APPENDIX 8.5: ECOLOGICAL MANAGEMENT PLAN

Ham Close Regeneration

Planning Application:

Ecological Management Plan

Author: Greengage

April 2022

QA

Ham Close – Ecological Management Plan

Issue/ Revision:	Draft	Final
Date:	March 2022	April 2022
Comments:		
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File Reference:	551842JBMar22DV02_EMP	551842JBMar22DV02_EMP

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1.0 EXECUTIVE SUMMARY

1.1 Greengage Environmental Ltd was commissioned to produce an Ecological Management Plan by Hill Residential for the site known as Ham Close in, in the London Borough of Richmond upon Thames.

1.2 This Ecological Management Plan has been produced in support of a planning application which seeks:

"Demolition of existing buildings on-site and phased mixed-use development comprising 452 residential homes (Class C3) up to six storeys; a Community/Leisure Facility (Class F2) of up to 3 storeys in height, a "Maker Labs" (sui generis) of up to 2 storeys together with basement car parking and site wide landscaping."

1.3 Ecological surveys of the site in 2021 confirmed the site has potential to support badgers, bats, birds and hedgehogs. Associated protection and mitigation actions are described.

1.4 Further, to the mitigation required to protect aforementioned ecological receptors the proposals will include extensive habitat creation and enhancement measures which will aim to increase the overall value of the site for biodiversity. Habitat creation measures include:

- Provision of substrate-based biodiverse brown roofs seeded and plug planted with a suitable native species mix. Roof areas are further enhanced with additional features such as log piles, shingle piles and sandy piles;
- Bird and bat boxes incorporated into suitable trees and buildings;
- Wildlife friendly landscaping to provide foraging resources for notable species; and
- Tree planting.

1.5 These enhancements are focussed in the development footprint of the site.

1.6 In addition to specifications for the above, the Ecological Management Plan also provides a detailed monitoring and maintenance schedule to ensure long term ecological benefits are achieved.

1.7 The provision of areas of landscaping with biodiversity value, will provide health and wellbeing benefits for any residents or users of the site. The landscaping features will also ensure the development is more resilient to a changing climate by providing ecosystem services such as:

- Rainwater attenuation;
- Reducing the impact of the Urban Heat Island Effect
- Air quality improvement; and
- Carbon sequestration.

2.0 INTRODUCTION

2.1 Greengage was commissioned to produce an Ecological Management Plan (EMP) by Hill Residential for the site known as Ham Close in Ham, in the London Borough of Richmond upon Thames (LBRuT).

2.2 This EMP has been produced in support of a planning application which seeks:

"Demolition of existing buildings on-site and phased mixed-use development comprising 452 residential homes (Class C3) up to six storeys; a Community/Leisure Facility (Class F2) of up to 3 storeys in height, a "Maker Labs" (sui generis) of up to 2 storeys together with basement car parking and site wide landscaping."

2.3 The EMP details a methodology for all ecological mitigation, compensation and enhancement actions associated with the clearance, construction and operational phases of the proposed development. It also provides a detailed monitoring and maintenance schedule to ensure objectives are met in perpetuity.

2.4 The ecological landscaping features are focussed in the development footprint of the site.

SITE DESCRIPTION

2.5 The assessment site covers an area of approximately 4.69 hectares (ha) and is centred on National Grid Reference TQ 0030585, OS Co-ordinates 550309, 158566.

2.6 The site comprises existing residential buildings arranged in five storey blocks, four storey deck access flats and three storey 'T' shaped blocks. The public realm consists of large areas of surface parking and amenity grassland with scattered trees. The Youth Centre and associated car park occupies a central location on the site. Ham Village Green sits at the eastern edge of the site.

2.7 The site is bound by Woodville Road to the north, Wiggins Lane and Ham Street to the east, Ham Clinic and Ashburnham Road to the south and St Richard's C of E Primary School playing fields and the children's garden pre-school to the west.

3.0 BASELINE INFORMATION

DESKTOP REVIEW

3.1 Consultations with the local biological record centre (GiGL) and the MAGIC dataset have confirmed that there are no statutory designations of national or international importance within the boundary of the site. However, Richmond Park which is covered by three statutory designations (see table below) is located 1.3km from the site. Further to this there are two statutory sites of local importance within a 2km radius of the site. Both of these sites are Local Nature Reserves (LNRs), the closest being Ham Lands located 300m to the southwest of the site.

3.2 Records from GIGL also identified 18 non-statutory sites, all Sites of Importance for Nature Conservation (SINCs) within 2km of the site boundary. SINCs are recognised by Local Planning Authorities (LPAs) as important wildlife sites.

3.3 Records for the following notable and/or protected species were revealed by the desk study:

- Bird species including, swift (*Apus apus*), house sparrow (*Passer domesticus*) and starling (*Sturnus vulgaris*).
- Bat species including, common pipistrelle (*Pipistrellus pipistrelles*), soprano pipistrelle (*Pipistrellus pygmaeus*), Nathusius's pipistrelle (*Pipistrellus nathusii*), noctule (*Nyctalus noctule*), Leisler's (*Nyctalus leisleri*), Natterers (*Myotis nattereri*), whiskered/Brandt's (*Myotis mystacinus/brandtii*), Daubenton's (*Myotis daubentonii*), brown long-eared (*Plecotus auritus*) and serotine (*Eptesicus serotinus*).
- Mammals - badger (*Meles meles*) and hedgehog (*Erinaceus europaeus*).
- Stag beetle (*Lucanus cervus*).
- London Invasive Species Initiative species ring-necked parakeet (*Psittacula krameri*).

ECOLOGICAL SURVEYS

3.4 Ecological surveys of the site completed in 2021 confirmed the following for the site:

- Had low potential to support foraging badgers;
- Had high potential to support nesting birds; and
- Had moderate potential to support hedgehogs.

3.5 Roosting bats were confirmed as being likely absent from the site.

4.0 OBJECTIVES

LOCAL CONSERVATION OBJECTIVES

4.1 In order to align the objectives of this EMP to local conservation objectives, a review of the relevant Biodiversity Action Plans (BAPs) was undertaken.

London BAP

4.2 The London BAP contains priority habitats and species Habitat and Species Action Plans (HAPs and SAPs) with specific regional actions for these habitats and species. Specific elements of the London BAP of relevance to this EMP are:

- Parks and Urban Green Spaces HAP;
- Built structures as a priority habitat;
- Bats SAP;
- House sparrow SAP;
- Stag beetle SAP; and
- Black redstart SAP.

London Borough of Richmond Upon Thames BAP

4.3 This LBAP for the Borough sets out the framework for the protection, conservation and enhancement of wildlife within the Borough. Features of the LBAP that are of relevance to this report are listed below:

- Lowland acid grassland HAP;
- Bats SAP;
- Hedgehogs SAP;
- House sparrows SAP;
- Swifts SAP;
- Stag beetle SAP; and
- Pollinators SAP.

4.4 Based on the London and LBRuT BAP, species records and observations made on ecological surveys at site, the following biodiversity objectives have been defined:

Table 4.1 Biodiversity aims and objectives

Priority Receptor	Aims of relevant BAP	Objectives of this EMP
Bats	• Reduce current population declines in London's bats; and • To redress Londoner's misconception about bats and secure their status as culturally valued animals	• Provide foraging resources by encouraging invertebrate prey to habitats on site; • Provide roosting opportunities within suitable buildings and trees on site. This objective is also supported through roosting opportunity provision within the EMP; • Ensure external lighting doesn't result in adverse impacts upon bats; and • Inclusion of interpretive boards with information relating to bat ecology.
Stag beetle and saproxylic inverts	• To protect, conserve and enhance nationally significant populations of stag beetle in London Borough of Richmond upon Thames (LBRuT). • To ascertain the reasons for uneven distribution of stag beetle populations across LBRuT. • To increase public awareness of the importance of stag beetle and that of the dead wood habitat.	• Enhance current stag beetle habitat currently on site by providing more deadwood, predominantly covered within the EMP.
House sparrow	• To reverse the current population decline of house sparrows in London Borough of Richmond upon Thames (LBRuT). • To address public misconceptions about house sparrows and secure their status as valued species.	• Provide and enhance the shrub and tree cover to provide additional food and shelter resources for the species; and • Provide specialised bird boxes (house sparrow terraces) to target the species and encourage breeding on site.
Black redstart	• To Protect, conserve and enhance the present population in London; and • To raise awareness of the black redstart to the population as a whole and more specifically to planning authorities, architects landscapers and developers	• Provide and enhance the current shrub and tree cover to provide additional food and shelter resources for the species; and • Provide bird boxes with open frontages to target the species and encourage breeding on site.
Swift	• To encourage and ensure the maintenance of habitable conditions for swifts in the London Borough of Richmond upon Thames (LBRuT). • To contribute to the prevention of a further decline of the swift in the UK. • To increase awareness of ways to accommodate swifts, e.g. through nestboxes. • To encourage the reporting of swift sightings.	• Provide specialised swift boxes on the taller buildings to target the species and encourage breeding.

Priority Receptor	Aims of relevant BAP	Objectives of this EMP
Hedgehog	• To prevent population decline of hedgehogs in the LBRuT. • To raise public and organisational awareness and concern about this culturally valued species.	• Encourage the practice of best horticultural practice in the management of on-site habitats, and promote the use of organic pesticide solutions rather than harsh chemicals; and • Provide foraging and hibernation opportunities for hedgehog on site through considerate landscape design.
Pollinators	• Ensure the needs of pollinators are represented in local plans, policy and guidance. • Understand current pollinator habitat within the London Borough of Richmond upon Thames (LBRuT). • Protect, increase and enhance the amount of pollinator habitat in LBRuT. • Encourage appropriate management of pollinator habitat. • Increase awareness of pollinators and their habitat needs with local residents, businesses and other landowners.	• Provide nectar rich species in areas of enhanced landscaping; and • Provide planting which considers the ecology of bumblebees, therefore providing a food source at the times of year when the bees are at vital stages of their yearly cycle e.g when the queen is breeding or emerging from winter hibernation.

4.5 This EMP will detail specific ecological interventions to contribute to delivery of the above objectives.

5.0 MITIGATION AND COMPENSATION

DESIGNATED SITES

5.1 All statutory designated sites are located over 200m from the site and consequently no construction phase impacts are anticipated. Suitable best practice construction management actions will be incorporated into a Construction Environmental Management Plan (CEMP).

BADGERS

5.2 Given the potential presence of badger on site and in the vicinity, best practice protection measures are recommended to be implemented and incorporated into a CEMP to ensure badger (and other small to medium sized mammals) are protected throughout the works:

- Any trenches or deep pits within the development site that are to be left open overnight should be provided with a means of escape should a badger enter. The simplest method for this would be in the form of a roughened plank of wood placed in the trench as a ramp to the surface. This is particularly important if the trench fills with water.
- Any trenches/pits should be inspected each morning to ensure no badgers have become trapped overnight. Should a badger become trapped in a trench it will likely attempt to dig itself into the side of the trench, by forming a temporary sett.
- The storage of topsoil or other 'soft' building materials on site should be given careful consideration. Badgers will readily adopt such mounds as setts. So as to avoid the adoption of any mounds, these should be kept to a minimum and any essential mounds subject to daily inspections with consideration given to temporarily fencing any such mounds to exclude badgers.
- The storage of any chemicals/liquids on site should be well away from the boundaries, and contained in such a way that they cannot be accessed or knocked over by any roaming badgers.
- Fires should only be lit in secure compounds away from areas of potential badger activity and not allowed to remain lit during the night.
- Food and litter should not be left within the working area overnight.
- The above recommendations will also ensure the protection of hedgehogs and other mammals.

BATS

5.3 Given the phased nature of the development, as a minimum it is recommended that an updated bat scoping survey should be undertaken prior to the commencement of works

on Phases 2 and 3. This survey will inform the requirement for updated emergence/re-entry surveys and any associated mitigation. This requirement can be secured by planning condition.

NESTING BIRDS

5.4 In order to mitigate the risk of disturbing, injuring or killing nesting birds tree removal and demolition of relevant buildings should take place outside of the nesting bird season (March – September inclusive). If this is not possible clearance may only take place after a suitably qualified ecologist (SQE) has confirmed the absence of nesting birds.

HEDGEHOGS

5.5 In order to minimise the potential for killing or injuring of hedgehogs (and other small to medium sized mammals) during site clearance, removal of dense vegetation should be undertaken in two phases, by cutting to 30cm in the first instance, then to ground level after that. The vegetation should be checked for mammals by hand search between these two cuts. Should any hedgehogs be found, they should be moved to a suitable area of habitat that is not subject to clearance.

6.0 ECOLOGICAL ENHANCEMENT

BIODIVERSE ROOFS

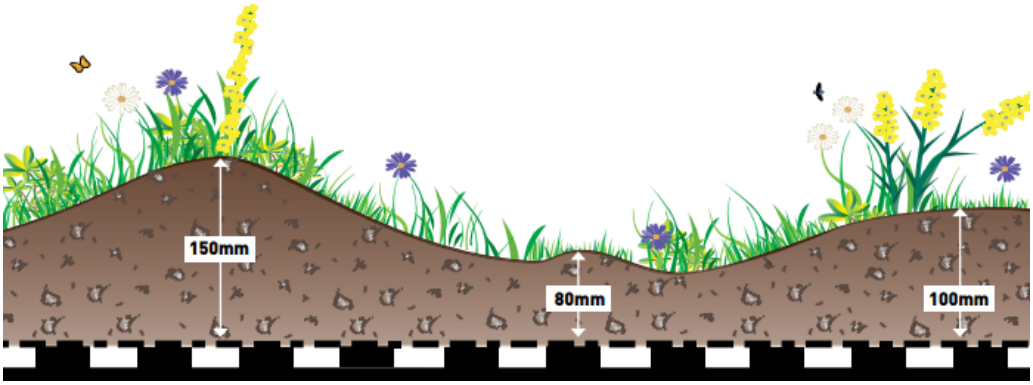
6.1 Biodiverse roofs will be incorporated on the flat roof blocks on site. These roofs are primarily focused at enhancing the site for biodiversity. However, they will also provide additional important ecosystem services including retaining significantly more water during high precipitation events than a standard roof and greatly reducing the initial run off of water. This reduced run off rate in turn means that in periods of high precipitation the wider drainage system is under less pressure over a longer period of time.

6.2 Exact biodiverse roof specifications will be confirmed by the relevant contractors however, they will be designed in accordance with the principles set out below.

6.3 The biodiverse roofs will take the form of extensive, substrate based biodiverse roofs. It will likely comprise of recycled crushed brick, expanded clay shale with composted organic material.

6.4 The substrate will vary in depth across the roof between 80 and 150mm.

Figure 6.1 Varying substrate depth



6.5 Due to the unpredictable nature of colonisation and its dependence on plant propagules in the area, the low-nutrient substrate will be seeded and plug planted with a suite of native species of known value for the targeted ecological receptors. The diverse mix of species increases the flowering period, increasing the availability of nectar for pollinators throughout the year. Seed mixes and species composition will vary across the roof depending on substrate types.

6.6 Seeds will be sown at a rate of 5g/m^2 with plugs planted at a density of 15-20/m^2 with a minimum root ball of 25cm^3. Suitable species are listed in Table 6.1 overleaf.

Figure 6.2 Extensive, substrate based biodiverse brown roof in situ.

6.7 Below the substrate layer will be a water retention/drainage layer, below which will be a root protection and waterproofing layer to protect the roof slab beneath.

Table 6.1 Potential species mix for biodiverse brown roof (*Final mix to be confirmed by roofing contractor in consultation with ecologist)

Scientific name	Common name
Achillea millefolium	Yarrow
Agrimonia eupatoria	Agrimony
Anthyllis vulneraria	Kidney Vetch
Armeria maritimis	Thrift
Bellis perenis	Common daisy
Centaurea nigra	Common Knapweed
Echium vulgare	Viper's Bugloss
Erigeron acer	Blue fleabane
Filipendula vulgaris	Dropwort
Galium verum	Lady's Bedstraw
Helianthemum nummularium	Common Rock-rose
Hypericum perforatum	Perforate St John's Wort
Hypochaeris radicata	Common cat's-ear
Iberis amara	Wild Candytuft

Knautia arvensis	Field Scabious
Leontodon hispidus	Rough Hawkbit
Leucanthemum vulgare	Oxeye Daisy
Lotus corniculatus	Birdsfoot Trefoil
Origanum vulgare	Wild Marjoram
Plantago media	Hoary Plantain
Sanguisorba minor	Salad Burnet
Primula veris	Cowslip
Prunella vulgaris	Selfheal
Sedum album	White stonecrop
Silene vulgaris	Bladder Campion
Trifolium pretense	Red clover
Verbascum nigrum	Dark Mullein
Viola tricolor	Wild pansy

Figure 6.3 Varied substrate depths in situ

Additional Biodiverse Brown Roof Enhancements

6.8 Additional enhancement features to the biodiverse roof can drastically increase ecological niche provision and habitat heterogeneity. For every 100m^2 of biodiverse roof, one of each of the below features will be incorporated.

Bare Shingle

6.9 Several invertebrate species favour warmth and shelter from wind and rain, therefore, places for shelter and sunny nooks can be important. This can be easily achieved through the provision of areas of bare shingle positioned preferably in circles or spirals (1mx1m) to create a range of micro habitats.

Sandy Piles

6.10 Sandy piles with a base size of 1mx1m will be included, piled up in the middle to a minimum height of 0.5m. Traditional builders' sand is suitable. Sand used will be sterile and contain no seed. Mounds of fine particulates provide nesting opportunities for aculeate hymenoptera including UK Biodiversity Action Plan species.

Figure 6.4 Sandy piles and nesting bees

Log Piles

6.11 Log piles will be included which will consist of freshly cut logs with diameter between 20 and 80cm. Bark will be left on. They will be laid on the bare substrate horizontally and built up. Holes can be drilled into each log to provide nesting opportunities for aculeate hymenoptera and as the wood decays it will provide a foraging resource for saproxylic coleoptera larvae, supporting species likely present within the woodland.

Figure 6.5 Log piles on a biodiverse roof

BAT BOXES

6.12 All bat species are BAP species in the UK. Bat boxes will be placed at least 2-5m height from the ground level and will be incorporated into suitable buildings and trees on site.

6.13 A minimum of 15 boxes will be installed across the site (See Appendix 1 for proposed locations). A variety of aspects will be selected although these will be focussed on the south western and south eastern facades, away from any windows or direct lighting.

6.14 An example specification is provided below which will be confirmed by the contractor (subject to approval from Greengage).

Figure 6.6 Greenwood Three Crevice Bat Box[1]

BIRD BOXES

6.15 The bird box types numbers are proposed to be installed in suitable buildings and trees on site on site, in order to provide nesting opportunities for London, UK and LBRuT BAP priority species:

- Sparrow terraces –12 in total;
- Swift boxes – 12 in total; and
- General bird boxes – 10 in total.

6.16 The following models (or similar, pending approval by Greengage) will be used.

6.17 Boxes will be placed at least 2-4m in height and on eastern or northern aspects. See Appendix 1 for proposed locations.

Sparrow Terraces

6.18 House sparrows nest in lose colonies of 10 to 20 pairs and it is therefore important to provide multiple nesting opportunities for this species. Whilst in theory these can be as little as 150mm apart, spacing them at least 1m can reduce aggression between males. It is recommended that three terraces are fitted along any available wall space.

6.19 Sparrow terraces will therefore be multi-entrance to reflect the social nature of house sparrows.

6.20 An example specification is provided below which will be confirmed by the contractor (subject to approval from Greengage).

Figure 6.7 Woodstone Sparrow Nest Box

Swift Boxes

6.21 Swift boxes will also be provided at a minimum height of 5m. As these boxes require a drop of at least 5m, it is recommended that six of these boxes are fitted as close to the eves of the new buildings as possible.

6.22 An example specification is provided below which will be confirmed by the contractor (subject to approval from Greengage).

Figure 6.8 Green and Blue Swift Nest Box

Generalist Boxes

6.23 Generalist bird boxes with 32mm entrance holes as well as open fronted boxes will be installed across the site. These boxes will be placed on the existing and newly planted

6.24 These boxes will appeal to a multitude of bird species including robin and London BAP species the black redstart.

Figure 6.9 Example open fronted bird box (left) and generalist box (right)

WILDLIFE FRIENDLY LANDSCAPING

6.25 Areas of wildlife friendly landscaping are to be included across the development site. These areas will aim to provide an aesthetic and ecological benefit.

6.26 A mix of non-native ornamental and native wildlife friendly planting will be included in the landscaping plans for the site. This will include a selection of flowering, nectar rich herbaceous and fruiting tree/shrub species. Species will be selected from the RHS Plants for Pollinators Guide**Error! Bookmark not defined.** and include the following.

Wildlflower Grassland

- Yarrow (*Achillea millefolium*)
- Common knapweed (*Centaurea nigra*)
- Scabious (*Knautia arvensis*)
- Meadow buttercup (*Ranunculus acris*)
- Betony (*Stachys officinalis*)
- Common bent (*Agrostis capillaris*)
- Red fescue (*Festuca rubra*)
- Meadow fescue (*Festuca pratensis*)
- Crested dog's-tail (*Cynosurus cristatus*)

Shrubs

- Rosemary (*Rosmarinus officinalis*)
- *Salvia* sp.
- *Phlomis* sp.
- *Hebe* sp.
- Russian sage (*Perovskia atriplicifolia*)
- Red bistort (*Persicaria amplexicaullis*)
- Sweet box (*Sarcococca confusa*)

Perennials and Grasses

- Purple coneflower (*Echinacea purpurea*)
- Purple top (*Verbena bonariensis*)
- *Echinops* sp.
- Eastern bluestar (*Amsonia tabernaemontana*)

- Speedwell (*Veronica spicata*)
- *Geranium* sp.
- *Bergenia* sp.
- Wood spurge (*Euphorbia amygdaloide*)

Climbers

- Clematis sp.
- Common jasmine (*Jasminum officinale*)

Tree Planting

6.27 Extensive replacement tree planting is proposed across the site.

6.28 Species have been selected for their amenity value in addition to the further ecosystem services they provide. Species to include (but not limited to):

- Hazel (*Corylus avellena*);
- Buckthorn (*Frangula alnus*);
- Silver birch (*Betula pendula*);
- Field maple (*Acer campestre*);
- Hornbeam (*Carpinus betulus*);
- Field maple (*Acer campestre*);
- Small-leaved lime (*Tilia cordata*);
- Prunus sp.;
- *Malus* sp.; and
- *Pyrus* sp.

INVERTEBRATES

Stag Beetle

6.29 Three stag beetle loggeries will be incorporated on the site.

6.30 Log sizes will range from ~10cm up to ~40cm diameter with approximately one third of the log buried. They will be located in sheltered locations in friable soil.

6.31 Plants such as ferns, bulbs and other woodland understorey plants can be planted amongst the loggeries.

Figure 6.10 Example loggery

Figure 6.11 Loggery diagram

7.0 MANAGEMENT AND MONITORING

7.1 This section provides an overview of the relevant management actions for habitats and ecological features at site. this management plan therefore includes:

- List of features to be managed;
- Appropriate management actions for achieving aims and objectives, including a works schedule;
- Ecological constraints on-site that could influence management; and
- Ecological management and monitoring (if required).

7.2 Based on the ecological baseline value of the site, as discussed in section 3 of this report, the enhancement recommendations and associated management actions focus on providing habitat for target species including invertebrates and birds (specifically stag beetle, bees, house sparrow and swift), and bats. Inclusion and ongoing maintenance of these enhancement features will therefore complement the aims of the London and LBRuT BAP.

FEATURES TO BE MANAGED

7.3 The following habitat features will be implemented on site and therefore require management in the long-term:

- Biodiverse roof;
- Shrub/tree planting; and
- Bird and bat boxes.

MANAGEMENT ACTIONS

7.4 This section details actions which will ensure adequate maintenance and management of the ecological features on site.

7.5 The following procedures will be carried out in order to ensure the ecological value of the features are maintained throughout the lifetime of the development, these actions are split in to general actions which apply to all features, and focused actions which are specific to certain habitats/features.

7.6 General:

- Check bat boxes and enhancement features are intact;
- Remove litter;
- Re-plant or supplement planting if necessary;
- Weed out competitive/invasive species listed on the London Invasive Species Initiative website if necessary;

- Irrigation if necessary after sustained dry periods;
- Fertilise planting to maintain healthy growth with organic fertiliser from peat free sources.

7.7 Focused:

- Clean out bird boxes
- Maintenance of biodiverse brown roof will vary depending on the supplier, however general actions include:
  - Removal of dead vegetation and leaf litter;
  - Removal of any vegetation blocking drainage outlets;
  - Check for degradation of waterproofing system;
  - Irrigate if necessary after long dry periods; and
  - Ensure that the additional roof enhancements are in place and in good condition.
- Trimming of shrub and trees

Horticultural Best Practice

7.8 Good horticultural practice will be followed at all times on site, including the use of peat-free composts, and sourcing of plants from local UK nurseries only, where possible.

7.9 Locally sourced mulch will be used to fertilise the planting only where possible, and pesticides and herbicides will not be used.

7.10 Slug pellets will not be used to control bests due to the bioaccumulate effects they have on wildlife, in particular hedgehogs. Instead biological controls measures will be favoured in line with recommendations from RHS[2].

Timing

7.11 Maintenance actions will be completed on a yearly basis during springtime and additionally in late autumn where necessary.

7.12 The table below summarises the timings of the management actions for the first 5 years. Following the initial 5 year period, the actions will be reassessed and repeated if there is found to be no change in site condition or contemporary best practice.

Table 7.1 Table showing key management and monitoring actions to be undertaken on a yearly basis.

Season	Management Actions
Spring/Summer	**General actions**
	Bird Boxes (General only)
	Check enhancement measures are intact such as species boxes and biodiverse roof features.
	Re-plant or supplement shrub and herbaceous planting and weed out competitive species if necessary (Buddleia)
	Check if any litter needs removing and dispose where necessary.
	Biodiverse roof maintenance in accordance with supplier guidelines.
	Focused Actions
	Water provision after extensive periods of particularly dry weather to areas of planting and biodiverse roof.
	Spread organic composting material on areas of planting to encourage growth. Select locally sourced mulch where possible and avoid the use of harsh chemical fertilisers.
	Biodiverse roof management: • Removal of dead vegetation and leaf litter; • Removal of any vegetation blocking drainage outlets; • Check for degradation of waterproofing system; • Irrigate if necessary after long dry periods; and • Ensure that the additional roof enhancements are in place and in good condition.
Winter/Autumn	**General Actions**
	Clean out general bird boxes if used during summer. To do this firstly remove any trace of nesting material then use a non-toxic soap solution with water to clean the internal surfaces. Next rinse with water to remove all traces of soap and leave to dry in natural sunlight.
	Trim back, clear and fell any vegetation and trees as and when needed, timed to avoid the nesting bird season taken to run from March-August. Shrubs will be trimmed as minimally as possible, to maintain dense coverage. Wherever possible, retain dead or pruned stems on the ground below the shrubs to provide value for invertebrate species.
	Leaf collection to take place twice over the autumn/winter period, collection will be done by hand only; no leaf blowers will be used on natural surfaces to avoid damage to plants.
	Focused Actions

Season	Management Actions
	Undertake canopy reductions or selective limb on trees if rotting or dead.

Ecological Constraints to Management

7.13 The features to be implemented of site, specifically, bird boxes and large shrub and tree planting, will provide potential to support nesting birds. To avoid disturbing, harming or killing any nesting birds or their young, any maintenance and management of these features will take place outside of the breeding bird season (the breeding season is taken to run from March-August inclusive). If this is not possible an inspection for nesting birds must take place, by a suitable qualified ecologist, prior to any works on taking place.

7.14 This principle has been embedded in within the above maintenance timings table.

ECOLOGICAL MONITORING

7.15 Due to the scale of the development it is not considered necessary for the installed ecological features to be monitored by a third party.

7.16 However, the bird boxes will be monitored between March-August each year to check their uptake by nesting birds. This monitoring will involve observation of the boxes for a minimum of 30 minutes once each month. This will take place as early in the morning as possible to minimise the amount of disturbance experienced during observation.

RESPONSIBILITY

Maintenance

7.17 Maintenance of all enhancement features, other than biodiverse brown roofs, will be the responsibility of RHP or a company appointed by RHP for site management purposes.

7.18 Biodiverse roof maintenance will be undertaken by the biodiverse brown supplier. This will take place annually for the lifetime of the biodiverse roof.

Monitoring

7.19 RHP, or the appointed management team, will be responsible for monitoring the success of the ecological features installed on site.

7.20 RHP, or the appointed management team, will keep a record of all monitoring.

8.0 SUMMARY AND CONCLUSION

8.1 Greengage Environmental Ltd was commissioned to produce an EMP by Hill Residential for Ham Close in Ham, LBRuT.

8.2 This EMP has been produced in support of a residential led planning application for the site.

8.3 This EMP describes the ecological mitigation, compensation and enhancement actions which will be implemented on site. These actions align with local conservation objectives, based on sound ecological data collected through a suite of ecological surveys of the site.

8.4 Many of the enhancements, although biodiversity focused, will provide multiple additional benefits in the form of ecosystem services for the site and wider area. Such ecosystem services beyond just biodiversity include increased health and wellbeing of users, a reduction in the urban heat island effect in the immediate locality and increased flood attenuation amongst others.

8.5 A monitoring and management programme is detailed to ensure successful delivery and ongoing contribution to local conservation objectives in the long term.

APPENDIX 1 ECOLOGICAL ENHANCEMENT LOCATIONS

Urban Greening Factor

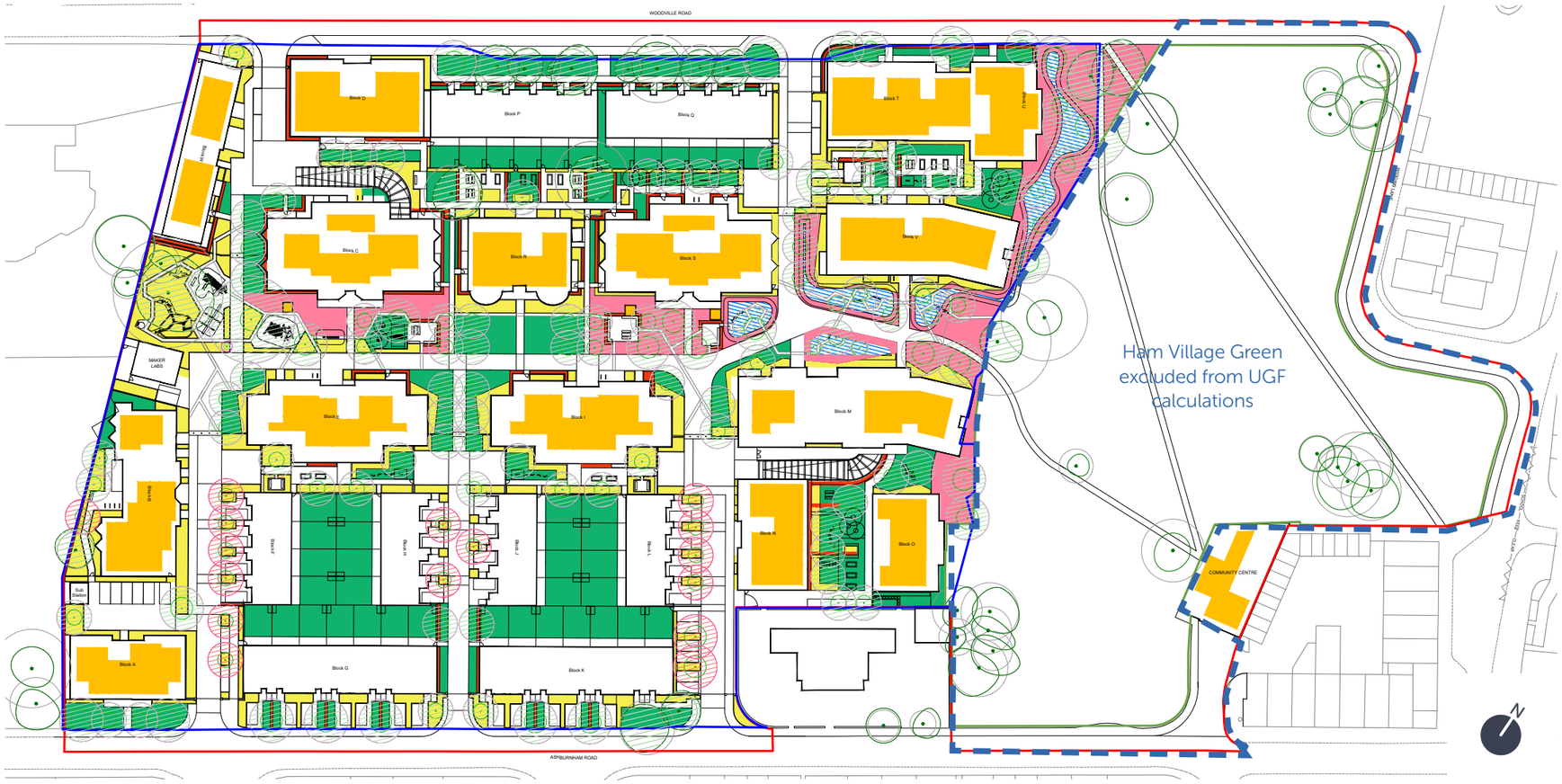
Landscape Strategies

An urban greening factor assessment has been undertaken in accordance with GLA policy. As demonstrated in the figure below and right, the proposals achieve an urban greening factor of 0.46 within the development site.

This figure does not include Ham Village Green and demonstrates the development exceeds the GLA policy of 0.4 within the ownership boundary.

Surface Cover Type	Colour	Area (Sqm)	Factor	Score
Semi-natural vegetation		1,729.36	1.0	1,729.36
Standard trees planted in connected tree pits		8,224.76	0.8	6,579.80
Extensive green roof		3,428	0.7	2399.6
Flower rich perennial planting		1,801.08	0.7	1,260.75
Vegetated sustainable drainage		388.61	0.7	272.025
Hedges		388.60	0.6	233.160
Standard trees in tree pits (soil volume less than two thirds of projected canopy area)		771.89	0.6	463.14
Groundcover planting		773.16	0.5	386.57
Amenity grassland		5,064.6	0.4	2025.8
Total	-	34,785	-	16,078

Urban Greening Factor: 0.441
(excluding Village Green)



Urban greening factor area definitions

Ecology

Landscape Strategies

Key ecological landscaping recommendations advise that green infrastructure should be designed to provide ecological connectivity across the site; complementing existing ecological features on site and in the surrounding areas. Further recommendations for Ecological mitigation are listed below and proposed locations identified on the adjacent plan. These features will complement the wider landscape and planting proposals spread across the scheme.

These enhancements will provide new foraging, commuting, and nesting/roosting opportunities for local bird, bat and invertebrate populations, and contribute to an overall net gain of 24.38%. Further information on net gain can be found in the Greengage BNG Report.

Key

- Bat boxes in buildings
- House sparrow boxes in buildings (in groups of 3)
- Swift boxes in buildings (in groups of 3)
- Generalist boxes trees or buildings
- Stag beetle loggeries
- Ventilation Stack - biodiverse roof and vertical insect habitat
- Improved ecological connectivity
- Linear foraging roots

Recommended locations for ecological mitigation

REFERENCES

1 Greenwood Three Crevice Bat Box https://www.greenwoodsecohabitats.co.uk/bats

2 Royal Horticultural Society (RHS) https://www.rhs.org.uk/advice/profile?PID=228