QA

Britannia Street

BREEAM Multi-Residential 2008: Land Use & Ecology Credits

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1.0 EXECUTIVE SUMMARY

1.1 Greengage Environmental were commissioned by Watkin Jones Group to prepare a report following a site survey relating to the available credits under BREEAM (2008) Land Use and Ecology to support the 'Very Good' target rating for the proposed development at 15-27 Britannia Street in London. This report includes an assessment of the present ecological value on the application site, and recommends ecological enhancement and management techniques for the proposed development to maximise the potential for these BREEAM credits to be obtained and to facilitate the BREEAM overall 'Very Good' rating.

1.2 Within *BREEAM Multi-Residential* there are 4 headings (LE3-LE6) relating to the provision of 8 available credits for Land Use and Ecology that are applicable. A summary of those credits being awarded is as follows:

- At present 1 credit can be recommended for LE3, the 'Ecological Value of the Site and Protection of Features' as taken as one whole ecological unit the site has low ecological value;
- 2 credits are considered appropriate for LE4 'Mitigating Ecological Impact' if written commitment is provided by the client confirming enhancement measures will be implemented, resulting in a positive increase in ecological value. If these measures are taken there will be no negative change in the ecological value of the site as a result of development, i.e. equal to, or greater than, zero species;
- A further 2 credits are considered appropriate under LE5 'Ecological Enhancement' due to the positive enhancements, if written commitment is provided by the client confirming the recommended enhancement measures will be implemented;
- 2 credits can be awarded for LE6 the 'Long Term Impact on Biodiversity' following written commitment to following guidance and legislation within this report; and
- Therefore, it is recommended to award the proposed development 7 credits at this stage with regards to *BREEAM Multi-Residential: Land Use and Ecology.* This is subject to written confirmation that ecological enhancements will be incorporated and the team commit to the mandatory requirements in category LE6.

2.0 INTRODUCTION

2.1 Greengage Environmental LLP were commissioned by Watkin Jones Group to undertake a site visit and provide ecological enhancement advice relating to the available credits under BREEAM Multi-Residential being undertaken on the proposed development at 15-27 Britannia Street in London. Specifically, advice was sought to maximise Land Use and Ecology credits within this category.

2.2 This report includes an assessment of the present ecological value on the application site, and recommends ecological enhancements and management techniques for the proposed development to maximise the potential for these BREEAM credits to be obtained and to facilitate the BREEAM overall 'Very Good' rating.

2.3 Within *BREEAM Multi-Residential* there are 4 headings (LE3-LE6) relating to the provision of 8 available credits for Land Use and Ecology that are addressed in this report. This report will address each heading, and demonstrate if the application site and proposed development has the required information for compliance, and therefore how many credits it will obtain in total.

2.4 Herein the report includes:

- Background of the proposed development and application site location;
- A description of the application site visit and status of the 'suitably qualified ecologist' (LE3);
- A description of the present ecological value of the application site, protection of ecological features and mitigation measures for the ecological impact of the proposed development (LE3 & LE4);
- Recommendations for ecological enhancement of the proposed development, and calculations of the change in ecological value of the application site, from present day to post completion of the proposed development (LE5);
- Discussion on the long-term impact on biodiversity (LE6);
- Table summary of credits to be awarded; and
- Conclusion, including the final number of credits that are considered appropriate for the proposed development.

3.0 BACKGROUND

SITE LOCATION DESCRIPTION

3.1 The application site covers an area of approximately 0.229 hectares, and is centred on National Grid Reference (NGR) 530602, 182870. The existing building on site is the former Whitbread Brewery's Depot.

3.2 The boundary of the development site is defined by Britannia Street to the north, Wicklow Street to the south and west, and the LUL railway cutting to east. See Figure 1.1.

3.3 The building is identified as one that makes a positive contribution to the King's Cross Conservation Area. As such, we appreciate there are sensitivities with regard to changing the visual appearance of the building; our recommendations will keep the Conservation Area status in mind.

THE PROPOSED DEVELOPMENT

3.4 The proposed development comprises applications for planning permission and conservation area consent associated with the partial demolition, rebuilding and extension of 15-27 Britannia Street in connection with the re-use of the site as student accommodation (226 bedspaces). The proposals incorporate the provision of communal areas and an external courtyard, and also the creation of offices, the change of use of unnumbered properties on Wicklow Street to residential accommodation (two studio apartments) and a performance space/ gallery area.

SITE VISIT

3.5 Greengage undertook an application site walkover on 14th May 2010 when weather conditions were clear and sunny. Features within the site boundary and accessible features immediately bordering it were evaluated for their ecological value. The extent and distribution of habitats including those suitable for statutorily protected species, where present, were noted and habitat types and plant communities were also recorded, supplemented as necessary with notes on key botanical species. The information recorded during this survey has been used to provide an assessment of the application sites ecological value in the context of this BREEAM report.

Detailed Description of Site Ecological Value

3.6 Habitats present across the site consist mainly of vacant buildings and hardstanding with the occasional plant species in the courtyard. All of the existing vegetation is being removed as part of the proposed development. Photographs 1-4 in Appendix 1 show the application site and associated vegetation.

Buildings

3.7 The majority of the site is taken up by the existing brick buildings. The structures are 3-4 storeys in height, in a relatively good condition and vacant; the exterior of the buildings are intact and offer no obvious entrance or exit points for bats. They have been identified as having a low potential for roosting bats due to lack of field signs or evidence and do not offer value for other wildlife. Therefore, overall they are deemed as having low ecological value. Photographs 1-4 in Appendix 1 refer to the buildings and existing features.

Hardstanding

3.8 The application site supports areas of concrete hardstanding as well as the aforementioned buildings. These areas have occasional emergent weed species growing through the crack of the concrete, therefore it is concluded this habitats' ecological value is low. Photograph 1-4 in Appendix 1 refers to the hardstanding on site.

Vegetation outside the Application Site Boundary

3.9 There was no vegetation noted outside the application site boundary, within the immediate vicinity.

THE EFFECT OF DEVELOPMENT

3.10 The proposed development will utilise the existing building and include the construction of additional storeys plus associated soft landscaping within the courtyard and living roofs. There are considered to be no negative effects on the existing ecology within the immediate and wider area as a result of the proposed development. The proposals will bring about a positive, net benefit for biodiversity within the vicinity.

4.0 BREEAM 2008: LAND USE & ECOLOGY CREDIT REQUIREMENTS

LE3 – ECOLOGICAL VALUE OF SITE AND PROTECTION OF ECOLOGICAL FEATURES

4.1 The credit criteria states that 1 credit can be awarded:

'*Where evidence provided demonstrates that the site's construction zone is defined as land of low ecological value and all existing features of ecological value will be fully protected from damaging site preparation and construction works.'*

LE4 – MITIGATING ECOLOGICAL IMPACT

4.2 With regards to Mitigating Ecological Impact (LE4) credits are awarded as follows:

- 1 credit: *'Where evidence provided demonstrates that the change in the sites existing ecological value, as a result of development, is minimal.'*
- 2 credits: *'Where evidence provided demonstrates there is no negative change in the sites existing ecological value as a result of development.'*

LE5 – ENHANCING SITE ECOLOGY

4.3 With regards to Enhancing Site Ecology (LE5) credits are awarded as follows:

- 1 Credit: '*Where the design team (or client) has appointed a suitably qualified ecologist to advise and report on enhancing and protecting the ecological value of the site; and implemented the professionals recommendations for general enhancement and protection of site ecology.'*
- 2 Credits: *'Where there is a positive increase in the ecological value of the site of up to (but not including) 6 species.'*
- 3 Credits: *'Where there is a positive increase in the ecological value of the site of 6 species or greater.'*

LE6 – LONG TERM IMPACT ON BIODIVERSITY

4.4 With regards to Long Term Impact on Biodiversity (LE6) credits are awarded as follows:

- 1 Credit: '*The client has committed to achieving the mandatory requirements listed and at least two of the additional requirements';*
- 2 Credits: '*The client has committed to achieving the mandatory requirements listed and at least four of the additional requirements.'*

5.0 LE3 - ECOLOGICAL VALUE OF LAND AND PROTECTION OF ECOLOGICAL FEATURES

SUITABLY QUALIFIED ECOLOGIST

5.1 Compliance with this credit is demonstrated by having a '*suitably qualified ecologist'* (SQE) identifying the land as being of low ecological value, through a site specific ecological survey and associated ecological report.

5.2 Greengage includes a number of SQEs, the necessary requirement for LE3, to establish the ecological value of the site. A SQE is defined as:

- *'An individual with a degree or equivalent qualification in ecology or a related subject;*
- *They should be a practicing ecologist with a minimum of three years experience; and*
- *Is covered by a professional code of conduct and subject to peer review'.*

5.3 Specifically Mitch Cooke has a degree in Ecology (Hons), an MSc in Environmental Assessment and Management, and is a full member of IEEM with over 20 years experience in ecological survey and assessment. Mitch has set up and developed ecological and environmental teams for over 10 years and has undertaken and managed numerous ecological surveys and assessments. He is the Partner at Greengage and manages the team.

5.4 Helen Newman has a degree in Biology (Hons), an MSc in Environmental Technology and a Landscape Design diploma and is an associate member of IEEM with over 5 years experience in ecological survey and assessment.

5.5 Lucy Plumb is an environmental consultant with a degree in Biological Sciences (Hons), and is a graduate member of IEEM. Lucy has experience in undertaking specialist bat surveys and ecological assessments.

5.6 Paul Roebuck has a degree in Geography (Hons), an MSc in Freshwater and Coastal Sciences and is a member of IEEM. Paul has over 5 years' experience in ecological survey and assessment of development sites.

5.7 The application site survey was undertaken by Lucy Plumb and the draft report was reviewed and approved by Helen Newman and Mitch Cooke. The final report was written by Paul Roebuck and reviewed and approved by Helen Newman.

LE3 - ECOLOGICAL VALUE OF LAND AND PROTECTION OF ECOLOGICAL FEATURES: AWARDING OF CREDITS

5.8 With regards to LE3 'Ecological Value of Land and Protection of Ecological Features' the application sites construction zone meets the criteria of being of low ecological value.

5.9 The application site is covered with hardstanding and buildings, there is a negligible or low potential for protected species to be present. Therefore, when assessed as an overall ecological unit, taking into account all areas within the development footprint, the application site has a low ecological value. We recommend 1 credit to be awarded for LE3 'Ecological Value of Land and Protection of Ecological Features'.

6.0 LE4 - MITIGATING ECOLOGICAL IMPACT

6.1 BREEAM calculates the change in ecological value by comparing the diversity of plant species pre- and post-construction. The ecological value of the application site is expressed as an area weighted average of plant species for the land types present on the site. Using the BREEAM assessment calculator the pre-construction habitat type is compared with post-construction and the total change in ecological value is calculated as 2.90 (refer to Appendix 4 for detailed calculations), which is a positive change and greater than zero species. This calculation takes into account all habitat types, species and recommendations in section 7.0, LE5 Ecological Enhancement.

LE4 – MITIGATING ECOLOGICAL IMPACT: AWARDING OF CREDITS

6.2 If the recommendations and floral species detailed within section 7.0 are incorporated into the design, the proposed development should be awarded the maximum 2 credits under LE4, due to there being no negative change in the ecological value of the site as a result of development, i.e. equal to, or greater than, zero species. Written commitment by the client will be required to confirm the enhancements, including the planting recommendations in section 7.0, will be undertaken.

7.0 LE5 - ENHANCING SITE ECOLOGY

GENERAL RECOMMENDATIONS

7.1 The client has appointed a SQE from Greengage to advise on the ecological value of the application site and accordingly 1 credit is recommended to be awarded in this regard. A further credit is available for protecting and enhancing the ecological value of the application site. This second LE5 credit will be awarded on receipt of written confirmation that the following enhancement and protection measures have been adhered to.

ENHANCEMENT: LANDSCAPING

7.2 Landscaped areas can provide numerous environmental benefits including general enhancement of biodiversity, providing habitat for invertebrates and birds, as well as visual amenity.

7.3 Due to the shaded nature of the courtyard, we would advise that any landscaping is situated to the north side of the open space to maximise the available sunlight. Table 7.1 provides possible landscaping plant species that will thrive in shady areas and be beneficial to local wildlife.

Table 7.1 Possible Landscaping Plant Species

Common Name	Latin Name
Bearberry	*Arctostaphylos uva-ursi*
Creeping Dogwood	*Cornus canadensis*
Blackberry	*Rubus fruticosus*
Elephant's Ear	*Bergenia cordifolia*
Common Male Fern	*Dryopteris filix-mas*
Cherry Laurel	*Prunus laurocerasus*
Wall Fern	*Aspleniaceae spp* (2010 LB Camden BAP species)
Viper's Bugloss	*Echium vulgare* (2010 LB Camden BAP species)

ENHANCEMENT: STAG BEETLE LOGGERY OR DEAD WOOD PILES

7.4 A key aim of the London Borough of Camden's Biodiversity Action Plan (BAP) is to '*encourage planners, developers and building owners to design for biodiversity and install features beneficial to wildlife.*'

7.5 London is nationally significant for the UK stag beetle population; as such, LB Camden aims to promote the creation of suitable habitats for this species. The aim of the BAP is to increase the provision of habitat within the Borough to maintain and increase breeding populations by ensuring a continued supply of suitable dead wood throughout the urban, suburban and rural range of the beetle.

7.6 A stag beetle loggery consists of several large logs, standing vertically and partially buried. It recreates the conditions necessary for stag beetles to complete their life cycles and their larvae to mature.

7.7 Wood should be used from broadleaved trees, such as oak and beech, and from fruiting trees such as apple and pear. The logs should be at least 15cm thick, and preferably with the bark still attached.

7.8 Log piles and loggeries should ideally be located in partial shade, so that they do not dry out. Plants should be allowed to grow over them, which will help retain moisture and provide cover for invertebrates. One log pile will be located in the courtyard space within the soft landscaping. The loggery is not only valuable habitat for the stag beetle but other invertebrates and plants.

Figure 7.1 A Stag Beetle Loggery

ENHANCEMENT: BIRD BOXES

7.9 We recommend that bird boxes are incorporated to enhance the ecological value of the proposed development. Taking into account the urban nature of the application site, we would recommend 'open-fronted bird boxes' for this development.

7.10 Open fronted nest boxes are best sited on the side of walls with the entrance facing outwards at approximately 2 metres above ground. Ideally the opening will be east facing with a clear flight path to the entrance. Within the development an ideal location will be adjacent to the proposed green roof areas.

7.11 This type of bird box importantly accommodates for the black redstart (*Phoenicurus ochruros*) which is a UK and London BAP species and will also provide opportunities for other birds such as sparrows, robins (*Erathacus rubecula*), spotted flycatcher (*Muscicapa striata*) and wrens (*Troglodytes troglodytes*). To attract black redstarts, boxes should be placed underneath structures like overhangs and balconies. One open fronted bird box should therefore be placed close to the green roof to provide continuity of habitat and nesting opportunity.

7.12 The provision of boxes at various heights should encourage a greater diversity of bird species, as different species have different optimum heights for nesting and roosting. Nest boxes are carefully designed to mimic natural nest sites and provide a stable environment for chick rearing as well as winter roosting.

7.13 Open fronted nest boxes, which are fixed, can be expected to last for many years without maintenance. The majority of nest boxes are made in accordance with the specifications approved by the RSPB, British Trust for Ornithology and used by conservation groups throughout the UK. They are simply screwed with attachments to the relevant wall. Each box comes with its own instructions on how to apply.

Figure 7.2 : The Open Fronted Nest Box[1]:

Swift Boxes

7.14 In order to breed, swifts need access to a space that is fairly flat in buildings where they can construct a nest. Swift nest boxes will be included within the development and will be located on a northern facing wall in the courtyard space. The boxes will be placed anywhere high, shaded and free from disturbance and obstructions to their flight paths. They will be located preferably under eaves out of sunlight.[2] A total of four swift boxes will be installed in this location.

Figure 7.3: Example of Swift Nest Box[3]

Sparrow Terrace

7.15 Sparrows prefer to nest close to each other so the Sparrow Terrace provides room for three families under one roof. It provides excellent insulation and needs no maintenance. It is designed for fixing to walls and is recommended to be installed in a direction between north and east to avoid strong sunlight. A total of four sparrow terraces will be installed in this location.

Figure 7.4: Example of Sparrow Terrace[4]

ENHANCEMENT: BIODIVERSE LIVING ROOFS

7.16 A total of 511sqm of Bio-diverse living roof will be installed at the proposed development. As an overview the roof will comprise mounded substrate/growing medium between 80mm-150mm and will be supplemented with a wildflower seed mix to aid natural colonization. Biodiversity features such as deadwood logs can be included to enhance the biodiversity value.

Substrate Specification

7.17 To maximise diversity in micro-climate across the roof, the substrate depth should be varied, between at least 80mm and 150mm. This variation will result in differences in exposure, shading, diurnal temperatures, humidity and water content giving rise to localised diversity in species composition.

7.18 This substrate can be formed of approximately 40% recycled crushed brick, 30% Leca – a lightweight expanded clay aggregate (4-10mm graded), 20% wood fibre and 10% green compost. This mix provides a low nutrient substrate that will be suitable for the proposed seed mix. The low nutrient composition will prevent undesired weed species growing and dominating the sward.

7.19 Substrates evolve as part of their normal function, with generally a steady increase in organic content over the lifespan of the roof.

Species Mix

7.20 Bio-diverse roofs can be left to colonise naturally although this can be a slow and unpredictable process that relies on a source of propagules in the local vicinity; the nearest ecological units could be considered as Regent's Canal approximately 400m to the north, or Holford Gardens 200m to the east.

7.21 To support rapid establishment and promote a more predictable mix of species of biodiversity benefit the decision has been taken to supplement the bio-diverse roof with specially chosen wildflower species. The species mix has been carefully chosen to optimise biodiversity across the roof spaces. The choice of plant has therefore, been based on the following criteria:

- Ability to grow in drought conditions and be wind tolerant;
- Relatively low growth height to be able to survive the harsh conditions at proposed roof heights;
- Range of vegetation heights for structural diversity;
- They are of wildlife benefit, providing valuable nectar sources and attracting invertebrates;

- Local to this part of London, commonly found growing in this area and typical of brownfield habitat;
- Wide ranging corolla (shape/size of flower petals) that is vital to attract a number of different invertebrate species, and in particular London BAP or Red Data book species;
- Will benefit local and London BAP species; and
- Wide ranging flowering periods to enable a long and variable flowering season throughout the year.

7.22 The table below summarises the species mix that has been selected for the bio-diverse roof, and includes further details on the wildlife benefit and growth conditions.

Table 7.2: Species Mix for Bio-diverse Roof

Species	Latin Name	Wildlife Benefit	Growth Conditions	Picture
Herb Robert	*Geranium robertianum*	Attracts a wide range of insects as well as Buff-tailed bumble bee, Common carder bumble bee and White-tailed bumble bee.	Is very adaptable, growing in a wide range of soils and light conditions.	
Bladder Campion	*Silene vulgaris*	Good for butterflies	Bladder Campion is a common wildflower found growing in meadows and grasslands, fields, hedgerows and roadside verges around the UK.	
Kidney vetch	*Anthyllis vulneraria*	Good for bees and butterflies	Common on chalk soils, shingle banks and dunes	

Black Medick	*Medicago lupulina*	Early flowering attracts butterflies, hoverflies and bees. Beneficial for black redstarts	Low growing, ground hugging plants. Very common on roads and roadsides and is drought and wind tolerant, and can survive relatively cold conditions. A member of the legume family therefore nitrogen fixing and will increase the nutrient value of the substrate over time.	 
Hares Foot Clover	*Trifolium arvense*	Attracts, honey bee, and bumble bees.	Drought and wind tolerant.	
Hedge Mustard	*Sisymbrium officinale*	Attracts caterpillars	Grows well on disturbed ground.	

Red Dead Nettle	*Lamium purpereum*	Good for bees and butterflies. Long flowering periods.	It occurs on all soils but prefers loose, nutrient-rich, loamy or sandy soils.	
Field Scabious	*Knautia arvensis*	Attracts Butterflies, Gatekeeper, Large skipper, Lime-speck pug moth, Meadow brown, Small skipper and Small white.	Flowers throughout July and October. Prefers well drained soils.	
Red Clover	*Trifolium pratense*	Late flowering attracts bumble bees, common carder bee, butterflies and weevils.	Low growing drought tolerant, hardy plant, low nutrient growth. A member of the legume family therefore nitrogen fixing and will increase the nutrient value of the substrate over time.	
Ribwort Plantain	*Plantago lanceolata*	Beneficial for black redstarts.	Drought tolerant and very common on wasteland, brownfield sites and roadsides.	
Self Heal	*Prunella vulgaris*	Mid flowering and good for bees. Beneficial for black redstarts.	Prefers sun or semi-shade and some moisture but drought tolerant, low growing creeping plant.	

Viper's Bugloss	*Echium vulgare*	An important food source for species of bumblebee and butterflies.	Grows in dry, sunny position in well-drained or sandy soils.	
White Clover	*Trifolium repens*	Late flowering, attracts, honey bee, bumble bees, weevils.	Low growing, relatively drought tolerant will not grow well in shade, low nutrient growth. A member of the legume family therefore nitrogen fixing and will increase the nutrient value of the substrate over time.	

7.23 The seed mix has been specified due to being native and the wildflower's local provenance to this area of London. The species are also commonly found on industrial, wasteland and brownfield sites in this region and is typical of the local flora.

Seed Application

7.24 The seed mix should be sown by hand in late winter/spring (dry hot summer months should be avoided) and will be applied with an appropriate, lightweight and dry seed carrier that will be low in nutrients. The use of a 'carrier' will not affect the overall nutrient level enough to dramatically change the overall growing conditions.

7.25 The seed carrier will be a different colour to the roof substrate and will act as a visual aid for seed application, highlighting areas that have been sown and areas that are still to complete, ensuring the application is level across all of the roof space. The seed carrier will consist of sand or perlite, and will encourage quicker germination with improved seedling growth. When the seed mix is purchased the amount of seed carrier suitable to the overall roof size and species will be specified and is usually provided as a percentage.

7.26 The seed mix will be applied by hand, and it is advised to aim for 1-2 grams of seed per sqm to provide good coverage across the roof for successful growth rates and good yields. When applying by hand the mix should be casted on to the roof over the prepared substrate in a measured and even fashion. Whilst this method is labour intensive it is successful to use, although practice and/or experience may be required to sow evenly at a suitable rate.

Bio-diverse Features

7.27 A range of additional ecological features have been specified for incorporation onto the bio-diverse roof to provide habitats suitable for invertebrates and further increase the range of micro-niches and biodiversity. It is anticipated that these structural features will create micro-climates around them that will also influence the floral establishment in the immediate proximity, leading to changes in floral composition and further increasing the diversity and mosaic of habitats across the roof areas.

Dead Wood

7.28 Many invertebrates depend on dead wood at some stage of their life cycle including species of worms, snails, copepods, millipedes, centipedes, spiders, mites and numerous insects. Many other groups of invertebrates, such as woodlice (*Isopoda*), are common inhabitants of deadwood, but also thrive in other habitats. Deadwood is also beneficial for mosses, lichens and fungi.

7.29 The invertebrates associated with the decay of timber are very diverse and vary considerably with different tree species. The richest fauna tend to be associated with native broadleaved tree species which are large, long-lived and decay slowly; oak (*Quercus robur*) and ash (*Fraxinus excelsior*) is the preferred species for this strategy and will be sourced locally (within 30km of the site). Birch (*Betula pendula*) logs look particularly attractive on roofs that may be overlooked. It is advised not to use freshly cut willow or poplar logs, as these have a tendency to re-sprout if left in contact with the ground. Wood that has been treated with paint or chemicals should not be used.

Log Piles

7.30 Include different sizes of wood ranging from at least 100mm in diameter with the bark still on. Logs in contact with the substrate will remain damp underneath which is vital for many invertebrates such as woodlice. Log piles are best placed in dappled shade to retain humidity; wood piles located in full shade will be beneficial for fungi but are likely to be too cold and sub-optimal for invertebrates[5]. Two of these log piles shall be included on the roof space.

Log & Woodchip Mounds

7.31 Four logs placed horizontally in a square or rectangle (approx. 500mm by 500mm) formation can be filled with a mix of sand and hardwood chips (the wood ships being either ask or ash), as with log piles these should be located in shady areas[5]. Five of these log and woodchip mounds shall be included on the roof space.

Bird Perches

7.32 A bird perch will be an approximate 2m high metal pole (approx. 30mm diameter) and will be attached to the corner of the roof for anchorage; a bird perch is intended to be of particular benefit to black redstarts who like to sing from prominent and exposed perches.

ENHANCEMENT: HORTICULTURAL GOOD PRACTICE

7.33 The implementation of good horticultural practice in any proposed soft landscaping scheme is recommended. It is advisable to use peat free composts, mulches and soil conditioners.

7.34 The use of pesticides (herbicides, insecticides, fungicides and slug pellets) should be discouraged to prevent changes to the food chain, particularly on invertebrates, birds and/or mammals.

CHANGE IN ECOLOGICAL VALUE OF THE SITE

7.35 In order to achieve the 2nd Credit *'Where there is a positive increase in the ecological value of the site of up to (but not including) 6 species.'* the following recommendations are made.

7.36 An area of at least 10m^2 should be planted with at least 4 of the species recommended within Table 7.1. This planted area should ideally be on the north side of the courtyard in a partially sunny/shady area. Dead wood should be incorporated into the landscaped area to benefit local wildlife; bird boxes should also be located within the development. 511sqm of living roof shall be incorporated into the design. See Figure 1.2 for recommended location of enhancing features.

LE5 – ENHANCING SITE ECOLOGY: AWARDING OF CREDITS

7.37 If the client follows the recommendations so far advised in Section 7.0, 2 out of the maximum 3 credits can be awarded for 'LE5 Enhancing Site Ecology' due to a positive increase in the ecological value of the site. The total species diversity after the proposed enhancements when expressed as an area weighted average of plant species equals 2.90, a positive change.

8.0 LE6 - LONG TERM IMPACT ON BIODIVERSITY

8.1 There is a maximum of 2 credits available under the issue 'Long Term Impact on Biodiversity' (LE6). The full 2 credits can be awarded where evidence is provided to demonstrate that the client has committed to achieving the mandatory requirements and at least 4 of the additional requirements. Alternatively, 1 credit can be awarded where evidence is provided to demonstrate that the client has committed to achieving the mandatory requirements and at least 2 of the additional requirements. All of the mandatory and additional requirements are detailed in Appendix 2; a summary of each requirement and an explanation of how they will be met (if applicable) are given below.

MANDATORY REQUIREMENTS

8.2 The mandatory requirements for LE6 are summarised as follows:

- Appointment of a SQE;
- SQE confirms that all relevant legislation relating to the protection and enhancement of ecology is complied with during design and construction process; and
- Production of a Landscape and Habitat Management Plan appropriate for the site to cover the first 5 years after project completion – information provided on scope of plan and key responsibilities.

8.3 The client team have appointed a SQE to produce this report. We advise all relevant UK and EU legislation relating to protection and enhancement of ecology should be complied with during the design and construction process. The relevant legislation that needs to be followed can be found at Appendix 3.

ADDITIONAL REQUIREMENTS

8.4 The additional requirements for LE6 are summarised as follows:

- The contractor is required to nominate a 'Biodiversity Champion' who oversees site activities;
- The contractor is required to train relevant workforce on how to protect ecology during the project;
- The contractor is required to record and monitor the effectiveness of protecting ecological features during the project;
- New habitat relevant to local Biodiversity Action Plans (BAP) is created;
- Programme site works to minimise disturbance to wildlife, a clear plan or timetable needs to demonstrate how this will happen; and

- Take full account of the UK BAP – Incorporate UK BAP issues into the project.

8.5 BREEAM guidance advises that where the additional requirements and the management plan are deemed in writing by the appointed SQE not to be applicable, all credits can be awarded. The guidance also suggests that this is likely to be the case in the majority of assessments in central town/city areas which have a high proportion of existing development with no existing external landscaped areas within the boundary of the assessed site.

8.6 The additional requirements are not relevant for this site due to its high proportion of existing development. However, due to the introduction of living roofs, a Landscape and Habitat Management Plan is deemed necessary. Full details are provided below.

MANAGEMENT PLAN: MAINTENANCE & MONITORING

8.7 The Ecological Management Plan will be the mechanism by which the results and findings of annual ecological monitoring will inform future habitat management to maximise the overall ecological interest of the site. The Management Plan will therefore, be an iterative process that will be subject to change.

AIMS & OBJECTIVES

8.8 The Ecological Management Plan will maintain and enhance the living roof habitat and species that are included in the Local and London BAP. It will help achieve initiatives and targets set out within these BAP's providing habitat for priority species. In particular the living roofs will contribute to London BAP targets for the Wasteland HAP, Built Structures Generic HAP and the Black Redstart Species Action Plan (SAP).

8.9 The Ecological Management Plan will follow a clearly defined 5 year timetable in the first instance that will be used as a reference point for site maintenance, monitoring and any future planting and enhancement works that may be necessary for the bio-diverse roof.

8.10 Living roofs are dynamic, and the species composition is anticipated to change over time, due to plant selection resulting from the prevailing climatic conditions, natural colonisation, and succession. As a result, some of the actions within the first 5 years will be dependent upon rate of growth or success of initial planting/sowing and enhancements. In general, where measures have not been stated it is due to a non-intervention policy once the features have been established.

8.11 The Ecological Management Plan will also be iterative in the medium to long-term, adapting, in a staged process, to the changing roof composition and in response to the feedback from monitoring exercises. Suggestions can be made to alter the enhancement measures or supplement the planting regime as necessary. Primarily, the Ecological Management Plan will include actions to maintain the ecological objectives for the bio-diverse roof, which are:

- Optimise biodiversity measured by the range of wildlife benefiting plant species, and invertebrate and bird species using the living roofs;
- Encourage invertebrates through diverse range of floral species and suitable invertebrate niche habitats; and
- Encourage species highlighted in the Local and UK BAP, Red Data Book and English Nature's (now Natural England) Species Recovery Programme such as the black redstart, the house sparrow, stag beetle and bees.

8.12 Greengage will undertake the monitoring programme that will measure the success of the bio-diverse roof for its overall ecological value, observing any natural colonisation, the success of the seed mix and use of the roof by birds and invertebrates as key biodiversity indicators. The monitoring for birds and invertebrates in particular will occur annually for the first 3 years and is recommended biennially thereafter. Monitoring will focus on the diversity and abundance of these species.

8.13 At or just after Practical Completion of the bio-diverse roof, we will inspect the ecological enhancements implemented as a result of the recommendations in this bio-diverse Roof Specification. We propose to undertake three further site surveys over the following 3 years after practical completion to monitor the effectiveness for increasing biodiversity.

8.14 After the initial 3 years of establishment and annual surveys, we highly recommend that biennial site surveys over the following 10 years are undertaken to monitor the effectiveness of the ecological enhancement and amend the Ecological Management Plan accordingly.

8.15 Indicators of success will include the successful establishment of a wide variety of plant species, natural colonisation of floral species in areas of the roof, evidence of invertebrates inhabiting the ecological features incorporated on the roofs, evidence of bird activity on the roofs such as birds using the bird perch or signs that the black redstart are using the roof.

8.16 Table 8.1 summarises management actions for the first 5 years. Assuming that practical completion of the living roofs is undertaken by spring 2013, Year 1 spring, and the start of the Management Plan, will be spring 2013.

Table 8.1 **Table Showing Key Stages of the 5 Year Management Plan**

Year and Season	Action	Comments
Year 1 – Spring	-	-
Year 1 – Summer	• Annual monitoring programme (survey to be undertaken between May and August) • Survey for signs of invertebrates and bird species using the roof areas • Check enhancement measures are intact	• An annual monitoring programme by Greengage will measure the success of the roofs for their biodiversity value, including surveying for dominant plant species - this will inform the need for any improvements/alterations • Survey for signs that invertebrates are inhabiting enhancement features and other fauna are using the site for foraging, nesting or perching • During the monitoring programme it will be necessary to check the enhancement measures are intact
Year 1 - Autumn	• Re – plant or supplement planting if necessary • Weed out competitive species if necessary	• Feedback from the monitoring programme will inform the need for any further planting or weeding if required
Year 1 – Winter	• Check if any litter needs removing and dispose where necessary	-
Year 2 – Spring	• Annual monitoring programme (survey to be undertaken between May and August) • Survey for signs of invertebrates and bird species using the roof areas • Check enhancement measures are intact	• An annual monitoring programme by Greengage will measure the success of the roofs for their biodiversity value, including surveying for dominant plant species - this will inform the need for any improvements/alterations • Survey for signs that invertebrates are inhabiting enhancement features and other fauna are using the site for foraging, nesting or perching • During the monitoring programme it will be necessary to check the enhancement measures are intact
Year 2 – Summer	-	-

Year and Season	Action	Comments
Year 2 – Autumn	• Re – plant or supplement planting if necessary • Weed out competitive species if necessary	• Feedback from the monitoring programme will inform the need for any further planting or weeding if required
Year 2 – Winter	• Check if any litter needs removing and dispose where necessary	-
Year 3 – Spring	-	-
Year 3 – Summer	• Annual monitoring programme (survey to be undertaken between May and August) • Survey for signs of invertebrates and bird species using the roof areas • Check enhancement measures are intact	• An annual monitoring programme by Greengage will measure the success of the roofs for their biodiversity value, including surveying for dominant plant species - this will inform the need for any improvements/alterations • Survey for signs that invertebrates are inhabiting enhancement features and other fauna are using the site for foraging, nesting or perching • During the monitoring programme it will be necessary to check the enhancement measures are intact
Year 3 – Autumn	• Re – plant or supplement planting if necessary • Weed out competitive species if necessary	• Feedback from the monitoring programme will inform the need for any further planting or weeding if required
Year 3 – Winter	• Check if any litter needs removing and dispose where necessary	-
Year 4 – Spring	-	-
Year 4 – Summer	-	-
Year 4 – Autumn	• Check enhancement measures are intact • Check if any litter needs removing and dispose where necessary	• Check the enhancement measures are intact
Year 4 – Winter	-	-

Year and Season	Action	Comments
Year 5 – Spring	• Biennial monitoring programme of dominant plant species, invertebrates and birds diversity & abundance (survey to be undertaken between May and August)	• A biennial monitoring programme is recommended to continue to measure the success of the roofs for their biodiversity value, including surveying for dominant plant species - this will inform the need for any improvements/alterations to the long term Ecological Management Plan (which may cover a period up to 25 years) • Survey for signs that invertebrates are inhabiting enhancement features and other fauna are using the site for foraging, nesting or perching • During the monitoring programme it will be necessary to check the enhancement measures are intact
Year 5 - Summer	-	-
Year 5 – Autumn	• Re – plant or supplement planting if necessary • Weed out competitive species if necessary	• Feedback from the monitoring programme will inform the need for any further planting or weeding if required
Year 5 – Winter	• Check if any litter needs removing and dispose where necessary	-

8.17 Table 8.1 outlines the necessary responsibilities and key objectives for the next 5 years. The Ecological Management Plan can extend beyond 5 years in appropriate stages, considered to be 5 – 10 years, 10 – 15 and up to 25 years. Hence, the Ecological Management Plan is necessary to be an iterative process and feedback from the monitoring exercises will inform and develop the Plan, which will be amended and updated accordingly to maintain the objectives.

LE6 'LONG TERM IMPACT ON BIODIVERSITY': AWARDING OF CREDITS

8.18 Due to the nature of the application site with its high proportion of existing development the additional requirements are not applicable and only the mandatory items 1 and 2 require the client team's commitment.

8.19 We have listed all relevant UK and EU legislation under Appendix 3 and protection of ecological features guidance can be found here. It is important that the team and

construction workforce commit to complying with this legislation and guidance during the design and construction process.

8.20 Therefore, all of the mandatory requirements will have been met and the maximum 2 credits can be awarded.

9.0 SUMMMARY OF LAND USE & ECOLOGY CREDITS TO BE AWARDED

9.1 Below is a table summarising land use and ecology credits that are recommended as awarded at this stage for the proposed development. Comments are provided where necessary.

Table 9.1 Table Summarising Credits to be Awarded for Land Use & Ecology Category

Land Use & Ecology Credit	Number of Credits to be Awarded	Comments
LE3 – Ecological Value of Site and Protection of Ecological Features	1	The application site has low ecological value.
LE4 – Mitigating Ecological Impact	2	The maximum 2 credits can be awarded following confirmation that recommendations within this report will be complied with.
LE5 – Enhancing Site Ecology	2	2 credits can be awarded following confirmation that recommendations within this report will be complied with.
LE6 – Long Term Impact on Biodiversity	2	2 credits can be awarded following confirmation that recommendations within this report will be complied with.
Total	**7**	

10.0 CONCLUSION

10.1 Greengage was commissioned by Watkin Jones Group to prepare a report relating to the available credits under *BREEAM Multi-Residential: Land Use and Ecology* to support the 'Very Good' target rating for proposed redevelopment of land at 15-27 Britannia Street, London.

10.2 The application site is set within largely urban surroundings and is immediately bound to the north by Britannia Street, Wicklow Street to the south and west and the LUL railway cutting to east.

10.3 Greengage undertook a walkover of the application site on 14th May 2010 to evaluate all the features within the application site boundary and accessible features immediately bordering it. It was established that the application site as existing consists of hardstanding and buildings and is defined as having an overall low ecological value.

10.4 Within *BREEAM Multi-Residential* there are 4 headings (LE3-LE6) relating to the provision of 8 available credits for Land Use and Ecology that are applicable. The report concludes:

- At present 1 credit can be recommended for LE3, the 'Ecological Value of the Site and Protection of Features' as taken as one whole ecological unit the site has low ecological value;
- 2 credits are considered appropriate for LE4 'Mitigating Ecological Impact' if written commitment is provided by the client confirming enhancement measures outlined in LE5 will be implemented. If these measures are taken there will be no negative change in the ecological value of the application site as a result of development, i.e. equal to, or greater than, zero species;
- 2 credits are considered appropriate for LE5 'Ecological Enhancement' if written commitment is provided by the client confirming enhancement measures outlined in LE5 will be implemented; and
- 2 credits can be awarded for LE6 the 'Long Term Impact on Biodiversity' following written confirmation of commitment to follow guidance and legislation within this report.

10.5 Therefore, it is recommended to award the proposed development 7 credits at this stage with regards to credits LE3 – LE6, *BREEAM Multi-Residential: Land Use and Ecology.* This is subject to written confirmation that ecological enhancements will be incorporated and the team commit to requirements in category LE6.

APPENDIX 1: SITE PHOTOGRAPHS

Photograph 1: The corner of Wicklow Road and Britannia Street

Photograph 2: The southern side of the existing building from Wicklow Street.

Photograph 3: Looking east across the courtyard

Photograph 4: Looking southwest across the courtyard

APPENDIX 2: LE6 MANDATORY & ADDITIONAL REQUIREMENT

Issue ID	Issue Title	No. of credits available	Minimum standards
LE6	Long Term Impact on Biodiversity	2	No

Aim

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

Assessment Criteria

The following demonstrates compliance:

One credit can be awarded where there is a commitment to achieve the mandatory criteria and at least two of the additional criteria (listed below).

Two credits can be awarded where there is a commitment to achieve the mandatory criteria and at least four of the additional criteria (listed below).

Mandatory Criteria

1. A *suitably qualified ecologist* (SQE) has been appointed prior to commencement of activities on site.

2. 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.

3. 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:

    - Management of any protected features on site
    - Management of any new, existing or enhanced habitats
    - A reference to the current or future site level or local Biodiversity Action Plan.

Additional Criteria

1. The 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.

2. The contractor trains the site workforce on how to protect site ecology during the project. Specific training should be carried out for the entire site workforce to ensure they are aware of how to avoid damaging site ecology. Training should be based on the findings and recommendations for protection of ecological features highlighted within a report prepared by a suitably qualified ecologist.

3. The contractor records actions taken to protect biodiversity and monitor their effectiveness throughout key stages of construction. The requirement commits the contractor to make such records available where publicly requested.

4. Where a new ecologically valuable habitat, appropriate to the local area, is created. This includes habitat that supports nationally, regionally or locally important biodiversity, and/or which is

nationally, regionally or locally important itself; including any habitat listed in the UK Biodiversity Action Plan (UK BAP)[68], Local Biodiversity Action Plan (LBAP), those protected within statutory sites (e.g. SSSIs), or those within non-statutory sites identified in local plans.

5. 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.

Compliance Notes	
New Build	There are no additional or different criteria to those outlined above specific to new build projects.
Refurbishment	There are no additional or different criteria to those outlined above specific to the assessment of refurbished buildings (unless the building is listed – see below).
Extensions to existing buildings	There are no additional or different criteria to those outlined above specific to the assessment of extensions to existing buildings.
Refurbishment of listed buildings	The refurbishment of a listed building may be exempt from the assessment criteria if they conflict with the need to maintain the building's listed features, or are counter to the conservation criteria. Confirmation is required from a suitably qualified ecologist that all possible criteria/enhancements have been achieved before the credit can be awarded (i.e. if no suitably qualified ecologist has been appointed then this credit cannot be awarded).
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.
The site and surrounding areas	The steps taken in the above criteria will depend on the nature of the site, e.g. urban sites, and the surrounding areas. It is likely that either all, or none, of the optional items will apply. Where the optional items and the mandatory item 3, the management plan, are deemed, in writing, by the appointed suitably qualified ecologist not to be applicable, all credits can be awarded. Mandatory items 1 and 2 must be met in all instances. This is likely to be the case in the majority of assessments in central town/city areas which have a high proportion of surrounding and existing development and no existing external landscaped areas within the boundary of the assessed site.
Sites of no ecological value	Where a site is deemed to have no ecological value, it is still necessary to employ a suitably qualified ecologist to achieve this credit. The ecologist must confirm that all the mandatory items (1), (2) and (3) have been achieved and provide guidance on how to achieve optional item (4). Note that in such cases, mandatory item (1) and additional requirement (4) is likely to be applicable in relation to any ecological enhancements (e.g. green roofs, bird boxes, etc.) adopted in order to achieve the Enhancing Site Ecology issue (LE5).

<table>
<tr><td>Not all additional items are applicable</td><td>Where the SQE confirms that not all additional items are applicable to the development, for example it is a city centre refurbishment on a confined site with no external areas, then the credits can be awarded accordingly:
<table>
<tr><th>No. applicable items</th><th>No. of BREEAM credits</th><th>Criteria</th></tr>
<tr><td rowspan="2">1 item</td><td>One credit</td><td rowspan="2">Meet mandatory reqs. plus applicable item</td></tr>
<tr><td>Two credits</td></tr>
<tr><td rowspan="2">2 items</td><td>One credit</td><td rowspan="2">Meet mandatory reqs. plus all applicable items</td></tr>
<tr><td>Two credits</td></tr>
<tr><td rowspan="2">3 items</td><td>One credit</td><td>Meet mandatory reqs. plus 2 applicable items</td></tr>
<tr><td>Two credits</td><td>Meet mandatory reqs. plus all applicable items</td></tr>
<tr><td rowspan="2">4 items</td><td>One credit</td><td>Meet mandatory reqs. plus 2 applicable items</td></tr>
<tr><td>Two credits</td><td>Meet mandatory reqs. plus all applicable items</td></tr>
</table></td></tr>
</table>

Schedule of Evidence Required

Req.	Design Stage	Post Construction Stage
Mandatory Criteria		
1&2	The SQE report or letter confirming: • That they were appointed prior to commencement of activities on site. • All relevant UK and EU legislations will be complied with. **AND** A completed, signed copy of checklist A6 – Relating ecology reports to BREEAM **OR** A copy of ecology report containing the information outlined in checklist A6.	A letter from the SQE confirming: • That all relevant UK and EU legislation relating to protection and enhancement of ecology has been complied with.

3	A copy of the site management plan. **OR** A copy of the specification requiring the development of plan and outlining the scope of its content. **OR** Where the timing of assessment does not permit either of the above, a letter from the client confirming: • A commitment to produce a management plan • The scope of the management plan	A copy of the site's landscape and habitat management plan.
Additional Criteria		
1	A letter from the contractor confirming: • The appointment of the biodiversity champion and their job title. • Their on site role and responsibilities. **OR** Where not yet appointed, a copy of the specification clause requiring the appointment of a biodiversity champion.	A copy of the relevant sections of the site log book, highlighting: • Details of any action/events taken by the biodiversity champion. If no actions required/taken, this should be confirmed in the log book.
2	Training schedule or letter of confirmation from the contractor committing to provide relevant training. **OR** Where not yet appointed, a copy of the specification clause requiring the training of the site's workforce.	A record of training undertaken by the site workforce confirming: • Who delivered & developed the training • The scope of the training delivered.
3	A letter from the contractor confirming: • Monitoring and reporting criteria for the development. • The records will be publicly available if and when requested. **OR** Where not yet appointed, a copy of the specification clause outlining the contractor's monitoring and reporting criteria.	A copy of the relevant sections of the site log book, highlighting: • Records of monitoring and actions taken to protect biodiversity. • Records and outcome of any requests to view such information.
4	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)	Assessor's (or SQE's) site inspection report and photographic evidence confirming the existence of the proposed habitat.

5	The SQE's report or letter confirming: • Wildlife on site that needs to be accounted for in programming works. • Actions required with respect to programming site works to minimise disturbance. A copy of the contractor's main programme of works. **OR** A copy of the relevant section of the main contract confirming: • The programme of site works will minimise disturbance to wildlife in accordance with SQE's recommendations.	A letter from the SQE, or a copy of their report confirming: • Site works executed in a manner that minimised disturbance to wildlife in accordance with their recommendations.

Additional Information

Relevant definitions

Suitably qualified ecologist (SQE): As defined for Issue LE3 – Ecological Value of site AND Protection of ecological features

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'

APPENDIX 3: LEGISLATIVE CONTEXT

LEGISLATIVE CONTEXT

NATIONAL POLICY

A strong planning framework for the protection of statutory and non statutory features of ecological value is provided by:

- Planning Policy Statement on Biodiversity and Geological Conservation (PPS9); and
- The UK Biodiversity Action Plan (UK BAP).

PPS9 sets out the Government's vision for conserving and enhancing biological diversity in England. The Government's objectives for planning are to promote sustainable development, to conserve enhance and restore the diversity of England's Wildlife and geology and to contribute to rural renewal and urban renaissance.

WILDLIFE & COUNTRYSIDE ACT (1981)

This policy strengthened the protection for SSSIs, providing additional safeguards for particular types of area and restricting the killing, taking from the wild and disturbance of various species. All of the UK's wild bird species are protected under the 1981 Act. Extra protection is given to birds listed in Schedule 1 of the 1981 Act.

GREAT CRESTED NEWTS

Great crested newts are protected by both the Wildlife and Countryside Act (1981) and the Conservation (Natural Habitats etc) Regulations (1994). Killing, injuring, capturing, handling or possessing the species is prohibited, as is damage to their habitats and trade in the species. Activities which involve the handling or disturbance of newts require a license form Natural England.

BADGERS

Natural England guidelines on development activities that may affect Badger setts, in addition to direct destruction/obstruction of entrances includes the following:

- No use of heavy machinery within 30m of an active sett entrance;
- No use of light machinery within 20m of an active sett entrance; and
- No use of hand tools within 10m of an active sett entrance (Natural England, 2002).

Any activity that could disturb a sett would require a licence to be obtained from Natural England following the granting of planning permission. For a major development, an activity that results in considerable loss of foraging area or obstruction of badger paths may also constitute disturbance.

TREE PRESERVATION ORDERS

There are a large number of well established and mature trees present on site. Due to the maturity and landscape value of these trees, some of them are subject to Tree Preservation Orders (TPOs) by the local authority. TPOs are used to protect trees that are particularly attractive and contribute to the appearance of an area. It is illegal to cut down, prune, or otherwise damage a tree protected by a TPO without the Council's consent. The

unauthorised lopping or felling of a tree is considered a criminal offence. TPO's are made by the Council when trees are under threat of being cut down or damaged.

BATS

All sixteen British bat species are listed in Schedule 5 of the Wildlife and Countryside Act, 1981 (as amended) and under Annexe IV of the Habitats Directive, 1992 as a European protected species. Furthermore, the Countryside and Rights of Way Act, 2000 (Schedule 12, paragraph 5) has amended Section 9 of the 1981 Act. They are therefore fully protected under Section 9 of the 1981 Act and under Regulation 39 of the Conservation (Natural Habitats etc) Regulations, 1994, which transposes the Habitats Directive into UK law.

Consequently, it is an offence to intentionally kill, injure or take any bat as well as intentionally or recklessly damage, destruct or obstruct the access to the place of shelter or disturb the animal while it is occupying it. This legislation applies to all life stages.

Additionally at a national level in terms of conservation, 6 of the 16 British species of bat have Biodiversity Action Plans (BAPs) assigned to them, which highlights the importance of specific habitats to species, details of the threats they face and proposes measures to aid in the reduction of population declines.

Although habitats that are important for bats are not legally protected, care should be taken when dealing with the modification or development of an area if aspects of it are deemed important to bats such as flight corridors and foraging areas.

REPTILES

All reptiles are protected under Section 9 of the Wildlife and Countryside Act 1981 (as amended). Under this legislation, it is illegal to intentionally kill or injure grass snakes, slow worms or common lizards.

There is no provision for licensing the intentional killing or injuring of grass snakes, slow worms or common lizards during development. The defence in the Act permits otherwise illegal activity if it is the incidental result of a lawful operation and could not *reasonably* have been avoided.

NESTING BIRDS

Any clearance works of vegetation that may be habitat for nesting birds should be undertaken out of the breeding season (generally outside the months of March – October). All birds, their nests and eggs are protected by law and it is thus an offence, with certain exceptions intentionally to:

- Kill, injure or take any wild bird;
- Take, damage or destroy the nest of any wild bird while it is in use or being built; and
- Take or destroy the egg of any wild bird.

JAPANESE KNOTWEED

Japanese knotweed is classed as controlled waste under the Environmental Protection (Duty of Care) Regulations, 1991 and must be dealt with in accordance with the Waste Management Licensing Regulations, 1994 if it is to be disturbed by any development works.

APPENDIX 4 - BREEAM MULTI-RESIDENTIAL 2008 LE4 & LE5 ECOLOGY CALCULATOR

LE4 & LE5 Mitigating Ecological Impact

Please select from the drop box the number of different habitat types you wish to enter and press 'select': 4 **Select**

To enter data from an ecologists report/survey please confirm that the ecologist is a 'suitably qualified ecologist' (as defined in the BREEAM manual) and they have been appointed to report on enhancing and protecting the ecology of the site, and the general recommendations of the ecologist have been, or will be, implemented by the client/design team. (Please note; this confirmation is required to award any of the credits available for LE5 Enhancing Site Ecology). Yes

Plot No.	Habitat Type	No. of plant species / habitat type	Pre-Development Area of Plot (m^2)	Post-Development Area of Plot (m^2)
1	hardstanding and buildings	0	2296	1779
2	weeds	6	4	0
3	landscaping	4	0	10
4	green roofs	13	0	511

Total site area (m^2):	2300	2300
Ecological Value (Area Weighted Plant Species):	0.01	2.91
Change in Ecological Value:	**2.90**	

TOTAL LE4 BREEAM CREDITS ACHIEVED	**2**
TOTAL LE5 BREEAM CREDITS ACHIEVED	**2**

FIGURE 1.1- EXISTING SITE PLAN

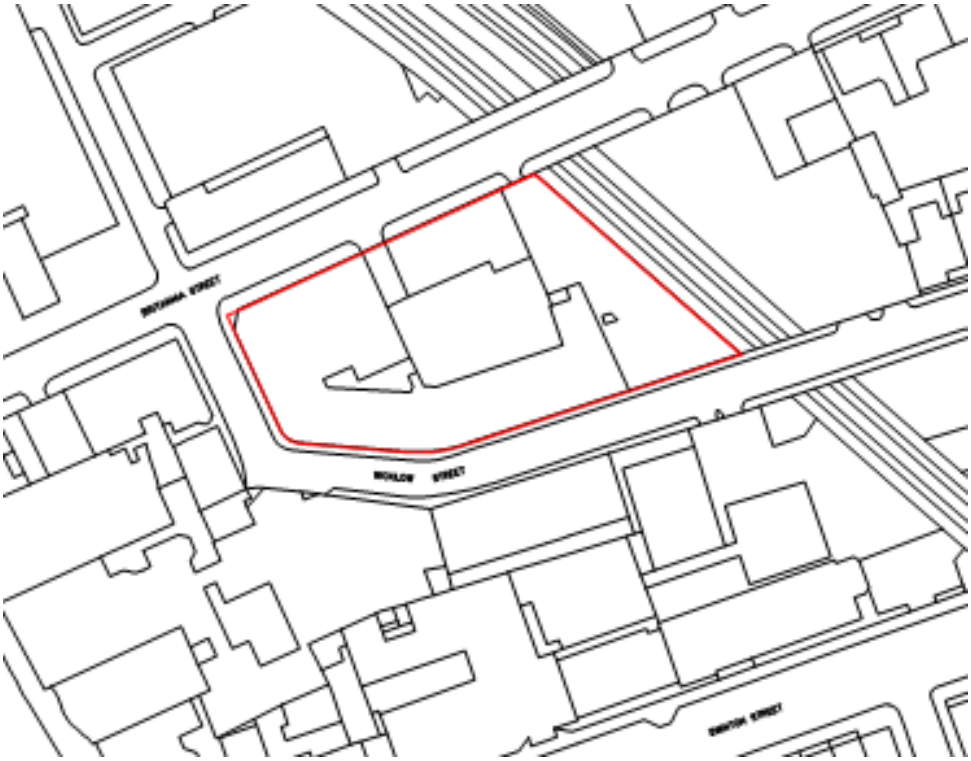
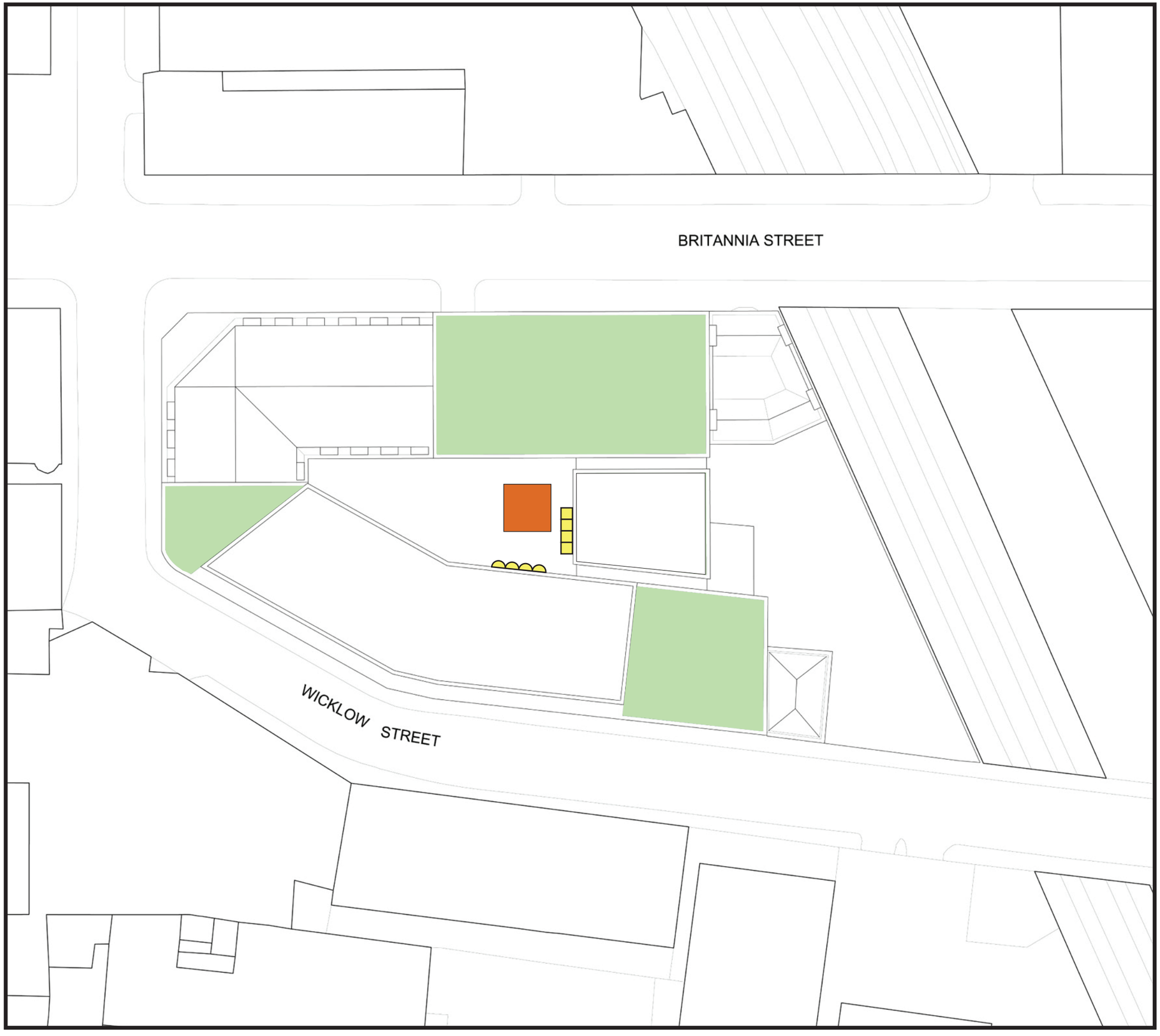


FIGURE 1.2 - PROPOSED LANDSCAPING ENHANCEMENTS



BRITANNIA STREET

- Green Roof
- Swift Boxes
- Sparrow Terrace
- Courtyard Planting with Stag Beetle Loggery

Greengage Environmental
64 Great Suffolk Street, London, SE1 0BL
T: 0203 544 4000

www.greengage-env.com

FIGURE 1.2

Proposed Roof Plan

Not to scale - May 2012

REFERENCES

[1] http://www.riverhillgardensupplies.com/page11.htm (Greengage do not specifically endorse this product).

[2] Dr Carol Williams (2010) *Biodiversity for Low and Zero Carbon Buildings, A Technical Guide for New Build*. RIBA Publishing

[3] http://www.jacobijayne.co.uk/nest-boxes-by-species/swift/no-18-swift-box/ (Greengage do not specifically endorse this product).

[4] http://www.bioquip.net/acatalog/bird_woodland.html (Greengage do not specifically endorse this product).

[5] RSBP, (2009); *Dead Wood for Wildlife*. http://www.rspb.org.uk/advice/gardening/deadwood.asp