

Saltbox, Bognor Regis
(1004567)

Landscape and Ecological Management Plan
(relating to the stated requirements of Conditions
18 [outline matters] / 16 [full matters] of Planning
Permission BE/102/17/OUT)

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Quality Management

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1 Introduction

1.1 Background and permitted development

- 1.1.1 Aspect Ecology has been commissioned by Landlink Estates in regard to ecological matters at the site, known as 'Saltbox Field', located west of the A29 Shripney Road, Bognor Regis, centred at OS grid reference SU 938 016 (see Plan 4567/LEMP1).
- 1.1.2 The site is in receipt of hybrid planning permission (ref: BE/102/17/OUT), comprising outline planning permission for the development of employment units, warehouse, hotel, 2 No. drive-thru units, public house, gym with associated engineering, landscaping and associated works and full planning permission for a class B8 warehouse, fuel island, car parking, access roads and entrance with engineering works, open space, landscaping and associated works.
- 1.1.3 The planning application was informed by ecological survey information and assessment, as set out within Aspect Ecology's report entitled "Saltbox, Bognor Regis: Ecological Appraisal", dated August 2017 (ref: 1004567 EcoAp vf).
- 1.1.4 The planning permission is subject to a number of conditions, which are listed separately in regard to the 'outline' matters and 'full' matters. Of these, condition 18 in relation to the 'outline' matters and condition 16 of the 'full' matters (which are similarly worded) relate to ecology and nature conservation issues, requiring information to be submitted to, and approved by the LPA prior to any development works at the site.
- 1.1.5 In addition, planning conditions 16/14 (nesting birds) and 17/15 (Badgers) relate to ecological matters.

1.2 Relevant Planning Conditions

- 1.2.1 Condition 18 ['outline' matters] of the planning permission for the site (ref: BE/102/17/OUT) states:

"A Landscape and Management Plan is submitted for approval in writing by the Local Planning Authority, which details the ongoing management and aftercare of the site once construction is complete. The Landscape and Management Plan should include the following requirements:

- *any trees removed should be replaced at a ratio of 2:1;*
- *a wildflower meadow should be planted in around the attenuation ponds adjacent to the Brook Local Nature Reserve (LNR), in the Village Buffer;*
- *ensure that mitigation measures are implemented to ensure that Bersted Brooks LNR adjacent to the site is not adversely affected by the industrial and commercial development on the Salt Box site;*
- *a 5 metre buffer, including planting to protect the water voles, is required around Shripney Manor Ditch;*
- *any gaps in tree lines or hedgerows should be filled with native species;*
- *bat and bird boxes should be installed in the Village Buffer and the Ecology Buffer;*

- *grassland areas in the Village Buffer and the Ecology Buffer should be managed to benefit reptiles;*
- *log piles should be provided in the Ecology Buffer.*

The approved details in the Landscape and Management Plan should be implemented in full prior to the occupation of Unit 2 and be maintained on site thereafter."

1.2.2 Condition 16 ['full' matters] is identically worded, except that the condition wording includes a number of references to drawing "1744-P02-D. Site Masterplan. Proposed Block Plan" to identify individual areas (Village Buffer and Bersted Brooks LNR).

1.2.3 Planning conditions 16/14 relate to nesting birds, stating:

"No ground clearance or vegetation clearance works shall take place within the bird nesting season (between 1 March and 31 August inclusive in any year unless a nesting bird check is carried out. This shall be undertaken by a suitably qualified ecologist immediately prior to the works taking place. If any active nest sites are identified, these nests shall remain undisturbed until all the young have fledged naturally."

1.2.4 Planning conditions 17/15 relate to Badgers, and state:

"Prior to start on site a badger survey should be undertaken to ensure badgers are not using the site. If badgers are discovered on site, mitigation measures will need to be submitted and approved in writing by the LPA in liaison with Natural England and the approved works carried out by a professional ecologist."

1.2.5 Accordingly, subject to the required update Badger survey work confirming the continued absence of Badger at the site, no further information would appear to be required for submission to the LPA in relation to conditions 16/14 and 17/15.

1.3 Purpose of this document

1.3.1 The purpose of this document is therefore to provide details relating to the required Landscape and [Ecological] Management Plan (LEMP), in order to address the stated requirements of conditions 18 ['outline' matters] and 16 ['full' matters] of the hybrid planning permission for information to be submitted to and approved by the LPA in relation to the site.

1.3.2 Where appropriate, the LEMP has been prepared with reference to the individual condition wording along with relevant guidance including the British Standard for Biodiversity. Information set out includes reference to the previous survey work undertaken at the site (as more fully described within the previously submitted information relating to the planning application process) and existing ecological position at the site; details of proposed ecological measures to be implemented and associated responsibilities, with reference to the specific requirements of the planning conditions.

2 Document Framework

2.1 Land covered by this document

- 2.1.1 This document relates specifically to the land within the identified site boundary for the permitted development, as shown at Plans 4567/LEMP1 and 4567/LEMP2.
- 2.1.2 General ecological protection measures set out cover the entirety of the land within the current site boundary where appropriate, with any initial measures relating to specified existing habitats and features with potential to contain particular species as appropriate, and as defined within the individual sections of the text.
- 2.1.3 The management and maintenance activities set out as part of this LEMP relate to proposed landscape areas of the site, located outside of the individual commercial units and associated car parking (see Plan 4567/LEMP2), including in particular management measures focussed on those areas proposed for new wildlife habitats.

2.2 Tenure and overall responsibility

- 2.2.1 The entirety of the land covered by this document (the site) is understood to be currently owned and managed by Landlink Estates.
- 2.2.2 In the long-term, responsibility for management of the relevant open space areas is anticipated to fall to a nominated management company (until such time it is assumed that they will remain the responsibility of Landlink Estates), and would need to be informed by the management actions set out and subsequently feed back into any revisions or amendments to the long term management measures set out within this document as appropriate.
- 2.2.3 Should any change to this position take place, this document should be updated to reflect the agreed position.

2.3 Map coverage

- 2.3.1 The site is located at the approximate Ordnance Survey (OS) Grid reference SU 938 016 and is included within the following OS Sheets:
- Landranger: 197 (Chichester & The South Downs); and
 - Explorer: OL22 (Arundel & Pulborough)

2.4 Environmental information

Physical Environment

- 2.4.1 The site is situated at approximately mean sea level.
- 2.4.2 Specific microclimatic information is not available for the site, however the conditions within the site are considered likely to conform in general to the national and regional averages.

Biological Environment

- 2.4.3 Details of the biological environment within the development site, as most recently recorded, are set out within the previously submitted Ecological Appraisal report, and summarised below (Section 3.), reflecting the existing conditions recorded prior to commencement of any construction works at the site associated with the permitted development proposals, based on survey work undertaken.

Surrounding Land Use

- 2.5 The site is located at the north of Bognor Regis, immediately west of the existing A29 Shripney Road, beyond which is the recently created A259 Felpham Relief Road and associated commercial/employment development within the wider Enterprise Bognor LDO area, along with arable land. South east of the site is an existing caravan and motorhome site, whilst the south west and west of the site are located adjacent to The Brooks (Bersted Brooks) nature reserve and further farmland.

2.6 Current Public Use, Interest and Access

- 2.6.1 The land within the site boundary is privately owned and comprises arable farmland in the form of a single field along with the associated field boundary features. Accordingly, no existing formal public access or right of way is understood to be present across the site.

2.7 Constraints

Ecological Constraints

- 2.7.1 Based on the previously available survey information, ecological constraints within the body of the site are limited due to the relatively low value of the existing habitats present (dominated by arable land within a single field, therefore lacking any internal boundary features). However, a number of key constraints and sensitive receptors have been identified, focused on the site boundaries and adjacent offsite land, which are considered individually, where appropriate, within this document.
- 2.7.2 Key ecological receptors present include in particular the following:

- Ecological Designations:
 - *The Brooks (Bersted Brooks) LNR*
- Habitats:
 - *Boundary Hedgerows and associated ditches and trees*
- Fauna:
 - *Water Vole*
 - *Bats*
 - *Badger*
 - *Nesting Birds*

- 2.7.3 Suitable protective measures and considerations are set out below at the relevant sections in order to ensure these, and any other identified constraints and considerations are suitably addressed.

Other Identified Constraints

- 2.7.4 The site is permitted for the construction of new employment, warehouse and commercial development and associated infrastructure, whilst areas of retained agricultural land are included within the north of the site, which are proposed for continued arable use in line with the existing situation. Accordingly, any measures need to take into account the future use of the site and associated activities and management of the individual areas identified.

3 Existing Ecological Position

3.1 Ecological Survey Work and Assessment

3.1.1 Ecological survey work was undertaken by Aspect Ecology Ltd most recently during 2017 in order to inform the proposed development scheme, including the planning application, as reported within the resultant report ('Saltbox, Bognor Regis: Ecological Appraisal', dated August 2017), which was submitted as part of the planning application, and is therefore understood to form part of the approved documents.

3.1.2 The survey work undertaken included obtaining background ecological information and records from sources including Sussex Biodiversity Records Centre (SxBRC), whilst the site was surveyed based on extended Phase 1 Habitat Survey methodology over a number of visits, most recently in July 2017. In addition, specific survey work and consideration in respect of bats, Badger, Water Vole and breeding birds was undertaken in 2017.

3.2 Ecological Designations

3.2.1 The site does not contain any existing ecological designations, however The Brooks (Bersted Brooks) Local Nature Reserve (LNR) is located offsite, immediately adjacent to the southern and western site boundaries.

3.3 Habitats

3.3.1 On the basis of the survey work undertaken, the land within the site boundary (including all internal areas) was recorded to be dominated by arable farmland in the form of a single field. Other habitats present within the site are limited to the boundary hedgerows, associated trees and ditches.

3.3.2 Accordingly, ecological habitats and features of value (and therefore requiring protection measures) are limited to the existing field boundary hedgerows and associated trees and ditches, the vast majority of which will be retained under the proposals.

3.4 Fauna

3.4.1 The previously submitted ecological information includes details of survey work including general consideration of any potential for the presence of protected species along with specific survey work and consideration in regard to of bats, Badger, Water Vole and breeding birds. A summary of the position with respect to individual faunal groups is set out below.

Bats

3.4.2 On the basis of the survey work undertaken, the site does not contain any features that provide potentially suitable opportunities for use by roosting bats. The site does not contain any internal features that are likely to offer particularly important, specific foraging/commuting habitats for bats, albeit the boundary features (particularly the western and southern boundaries which are removed from light pollution associated with Shripney Road) offer suitable corridors for use by this group. Specific bat survey

work identified low levels of bat activity at the site, focussed on the (retained) western and southern boundary corridors.

Badger

- 3.4.3 No Badger setts, or other evidence of use by Badger were recorded within the site boundary during the survey work undertaken. However, evidence of Badger presence was recorded within the site, in the form of footprints within the cropped areas in the north east of the arable field and accordingly it is clear that this species is present within the local area and therefore likely accesses the site.
- 3.4.4 Accordingly, in order to ensure that Badger is appropriately safeguarded at the site, (and in line with the recommendations set out within the previously submitted information), planning conditions 17/15 require update Badger survey work to be undertaken prior to commencement of works at the site to confirm the up to date position at that time.
- 3.4.5 Aspect Ecology Ltd has been commissioned to undertake the required Badger update survey work, which will be timed to fall shortly before the commencement of works in order to ensure (in line with the reasons for the condition) that the progression of works is informed by the most up to date position at that time and does not further become outdated prior to the commencement of works.

Water Vole

- 3.4.6 Previous specific survey work undertaken in 2014 identified evidence of Water Vole within the northern boundary ditch (Shripney Manor Ditch) at the site, albeit no evidence for the presence of this species was recorded during the most recent 2017 work, likely due to the reduced water levels and overgrown nature of the ditch at the time of survey. Nonetheless, not least given the previously recorded evidence for the presence of Water Vole within the site and ditch habitat present, the previously submitted ecology information included recommendations for a number of mitigation measures and safeguards be put in place in regard to this species.

Reptiles

- 3.4.7 No evidence of reptiles within the site was recorded during previous specific surveys undertaken during 2014, whilst the majority of the site (including all internal areas to be worked as part of the permitted development, with the exception of the site access and proposed new habitat corridors) is dominated by intensively managed arable land that is unlikely to support reptiles. Nonetheless, the potential exists (particularly should the previous intensive arable management cease) for the boundary hedgerows to provide minor movement corridors and other habitats to develop potential suitability, such that in line with the previously submitted information, a precautionary approach and associated safeguards will be put in place in regard to this group as part of site clearance and construction works.

Nesting Birds

- 3.4.8 The habitats present, in particular including the boundary hedgerows and trees are likely to provide potential opportunities for common nesting birds, which receive protection under the legislation whilst nesting.

Other Species

- 3.4.9 On the basis of the survey work undertaken, other species likely to be present at the site remain common and widespread and receive no specific legislative protection, such that other protected species are unlikely to be present, or represent a constraint on construction works. Accordingly, no specific protective measures or mitigation would appear to be required in respect of such species, whilst in any event the measures and safeguards set out in respect of other ecological receptors will also serve to safeguard common and widespread species.

4 Ecological Protection, Mitigation and Enhancement Measures

4.1 Summary of Protection, Mitigation and Enhancement Measures

- 4.1.1 A summary of the proposed ecological protection, mitigation and enhancement measures at the site is provided at Plan 4567/LEMP3 and individual measures are discussed below, with particular reference to the specific, stated requirements of planning conditions 18/16.

4.2 Specific Measures Referred to under planning conditions 18/16

Trees to be removed and associated replacements

- 4.2.1 Planning conditions 18/16 require that any trees removed should be replaced at a ratio of 2:1.
- 4.2.2 As set out above, and within the previously submitted information the vast majority of the site (including all internal areas) is composed of intensively managed arable land, such that trees are limited to the site boundaries, which are largely retained.
- 4.2.3 The permitted Arboricultural information (prepared by Aspect Arboriculture), identifies that removal of trees required as a result of the permitted development is limited to the loss of a single small Ash (adjacent to the offsite roundabout, in order to facilitate the main site access) and a small group of Crack Willow and Hawthorn located in the south of the site.
- 4.2.4 In addition, short sections of hedgerow located along the eastern site boundary (3 sections, totalling approximately 15m in length) are required for removal in order to facilitate access from Shripney Road.
- 4.2.5 The detailed landscape planting proposals for the site (Appendix 4567/LEMP1) incorporate the provision of a substantial number of new native trees within the landscape buffers around the site, such that it is clear that considerably greater proportion of replacement/compensation planting will be provided than the required 2:1 ratio.
- 4.2.6 In addition, substantial new native hedgerow planting will be provided, including filling gaps within the existing boundary hedgerows where these are present, along with new hedgerow sections, such that it is clear that similarly new hedgerows will be created at a ratio considerably greater than 2:1 when compared to the minor losses.

Wildflower Meadow Planting

- 4.2.7 Considerable areas of new wildflower grassland will be provided and managed within the ecology buffer zone at the west of the site, in particular associated with the attenuation ponds (see Plan 4567/LEMP3 and Appendix 4567/LEMP1), in line with the stated requirements of conditions 18/16 in this regard.

- 4.2.8 These areas will be seeded with a native wildflower mixture, using species common to the local area, in line with the landscape architect's specifications (see landscape planting plans, Appendix 4567/LEMP1). The seed should be surface sown and can be applied by machine or broadcast by hand at the rate specified by the supplier (taking care to ensure compliance with any tree/hedgerow protection measures). The seed should be firmed in following sowing with a roller or by treading to give good soil / seed contact. Sowing should not be carried out during periods when the ground is dry, waterlogged or frozen and is ideally undertaken in autumn. Initial over-seeding of any retained vegetation will increase the habitat variation and value.
- 4.2.9 In addition, monitoring and spot treatment of pernicious/ruderal weeds (e.g. Docks and Stinging Nettle) may be necessary during establishment of the grassland in order to allow a healthy, mixed sward to develop, and this should be undertaken only as required where these dominate.

Mitigation Measures to Protect Bersted Brooks LNR

- 4.2.10 In order to ensure that the adjacent LNR designation is not adversely affected by the permitted development, a number of safeguarding measures are proposed to be implemented, with particular reference to (but not limited to) the offsite Penmire Lakes and Brook LWS/pLWS, including the following measures, the details and timing of which will be confirmed once detailed design information and construction timetables are available:
- **Construction Staff.** Prior to any works at the site, all construction staff should be fully briefed on the location and sensitivity of the offsite Bersted Brooks LNR designation and associated boundary treatment, along with other retained ecological habitats and the need to ensure they are fully protected during the works.
 - **Lighting.** Any temporary construction lighting should be avoided within the southern and western site boundaries (closest to the boundary with the LNR designation), with any lighting that is required directed internally within the site, away from the boundaries (in particular those located at the south of the site), and measures put in place to ensure they are turned off when construction activity is not in progress to prevent light spill and disturbance to the nocturnal/crepuscular faunal species.
 - **Storage.** Any storage of chemicals, construction materials or other items associated with the construction works should be removed from the site boundary vegetation and associated corridors with suitable buffers maintained to all such features. Specifically, no storage of construction materials should be located within 20m of the southern and western boundaries with The Brooks LNR.
 - **Drainage.** All works should proceed in accordance with Pollution Prevention Guidance information previously issued by the Environment Agency in order to minimise the risk of run-off or contaminants leaving the site.
 - **Fires.** Fires should only be lit in secure compounds and not allowed to remain lit during the night.
 - **Protective Fencing / Buffer Zones.** In order to ensure no encroachment of works towards the offsite LNR designation, suitable protective fencing (e.g. secure Heras or similar) will be installed (in line with BS5837) within the site boundary with the designation in the first instance (see Plan 4567/LEMP3), in order to allow the

progression of works, including the creation of the proposed wildlife planting. Following the creation of the buffer zone habitats, the protective fencing will be relocated to mark the boundary to the remaining development zone/construction areas (see Plan 4567/3).

Fencing will be maintained and regularly inspected for the duration of construction works to ensure it continues to provide a suitable barrier to disturbance or encroachment from construction works. With the exception of specific management and enhancement works to the hedgerows/trees or other ecological habitats in order to benefit these retained areas (e.g. through reinforcement planting), no access to fenced areas should be made by any construction staff.

Buffer Zone adjacent to Shripney Manor Ditch

- 4.2.11 In line with the stated requirements of conditions 18/16, a buffer zone will be maintained adjacent to Shripney Manor Ditch where this is located along the site boundary.
- 4.2.12 In the long term, new native planting will be provided in order to provide a wide corridor for wildlife. A 5m access strip composed of wildflower grassland will be provided adjacent to the ditch, which will assist in maintaining the open ditch corridor to benefit Water Vole. Adjacent to the 5m access strip, new native trees and scrub will be planted to provide further protection and additional wildlife habitats.
- 4.2.13 In addition, in order to prevent any potential encroachment of construction works into the ditch corridor, protective fencing (e.g. secure Heras or similar) will be installed, at approximately 5m from the ditch in order to mark the protective buffer in this location.
- 4.2.14 Fencing will be maintained and regularly inspected for the duration of construction works to ensure it continues to provide a suitable barrier to disturbance or encroachment from construction works. With the exception of new planting/ specific habitat enhancement works to the ditch corridor, no access to fenced areas should be made by any construction staff.

Gaps within tree lines/hedgerows

- 4.2.15 Considerable areas of new native tree and shrub planting are proposed throughout much of the site, including in particular associated with the existing boundary vegetation, whilst new native hedgerow planting is proposed (see Appendix 4567/LEMP1). Planting will include native species common to the local area. Accordingly, in line with the previously submitted information and detailed landscape planting plans prepared (see Appendix 4567/LEMP1) appropriate tree species include Field Maple *Acer campestre*, Downy Birch *Betula pubescens*, Hornbeam *Carpinus betulus*, Crab Apple *Malus sylvestris*, Wild Cherry *Prunus avium*, Alder *Alnus glutinosa*, Oak *Quercus robur* and Small-leaved Lime *Tilia cordata*, whilst shrubs and hedgerow species will include Dogwood *Cornus sanguinea*, Hazel *Corylus avellana*, Hawthorn *Crataegus monogyna*, Blackthorn *Prunus spinosa*, Holly *Ilex aquifolium*, Goat Willow *Salix caprea*, Grey Willow *Salix cinerea*, Guelder Rose *Viburnum opulus* and Dog Rose *Rosa canina* (see Appendix 4567/LEMP1).
- 4.2.16 In addition, new native trees and shrubs will be used to strengthen and enhance the existing retained boundary hedgerow corridors, particularly where existing gaps have opened up or dead/dying vegetation is present, using species similar to those listed

above, in line with the specific requirement set out within conditions 18/16 in this regard.

Provision of Bat and bird boxes

- 4.2.17 **Bat Boxes.** It is proposed that new opportunities for roosting bats will be provided at the site in the form of at least 5x woodcrete bat boxes attached to retained trees, (see Plan 4567/LEMP3 and Appendix 4567/LEMP4). It is recommended that boxes include 2x Schwegler 1FF and 3x Schwegler 2F bat boxes are installed on existing, retained trees at the site.
- 4.2.18 The bat boxes will be erected on the main trunks of mature trees, yet still be within reach of a ladder to enable monitoring to be undertaken where possible. Bat boxes will be sited in sheltered wind-free areas, in positions that provide a range of temperature conditions. Furthermore, boxes will be placed where bats can attain direct and free access to them and not in areas where access is restricted by the presence of dense vegetation. Health and safety issues will also be considered when positioning boxes. Care should be made to ensure no new lighting is to be placed within the vicinity of the bat boxes, including any security lighting or temporary construction lighting.
- 4.2.19 **Bird Boxes.** In order to provide additional nesting habitats for bird species, a total of at least 3x woodcrete bird boxes will be installed on existing mature trees to be retained within the site boundary (example bird boxes are included at Appendix 4567/5), for instance in the locations shown at Plan 4567/LEMP3.
- 4.2.20 The provision of the above boxes is considered appropriate given the small number of existing trees present of sufficient size to accommodate new boxes and will address the stated requirements of conditions 18/16 in this regard.

Management of grassland areas to benefit reptiles

- 4.2.21 In line with the stated requirement of planning conditions 18/16, wildflower grassland areas associated with the balancing/attenuation corridors and surrounding ecological buffer areas at the west of the site will be managed in the long term for the benefit of wildlife, particularly reptile species should they colonise the site from offsite areas. Details of the proposed management measures are set out below at section of this report.

Provision of log piles

- 4.2.22 In order to provide new habitat opportunities, in particular relating to invertebrates, but also likely benefitting birds, small mammals and herpetofauna species, (whilst also addressing the relevant requirement set out within the wording of planning conditions 18/16 in this regard), it is proposed to incorporate new log piles within the new native habitat areas, at the locations show at the proposed planting plans (see Appendix 4567/LEMP1) and Plan 4567/LEMP3. Wood piles will be constructed in accordance with the details set out at Appendix 4567/LEMP4.

4.3 New native planting scheme

- 4.3.1 Details of the proposed replacement native planting are set out at the detailed landscape planting plans for the site (see Appendix 4567/LEMP1), in line with the

previously submitted information, including the previous Ecological Assessment document (dated August 2017) and landscape strategy plans.

4.3.2 In particular, in line with the above information, the new areas of open space will include extensive areas of wildflower grassland and scattered scrub, which will be created using native species typical of the locality. Existing retained boundary vegetation and hedgerows will be supplemented with new native tree and shrub species, as indicated above and at the proposed planting plans (Appendix 4567/LEMP1). In addition, SUDs features in the form of the balancing/attenuation ponds will be planted with native species suitable for the relevant ground conditions and consistent with the required drainage functions, as identified at the proposed planting plans (Appendix 4567/LEMP1).

4.3.3 **Wildflower Grassland.** New wildflower grassland will be provided in line with the details set out above (paragraphs 4.1.7-9.).

4.3.4 **Native hedgerows, tree and shrub planting.** Similarly, considerable new native tree, shrub and hedgerow planting (including enhancement planting to strengthen and stock up gaps within the existing boundary hedgerows) will be provided in line with the details set out above (paragraphs 4.1.1-6 and 4.1.12-13)

4.3.5 **New balancing ponds.** A number of new balancing/attenuation ponds will be created within the open space area in the west of the site. Creation and detailed design of the balancing pond will necessarily need to be directed by flood drainage requirements. Nonetheless, where these do not conflict with drainage requirements, the new balancing/attenuation ponds will be constructed in accordance with the following broad principles:

- Where possible, the ponds should be excavated sufficiently to provide permanent standing open water and associated aquatic and marginal vegetation. Open water areas should be large and deep enough to prevent total drying during most years in order to provide a consistent resource
- The banks should be profiled to ensure that gentle slopes and broad draw down zones are created which will ensure the safety of the general public, as well as providing a variety of microhabitats including shallows and shelves which will warm up quickly in the mornings, and deeper 'cooler' areas of water available at the pond centres. Pond slopes should be designed to generally be between 1:5 and 1:20 in gradient, providing large areas of shallow water, and the margins should have a sinuous form, maximising the available edge habitat
- Natural colonisation of waterbodies should be favoured where possible, albeit in order to speed vegetative development and minimise potential erosion of newly created features, planting of native aquatic/marginal species is proposed (see Appendix 4567/1) to speed colonisation/development of vegetation. In any event, specific care should be taken during this process to avoid the potential introduction or spread of any non-native invasive species
- Protective fencing installed to reduce disturbance to the new balancing pond area following initial creation, both during remaining construction works/initial establishment and subsequent operational phase.

4.4 Reptile mitigation measures

- 4.4.1 As set out above, no evidence for the presence of any reptiles was recorded within the site, whilst suitable habitats are limited to the extreme margins, which will be largely incorporated into the wider, enhanced wildlife habitats (including considerably greater potential opportunities for reptiles in the long term). Nonetheless, given the potential for individual reptiles to colonise the minor opportunities at the site (particularly should the arable management cease), in line with the previously submitted information, a precautionary approach to any minor clearance or works affecting suitable vegetation will be undertaken, (including any suitable habitats that may arise should the existing arable management cease) in line with the below methodology.
- 4.4.2 Prior to any works, ongoing management of the internal areas of the site should aim to prevent the development of habitats that could encourage reptiles to move in. In particular, vegetation should be managed to prevent development of a dense, grassland sward or taller, more diverse vegetation (e.g. through regular mowing or ploughing in line with the current arable management).
- 4.4.3 Where existing suitable habitats for reptiles (currently limited to the boundary features) are to be affected, the following habitat manipulation methodology should be put in place in order to encourage any reptiles that may be present to disperse prior to clearance works commencing:
- Initial habitat works ideally to be undertaken during March to September / October, inclusive (subject to weather conditions) outside of the winter hibernation period for reptiles;
 - Any potential refugia, such as fallen dead wood, rubble or brash piles, to be searched for any reptiles prior to clearance and dismantled by hand wherever possible;
 - Suitable vegetation (tall grass field margins) to be cut in two stages, initially to a height of no less than approximately 15cm, (the arisings being carefully removed to prevent them forming cover or refugia for reptiles) to encourage reptiles to disperse naturally. Cut vegetation should then be left for a period of not less than 24 hours to allow any reptiles to disperse, following which the remaining vegetation can be cut to ground level;
 - In the event that any reptiles are encountered within the affected areas, works within that area should cease and a suitably qualified ecologist (e.g. Aspect Ecology) contacted for further advice.

4.5 Update/precautionary badger survey work (*planning conditions 17/15*)

- 4.5.1 Based on the survey work previously undertaken (as set out within the previously submitted report and summarised above), no Badger setts were recorded to be present within the site. However, evidence of Badger presence was recorded within the site form of footprints within the cropped areas in the north east of the arable field and accordingly it is clear that this species is present within the local area and could wander onto the site at any time, such that suitable mitigation and safeguards will be put in place in regard to this species.

- 4.5.2 In particular, given the dynamic nature of Badger (and in line with the requirements of planning conditions 17/15) update Badger survey work will be undertaken at the site to confirm the up to date position with regard to this species shortly-prior to the commencement of works at the site. During the surveys, the site and immediately adjacent areas will be specifically searched for any new Badger setts or evidence of use by this species. The update Badger survey work will be timed to take place shortly-prior to (i.e. ideally within no more than 1 month of) commencement of site works, in order to ensure that it reflects the up to date position at the time of commencement and remove the need for further, repeat survey work at that time.
- 4.5.3 Should any new setts or activity be encountered, further consideration and specific mitigation will be put in place (under licence if necessary) in order to ensure that Badgers are suitably safeguarded.
- 4.5.4 Regardless of the update survey results, general construction safeguards and working measures in respect of this protected species will be put in place by site staff throughout the construction period, including the following measures (which will also help to safeguard other faunal species at the site):
- Construction staff to be briefed on the potential presence of Badger at the site and the need to carry out measures to ensure this species is safeguarded.
 - Any excavations or deep pits within the site that are to be left open overnight will be provided with a means of escape should mammals such as Badger enter. This could simply be in the form of a roughened plank of wood placed in the pit as a ramp to the surface. Any such excavations or pits will be inspected each morning to ensure no animals have become trapped and / or buried into the sides overnight. (In the event any Badgers are encountered, Aspect Ecology Ltd will be contacted immediately for further advice).
 - The storage of topsoil or other 'soft' building materials within the site will be given careful consideration. Badgers will readily adopt such temporary mounds as setts. So as to avoid the potential adoption of any such mounds, these will be kept to a minimum and any essential mounds subjected to daily inspections (or nightly patrols if 24 hour security is present at the site) with consideration given to temporary fencing of any such mounds to assist in excluding Badgers.
 - Fires will only be lit in secure compounds and not allowed to remain lit *during* the night.
 - Any storage of chemicals, construction materials or other items associated with the construction works will be kept away from the site boundary features and retained vegetation, with suitable buffers maintained to all such features. All items stored within the site will be contained within appropriate containers, to ensure they cannot be accessed or knocked over by roaming Badgers.
 - Food and litter should not be left within the working areas overnight.

4.6 Nesting Birds (Planning conditions 16/14)

- 4.6.1 The habitats within the site have some potential to be utilised by a number of common nesting birds. All wild birds receive protection under Section 1 of the Wildlife &

Countryside Act 1981 (as amended) such that, with certain exceptions, it is an offence to intentionally:

- Kill, injure or take any wild bird;
- Take, damage or destroy the nest of any wild bird whilst in use or being built; and / or
- Take or destroy an egg of any wild bird

4.5.2 Accordingly, in order to prevent damage or destruction of nests and avoid any potential offence (whilst also ensuring compliance with the requirements of planning conditions 16/14), any removal or works to hedgerows, or other woody vegetation (including regular maintenance) should ideally be undertaken outside of the breeding season (i.e. outside of 1 March to 31 August inclusive). In addition, initial clearance of former arable areas may have potential to affect ground-nesting birds such as Skylark and accordingly, where possible any *initial* clearance works (in order to render the habitats unsuitable for such species wherever possible) should be undertaken outside of the breeding season (i.e. outside of 1 March to 31 August inclusive).

4.6.3 Should this not be possible, clearance of vegetation (including in particular any removal of hedgerows or woody vegetation, as well as *initial* clearance of former arable areas) will only be undertaken following (within no more than three days) confirmation of the absence of any active nests by a suitably qualified ecologist/Ecological Clerk of Works (i.e. Aspect Ecology Ltd – see below) and will be preceded by a toolbox talk provided to site staff by the ecologist. Any nests identified would need to be retained within a suitable buffer of retained vegetation and protected until nesting is finished.

4.7 Ongoing management and retention measures

4.7.1 Details of proposed long-term management and maintenance measures to be implemented within the open space areas are set out below at section 5., and summarised at the individual habitat management prescription sheets at Appendix 4567/3.

4.8 Timetable of implementation for ecological and landscape protection, mitigation and enhancement measures

4.8.1 Precise scheduling of proposed works will depend on the progression of current planning considerations, including discharge of planning conditions (including conditions 18/16, to which this report relates), along with associated constraints and mitigation measures (e.g. including mitigation measures in regard to protected species, such as nesting birds, as set out within this document).

4.8.2 Nonetheless, on the basis of the current information, a schedule of works and identified responsibilities for the above measures is detailed in Table 4.1 below.

Table 3.1 *Timetable for Implementation or protection, mitigation and enhancement measures*

Activity	Trigger Point	Time Restrictions	Responsibility
Pre-commencement checks/safeguards			
Badger update check (including in line with the requirements of planning condition 17/15)	Ecologist to carry out checking survey no more than four weeks prior to any works commencing.	None	Site Manager (or appointed member of staff) to inform the Ecologist/ECOW when the check is required. Ecologist/ECOW to carry out the checks/survey prior to commencement of construction works and advise results/further measures.
Reptile mitigation works (habitat manipulation and watching brief) prior to works affecting suitable habitats supporting reptile species.	Prior to/during works affecting suitable habitats.	To be undertaken during the reptile active season March-Sept/Oct.	Site manager / construction staff
Nesting Bird checks prior to any ground clearance works required during the bird nesting season (in line with the requirements of planning conditions 16/14)	Ecologist to carry out checking survey no more than three days before any initial ground / vegetation clearance works commence if required during nesting season.	Only required if ground clearance is carried out during the breeding season between March and August inclusive (clearance outside this period can proceed without the need for any such inspections)	Site Manager (or appointed member of staff) will inform the Ecologist/ECOW when checks are required. The Ecologist will then carry out the check(s).
Installation of protective fencing	Prior to commencement of any works at the site with potential to encroach on retained habitats.	N/A	Site Manager / Landlink Estates
Safeguards During Construction			
Site-wide pollution prevention (with particular reference to avoidance measures relating to the adjacent LNR designation)	To be adhered to at all times	Ongoing throughout construction	All staff
Badger/Mammal safeguards	To be adhered to at all times	Ongoing throughout construction	All staff. Site manager to appoint a member of staff to carry out daily checks on excavations/spoil piles, open pipes etc as appropriate where these are present.

Activity	Trigger Point	Time Restrictions	Responsibility
Appropriate inspection and maintenance of protective fencing	To be adhered to at all times	Ongoing throughout construction	All staff. Site manager to appoint member of staff responsible for weekly checks to ensure the protective fencing installed remains present and in suitable condition.
Positioning of any temporary lighting required during construction to safeguard commuting/foraging bats (in particular removed from the western and southern site boundaries adjacent to the offsite LNR designation	To be adhered to at all times when erecting or moving temporary lighting	Ongoing throughout construction	Site manager (or a member of staff appointed by them) will review the locations of temporary lighting and adjust if necessary and ensure lighting is only in use during permitted periods. Further advice sought from Ecologist/ECOW should construction lighting be required in the vicinity of the site boundaries.

5 Prescriptions for Management Actions

5.1 Introduction

- 5.1.1 Prescriptions for management actions relating to individual wildlife habitats within the open space areas are set out below, with the individual areas of the completed development that will be subject to the relevant action identified at Plan 4567/LEMP4.

5.2 Ecological Features Subject to Management Operations

- 5.2.1 Under the permitted development proposals, the internal areas of the site will be re-worked, whilst the majority of the existing field boundary vegetation will be retained wherever possible. On the basis of the survey results to date, a number of ecological features are present at the site, which were previously identified to offer elevated ecological value and will be largely retained under the proposals, namely in the form of the field boundary hedgerows and a small number of mature trees. New habitats of potential value to wildlife will be created within the site in the form of wildflower grassland and a new pond (including standing water areas), whilst specific faunal enhancements, in the form of bat and bird boxes, will also be provided within the site. As such, in order to ensure the site continues to provide opportunities for wildlife in the long term, the following habitats / faunal opportunities should be subject to ecologically-led management:

- New Balancing/Attenuation Ponds (SUDs - Standing Water and Marginal/Inundation Vegetation);
- Watercourse / Ditch (Shripney Manor Ditch)
- Wildflower Grassland;
- Hedgerows;
- Trees, Scrub and Woody Vegetation; and
- Specific Faunal Enhancements

5.3 Aims and Objectives of Management Measures

- 5.3.1 Following the completion of development works at the site, including provision of the new habitats and features as set out above, these areas will be subject to ongoing management and maintenance operations in order to ensure that the vegetation continues to develop and in order to maximise the ecological opportunities at the site in the long term.
- 5.3.2 In terms of ecological measures, any management should in particular aim to include, enhance and strengthen the existing (retained) hedgerows, semi-mature and mature trees and new balancing/attenuation ponds and associated buffer vegetation, where possible, whilst providing new habitats and long-term opportunities for faunal species present within the site, as well as providing opportunities for additional faunal species which may be present within the wider area.
- 5.3.3 In addition, management measures should take into account the need to ensure that the landscaped areas form part of the SUDs/drainage function, whilst providing enhanced landscape opportunities, including visual buffers and screening.

- 5.3.4 Management activities should therefore be undertaken in accordance with the details below, albeit these will be periodically reviewed in order to ensure they remain appropriate at the site in the long term.

5.4 Appropriate Management Options for Achieving Aims and Objectives

- 5.4.1 The measures set out below include management operations to be undertaken within different habitat types, that will ensure the habitats maintain, and where possible increase their value and structure in the long term, benefiting wildlife at the site and thereby ensuring that the long term aims and objectives are met. Management and maintenance operations are summarised for each habitat type within the individual maintenance schedules at Appendix 4567/3, with individual areas further discussed below and highlighted at Plan 4567/LEMP4 as appropriate.

- 5.4.2 Further, ongoing review and updating of these, will ensure that further options can be incorporated for the benefit of wildlife (and thereby contribute towards successful achievement of the aims and objectives) should these become available.

5.5 General measures to be implemented across identified wildlife habitat areas

- 5.5.1 A number of general measures should be implemented across the site in general to benefit wildlife wherever possible within the open space areas at the development site including:

- Avoiding the use of pesticides and fertilizers wherever possible, but in particular within the vicinity of the new balancing/attenuation ponds/wetland features;
- Given the close proximity of the proposed wildlife habitats to developed/commercial areas, it may be necessary to remove any litter that has been left or blown into this area and as such, regular checks should be undertaken of these habitats to remove any litter.
- Regular monitoring and inspection of habitat areas should be undertaken in order to establish the ongoing status of habitats and inform future management works and any alterations to the proposed management actions to benefit the wildlife and habitats present (see below).

5.6 New balancing / attenuation (SUDs) ponds

- 5.6.1 The new SUDs ponds will provide potential opportunities for a range of additional species, providing functional use for the suitable drainage requirements whilst also providing wetland habitats and additional marginal vegetation. Given the new creation of this habitat, management measures will relate to 2 phases: initial management measures required to ensure suitable establishment and subsequent ongoing management activities. Accordingly, these are set out separately below:

Initial Management

- 5.6.2 **Establishment of Vegetation.** Natural colonisation of aquatic vegetation would be favoured where possible, albeit it is envisaged that some planting will be required to assist swift and favourable establishment of the habitat and minimise potential

scouring. Wherever possible, management measures will be minimised during the initial period following creation in order to allow successful colonisation and development, albeit any vegetative die-back may need to be replaced. Partially natural colonisation in this manner is likely to take place over a period of at least 2-3 years to reach a relatively stable community

5.6.3 During the early stages following creation, whilst the vegetation is establishing, the possibility of colonisation by invasive/alien plant species is high. As such, a watching brief will be maintained for the presence of invasive exotic aquatic species such as:

- New Zealand Swamp-stonecrop *Crassula helmsii*
- Parrot's-feather *Myriophyllum aquaticum*
- Floating Pennywort *Hydrocotyle ranunculoides*
- Water Primrose *Ludwigia grandiflora*
- Water Fern *Azolla filiculoides*

5.6.4 Should any of these species be found to be present, early intervention/removal will help to control the spread of these species, which if left unmanaged may out-compete native flora.

5.6.5 Naturally colonising vegetation may include species such as Greater Reedmace *Typha latifolia*, Common Reed *Phragmites australis* and Reed Sweet-grass *Glyceria maxima*. These species can be very invasive, rapidly dominating areas of shallow water, and accordingly, ongoing management will include monitoring (particularly during this initial establishment phase) and control of these species if required to prevent dominance whilst maintaining cover and benefits provided by this habitat type. Similarly, colonising vegetation would likely include scrub species such as Willows which favour damp ground. Whilst these would likely provide some valuable cover, such species can be invasive and encroach on open habitats, including potentially affecting the required functional properties of the balancing pond for flood drainage. As such, in order to ensure the pond/wetland features provide long-term aquatic features within the open space areas and prevent any potential to increase scrub encroachment, whilst retaining associated flood drainage uses, any scrub colonisation will be closely monitored and controlled where necessary, particularly during the early colonisation stages when early colonists can take hold.

Ongoing Management

5.6.6 Ongoing management of the new balancing pond will be required in order to ensure that the feature continues to function appropriately to fulfil the SUDs/drainage requirements, whilst maximising the long-term ecological value of the feature. Management will be undertaken in line with the following measures:

- Vegetation around the upper banks will be managed in line with the adjacent grassland areas (see below)
- Cutting of vegetation along the margins of any standing water and lower banks will be undertaken as required on a rotational basis with no more than 50% of the marginal vegetation being cut in a single year
- Removal of submergent and floating vegetation (e.g. pondweed, duckweed) as required to maintain areas of open water wherever possible

- Cutting back or dredging out of tall emergent vegetation (e.g. Reeds or Reedmace) to be minimised and only undertaken as required to prevent extensive encroachment/silting of open water areas
- Dredging of accumulated sediment similarly to be minimised to avoid disturbance and undertaken on an 'as needed' basis to be informed by monitoring checks
- Control or removal of any invasive/alien plant species and fish where required.

5.6.7 Generally, where such measures are required, all vegetation cutting and dredging works should be undertaken during the winter months (November to January). All arisings from wetland areas will be left on the bankside for at least 24 hours to enable trapped aquatic fauna to return to the wetland areas prior to removal from site.

5.6.8 The use of pesticides and fertilisers should be avoided where possible throughout the wildlife habitats and informal open space, but in particular within the vicinity of the balancing pond.

5.7 Watercourse / Ditch (Shripney Manor Brook)

5.7.1 Management of the watercourse corridor and associated north side through the site should focus on maximising benefits for wildlife, including in particular aiming to maintain a healthy and diverse corridor of native flora and fauna (with particular reference to Water Vole should this species recolonise the site), whilst continuing to facilitate flood drainage functions. In particular the following measures/approach should be followed, guided and updated through the ongoing monitoring and inspections:

- Cutting of vegetation along the ditch/swale margins, along with any dredging/desilting/clearance of the channel should be minimised, albeit where required (e.g. to accord with flood drainage function requirements) to be undertaken on a rotational basis, with ideally cutting/desilting taking place across only one bank at any time, or in short sections to ensure taller vegetation and cover remains for wildlife use at all times.
- Generally cutting of vegetation/desilting/dredging to be undertaken during the winter months (November to February) or during periods when the ditch is dry in order to minimise disturbance to wildlife.

5.8 Wildflower grassland

5.8.1 Initial frequent monitoring of newly created wildflower grassland areas should take place during the first 6-12 months if required to assist the successful establishment of new grassland vegetation and minimise dominance of ruderal weeds.

5.8.2 Any failed areas of grassland may be re-seeded/over-seeded as required using a suitable seed mixture (wherever possible, care should be taken to avoid risk of importing non-native species or variants within seed mixtures), albeit it should be noted that many of the species provided would not be expected to flower within the first year following planting.

5.8.3 In addition, ruderal colonising weeds likely to dominate the areas of grassland if left untreated such as docks and thistles will be subject to spot treatment with herbicide if required during the first year to allow successful establishment of a healthy sward.

- 5.8.4 Following initial establishment, areas of new wildflower grassland should be cut once per year, ideally during late-summer/autumn to allow the herb species to set seed, whilst maintaining suitable grassland habitats in the long term and preventing encroachment of woody species. More frequent cuts may be required in identified areas in order to maintain open farm access. All arisings will be removed from the grassland areas to prevent build-up of organic matter, which can smother new growth. Arisings can be placed within areas of proposed shrub and tree planting in discrete piles, in association with wood/brush piles produced from management of woody vegetation to provide further opportunities for faunal species.
- 5.8.5 In addition, more frequent removal of encroaching woody vegetation will be undertaken if necessary (in line with measures set out in regard to trees and shrubs where appropriate) in order to maintain an open sward in areas of the proposed wildflower grassland.
- 5.8.6 The application of fertilisers should be avoided to the wildflower grassland areas to encourage the development of diversity and varied structure within the sward.

5.9 Native Hedgerows

- 5.9.1 Management of hedgerows and associated trees should be undertaken with ecological principles in mind. Minimal clipping should be undertaken where possible, with the aim of providing dense growth and stature to provide dense, continuous corridors for wildlife movement. Nonetheless, in order to maintain healthy dense growth, occasional trimming will likely be appropriate and, where possible this should ideally be limited to a single side, or short sections, leaving the remainder un-trimmed during any one year to ensure some denser habitats remain present at all times.
- 5.9.2 Trimming should ideally take place during the late autumn or winter so as to maximise food and cover availability and to avoid detrimental effects to nesting birds.
- 5.9.3 In general existing mature/semi-mature trees should be retained at regular intervals and allowed to continue to mature, such that management actions will be limited, albeit selective thinning and felling of new tree planting in particular may be required in time to create space for more mature development. Development of new individual, spaced, standard trees within the hedgerow corridors should be encouraged through selective pruning/trimming.
- 5.9.4 Wherever possible, trimming should take place over no more than one side of the hedgerow at any one time (or discrete sections, should for example traditional/beneficial methods such as laying be employed) to allow areas of untrimmed vegetation and growth to remain, providing continuous wildlife habitats.

5.10 Trees, Scrub and Woody Vegetation

- 5.10.1 New native trees and scrub planting will be provided under the proposals. These habitats will be subject to management activities as detailed below.
- 5.10.2 New tree and scrub growth will be monitored at least every six months during the first year following planting and annually thereafter, with weed control, watering, replacement of tree guards and replanting of failed specimens undertaken as required to ensure successful establishment and healthy growth.

5.10.3 Trees and scrub will generally only be subject to ongoing management on an 'as needed' basis. This may include thinning out or pruning of tree and shrub species to enhance habitat structure or reduce shading, coppicing on rotation and removal of any colonising non-native species. Newly planted areas in particular will not be subject to any substantial works in the short-term to allow them to establish.

5.10.4 Arisings from any management works will be used to strengthen existing habitat piles/hibernacula or could be used to create additional, discrete habitat piles with excess material disposed of as appropriate through chipping or removal from site.

5.11 Faunal measures and enhancements

5.11.1 The above individual habitat management activities and associated timing have been directed where possible to ensuring faunal species within those habitats are safeguarded and opportunities for use by wildlife maximised. The measures set out should be reviewed regularly, with particular reference to the species present, in order to ensure they remain appropriate and updated where necessary. In addition, site maintenance staff should be made aware of the potential presence of particular faunal groups of concern (i.e. Badger, Water Vole, reptiles and nesting birds) and associated legislative implications, including the need to avoid disturbance to individuals whilst maintaining the habitats for the benefit of these species.

Specific faunal enhancements

5.11.2 Schwegler woodcrete bat and bird boxes are extremely long lasting, rot-proof, and do not require any particular maintenance, other than to be left unobstructed and *in situ*. Nonetheless, annual visual inspections from the ground will be taken of bat and bird boxes where these have been installed, as part of regular site maintenance to ensure they remain securely fastened to the trees and as such do not pose a health and safety risk, whilst continuing to offer suitable opportunities for these species groups.

5.11.3 Where boxes or other features have become dislodged or unsafe, these should be re-secured, ideally during the late autumn / early winter months when they are less likely to be in use, whilst in any case boxes can be viewed more easily during this period, once the leaves have fallen from the trees.

5.11.4 Other features providing faunal enhancements (e.g. wood piles) should not require any regular management, although should be monitored occasionally as part of the general site maintenance inspections, with repairs or replacement undertaken as required. Further, where general maintenance activities include removal of woody vegetation, the arisings should be used to 'top up' wood piles and/or create new piles within vegetated areas in line with the above habitat measures (in line with the information set out elsewhere).

5.12 Works Schedule

5.12.1 An annual implementation programme of works is set out at Appendix 4567/2.

5.13 Responsibility for Implementation of the Plan

5.13.1 In the first instance, Landlink Estates will be responsible for the implementation of the measures set out within this LEMP.

- 5.13.2 It is anticipated that long-term responsibility for management of the open space areas will be handed over to a nominated management company. Accordingly, upon appointment, the nominated management company will also be responsible for the implementation of the management and maintenance measures detailed in this document. Specific responsibilities for individual nature conservation management operations will be dependent on the appropriate stage and timescales involved, and for clarity individual responsibilities are detailed at the associated management sheets, where appropriate.

5.14 Monitoring and Associated Remedial / Contingency Measures

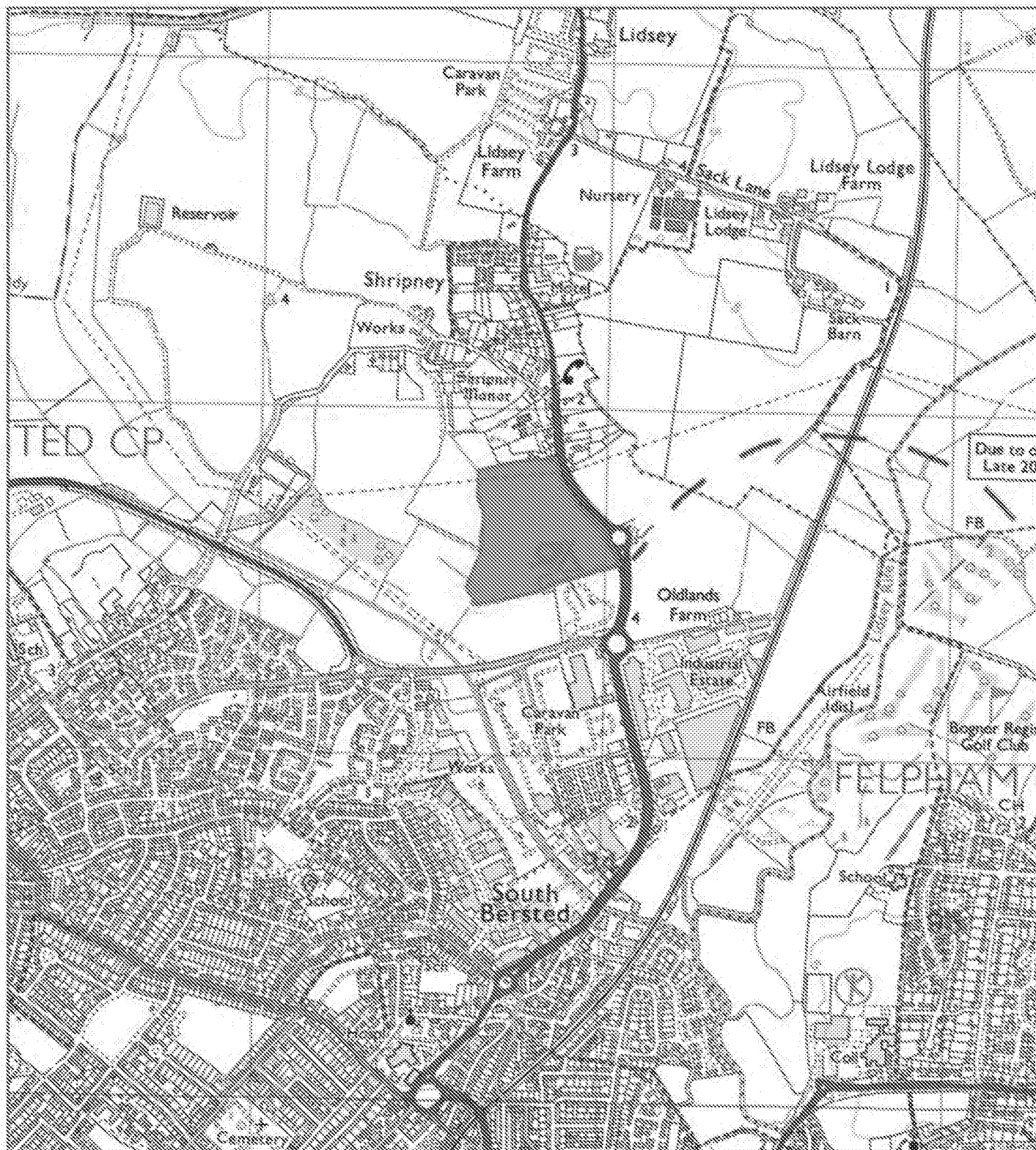
- 5.14.1 In order to inform ongoing management activities, annual inspections of all habitats within the site will be undertaken by the maintenance contractor responsible and any remediation or other appropriate action informed by the results of such inspections on a day to day basis.
- 5.14.2 In addition, faunal enhancements should be visually checked annually to ensure that they remain present and, where appropriate, securely affixed. In the unlikely event that any boxes have become damaged, detached or missing, they will be re-secured or replaced as appropriate.
- 5.14.3 A formal record/log of management activities undertaken should be kept, along with details of vegetation development (and any informal records of associated wildlife use where appropriate), which should be used to inform and provide suitable justification for any alterations to the management activities undertaken. An annual summary of the measures undertaken and any snags or deviations should be prepared. Should measures not have been undertaken in line with the requirements, or other issues identified, the annual summary should include actions to remedy these, including dates, timelines and responsibility. A copy of the annual summary should be kept with the log/record and made available upon request for inspection.

6 Summary and Conclusions

- 6.1.1 Aspect Ecology has been commissioned by Landlink Estates in regard to ecological matters at the site, known as 'Saltbox Field', located west of the A29 Shripney Road, Bognor Regis.
- 6.1.2 This report sets out a Landscape and Ecological Management Plan to address the stated requirements of Planning Conditions 18/16 (in respect of 'outline' and 'full' matters respectively) of the hybrid planning permission for the site (ref: BE/102/17/OUT).
- 6.1.3 The majority of the habitats recorded at the site (including all internal areas) prior to commencement of development offer no negligible ecological value, with the exception of the boundary trees and hedgerows, the majority of which will be retained under the permitted development. Offsite ecological designations include The Brooks (Bersted Brooks) LNR, which is located adjacent to the site boundary and accordingly, buffer zone and associated management are proposed which will protect the LNR.
- 6.1.4 The site was previously recorded to offer some minor suitable habitat that could be colonised by Badger, Water Vole and common reptile species, whilst trees, hedgerows and scrub provide nesting habitat for birds. Accordingly, suitable protection and mitigation measures are set out (including update Badger survey work in line with the requirements of planning conditions 17/15).
- 6.1.5 Provision of substantial new habitats and management of the open space areas presents an opportunity to enhance the ecological value present, whilst safeguarding any existing ecological interest where possible.
- 6.1.6 Management prescriptions are set out for the new and retained habitats, along with new faunal enhancements in line with the wording set out within planning conditions 18/16. Management activity sheets for use by the appointed management personnel are provided at Appendix 4567/2, whilst a timetable is provided at Appendix 4567/3.
- 6.1.7 It is considered that, subject to the implementation of the detailed measures set out and associated ongoing updates and revisions, this report will satisfy the stated requirements of the relevant planning condition (18/16) of the hybrid planning permission for the site and as such, the relevant pre-commencement requirements of these conditions can be suitably discharged.

Plan 4567/LEMP1:

Site Location



Key:

 Site Location

aspect ecology

Aspect Ecology Limited - West House - Handwork Business Park
Nene Way - Barking - Dagenham - D19 2JF
01205 270044 - info@aspectecology.co.uk - www.aspectecology.co.uk

Saltbox, Bognor Regis PROJECT

Site Location TITLE

4567/LEMP1 DRAWING NO.

REV

November 2018 DATE



Plan 4567/LEMP2:

Areas included within the LEMP



Plan 4567/LEMP3:

Ecological protection, mitigation and enhancement measures



Plan 4567/LEMP4:

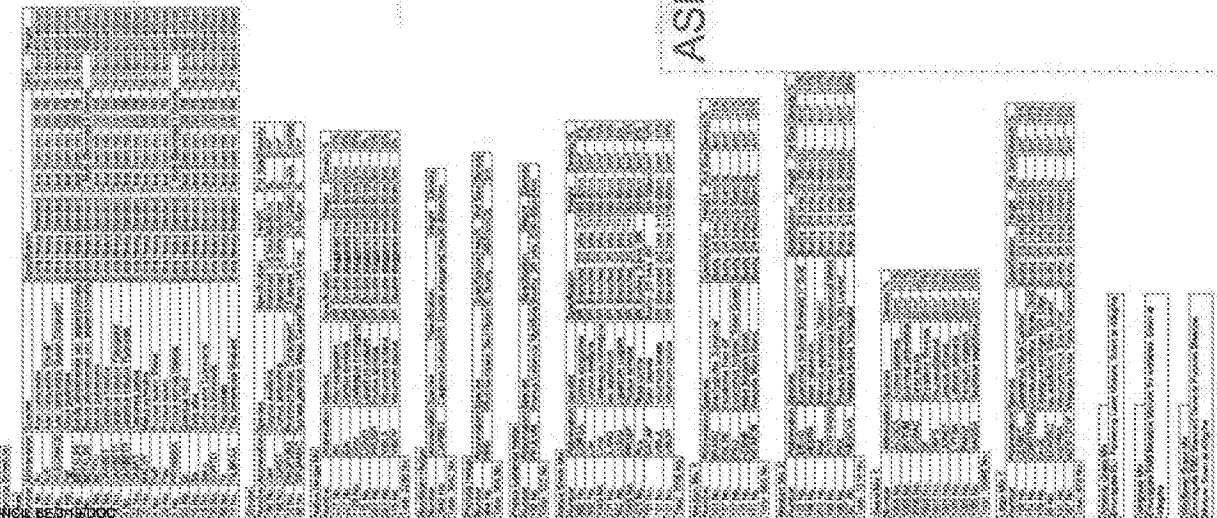
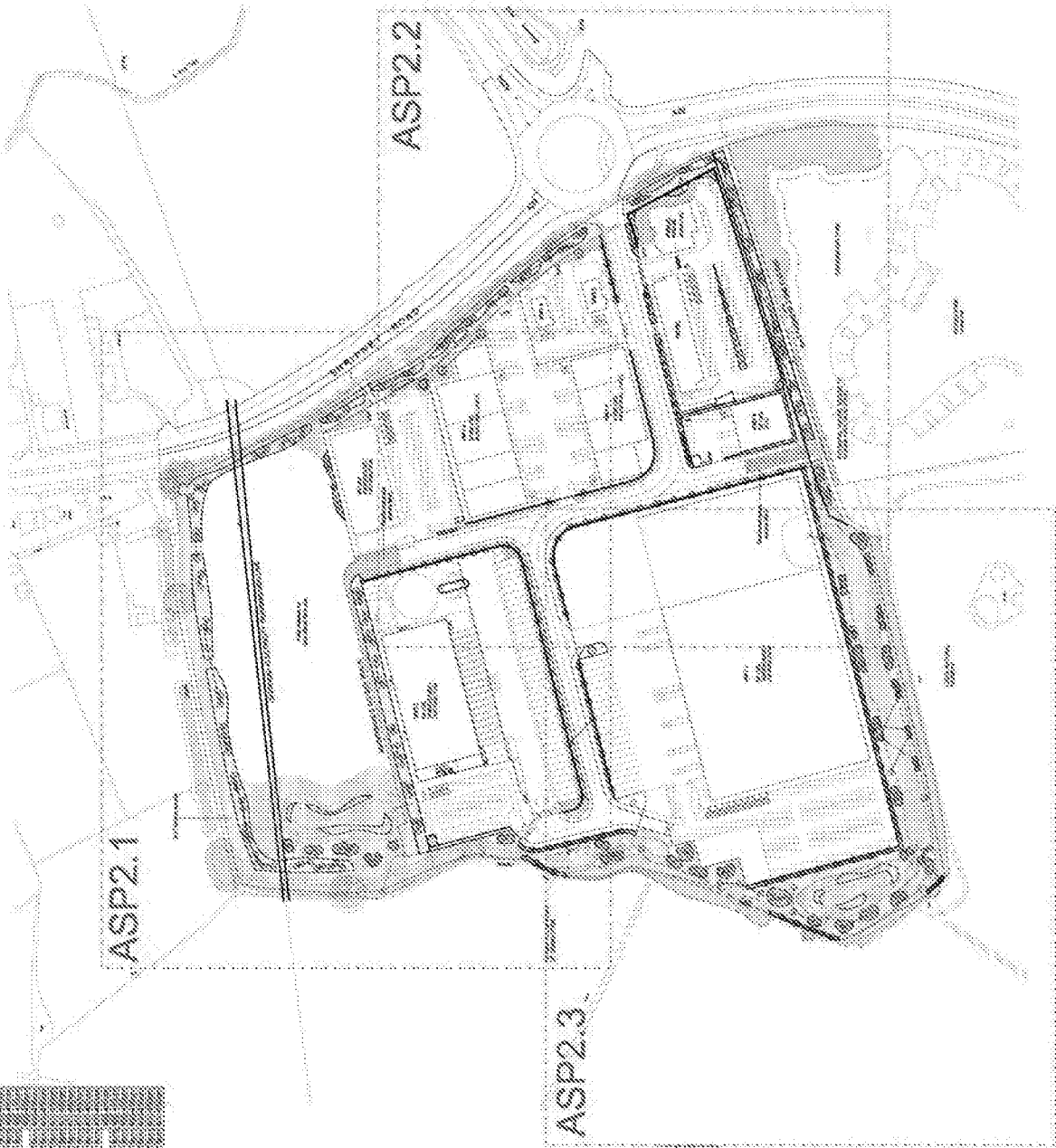
Ecological management areas



Appendix 4567/1:

Proposed soft landscape plans:

Aspect Landscape Planning Drawing No. 5920/PP/ASP2



- LEGEND
- Site Boundary
 - Existing Trees
 - Existing Shrubs
 - Proposed Trees
 - Proposed Native Plants
 - Proposed Ornamental Shrubs
 - Proposed Feature Shrubs
 - Proposed Native Grasses
 - Proposed Ornamental Grasses
 - Proposed Amenity Grass / Turf
 - Proposed Watercourse
 - Proposed Vegetation Mix
 - Proposed Reinforced Grass Matt

aspect landscape planning

Site: Bishops, Bishopsgate Regis
Planning Ref: Overreeds

Landmark Estates

Scale: 1:1000
Date: 10/07/2018
Drawn: JH
Checked: JH
Project: ASP2.1



Appendix 4567/2:

Annual implementation programme of management works

Annual Implementation Programme of Management Works

Habitat / feature	Activity	Month												Notes
		J	F	M	A	M	J	J	A	S	O	N	D	
<i>New Balancing Pond / Wetland Features (SUDs) (A)</i>	Clearance of excessive weed growth / dredging of silted areas.													Only as required to ensure open water areas remain where possible. Any removed material should be left on the bankside for at least 24 hours and at most only part of any open water area dredged/cleared in any one year.
	Cutting bankside vegetation.													Maintained as wildflower grassland when not inundated – cut ideally no more than once per year outside of the main flowering season, to a height of approximately 10-15cm. Cutting on a rotational basis over no more than 50% in any one year.
<i>Watercourse / Ditch (Shripney Manor Ditch) (B)</i>	Minimal management to remove debris/blockages where necessary, with.													Only undertaken where necessary, incorporating safeguards/ consideration with regard to potential presence of Water Vole. Dredging/desilting minimised (ideally undertaken only when dry) on rotation to ensure unaffected sections remain present. Measures to be determined in accordance with drainage requirements.
	Cutting bankside vegetation.													Bankside vegetation maintained in line with surrounding wildflower grassland areas where possible, except that measures taken where possible to prevent choking of the watercourse channel itself. Cutting undertaken on rotation in sections to ensure uncut refuges remain at all times.
<i>Wildflower grassland (C)</i>	The majority of the grassland to be maintained as meadow grassland with rank sward where possible for the benefit of wildlife including reptiles, albeit margins and other areas may require additional works.													Wildflower grassland ideally to be cut no more than once per year (certainly no more than 2-3 times a year), with areas remaining un-cut during any year. Cuts timed to fall outside of the main flowering season, to approximately 10cm. Arisings removed (may be placed within discrete piles at the margins to provide wildlife habitat/refugia for reptiles).
<i>Hedgerows (D)</i>	Hedgerows to be trimmed only where necessary to encourage dense growth and maintain continuous corridors.													Trimming to be undertaken outside of the bird nesting season, with ideally only a proportion of the hedgerows cut at any time to ensure uncut areas remain available at all times for use by wildlife.
<i>Trees, scrub and woody vegetation. (E)</i>	Health and safety works													Based on appropriate aboricultural assessments. Carried out as and when required outside of the bird nesting season.
	Removal of encroaching vegetation from SUDs features/grassland sward area as required													Hand pulling or cutting back to the stump and treating with herbicide. Carried out as and when required outside of the bird nesting season.
<i>General site maintenance</i>	Litter picking and repairing of site infrastructure													Informed by regular checks, as and when required. Combined with other management tasks where possible.

Appendix 4567/3:

Habitat management prescription sheets

Initial Works/Aftercare				
	Action	Responsibility	Frequency/Timing	Notes
1.	Appropriate initial preparation of substrate areas and seeding of new areas with appropriate native wildflower mixture.	Main contractor/ appointed landscape contractor	-	
2.	Carry out regular cutting of newly seeded grassland areas to ensure establishment of a healthy sward.	Appointed landscape contractor	As required up to 2 times a month for first 6-12 months.	
3.	Monitor presence of invasive/ruderal weeds and control if required using spot treatment of herbicides or cutting.	Appointed landscape contractor	Monitor throughout year, control as required.	Subject to monitoring visits. Only control if detrimental to general sward as weed species may be of benefit to invertebrates.
Ongoing Management Activities				
4.	Maintain wildflower grassland area as long-sward grassland, cut to approximately 10-15cm height no more than annually, with ideally areas left uncut each year.	Appointed landscape maintenance contractor	Cut annually in late summer (late-July/Aug). Should additional spring cut be required, undertake early spring (March/April).	Remove arisings from site or create grass habitat piles in discrete areas within tree/shrub planting.
5.	Undertake scrub control (hand pulling or cutting) to prevent extensive encroachment into grassland areas.	Appointed landscape maintenance contractor	As required, carried out in October-February	Arisings used to create habitat piles or removed from site.
6.	Monitor presence of invasive weeds and control if required using spot treatment of herbicides or cutting.	Appointed landscape maintenance contractor	Monitor throughout year, control as required.	Subject to monitoring visits. Only control if detrimental to general sward as weed species may be of benefit to invertebrates.
7.	Use of herbicides and fertilisers to be avoided at all times aside from spot treatment of weeds where necessary.	-	-	-

Initial Works/Aftercare				
	Action	Responsibility	Frequency/Timing	Notes
1.	Protective fencing/protection measures to be maintained throughout clearance/construction works to prevent damage/disturbance to retained hedgerows/boundary vegetation.	Main contractor	As required, to be installed prior to commencement and maintained throughout construction period.	
2.	Initial creation of new hedgerows through appropriate planting of native species in line with landscape architect's specifications. Fill up any minor gaps and strengthen areas of boundary vegetation with additional native understorey species as appropriate.	Main contractor/appointed landscape contractor	As required – ideally to be undertaken during appropriate planting season (autumn/spring)	-
3.	Monitor initial establishment of hedgerows and ensure suitable protective measures remain in place as required.	Appointed landscape contractor	As required.	-
4.	Failed vegetation to be replaced and suitable irrigation provided where necessary.	Appointed landscape contractor	As required for first year following planting / initial contract period, whichever longer.	To ensure successful initial establishment of woody vegetation within the new boundary corridors and hedgerows.
Ongoing Management Activities				
5.	Hedgerows to be trimmed as appropriate to maintain dense, continuous vegetation whilst allowing growth and screening function.	Appointed landscape maintenance contractor	Any trimming to take place during November to February, no more than annually for native species-rich hedgerows (ideally less frequently) with only a proportion cut in any year to ensure uncut areas remain available for wildlife use.	Arisings used to create habitat piles or removed from site.
6.	Standard trees to be allowed to develop/mature at regular intervals and remain untrimmed where possible.	Appointed landscape maintenance contractor	-	-
7.	Monitor health of hedgerows/boundary corridors and any developing gaps to be restocked with native species similar to those already present.	Appointed landscape maintenance contractor	As required to maintain continuous corridors.	
8.	Use of herbicides and fertilisers to be avoided.	-	-	-

Initial Works/Aftercare				
	Action	Responsibility	Frequency/Timing	Notes
1.	Initial provision of new planting as part of new landscape provision.	Main contractor/ appointed landscape contractor	-	
2.	Monitor initial establishment of new trees and shrubs to ensure they remain upright, firm, stable and in good health.	Appointed landscape contractor	As required up to monthly for first 6-12 months / initial contract period whichever longer.	To ensure successful initial establishment of woody canopy and understorey vegetation.
3.	Failed trees and/or shrubs to be replaced and suitable irrigation provided where necessary.	Appointed landscape contractor	As required for first year following planting / initial contract period, whichever longer.	To ensure successful initial establishment and varied vegetation within the new planted areas.
Ongoing Management Activities				
4.	Selective thinning and felling of trees and shrubs to take place as required in order to maintain open habitat structure and development.	Appointed landscape maintenance contractor	As appropriate, cutting to take place during October to February (avoiding the nesting bird season).	To ensure successful development of an open canopy, allowing light to enter the ground layer whilst maintaining screening function. All arisings to be retained within the site to create distinct habitat piles.
5.	Standing dead wood to be retained in situ where possible. Any wood which is removed as part of the thinning/felling to be retained within suitable habitat piles.	Appointed landscape maintenance contractor	-	To provide additional habitat opportunities and encourage use by a range of species including invertebrates, birds and small mammals.
6.	Use of herbicides and fertilisers to be avoided.	-	-	-

Initial Works/Aftercare				
	Action	Responsibility	Frequency/Timing	Notes
1.	Initial creation and seeding of wetland grassland area with appropriate wildflower mixture(s), reflecting likely soil/hydrology conditions. Provision of native marginal planting in line with Landscape Architect specifications.	Appointed landscape contractor	-	-
2.	Install/maintain appropriate fencing/barriers to prevent damage during initial establishment.	Appointed landscape contractor	As appropriate following creation until suitable establishment of vegetation.	-
3.	Monitor presence of invasive/ruderal weeds and control if required.	Appointed landscape contractor	Monitor throughout year, control as required.	Subject to monitoring visits. Only control if detrimental to general development of vegetation as weed species may be of benefit to invertebrates and other fauna.
Ongoing Management Activities				
4.	Dredging / de-silting only to take place where necessary to facilitate functional drainage requirements and/or maintain open water areas for ecological benefit.	Appointed landscape maintenance contractor	As required during November-early February, or at times when dry.	All arisings to be deposited on the bankside for at least 24 hours to enable trapped aquatic fauna to return to the habitats prior to removal from the site.
5.	Aquatic and marginal vegetation to be cut back / dredged out of the permanently wet areas where necessary.	Appointed landscape maintenance contractor	As required during November-early February, or at times when dry.	To maintain open water habitats where possible and prevent these from becoming choked / overgrown with vegetation. All arisings to be deposited on the bankside for at least 24 hours to enable trapped aquatic fauna to return to the water prior to removal from the site.
6.	Lower banks/basin to be managed with minimal cuts (no more than once per year, except where required in order to facilitate functional drainage requirements) to prevent development of shrubs or woody vegetation.	Appointed landscape maintenance contractor	Unless otherwise required due to drainage requirements, cut no more than annually outside of the flowering/seeding period (late-July/Sept).	To allow continued drainage functionality, whilst providing habitat structure and varied vegetation for the benefit of faunal species. Arisings to be removed.
7.	Upper banks to be managed in line with surrounding grassland (see above)	Appointed landscape maintenance contractor	See above.	-
8.	Removal of any debris or other deposits as required in order to facilitate functional drainage requirements.	Appointed landscape maintenance contractor	As required, ideally limited to winter periods (November-early February).	To maintain the functionality of the detention basin as a drainage system whilst also ensuring (where possible) wildflower grassland vegetation is maintained for the benefit of wildlife.
9.	Use of herbicides and fertilisers to be avoided.	-	At all times	In order to benefit species diversity and habitat value, whilst also minimising/ preventing leaching of chemicals into surface water systems.

Initial Works/Aftercare				
	Action	Responsibility	Frequency/Timing	Notes
1.	Protective fencing/protection measures to be maintained throughout construction works to prevent damage/disturbance to watercourse corridor, including retained trees/boundary vegetation where appropriate.	Main contractor	As required, to be installed prior to commencement and maintained throughout construction period.	
2.	Construction safeguards within adjacent development areas (including buffer zones, safe storage of materials away from the watercourse corridor and measures to prevent run-off).	Main contractor	As appropriate throughout construction period.	-
Ongoing Management Activities				
3.	Removal of debris or blockages from drainage routes and flood storage areas	Appointed landscape maintenance contractor	Only as required to fulfil drainage requirements.	-
4.	Cut grassland vegetation no more than every 2 years on a rotational basis where possible.	Appointed landscape maintenance contractor	No more than 50% vegetation cut annually, carried out in November-January/February.	Undertaken in sections to maintain open drainage routes/function. Leave arisings on bankside for 24 hours before removal from site.
5.	Clearance / desilting or dredging of watercourse channel to be undertaken only when required to maintain open channel.	Appointed landscape maintenance contractor	Only where required, as infrequently as possible, albeit sufficient to maintain open water channel where possible.	Avoid where possible, only to be undertaken on sections where necessary to maintain open channel. Works to take place only from one side to minimise disturbance to bankside vegetation.
6.	No pesticides or fertilisers to be administered to the habitats within or adjacent to the wetland areas.	-	At all times	In order to prevent pollution or eutrophication of the wetland habitats.

Habitat Type: General Management Activities

Ongoing Management Activities				
	Action	Responsibility	Frequency/Timing	Notes
1.	Carry out regular litter inspections and remove and suitably dispose of any litter/arising.	Appointed landscape maintenance contractor	As required: likely weekly throughout the year.	-
2.	Create/strengthen habitat/wood piles using any arisings from other management activities.	Appointed landscape maintenance contractor	As required to maintain wildlife opportunities. Excess arisings to be composted/ legally disposed of from the site as appropriate.	-
3.	Regular monitoring (at least annually) of habitat/vegetation conditions and review of management actions/progress (including these sheets) in order to inform future management.	Appointed landscape maintenance contractor	At least annually – date to be confirmed.	All areas to be inspected/ monitored and clear logs/records of actions and associated conditions kept to inform updates/amendments to the management plan.
4.	Annual visual inspections of bird and bat boxes to be undertaken from the ground. Where boxes have become dislodged or unsafe, these should be re-secured.	Appointed landscape maintenance contractor	Inspection at least annually, any time of year. Re-securing / replacement or other actions affecting boxes to be undertaken during late autumn/early winter.	To maintain the value of these installations for wildlife at the site and ensure suitable health and safety issues are complied with.

Appendix 4567/4:

Faunal enhancement specifications

Bat Boxes

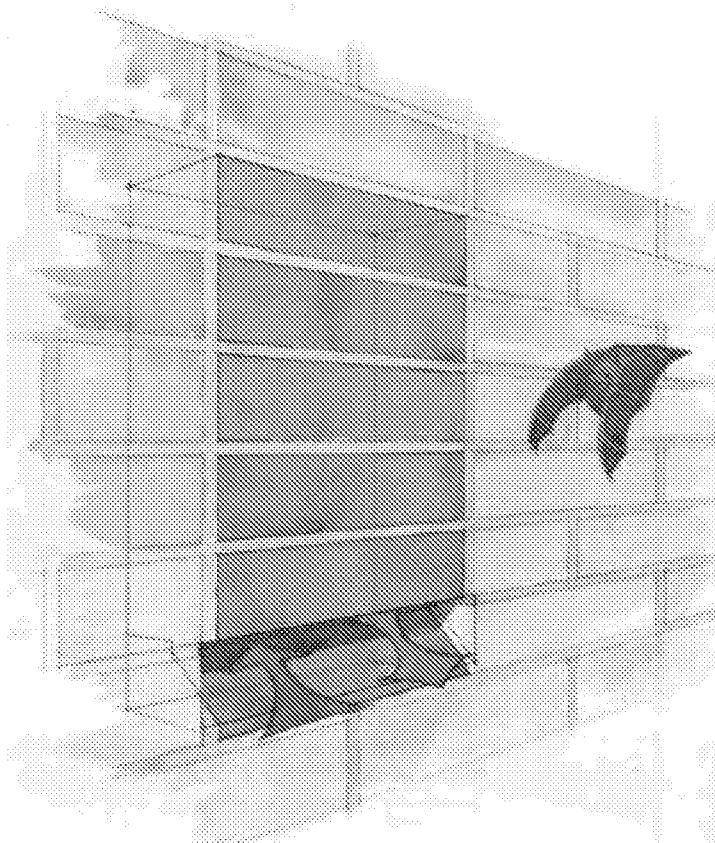
Habibat Access Box

The Habibat box is an integrated bat box, designed to suit a number of bat species and fit in the majority of buildings. Habibats can even be joined side by side to increase the roost space available

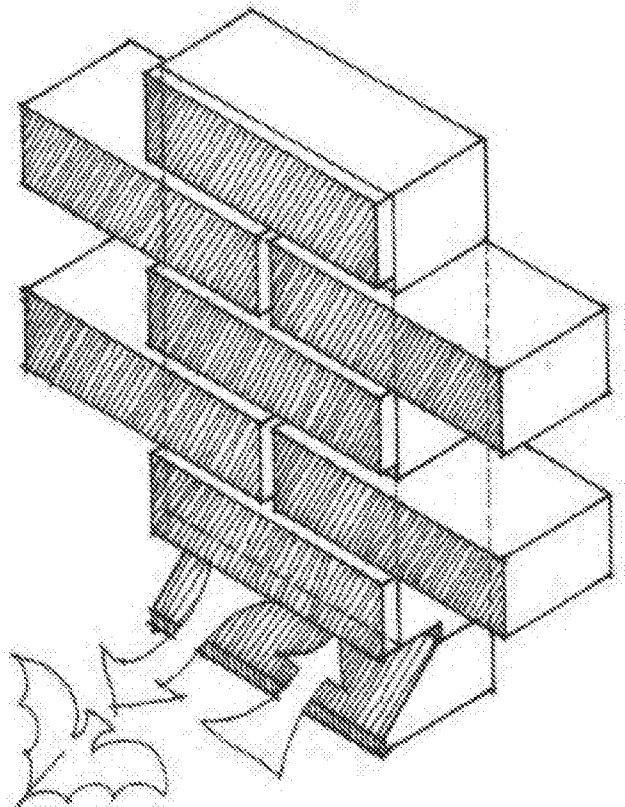
It is a solid bat box comprising a rough aggregate block with an internal roost space, which can be incorporated into the fabric of a building as it is being built or renovated. Habibat boxes can be supplied unfaced for a render finish, or can be finished with a block-work effect in brick, stone, granite, masonry, slate, terracotta, tile and timber to match your building. Alternatively, bespoke boxes can be made to order and faced in a material of your choosing.

Dimensions:

103mm (d) x 215mm (w) x 440mm (h).



Habibat Access Box 001



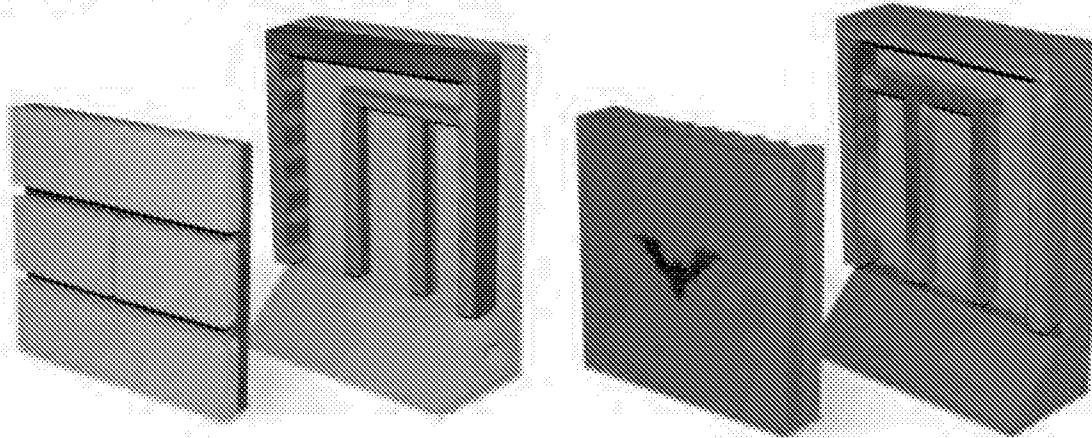
Habibat Access Box 003

Bat Boxes

Ibstock Integrated Bat Box

Designed with the Pipistrelle Bat in mind. Available in all brick types and various sizes. A discrete home for bats with several roosting zones created inside the box. Ideal for new build and conservation work. Maintenance free as the entrance is at the bottom.

Dimensions 215 x 215 or 215 x 290mm.



*Bat Access Bricks produced by Ibstock
<http://www.ibstock.com>*

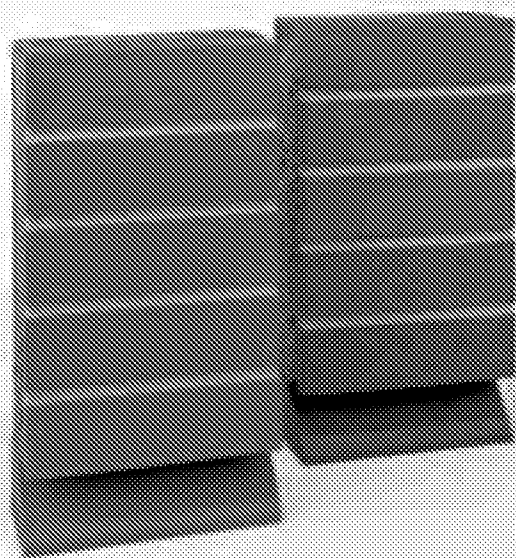
Weinerberger Integrated Bat Box

The Terca/EcoSurv Bat Box has been specifically designed to be incorporated into the fabric of the building and to encourage the use by species such as Pipistrelles, Natterer's, Whiskered and Brandt's bats which are most commonly found roosting in buildings.

They are larger in size than other similar boxes and can accommodate more bats. The internal structure is not split into chambers and with the unique arrow head internal fixings allows bats to congregate in different areas. The box is available in either Staffordshire Smooth Red or Smooth Blue but can also be manufactured to suit any other colour from the Wienerberger range.

*Dimensions:
102mm (d) x 215mm (w) x 440mm (h).*

*Bat Access Bricks produced by Wienerberger
<http://www.wienerberger.co.uk>*

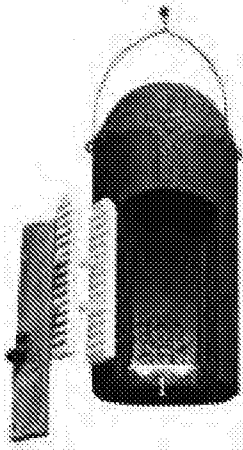


Bat Boxes

Schwegler bat boxes are made from 'woodcrete' and have the highest rates of occupation of all types of box.

The 75% wood sawdust, clay and concrete mixture is ideal, being durable whilst allowing natural respiration and temperature stability. These boxes are rot and predator proof and extremely long lasting.

Boxes can be hung from a branch near the tree trunk or fixed using 'tree-friendly' aluminum nails.



1FD Bat Box

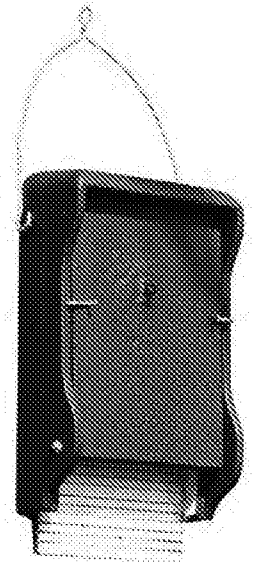
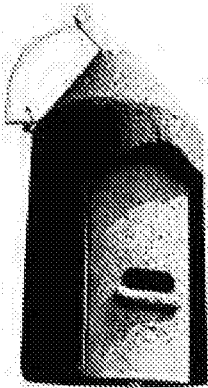
A larger than standard bat box, with two additional roughened wooden panels inside to be used by the bats as perches.

Woodcrete construction, 16cm diameter, height 36cm.

1FF Bat Box

The rectangular shape makes the 1FF suitable for attaching to the sides of buildings or in sites such as bridges, though it may also be used on trees. It has a narrow crevice-like internal space to attract Pipistrelle and Noctule bats.

Woodcrete construction, 27cm width, 43cm height, 7.3kg weight



Schwegler 2F Bat Box

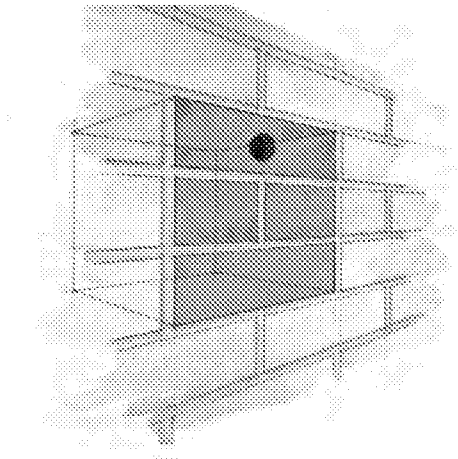
The 2F from Schwegler is the most popular general purpose bat box. It is particularly attractive to the smaller British bats. A simple design made from strong, natural WoodcretePLUS material, with a narrow entrance slit on the front. Hang from a tree branch near the trunk, or fix to a trunk with the supplied 'tree-friendly' aluminium nail.

Woodcrete construction, 16cm diameter, 33cm height, 4kg weight.

Bird Boxes

Bird Brick Box

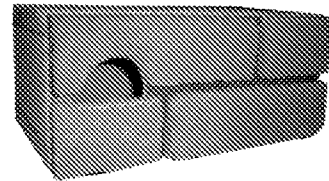
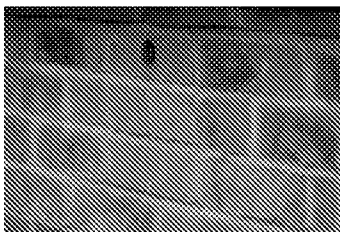
The Bird Brick Box is a cleverly designed bird box, that provides a permanent nesting site for hole-nesting birds, as an interegral part of the fabric of a building.



The Bird Brick Box is a large, solid box made of insulating concrete with an internal nesting space, which can be incorporated into the fabric of a building as it is built or renovated. The box is designed to be both unobtrusive and aesthetically pleasing.

Swift Brick Box

Entrance dimensions: 33 x 65 mm

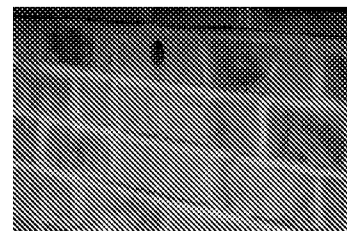


Sparrow Brick Box

* Height: 215 mm * Depth: 135 mm
* Width: 215 mm * Hole diameter: 32 mm

Starling Brick Box

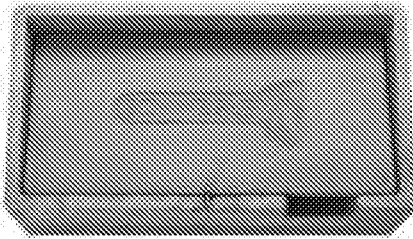
* Height: 215 mm * Depth: 135 mm
* Width: 215 mm



The brick boxes are faced in standard Staffordshire Smooth brick (Red or Blue), and are ideal for new builds. They are supplied unpointed so they can be matched as closely as possible to the building. Some designs can be made to order and faced in brick to match your building.

Bird Boxes

Schwegler No 16 Swift Box



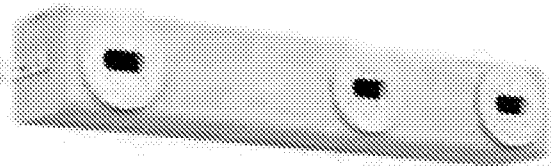
The design of this box mimics bell tower louvres. It has a removable panel for easy inspection of the nest chamber. The entrance hole should be positioned at least 5m above the ground. Ensure unobstructed access for birds entering or leaving the box. Designed for fixing on or within walls.

Dimensions: 240H x 430W x 220D mm. Weight 11kg

Schwegler No 17 Triple Cavity Swift Box

This box is constructed from plant-fibre based material. It can accommodate 3 pairs of swifts assisting the rapid formation of colonies. It should be sited 6-7m above the ground, near the roof of a building, ensuring unobstructed access for birds.

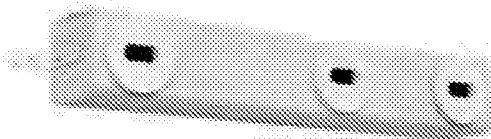
Dimensions: 150H x 900W x 150D mm. Weight 7kg



Schwegler No 18 Swift Box

This nest box is suitable for fixing high under the eaves or under the guttering of a building.

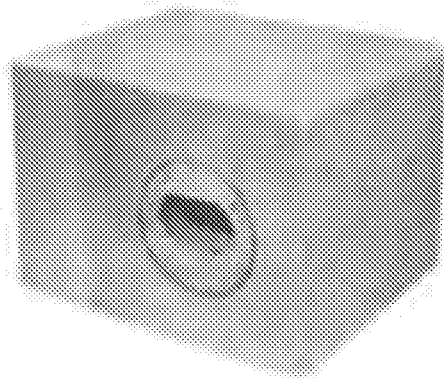
*Interior dimensions 14 x 34 x 15 cm.
Exterior dimensions 19 x 50 x 22 cm*



N25 Nest Brick

Designed for installation into the fabric of a building, this box is suitable for swifts.

*Entrance hole 55 x 33mm
Dimensions 180H x 260W x 220D mm. Weight 8.8kg*



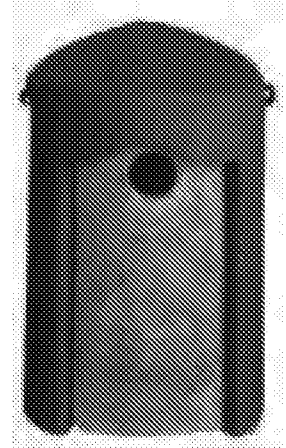
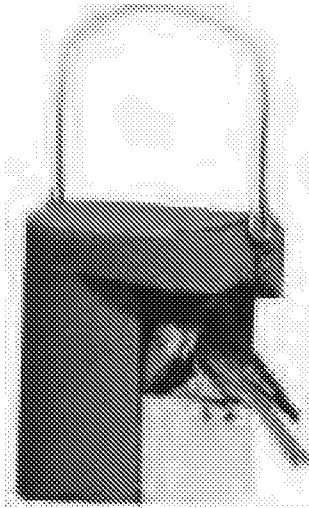
Bird Boxes

Schwegler bird boxes have the highest rates of occupation of all types of box. They are designed to mimic natural nest sites and provide a stable environment with the right thermal properties for chick rearing and winter roosting. Boxes are made from 'Woodcrete'. This 75% wood sawdust, clay and concrete mixture is breathable and very durable making these bird boxes extremely long lasting.

1B Bird Box

This is the most popular box for garden birds and appeals to a wide range of species. The box can be hung from a branch or nailed to the trunk of a tree with a 'tree-friendly' aluminium nail.

*Available in four colours and three entrance hole sizes.
26mm for small tits, 32mm standard size
and oval, for Redstarts.*



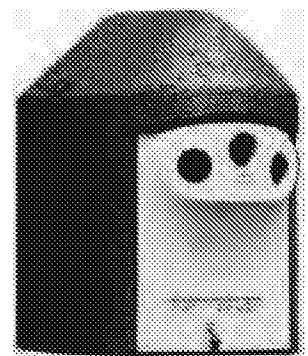
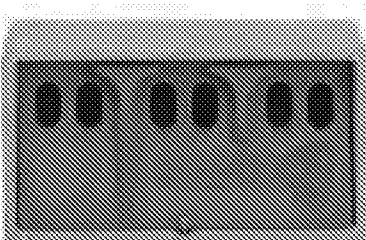
2H Open Fronted Nest Box

This box is attractive to Robins, Pied Wagtails, Spotted Flycatcher, Wrens and Black Redstarts. They are best sited on the walls of buildings with the entrance on one side.

2GR Nest Box

Because of the special design of the large nesting area and front panel, this box is especially well protected against predators.

*Available as shown with three 27mm holes for small tits or with a single oval entrance hole.
Nesting area 14cm x 19cm.*



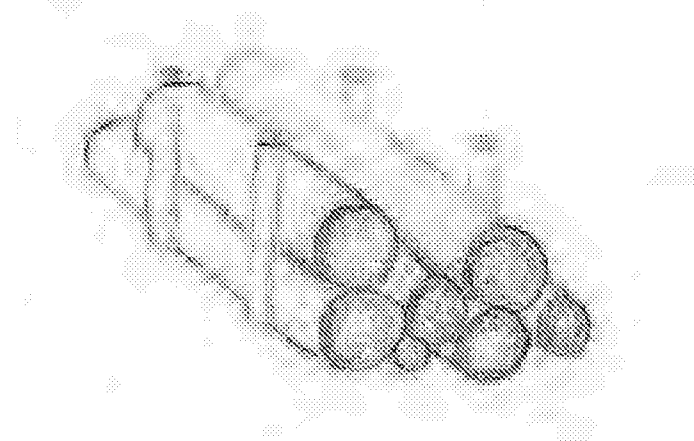
1SP Sparrow Terrace

House sparrows are gregarious and prefer to nest close to each other, so this woodcrete box provides room for three families under one roof.

For siting on buildings of all kinds at a height of at least 2m (e.g. under eaves.)

Wood Piles for invertebrates

Dead and decaying wood is an important wildlife habitat, used by many species of beetle and other invertebrate.



These creatures then become a foraging resource for species higher up the food chain, including birds, bats and terrestrial mammals.

Create a wood pile by sinking 4 posts approximately 8-10cm in diameter, at least 20cm into the ground as shown above.

Logs with bark, of any diameter should be cut into consistent lengths of 1.5 - 2m, and then tightly and neatly stacked into the space between the uprights.

Avoid making log piles too high, or the timber will dry out.

Wood from any broad-leaved tree can be used, but oak, beech or fruit trees are best, as these support the richest insect communities.

A buffer zone should be created around the logs so that the soils and vegetation are protected as much as possible from disturbance, and ideally the surrounding vegetation should not be cut between May-September.

Allowing plants to grow over the log pile both retains moisture and provides shade for the invertebrates.

Buried “Loggery”

Dead and decaying wood is an important wildlife habitat, used by many species of beetle and other invertebrates

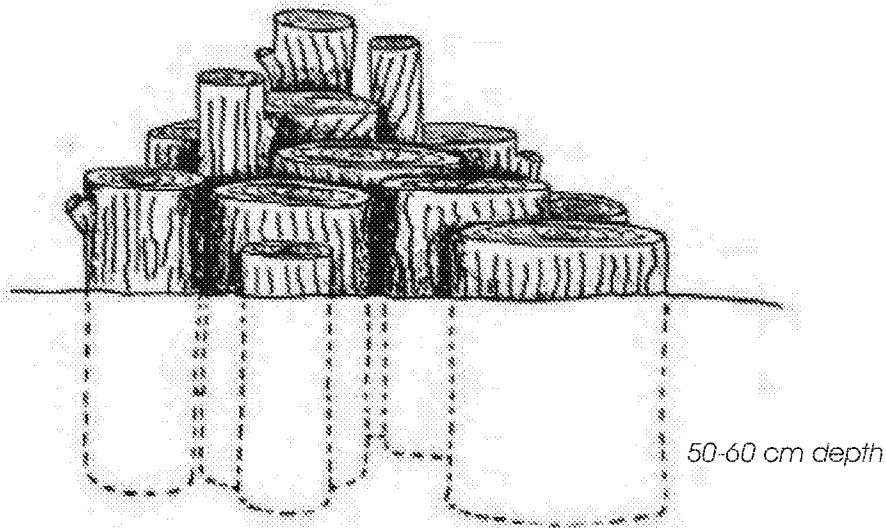


Image taken from the London Wildlife Trust publication: Stag Beetle: an advice note for its conservation in London, 2000.

Create a “loggery”, by simply partially burying hardwood logs (with bark still attached) c.60cm into the ground, packing logs as closely together as possible. Position in partially shaded areas to prevent dessication. Avoid making log piles too high, or the timber will dry out. The logs should be at least the thickness of an adult’s arm (10-50cm diameter).

Wood from any broadleaved tree can be used, but oak, beech or fruit trees (such as apple/pear) are best, as these support the richest insect communities.

A buffer zone should be created around the logs so that the soils and vegetation are protected as much as possible from disturbance, and ideally the surrounding vegetation should not be cut between May-September. Allowing plants to grow over the log pyramid both retains moisture and provides shade for invertebrate species.

landscape planning • ecology • arboriculture

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