AECOM Environment

UNITE Group and Travis Perkins PLC

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BREEAM Multi-residential 2008 Land Use and Ecology Credits Report – 11-13 St Pancras Way

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Introduction

A BREEAM Multi-residential 2006 assessment was undertaken at the Travis Perkins Plc commercial premises 11-13 St Pancras Way site, Camden Town in London in April 2010 by AECOM as commissioned by UNITE Group and Travis Perkins Plc. This assessment establishes the number of credits that may be available as a result of the redevelopment of the site.

Credit Summary

Should the Client act upon all of the recommendations described in this report, a total of nine (9) credits would be available to the scheme. Table 1 provides a summary of the credits that could be awarded if all recommendations are carried out in full, as discussed in Chapter 4.

Table 1: Summary of Credits Available if Recommendations are Followed

Ecology Credit	Credit Description	Maximum BREEAM Bespoke 2008 Ecology Credits	Credits Potentially Available
LE1	Re Use of Land	1	**1**
LE2	Contaminated Land	1	**0**
LE3	Ecological Value of Land and Protection of Ecological Features	1	**1**
LE4	Mitigating Ecological Impact	2	**2**
LE5	Enhancing Site Ecology	3	**3**
LE6	Long Term Impact on Biodiversity	2	**2**
Total		10	**9**

Summary of Actions Required to Gain Credits

LE1 Re Use of Land:
This credit is available to the project, as at least 75% (in this case 100%) of the proposed building will fall within the footprint of previously developed land.. No further action is required. One (1) credit will be available under the current design scheme.

LE2 Contaminated Land
The site is not considered to be contaminated and therefore this credit is not available.

LE3 Ecological Value of land and protection of ecological features
There are no ecological features on site and the land is of negligible ecological value. Therefore one (1) credit can be awarded by default. No further action is required.

LE4 Mitigating Ecological Impact
Two (2) credits are available if no negative change in the ecological value of the site results from the development, and if the proposed green roof is installed these credits will be available.

LE5 Enhancing Site Ecology
If all general enhancements, listed below, and the soft landscaping area planted with the required number of species three (3) credits would be available.

- Area of planting
  It is recommended that at least 1484m^2 of planting, incorporate at least 21 native species, is designed into the development. The plant species should be native or be species with value for wildlife, that flower throughout the year. This would provide year round resources for birds, bats and insects such as bees.
- Green roof designed with value to biodiversity created.
- Bird Boxes
  It is recommended that at least four bird boxes are installed on the new building.
- Bat Boxes
  Install at least two bat boxes on the new building at appropriate locations and include planting that attracts bats in the soft landscaping.

LE6 Long Term Impact on Biodiversity

The site is of negligible ecological value therefore two credits are available if all the mandatory requirements and Additional Requirement 4 are fulfilled.

Mandatory Requirements

- ALL relevant UK legislation must have been and continues to be complied with at all stages of the project; and
- A five-year management plan must be produced.

Additional Requirement 4

- Protecting and Enhancing Biodiversity
  Install a green roof and use native species and species of value to wildlife which flower at different times of the year within the area of planting. Provide BAP species habitat in the form of bat and bird boxes. The proposed green roof must be designed with biodiversity features which enhance the biodiversity of the landscaping.

Summary of Protected Species Considerations

The site has low potential to support protected species. Although considered very unlikely at this site, bats and nesting birds can use urban buildings. Nesting birds, bats, and any other wildlife present on site, should be considered throughout the development. If any protected species are discovered on site, the advice of a suitably qualified ecologist should be sought immediately.

1 Introduction

1.1 Appointment

AECOM was commissioned by UNITE Group and Travis Perkins Plc to conduct the ecological component of the Building Research Establishment Environmental Assessment Methodology (BREEAM) Multi-residential 2008 assessment in relation to the redevelopment at the 11-13 St Pancras, Camden Town Travis Perkins Site in March 2011. The BREEAM Multi-residential 2008 criteria[1] were used for the assessment of the aforementioned project and were used as the guideline for the ecological study.

AECOM was asked to conduct an on-site assessment and produce a report outlining the number of BREEAM Multi-residential 2008 Land Use and Ecology credits that could be awarded to the scheme under the current design regime. This included for the recommendation of activities that could be undertaken to increase the number of credits that could be awarded. The categories of BREEAM Multi-residential 2008 credits used for the assessment were as follows:

- LE1 Re Use of Land;
- LE2 Contaminated Land;
- LE3 Ecological Value of Land and Protection of Ecological Features;
- LE4 Mitigating Ecological Impact;
- LE5 Enhancing Site Ecology; and
- LE6 Long Term Impact on Biodiversity.

1.2 Site Location and Setting

11 – 13 St Pancras Way is located in central London situated in between The Royal Veterinary College to the west and the Camden and Islington Mental Health & Social Care Trust. The site's central OS grid reference is TQ295836.

The site is located in an urban setting, bordered by St Pancras Way (A5202) to the east and surrounded by built up urban landscape to the north, south and west. Regents Canal is situated 200m north-east at its nearest point and runs in a north-west to south-east direction and is the only notable nearby riparian habitat. The grounds of Old St Pancras Church are situated approximately 300m south-east and is the nearest area of substantial green space within the predominately urban surrounding landscape.

The site itself is an operating commercial premises. It comprised of office, retail, warehouse and open hard standing which encompass the entire development footprint.

1.3 Brief Description of the Project

The proposed scheme at 11-13 St Pancras Way includes the demolition of the existing Travis Perkins premises which will be replaced by ten levels of multi-story student accommodation surrounded by a single storey commercial premises. A first floor planting terrace is to be included within the student accommodation as well as the installation of a green roof on the top of the building. This report is the BREEAM Multi-residential 2008 assessment of the student accommodation portion of the new development.

1.4 Report Objectives

The objectives of this assessment were to:

- assess the ecological value of the site;
- provide recommendations for protecting and improving the site's ecology in the short and long term; and
- suggest which ecological credits may be available to the project.

1.5 Quality Assurance

All AECOM Ecologists are members of the Institute of Ecology and Environmental Management (IEEM) at the appropriate level and follow their code of professional conduct when undertaking ecological work.

AECOM is BS EN ISO 9001:2000, BS EN ISO 14001:2004 and OHSAS 18001:2007 accredited.

[1] BRE (2008) BREEAM Retail 2008. BRE London.

2 Methodology

2.1 Introduction

The BREEAM Multi-residential 2008 methodology outlined below was used for the assessment of the 11- 13 St Pancras way site.

2.2 Site Assessment

In order to achieve the maximum BREEAM Multi-residential 2008 Land Use and Ecology credits, the site visit must be undertaken by a suitably qualified ecologist prior to the start of works and at a suitable time of year. The BREEAM guidance defines a suitably qualified ecologist as someone who:

- holds a degree or equivalent qualification (e.g. N/SVQ level 5) in ecology or related subject; AND
- is a practicing ecologist with a minimum of three years of relevant experience (within the last five years); AND
- is coved by a professional code of conduct and subject to peer review (e.g. a member of the Institute of Ecology and Environmental Management, IEEM).

The ecologist's report must be based on the site visit for certain credits to be awarded.

2.3 Limitations

As with all ecology surveys, the results of a site visit for a BREEAM assessment can only provide an indication of the species present on site at the time of the survey and the potential for species to be present. Many species, including those that are protected under UK and EU legislation, are highly mobile and regularly move on and off sites. Therefore, the fact that no evidence of a particular species was recorded during a site visit does not necessarily mean that they are not present. Consequently, a risk based approach has been adopted when making recommendations in this report.

2.4 Health and Safety

Please note that consideration of any health and safety implications of the design and implementation of our ecological credits recommendations must be risk assessed by the client to their own satisfaction. Our recommendations are designed to relate solely to biodiversity and nature conservation.

2.5 LE1 Re Use of Land

The aim of this credit is to encourage the re use of land that has been previously occupied by building developments and discourage the use of previously undeveloped land for building.

One (1) credit is available if evidence is provided that at least 75% of the footprint of the proposed development (including any proposed buildings, hard landscaping, car parks and access) falls within the boundary of land previously developed.

2.6 LE2 Contaminated Land

The aim of this credit is to encourage the use of contaminated land that otherwise would not have been developed.

One (1) credit is available where evidence is provided to demonstrate that the land used for the new development has, prior to development, been defined as significantly contaminated, and where adequate remedial steps have been taken to decontaminate the site prior to construction.

2.7 LE3 Ecological Value of Land and Protection of Ecological Features

The aim of this credit is to encourage development on land that already has limited value to wildlife and to protect existing ecological features from substantial damage during site preparation and completion of construction works.

One (1) credit is awarded where evidence is provided to demonstrate that the construction zone is defined as land of low ecological value and that all existing features of ecological value will be fully protected from damage during site preparation and construction works.

2.8 LE4 Mitigating Ecological Impact

The aim of this credit is to minimise the impact of a building development project on existing site ecology.

Two credits are awarded as follows:

- **one (1)** credit is awarded where evidence is provided to demonstrate the change in ecological value of the site (calculated as an index of biodiversity), as a result of development, is between less than zero and equal to, or less than, minus nine species i.e. there is a small negative change in the biodiversity of the site; and
- **two (2)** credits are awarded where evidence is provided to demonstrate there is no negative change in the ecological value of the site (calculated as an index of biodiversity) as a result of development, i.e. there is a change in the biodiversity of the site that is equal to, or greater than, zero species.

The change in value is calculated using the formula below which also takes into account the area of the site, the size of the area used for planting and the number of native species within it. Please note that only native species can be included in this calculation.

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

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

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

2.9 LE5 Enhancing Site Ecology

This credit aims to maintain and enhance the ecological value of the site.

Three credits are awarded as follows:

- **one (1)** credit is awarded where evidence is provided to demonstrate that the design team (or client) has:
  - appointed a professional 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.
- **two (2)** credits are available where the first credit has been achieved and evidence is provided to demonstrate a positive increase in the ecological value of the site of up to (but not including) six species;
- **three (3)** credits are available where the first credit has been achieved and evidence is provided to demonstrate a positive increase in the ecological value of the site of six species or greater.

The change in ecological value of the site for the second and third credit is determined by the calculation used in LE4 and described above. The ecologist must have visited the site prior to the commencement of initial site preparation works to assess the ecological baseline before development.

2.10 LE6 Long Term Impact on Biodiversity

The aim of this credit is to minimise the long term impact of the development on the site's and surrounding area's biodiversity.

Two credits are awarded as follows:

- **one (1)** credit can be awarded where evidence is provided to demonstrate that the client has committed to achieving the mandatory requirements and at least two of the additional requirements (listed below); and

- **two (2)** credits can be awarded where evidence is provided to demonstrate that the client has committed to achieving the mandatory requirements and at least four of the additional requirements (listed below).

However, this is not the case for this development due to the negligible ecological value of the site prior to development. In this case, the Mandatory Requirements and only Additional Requirement 6 (protecting and enhancing biodiversity) must be achieved to gain both credits. Further details are given in section 4.9.2.

2.10.1 Mandatory Requirements

The mandatory requirements for LE6 are as follows:

- all the relevant UK legislation relating to protection and enhancement of ecology has been, and will be, complied with during the design and construction process;
- an appropriate management plan is produced covering at least the first five years after project completion. This is to be handed over to the building occupants and include:
  - management of any protected features on site;
  - management of any new, existing or enhanced habitats; and
  - a reference to the current or future site level Biodiversity Action Plan.
- where there is a commitment to produce a management plan, information is provided detailing:
  - the scope of management plan; and
  - key responsibilities, and with whom these responsibilities lie, e.g. owner, landlord, occupier, AECOM or other.

2.10.2 Additional Requirements

1. **Additional Requirement 1 - Biodiversity Champion:** The contractor is required to nominate a 'Biodiversity Champion' with the authority to influence site activities.
2. **Additional Requirement 2 - Training: The contrac**tor is required to train ALL of the relevant site work-force on how to protect the site ecology during the project.
3. **Additional Requirement 3 - Recording Biodiversity Protection Measures:** The contractor is required to record actions taken to protect biodiversity and monitor their effectiveness throughout key stages of construction.
4. **Additional Requirement 4 - Habitat Creation: The client requires that a** new ecologically valuable habitat, appropriate to the local area, be created. This includes habitat that supports nationally, regionally or local**ly important biodiversity, and** / **or which is** nationally, regionally or locally important itself.
5. **Additional Requirement 5 - Sensitive Work Scheduling:** The client requires the contractor to programme the site work to minimise disturbance to wildlife.

3 Site Visit Results

3.1 Introduction

The site was visited by Richard Graves BSc MSc Dip MIEEM CEnv and Mark Wingrove BSc (Hons) AIEEM for the purposes of assessing the availability of Land Use and Ecology Credits for BREEAM on 4th March 2011. During the site visit, the site was also assessed for the presence, or potential presence, of protected species.

3.2 Results

Below is detailed the results of the ecology desk study and walkover of the 11-13 St Pancras Way site.

3.2.1 Habitat Types Present on Site

The entire site consisted of buildings and hard standing, detailed below. No areas of ornamental planting, semi-natural or natural habitat were present.

3.2.1.1 Building

The site consisted of two main buildings. A warehouse was present on the northern part of the site used for storage and loading of commercial materials. This warehouse was of 60s-70s type construction made up of a combination of red brick walls and breeze block construction. The walls were in good condition with intact mortar and little damage or erosion to the brick work. The internal concrete ceiling was arched, although the building was flat-roofed externally. Sheet metal cladding was present around the building, extending from approximately 2 metres above ground up to the roof.

An area of hard standing separated this warehouse from another building to the south. This was a multi-purpose building, originally warehouse of the same design and structure as the first, also metal clad. The southern half of the building was still in use as a warehouse, however the northern half had been retro-fitted and converted into office and retail space.

3.2.1.2 Hard standing

Three areas of hard standing were present with the two buildings. An area north of the northern warehouse was surrounded by perimeter brick wall and used as a storage area for commercial material. A courtyard was present between the two buildings. This functioned as an entrance to the premises for vehicles loading materials in and out of the northern warehouse as well as a pedestrian access. An area of hard standing to the south of the southern building acted as a back entrance to the premises, for loading in and out of the southern warehouse and as a small car park. A property and associated small garden were present immediately adjacent to this area.

Where the buildings walls did not comprise the boundary of the site, a brick wall was present as a boundary enclosing the property fully on the western, northern and southern sides. The wall, interrupted by gates and the buildings also extended to enclose parts of the courtyards on the eastern edge along St Pancras road. Limited scattered ruderal vegetation was present along the boundary walls and hard standing area. The species identified during the site visit are listed in Table 2.

Table 2: Species List from Site Visit

Taxon Name	Species name
Buddleja davidii	Butterfly bush
Chamerion angustifolium	Rosebay Willowherb
Stellaria media	Common chickweed
Rubus fruticosus	Bramble
Tussilago farfara	Colts Foot
Lapsana communis	Nipplewort

3.3 Protected Species

During the site visit the site was assessed as being of negligible ecological value with low potential to support protected species. Gaps under the soffits on the western wall of the northern warehouse have low potential to support a bat roost, especially when considering the availability of better alternative roost sites present on and in buildings nearby. The warehouses provide some minor potential to provide nest sites on small supports and features for birds tolerant of human disturbance (e.g. Robin (*Erithacus rubecula)* and Feral Pigeon (*Columba livia*)). However, no signs of previous bird activity such as droppings or previous nest sites were recorded within the buildings during the survey, therefore the potential for nesting birds in considered low.

3.3.1 Bats

As the potential for roosting bats on site is low no further surveys are required for bats. In the unlikely event a bat roost is found on site, works will need to cease and further investigation will be needed and a Natural England licence may be required. An ecologist should be consulted if a bat is found.

3.3.2 Birds

The main bird nesting season runs from March to August inclusive although some species may nest outside this season (e.g. Feral Pigeon). In the unlikely event of a bird being found to be nesting on site the nest must be left undisturbed while it is 'in use'(as summarised in section 3.4.2 below). This is from the initial construction or occupation of the nest until the young have fledged and are completely independent of the nest. Also note breeding pairs may have more than one clutch each season, using the same nest to raise each clutch.

There is low potential for nesting birds to be present at the 11-13 St Pancras Way site. However, if a birds nest is found an ecologist should be consulted.

Capabilities on project:
Environment

4 Ecological Credits

4.1 Introduction

This chapter outlines the maximum potential number of credits that could be awarded to the 11 – 13 St Pancras site redevelopment, if all recommendations in this report are followed, under the BREEAM Multi-residential 2008 methodology.

4.2 Assumptions

This report outlines the maximum potential number of credits that could be awarded to this scheme if all the recommendations are followed.

It is assumed that all information provided by the client is correct and complete as far as possible. Many of the credits that could be awarded to this scheme must be supported by additional evidence when submitted to the BREEAM Assessor. It is assumed that this evidence will be made available.

It is also assumed that all those who work on the scheme, including contractors, will adhere to the mitigation, protection measures and best practice outlined in this report and any additional relevant legislation or guidance.

4.3 Site Visit and Assessment

In order to assess which credits were available to the scheme, a site visit was conducted by Richard Graves BSc MSc MIEEM and Mark Wingrove BSc AIEEM on 4th March 2011, before the commencement of works.

For the purpose of this assessment, Richard Graves is the SQE. Richard fulfils the criteria set out to be an SQE as described below.

1. Training

Richard Graves BSc MSc Dip CEnv MIEEM

Academic Training:
- MSc Crop Production in the Changing Environment
- Postgraduate Diploma Environmental Impact Assessment
- BSc (Hons) Human Biological Sciences (Ecology)

2. Experience

Richard Graves is the Director of Ecology for AECOM and practice area leader for ecology. He has particular experience of providing ecological advice for development, for both public and private clients and for major infrastructure, housing, industrial, road and rail schemes. Richard is a trained expert witness and has given evidence at major public inquiries. He is the treasurer of IEEM and is a chartered environmentalist. Richard's started as an ecologist in 1991 and has been working full time as an ecologist since then. Richard has worked full time as an ecologist for more than three years in the last five.

3. Professional Membership

Richard Graves is a full Member of the Institute of Ecology and Environmental Management (MIEEM).

4.4 LE1 Re Use of Land

The proposed redevelopment of the 11-13 St Pancras Way site will fall entirely within the existing building's footprint. This exceeds the minimum 75% re use of land required to achieve this credit.

One (1) credit will be available to the scheme under the current design regime.

4.5 LE2 Contaminated Land

The site is not considered to be contaminated. In order to gain the credit evidence must be provided identifying the contamination and outlining the remedial steps that will be taken to decontaminate the site prior to construction, in line with the contaminated land report. If the site is found to be contaminated and is subsequently appropriately remediated, this credit may be available.

Zero (0) credits are available to the scheme at present.

4.6 LE3 Ecological Value of Land and Protection of Ecological Features

The site is located in a built-up urban area and consisted entirely of one building and hard standing. There are no existing features of ecological value on site, such as trees, hedges, ponds, watercourses or other natural areas. The site is assessed as having negligible potential to support protected species. The site is considered to be of negligible ecological value therefore this credit is available.

One (1) credit will be available as the site was considered have no ecological value.

4.7 LE4 Mitigating Ecological Impact

Two credits are available if no negative change in the ecological value of the site results from the development. A minor amount of native, and non-native, ruderal vegetation will be lost as part of the proposed development.

The calculation used to determine change in ecological value because of development, and thus determine the planting required to mitigate ecological value, takes into account both the area and number of species planted.

In order to gain two credits, the change in ecological value of the site must be over zero (0). As there was vegetation on site prior to development, new native planting will have to be included in the proposed design to mitigate for the associated ecological impact, according to the criteria for this credit.

The area of the proposed green roof and area of planting exceeds the area of vegetation present prior to development.

Planting 5 native plant species, or species with value for wildlife on the green roof (1062m2), would result in a positive change in ecological value of 1.1.

However, to gain credits for LE5 the recommendation for the planting is greater, please see below.

Two (2) credits will be available if the proposed green roof (1062m2) incorporate at least 5 native species or species of wildlife value.

4.8 LE5 Enhancing Site Ecology

The design team has appointed professional ecologists from AECOM to provide advice on enhancing the site's ecological value. This advice has been provided by Richard Graves and Mark Wingrove and is reported in this document.

4.8.1 General Recommendations

Listed below are the general recommendations made for enhancing site ecology. All of these recommendations should be followed for the LE5 credit to be available.

4.8.1.1 Green roof installation

It is recommended that the green roof is installed on the roof of the student accommodation as this will increase the number of native species present on site. This should incorporate a minimum of 15 native species

Green roofs provide additional / new nesting and foraging opportunities for birds, invertebrates and small mammals as will as increasing botanical diversity. They also enhance the visual appearance of buildings as well as providing cooling and insulation.

Green roofs are vegetated roofs, made up of layers (i.e. waterproof membrane, insulation layer, drainage layer, soil layer etc) that create an environment suitable for plants to grow.

There are broadly two types of green roofs:

- Intensive green roof or roof garden: They have a deep layer of soil and are usually planted with ornamental species, similar to a garden, and primarily aesthetic. They are designed to provide access for people and need regular maintenance.
- Green roof: They are lightweight and not normally designed for people. They require minimum maintenance. Green roofs can be made up of sedum mats, or be substrate based roofs (often crushed recycled brick). Substrate based roofs can, in some

cases, use recycled aggregate from site which is then allowed to colonise naturally. This type of roof is often known as 'extensive green roof' or 'eco' roof. 'Eco' roofs are specifically design for biodiversity.

A green roof will greatly increase the ecological value of the site as it will provide an area of early successional habitat which can contain a high species diversity. Appendix F details a variety of species of value to wildlife that could be included in the area of planting, size and root depth considerations will probably exclude most woody and shrub plants.

In order to provide biodiversity enhancements, green roofs should:

- contain substrate and not be sedum mats;
- have varying types, and depths, of substrate;
- be planted with native species;
- be designed not to be irrigated or fertilised;
- contain features, such as logs, in order to provide perches for nesting birds.

Appendix F details a variety of plant species of value to wildlife.

4.8.1.2 Bird Boxes

It is recommended that at least two swift bricks or boxes are installed on the new building.

In many areas, the natural nesting and roosting sites of birds are diminishing, or have disappeared altogether, due to changes in the landscape, environment and building techniques. The installation of internal bird bricks or external bird boxes has been recommended as a general enhancement option for the site.

The proximity of the site to the nearby Regents Canal may also indicate the presence of water associated species. In particular Swifts (*Apus apus*) are often found within urban areas especially in close proximity to water ways and is recorded within the vicinity. Providing internal bird bricks or external bird boxes for these species will encourage these or a range of other species to nest on site.

Bird boxes can be attached to or incorporated into buildings. Boxes for birds can provide lasting nesting sites that:

- are relatively safe from predators such as cats (if installed appropriately);
- are close to feeding areas; and
- provide essential winter protection for roosting birds.

Bird boxes should be positioned out of direct sunlight (i.e. so that they are facing between north and east or are shaded by buildings or trees and should not face south), sheltered from the most prevalent wind and positioned or tilted to avoid rain entering the box. Birds also need a clear flight path to and from nesting sites. As a general rule, the boxes should be at least 4m from the ground to prevent access by predators. The boxes could either be incorporated into the building itself (also known as bird bricks) or retrospectively fitted upon completion, depending on the style of box agreed upon. Examples of suitable bird boxes to fulfil this recommendation are included in Appendix G. Boxes can be incorporated onto rooftop structures to avoid disturbance from building users.

4.8.1.3 Bat Boxes

Install at least two bat boxes on the new building at appropriate locations and include planting that attracts bats in the soft landscaping.

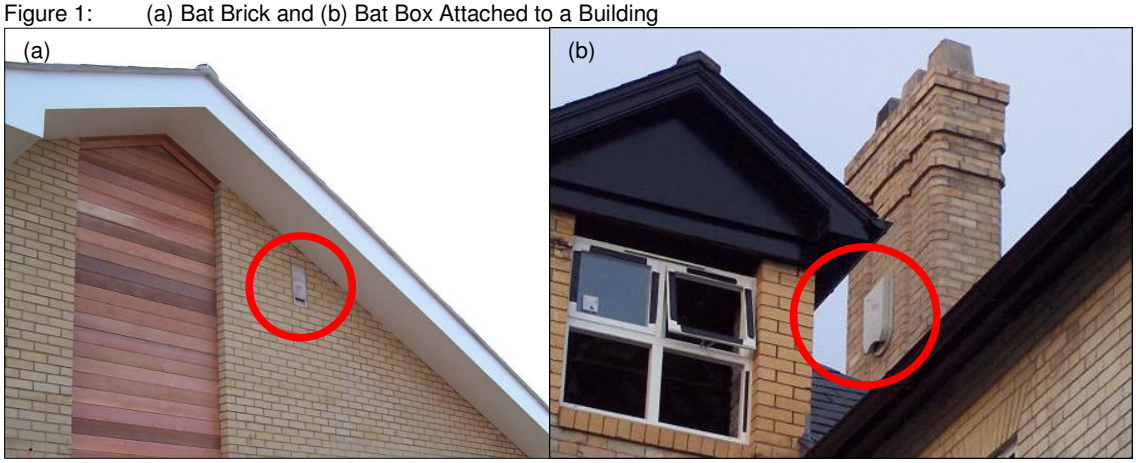
All bat species are listed on the London BAP. Targeting species on the local BAP helps to maintain biodiversity relevant to the area of new developments. Provision of roosting habitats for bat species is likely to improve the conservation status of local bat populations, especially if new foraging habitats, such as a green roof, are installed. It is therefore recommended that a minimum of two bat boxes are installed in or on the new building as a key enhancement option. The choice of bat box should be suitable for bats recorded on or near the site. The nearby Regents Canal may act as a commuting corridor for local bat populations.

Installation of bat boxes at 11-13 St Pancras Way may therefore provide additional roost sites for local bat populations utilising this nearby watercourse.

The bat boxes should be positioned at least 4m above the ground and in a location that cannot be reached from a window. It is recommended that the boxes are placed on different faces of the building, as they will then offer a range of temperature conditions, accounting for different seasons and species preferences. The boxes should all be exposed to sunlight for part of the day. A range of bat boxes are available on the market, including designs that can be integrated into or attached to buildings, as shown in Figure 1. Bat boxes can be built into the brickwork of new buildings so they are flush to the surface (refer to Figure 1(a), placed beneath plasterwork or wood panelling, or retrofitted to completed buildings, as shown in Figure 1(b)

Boxes built into buildings often offer superior protection from both predators and the elements. Integrated boxes or bricks are designed to allow any bat faeces to fall directly out of the structure, removing the requirement for cleaning. Bat droppings are very dry, as they consist almost completely of insect exoskeleton. It is therefore very unlikely to stain the wall below a bat box Examples of bat boxes that are suitable for the species recorded within the vicinity of the site are given in Appendix G.

Figure 1: (a) Bat Brick and (b) Bat Box Attached to a Building



The use of certain species of plant that are fragrant in the evening will attract some insect species that bats feed on. It turn, this may attract bats to the site[2]. Suggested plants are included in Appendix F.

One (1) credit will be available to the scheme if the three general enhancement recommendations above are followed.

4.8.2 Landscape Enhancements

The calculation for change in ecological value is provided in the table below. The species planted must be native or have proven value to wildlife.

[2] **Bat Conservation Trust** (May 2007) *Encouraging Bats: A guide for bat-friendly gardening and living* [Online] Available from: http://www.bats.org.uk [Accessed on 04/03/11]

Table 3: LE5 Calculation for Change in Ecological Value

Before Development				
Plot Type	Description	Area m^2	Species	Species x Area
Building Footprint (Ground Level)	Building footprint	2904	0	0.00
Area of Hard Standing		1767.77	0	0.00
<0.1% area of native ruderal species		1.23	5	6.16
Whole Site		***4673.00***		***6.16***
After Development				
Plot Type	Description	Area m^2	Species	Species x Area
Building Footprint (Ground Level)	Enclosed areas	3972.2	0	0
Hard Landscaping	Parking area	85.5	0	0
	area next to plant room	99	0	0
	External areas	268.2	0	0
	other	233.1	0	0
Soft Landscaping	soft land next to plantroom	15	5	75
	green roof planter above TP showroom	107.1	10	1071
	First floor soft landscaping	300	20	6000
	second floor green roof	67	18	1206
	sixth floor green roof	164	18	2952
	seventh floor green roof	398.8	21	8374.8
	Eighth floor green roof	432	21	9072
Whole Site		***4673***		***28750.8***

Index of Ecological Value After Development		6.15
Index of Ecological Value Before Development		0.0013
Total Change in Ecological Value		**6.1512**

Three (3) LE5 credits will be available to the scheme if the general recommendations detailed above are followed and the soft landscaping areas (1484m^2) are planted with the number of species listed in the above table.

Two (3) credits will be available if the three general enhancements outlined above, and the landscaping described in Table 3, is implemented.

4.9 LE6 Long Term Impact on Biodiversity

4.9.1 Mandatory Requirements

In order to be eligible for any of the LE6 credits, the mandatory requirements outlined in the BREEAM Methodology must be met. This includes preparing a comprehensive management plan for the site and adhering to all relevant UK legislation throughout the project.

4.9.1.1 Ecology and Biodiversity Management Plan

A five-year management plan is required in order to gain this credit. This is particularly important as new habitats (first floor planting and nesting/roosting habitat for birds and bats) are to be created on site.

A five-year management plan would include information on the following:

- the current ecological status of the site;
- the management of the roof habitat, bird and bat boxes;
- the management of any landscaping areas;
- the management of the site in terms of species listed in the National and Local BAPs;
- the implementation of a site level BAP; and
- who is responsible for these actions.

A management plan would link in with site management, maintenance and services to ensure that activities do not conflict. All those involved in site management should have a copy of the ecology and biodiversity management plan so that actions could be suitably integrated.

4.9.1.2 Legislation

The client will need to confirm that they have complied with all current EU and UK legislation relating to protected species and habitats applicable to the development site, and that they will continue to do so throughout the development. Appendix H provides an overview of relevant UK legislation. The original legislation should be read in conjunction with this summary to ensure legislative compliance. Contractors, and all those involved in the redevelopment of the 11 – 13 St Pancras Way site, must be aware of this and all other applicable legislation as they will be required to confirm that they have complied with the law throughout the course of the development, for this credit to be awarded.

4.9.2 Additional Requirements

The 11 – 13 St Pancras Way site has been assessed by a suitably qualified ecologist as being of 'negligible ecological value', please refer to section 4.6, therefore only **one (1)** of the additional requirements, Additional Requirement 4, must be fulfilled to be awarded two credits.

4.9.2.1 Additional Requirement 4: New Ecologically Valuable Habitat

Use at least 10 native species and species of value to wildlife which flower at different times of the year within the first floor planting. Provide BAP species habitat in the form of bat and bird boxes.

According to the BREEAM guidance, this credit can only be awarded if the client requires actions to be taken to protect / enhance biodiversity, takes full account of the UK BAP, and uses local biodiversity experts, (e.g. the local Wildlife Trust) to help identify ecologically important habitats/species on site. At present, there is little of ecological value on the site. Consequently, enhancing the site is likely to make an appreciable difference to biodiversity in the local area.

Habitats that support BAP species would include the green roof, first floor planting and species boxes, as recommended to achieve LE5 credits. Native planting will also improve the area for local species generally. Areas of planting do not necessarily have to be large and, given the constraints of the site. However, they should provide a variety of plants which flower at different times of the year, providing food sources for insects, birds and bats.

Two (2) credits will be available to the project if all of the mandatory requirements and Additional Requirement 6 detailed above are met.

Appendices

Appendix A: Site Photographs

Plate 1: View of Travis Perkins retail and office frontage from inside central courtyard.	Plate 2: View of central courtyard showing adjacent industrial buildings and northern warehouse
	
Plate 3: Inside northern warehouse showing warehouse construction type and arched concrete ceiling	**Plate 4: Northern hard standing area used as storage. Boundary brick wall can also be seen**
	

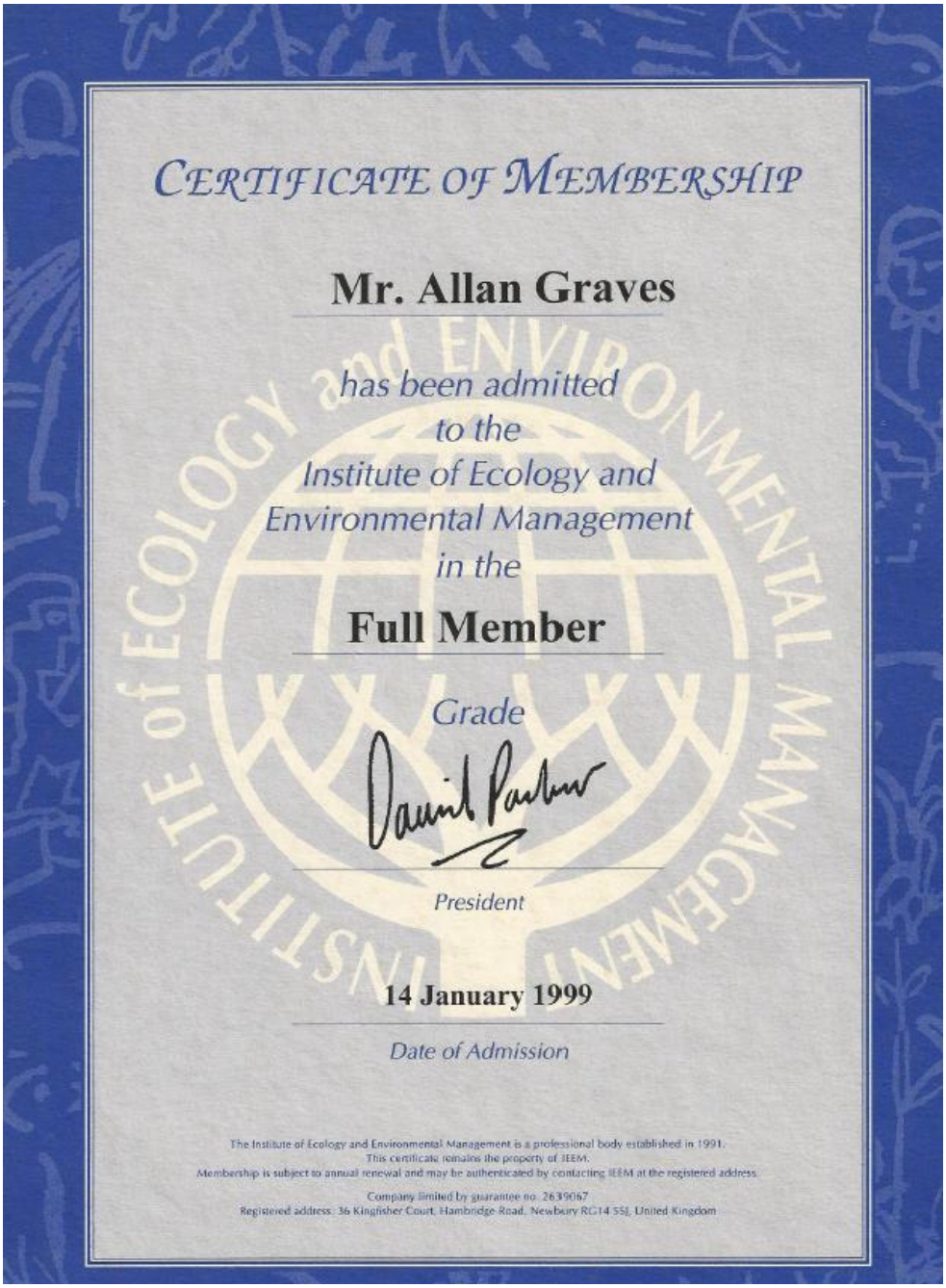
Plate 5: Inside southern warehouse, again illustrating internal warehouse structure.

Plate 6: View of southern area of hard standing (car park) with property and garden adjacent to the south.

Plate 7: View from St Pancras Way showing external metal cladding and some surrounding landscape.

Capabilities on project:
Environment

Appendix B: Richard Grave's MIEEM Certificate



CERTIFICATE OF MEMBERSHIP

Mr. Allan Graves

has been admitted
to the
Institute of Ecology and
Environmental Management
in the

Full Member

Grade

David Parker

President

14 January 1999

Date of Admission

The Institute of Ecology and Environmental Management is a professional body established in 1991.
This certificate remains the property of IEEM.
Membership is subject to annual renewal and may be authenticated by contacting IEEM at the registered address.

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Appendix C: London BAP Species

Below are listed the London Biodiversity Partnership Local Biodiversity Action Plan Species and Habitats for Greater London[3].

Table C1: Habitats with London Action Plans

Habitats	
Acid grassland	Private gardens
Built structures	Reedbeds
Canals	Rivers & streams
Chalk grassland	Standing water
Churchyards & cemeteries	Tidal Thames
Heathland	Wasteland
Parks & urban greenspaces	Woodland

Table C2: Species with London Action Plans

Common Name / Group	Scientific Name
Bats	Chiroptera
Black poplar	*Populus nigra* spp.
Black redstart	*Phoenicurus ochruros*
Grey heron	*Ardea cinerea*
House sparrow	*Passer domesticus*
Mistletoe	*Viscum album*
Peregrine falcon	*Falco peregrinus*
Reptiles	-
Sand martin	*Riparia riparia*
Stag beetle	*Lucanus cervus*
Tower mustard	*Arabis glabra*
Water vole	*Arvicola terrestris*

A full list of London BAP Priority Species can be found online at: http://www.lbp.org.uk/londonpriority.html [Accessed on 04/03/2011]

[3] London Biodiversity Partnership (2007) The London Biodiversity Action Plan – London's habitats and species. Available from: http://www.lbp.org.uk/londonhabspp.html [Accessed: 04/03/2011]

Appendix D: Native Species and Species with Wildlife Value Recommended Planting

Native Species Planting

Native species are essential in planting schemes. The list in Table D1 below details native species which could be included within planting schemes on site.

Table D1: Native species

Common name	Scientific name
Wild Flowers - Tall	
Agrimony	*Agrimonia eupatoria*
Field scabious	*Knautia arvensis*
Foxglove	*Digitalis purpurea*
Greater knapweed	*Centaurea scabiosa*
Chamomile	*Chamaemelum nobile*
Teasel	*Dipsacus fullonum*
Wild Flowers - Short	
Cowslip	*Primula veris*
Germander speedwell	*Veronica chamaedrys*
Harebell	*Campanula rotundifolia*
Herb-robert	*Geranium robertianum*
Lady's bedstraw	*Galium verum*
Margoram	*Origanum vulgare*
Oxeye daisy	*Leucanthemum vulgare*
Spiked speedwell	*Veronica spicata*
Toadflax	*Linaria vulgaris*
Wild thyme	*Thymus drucei*
Chive	*Allium schoenoprasum*
Cornflower	*Centaurea cyanus*
Golden rod	*Solidago virgaurea*
Native Shrubs	
Hawthorn	*Crataegus monogyna*
Dogwood	*Cornus sanguinea*
Blackthorn	*Prunus spinosa*
Geulder rose	*Viburnum opulus*
Holly	*Ilex aquifolium*
Box	*Buxus sempervirens*
Other species which have value to wildlife include:	
Traveller's-joy	*Clematis vitalba*
Spindle	*Euonymus europaeus*
Common Eyebright	*Euphrasia nemorosa*
Guelder-rose	*Viburnum opulus*
Wild Strawberry	*Fragaria vesca*

Plant species to attract insects

A list of species that encourage bee and other insect species and flower throughout the year are given in Table D2 below.

Table D2: Plants for Bees by Season

Common Name	Scientific Name
Species that Flower in March and April	
Bugle	*Ajuga reptans*
Lungwort	*Pulmonaria longifolia*
False heather	*Cuphea hyssopifolia*
Ribwort plantain	*Plantago lanceolata*
Germander speedwell	*Veronica chamaedrys*
Oxlip	*Primula elatior*
Dog's mercury	*Mercurialis perennis*
Ground ivy	*Glechoma hederacea*
Herb robert	*Geranium robertianum*
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*
Honeysuckle	*Lonicera periclymenum*
Selfheal	*Prunella vulgaris*
Bladder campion	*Silene vulgaris*
Cowslip	*Primula veris*
Thyme	*Thymus drucei*
Sorrel	*Rumex acetosa*
Bugle	*Ajuga reptans*
Species that Flower between July and August	
Round headed rampion	*Phyteuma orbiculare*
Autumn hawkbit	*Leontodon autumnalis*
Blue fleabane	*Erigeron acer*
Common catsear	*Hypochaeris radicata*
Fragrant agrimony	*Agrimonia procera*
Night flowering catchfly	*Silene noctiflora*
Field scabious	*Knautia arvensis*

Shrub species

Shrub species can provide wildlife with a variety of valuable resources. They provide shelter and nesting sites for many small bird species. There flowers can attract insects which in turn provide a food source for birds and bats. Species with berries, fruits and seeds can provide a very important source of winter nutrition for birds. A list of shrub species suitable for use on terraces and balconies suggested by the RSPB[4], therefore suitable for use in the proposed first floor planting, is provided in Table D3 below.

Table D3: Shrub species for use on terraces and balconies

Common Name	Scientific Name	Benefits to Wildlife
Barberry	*Berberis vulgaris*	Good shelter and nest cover for birds, berries may provide food
Blackthorn	*Prunus spinosa*	Attracts insects, food for birds, nesting sites
Buckthorn	*Rhamnus cathartica*	Food plant of brimstone butterfly, fruits eaten by birds
Dogwood	*Cornus sanguinea*	Food for birds, winter stem colour
Elder	*Sambucus nigra*	Food for birds
Field Maple	*Acer campestre*	Good source of insect food for birds
Firethorn	*Pyracantha coccinea*	Berries popular with many bird species
Garria	-	Winter, catkins, early cover for nesting birds
Goat willow	*Salix caprea*	Catkins attractive to bees, good source of insect food for birds
Hazel	*Corylus avellana*	Food for birds, insects and mammals, nesting sites
Hawthorn	*Crataegus monogyna*	Flowers attractive to insects, fruits eaten by birds, good shelter and nesting site
Lavender	*Lavendula spp*	Flowers attract many insects, seeds popular with finches
Privet	*Ligustrum vulgare*	Flowers attract butterflies, produces berries
Rose	*Rosa spp*	Fruits of some varieties attractive to birds
Rosemary	*Rosmarinus officinalis*	Flowers attract many insects

[4] **RSPB** (2010) *Recommended shrubs for the garden* [Online] Available from: http://www.rspb.org.uk/Images/Shrubs_tcm9-162426.pdf [Accessed on 10/06/10]

Planting to attract bats

The use of certain species of plant that are fragrant in the evening will attract some insect species that bats feed on. It turn, this may attract bats to the site[5]. Suggested plants are included in Table D4.

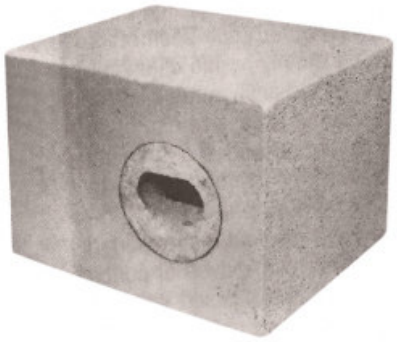
Table D4: Flowering Plants to Attract Bats

Common Name	Scientific Name
Yarrow	*Achillea millefolium*
Wild angelica	*Angelica sylvestris*
Cornflower	*Centaurea cyanus*
St John's wort	*Hypericum sp.*
Ox-Eye daisy	*Leucanthemum vulgare*
Night-scented stock	*Matthiola bicornis*
Tobacco plant	*Nicotiana affinis*
Evening primrose	*Oenothera biennis*
Wild marjoram	*Origanum vulgare*
Field poppies	*Papaver rhoeas*
Primrose	*Primula vulgaris*
Feverfew	*Tanacetum parthenium*

[5] **Bat Conservation Trust** (May 2007) *Encouraging Bats: A guide for bat-friendly gardening and living* [Online] Available from: http://www.bats.org.uk [Accessed on 04/03/11]

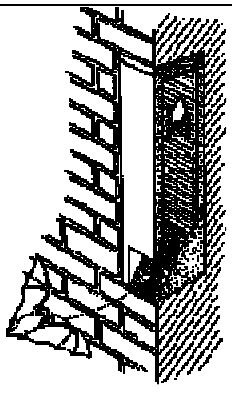
Appendix E: Bird and Bat Box Option Examples

Table E1: Bird Boxes[6]

Name of Model	**Schwegler No 25 Swift Brick Box**
Material	SCHWEGLER wood-concrete
Size and Dimension	Height: 240mm Width: 180mm Depth: 180mm Weight: 7.3kg
Comments	Designed for installation into the fabric of a building, this box is suitable for swifts. The box should be positioned on a building at a height of at least 2m and preferably higher (eg. under the eaves of a building). Ideally the entrance hole should face any direction from north to east. Boxes should not face south or they will get too hot.
Picture	

[6]Alana Ecology (2008) Equipment [Online] Available from: http://www.alanaecology.com/acatalog/index.html [Accessed on 04/03/11]
Jacobie (2009) Equipment [Online] Available from: http://www.jacobijayne.co.uk/ [Accessed on 04/03/11]
Schwegler (2009) Equipment [Online] Available from: http://www.schweglershop.de/shop/index.php?language=en [Accessed on 04/03/11]

Table E2: Bat Box and Brick Option Examples

Name of Model	**Schwegler 1FQ Bat Box for external attachment to buildings**	**Schwegler 1FR Bat Tube**
Material Used	Woodcrete (75% wood sawdust, concrete and clay mixture)	Woodcrete (75% wood sawdust, concrete and clay mixture)
Size and dimension	Height: 56.5cm Width: 35cm Depth: 8.5cm Weight: 15kg	Width: 20cm Height: 47.5cm Depth: 12.5cm Weight: 13kg
Comments	The latest model from Schwegler is an attractive box designed specifically to be fitted on the external wall of a house, barn or other building. Equally appealing to bats as a roost or a nursery, it features a special porous coating to help maintain the ideal temperature inside as well as a roughened front panel to enable the bats to land securely. Access into the box is via a step-like recess. Inside the box, rough pieces of wood are incorporated into the back of the box which are good insulators and are used by the bats as perches. The internal layout offers three different areas with varying degrees of brightness and temperature. This durable box is easy to attach to most walls, requires no maintenance or cleaning and will last for decades.[8]	This Tube system meets the characteristic behavioural requirements of the types of bats that inhabit buildings. The design maintains excellent climatic conditions inside the Tube allowing the animals to either hang onto the wooden rear or onto the wood-concrete front. It requires no maintenance because droppings fall out of the entrance ramp. Installation: Can be installed on external walls – either flush or beneath a rendered surface in concrete and, during renovation work, under wooden panelling or in building cavities (e.g., slab-type building structures, bridges, etc). If required, it can be painted using standard air-permeable exterior paint.[7]
Picture[8],[7]		 

[7] Schwegler (2009) Equipment [Online] Available from: http://www.schweglershop.de/shop/index.php?cPath=34_38 [Accessed on 04/03/11]
[8] Alana Ecology (2008) Equipment [Online] Available from: http://www.alanaecology.com/acatalog/Schwegler_Boxes.html [Accessed on 04/03/11]

Appendix F: UK Legislation Summary

Table F1: Key Protection Afforded to Species and Habitats

Legislation	Brief Description
EU / Worldwide	
The Birds Directive (79/409/EEC)	The Directive aims to maintain the favourable conservation status of all wild bird species (Article 2). It establishes a general scheme for the protection of all wild birds (Article 5). The Directive also requires the identification and classification of Special Protection Areas (SPAs) for rare or vulnerable species listed in Annex I of the Directive and regularly occurring migratory species.
The Habitats Directive (92/43/EEC)	Annex II of the Directive lists the European protected species that are afforded special protection under this Directive. See the Conservation of Habitats and Species Regulations 2010 section below for the implications of this Directive in the UK context.
Convention on Biological Diversity	Conservation of biodiversity (the variety of life on earth) is an essential element of sustainable development. The UK Biodiversity Action Plan (BAP) provides the framework for fulfilling the UK's responsibilities towards the Convention on Biological Diversity via the NERC Act. See Table H2 for more information on the UK BAP list.
UK	
Wildlife and Countryside Act, 1981, as amended (WCA)	The WCA sets out the protection offered to various species of plants, birds and animals in England and Wales. Bird species listed in Schedule 1, animal species listed in Schedule 5 and plant species listed in Schedule 8 of the WCA are protected. Under section 14(2) of the WCA it is an offence to "*plant or otherwise cause to grow in the wild*" any plant listed in Schedule 9, Part II of the Act. Japanese knotweed (*Fallopia japonica*) is a Schedule 9, Part III species. The WCA has since been strengthened and updated by the CRoW Act (see below).
Protection of Badgers Act 1992	Offenses under the Act include: (1) taking, injuring or killing badgers; (2) cruelty to badgers; (3) interference with badger setts; (4) selling and possession of live badgers and (5) marking and ringing. Exceptions and licences can apply.
Countryside and Rights of Way Act 2000 (CRoW Act)	The CRoW Act strengthens the legal protection offered to species listed on Schedule 1 and Schedule 5 of the WCA by introducing a new offence of '*reckless disturbance'.* Section 74 of the CRoW Act, which provided a statutory basis for biodiversity conservation to be undertaken as a matter of policy, has now been replaced by sections 40, 41 and 42 of the NERC Act.

Legislation	Brief Description
Natural Environment and Rural Communities Act 2006 (NERC Act)	The NERC Act created a new integrated agency 'Natural England' to act as a champion for the natural environment and officially established a Commission for Rural Communities. The Act makes provision in respect of biodiversity, pesticides harmful to wildlife and the protection of birds, and in respect of invasive non-native species. It alters enforcement powers in connection with wildlife protection, and extends time limits for prosecuting certain wildlife offences. It addresses a small number of gaps and uncertainties which have been identified in relation to the law on SSSIs. It also amends the functions and constitution of National Park authorities, the functions of the Broads Authority and the law on rights of way. Section 40 to 42 of the NERC Act replace and extend the requirements of Section 74 of the CRoW Act. Section 40(1) of the NERC Act states every public body, including local planning authorities, must '*have regard'* for conserving biodiversity.
The Conservation of Habitats and Species Regulations 2010	The provisions of the Habitats Directive are transposed into English law by the Conservation of Habitats and Species Regulations. Schedule 2 of these Regulations lists the European protected species of animals whilst Schedule 5 lists the European protected species of plants. Under the Conservation of Habitats and Species Regulations, it is illegal to deliberately capture, kill, disturb, or trade in the animals listed in Schedule 2, or pick, collect, cut, uproot, destroy, or trade in the plants listed in Schedule 5 without a licence granted by the appropriate authority. Licences can only be granted for certain purposes and if a set of conditions have been met.

Proposed development must be able to show that all reasonable measures have been taken to ensure that protected species are not disturbed. The habitats of all Conservation of Habitats and Species Regulations Schedule 2 species, WCA Schedule 1 and some WCA 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 UK Biodiversity Action Plan

Biodiversity encompasses the whole variety of life on earth. It includes the whole of the natural world from the commonplace to the critically endangered. However, the world is losing biodiversity at an ever-increasing rate as a result of human activity. In the UK, we have lost over 100 species during the last century. In 1992, the global community responded to biodiversity loss by publishing the Convention on Biological Diversity. Table H2 below summarises the legislative background to the UK BAP, which is the UK's framework to meet its responsibilities under the Convention on Biological Diversity.

Capabilities on project:
Environment

Table F2: Legislative Background to the UK BAP

Legislative Background to the UK BAP
The UK's responsibilities in relation to the **Convention on Biological Diversity** are given a framework in the form of the UK BAP. The **NERC Act** increases the legislative impetus behind BAPs by requiring the relevant authorities to '*have regard'* to the species and habitats listed. Section 40(1) of the NERC Act states every public body, including local planning authorities, must '*have regard'* for conserving biodiversity. Under Section 41, the Secretary of State must compile and publish a list of species and habitats that are '*are of principal importance for the purpose of conserving biodiversity*'. In 2008, the **S41 List** was published to fulfil the Secretary of State's duty under Section 41 of the NERC Act. The S41 List is the same as the current UK BAP List.