Ecological Assessment

At

101 Camley Street, London, NW1 0PF

For

Gateway Evolution Limited

June 2014

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Ecological Assessment

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1. INTRODUCTION

1.1. Background & Proposals

1.1.1. Aspect Ecology has been commissioned on behalf of Gateway Evolution Ltd to undertake ecological survey and assessment work in respect of the site, located at 101 Camley Street, Kings Cross in the London Borough of Camden (see Plan 3695/ECO1).

1.1.2. The site is proposed for redevelopment to provide predominantly new residential provision, along with flexible commercial space. It is understood that the scheme is registered under the Building Research Establishment's Environmental Assessment Methodology (BREEAM).

1.2. Site Characteristics

1.2.1. The site is located within an existing heavily developed area of central London, approximately 300 metres north west of St. Pancras International Railway Station. The site is bounded to the east by Camley Street and to the south west by Granary Street. The northern site boundary lies adjacent to the Regent's Canal and associated moorings.

1.2.2. The site itself is occupied by an existing postal distribution centre and accordingly is dominated by existing hardstanding and buildings, with the only vegetation present in the form of a small number of conifers at the southern boundary, a number of ornamental planters and colonising weeds within gaps in the hardstanding.

1.3. Qualifications

1.3.1. In line with BREEAM requirements, the author holds the following qualifications and experience:

- The author is a fully qualified ecologist and holds an honours degree in Biology from The University of Nottingham and PhD in ecology from The University of Bristol.
- The author is a practising ecologist at Aspect Ecology Ltd and in line with BREEAM requirements has had more than 3 years relevant such experience in the last 5 years.
- The author is a full member of the Institute of Ecology and Environmental Management (IEEM) of which members are subject to a professional code of conduct and peer review.

1.4. Ecological Assessment

1.4.1. This document assesses the ecological interest of the site as a whole. The importance of the habitats and species present is evaluated. Where necessary, mitigation measures are recommended so as to safeguard any significant existing ecological interest within the site and where appropriate, opportunities for ecological enhancement are proposed with reference to national and local Biodiversity Action Plans (BAPs).

1.4.2. In addition, this report includes an assessment of the likely qualification of the development for the relevant credits available under the ecological component of the BREEAM New Construction 2011 Assessment.

2. SURVEY METHODOLOGY

2.1. The methodology utilised for the survey work can be split into 3 main areas; namely desktop study, habitat survey and faunal survey. These are discussed in more detail below.

2.2. Desktop Study

2.2.1. In order to compile background information on the site and its immediate surroundings, information on statutory nature conservation designations was reviewed on from the online Multi-Agency Geographic Information for the Countryside (MAGIC) database, which incorporates information from Natural England. The information obtained from MAGIC is reproduced at Appendix 1 and, where appropriate referred to in the text and at Plan 3695/ ECO2.

2.2.2. In addition, the adopted London Borough of Camden online proposals map and online information available from Greenspace Information for Greater London (GiGL) were reviewed in order to provide information on the locations and nature of non-statutory nature conservation designations.

2.2.3. The National Biodiversity Network (NBN) database was also reviewed for up to date relevant records where appropriate in respect of the site and adjacent areas in order to inform and direct the survey work and fully inform the ecological assessment. Where records are held, these are available via the NBN, but cannot be specifically referenced without further permission from the information provider and accordingly, are not specifically referred to within the text. Given the relatively small size, heavily developed urban/metropolitan setting and in particular the nature of the habitats present, which are clearly unlikely to support any use by protected faunal species, a full search of protected species records from the local records centre (GIGL) was not considered warranted in this case.

2.2.4. The Woodlands Trust database was searched for any records of veteran trees within or adjacent to the site, while the Pond Conservation database was also searched for any records of priority ponds or important areas for ponds in the vicinity of the site. In addition, the inventory and survey for Open Mosaic Habitats on Previously Developed Land resource was reviewed for relevant areas within the vicinity of the site.

2.3. Habitat Survey

2.3.1. The site was surveyed in April 2014 in order to ascertain the general ecological value of the land contained within the boundaries of the site and to identify the main habitats and features present.

2.3.2. The site was surveyed based on the Phase 1 Habitat Survey methodology[1], as recommended by Natural England, whereby the habitat types present are identified and mapped, together with an assessment of the species composition of each habitat. This technique provides an inventory of the basic habitat types present and allows identification of areas of greater potential which require further survey. Any such areas identified can then be examined in more detail through Phase 2 surveys. This method was extended, in line with the Guidelines for Preliminary Ecological Appraisal

[1] Joint Nature Conservation Committee (2010) "Handbook for Phase 1 habitat survey: A technique for environmental audit."

(GPEA)[2], to include recording details of notable or protected species present, or habitats that may have the potential to support notable or protected species.

2.3.3. Using the above method, the site was classified into areas of similar botanical community types, with a representative species list compiled for each habitat identified.

2.4. Faunal Surveys

2.4.1. General faunal activity, such as mammals or birds observed visually or by call during the course of the surveys was recorded. Specific attention was also paid to the potential presence of any protected, rare or notable species, and specific appraisal and inspection survey work was undertaken in regard to bats.

Bats[3]

2.4.2. **Buildings.** External and internal inspections of the buildings present within the site were undertaken in order to search for signs of any use by bats where access was available.

2.4.3. Evidence for the presence of bats was searched for, with particular attention paid to any loft voids and gaps between rafters and beams. Specific searches were made for bat droppings that can indicate present or past use and the extent of use, whilst other signs that can indicate the possible presence of bats were also searched for, e.g. presence of stained areas or feeding remains.

2.4.4. **Trees**. The trees present within the site were appraised for their likely potential to support roosting bats. Visual searches were undertaken, with the use of binoculars where necessary. For a tree to be classed as having some potential for roosting bats it would normally support one or more of the following characteristics:

- obvious holes, e.g. rot holes and old woodpecker holes;
- dark staining on the tree below a hole;
- tiny scratch marks around a hole from bats' claws;
- cavities, splits and/or loose bark from broken or fallen branches, lightning strikes etc.; and
- very dense covering of mature ivy over trunk.

2.4.5. Visual assessment of the trees within the site followed that set out within the Bat Conservation Trust (BCT) "*Bat Survey – Good Practice Guidelines 2nd Edition*" 2012, whereby individual trees are assigned to one of the following categories according to their apparent potential to support roosting bats;

- *Known or Confirmed Roost.*
- *Category 1** – trees with multiple highly suitable features capable of supporting larger roosts

[2] Institute for Ecology and Environmental Management (IEEM) (2012) "Guidelines for Preliminary Ecological Appraisal"
[3] Surveys based on: Hundt, L. (2012) Bat Surveys: Good Practice Guidelines, 2nd Edition, Bat Conservation Trust

- *Category 1* – trees that have definite bat potential, supporting fewer suitable features than category 1* trees or with potential for use by single bats
- *Category 2* – trees with no obvious potential, although the tree is of a size and age that elevated surveys may result in cracks or crevices being found; or the tree supports some features which may have limited potential to support bats
- *Category 3* – trees with no potential to support bats

2.5. Survey Constraints

2.5.1. All of the species that occur in each habitat would not necessarily be detectable during survey work carried out at any given time of the year, since different species are apparent at different seasons. Survey work was undertaken outside of the optimal seasonal period for botanical work, however the existing nature of the site and surroundings is such that it is considered that a robust assessment of the intrinsic ecological interest of the site could be made.

2.5.2. Further specific consideration of constraints in respect of individual species or issues is set out below, within the body of the text as appropriate.

3. ECOLOGICAL DESIGNATIONS

3.1. Statutory and non-statutory ecological designations identified within the vicinity of the site are shown at Plan 3695/ECO2 and summarised at Table 3.1., below.

3.2. Statutory Designations

3.2.1. No identified statutory nature conservation designations are located within or immediately adjacent to the site itself. The nearest such designation to the site is Camley Street Natural Park Local Nature Reserve (LNR), which is located approximately 150 metres south east of the site. Camley Street Natural Park LNR is designated as an important educational resource, whilst also supporting a number of habitats and species that are notable within Greater London.

3.2.2. All other identified statutory nature conservation designations are well separated from the site, including within heavily developed metropolitan areas within central London.

3.2.3. **Evaluation.** The site does not contain, nor is it adjacent to any statutory nature conservation designation, whilst further it is set within an existing heavily developed area within central London. Camley Street Natural Park LNR is located approximately 150m from the site, whilst the LNR is set up to accept visitors, with a managed visitors centre and pathways such that any additional recreational visits could be well accommodated. Regent's Canal provides a potential link between the site and the LNR. However, the nature of the canal and surroundings is such that little vegetation is present along the canal corridor in the location of the site, whilst a number of considerable bridges and structures are present between the two further limiting connectivity between the two, such that no continuous vegetated corridor is present. Further, given the existing developed and active nature of the site, in the long term the proposals would be extremely unlikely to result in any adverse effect on the LNR. All other statutory nature conservation designations are well-removed from the site boundaries. Accordingly, the proposals are extremely unlikely to result in any adverse effect on any such designations.

3.3. Non-statutory Designations

3.3.1. The nearest Site of Importance for Nature Conservation (non-statutory ecological designation) identified to the site London's Canals Site of Metropolitan Importance for Nature Conservation (SMINC), part of which is located adjacent to the northern site boundary. London's Canals SMINC comprises the whole of the Grand Union Canal system within Greater London and is designated for supporting a wide range of locally notable aquatic flora and fauna. The section of canal situated adjacent to the site comprises a number of apparently private moorings, noted to be in use by three boats at the time of survey. A small number of trees are present, along with Ivy, Bramble and scrub, whilst the banks themselves were noted to be comprised of vertical man made structures with short, trampled vegetation above. Elsewhere along the adjacent sections of canal, including the northern bank these are dominated by man made structures and hardstanding such that taller vegetation (such as that adjacent to the site) is somewhat isolated. Due to the heavily modified nature of the canal,

aquatic species within the water are similarly limited, albeit occasional vegetation is present in sheltered areas.

3.3.2. The next nearest such designation to the site is Camley Street Natural Park (SMINC), which is discussed above in relation to the LNR designation.

3.3.3. **Evaluation:** The site boundary lies outside of the SMINC and accordingly, the proposed development of the site itself would not be anticipated to result in any direct effects on the canal. Further, the existing active nature of the site, comprised entirely of buildings and active service yard in the section adjacent to the canal corridor are such that the redevelopment of the site is unlikely to result in any long term adverse effect on the canal corridor through activities contained within the site itself. Nonetheless, particularly should the proposals include the removal of the boundary wall present the potential exists for run-off or contaminants to enter the water channel during construction work, whilst given the location of the site situated immediately south of the canal, potential exists for shading from buildings and/or new lighting to affect the canal corridor. Further, it is understood that the proposals also incorporate potential for provision of a new footbridge over the canal corridor, connecting numbers 101 and 103 Camley Street, albeit this is understood to outwith the current site boundary line. Accordingly, suitable mitigation measures and safeguards are recommended at section 6. Below. Subject to the successful incorporation of these measures the existing ecological interest of the SMINC designation within the vicinity of the site would be unlikely to be adversely affected.

3.3.4. All other identified non-statutory nature conservation designations are removed and separated from the site such that the proposals are unlikely to result in any significant adverse effects on any such designations.

3.3.5. **Ancient Woodland.** There are no areas of ancient woodland situated within or immediately adjacent to the site, whilst all identified areas of ancient woodland (both semi-natural and replanted) are very well removed and separated from the site, including by extensive urban development.

3.3.6. **Evaluation:** All identified areas of ancient woodland are well removed and separated from the site, including by existing heavily developed urban areas and barriers such that they are unlikely to be adversely affected by the proposals.

Other Designated Features

3.3.7. A search of the Woodlands Trust database, Pond Conservation database and The inventory and survey for Open Mosaic Habitats on Previously Developed Land returned no records of veteran trees or priority ponds / important areas for ponds or valuable brownfield habitats within the site or immediately surrounding areas and accordingly, no such identified features would be affected by the proposals.

Table 3.1: Statutory and non-statutory nature conservation designations identified within the vicinity of the site.

Designation Name	Designation	Approximate Distance and Direction from Site
Statutory Designations		
Camley Street Nature Park	LNR	150m SE
Barnsbury Wood	LNR	1.2km NE
Non-statutory Designations		
London's Canals	SMI	Adjacent to North
St Pancras Gardens	SBI 2	50m S
Camley Street Nature Park	SMI	150m SE
Bingfield Gardens	SLI	650m E
Caledonian Park	SBI 1	1km NE
Thornhill Square	SLI	1km E
St James's Gardens	SLI	1km SW
Rochester Terrace Gardens	SLI	1km NW

4. HABITATS & ECOLOGICAL FEATURES

4.1. The following habitats/ecological features were identified within the site:

- Buildings
- Hardstanding and Associated features
- Conifers

4.2. The locations of these habitat types and features are represented on Plan 3695/ECO2, with each habitat type described individually below.

4.3. In addition, consideration is given to the offsite section of Regent's Canal situated adjacent to the northern site boundary.

4.4. Buildings

4.4.1. The site is dominated by the single existing building (B1), which was recorded to be in use by DPD as an existing postal distribution centre. The building is of metal, portal frame construction with largely metal sheet cladding and large doors to the northern façade. The southern part of the building is lower in nature containing office sections.

4.4.2. **Evaluation.** The building supports negligible vegetation limited to occasional colonising weeds at the building base, such that it offers negligible ecological value and its loss to the proposals would be of no ecological importance.

4.5. Hardstanding and Associated Features

4.5.1. The remainder of the site is dominated by hardstanding, largely in the form of concrete and asphalt yard areas and small retaining walls, which support negligible vegetation. Occasional common colonising weeds were noted within gaps at the building bases and cracks, particularly at the site boundaries. An area of gravel is present at the south of the site, overshaded by the boundary conifers in this location (see below), such that negligible colonising weeds were recorded here also.

4.5.2. Part of the northern site boundary with Regent's Canal comprises a brick wall, which was noted to incorporate some Ivy *Hedera helix* extending over from offsite areas. In addition, a very small number of planters were noted, associated with the pedestrian entrance to the south of building B1, containing ornamental planting including Rose *Rosa* spp., Polyanthus and a small number of other common ornamental species and weeds.

4.5.3. **Evaluation:** The hardstanding and associated features support negligible vegetation limited to common colonising weeds and very small, isolated amenity planters. Accordingly, this habitat type offers negligible ecological value and its loss to the proposals would be of no importance.

4.6. Conifers

4.6.1. The only significant vegetation within the site comprises a line of mature Cypress *Cupressus* sp. present at the southern site boundary, situated at the top of a short, brick retaining wall marking the site boundary in this location, with the junction between Camley Street and Granary Street beyond. The conifers are set within an area of gravel and are isolated from

other vegetation, albeit a small number of street trees are also present within the adjacent offsite areas, set within openings in the hardstanding footway associated with the road junction.

4.6.2. **Evaluation:** The conifers present comprise non-native, ornamental planting, situated within hardstanding and isolated from any wider vegetated areas. Accordingly, the conifers offer negligible ecological value and their loss to the proposals is unlikely to be of any ecological importance.

4.7. Habitat Summary

4.7.1. Overall the habitats present within the site boundary are dominated by active buildings and hardstanding, with vegetation limited to conifers and associated colonising weeds, all of which offer negligible ecological value such that the proposals would not result in any loss of ecologically valuable habitats or features.

4.8. Exotic Invasive Plant Species Listed on Schedule 9 of the Wildlife and Countryside Act

4.8.1. No evidence for the presence of any species included within Schedule 9 Part II, such as Japanese Knotweed *Fallopia japonica* or Giant Hogweed *Heracleum mantegazzianum* was recorded at the site during the survey work undertaken. Accordingly, on the basis of the current survey work, such species appear to be currently absent from the site and do not therefore represent a constraint to the proposals.

5. FAUNAL USE OF THE SITE

5.1. During the survey work, general observations were made of any faunal use of the site with specific attention paid to the potential presence of protected or notable species. In addition, specific consideration was paid to the potential presence of bats.

5.2. **Mammals**

Bats

5.2.1. **Legislation**. All British bats are classed as European Protected Species under the Conservation of Habitats and Species Regulations 2010, and are also listed under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended). As such, both bats and their roosts (breeding sites and resting places) receive full protection under the legislation.

5.2.2. **Survey Results and Evaluation - Roosts.**

5.2.3. The existing building within the site comprises a portal framed, metal structure with predominantly metal sheet cladding. Internally, the building is open into the roof structures across the majority of areas, albeit a false-ceiling is present at the small southern section above a small number of offices. The roof supports a number of skylight sections, whilst it remains in active use as a postal distribution depot, such that it is active, light and noisy internally. The building is therefore of a construction type that is extremely unlikely to support roosting bats, albeit potential access points are present across the building which could provide access to bats should they be present. No evidence for any use of the building by bats was recorded during the inspection survey work undertaken.

5.2.4. The conifers present similarly do not support any features offering potentially suitable opportunities for roosting bats. No other trees are present within the site.

5.2.5. Accordingly, the site is unlikely to support any roosting bats, such that the proposals are unlikely to result in any adverse effect on this group.

5.2.6. **Foraging / Commuting Features.** In terms of foraging opportunities, the site itself is dominated by the existing building and hardstanding in use as an active postal distribution depot, which is well-lit and with the exception of the northern boundary with the canal, surrounded by existing lit roads. Accordingly, the site clearly does not represent an important foraging resource or commuting route for bats.

5.2.7. The offsite canal corridor situated adjacent to the northern site boundary provides a linear habitat corridor and likely supports an invertebrate population providing a potential food source for bats, whilst providing a linear navigational feature. Further, the small number of offsite trees and scrub associated with the canal section adjacent to the site provides some cover and further invertebrate habitats. Nonetheless, the majority of the canal within the surrounding areas is devoid of vegetation, with man-made vertical banks and towpath, situated within heavily developed areas, including the Camley Street bridge adjacent to the site boundary thereby limiting any potential importance for bats.

Other Mammals

5.2.8. **Survey Results and Evaluation.** No evidence for the presence of any other protected, rare or notable mammal species was recorded within the site during the survey work undertaken. The site is securely fenced in all directions in line with its use as an active postal distribution depot, whilst the habitats present support little vegetation, limited to a small number of conifers, isolated from other vegetation and common colonising weeds.

5.2.9. The habitats present within the site are therefore extremely unlikely to provide suitable opportunities for mammal species, albeit occasional visits by common urban mammal species, such as Brown Rat *Rattus norvegicus* cannot be ruled out. Nonetheless, the extent, location and limited vegetative habitats present are such that the site is unlikely to support more than occasional transient use even by these species.

5.2.10. Urban mammal species likely to frequent the site, such as Brown Rat remain common in both a local and national context. As such these species carry no legal protection and the loss of potential opportunities for these species to the proposals would be of little importance. In any event, it is likely that these species would continue to wander onto the site following completion of construction works.

5.3. Birds

5.3.1. **Legislation.** All wild birds and their nests receive protection under Section 1 of the Wildlife and Countryside Act 1981 (as amended) in respect of killing and injury, and their nests, whilst being built or in use, cannot be taken, damaged or destroyed. Species included on Schedule 1 of the Act receive greater protection and are subject to special penalties.

5.3.2. **Conservation Status.** The RSPB categorise British bird species in terms of conservation importance based on a number of criteria including the level of threat to a species' population status[4]. Species are listed as Green, Amber or Red depending on the level of importance. Red Listed species are considered to be of the highest conservation concern being either globally threatened and/or experiencing a high/rapid level of population decline (e.g. a reduction in breeding population size of approximately 50% over the past 25 years or since 1969, when the first species assessment was made).

5.3.3. **Survey Results And Evaluation.** The majority of the site is comprised of hardstanding with negligible vegetation, albeit the conifers present, along the southern boundary provide some cover and minor opportunities for use by nesting and foraging urban bird species. Nonetheless, the active nature of the site and urban setting is such that any potential for use by bird species is extremely limited.

5.3.4. Nonetheless, any clearance of suitable habitats during the nesting season may have the potential to result in damage or disturbance to nests should they be present and as such safeguards are recommended (as detailed at section 6, below).

[4] RSPB "The population status of birds in the UK - *Birds of Conservation Concern: 2009*"

5.4. Herpetofauna

5.4.1. **Legislation.** All reptile species receive protection under legislation in the UK. Due to their relatively common and widespread status, Slow-worm *Anguis fragilis*, Grass Snake *Natrix natrix*, Common Lizard *Lacerta vivipara* and Adder *Vipera berus* receive only partial protection under the Wildlife and Countryside Act 1981 (as amended) being protected from deliberate killing or injury, their habitat receiving no statutory protection. These species are also listed as UK BAP species.

5.4.2. All British amphibian species receive a degree of protection under the Wildlife and Countryside Act 1981 (as amended). Great Crested Newt *Triturus cristatus* is fully protected under Schedule 5 of this legislation, and is also classed as a European Protected Species under the Conservation of Habitats and Species Regulations 2010. As such, both Great Crested Newt and habitats utilised by this species are afforded protection. This species is also listed as a UK BAP species.

5.4.3. **Survey Results and Evaluation.** The site is dominated by buildings and hardstanding with the only vegetation in the form of a number of conifers and colonising weed species, surrounded by existing developed areas. Accordingly, the site does not provide any potential opportunities for reptile or amphibian species and as such it is clear that these groups are absent and do not represent a potential constraint on the proposals.

5.5. Invertebrates

5.5.1. **Survey Results and Evaluation.** No evidence for the presence of any protected, rare or notable invertebrates was recorded within the site, whilst the size and setting of the site, along with the habitats present (dominated hardstanding, with vegetation including a high proportion of non-native ornamental species) is such that they are extremely unlikely to support any notable species or invertebrate assemblages. Indeed the nature of the site is such that at best, only occasional common urban invertebrate species would be anticipated to be present and accordingly, this group does not represent a constraint to the proposals

6. RECOMMENDATIONS AND ENHANCEMENTS

6.1. The existing habitats that make up the site appear to offer no more than low to negligible ecological value and appear largely unconstrained in relation to the proposed redevelopment of the site on the basis of the survey work undertaken. Further the small size and metropolitan setting of the site, within an existing heavily developed urban area in central London are such that potential for meaningful ecological enhancement measures is limited. Nonetheless, in order to ensure that the proposals incorporate suitable measures where possible in order to benefit wildlife and safeguard existing ecological use, a number of measures and enhancements are set out below. These measures would aim to maximise opportunities for wildlife under the proposals in line with planning policy requirements, whilst also attempting to contribute towards the aims of local and national Biodiversity Action Plans (BAPs) insofar as is possible.

Recommendations

6.2. **Ecological Designations**

London's Canals SMINC

6.2.1. The site is situated immediately south of Regent's Canal, which forms part of London's Canals SMINC designation. Accordingly, a number of potential risks have been identified, for which suitable mitigation measures/safeguards are recommended in order to prevent any significant adverse effects on the canal. Specifically, potential exists for run-off or contaminants to enter the water channel during construction work as well as potential disturbance during construction of any proposed new footbridge outwith the current site boundary line. As such, it is recommended that construction measures be put in place to safeguard the canal. Such measures would likely include:

- Provision and maintenance of protective fencing at the site boundary with the canal throughout the course of construction works.
- Storage of chemicals and other materials to be kept away from the canal boundary.
- Measures such as temporary bunding and run-off to be put in place to prevent run-off into the canal corridor.

6.2.2. In addition, it is recommended that the proposals incorporate additional vegetation along the northern site boundary with the canal to supplement and extend the existing canal corridor and benefit wildlife. In addition, given the location of the site, immediately south of the canal corridor, it is recommended that any new buildings at the site be designed to minimise sun-shading to open canal sections.

6.2.3. Light spill into the canal corridor has potential to affect nocturnal/crepuscular wildlife using the canal, albeit the location and setting of the canal, within a heavily developed and generally well-lit area in central London is such that any fauna would likely be well-habituated to associated lighting levels, particularly given the general lack of connected vegetation or cover associated with the canal corridor in the vicinity of the site. In particular, bat species likely to forage within the canal would likely centre on common urban species (e.g. Pipistrelles) that are known to be less sensitive to lighting. Nonetheless, where possible it is recommended that any lighting

scheme be designed to maintain dark areas along the canal, with lighting focussed on areas within the site and directed away from the canal corridor.

6.2.4. Subject to these measures the existing ecological interest of the SMINC designation within the vicinity of the site would be unlikely to be adversely affected.

6.3. General Construction Safeguards

6.3.1. In order to minimise any potential adverse effects associated with construction activities at the site, a number of general safeguarding measures should be implemented, including the following:

- Storage of chemicals and hazardous materials should be in line with best practice guidelines, ensuring that they are kept secure and away from the site boundaries and cannot be accessed or knocked over by roaming animals;
- Fires should only be lit in secure compounds and not allowed to remain lit during the night;
- Protective measures to prevent damage or encroachment to the canal corridor.

6.4. Nesting Birds

6.4.1. The vegetation present appears to offer some (albeit very limited) potential opportunities for nesting birds. Accordingly, in order to safeguard this group and avoid any potential offence under the Wildlife & Countryside Act 1981 (as amended) in respect of common nesting birds, it is recommended that any clearance of suitable nesting habitats be undertaken outside of the bird nesting season (i.e. outside of March to August inclusive). Should this not be possible, areas due to be worked on should first be checked by a suitably qualified ecologist in order to confirm the absence of any active nests prior to removal. Any active nests identified would need to be retained and protected until the end of the nesting season or until the birds have fledged.

Ecological Enhancements

6.5. National planning policy in the form of the National Planning Policy Framework sets out that opportunities to incorporate biodiversity in and around developments should be encouraged. Opportunities for meaningful ecological enhancements are extremely limited due to the existing nature, setting and location of the site, within an existing heavily developed area, surrounded entirely by existing development and roads. Nonetheless, the recommendations and enhancements summarised below are considered appropriate given the context of the site.

6.6. Landscape Planting

6.6.1. It is recommended that new landscape planting be provided as part of the scheme, particularly associated with the northern boundary with the canal corridor. In particular it is recommended that planting include native species or those of recognised wildlife value. In addition, where green roof areas are proposed, it is recommended that consideration be given to provision of native habitats and species within these features.

6.7. Habitat Management

6.7.1. Furthermore, it is recommended that suitable management be implemented across these areas for the benefit of wildlife in the long term to maximise opportunities at the site for a range of species

6.8. Bird Boxes

6.8.1. Negligible existing nesting opportunities are present for birds at the site and as such it is recommended, where possible, that enhancements are provided in the form of additional potential nest sites for common urban bird species in the form of nesting boxes. Given the urban nature of the proposals, it is recommended that nesting opportunities be provided at the site in the form of ledges and boxes, specifically targeting declining urban species such as House Sparrow *Passer domesticus* and Swift *Apus apus*. Bird boxes should be positioned in suitable locations high on new building walls, particularly associated with the canal boundary where possible.

Summary of Recommendations

- General construction safeguards and protective measures;
- Safeguards in respect of nesting birds during habitat clearance works;
- Provision of Bird Boxes if possible;
- New native planting and management of new/retained habitats for the benefit of wildlife.

7. BREEAM ASSESSMENT

7.1. Introduction

7.1.1. BREEAM is the Building Research Establishment's Environmental Assessment Method.

7.1.2. It is used to assess the environmental performance of both new and existing buildings, and is regarded by the UK's construction and property sectors as the measure of best practice in environmental design and management. It is a widely used means of reviewing and improving the environmental performance of housing developments and covers a wide range of environmental issues, including ecology, within one assessment.

7.1.3. It is the purpose of this section to address the ecology component of the assessment and to detail measures that will enhance the ecological value of the site and result in significant gains for nature conservation.

7.2. BREEAM New Construction 2011 Assessment

7.2.1. BREEAM Code for New Construction 2011 Assessment awards credits under a number of categories, including the following 4 which specifically relate to the ecological value of the development:

LE02: Ecological Value of the Site and Protection of Ecological Features (1 credit);
LE03: Mitigating Ecological Impact (2 credits);
LE04: Enhancing Site Ecology (3 credits);
LE05: Long Term Impact on Biodiversity (up to 2 credits).

7.2.2. In order to receive BREEAM New Construction 2011 credits, the site is assessed against criteria given for each category, in the BREEAM New Construction 2011 Guidance Notes. The relevant sections of the guidance notes are reproduced at Appendix 2.

7.2.3. The qualification of the proposed development at the site for BREEAM New Construction 2011 credits relating to ecology is assessed below.

7.2.4. Where appropriate, recommendations are made for specific ecological protection and enhancements that will aim to benefit nature conservation in the local area. Particular attention is paid, where appropriate, to enhancements that accord with the aims of national and local BAPs.

7.3. LE02: Ecological Value of the Site and Protection of Ecological Features

7.3.1. Under category LE02, a single credit is available:

'"This credit can be awarded where the construction zone is defined as 'land of low ecological value' (either using the BREEAM checklist , or as identified by a suitably qualified ecologist) and where all features of ecological value in the surrounding areas are adequately protected from damage."

7.3.2. As set out above within this report (summarised at paragraph 4.7), the habitats present within the site's identified red line boundary are of negligible

to low ecological value, comprising buildings, hardstanding, amenity planting and a small number of conifers.

7.3.3. The site is situated adjacent to the Grand Union Canal, including associated bankside vegetation, situated beyond the site boundary wall. In this location, the canal bank itself comprises vertical, man-made banks, with vegetation above including trampled planting, Bramble and ruderal species and a small number of trees, which appear to offer no more than low ecological value, whilst the trees are situated adjacent to the western end of the site and will be retained and protected. Where possible it is recommended that suitable safeguards be incorporated in order to prevent any adverse effects on the canal corridor and associated retained trees. As such, subject to these measures, the land within the construction area can be defined as land of low ecological value in respect of BREEAM criteria.

7.3.4. On the basis of the above consideration and the identified site red line boundary, it is therefore considered that the development can be awarded the **1 credit** available for under LE2.

7.4. LE03: Mitigating Ecological Impact

7.4.1. Under LE03, up to 2 credits are available:

One credit is available where *'the change in ecological value is less than zero but equal to or greater then minus nine i.e. a minimal change'.*

Two credits are available where *'the change in ecological value of the site is equal to or greater than zero i.e. no negative change'.*

7.4.2. Change of ecological value of a site with regard to the BREEAM 2011 assessment is approximated using the average number of plant species estimated to be present at the site (where a suitably qualified ecologist has been appointed actual species numbers must be used). The estimated ecological value for the site before and after development can therefore be calculated by multiplying the area of the different habitat types by actual species numbers and then dividing by the total site area:

$$\text{Ecological Value} = \frac{\sum \text{(Habitat area x Species number for the habitat)}}{\text{Total Site area}}$$

7.4.3. The estimated change in ecological value can then be calculated by subtracting the total value obtained for the site before development from the total value for the site after development using the final detailed layout and planting plans. A negative result represents a decrease in ecological value while a positive result represents an increase in ecological value at the site.

7.4.4. The total site area is estimated to be 0.35 hectares.

7.4.5. Existing ecological values currently present at the site (prior to development) are set out below at Table 7.1.

Plot Type	Area of Plot Type (m^2)		Number of Species*		Species x Area of Plot Type
Buildings, Hardstanding and Amenity Planting/Conifers	3540	x	0	=	0
Total Site Area (1)	3540			(2) Total Species Values =	0
				Species before development= Total species x area of plot type / Total area = (2)/(1)=	0

Table 7.1: Existing Ecological Value of Site
***** This number has been derived based on the native species/species of wildlife value recorded during the site survey work.

7.4.6. *The total ecological value (as defined by BREEAM guidance) for the site before development is therefore calculated to be 0.00.*

Ecological value following the proposals

7.4.7. The ecological values calculated in line with BREEAM guidance for the proposals (post development) are set out at Table 2., below, based on the indicative information received from Turkington Martin (Including Drawing 156XR01).

7.4.8. Given the existing nature, extremely constrained space and surroundings at the site it is clear that there is little potential for inclusion of semi-natural habitats or wildlife planting within the identified red line boundary of the site (albeit considerable amenity/landscape planting will be provided, such that vegetated areas are frequent over the site, whilst areas of green roof will also be provided over the new buildings), as reflected in the calculated values (see also below). Further, new offsite planting, in particular associated with the canal boundary provide the potential for additional enhancements through provision of native species albeit outside of the identified red line boundary, and it is recommended that this incorporate native species common to the local area that offer additional wildlife value.

7.4.9. On the basis of the proposals (incorporating new native planting areas, particularly associated with the canal boundary), the calculated ecological values are set out below with respect to the identified red line boundary. Information on the precise areas of native/wildlife friendly areas to be planted remains to be determined and accordingly, these figures would be anticipated to be confirmed at the detailed design stage. Should it not be possible to provide areas of additional native planting within the identified red line boundary as part of the detailed design, the proposals would be considered to result in a post-development value of 0.

Ecological value following the proposals

Plot Type	Area of Plot Type (m^2)		Number of Species		Species x Area of Plot Type
Buildings, Hardstanding and Amenity Planting	*TBD*	X	0	=	0
New native planting*	*NB Final areas and species planting mixtures to be determined at the detailed design stage following planning granting of permission.*				
New biodiverse green roof areas					

Total Site Area (1)	3540		(2) Total Species Values =	*TBD*
			Species following development= Total species x area of plot type / Total area = (2)/(1)=	*TBD*

Table 7.2: Ecological Value of Site Post Development. Habitats based on indicative planting details provided by Turkington Martin. * New native planting within the extent of the identified red line boundary, comprising entirely native species of wildlife value. As set out, the precise scores attributed will need to be determined at the detailed design stage, following the granting of planning permission, once detailed planting plans and areas are available.

7.4.10. *The total ecological value calculated (in line with BREEAM procedure) for the site after development (subject to incorporation of a new native planting and green roofs within the identified site red line boundary, of any area) is therefore confirmed to be positive, albeit the precise value would need to be determined at the detailed design stage.*

7.4.11. Accordingly, subject to the above considerations and inclusions within the final detailed design, the proposals would likely result in a change in calculated value of equal or greater than zero, and *therefore it is considered that 2 credits would be achieved under this category.*

7.5. LE04: Enhancing Site Ecology

7.5.1. Under LE04, the first credit is available where:

> *'a suitably qualified ecologist has been appointed to report on enhancing and protecting the ecology of the site AND the general recommendations of the Ecology report for enhancements and protection of site ecology have been, or will be, implemented.*

7.5.2. The second credit is awarded where the first credit is obtained and the development *'will result in an increase in ecological value of up to 6 plant species.'*

7.5.3. The third credit can is awarded where the first credit is obtained and the development *'will result in an increase in ecological value of 6 plant species or greater.'*

7.5.4. Aspect Ecology has been commissioned to report on enhancing the ecology of the site, based upon a site visit. As set out at Section 6 above, due to the existing nature and setting of the site, few safeguards or mitigation measures are necessary, whilst there is limited potential to provide meaningful enhancements across the majority of the site, albeit the interface with the adjacent canal corridor in particular provides the opportunity for enhancement measures including new planting. Accordingly, the following enhancement recommendations are made:

- New native planting, including in particular offsite planting associated with the canal corridor to be comprised of native species appropriate to the canal setting wherever possible;
- Provision of new nesting opportunities for birds;

7.5.5. Given the nature of the identified site red line boundary and the immediate surroundings, which largely comprise buildings, hardstanding and amenity planting, it is apparent that ecological receptors that could be subject to adverse effects are largely limited to the canal corridor. The adjacent canal

corridor (albeit set within a heavily urbanised setting, with little associated vegetation and man-made vertical banks) provides some identified ecological potential for adverse effects and accordingly, recommendations are set out within this report to ensure the protection of the corridor as appropriate.

7.5.6. Final scores would need to be calculated with respect to ecological value in accordance with BREEAM calculations once the detailed designs and associated areas confirmed, based on the detailed planting schemes, however on the basis of the proposals a small increase in value would be anticipated (a calculated increase of 6 'species' or greater would clearly be unfeasible on the basis of the proposed scheme and effective land use, as even with a native species mixture of at least 24 species (e.g. as provided by high species habitats such as wildflower grassland), this would require at least 25% of the site area to be given over to such habitats). *Accordingly, 2 credits would likely to achieved under this criterion.*

7.6. LE05: Long Term Impact on Biodiversity

7.6.1. Under LE05, up to 2 credits are available. Credits are awarded where there is commitment to achieve all relevant mandatory criteria as detailed within BREEAM guidance, along with appropriate numbers of additional criteria, as listed.

Mandatory Requirements

7.6.2. Information set out within BREEAM guidance states that in order to fulfil the mandatory requirements (numbered 2-4 within the guidance):

2. "*A suitably qualified ecologist must be appointed prior to commencement of activities on site*".

3. "*All relevant UK and EU legislation relating to protection and enhancement of ecology has been complied with* during *design and construction process*."

4. *"A landscape and habitat management plan, appropriate to the site, is produced covering at least the first 5 years after project completion. This is to be handed over to the building occupants and includes:*
   a. Management of any protected features on site,
   b. Management of any new, existing or enhanced habitats,
   c. A reference to the current or future site level or local Biodiversity Action Plan."

7.6.3. Aspect Ecology has been appointed to advise on the project, prior to the commencement of development activities at the site and accordingly mandatory requirement '2' is considered to have been met.

7.6.4. Ecological survey work has been undertaken at the site during April 2014, which has confirmed that the land within the identified site red line boundary to be comprised entirely of habitats of low ecological value, whilst measures are set out in order to safeguard any protected species or raised ecological potential where appropriate. Accordingly, provided the measures set out within the above sections have been fully implemented, the proposals are considered to fully comply with EU and UK law in respect of ecology and mandatory requirement '3' will have been achieved.

7.6.5. As set out above, the site comprises entirely habitats of low ecological value, dominated by existing built form and hardstanding, with the only other habitats comprising very small amenity planted beds and conifers.

7.6.6. Given the nature and setting or the site, opportunities for new habitat creation are limited, albeit new planting will be provided, including (it is understood) extending outside of the identified red line boundary in order to benefit the adjacent canal corridor. Accordingly, a suitable management plan could be drawn up at the appropriate stage (once the detailed landscaping scheme and construction timescales have been established, likely following the grant of planning permission) in order to ensure that the wildlife value of new habitats is maximised in the long term.

7.6.7. No site level Biodiversity Action Plan (BAP) is understood to be in place for the site, which is of low ecological value, such that even a site level BAP would currently appear unwarranted in this case. Nonetheless, should any future site level BAP be produced for the site, the management prescriptions set out within any management plan produced in line with requirement 4 could be used to inform any BAP, which will also feed into future management prescriptions at the site.

7.6.8. Following the above information, subject to the provision of a suitable management plan and implementation of the additional recommendations and measures set out, it is considered that the specified Mandatory Requirements would have been fully met.

Additional Requirements

7.6.9. A total of 5 additional requirements are set out within the BREEAM guidance, as summarised below:

5. *The Principle Contractor nominates a 'Biodiversity Champion' with the authority to influence site activities and ensure that detrimental impacts on site biodiversity are minimised.*
6. *The Principle Contractor trains the workforce on how to protect site ecology during the project.*
7. *The Principle Contractor records actions taken to protect biodiversity and monitor their effectiveness throughout key stages of construction.*
8. *Where new ecologically valuable habitat, appropriate to the local area is created, this includes habitat that supports nationally, regionally or locally important biodiversity and/or is important itself, including any habitat listed in the UKBAP, Local BAP…*
9. *Where flora and/or fauna habitats exist on site, the contractor programmes work to minimise disturbance to wildlife*

7.6.10. As set out above, the existing habitats present within the identified red line boundary do not contain any habitats or features of particular existing ecological value and as such, it may be that a number of the additional requirements (in particular additional requirements 5-8) are considered not applicable, in line with BREEAM Guidance, albeit relevant considerations and protective measures should be kept in place in regard to the adjacent canal corridor. Nonetheless, in any event, it is recommended that a suitable person be identified at the site during construction works ('Biodiversity Champion') who has responsibility on the site for recording any relevant actions and ensuring appropriate levels of training and information are in

place (with particular consideration paid to maintenance of any protective fencing installed and other measures to protect the adjacent canal corridor).

7.6.11. *Accordingly, subject to the implementation of the recommendations set out above, it is considered that the mandatory requirements and all relevant additional requirements would be met and the full 2 credits could be awarded under LE05.*

7.7. BREEAM Summary

7.7.1. In conclusion, it is considered that the proposals would likely achieve the following credits under the BREEAM assessment:

- LE02 – **1 credit**
- LE03 – **2 credits**
- LE04 – **2 credits**
- LE05 – **2 credits**

7.7.2. Accordingly, under the current proposals it is considered that, following the implementation of the general recommendations set out within this report under criteria LE02 to LE05 the development would likely achieve a total of 7 credits from the 8 available under these criteria.

8. SUMMARY AND CONCLUSIONS

8.1. Aspect Ecology has been commissioned on behalf of Gateway Evolution Limited to undertake ecological survey and assessment work in respect of the site, located at 101 Camley Street, Kings Cross.

8.2. The site was surveyed during April 2014, based around extended Phase 1 methodology. In addition, a general appraisal of faunal species was undertaken to record the potential presence of any protected, rare or notable species, with specific consideration in respect of bats.

8.3. **Ecological Designations.** The site itself is not subject to any statutory or non-statutory nature conservation designation. The adjacent Regent's Canal forms part of the wider London Canals non-statutory nature conservation designation and accordingly, a number of measures are set out in order to safeguard this designation where appropriate. Camley Street Natural Park LNR is separated from the site by Camley Street, the mainline railway and further development, albeit the canal also forms a potential link with the site. Nonetheless, the measures set out will also ensure that the proposals do not result in any significant adverse effect on the LNR. All other identified ecological designations are sufficiently well separated from the site by existing development and barriers to movement such that they are unlikely to be adversely affected by the proposals.

8.4. **Habitats.** The majority of the site is dominated by buildings and hardstanding forming an existing, active postal delivery depot with vegetation limited to a number of conifers, small amenity planters and common colonising weeds, which are extremely unlikely to provide any significant ecological value, particularly given the relatively small extent and isolated location of the site.

8.5. **Protected Species.** The habitats present within the site are unlikely to provide potential opportunities for any protected, rare or notable faunal species with the exception of very minor potential for use by common nesting birds. Nonetheless, recommendations and measures are set out in regard to faunal species (particularly associated with the offsite canal corridor) where appropriate in order to ensure that they are fully safeguarded under the proposals, following which the proposals are unlikely to adversely affect any such species.

8.6. **Enhancements.** Opportunities for meaningful ecological enhancement are extremely limited due to the size, nature and metropolitan setting of the site. However, where appropriate ecological enhancements have been recommended, focussing on the creation and management of new habitats, along with provision of new nesting opportunities for birds.

8.7. **BREEAM 2011 Assessment.** Specific attention has been paid to assessment of the proposals under the ecological credits for the BREEAM 2011 assessment with a view of maximising the score achievable, including recommendations to safeguard and enhance the ecological value of the site where appropriate. Assessment of the proposals in respect of the likely BREEAM ecological credits (LE2-LE5) achieved is set out, concluding that the proposals would likely achieve a total of 7 of the 8 available credit points.

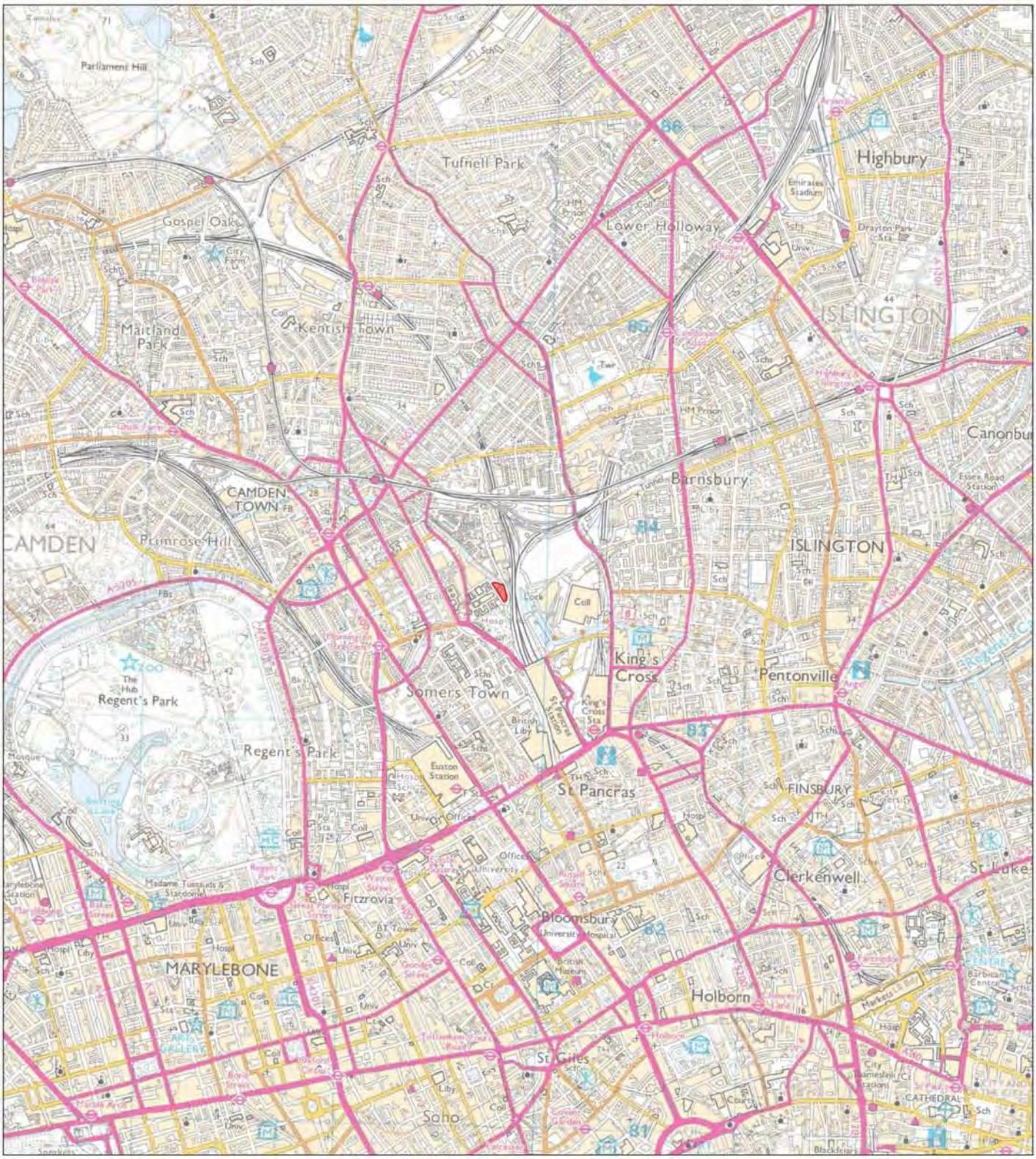
8.8. **Conclusion.** In conclusion, based on the evidence obtained from detailed ecological survey work and with the implementation of the recommendations

set out in this report, there is no reason to suggest that any ecological designations, habitats of nature conservation interest or any protected species will be adversely affected by the proposals.

PLANS

PLAN 3695/ECO1

Site Location



KEY:

SITE LOCATION

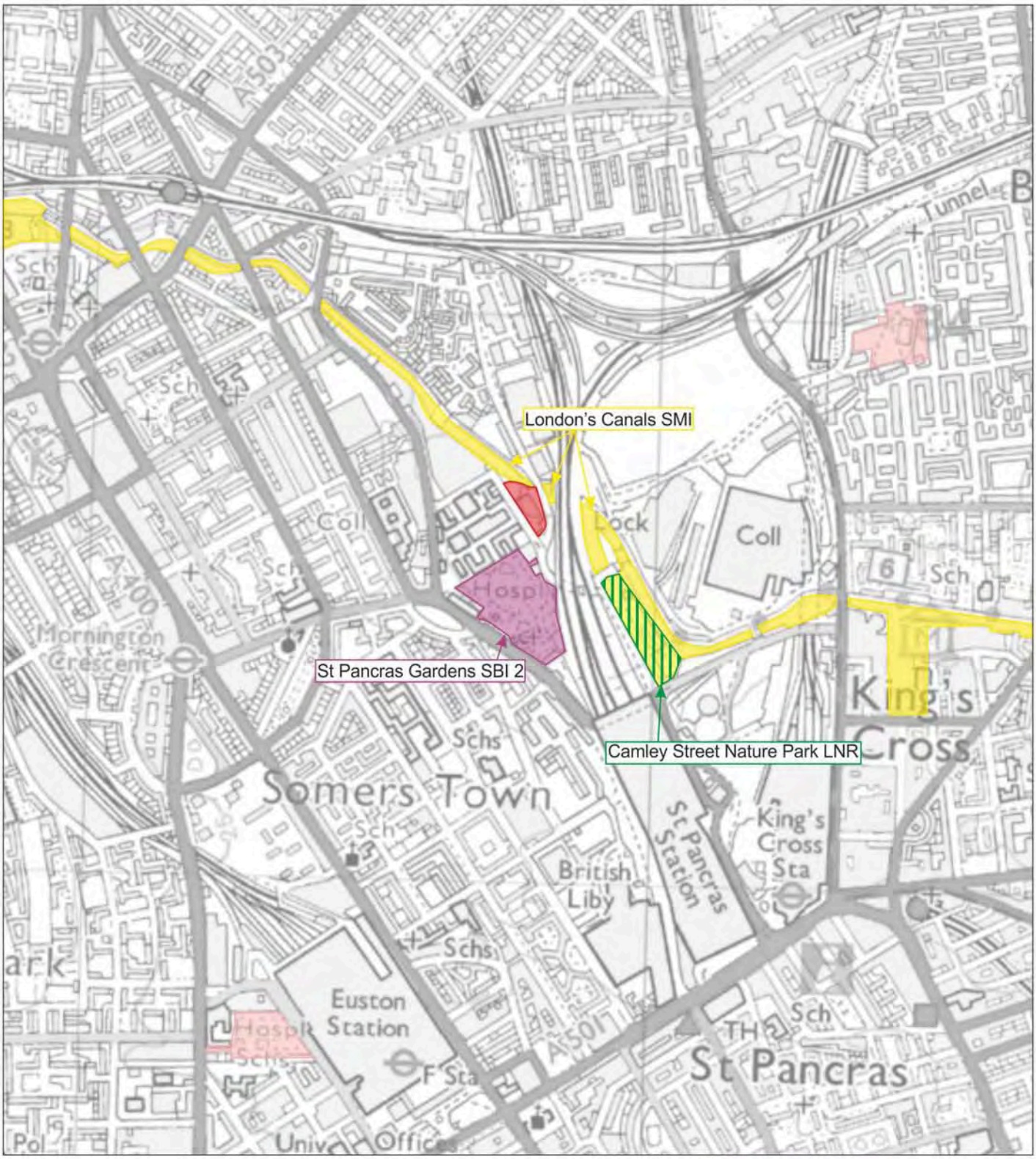
aspect ecology

Aspect Ecology Limited - West Court - Hardwick Business Park
Noral Way - Banbury - Oxfordshire - OX16 2AF
01295 276066 - info@aspect-ecology.com - www.aspect-ecology.com

101 CAMLEY STREET, LONDON	PROJECT
SITE LOCATION	TITLE
3695/ECO1	DRAWING NO.
-	REV.
MAY 2014	DATE

PLAN 3695/ECO2

Ecological Designations



KEY:

- SITE LOCATION
- LOCAL NATURE RESERVE (LNR)
- SITE OF METROPOLITAN IMPORTANCE (SMI)
- SITE OF BOROUGH IMPORTANCE GRADE 2 (SBI 2)
- SITE OF LOCAL IMPORTANCE (SLI)

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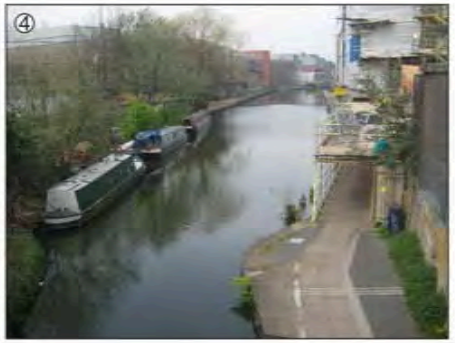
101 CAMLEY STREET, LONDON	PROJECT
ECOLOGICAL DESIGNATIONS	TITLE
3695/ECO2	DRAWING NO.
-	REV.
MAY 2014	DATE

PLAN 3695/ECO3

Habitats, Ecological Features and Photographs



KEY:

- SITE BOUNDARY
- HARDSTANDING
- BUILDING/OTHER STRUCTURE
- TREE
- AMENITY PLANTING
- SCRUB
- OFFSITE CANAL
- PHOTOGRAPH LOCATION

101 CAMLEY STREET, LONDON — PROJECT

HABITATS, ECOLOGICAL FEATURES AND PHOTOGRAPHS — TITLE

3695/ECO3 — DRAWING NO.

\- — REV.

MAY 2014 — DATE

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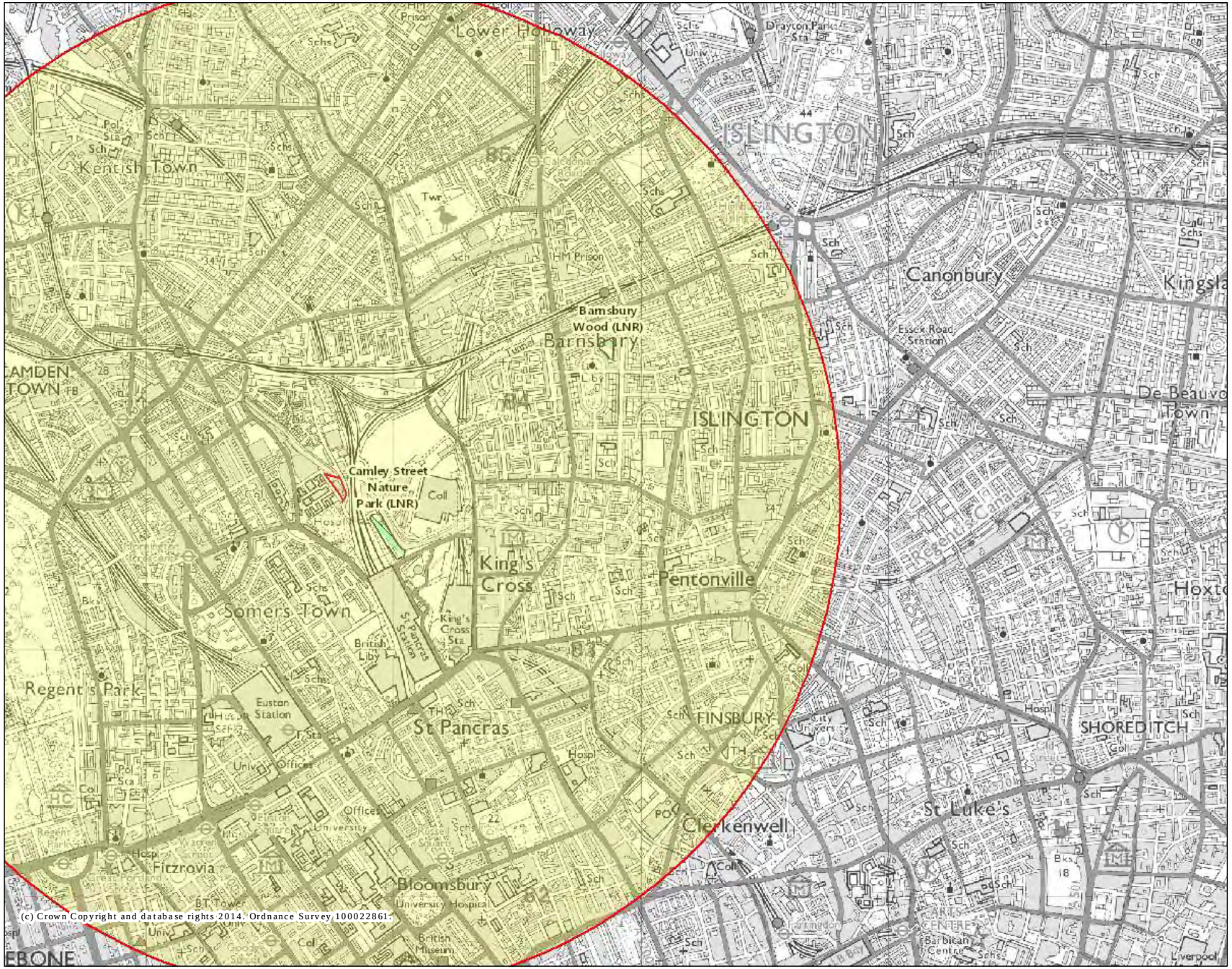
APPENDICES

APPENDIX 1

Information obtained from Multi-Agency Geographic Information for the Countryside (MAGIC)

ECO3695 MAGIC Designations



LEGEND

- Local Nature Reserves (England)
- National Nature Reserves (England)
- Ramsar Sites (England)
- Sites of Special Scientific Interest (England)
- Special Areas of Conservation (England)
- Special Protection Areas (England)
- Biosphere Reserves (England)

Projection = OSGB36
xmin = 527000
ymin = 181400
xmax = 534800
ymax = 185900
Map produced by MAGIC on 2 May, 2014.

Site Check Report Report generated on Fri May 02 2014
You selected the location: Centroid Grid Ref: TQ297836
The following features have been found in your search area:

Local Nature Reserves (England) - points

Reference	1008761
Name	BARNSBURY WOOD
Hectares	0.32
Hyperlink	http://www.lnr.naturalengland.org.uk/special/lnr/lnr_details.asp?themeid=1008761

Reference	1008823
Name	CAMLEY STREET NATURE PARK
Hectares	0.84
Hyperlink	http://www.lnr.naturalengland.org.uk/special/lnr/lnr_details.asp?themeid=1008823

Local Nature Reserves (England)

Reference	1008761
Name	BARNSBURY WOOD
Hectares	0.32
Hyperlink	http://www.lnr.naturalengland.org.uk/special/lnr/lnr_details.asp?themeid=1008761

Reference	1008823
Name	CAMLEY STREET NATURE PARK
Hectares	0.84
Hyperlink	http://www.lnr.naturalengland.org.uk/special/lnr/lnr_details.asp?themeid=1008823

National Nature Reserves (England) - points
No Features found

National Nature Reserves (England)
No Features found

Ramsar Sites (England) - points
No Features found

Ramsar Sites (England)
No Features found

Sites of Special Scientific Interest (England) - points
No Features found

Sites of Special Scientific Interest (England)
No Features found

Special Areas of Conservation (England) - points
No Features found

Special Areas of Conservation (England)
No Features found

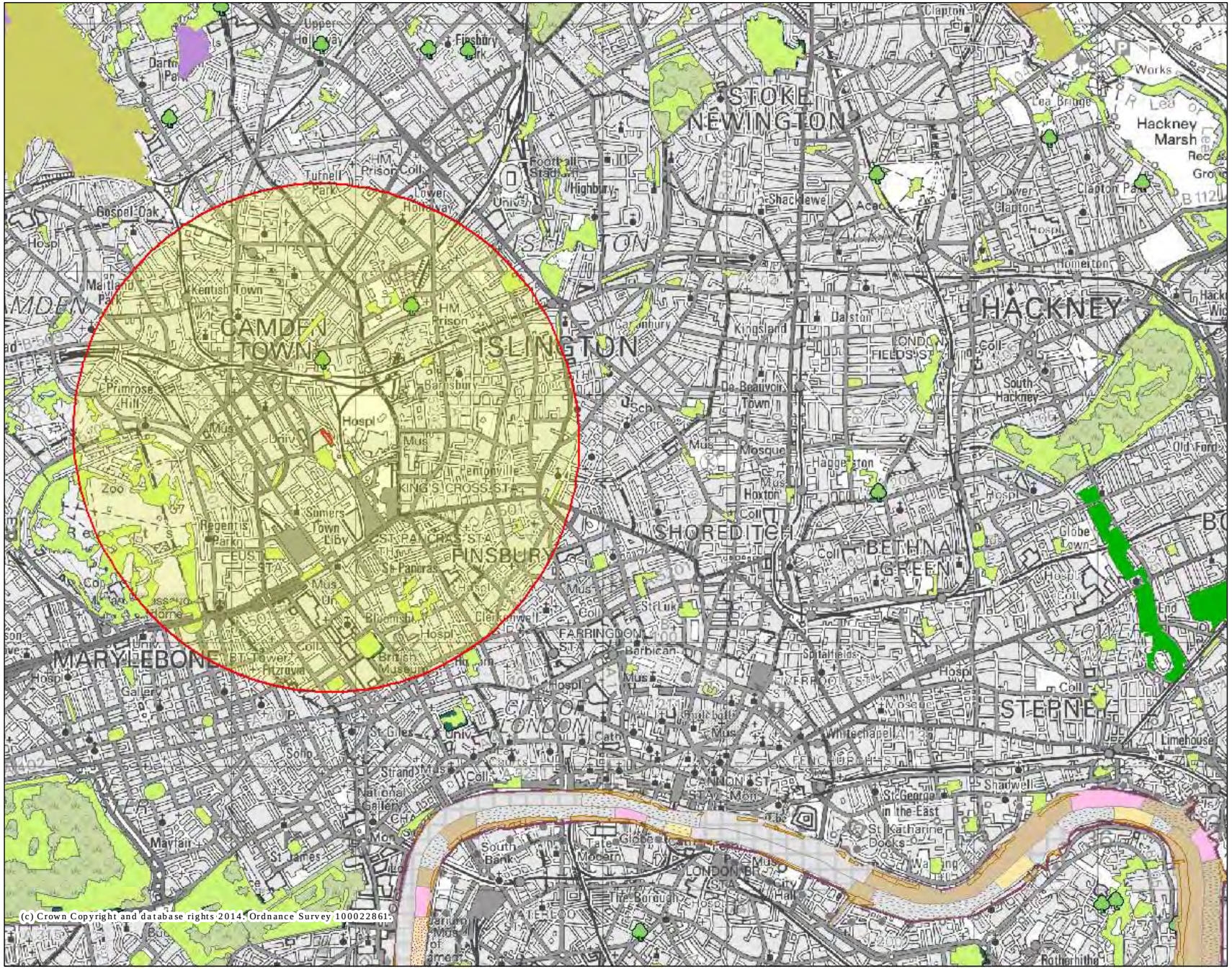
Special Protection Areas (England) - points
No Features found

Special Protection Areas (England)
No Features found

Biosphere Reserves (England) - points
No Features found

Biosphere Reserves (England)
No Features found

ECO3695 MAGIC Habitats



LEGEND

- Lowland Calcareous Grassland BAP Priority Habitat (England)
- Lowland Dry Acid Grassland BAP Priority Habitat (England)
- Lowland Meadows BAP Priority Habitat (England)
- Undetermined Grassland BAP Priority Habitat (England)
- Upland Calcareous Grassland BAP Priority Habitat (England)
- Upland Hay Meadow BAP Priority Habitat (England)
- Lowland Heathland BAP Priority Habitat (England)
- Upland Heathland BAP Priority Habitat (England)
- Limestone Pavements BAP Priority Habitat (England)
- Coastal Sand Dune BAP Priority Habitat (England)
- Sand Dunes (Wales)
- Coastal Vegetated Shingle BAP Priority Habitat (England)
- Coastal and Floodplain Grazing Marsh BAP Priority Habitat (England)
- Maritime Cliffs and Slopes BAP Priority Habitat (England)
- Mudflat BAP Priority Habitat (England)
- Saltmarsh (Wales)
- Saline Lagoons BAP Priority Habitat (England)
- Saline Lagoons (Wales)
- Seagrass (Wales)
- Nationally Important Intertidal Habitats (Wales)

Projection = OSGB36
xmin = 524300
ymin = 178700
xmax = 539900
ymax = 187800

Map produced by MAGIC on 2 May, 2014.

APPENDIX 2

Extracts from BREEAM New Development Guidance Notes 2011

BREEAM®

www.breeam.org

BREEAM New Construction

Non-Domestic Buildings

Technical Manual
SD5073 – 2.0:2011

bre

Manual Issue: 1

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2. Testing and certification in the areas of fire, electronics, security and sustainability
3. Developing world leading sustainability assessment methods
4. Undertaking research and consultancy for clients and regulators
5. Promulgating standards and knowledge throughout the industry through publications and events
6. Developing and delivering training

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BRE Global Limited is a trading subsidiary of the BRE Trust, the registered research and education charity which owns the BRE Group.

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As a certification body accredited by the UK Accreditation Service (UKAS) BRE Global Limited maintains an open and accountable governance structure. The operation of BREEAM (and indeed all our assurance activities) is overseen by an independent Governing Body and a Standing Panel for Peer & Market Review.

The Governing Body represents stakeholder interests to ensure, amongst other things, that BRE Global Limited are acting independently and impartially, that we are operating our processes correctly, and that we are treating our customers fairly.

The Standing Panel provides BRE Global with access to a range of experts that can review BRE Global Limited's standards and schemes to ensure their robustness from a scientific, technical and market perspective as well as ensuring the development of the standards and schemes is open to greater external and independent scrutiny.

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Introduction

What is BREEAM

BREEAM (Building Research Establishment's Environmental Assessment Method) is the world's leading and most widely used environmental assessment method for buildings. At the time of writing, BREEAM has certified over 200,000 buildings since it was first launched in 1990.

Aims of BREEAM

1. To mitigate the life cycle impacts of buildings on the environment
2. To enable buildings to be recognised according to their environmental benefits
3. To provide a credible, environmental label for buildings
4. To stimulate demand for sustainable buildings

Objectives of BREEAM

1. To provide market recognition of buildings with a low environmental impact
2. To ensure best environmental practice is incorporated in building planning, design, construction and operation.
3. To define a robust, cost-effective performance standard surpassing that required by regulations.
4. To challenge the market to provide innovative, cost effective solutions that minimise the environmental impact of buildings.
5. To raise the awareness amongst owners, occupants, designers and operators of the benefits of buildings with a reduced life cycle impact on the environment.
6. To allow organisations to demonstrate progress towards corporate environmental objectives.

BREEAM has been developed to meet the following underlying principles:

1. Ensure **environmental quality** through an accessible, holistic and balanced measure of environmental impacts.
2. Use **quantified measures** for determining environmental quality.
3. Adopt a **flexible approach**, avoiding prescriptive specification and design solutions.
4. Use **best available science** and **best practice** as the basis for quantifying and calibrating a cost effective performance standard for defining environmental quality.
5. Reflect the **social and economic benefits** of meeting the environmental objectives covered.
6. Provide a **common framework** of assessment that is tailored to meet the 'local' context including regulation, climate and sector.
7. **Integrate construction professionals** in the development and operational processes to ensure wide understanding and accessibility.
8. Adopts **third party certification** to ensure independence, credibility and consistency of the label.
9. Adopts **existing industry** tools, practices and other standards wherever possible to support developments in policy and technology, build on existing skills and understanding and minimise costs.
10. **Stakeholder consultation** to inform ongoing development in accordance with the underlying principles and the pace of change in performance standards (accounting for policy, regulation and market capability).

What is BREEAM New Construction

BREEAM New Construction is a performance based assessment method and certification scheme for new buildings. The primary aim of BREEAM New Construction is to mitigate the life cycle impacts of new buildings on the environment in a robust and cost effective manner. This is

Scope of BREEAM 2011 New Construction

The BREEAM New Construction scheme can be used to assess the environmental life cycle impacts of new non-domestic buildings at the design and construction stages. 'New Construction' is defined as development that results in a new standalone structure, or new extension to an existing structure, which will come into operation/use for the first time upon completion of the works.

This BREEAM 2011 New Construction scheme is applicable to new non-domestic buildings in the United Kingdom only.

Type of buildings that can be assessed using the BREEAM 2011 New Construction scheme

The non-domestic building types which can be assessed and rated using this scheme are outlined below and on the following pages.

Sector	Building type	Description
Commercial	Offices	• General office buildings • Offices with research and development areas (i.e. cat 1 labs only)
	Industrial	• Industrial unit – warehouse storage/distribution • Industrial unit – process/manufacturing/vehicle servicing
	Retail	• Shop/shopping centre • Retail park/warehouse • 'Over the counter' service provider e.g. financial, estate and employment agencies and betting offices • Showroom • Restaurant, cafe & drinking establishment • Hot food takeaway

Sector	Building type	Description
Public (non housing)	Education[1]	• Pre-School • Schools and Sixth Form Colleges • Further Education/Vocational Colleges • Higher Education Institutions
	Healthcare[2]	• Teaching/specialist hospitals • General acute hospitals • Community and mental health hospitals • GP surgeries • Health centres and clinics
	Prisons[3]	• High security prison • Standard secured prison • Young offender institution and juvenile prisons • Local prison • Holding centre
	Law Courts	• Crown & criminal courts • County courts • Magistrates' courts • Civil justice centres • Family courts • Youth courts • Combined courts
Multi-residential accommodation[4]	Residential institutions	• Residential care home • Sheltered accommodation • Residential college/school (halls of residence) • Local authority secure residential accommodation • Military barrack

[1]For schools, further and higher educational building types, see also Appendix B for further detail of scope
[2]For healthcare building types, see also Appendix A for further detail of scope
[3]Category includes any building type part of a prison establishment, including residential blocks or a hybrid of building types
[4]For multi-residential building types, see also Appendix C for further detail of scope

Sector	Building type	Description
Other	Residential Institutions	• Hotel, hostel, boarding and guest house • Secure training centre • Residential training centre
	Non residential institutions	• Art gallery, museum • Library • Day centre, hall/civic/community centre • Place of worship
	Assembly and leisure	• Cinema • Theatre/music/concert hall • Exhibition/conference hall • Indoor or outdoor sports/fitness and recreation (with/without pool)
	Other	• Transport hub (coach/bus station and above ground rail station) • Research and development (cat 2 or 3 labs - Non Higher Education) • Crèche

In terms of the application of the New Construction scheme, non-domestic buildings are defined in BREEAM as either standard or non-standard types. The standard type category includes buildings listed above against the commercial, public (non-housing) and multi-residential sectors. These are building types which BREEAM New Construction is specifically designed to assess and the assessment criteria tailored for. This standard category includes building types that in the past would have had their own stand-alone BREEAM scheme document, such as Offices, Retail, Industrial, Education, Healthcare, Multi-residential and so on.

Non-standard building types are those listed above against the 'other buildings' sector and includes many types of building that, under previous version of BREEAM, would have been classified and assessed using the BREEAM Bespoke scheme. The non-standard building types listed against the 'other buildings' category now fall within the scope of the BREEAM 2011 New Construction scheme and therefore do not require separate tailored assessment criteria.

Mixed use developments / building types

Buildings which are a mixture of the above uses/types can be assessed using BREEAM New Construction. If the proposed new construction contains both standard and non-standard building types/uses, then for the purpose of the project's registration and certification it will be defined as a non-standard building type.

Small building developments

BRE Global is currently developing a set of revised procedures for the assessment of small buildings with a simple servicing strategy. Once available, these procedures may be used in place of the full criteria set and will apply a reduced set of the technical assessment criteria from the BREEAM 2011 scheme. Until such time as the procedure is defined the current BREEAM New Construction criteria, contained within this issue of the 2011 version, should be used to complete an assessment of any building type listed above, regardless of size or servicing strategy.

Buildings not covered by the scope of the BREEAM 2011 New Construction scheme

Building types not listed above will fall into one of two categories, those where a current but separate BREEAM New Construction scheme document exists and those which currently do not have an existing, up-to-date scheme document.

Other current BREEAM New Construction schemes

Data centres: 2010 version

There is a separate BREEAM New Construction 2010 scheme document for Data Centres (SD5068); the 2010 version should be used for the assessment and certification of data centres.

Tailored BREEAM criteria: 2008 version

BRE Global has developed a number of tailored criteria sets for specific clients and repeatable building types, including:

1. Forestry Commission: Visitor Centres
2. UK Fire Service: Fire Stations

Assessments of the above building types can be carried out using the BREEAM Bespoke 2008 scheme document and the appropriate appendix document for the above building types, which can be found on the BREEAM Assessors Extranet.

Other building types not defined

If a particular building type is not listed above and it cannot be defined as a mixture of standard and non-standard building types then it cannot be assessed using this BREEAM scheme. Such building types can still be assessed using BREEAM, but they require the development of bespoke assessment criteria. Contact BRE Global for further advice and information.

Building life cycle stages covered by the BREEAM 2011 New Construction scheme

This BREEAM New Construction scheme can be used to assess and rate the environmental impacts arising from a newly constructed building development (including external site areas), and its ongoing operation, at the following life cycle stages:

1. Design Stage (DS) - leading to an Interim BREEAM certified rating
2. Post-Construction Stage (PCS) – leading to a Final BREEAM certified rating

Design Stage

The DS assessment and interim certified BREEAM rating confirms the building's performance at the design stage of the life cycle. Assessment and certification will ideally occur prior to the beginning of operations on site. The certified BREEAM rating at this stage is labelled as 'interim' because it does not represent the building's final, new construction BREEAM performance.

To complete an assessment at this stage the design must be advanced to a point where the relevant design information is available to enable the BREEAM Assessor to evaluate and verify the building's performance against the criteria defined in this scheme document. The interim DS assessment will therefore be completed and certified at the scheme design or detailed design stages.

Post-Construction Stage

The PCS assessment and BREEAM rating confirms the final 'as-built' performance of the building at the new construction stage of the life cycle. A final PCS assessment is completed and certified after practical completion of the building works.

There are two approaches to assessment at the post-construction stage:

1. A post-construction review of an interim design-stage assessment
2. A post-construction assessment

A post-construction review serves to confirm that the building's 'as built' performance and rating is in accordance with that certified at the interim design stage. Where an interim DS assessment has not been carried out i.e. certified, and a BREEAM assessment and rating is required, a full post construction stage assessment can be conducted.

Further information about BREEAM's evidential requirements for each of the above assessment stages can be found in Appendix G.

BREEAM New Construction and assessment of shell and core / speculative buildings

Non fitted-out 'speculative' new buildings, often referred to as shell and core buildings, can be assessed using the BREEAM New Construction scheme. Further details on the application of the scheme to these types of new building can be found in Appendix D.

Building life cycle stages not covered by the BREEAM 2011 New Construction scheme

The BREEAM New Construction scheme is not designed for, and therefore not appropriate to assess the environmental impacts of buildings at the following life cycle stages:

1. Existing building refurbishment and fit-out (see guidance below)
2. Existing building in operation or existing unoccupied building
3. Existing building de-construction
4. Infrastructure projects

Existing buildings (occupied/unoccupied) can be assessed and certified using the BREEAM In-Use scheme.

Existing building refurbishment and fit out projects

The scope of this BREEAM scheme and version is the quantification and mitigation of environmental impacts of new building projects only. This version therefore is not specifically designed to cater for the assessment of refurbishment and fit-out projects. At the time of writing, BRE Global are developing a standalone BREEAM scheme to cover the refurbishment and fit out stages of the life cycle for non domestic buildings, following a similar approach to that taken in BREEAM Domestic Refurbishment.

Prior to the launch of a refurbishment scheme for non-domestic buildings, clients may continue to apply BREEAM and certify refurbishment and fit out projects using the BREEAM method. There are two options available in terms of which BREEAM version to use for these types of project, as follows:

1. Major refurbishment projects only (see box for definition): assess and certify using the BREEAM 2011 version i.e. assess performance against the New Construction criteria.
2. Other refurbishment and fit out projects could be assessed and certified using the BREEAM 2008 version. Please check the scope of the relevant BREEAM 2008 scheme for further details.

Major refurbishment is defined as construction that results in the fundamental remodelling or adaptation of existing elements of the building envelope, structure and renewal of key building services. And where, on completion of the works, such remodelling / renewal will materially impact on the performance of the building. The term 'elements' includes:

a. Structural/building envelope elements including walls (including glazing), roofs (including rooflights) and floors.
b. Building services elements including lighting (artificial and daylighting), heating, mechanical ventilation/cooling plant and ductwork, water/drainage systems.

For the purposes of this definition, works to both (a) and (b) above must be taking place for the project to be classed as a major refurbishment. Where only individual elements of the structural/building envelope element (e.g. windows or doors), or individual services elements (e.g. a boiler, heating system or lighting installation) are being replaced, remodelled or upgraded, then, the project should not be classed a major refurbishment. It should be noted that all major refurbishment projects will reuse the majority of the buildings existing supporting sub and superstructure and it is likely that in many cases the building façade will be retained, albeit with some remediation or renovation. Refer to a relevant BREEAM 2008 scheme document for a description of fit-out projects.

Part new-build, Part refurbishment projects

BREEAM 2011 New Construction can be used to assess new build extensions to existing buildings. Where the existing building is also undergoing major refurbishment and requires assessment, the following options, in terms of this scheme's application, are available to the client:

1. Apply the New Construction scheme and its assessment criteria to the whole building development/project i.e. the new construction and major refurbished elements.
2. Apply the New Construction scheme and its assessment criteria to the new-build element only.
3. Where the project is predominantly a refurbishment, albeit with some new elements, follow the guidance and options above for existing building refurbishments projects.

In determining the appropriate option for a refurbishment or part new-build part-refurbishment project, the BREEAM assessor should review the scope of the proposed works and consider in-particular the scope of the refurbished elements i.e. is it major refurbishment, will there be a significant change of use and will the buildings thermal and structural elements remain 'as existing'? Using this information the assessor should advise the client on the most suitable option in terms of which BREEAM version/scheme is most appropriate for maximising the buildings environmental performance.

Scoring and Rating BREEAM assessed buildings

There are a number of elements that determine the overall performance of a new construction project assessed using BREEAM, these are as follows:

1. The BREEAM rating level benchmarks
2. The minimum BREEAM standards
3. The environmental section weightings
4. The BREEAM assessment issues and credits

How these elements combine to produce a BREEAM rating is summarised on the following pages. This is followed by a description and example describing the methodology for calculating a rating.

BREEAM rating benchmarks

The BREEAM rating benchmarks for new construction projects assessed using the 2011 version of BREEAM are as follows:

Table 3-1: BREEAM rating benchmarks

BREEAM Rating	% score
OUTSTANDING	85
EXCELLENT	70
VERY GOOD	55
GOOD	45
PASS	30
UNCLASSIFIED	<30

The BREEAM rating benchmark levels enable a client or other stakeholder to compare an individual building's performance with other BREEAM rated buildings and the typical sustainability performance of new non-domestic buildings in the UK.

In this respect each BREEAM rating level broadly represents performance equivalent to:

1. Outstanding: Less than top 1% of UK new non-domestic buildings (innovator)
2. Excellent: Top 10% of UK new non-domestic buildings (best practice)
3. Very Good: Top 25% of UK new non-domestic buildings (advanced good practice)
4. Good: Top 50% of UK new non-domestic buildings (intermediate good practice)
5. Pass: Top 75% of UK new non-domestic buildings (standard good practice)

An unclassified BREEAM rating represents performance that is non-compliant with BREEAM, in terms of failing to meet either the BREEAM minimum standards of performance for key environmental issues or the overall threshold score required for formal BREEAM certification.

Minimum standards

To maintain a flexible system BREEAM adopts a 'balanced score-card' approach to the assessment and rating of building performance. This means that, to achieve a particular level of

performance the majority of BREEAM credits can be traded, i.e. non-compliance in one area can be off-set through compliance in another to achieve the target BREEAM rating.

However, to ensure that performance against fundamental environmental issues is not over-looked in pursuit of a particular rating, BREEAM sets minimum standards of performance in key areas e.g. energy, water, waste etc. It is important to bear in mind that these are minimum acceptable levels of performance and, in that respect they should not necessarily be viewed as levels that are representative of best practice for a BREEAM rating level.

To achieve a particular BREEAM rating, the minimum overall percentage score must be achieved and the minimum standards, detailed in Table 3-2 below, applicable to that rating level complied with.

Table 3-2: Minimum BREEAM standards by rating level

	Minimum standards by BREEAM rating level				
BREEAM issue	**PASS**	**GOOD**	**VERY GOOD**	**EXCELLENT**	**OUTSTANDING**
Man 01: Sustainable procurement	One credit	One credit	One credit	One credit	Two credits
Man 02: Responsible construction practices	None	None	None	One credit	Two credits
Man 04: Stakeholder participation	None	None	None	One credit (Building user information)	One credit (Building user information)
Hea 01: Visual comfort	Criterion 1 only	Criterion 1 only	Criterion 1 only	Criterion 1 only	Criterion 1 only
Hea 04: Water quality	Criterion 1 only	Criterion 1 only	Criterion 1 only	Criterion 1 only	Criterion 1 only
Ene 01: Reduction of CO_2 emissions	None	None	None	Six credits	Ten credits
Ene 02: Energy monitoring	None	None	One credit (First sub-metering credit)	One credit (First sub-metering credit)	One credit (First sub-metering credit)
Ene 04: Low or zero carbon technologies	None	None	None	One credit	One credit
Wat 01: Water consumption	None	One credit	One credit	One credit	Two credits
Wat 02: Water monitoring	None	Criterion 1 only	Criterion 1 only	Criterion 1 only	Criterion 1 only
Mat 03: Responsible Sourcing	Criterion 3 only	Criterion 3 only	Criterion 3 only	Criterion 3 only	Criterion 3 only
Wst 01: Construction waste management	None	None	None	None	One credit

	Minimum standards by BREEAM rating level				
Wst 03: Operational waste	None	None	None	One credit	One credit
LE 03: Mitigating ecological impact	None	None	One credit	One credit	One credit

Environmental section weightings

Environmental weightings are fundamental to any building environmental assessment method as they provide a means of defining, and therefore ranking, the relative impact of environmental issues. BREEAM uses an explicit weighting system derived from a combination of consensus based weightings and ranking by a panel of experts. The outputs from this exercise are then used to determine the relative value of the environmental sections used in BREEAM and their contribution to the overall BREEAM score.

This weighting system is defined in greater detail within the BRE Global Core Process Standard (BES 5301) and it's supporting procedural documents. These form part of the over-arching BREEAM Standard and the Code for a Sustainable Built Environment. The same ranking of impacts used in BREEAM underpins the scoring mechanisms in the BRE Green Guide to Specification and the BRE Environmental Profiling Method for construction materials.

Table 3-3 below outlines the weightings for each of the nine environmental sections included in the BREEAM New Construction scheme:

Table 3-3: BREEAM Environmental section weightings

Environmental section	Weighting
Management	12%
Health & Wellbeing	15%
Energy	19%
Transport	8%
Water	6%
Materials	12.5%
Waste	7.5%
Land Use & Ecology	10%
Pollution	10%
Total	100%
Innovation (additional)	10%

Each of the above environmental sections consists of a differing number of assessment issues and BREEAM credits (as described below and defined in detail in the technical sections of this Scheme Document). As a result, each individual assessment issue and credit varies in terms of its contribution to a building's overall score. For reference, Appendix H contains a breakdown of individual assessment issues by building type for this BREEAM scheme, and lists the maximum percentage available under each issue to contribute towards the overall BREEAM score.

BREEAM assessment issues and credits

BREEAM New Construction consists of forty nine individual assessment issues spanning the nine environmental categories, plus a tenth category called 'innovation' (described below). Each issue addresses a specific building related environmental impact or issue and has a number of 'credits' assigned to it. 'BREEAM credits' are awarded where a building demonstrates that it meets the best practice performance levels defined for that issue i.e. it has mitigated an impact or, in the case of the health and wellbeing section, addressed a specific building occupant-related issue e.g. good thermal comfort, daylight or acoustics.

The number of 'credits' available for an individual assessment issue will vary and generally the higher the number there are for a given issue, the more important that issue is in terms of mitigating its impact. In most cases, where there are multiple 'credits' available, the number awarded is based on a sliding scale or benchmark, where progressively higher standards of building performance are rewarded with a higher number of 'credits'.

It is worth noting that, in addition to the environmental section and overall score and BREEAM rating, verified performance against individual assessment issues also provides users with a credible set of key building performance indicators for a range of embodied, operational and construction phase building impacts. In this respect, in addition to using BREEAM to define overall targets, it is possible to use the method to define performance levels in support of specific organisational policy objectives for individual environmental issues. Care should be taken when setting design targets using individual issues and credit levels in this way as it can limit design flexibility and have an impact on project costs.

Awarding 'credits' for innovation

It is one of the aims of BREEAM to support innovation within the construction industry. BREEAM does this by making additional 'credits' available for the recognition of sustainability related benefits or performance levels which are currently not recognised by standard BREEAM assessment issues and criteria. By doing this BREEAM is rewarding buildings that go beyond best practice in terms of a particular aspect of sustainability i.e. where the building or its procurement has demonstrated innovation.

Awarding 'credits' for innovation enables clients and design teams to boost their building's BREEAM performance and, in addition, helps to support the market for new innovative technologies, and design or construction practices.

There are two ways in which BREEAM awards 'innovation credits' to recognise innovation in building design and procurement. The first is by meeting exemplary performance criteria defined within an existing BREEAM issue i.e. going beyond the standard BREEAM assessment criteria and therefore best practice. Note, not all assessment issues have exemplary performance criteria. The second route is where an application is made to BRE Global by the BREEAM Assessor in connection with a project registered for BREEAM assessment to have a particular building technology or feature, design or construction method or process recognised as 'innovative'. If the application is successful and subsequently building compliance is verified, an 'innovation credit' can be awarded.

An additional 1% can be added to a building's overall score for each 'innovation credit' achieved. The maximum number of 'innovation credits' that can be awarded for any one building is 10; therefore the maximum available additional score for 'innovation' is 10%. Innovation credits can be awarded regardless of the building's final BREEAM rating i.e. they are awardable at any BREEAM rating level.

Calculating a building's BREEAM rating

A BREEAM Assessor must determine the BREEAM rating using the appropriate assessment tools and calculators. An indication of performance against the BREEAM scheme can also be determined using a BREEAM Pre-Assessment Estimator. The Pre-Assessment Estimator is available from the BREEAM website www.breeam.org.

The process of determining a BREEAM rating is outlined below and an example calculation included in Table 3-4:

1. For each environmental section the number of 'credits' awarded must be determined by the assessor in accordance with the criteria of each assessment issue (as detailed in the technical sections of this document).
2. The percentage of 'credits' achieved is then calculated for each section.
3. The percentage of 'credits' achieved in each section is then multiplied by the corresponding section weighting. This gives the overall environmental section score.
4. The section scores are then added together to give the overall BREEAM score. The overall score is then compared to the BREEAM rating benchmark levels and, provided all minimum standards have been met, the relevant BREEAM rating is achieved.
5. An additional 1% can be added to the final BREEAM score for each 'innovation credit' achieved (up to a maximum of 10%).

Table 3-4: Example BREEAM score and rating calculation

BREEAM Section	Credits Achieved	Credits Available	% of Credits Achieved	Section Weighting	Section score
Management	10	22	45.45%	0.12	5.45%
Health & Wellbeing	8	10	80.00%	0.15	12.00%
Energy	16	30	53.33%	0.19	10.13%
Transport	5	9	55.56%	0.08	4.44%
Water	5	9	55.56	0.06	3.33%
Materials	6	12	50.00%	0.125	6.25%
Waste	3	7	42.86%	0.075	3.21%
Land Use & Ecology	5	10	50.00%	0.10	5.00%
Pollution	5	13	38.50%	0.10	3.85%
Innovation	2	10	20%	0.10	2%
			Final BREEAM score	55.66%	
			BREEAM Rating	VERY GOOD	

Minimum Standards for BREEAM 'Very Good' rating	Achieved?
Man 01: Sustainable procurement	Y
Hea 01: Visual comfort	Y
Hea 04: Water quality	Y
Ene 02: Energy monitoring	Y

Minimum Standards for BREEAM 'Very Good' rating	Achieved?
Wat 01 - Water consumption	Y
Wat 02: Water monitoring	Y
Mat 03: Responsible sourcing	Y
LE 03: Mitigating ecological impact	Y

Land Use and Ecology

LE 01 Site selection

No. of credits available:	**2**
Minimum standards:	**No**

Aim

To encourage the use of previously developed and/or contaminated land and avoid land which has not been previously disturbed.

Assessment Criteria

This issue is split into two parts:

- Previously developed land (1 credit)
- Contaminated land (1 credit)

The following is required to demonstrate compliance for:

Previously developed land

One credit

1. At least 75% of the proposed development's footprint is on an area of land which has previously been developed for use by industrial, commercial or domestic purposes in the last 50 years.

Contaminated land

One credit

2. The site is deemed to be significantly contaminated as confirmed by a contaminated land specialist's site investigation, risk assessment and appraisal, which has identified:
    a. The degree of contamination
    b. The contaminant sources/types
    c. The options for remediating sources of pollution which present an unacceptable risk to the site.

3. The client or principal contractor confirms that remediation of the site will be carried out in accordance with the remediation strategy and its implementation plan.

Compliance notes	
Temporary works	Undeveloped areas of the site to be used for temporary works (e.g. temporary offices/parking, material/machinery storage) must be considered as development on undeveloped land and therefore included in the calculations unless they have been defined as 'land of low ecological value' (Ecological value and protection issue, LE 02).
Developed more than 50 years ago	Where a site has been previously developed (more than 50 years ago) but is now considered undeveloped, the credit for re-use of land may only be awarded if the site is deemed to be contaminated (as defined by the above

Compliance notes	
	criteria).
Infill development	New buildings developed within the boundary of existing sites do not automatically comply with the re-use of land criteria. The land on which at least 75% of the new building will be sited must meet the definition of previously developed.
Prison buildings	All land within a secure perimeter fence on an existing prison site can be classified as previously developed land. Therefore assessments of buildings located within this area will achieve the credit. If the secure perimeter fence of a prison is being extended to accommodate the proposed building, or the proposed building is located on a completely new site, then the building must comply with the assessment criteria defined above.
Schools: Playing fields	Development of a playing field within the construction zone can be counted as development on previously developed land only if an equivalent area of playing field is reinstated within one year of the completed construction works; and where such reinstatement will not encroach on land of high ecological value as defined in BREEAM issue LE 02, Ecological value and protection.
Prior decontamination	The credit for use of contaminated land can only be awarded where remediation has taken place to enable development of the site for the assessed building, or a larger phased development that includes the assessed building (see below). The credit is not achievable for instances where historical remediation and development of the site has occurred outside the scope of the current development proposals.
Large sites split into smaller plots	Where contamination of a large site has been remediated and has then been packaged up into smaller plots of land for individual buildings (possibly as part of a phased development strategy), the credit can be awarded regardless of the plot location of the assessed building within the wider development plan. This is on the condition that the whole site could not have been developed without remediation work taking place.
Health and safety related decontamination	Contaminated land that has been decontaminated solely for health and safety reasons (rather than for the specific purpose of re-development) does not comply.
Asbestos	Where the only remediation required is the removal of asbestos within an existing building fabric, the site cannot be classified as contaminated land. However, where asbestos is found to be present in the ground this will be classed as contamination for the purposes of assessing this issue.

Schedule of Evidence

Req	Design Stage	Post Construction Stage
1	Design drawings (including existing site plan), report or site photographs confirming: 1. Type and duration of previous land use. 2. Area (m^2) of previous land use. Proposed site plan showing; 3. Location and footprint (m^2) of proposed development and temporary works.	BREEAM Assessor's site inspection report and photographic evidence or 'as built' drawings confirming the footprint or orientation of the developed area has not altered from that confirmed in the design stage evidence. Where alteration has occurred the % must be re-calculated using 'as built' plans.
2	A copy of the specialist's land contamination report. Design drawings (including existing site plan) showing contaminated areas and areas to be remediated in relation to any proposed development.	As design stage.
3	A letter from the principal contractor or remediation contractor confirming: 1. The remediation strategy for the site. 2. Summary details of the implementation plan. If a contractor has not yet been appointed, a letter from the client, or their representative confirming that the appointed contractor will undertake necessary remediation works to mitigate the risks identified in the specialist report.	A copy of the professional report (or relevant sections of the report) confirming: 1. Description of remedial works undertaken. 2. Description of relevant pollution linkages addressed*. * This may not be applicable where the contaminant is a non-native invasive plant species.

Additional Information

Relevant definitions

Construction zone: For the purpose of this BREEAM issue the construction zone is defined as any land on the site which is being developed (and therefore disturbed) for buildings, hard standing, landscaping, site access, plus a 3m boundary in either direction around these areas. It also includes any areas used for temporary site storage and buildings.

If it is not known exactly where buildings, hard standing, site access and temporary storage will be located it must be assumed that the construction zone is the entire site.

Contaminant: is defined as any solid, liquid or gaseous material in, or on the ground to be covered by the building, which is classed as a hazard and therefore presents an unacceptable

risk to human health and the environment. The definition also includes land significantly infested by non-native invasive plant species (see definition below).

Non-native invasive plant species: are non-indigenous species that adversely affect the habitats they invade economically, environmentally or ecologically. For the purposes of the BREEAM UK New Construction scheme this currently includes Japanese Knotweed and Giant Hogweed only. Further information on control and disposal together with legislative requirements relating to such species can be obtained from DEFRA.

Pollution linkages: A relevant pollutant linkage is one that has been identified during the risk assessment stage as representing unacceptable risks to human health or the environment.

Proposed development: Any development (building, hard landscaping, car park and access roads) that falls within the boundary of the assessed site.

Previously developed land: For the purposes of this issue BREEAM uses the definition from Planning Policy Statement 3[1] which defines previously developed land as that which is or was occupied by a permanent structure, including the curtilage of the developed land and any associated fixed surface infrastructure.

The definition includes:

1. Defence buildings

The definition excludes:

1. Land that is or has been occupied by agricultural or forestry buildings.
2. Land that has been developed for minerals extraction or waste disposal by landfill purposes where provision for restoration has been made through development control procedures.
3. Land in built-up areas such as parks, recreation grounds and allotments which, although may feature paths, pavilions and other buildings, have not been previously developed.
4. Land that was previously developed but where the remains of the permanent structure or fixed surface structure have blended into the landscape in the process of time (to the extent that it can reasonably be considered as part of the natural surroundings).

Remediation: Activity undertaken to prevent, minimise, remedy or mitigate the risk caused by contaminated land to human health or the environment.

Significant contamination: For the purposes of this issue, significant contamination is contamination compliant with the above definition and that which without remediation, development of the site is not possible.

Checklists and Tables

None

Calculation procedures

None

Other information

None

LE 02 Ecological value of site and protection of ecological features

No. of credits available:	**1**
Minimum standards:	**No**

Aim

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.

Assessment Criteria

The following is required to demonstrate compliance for:

One credit

1. Land within the construction zone is defined as 'land of low ecological value' using either:
    a. The BREEAM checklist for defining land of low ecological value (see Additional Information section below) OR
    b. A Suitably Qualified Ecologist who has identified the land as being of 'low ecological value' within an ecological assessment report, based on a site survey.

2. All existing features of ecological value surrounding the construction zone and site boundary area are adequately protected from damage during clearance, site preparation and construction activities as listed below:
    a. Trees of over 100 mm trunk diameter, and/or of significant ecological value, are protected by barriers. Barriers must prohibit construction works in the area between itself and the tree trunk. Minimum distance between tree trunk and barriers must be either the distance of branch spread or half tree height, whichever is the greater.
    b. Trees are protected from direct impact and from severance or asphyxiation of the roots.
    c. Hedges and natural areas requiring protection must either have barriers erected and be protected, or, when remote from site works or storage areas, be protected with a prohibition of construction activity in their vicinity.
    d. Watercourses and wetland areas are to be protected by cut-off ditches and site drainage to prevent run-off to natural watercourses (as this may cause pollution, silting or erosion).

3. In all cases, the principal contractor is required to construct ecological protection prior to any preliminary site construction or preparation works (e.g. clearing of the site or erection of temporary site facilities).

Compliance notes	
No features of ecological value	This credit can be awarded where the construction zone is defined as 'land of low ecological value' and where the surrounding site contains no features of ecological value,.
Use of a suitably qualified ecologist	Where a Suitably Qualified Ecologist is employed and has, using their

Compliance notes	
	professional judgement, defined the site as land of low ecological value, this assessment/judgement overrides any assessment determined using the BREEAM checklist for defining land of low ecological value. The Suitably Qualified Ecologist must base their findings on data collected from a site visit conducted at appropriate time(s) of the year, when different plant and animal species are evident. The content of the Ecology Report is to be representative of the existing site's ecology prior to the commencement of initial site preparation works (i.e. before RIBA stage K, construction to practical completion). Where the ecologist has not visited the site at the appropriate times the credit cannot be awarded (except in the circumstances indicated below in the Compliance note 'Site clearance prior to purchase of the site'). See Additional Information for the BREEAM definition of a Suitably Qualified Ecologist.
Features of little or no ecological value	If a Suitably Qualified Ecologist has confirmed that a feature has little or no ecological value, or where a tree is deemed to create a significant danger to the public or occupants by a statutory body or qualified arboriculturalist, then that feature may be exempt from the protection of ecological features requirement of this issue.
Removal of features of ecological value	If features of ecological value have been removed as part of the site clearance then the development cannot achieve this credit, even if they are to be replaced as part of a new landscaping strategy.
Site clearance prior to purchase of the site	For sites cleared prior to purchase of the site and less than five years before assessment, a suitably qualified ecologist should estimate the site's ecological value immediately prior to clearance using available desktop information (including aerial photography) and the landscape type/area surrounding the site. Where it is not possible for the ecologists to determine that the site was of low ecological value prior to the site clearance then the credit must be withheld i.e. where there is no evidence and therefore justification for awarding the credit. For sites cleared more than five years ago, the ecological value of the site is to be based on the current situation on the basis that within five years, ecological features would have started to re-establish themselves and therefore act as an indicator of the site's ecological value.
Multi-residential development with CSH assessed dwellings	For buildings with self-contained dwellings also being assessed under the Code for Sustainable Homes (CSH), the following applies: Where CSH issues Eco 1 and Eco 3 have been achieved for the site and compliance with Eco 1 has been demonstrated using a Suitably Qualified Ecologist, then the credit available for this assessment issue can also be awarded. Where Eco 1 has been awarded in the CSH assessment on the basis of compliance with the CSH checklist for Eco 1 Land of Low Ecological value, the credit for this issue in the BREEAM assessment cannot automatically be awarded, as the BREEAM checklist differs from that used in the CSH. Compliance must be demonstrated using the BREEAM checklist.

Compliance notes	
Verification of a report written by an ecologist not meeting the BREEAM SQE criteria	Where a suitably qualified ecologist is verifying an Ecology Report produced by another ecologist who does not meet the SQE criteria, they must, as a minimum, have read and reviewed the report and confirm in writing that they have found it to: 1. represent sound industry practice 2. report and recommend correctly, truthfully and objectively 3. be appropriate given the local site conditions and scope of works proposed 4. avoid invalid, biased and exaggerated statements. Additionally, written confirmation from the third party verifier that they comply with the definition of a Suitably Qualified Ecologist is required.

Schedule of Evidence

Req	Design Stage	Post Construction Stage
All	A completed copy of Table 11-1signed and dated by the client or a design team member AND EITHER Plans, site photographs and specifications confirming presence, or otherwise, of ecological features and the protection measures specified. OR Ecologist's report highlighting information required in accordance with the Appendix F 'Relating Ecology Reports to BREEAM'. Where relevant for multi residential buildings: Evidence in line with the Design stage evidence requirements of the CSH Issues Eco 1 and Eco 3 OR A copy of the Design Stage CSH certificate and report.	As design stage BREEAM Assessor's site inspection report and photographic evidence OR ecologist's report confirming: 1. The boundary of the site and the construction zone has not been altered. 2. Where applicable, all existing ecological features still remain. Where relevant for multi residential buildings: Evidence in line with the Post Construction Stage evidence requirements of the CSH Issues Eco 1 and Eco 3, OR A copy of the Post Construction Stage CSH certificate and report.

Additional Information

Relevant definitions

Appendix F - Relating Ecology Reports to BREEAM: A guidance document to help assessors relate the contents of a Suitably Qualified Ecologists report to the land use and ecology criteria of BREEAM. The document takes the form of a questionnaire which can be given to an SQE to complete, therefore giving the BREEAM Assessor the necessary information required to complete their assessment of the building.

Construction zone: For the purpose of this BREEAM issue the construction zone is defined as any land on the site which is being developed (and therefore disturbed) for buildings, hard standing, landscaping, site access, plus a 3m boundary in either direction around these areas. It also includes any areas used for temporary site storage and buildings.

If it is not known exactly where buildings, hard standing, site access and temporary storage will be located it must be assumed that the construction zone is the entire site.

Site clearance: The preparation of the site prior to construction works commencing including removal of walls, hedges, ditches, and trees, other vegetation and services from the site. It can also involve the clearance of fly-tipped materials.

Suitably qualified ecologist (SQE): An individual achieving all the following items can be considered to be "suitably qualified" for the purposes of compliance with BREEAM:

1. Holds a degree or equivalent qualification (e.g. N/SVQ level 5) in ecology or a related subject.
2. Is a practising ecologist, with a minimum of three years relevant experience (within the last five years). Such experience must clearly demonstrate a practical understanding of factors affecting ecology in relation to construction and the built environment; including, acting in an advisory capacity to provide recommendations for ecological protection, enhancement and mitigation measures. Examples of relevant experience are: ecological impact assessments; Phase 1 and 2 habitat surveys and habitat restoration.
3. Is covered by a professional code of conduct and subject to peer review.

Full members of the following organisations, who meet the above criteria, are deemed suitably qualified ecologists for the purposes of BREEAM:

1. Chartered Institution of Water and Environmental Management (CIWEM)
2. Institute of Ecology and Environmental Management (IEEM)
3. Institute of Environmental Management and Assessment (IEMA)
4. Landscape Institute (LI)

Peer review: is defined as the process employed by a professional body to demonstrate that potential or current full members maintain a standard of knowledge and experience required to ensure compliance with a code of conduct and professional ethics.

Ecology related subject: Depending on the ecological content (minimum 60%), the following degrees might be considered relevant: Ecology, Biological Sciences, Zoology, Botany, Countryside Management, Environmental Sciences, Marine and Freshwater Management, Earth Sciences, Agriculture, Forestry, Geography, Landscape Management.

Checklists and Tables

BREEAM checklist for defining land of low ecological value

If the answer to all questions in the checklist is 'no', the land can be defined as having a low ecological value and the credit awarded. Should any of the questions be answered 'yes', the credit can only be awarded on confirmation from a Suitably Qualified Ecologist that the site is of low ecological value.

The checklist should be completed by either the BREEAM Assessor, using appropriate evidence submitted by the design team or completed by the design team and submitted to the Assessor along with appropriate supporting evidence. The answers to the checklist must be based on an evaluation of the site prior to any site clearance or construction activities (refer to Compliance notes for further detail).

Table 11-1: BREEAM checklist for defining land of low ecological value

		Please tick as appropriate	
Q1	Has the Planning Authority required that an ecological survey or statement be prepared?	YES	NO
Q2	Is the development within 2 km of a Special Area of Conservation (SAC), Special Protection Area (SPA) or Ramsar site? 1. www.n-atureonthemap.org.uk/ 2. www.magic.gov.uk 3. Local Plan Proposals Map	YES	NO
Q3	Is the development within 500m of a Site of Special Scientific Interest (SSSI) 1. www.natureonthemap.org.uk 2. www.magic.gov.uk 3. Local Plan Proposals Map	YES	NO
Q4	Are any of the following habitats present on, or within 100m of the construction zone? 1. Broad-leaved woodland* 2. Water courses (rivers, streams or canals)** 3. Wetlands (ponds, lakes, marshland, fenland) 4. Flower-rich meadow/grassland 5. Heathland (habitat/plants that thrive on acidic soils, such as heather and gorse)	YES	NO
Q5	Are any of the following features present within or on the boundary of the construction zone? 1. Trees more than 10 years old 2. Mature Hedgerow (field hedgerows over 1m tall and 0.5m wide)*** 3. Existing buildings (occupied or derelict) with either pitched tile, slate or shingle roofs, lofts, wall hanging tiles, weatherboarding or dense climbing plants, soffits and cellars/basements/ice houses etc.	YES	NO
Notes:			

	Please tick as appropriate
* The Countryside Survey defines woodland as 'having over 25% canopy cover of trees and shrubs, over a metre high'. Broad-leaved woodland should be taken to mean broad-leaved, mixed and Yew woodland.	
** The Countryside Survey defines the broad habitats of rivers and streams as running watercourses ranging from small headwater streams to large rivers. This broad habitat, along with wetlands, includes the open water itself and the vegetation along the water's edge.	
*** The Countryside Survey defines a hedge as 'a line of woody vegetation that has been subject to management so that trees no longer take their natural shape.'	
www.countrysidesurvey.org.uk/index.html	

Calculation procedures

None

Other information

Very often there is the potential for a site to increase its biodiversity value through appropriate design and management, regardless of whether enhancing biodiversity is required to gain Planning Consent. This BREEAM assessment issue provides the opportunity to reward those projects that contribute to protecting and enhancing biodiversity, improve living environments and meet environmental objectives.

Whilst not mandatory, BREEAM recommends that a Suitably Qualified Ecologist is appointed to ensure that a project maximizes biodiversity gains. Although a large number of developments are not required to undertake formal ecological assessments as part of the planning process because of the nature of the existing site, they may have potential to be of biodiversity value. Verification of this is best achieved by the appointment of a Suitably Qualified Ecologist.

Organisations and Institutes, including the Institute of Ecology and Environmental Management (IEEM) and the Association of Wildlife Trust Consultancies (AWTC), provide lists of ecologists working within a particular region that may meet the SQE requirements.

LE 03 Mitigating ecological impact

No. of credits available:	**2**
Minimum standards:	**Yes**

Aim

To minimise the impact of a building development on existing site ecology.

Assessment Criteria

The following is required to demonstrate compliance for:

One credit

1. The change in ecological value of the site is less than zero but equal to or greater than minus nine i.e. a minimal 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 (see checklists and tables in the Additional Information section).
        ii. Area (m^2) of the existing and proposed broad habitat types.

    OR

    b. Where a suitably qualified ecologist (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.

Two credits

2. Where the change in ecological value of the site is equal to or greater than zero i.e. no negative change, using the methods outlined in either (a) or (b) above.

Compliance notes	
Average total taxon (plant species richness)	BREEAM uses plant species richness as an indicative measure of ecological value of the assessed site and therefore an indication of ecological impact resulting from its development. The ecological value is expressed as an area weighted average of plant species richness for a site's broad habitat types. Where a suitably qualified ecologist has been appointed the actual number of surveyed and specified plant species (before and after construction) must be used to calculate the change in ecological value (using the BREEAM LE 03/LE 04 calculator). Alternatively, the BREEAM Assessor may calculate the change by defining the broad habitat types (before and after construction) for the assessed site within the BREEAM LE 03/LE 04 calculator. Using this information a

Compliance notes	
	default number of average plant species is determined for the purpose of the calculation. These figures are based on national data collated for the 2007 Countryside Survey (see Table 11-3).
Derelict Sites	The ecological value of derelict sites in Table 11-3 is time dependent; a linear scale has been used to determine intermediate values between zero ecological value where development occurs within 5 years from dereliction/demolition, to a value at 30 years based on the full species richness for that particular broad habitat. This presents a minimum figure which can be amended on the advice of a suitably qualified ecologist's and their site survey.
Assessment of a single development on a larger site	Where the assessment is of a single building that forms part of a larger development and the landscaping and ecological features form a common part of the whole site, for the purpose of assessing this issue the plot types and areas for the entire site must be used.
Infill developments on existing occupied site	Where a new building is an infill on an existing occupied site, then the construction zone for the new building would be the area of site assessed for the purposes of this issue.
Site clearance prior to purchase of the site	Refer BREEAM issue LE 02 (Compliance notes).
Green Roofs	The contribution of plant species on a Green roof can only be incorporated within the calculation where a suitably qualified ecologist has been appointed to advise on suitable plant species for the roof.
Multi-residential developments with CSH assessed dwellings	For buildings with self-contained dwellings also being assessed under the Code for Sustainable Homes (CSH), the following applies: The number of credits achieved under the CSH assessment of issue Eco 4 cannot be directly applied to this issue for assessment of a multi-residential building due to the difference in number of credits available and respective benchmarks. However, where a suitably qualified ecologist has been used to calculate the change in ecological value in the CSH assessment, the data/information used can be used to determine the number of credits for this BREEAM issue (and vice-versa, BREEAM to CSH), provided compliance with all requirements of the BREEAM/CSH technical guide are met.

Schedule of Evidence

Req	Design Stage	Post Construction Stage
All	Design drawings including proposed and existing (pre-development) site plan/survey. AND EITHER 1. A completed copy of the BREEAM LE 03/LE 04 calculator OR 2. Ecologist's report highlighting information required in Appendix F OR a copy of Appendix F completed by the ecologist AND written confirmation from the client/design team detailing how the ecologist's recommendations will be implemented. Where relevant for multi-residential buildings; Evidence in line with the Design stage evidence requirements of the CSH Issues Eco 4 OR A copy of the Design Stage CSH certificate and CSH compliance report confirming the change in ecological value for the site.	As design stage AND BREEAM Assessor's site inspection report and photographic evidence confirming planting in accordance with design stage plan. Relevant section/clauses of the building specification or contract or a letter from the client or principal contractor confirming any planting will be completed within 18 months from completion of the development*. * This is only for large mixed-use/multi-building developments, where the whole site has not been completed and ecological enhancements have not yet been added, or where features are being added at a later date in an appropriate planting season. Where relevant for multi-residential buildings; Evidence in line with the Design stage evidence requirements of the CSH Issues Eco 4 OR A copy of the final post construction CSH certificate and CSH compliance report confirming the change in ecological value for the site.

Additional Information

Relevant definitions

Construction zone: Refer to BREEAM issue LE 02.

Suitably qualified ecologist (SQE): Refer to BREEAM issue LE 02.

Checklists and Tables

Table 11-2: Broad habitat types

Broad habitat name	Description
Acid Grassland	Vegetation dominated by grasses and herbs on a range of lime-deficient soils which have been derived from acidic bedrock or from superficial deposits such as sands and gravels. They characteristically include a range of calcifuge or 'lime-avoiding' plants.
Arable and Horticultural	Includes all arable crops such as different types of cereal and vegetable crops, together with orchards and more specialist operations such as market gardening and commercial flower growing. Freshly ploughed land, fallow areas, short-term set-aside and annual grass leys are also included in this category.
Boundary and Linear Features	This habitat includes a diverse range of linearly arranged landscape features such as hedgerows, lines of trees (whether they are part of a hedgerow or not), walls, stone and earth banks, grass strips and dry ditches. These features may occur separately or in combinations forming multi-element boundaries. This habitat type also includes some of the built components of the rural landscape, including roads, tracks and railways. The narrow strips of semi-natural vegetation along verges or cuttings are also included.
Bracken	Stands of vegetation greater than 0.25 ha in extent which are dominated by a continuous canopy cover (>95% cover) of bracken (Pteridium aquilinum) at the height of the growing season.
Built-up and Gardens	Covers urban and rural settlements, farm buildings, caravan parks and other man-made built structures such as industrial estates, retail parks, waste and derelict ground, urban parkland and urban transport infrastructure. It also includes domestic gardens and allotments. This category has been split in to three individual broad habitat categories for the purpose of BREEAM: 1. Gardens, allotments and urban parkland 2. Built-up (maintained buildings and infrastructure) 3. Derelict land (where the land was previously used for major historical industrial use or development). This split is to reflect the differing impact of development in these types of habitats.
Broadleaved, Mixed and Yew Woodland	This form of woodland is dominated by trees that are more than 5m high when mature, which form a distinct, although sometimes open, canopy with a cover of greater than 20%. It includes stands of native broadleaved trees (such as oak, ash and beech), non-native broadleaved trees (such as sycamore and horse chestnut), and yew trees, where the percentage cover of these trees in the stand exceeds 20% of the total cover of the trees present. Scrub vegetation, where the woody component tends to be mainly shrubs (usually less than 5m high), is included if the cover of woody species is greater than 30%.
Calcareous Grassland	Vegetation dominated by grasses and herbs on shallow, well-drained soils, which are alkaline, as a result of the weathering of chalk, limestone or other types of base-rich rock. They characteristically include a range of calcicoles or 'lime-loving' plants.

Broad habitat name	Description
Coniferous Woodland	Dominated by trees that are more than 5m high when mature, which form a distinct, although sometimes open, canopy which has a cover of greater than 20%. It includes stands of both native conifers (Scots pine but not yew) and non-native conifers (such as larch and Sitka spruce) where the percentage cover of these trees in the stand exceeds 80% of the total cover of the trees present.
Mixed woodland	This is not a category in its own right, but has been included separately by BRE Global for clarification; Many areas of woodland contain both broadleaved and coniferous trees. There is not a separate Broad Habitat for mixed woodland. Instead where mixtures occur they are assigned to the Broadleaved, Mixed and Yew Broad Habitat type if the proportion of conifers is less than 80%. The separation of coniferous from Broadleaved, Mixed and Yew habitat is applied at a stand or sub-compartment level within large woodlands to avoid areas that are predominantly coniferous being treated as mixed because they are part of a larger wood, of which 20% consists of pure broadleaved trees. Therefore, most areas of mixed woodland that are assigned to the Broadleaved, Mixed and Yew Broad Habitat would normally have much more than 20% broadleaved or yew trees.
Dwarf Shrub Heath	Vegetation that has a greater than 25% cover of plant species from the heath family or dwarf gorse species. It generally occurs on well-drained, nutrient-poor, acid soils.
Improved Grassland	Occurs on fertile soils and is characterised by the dominance of a few fast-growing species, such as rye-grass and white clover. These grasslands are typically used for grazing and silage, but they can also be managed for recreational purposes. They are often intensively managed using fertiliser and weed control treatments, and may also be ploughed as part of the normal rotation of arable crops but if so, they are only included in this Broad Habitat type if they are more than one year old.
Inland Rock	Habitat types that occur on both natural and artificial exposed rock surfaces, such as inland cliffs, caves, screes and limestone pavements, as well as various forms of excavations and waste tips, such as quarries and quarry waste.
Neutral Grassland	Found on soils that are neither very acid nor alkaline. They support different types of vegetation communities compared to Acid and Calcareous Grasslands in that they do not contain calcifuge ('lime-avoiding') plants which are found on acid soils, or calcicole (lime-loving) plants which are found on calcareous soils. Unimproved or semi-improved Neutral Grasslands may be managed as hay meadows, pastures or for silage. They differ from Improved Grassland in that they are less fertile and contain a wider range of herb and grass species. Usually the cover of rye grass is less than about 25%.

Table 11-3: Inclusive analysis of Average Total Taxon Richness by broad habitat in 'Fields and Other Main Land Cover Parcels plots' in Great Britain.

Habitat type	Previously Undeveloped Land	Previously Developed Land (within Broad Habitat type)[2] (Time period that the site has been unoccupied/unmaintained and therefore derelict)			
		<5 Years	5-10 Years	10 - 20 Years	20 - 30+ Years
	Average Total Taxon (plant species) Richness[1]				
Acid Grassland	19.58	0	5.87	14.69	19.58
Arable and Horticultural Land	10.25	-	-	-	-
Boundary and Linear Features	15.42	-	-	-	-
Bracken	19.29	-	-	-	-
Built-up (buildings and infrastructure)[3]	-	0	-	-	-
Calcareous Grassland	43.02	0	12.91	32.27	43.02
Coniferous Woodland	14.05	-	-	-	-
Derelict land[3]	-	0	6.00	14.99	19.99
Gardens, allotments and urban parkland[3]	19.99	0	6.00	14.99	19.99
Dwarf Shrub Heath	15.87	0	4.76	11.90	15.87
Improved Grassland	14.28	0	4.28	10.71	14.28
Inland Rock	16.74	-	-	-	-
Mixed, Broadleaved and Yew Woodland	20.91	-	-	-	-
Neutral Grassland	20.44	0	6.13	15.33	20.44

1. Total taxon richness is higher plant species only, no bryophytes (non flowering plants). Figures are based on the average species richness per 200m^2 plot.
2. The derelict land and built-up figures are not from the Countryside survey data (see Additional information).
3. BRE Global have split the "Built-up and gardens" Countryside survey category into these headings to reflect the differing impact of building on this types of land.

Calculation procedures

Calculating the change in ecological value for a site

The change in ecological value is determined using the diversity (species richness and cover) of plants on the site immediately before site clearance/preparation and after construction of the assessed development. The ecological value is expressed as an area-weighted average of plant species richness for the site's broad habitat types. This enables BREEAM to use plant species as an indicator of the development's impact on the site's existing ecological value.

A simple example of the calculation is outlined below.

1. Calculate the ecological value of a previously developed existing site:

   A 2065m^2 existing site consists of the following types of land and, using data from the table above, plant species richness:

   a. 1865 m^2 hard landscaping = 0 species
   b. 200m^2 urban parkland = 19.99 species

   The ecological value of the site in its existing condition is calculated as follows, for each plot type;

   Number of species on plot type x plot type area as % of total area.

   Therefore, for our example site:

   a. Hard landscaping: {(0 species x (1865m^2/2065m^2)} = 0
   b. Urban parkland: {(19.99 species x (200m^2/2065m^2)} = 1.94
   c. Ecological value of the existing site = 0 + 1.94 = 1.94

2. Calculate the ecological value of the site in its proposed, post-developed state:

   The 2065m^2 post-construction site consists of the following types of land:

   a. 1375m^2 of building = 0 species.
   b. 550m^2 of hard landscaping = 0 species
   c. 140 m^2 has remained as urban parkland = 19.99 species

   The ecological value of the proposed site is as follows:

   a. Building: {(0 species x (1375m^2/2065m^2)} = 0
   b. Hard landscaping: {(0 species x (550m^2/2065m^2)} = 0
   c. Urban parkland: {(19.99 species x (140m^2/2065m^2)} = 1.36
   d. Ecological value of the proposed site = 0 + 0 + 1.36 = 1.36

   The ecological impact is the difference between the two ecological values:

   a. Change in ecological value: 1.36 (after) – 1.94 (before) = - 0.58

   Therefore, as the ecological value has decreased by no less than minus nine, for this example one credit can be awarded.

Other information

BREEAM recommendation

Very often there is the potential for a site to increase its biodiversity value through appropriate design and management, regardless of whether enhancing biodiversity is required to gain Planning Consent. This BREEAM assessment issue provides the opportunity to reward those projects that contribute to protecting and enhancing biodiversity, improve living environments and meet environmental objectives.

Whilst not mandatory, BREEAM recommends that a Suitably Qualified Ecologist is appointed to ensure that a project maximizes biodiversity gains. Although a large number of developments are not required to undertake formal ecological assessments as part of the planning process, because of the nature of the existing site they may have potential to be of biodiversity value. Verification of this is best achieved by the appointment of a Suitably Qualified Ecologist.

Countryside Survey (2007) data

The data used in this BREEAM issue has been obtained from the Countryside Survey 2007 tables; http://www.countrysidesurvey.org.uk/data_access/Graphs/SummaryResults.aspx

Broad habitat definitions have been sourced from;
http://www.countrysidesurvey.org.uk/archiveCS2000/Report_pdf/appen.pdf

Some of the Countryside Survey broad habitat data has not been used within this BREEAM issue either because the broad habitat supports no taxon richness or because it is unlikely that buildings will be constructed within these habitat types e.g. bog, fen etc.

BREEAM assumptions

In order to use the Countryside survey data within BREEAM, BRE Global have made the following assumptions;

1. Built-up (maintained buildings and hard landscaping) have a plant species richness of zero.
2. The previously developed land category is relevant for derelict sites within a broad habitat type where plant species found in that habitat are likely to reclaim the site if left to do so over a defined period of time. BRE have assumed this is the case for land found within the grassland, heath, derelict, gardens, allotments and urban parkland habitats. It has not been assumed for other categories as BRE Global are unable to confirm an appropriate period over which planting will re-establish itself on derelict land within these other broad habitat types.
3. A period of five to ten, ten to twenty and twenty to thirty year's dereliction is used; the species richness figures against each period for a particular habitat type are based on a re-establishment rate of 30% of richness, 75% and 100% respectively.
4. BRE have split the 'Built up and gardens' category from the Countryside survey into 'Gardens, allotments and urban parkland', 'Derelict' and 'Built-up' habitat types. This split is to reflect the differing impact of building on this type of land.

LE 04 Enhancing site ecology

No. of credits available:	Building type dependent
Minimum standards:	No

Aim

To recognise and encourage actions taken to maintain and enhance the ecological value of the site as a result of development.

Assessment Criteria

The following is required to demonstrate compliance for:

One credit (except buildings on HM Prison sites where two credits are available for compliance with criteria 1 and 2)

1. A suitably qualified ecologist (SQE) has been appointed to report on enhancing and protecting the ecology of the site and:
   a. The SQE provides an Ecology Report with appropriate recommendations for protection and enhancement of the site's ecology.
   b. The report is based on a site visit/survey by the SQE (see also compliance note 'timing of ecologist's survey and report')..

2. The general recommendations of the Ecology Report for enhancement and protection of site ecology have been, or will be, implemented.

Two credits (all building types except those on HM Prison sites)

3. Criteria 1 and 2 are achieved.
4. The recommendations of the Ecology Report for enhancement and protection of site ecology have been implemented, and the suitably qualified ecologist confirms that this will result in an increase in ecological value of the site up to (but not including) 6 plant species.
5. The increase in plant species has been calculated using the BREEAM LE03/LE04 calculator, using actual plant species numbers.

Three credits (all building types except those on HM Prison sites)

6. The requirements of the first credit are achieved.
7. The recommendations of the Ecology Report for enhancement and protection of site ecology have been implemented, and the suitably qualified ecologist confirms that this will result in an increase in ecological value of the site of 6 plant species or greater.
8. The increase in plant species has been calculated using the BREEAM LE 03/LE 04 calculator, using actual plant species numbers.

Compliance notes	
Timing of ecologist's survey and report	The suitably qualified ecologist must be appointed to carry out site surveys of existing site ecology, on which their report is based (or to provide verification where the report is prepared by others) at the design brief stage (RIBA Stage B or equivalent) in order to facilitate and maximise potential ecological enhancement.

Compliance notes	
General recommendations	'General' recommendations for enhancing and protecting the ecological value of the site are to include, and go beyond, compliance criteria for all current EU and UK legislation relating to protected species and habitats. These 'general' recommendations may include ecological recommendations as detailed in the definitions.
Guidance for ecologists and assessors	Please refer to Appendix F, Guidance on relating ecology reports to BREEAM.
Plant species	Only native floral/plant species, and/or those contributing to a local or UK Biodiversity Action Plan or those with a known attraction or benefit to local fauna (as recommended by the SQE) can be considered for the purpose of increasing the number of species on site, as well as general enhancement. The planting area, density and mixture of different species must be specified on advice from the SQE, to give the best possible chance of long term establishment and survival of the species within the habitat. The Natural History Museum has an online Postcode Plants Database which generates lists of native plants and wildlife for any specified postal district in the UK. http://www.nhm.ac.uk/nature-online/life/plants-fungi/postcode-plants/index.html
No ecological survey completed or construction works have commenced	Where it is not possible to determine 'actual' number of species per vegetation plot type, either because an on-site ecological survey has not been conducted, or, because construction works have already commenced, the second and third credits cannot be achieved. Note: This guidance is not applicable to assessments of buildings on HM Prison sites.
Infill construction on existing sites with limited space for ecological enhancements or overriding security requirements	Where it is not possible to implement ecological enhancements within the construction zone due to overriding security issues, or where space for ecological enhancements within the zone is severely limited, ecological enhancements made to other areas of the site can be taken into account and used to determine the number of BREEAM credits achieved. These enhancements must be made within the boundary of the wider existing development and be planned and commissioned on a similar timescale to the assessed development. Example's of instances where this Compliance note may apply include new 'infill' building development within existing HM Prison sites, further and higher education campuses, retail or business parks.
Multi-residential developments with CSH assessed dwellings	For buildings with self-contained dwellings also being assessed under the Code for Sustainable Homes (CSH), the following applies: The number of credits achieved under the CSH assessment of issue Eco 4 cannot be directly applied to this issue for an assessment of a multi-residential building due to the difference in number of credits available and respective benchmarks. However, the data/information and output used in CSH assessment to calculate the change in ecological value can be used to determine compliance with the second and third credits of this BREEAM issue (and vice-versa, BREEAM to CSH, provided compliance with all requirements of the CSH technical guide is met).

Schedule of Evidence

Req	Design Stage	Post Construction Stage
All	Ecologist's report highlighting information required in Appendix F or a copy of Appendix F completed by the ecologist. Design drawings including proposed and existing (pre-development) site plan/survey Written confirmation from the client/design team confirming how the ecologist's recommendations will be implemented. Where relevant for multi residential buildings: Evidence in line with the Design stage evidence requirements of the CSH Issues Eco 4 OR A copy of the Design Stage CSH certificate and CSH compliance report confirming the change in ecological value for the site.	As design stage requirements BREEAM Assessor's site inspection report and photographic evidence confirming planting in accordance with design stage plan. Relevant section/clauses of the building specification or contract or a letter from the client or principal contractor confirming the planting will be completed within 18 months from completion of the development*. * This is for large mixed-use/multi-building developments, where the whole site has not been completed and ecological enhancements have not yet been added, or where features are being added at a later date in an appropriate planting season. Where relevant for multi residential buildings: Evidence in line with the Design stage evidence requirements of the CSH Issues Eco 4 OR A copy of the final post construction CSH certificate and CSH compliance report confirming the change in ecological value for the site.

Additional Information

Relevant definitions

Suitably qualified ecologist (SQE): Refer to BREEAM issue LE 02.

Checklists and Tables

None

Calculation procedures

None

Other information

Ecological recommendations are defined as measures adopted to enhance the ecology of the site, which may include:

1. The planting of native species or those with a known attraction or benefit to local wildlife
2. The adoption of horticultural good practice (e.g. no, or low, use of residual pesticides)
3. The installation of bird, bat and/or insect boxes at appropriate locations on the site
4. Development of a full Biodiversity Management Plan including avoiding clearance/works at key times of the year (e.g. breeding seasons)
5. The proper integration, design and maintenance of SUDs and Green Roofs, community orchards etc.

Only native floral species or those with a known attraction or benefit to local wildlife can be considered for the purpose of enhancing the ecological value of the site.

LE 05 Long term impact on biodiversity

No. of credits available:	Building type dependent
Minimum standards:	No

Aim

To minimise the long term impact of the development on the site and the surrounding area's biodiversity.

Assessment Criteria

The following is required to demonstrate compliance:

1. There is a commitment to achieve the mandatory criteria and appropriate number of additional criteria (listed below) as follows:

Building type	No. of credits	No. of additional criteria
All building types except prisons	1	2
	2	4
Prison buildings	1	2
	2	3
	3	4

1. Where the Suitably Qualified Ecologist (SQE) confirms that some of the additional criteria listed below are not applicable to the assessed development, the credits can be awarded as follows:

		Applicable additional criteria				
		All	4	3	2	1
Building type	Credits	Number of additional criteria to achieve				
All building types except prisons	1	2	2	2	2	1
	2	4	4	3		
Prison buildings	1	2	2	1	2	1
	2	3	3	2		
	3	4	3	3		

Mandatory criteria

2. A suitably qualified ecologist (SQE) has been appointed prior to commencement of activities on site.
3. The suitably qualified ecologist confirms that all relevant UK and EU legislation relating to protection and enhancement of ecology has been complied with during the design and construction process.

4. A landscape and habitat management plan, appropriate to the site, is produced covering at least the first five years after project completion. This is to be handed over to the building occupants and includes:
    a. Management of any protected features on site
    b. Management of any new, existing or enhanced habitats
    c. A reference to the current or future site level or local Biodiversity Action Plan.

Additional criteria

5. The principal contractor nominates 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.
6. The principal contractor trains the site workforce on how to protect site ecology during the project. Specific training must be carried out for the entire site workforce to ensure they are aware of how to avoid damaging site ecology during operations on site. Training should be based on the findings and recommendations for protection of ecological features highlighted within a report prepared by a suitably qualified ecologist.
7. The principal contractor records 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.
8. 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)[2] , Local Biodiversity Action Plan (LBAP), those protected within statutory sites (e.g. SSSIs), or those within non-statutory sites identified in local plans.
9. Where flora and/or fauna habitats 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.

Additionally for Education building types only (criterion 10.)

10. 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 and/or 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 of any features or species of ecological interest on or near the site.
    c. Provided 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 the Local Biodiversity Action Plan (LBAP) in the school/college landscape design.

Compliance notes	
Biodiversity Champion	A Biodiversity Champion does not have to be an ecologist or ecological expert but must have sufficient authority and time on site to influence activities and ensure that they have minimal detrimental impact on biodiversity.
Local biodiversity expertise	Local biodiversity expertise should be sought at, or before, the design stage to help identify species of local biodiversity importance on site. It is likely that their recommendations will draw on the Local Biodiversity Action Plan (LBAP) where one exists.
Where additional criteria are not applicable	In all cases it is necessary to employ a suitably qualified ecologist to achieve these credits. As a minimum the ecologist must provide the following in writing; 1. Confirmation that mandatory criteria 2 and 3 have been achieved 2. Clarification on whether mandatory criterion 4 is applicable and if so that it has been achieved 3. Clarification on how many of the additional criteria are applicable and have been achieved 4. Guidance on how to achieve additional criterion 8 (where possible) Where the suitably qualified ecologist confirms that mandatory criterion 4 and all additional criteria are not applicable (due to the nature of the site and its surroundings) full credits can be awarded for demonstrating compliance with mandatory criteria 2 and 3.
Prison Service Biodiversity Action Plan (PSBAP)	The additional criterion 8 'creation of a new ecologically valuable habitat' should consider the Prison Service Biodiversity Action Plan (PSBAP)[3] in lieu of, or as well as, the UKBAP.
Existing prison sites	For assessments of buildings on existing HM Prison sites, the assessor should determine which classification of the PSBAP the site falls into (see Additional Information). The classification of the site will affect the measures required to maintain any new ecologically valuable habitat and protect long-term biodiversity.
Ground maintenance & management plan	The management plan should include guidelines for ground maintenance. Without this there may be a tendency for grounds maintenance staff to pursue a largely unchanging maintenance routine. This may not be favourable to biodiversity on site, and may reduce scope for involvement of building users (e.g. pupils in schools) in the management of and engagement with site biodiversity.
Additional criterion 10: Education buildings only	
Ongoing support and advice	This could take the form of meetings several times a year with a staff/pupils/students working party to help them plan conservation/ecological enhancement work, or activities relating the ecology in or near the school/college grounds.
Local Wildlife Trust	The local wildlife trust would be a suitable body to set up a partnership with. Alternative groups may also be appropriate. The design team should investigate wildlife projects that these groups have been involved with locally, in order to make a decision on their suitability before entering into discussions about setting up a partnership.

Schedule of Evidence

Req	Design Stage	Post Construction Stage
1	See below	See below
Mandatory criteria		
2-4	Ecologist's report highlighting information required in Appendix F or a copy of Appendix F completed by the ecologist AND EITHER A copy of the site's landscape and habitat management plan OR Relevant section/clauses of the building specification or contract confirming its development and scope OR A letter from the client confirming a commitment to produce the management plan and its' scope	A letter from the SQE confirming that all relevant UK and EU legislation relating to protection and enhancement of ecology has been complied with. A copy of the site's landscape and habitat management plan.
Additional criteria		
5	Relevant section/clauses of the building specification or contract or an appointment letter from the Contractor.	Assessor inspection of, or a copy of the relevant sections of the site log book confirming the details of any action/events taken by the biodiversity champion. If no actions required/taken, this should be confirmed in the log book.
6	Training schedule or letter of confirmation from the principal contractor committing to provide relevant training OR A copy of the specification clause requiring the training of the site's workforce by the principal contractor.	A record of training undertaken including the necessary details.
7	A letter from the principal contractor confirming monitoring and reporting criteria for the development OR	Assessor inspection of, or a copy of the relevant sections of the site log book confirming: 1. Records of monitoring and actions taken to protect biodiversity.

Req	Design Stage	Post Construction Stage
	A copy of the specification clause requiring the principal contractor to undertake monitoring and reporting.	2. Records and outcome of any requests to view such information.
8	A copy of the proposed site plan highlighting the new ecologically valuable habitat. A SQE's report or letter confirming that the habitat supports the relevant biodiversity action plan(s)	BREEAM Assessor's (or SQE's) site inspection report and photographic evidence confirming the existence of the proposed habitat.
9	The SQE's report or letter confirming actions required with respect to programming site works to minimise disturbance. The principal contractor's programme of works. OR Relevant section/clauses of the building specification or contract confirming that the programme of site works will minimise disturbance to wildlife in accordance with the SQE's recommendations.	A letter from the SQE, or a copy of their report confirming site works were executed in a manner that minimised disturbance to wildlife in accordance with their recommendations.
10	Documentary evidence from the design team or wildlife group confirming: 1. Scope of the partnership. 2. Details and remit of the wildlife group. 3. A description of the process for ongoing support that the group commit to give to the partnership. 4. Details of meetings and actions to date	Documentary evidence from the design team or wildlife group detailing as a minimum meetings, actions, advice given, framework for future support including a timetable for meetings and events.

Additional Information

Relevant definitions

Suitably qualified ecologist (SQE): Refer to BREEAM issue LE 02.

Biodiversity: is defined as the variety of life on earth. It includes all species, animal, plants, fungi, algae, bacteria and the habitats that they depend upon.

Biodiversity Action Plan: A plan which sets specific, measurable, achievable, realistic and time bound conservation targets for species and habitats. The UKBAP website www.ukbap.org

supports the implementation of the UK Biodiversity Action Plan (UK BAP) on behalf of the UK Biodiversity Partnership and the UK Government.

Steps to produce a BAP are outlined in the UK Business and Biodiversity Resource Centre website, hosted by Earthwatch Institute Europe http://www.businessandbiodiversity.org under 'your sector'

Prison Service BAPs: In March 2003 HM Prison Service produced a Strategy Statement of Action for a Prison Service biodiversity action plan. The Prison Service BAP comprises three stages, the first of which involves managing SSSI sites. The second stage addresses the management of sites that are not designated, but which may have land which has local, county or regional importance on biodiversity. The third stage addresses the rest of the prison estate, principally comprising urban prisons.

Checklists and Tables

None

Calculation procedures

None

Other information

None

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[1]Planning Policy Guidance (PPG) 3: Housing. www.planningportal.gov.uk

Scottish Planning Policy Guidance (SPPG) 3: Housing. www.scotland.gov.uk/

[2]UK BAP: www.ukbap.org.uk

[3]Statement of Action and Strategy for a Prison Service Biodiversity Action Plan, HMPS, 2003.

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