate the new road and bus drop off area. Partial removal of the woodland strip will have a negative impact on species using this habitat through loss of foraging, commuting and nesting habitats. The loss of this linear feature will reduce connectivity with the surrounding landscape. If the row of trees can be retained, this will retain the existing connectivity and there will be no impact.

All other areas of broadleaved plantation woodland are to be retained, though the construction of the games court and 3G sports pitch may require crown lifting of removal of edge trees from the south-west boundary plantation woodland.

During construction, without mitigation, there is the potential for the retained woodland close to the working area to be damaged or killed through: root compaction by vehicles or machinery tracking over or repeated foot traffic over the roots, pollution and/or run off, and directly damaged by vehicles or machinery knocking limbs off or damaging the trunks/stems.

Lighting plans are not currently available; lighting of plantation woodland will have a negative impact, reducing their suitability as a commuting corridor to nocturnal species including bats.

4.3.2 Dense Scrub

Under the current proposals (AR-900003 Initial Master Planning Concept, Lawary Architects Limited, issued 30/05/2018) the dense scrub along the southern boundary will be removed and replaced by a new 3G pitch and games court. This will impact any species using this habitat. All other areas of dense scrub are to be retained.

During construction, without mitigation, there is the potential for the retained dense scrub close to the working area to be damaged or killed through: root compaction by vehicles or machinery tracking over or repeated foot traffic over the roots, pollution and/or run off, and directly damaged by vehicles or machinery knocking limbs off or damaging the trunks/stems.

Lighting plans are not currently available; lighting of vegetated boundaries will have a negative impact reducing their suitability as a commuting corridor to nocturnal species including bats.

4.3.3 Scattered Scrub

Under the current proposals, part of the scattered scrub will be removed to facilitate the new road. All other areas of scattered scrub are to be retained.

During construction, without mitigation, there is the potential for the retained dense scrub close to the working area to be damaged or killed through: root compaction by vehicles or machinery tracking over or repeated foot traffic over the roots, pollution and/or run off, and directly damaged by vehicles or machinery knocking limbs off or damaging the trunks/stems.

4.3.4 Rows of Trees and Standalone Trees

Under the current proposals there is potential for one standalone birch tree (Table 4.2: Tree 28) to be removed as part of the new teaching/ sports block, this will have a negligible impact . Currently there are no proposals to remove trees suitable to support roosting bats.

During construction, without mitigation, there is the potential for the retained trees close to the working area to be damaged or killed through: root compaction by vehicles or machinery tracking over or repeated foot traffic over the roots, pollution and/or run off, and directly damaged by vehicles or machinery knocking limbs off or damaging the trunks.

Lighting plans are not currently available; lighting of linear features will have a negative impact reducing their suitability as a commuting corridor to nocturnal species including bats.

4.3.5 Semi-Improved Grassland

Under the current proposals, this habitat will be removed to construct additional car parking. This will result in loss of all semi – improved grassland habitat on Site.

4.3.6 Poor Semi-Improved Grassland

Under the current proposals, this habitat will be retained; there will be no impacts upon the poor semi-improved grassland habitat.

4.3.7 Standing Water

Under the current proposals, the two ponds will be retained; there will be no impacts upon the standing water.

4.3.8 Hedgerows

Under the current proposals, this habitat will be retained.

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 hedgerows through root compaction by machinery tracking over the root zone or damage to hedgerow trees and shrubs by knocking off or damaging limbs., there will be no impacts upon the hedgerows.

Lighting plans are not currently available; lighting of hedgerows will have a negative impact on wildlife reducing their suitability as a commuting corridor to nocturnal species including bats.

4.3.9 Amenity Grassland

Under the current proposals some of this habitat will be removed to facilitate the new; road, bus drop off, games court, 3G sports pitch, reception and teaching/ sports block.

Under the current proposals, amenity grassland will likely remain the dominant habitat type on Site. Amenity grassland is typically of low ecological value and is widely available in the surrounding landscape. Removal of a proportion of this habitat will have a low site-level impact and a negligible impact at the local level.

4.3.10 Introduced Shrub

Under the current proposals, introduced shrub habitat is unlikely to be affected. Loss of this habitat type will have a negligible impact due to the low nature conservation value of the introduced shrub and its wide availability in the surrounding residential areas.

4.3.11 Bare Ground (Hardstanding)

Under the current proposals, some hardstanding will be removed to facilitate the new road, reception, 3G sport pitches and teaching/sports block. This habitat type has no conservation value. There will be an increase in hardstanding post-development.

4.3.12 Buildings

All existing buildings will be retained, with some subject to refurbishment which has not yet been detailed. At least one new building will be constructed.

4.3.13 Fences

All existing fences will be retained.

4.4 Protected and/or Priority Species

4.4.1 Reptiles

The site has the potential to support reptiles within the area of semi-improved grassland and adjacent scrub. Under the current proposals part of this area will be removed to create additional car parking. Without mitigation, this will impact on any reptiles present through habitat loss and potential killing and injury by trampling or crushing with machinery during construction.

If the Master Plan is updated, and this area is avoided and protected from construction works, there will be no impact on reptiles. Breeding Birds

Loss of broadleaved plantation woodland, hedgerows, trees, and scattered scrub to facilitate the new road and games courts and new teaching/ sports block could destroy nesting sites of breeding birds if clearance is completed during the breeding bird season. Without mitigation, this will also result in a reduction in available breeding habitat at the Site.

Gulls are nesting on roofs on some of the existing buildings on Site.

The final plans for refurbishment of the existing buildings are not yet known. As gulls are nesting on roofs of existing buildings on Site, any proposed refurbishment has the potential to disturb nesting gulls, and damage or destroy active nests if works are undertaken during the breeding bird season. Breeding bird season is between 1st March and end August. Once the refurbishment plans have been finalised, this this will need to be reviewed by a SQE to establish any potential impacts on breeding birds.

If construction is undertaken within close proximity to breeding bird habitat, during the breeding season, increased levels of disturbance during the works may deter birds from breeding and result in abandonment of active nests.

4.4.2 Bats

4.4.2.1 Roosting

Buildings identified in Table 3.5 are suitable to support roosting bats. Further surveys will confirm if bats are present. If roosting bats are present then the refurbishment of the buildings may have a negative impact on bats. Works have the potential to destroy roosts and kill or injure bats. If bats are present a Natural Resources Wales (NRW) European Protected Species License and mitigation will be required.

There are two trees which have been assessed as having suitability to support roosting bats. Under current Site plans, these will be retained, but could be negatively impacted by lighting from the games cour and 3G sports pitch.

4.4.2.2 Habitat Loss

Based on the current proposals, linear habitats suitable to support commuting bats including hedgerows and rows of trees will be retained, the plantation woodland along the northern boundary and dense scrub along the south-west boundary will be removed. Removal of these vegetated ‘green’ boundaries will impact connectivity.

Reduction in scattered scrub, dense scrub, plantation woodland will reduce the available foraging habitat on Site. Standalone trees, rows of trees and hedgerows will be retained, these provide foraging opportunities. Habitat of equal of greater value to foraging bats is available in the wider landscape. Development proposals include new areas of planting and depending on the diversity of the planting and light spill this may provide alternate foraging in the longer term.

4.4.2.3 External Lighting and Vegetated Corridors

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

4.4.3 Hedgehogs

Based on current proposal, part of the broadleaved plantation woodland will be removed, this will impact any hedgehogs using this feature for commuting, foraging or shelter and may result in loss of connectivity.

Amenity grassland will be partially completely removed, this has potential to provide foraging habitat for hedgehog and will result in a loss of habitat during construction. However, other suitable foraging habitat will available in the surrounding landscape and connected to the Site via hedgerows and tree lines.

During construction there will be increased on site traffic and machinery. There is the potential for hedgehogs to be killed by collision with vehicles or get trapped in excavations.

Lighting plans are currently unavailable. If hedgerows and tree lines and newly created habitats are illuminated, their suitability for hedgehogs will be reduced having a negative impact on any hedgehogs using the Site.

4.4.4 Invasive Non-Native Species

Under the current proposals no ground breaking works are proposed neat areas within INNS. If the athletics track requires cutting of the grassland up to the boundary fence, this could cause the spread of Montbretia at Figure 1 INNS Point 2. The Japanese rose at INNS point 1, will not be disturbed by the proposed works.

4.4.5 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 current Master Plan (AR-900003 Initial Master Planning Concept, Lawary Architects Limited, issued 30/05/2018) does not currently include details of landscaping design. AECOM recommend that the development retains/ creates a 'green corridor' of retained woodland and scrub and that light spill is controlled onto these areas which will maximise its value. Native plant species should be chosen for any new landscaping design which are suitable to the local context and in relation to climate change, which will remain local suitable for the next 25 to 50 years.

5. Further Surveys and Recommendations for Mitigation

5.1 Further Surveys

Recommendations for further surveys are discussed in combination with LE04.

5.1.1 Reptile Surveys

Reptile surveys are required in the semi-improved grassland. To assess for presence or likely absence of reptiles at the Site further surveys should be completed paying due regard to best practice guidelines (Froglife, 1999, and Gent, T and Gibson, S 1998).

At least 30 artificial refugia (approximately 0.5m x 0.5m square sheets of heavy-duty mineral roofing felt – known as 'reptile survey mats') should be placed within the semi-improved grassland and along the edge of the adjacent scrub habitat. Artificial refugia should be left in situ for at least 7 days before surveys are undertaken. Table 5.1 describes the survey effort and suitable survey months.

Table 5.1Reptile Survey Effort and Timings

Number of Artificial Refugia	Survey Months	Number of Survey Days
30	March to June and September avoiding the hottest months of July and August. At this site we recommend the surveys are completed in September 2018.	7 (with at least one day in-between checks) in suitable survey months.

5.1.2 Bat Roost and Activity Surveys

Refurbishment of the buildings and construction is due to commence in April 2019. The current Master Plan Plan (AR-900003 Initial Master Planning Concept, Lawary Architects Limited, issued 30/05/2018) does not include details of the refurbishment element of the project and therefore it is not known if the proposals will affect any potential bat roosts. To inform the Site design and programme of construction works the project team have decided to complete bat surveys in 2018.

Ecological data is only valid for two years. Follow up bat surveys may be required in 2020, if the timetable slips, to guide construction and inform planning.

5.1.2.1 Bat Roost Emergence/Re-entry Surveys

Bat surveys are recommended to confirm presence, or likely absence bat roosts at the Site. The following surveys are recommended:

Table 2.1. Bat Roost Survey Effort

Building No.	Bat Roost Suitability	Number of Survey Visits Required	Timing
Building 2	Low	One survey (dusk emergence or dawn re-entry)	May- August
Building 5	Low	One survey (dusk emergence or dawn re-	May- August

Building No.	Bat Roost Suitability	Number of Survey Visits Required	Timing
		entry)	
Building 6	Low	One survey (dusk emergence or dawn re-entry)	May- August
Building 10	Moderate	Two separate surveys to include one dusk emergence and one dawn re-entry	May -September.
Bat Tree 1	Low	Climbed Inspection – Followed by activity surveys if inspection results require it	Climbed Inspections can be at any time of year. Any follow up roost surveys will be May-September.
Bat Tree 2	High	Climbed Inspection – Followed by activity surveys if inspection results require it	

Surveys will pay due regard to guidelines provided in Bat Surveys for Professional Ecologists – Good Practice Guidelines (Collins, 2016).

If roosts are identified during surveys on the Low or Moderate suitability buildings then additional surveys will be undertaken so that a total of three separate surveys per building are undertaken. Three surveys are required to support a European Protected Species License (EPSL).

There are two trees on Site with bat roost suitability. These are located close to the proposed sports pitch and may be impacted by lighting but also directly by felling, crown lifting, removal of limbs etc. We recommend that a climbed aerial inspection of the trees and the features is completed. Surveyors will climb the trees and inspect the features at height with an endoscope. This can help confirm roosts straight away or help to rule trees out from requiring further surveys, reducing the costs of repeat visits. If the climbed inspection is limited or concludes that there is bat roost suitability or evidence of bats is identified or suspected, further roost surveys may be required.

Both trees can be climbed and inspected in one visit.

5.1.2.2 Bat Activity Surveys

Bat activity surveys are recommended to identify what species are using the Site and how bats are using the boundary features at the Site.

The Site has been assessed as having 'Moderate' suitability to support foraging and commuting bats. Collins, 2016 recommends for Moderate suitability that a walked activity transect is completed once a month between April and October. However, given the local context of the Site and the dominance of the Site by low value amenity grassland, it is recommend that a combined approach is taken, comprising: 'Low' suitability methodology of one visit per season (spring, summer and autumn) is completed; and that static detector surveys will follow a Moderate Suitability methodology of one survey per month. This approach will be agreed with the LPA Ecologist, but we consider it proportionate for this Site.

5.1.2.3 Bat Activity – Walked Transect Survey

One walked transect survey route around both the Bro Morgannwg and Whitmore High Site will be undertaken. This will reduce survey costs, compared to a transect visit at each Site.

Surveys will be undertaken paying due regard to Bat Surveys for Professional Ecologists – Good Practice Guidelines (Collins 2016).

We recommend walked activity surveys in June, August and late September, in suitable weather.

All bat passes will be recorded and best effort will be made to record direction of flight and activity. Two surveyors per transect visit will be required for Health and Safety.

5.1.2.4 Bat Activity – Static Detector Survey

A total of four static detectors will be used covering both Bro Morannwg and Whitmore High School.

One static detector survey covering both the Bro Morgannwg and Whitmore High School Site will be undertaken. This will reduce survey costs, compared to a static detector survey at each Site.

Each static detector will be deployed once per month between June and October 2018 and April and May 2019 recording for a minimum of five consecutive nights. The devices will be retrieved after each session and the data analysed for bat species and counts using Analook software.

5.2 Recommendations for Mitigation of Potential Impacts

The mitigation hierarchy has be 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 LE04. 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.

5.2.1.1 Ancient Woodland and LNR

Avoid ground breaking works, storage of equipment, site compound and tracking of vehicles within the Root Protection Zone of the adjacent Cwm Talwg Woodlands LNR/Ancient Woodland.

The Root Protection Zone must be mapped and fenced off, to create an exclusion zone during construction.

The mitigation for Ancient Woodland is covered as a 'mandatory requirement' in Section 9.2 LE04.

5.2.1.2 Habitats

All plantation woodland should be retained wherever possible.

Based on the current proposals, hedgerows, rows of trees, 33 out of 34 standalone trees and the majority of the broadleaved plantation woodland will be retained. These should be protected during construction to avoid damage to these features. Retained broadleaved plantation woodland, 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.

Landscaping at the Site should be designed to include native species suitable for the area. Recommendations to enhance habitats on Site are provided in Section 9 LE04.

Creation of green corridors along boundaries will 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 of any tree lines/hedgerows, to create a 'field margin' of at least 3 m from the base of the hedgerow/tree line. 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.

5.2.1.3 Invertebrates

There will be no long term negative impacts on invertebrates. There are no specific mitigation measures. Compensation for habitat loss will be included by design. Enhancement opportunities which benefit invertebrates are discussed in LE04.

5.2.1.4 Reptiles

The need for mitigation will be determined by the results of the reptile surveys. If reptiles are present, mitigation is likely to include avoidance of reptile habitat, fencing off the area suitable to support

reptiles to ensure there is no risk of injury or death. Or if the habitat cannot be avoided a trapping and translocation of reptiles from the area to a receptor site may be required.

5.2.1.5 Breeding Birds

To avoid impacts on breeding birds and nesting gulls removal of vegetation and works of buildings should be undertaken outside of the breeding bird season (works to be undertaken between 1 September and end February).

If vegetation clearance must be undertaken during of the nesting bird season then an ecologist must check these features a maximum of 48 hrs prior to removal/demolition. If any nests are found, work should be halted and the nest left undisturbed with an exclusion zone until the chicks have fledged, this can take at least 6 weeks. To avoid disturbance to nesting birds in retained habitats during construction, fences must be put up adjacent to hedgerows and around trees to create a buffer zone.

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

5.2.1.6 Bats

Further detailed mitigation for bats will be provided following completion of bat surveys. Mitigation is likely to include retaining green corridors, mitigate lighting to avoid features used by bats and provide alternative bat roosts on Site.

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

5.2.1.7 Roosting Bats

If roosting bats are confirmed and proposed works are to impact on the roosts, a EPSL must be gained prior to demolition of the buildings or felling of trees. Mitigation will be required to gain the EPSL (such as compensatory roost boxes/spaces, timing of works, supervision of works and mitigation of lighting). Results of the surveys and further requirements for mitigation will be detailed in the bat report following completion of bat surveys.

5.2.1.8 Foraging and Commuting Bats

The planation woodland along all the north and south-west Site boundary and other vegetated 'green' boundaries may be used by foraging and commuting bats. Mitigation will be determined by the results of the bats surveys and is likely to include retaining green corridors and mitigate lighting to avoid features used by bats.

5.2.1.8.1 Bat and Lighting

The following recommendations in line with the Bat Conservation Trust (BCT) (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 sensitive areas such as the Site boundaries which have the potential to be used by commuting and foraging bats or foraging area should be limited to levels of 3 Lux or less.

Compensatory bat boxes may be a requirement at the Site, following the results of the bat surveys, lighting of these must be avoided as detailed below.

Suggestions for mitigating external lighting and achieving the lighting recommendations above are outlined in the best practice guidance by the BCT (BCT, 2009, BCT 2014 and Gunnell et. al., 2012). These include:

- 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 550nm 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/road/car park/foot path and design the luminaire appropriately, including the use of hoods, cowls, shields etc to avoid spillage onto tree lines, mature trees or known roost location. Roadways, footways and car parks could, for example, be lit using bollards to keep the light below the tree canopy. Or use embedded lights within the surface to illuminate the roadway and only light high risk stretches and junctions;
- Where new lighting is proposed, use lighting modelling programs to indicate where the light spill will occur, if appropriate;
- 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);
- Use movement sensors or timers on security lighting;
- 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.

5.2.1.9 Hedgehogs

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

Where possible, excavations adjacent to hedgehog habitat should be covered over night or ramps installed so trapped hedgehogs can escape.

Landscaping at the Site should be designed to include native species suitable for the area and to create habitat of benefit to hedgehogs. Recommendations to enhance habitats on Site for hedgehogs are provided in Section 9 LE04.

5.2.1.10 Invasive Non-Native Species

Avoid ground breaking works and tracking vehicles (including mowers) over areas of invasive plants. Disturbing areas of invasive plant growth or areas of soil contaminated with the remains (roots, seeds, and rhizomes) will likely cause the plant to spread. Removal should pay due regard to the Department for Environment, Food and Rural Affairs (DEFRA, 2013), Environment Agency (2007) invasive species guidance.

As a possible enhancement measure, the Japanese rose at INNS point 1 should be removed following a method statement and the area replanted with native species of value to wildlife.

5.2.1.11 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 17th 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. BREEAM Landscape and Ecology Assessment

Opportunities for BREEAM Credits and Ecological Enhancement are discussed within Sections 7, 8, 9 and 10 along with recommendations for the mitigation and protection of legally protected species within the Site.

The credits covered by these sections are LE02, LE03, LE04 and LE05. The potential for gaining these credits is discussed.

7. BREEAM LE02: Ecological Value of Site and Protection of Ecological Features

7.1 LE02 Ecological Value of Site and Protection of Ecological Features

The Site has been assessed by a Suitably Qualified Ecologist (SQE) as having ecological value.

- Standalone trees and rows of trees exceeding 10cm DBH are present. Two trees are to be removed. All retained trees exceeding 10cm DBH will need to be fenced and protected in accordance with British Standard 5387 Trees in Relation to Construction.
- The area of broadleaved plantation woodland on the north boundary is considered to have ecological value and its linear form may provide commuting and foraging habitat for bats. The woodland will be partially permanently removed to facilitate the new road. Retained woodland should be fenced and protected in accordance with British Standard 5387 Trees in Relation to Construction and lighting of woodland should be avoided.
- The hedgerows on Site are considered to have ecological value. These are being retained. Hedgerows should be fenced and protected during construction; lighting of hedgerows should be avoided.
- The semi-improved grassland and adjacent scrub habitats have the potential to support reptiles. This area is being partially removed for the creation of the additional car parking. Works must not kill or injure reptiles. If reptiles are present, prior to construction reptiles must be translocated or habitat managed under a Method Statement to prevent killing or injury of reptile;
- Buildings 2, 5, 6 and 10 have the features suitable to support roosting bats. The Master Plan for the refurbishment works is not yet currently known and without mitigation there is the potential for the development proposals to impact upon any bats roosting in these buildings;
- Two trees have the potential to support roosting bats. These trees are being retained, but have the potential to be impacted by any new or upgraded lighting design.

LE02 – The Site has been classified as having ecological value. Habitats with ecological value will be removed under current proposals. Therefore, the first credit available under LE02 cannot be awarded.

To enable the second credit under LE02 to be awarded any ecological features on site to be retained must be protected from damage, destruction and/or disturbance during construction.

8. BREEAM LE03 Mitigating Ecological Impact

8.1 Mitigating Ecological Impact

To achieve one credit under LE03, the change in species diversity must be less than zero but equal to or greater than minus nine species.

To achieve two credits under LE03, the change in diversity must be equal to or greater than zero species.

The Ecological Value before development is based on the Phase 1 Habitat Survey undertaken on 09 May 2018. The Ecological Value before development is **15.48**

The Ecological Value after development will be calculated when a detailed site layout plan has been developed.

The before development calculations can be used to help inform the final design of the scheme to help one or two credits to be achieved. AECOM can work alongside the landscape architect to advise on how to achieve this. The recommendations for enhancing the Site under LE04 will help to achieve LE03 if implemented.

Table 7.1 Shows the LE03 pre development Calculation.

Table 8.1 LE03 calculations based on Phase 1 Habitat Survey on 9th May 2018.

Plot / Habitat Type	Total No. of Species	Area BEFORE development (m2)
Broadleaved Plantation Woodland	31	2560.96
Dense Scrub	33	2536.01
Scattered Scrub (including the row of silver birch trees)	2	1033.58
Row of Trees – Broadleaved	Included within the broadleaved plantation woodland species totals and area calculations.	
Row of Trees – Coniferous	0	1.09
Standalone Trees	7	34
Semi-Improved Grassland	21	479.06
Poor Semi-Improved Grassland	13	176.83
Standing Water	0	Not included in area calculations
Hedgerow with Trees – Species-Poor	2	22.15
Defunct Hedgerow – Species Poor	17	178.36
Amenity Grassland	22	53492.69
Introduced Shrub	0	338.26
Bare Ground (Hardstanding)	0	17277.02
Buildings	0	9530.56
Fence	0	Not included in area calculations
TOTAL SITE AREA		87625.48
ECOLOGICAL VALUE (AREA WEIGHTED NO. PLANT SPECIES	-	15.48

LE03 – Credits to be confirmed following issue of detailed landscape plan.

9. BREEAM LE04 Enhancing Site Ecology

9.1 Enhancing Site Ecology

One credit will be achieved if the recommendations outlined below are implemented. This section includes recommendations to be acted upon by the client and/or principal contractors. These recommendations are based on the results of the Phase 1 Survey completed on 09 May 2018.

The recommendations are for the protection and enhancement of the Site's ecology categorised as 'legal', and 'additional'. Legal 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.

All of the legal recommendations need to be completed as well as at least 6 of the 8 additional recommendations to achieve the first credit under LE04. Liaison between ecologists and the architects will be required to achieve these.

The current Site plan includes provision of a 'Habitat Area'; the additional requirements can be used to aid design of these areas.

9.2 Legal Requirements

9.2.1 Ancient Woodland and LNR

As detailed in Section 5.1, avoid ground breaking works, storage of equipment, site compound and tracking of vehicles within the Root Protection Zone of the adjacent Cwm Talwg Woodlands LNR/Ancient Woodland.

The Root Protection Zone must be mapped and fenced off, to create an exclusion zone during construction.

9.2.2 Reptiles

Undertake presence/absence surveys as detailed in Section 5.1.

9.2.3 Breeding Birds

Mitigation recommendations, based on current baseline information, are listed in Section 9 and must be followed, as appropriate, to achieve this credit. .

9.2.4 Bats

9.2.4.1 Roosting Bats

Bat surveys must be undertaken on buildings and trees as detailed in Section 5.2.

Mitigation recommendations, based on current baseline information, are listed in Section 5 and must be followed, as appropriate, to achieve this credit. .

Further detailed mitigation for bats will be provided following completion of bat surveys. Mitigation is likely to include retaining green corridors, mitigate lighting to avoid features used by bats and provide alternative bat roosts on Site.

9.2.4.2 Foraging and Commuting Bats

The Phase 1 Survey identified the potential for foraging and commuting bats within the Site. Bat activity surveys should be undertaken as described in Section 5.1.3.2.

Mitigation recommendations, based on current baseline information, are listed in Section 9 and must be followed, as appropriate, to achieve this credit. These relate to retention of boundary features and avoidance/mitigation of light spill.

9.3 Additional Requirements

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.

Wildflower planting will benefit invertebrates and hence to birds, foraging bats and hedgehogs.

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

This will count as additional species on the Ecology Calculator.

2) Swale Creation

Swales could be created around parking areas, this can be considered in line with a Sustainable Drainage System (SuDS) scheme. 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 pond or 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.

3) Insect Wall

An insect wall or insect boxes 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).

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

The success of the invertebrate wall 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.

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 refurbished 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 designed into the new building. Until the bat surveys are undertaken it is not possible to state how many boxes are required for the EPSL. By fitting a minimum of three boxes of various designs into the building at design stage, retro fitting of bat boxes to comply the EPSL could be avoided.

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 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 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 4m 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.

5) Kitchen Garden

An area within the school grounds should be designed to be used as a kitchen garden. 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 will count as species on the Ecology Calculator.

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. Appendix G gives a list of native plants that are attractive to butterflies. 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 species listed 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 will count as species on the Ecology Calculator.

7) Hedgehog Habitat

Habitats on Site currently have potential to support hedgehog. Habitats could be enhanced and new refugia 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 and woodland.

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

8) Green Corridors

Green corridors should be enhanced and created to provide habitat for wildlife and connectivity across the Site and within the surrounding area. Planting could 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.

A new green corridor should be created either side of the proposed new road by hedgerow and/ or tree planting.

General, 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 could be enhanced to increase their value to commuting and foraging animals. This could be through the addition new plants into gaps.

This will count as species on the Ecology Calculator

9.3.1 Second Credit

The second credit relates to where there is a positive increase in the ecological value of the Site of 6 species or greater. The post development ecological value has not been calculated at this stage. These credits will be awarded if the change in ecological value is calculated to be of 6 species or greater.

LE04 – One credit can be achieved if all of the legal requirements are completed as well as at least 4 of the 8 additional requirements. Liaison between ecologists and the architects will be required to achieve these. A further credit will be awarded following post development calculations if there is a positive increase in ecological value.

10. BREEAM LE05: Long Term Impact on Biodiversity

10.1 LE05 Long Term Impact on Biodiversity

The first credit under LE05 can be achieved when the client has committed to achieving the following and at least two of the additional measures.

The second credit can be achieved when the client has committed to achieving the following and at least four of the additional measures.

The following is required to demonstrate compliance:

- A SQE is appointed prior to commencement of activities on-site and they confirm that all relevant UK and EU legislation relating to the protection and enhancement of ecology has been complied with during the design and construction process.
- A landscape and habitat management plan, appropriate to the site, is produced covering at least the first five years after project completion in accordance with BS 42020:2013 Section 11.1. This is to be handed over to the building owner/occupants for use by the grounds maintenance staff.
- Additional measures (two to achieve the first credit, four to achieve the second credit) to improve the assessed site's long term biodiversity are adopted.

Although it is possible to produce a full 5-year Landscape and Habitat Management Plan (LHMP) at the Design Stage to help attain credits under LE05, 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 LHMP once the landscaping plan has been finalised. The landscape and habitat management plan should be produced in accordance with BS 42020:2013 Section 11.1 and a suggested format is included in Appendix F.

11. Additional Measures

The following additional credits are considered relevant to this development (two additional measures are required to be implemented to achieve the first credit; four additional measures are required to be implemented to achieve the second credit under LE05). The full details of these requirements in outlined in the Methodology Section 2.2.4

1. The contractor is required to nominate a ‘Biodiversity Champion’ as outlined in Section 2.2.4.
2. The contractor is required to train all relevant site work-force on how to protect site ecology during the project as outlined in Section 2.2.4.
3. The contractor is required to record actions taken to protect biodiversity and monitor their effectiveness throughout key stages of construction as outlined in Section 2.2.4.
4. Where a new ecologically valuable habitat, appropriate to the local area, is created. This includes habitat that supports nationally, regionally or locally important biodiversity, and/or which is nationally, regionally or locally important itself; including any habitat listed in the UK Biodiversity Action Plan (UK BAP), those protected within statutory sites (e.g. SSSIs), or those within non-statutory sites identified in local plans. Some bat species and hedgehogs are Section 7 Priority Species of Principal Importance in Wales. The installation of bat boxes will benefit bats. Creation

of species rich areas of grassland, a sensory garden, swale and/or a kitchen garden will be of benefit to invertebrates, and hence bats, birds and hedgehogs.

5. The client requires the contractor to programme site works to minimise disturbance to wildlife. For example, site preparation, ground works, and landscaping have been, or will be, scheduled at an appropriate time of year to minimise disturbance to wildlife. Timing of works may have a significant impact on, for example, breeding birds, flowering plants, seed germination etc. This additional requirement will be achieved where a clear plan has been produced detailing how activities will be timed to avoid any impact on site biodiversity in line with the recommendations of a suitably qualified ecologist.
6. A partnership has been set up by the design team with a local group that has wildlife expertise (e.g. local wildlife trust or similar local body) and the group has:
    a. Provided advice early in the design process regarding protecting/providing habitat for species of local importance on the site.
    b. Provided advice to ensure the design is in keeping with the local environment. In particular this should draw on their local knowledge if any features or species of ecological interest on or near the site.
    c. Provide or will continue to provide ongoing support and advice to the educational establishment to help them manage, maintain and develop the outdoor space in the longer term.

A suitable starting point for discussion with the local wildlife group would be to ask for advice on how to take account of locally important species in the school/college landscape design.

LE05 - Two credits can be achieved when the client has committed to achieving the requirements as outlined above and at least four of the additional measures. It is important the client maintains good record keeping throughout the project such as photos, diary, documents, email etc. to be able to be able to demonstrate that the measures have been completed.

12. Summary of BREEAM Credits

12.1.1 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 12.1 Ecological Credits Available Based on the Current Landscaping Plan

Credit	Total available	Credits achievable under current landscaping proposals
LE02	2	1*
LE03	2	TBC**
LE04*	2	2*
LE05*	2	2*
LE Total	8	5*

*Achieving this credit is dependent on recommendations being implemented by the client/contractor.

**LE03 will be confirmed once a detailed site plan including landscape design has been issued.

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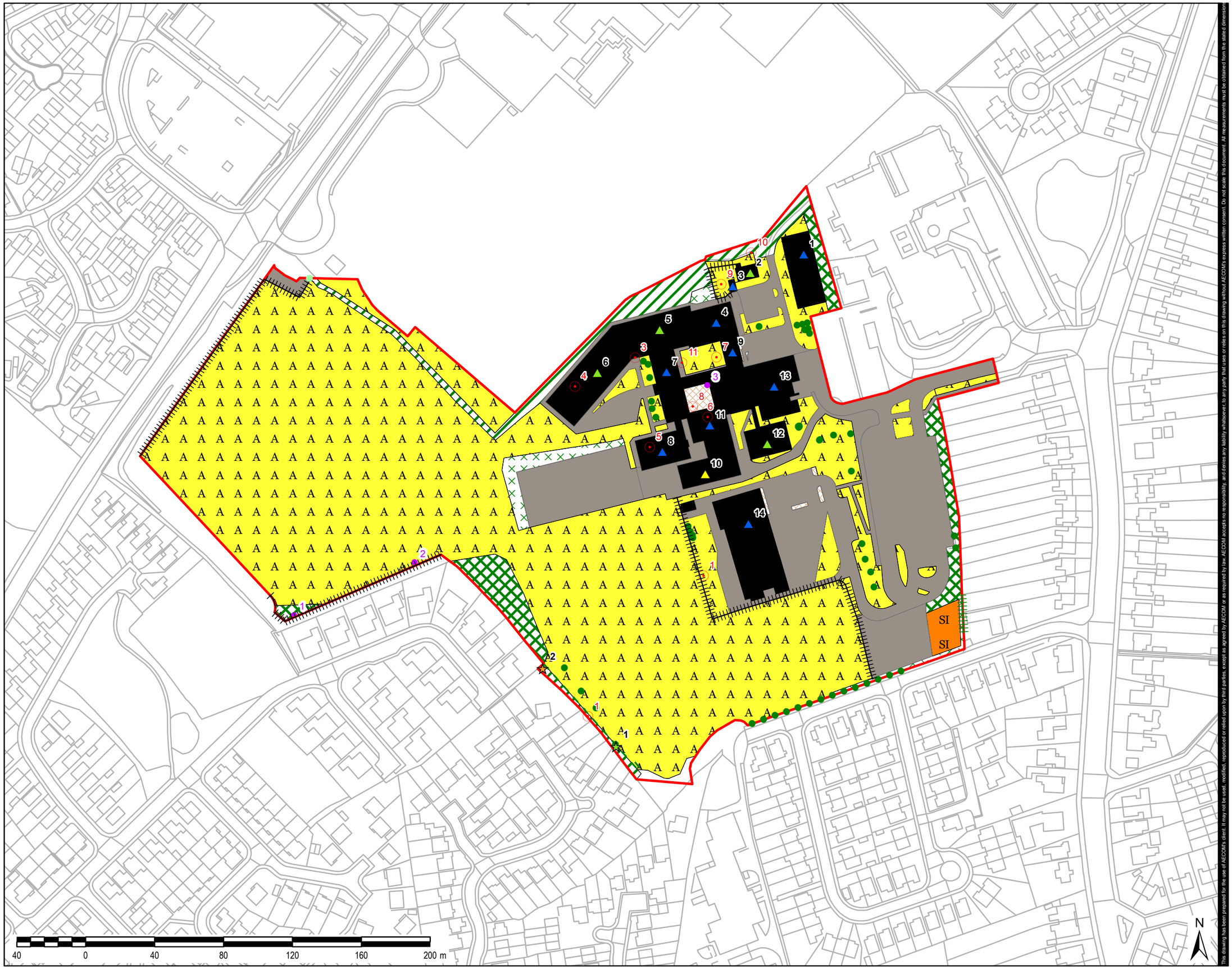
Figure 1 Phase 1 Habitat Map



AECOM Limited
1 Callaghan Square
Cardiff, CF10 5BT
+44 (0)29 2067 4600 tel
www.aecom.com

Project Title:

ECOLOGICAL APPRAISAL AND BREEAM ECOLOGY REPORT

Client:

VALE of GLAMORGAN
BRO MORGANNWG

LEGEND

- Site Boundary
- Target Notes
- Trees
- Invasive Species

Bat Roost Potential for Buildings

- Medium Potential
- Low Potential
- Negligible

Bat Roost Potential for Trees

- High Potential
- Low Potential

Phase 1 Habitat Linear Features

- Row of trees - broadleaf
- Row of trees - coniferous
- Defunct Hedge - Species-Poor
- Hedge with Trees - Species-Poor
- Fence

Phase 1 Habitat Areas

- Broadleaved woodland - plantation
- Dense/Continuous scrub
- Scattered scrub
- Semi-improved - neutral grassland
- Poor semi-improved grassland
- Amenity grassland - cultivated land
- Introduced shrub - cultivated land
- Buildings
- Hard Standing

AECOM Internal Project No:
60571314

Drawing Title:

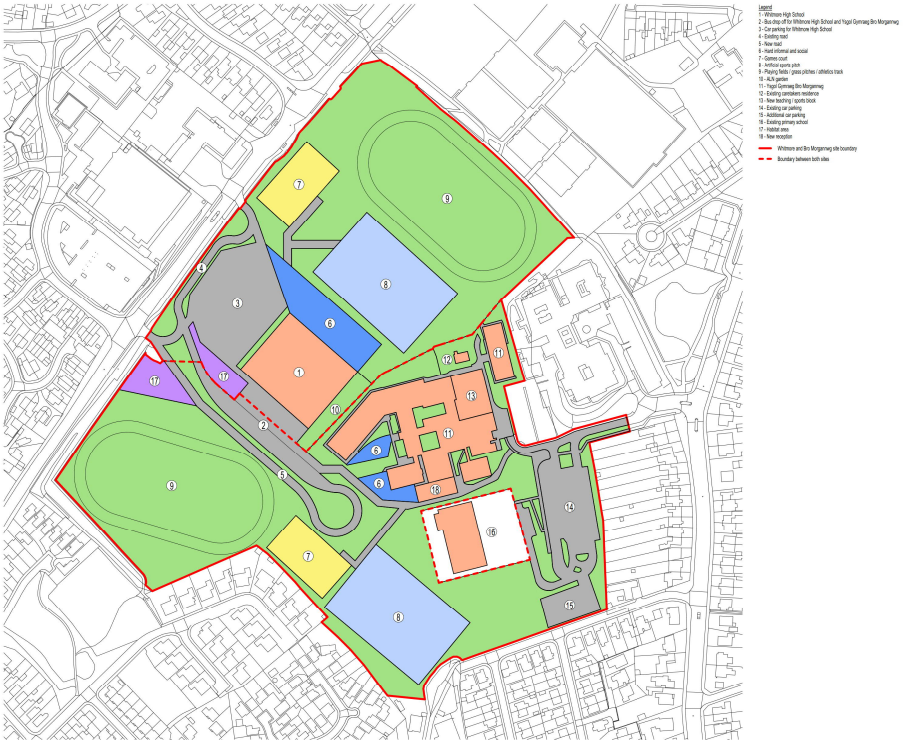
PHASE 1 HABITAT MANAGMENT PLAN

Scale at A3: 1:2,000

Drawing No:			Rev:
FIGURE 1			001
Drawn:	**Chk'd:**	**App'd:**	**Date:**
GM	CM	LN	31/05/18

Filename: P:\UKCDF1-IE\Projects\Environmental\Jobs - Potential\2018\2018 Q1\Vale of Glamorgan Schools\010 GIS\Bro Morgannwg\02_Maps\Bro Morgannwg - Phase 1.mxd

Figure 2 AR-900003 Initial Master Planning Concept, Lawary Architects Limited .Dated 30/05/2018



Appendix A 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 circumstances semi-

Designation	Brief Description
	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 2017 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 2017. Badgers are protected under their own Act: The Protection of Badgers Act 1992. Activities affecting protected species must usually be conducted under licence obtained from the appropriate body (in Wales, this is Natural Resources Wales).

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

Designation	Brief Description
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 2017) (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, 2017 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

Designation	Brief Description
	Directive are implemented in the UK. The Countryside and Rights of Way Act 2000 has strengthened this legal protection (see below).
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.

Appendix B Site Photographs

Photograph 1: Car park (hardstanding) with dense scrub.

Photograph 2: Semi-improved grassland

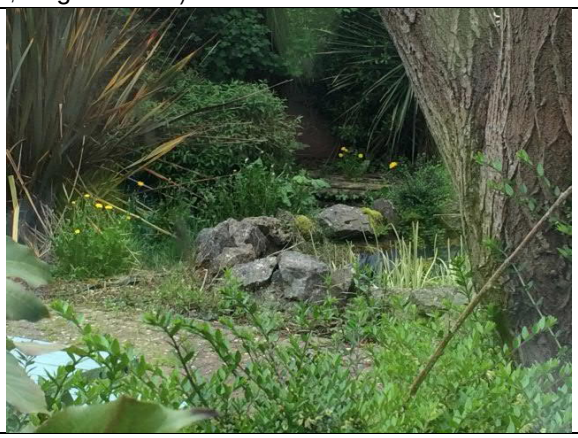
Phtograph 3: Gravel car parking (hardstanding)

Photograph 4: Amenity grassland playing fields

Photograph 5: Norway maple trees and amenity grassland with hardstanding

Photograph 6: Fence, poor semi-improved and amenity grassland.

	
Photograph 7: Defunct hedge with broadleaved plantation woodland.	Photograph 8: Scattered scrub and hardstanding
	
Photograph 9: Amenity grassland, foot path (hardstanding) and hedgerow with trees.	Photograph 10: Scattered scrub.
	
Photograph 11: Montbretia adjacent to amenity grassland and a wooden fence.	Photograph 12: Courtyard 1 with amenity grassland and Pond 1.

	
Photograph 13: Pond 1 within Courtyard 1(Figure 1, Target Note 7).	Photograph 14: Courtyard 2 with ornamental planting an hardstanding
	
Photograph 15: Pond 2 in Courtyard 2 (Figure 1, Target Note 8).	Photograph 16: Seating area (hardsatnding) within Courtyard 2.
	
Photograph 17: Bat Tree 1. The red circles indicate the area of bat interest.	Photograph 18: Bat Tree 1, a close up of the knothole.

Photograph 19: Bat Tree 2.

Photograph 20: Bat Tree 2, a close up of the knothole.

Photograph 21: Bat Tree 2, the lower cavity

Photograph 22: Garden fly tipping waste (Figure 1: Target Note 2).

Photograph 23: Building 1

Photograph 24: Building 2, the east and south faces.

Photograph 25: Building 2, the north-east corner.

Photograph 26: Building 2, the west face.

Photograph 27: Building 4

Photograph 28: Building 9 and Building 4.

Photograph 29: Building 5

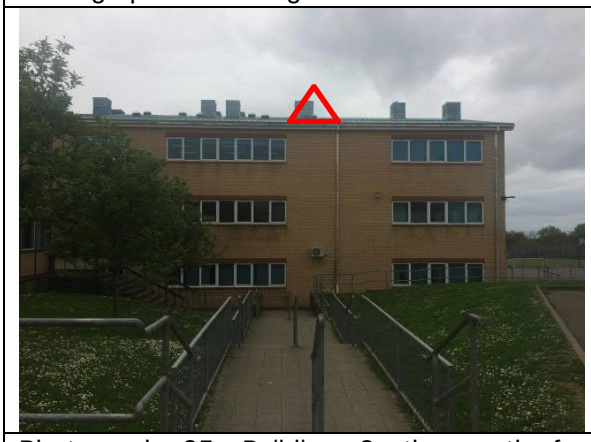
Photograph 30: Building 5

Photograph 31: Building 6, the north face and dense scrub with row of trees.

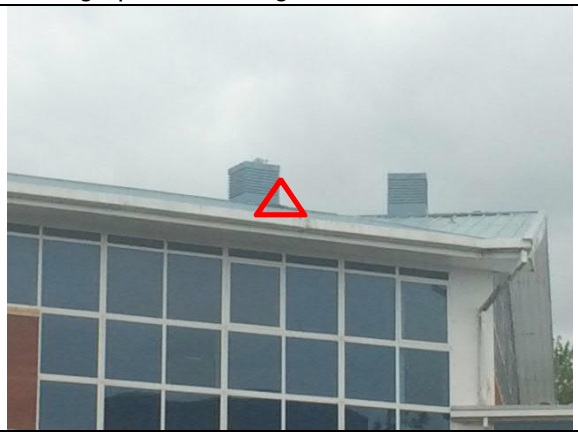
Photograph 32: Building 6.

Photograph 33: Building 6 the west face

Photograph 34, Building 7, the west face.



Photograph 35: Building 8, the north face. Evidence of nesting birds is indicated by the red triangle.



Photograph 36: Building 8, a close up of the roof with nesting material.

Photograph 37: Looking towards the roof of Building 11.

Photograph 38: Building 11, a close up of the nesting bird on the roof indicated in Photograph 37.

Photograph 39: Building 10, the west face.

Photograph 40: Building 10. The north-west corner.

Photograph 41: Building 10, a close up of the bat potential feature indicted in Photograph 39.

Photograph 42: Building 10. The south-west corner.

Photograph 43: Building 10

Photograph 44: Building 10, a close up of the bat feature identified in Photograph 43.

Photograph 45: Building 10 connected to Building 11.

Photograph 46: Building 12, the south and west faces.

Photograph 47: Building 12, the south-east corner.

Photograph 48: Building 12, the east face.

Photograph 49: Building 12, a close up of the feature identified in Photograph 48.

Photograph 50: The east faces of Building 13.

Appendix C Target Notes

Target Note Number	Description
TN1	A raised herb planter with mint, rosemary, forget me not, cherry and ornamental plant species.
TN2	An area of garden fly tipping waste within the Site (Appendix B: Photograph 22).
TN3	Possible location of bird's nest. This is mossy and view is restricted.
TN4	Gulls observed nesting on the roof near the chimney
TN5	Evidence of nesting gulls. There is nest material behind one of the roof chimneys on the north side of Building 8 (Appendix B: Photographs 35 and 36).
TN6	There is a gull on a nest on the west side of the roof of Building 11 (Appendix B: Photographs 37 and 38).
TN7	Pond in Courtyard 1 (Appendix B: Photographs 12 and 13).
TN8	Pond in Courtyard 2 (Appendix B: Photograph 15).
TN9	The area of amenity grassland to the north and west of Building 2 could not be accessed and has mapped using aerial photography.
TN10	The strip of broadleaved plantation woodland to the north of Building 2 could not be accessed and has mapped using aerial photography.
TN11	Wooden garden shed within Courtyard 1. This has no potential for roosting bats.

Appendix D 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	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. The LDP provides a policy framework that seeks to preserve and enhance the Vale of Glamorgan's important historic built environment particularly in relation to the numerous listed buildings (both 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;

Policy	Details
	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. 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

Policy	Details
	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 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	Development likely to have an adverse effect either directly or indirectly on the

Policy	Details
Protected Sites and Species	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. 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.

Policy	Details
	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 E Project Staff – Suitably Qualified Ecologist

Lisbeth Nash BSc (Hons) MCIEEM, Principal Ecologist:

Lisbeth is a Principal Ecologist over 12 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 seven years of consultancy experience and eleven 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.

Clare Morgans BSc (Hons) GradCIEEM, Ecologist

Clare is an Ecologist with five years of consultancy experience. Clare has experience undertaking Phase 1 Habitat Surveys (PEA), site supervision and surveying for protected species including: bats, reptiles, badgers, otter, water vole, and great crested newts and has expertise in mapping and GIS (ArcMap). She is competent in undertaking a range of surveys and desk studies and producing high quality reports including PEA reports and biodiversity management plans. Clare holds protected species licences for great crested newts with Natural England (NE) and Natural Resources Wales (NRW). She is a Member of the Chartered Institute of Ecology and Environmental Management.

Appendix F Habitat Management Plan Structure

1. 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

Appendix G: Suggested Planting

Suggested plant species of benefit to invertebrates

List available in Landscape and urban design for bats and biodiversity - Gunnell et.al. (2012).

Free to download http://www.bats.org.uk/pages/landscapedesign.html

Suggested plant species of benefit to butterflies and moths

Suggested plant species of benefit to butterflies and moths

Common Name	Scientific Name
Agrimony	Agrimonia eupatoria
Barren strawberry	Potentilla sterilis
Blackthorn	Prunus spinosa
Bramble	Rubus fruticosus
Common bird's-foot trefoil	Lotus corniculatus
Creeping cinquefoil	Potentilla reptans
Dog-rose	Rosa canina
Greater bird's-foot-trefoil	Lotus pedunculatus
Horseshoe vetch	Hippocrepis comosa
Salad burnet	Sanguisorba minor
Tormentil	Potentilla erecta
Wild plum	Prunus domestica
Wild strawberry	Fragaria vesca
Wood avens	Geum urbanum

(Eeles, P. (2008) UK Butterflies Food Plants [Online] Available from: http://www.ukbutterflies.co.uk/foodplants.php)

Suggested plants for bees by season

Common Name	Scientific Name
Species that flower in March and April	
Bluebell	Hyacinthoides non-scriptus
Bugle	Ajuga reptans
Lungwort	Pulmonaria longifolia
False heather	Cuphea hyssopfplia
Ribwort plantain	Plantago lanceolata
Hedge garlic	Alliaria petiolata
Germander speedwell	Veronica chamaedrys
Oxlip	Primula elatior
Dog's mercury	Mercuralis perennis
Ground ivy	Glechoma hederacea
Herb Robert	Geranium robertianum
Coltsfoot	Tussilago farfara

Common Name	Scientific Name
Species that flower between May and June	
Wild wallflower	Cheiranthus cheiri
Red clover	Trifolium pratense
Salad burnet	Sanguisorba minor ssp minor
Rock rose	Helianthemum nummularium
Rock cinquefoil	Potentilla rupestris
Foxglove	Digitalis purpurea
Honeysuckle	Lonicera periclymenum
Selfheal	Prunella vulgaris
Bladder campion	Silene vulgaris
Cowslip	Primula veris
Thyme	Thymus drucei
Sorrel	Rumex acetosa
Bugle	Ajuga reptans
Cow parsley	Anthriscus sylvestris
Wild wallflower	Cheiranthus cheiri

Species should be chosen to fit with the local ground conditions and local conditions such as shading.

Appendix H: Examples of Invertebrate Boxes