

COURTWICK LANE, LITTLEHAMPTON

Ecological Mitigation and Management Plan
(addressing the requirements of Conditions 14, 15
and 35 of Planning Permission LU/355/10/)

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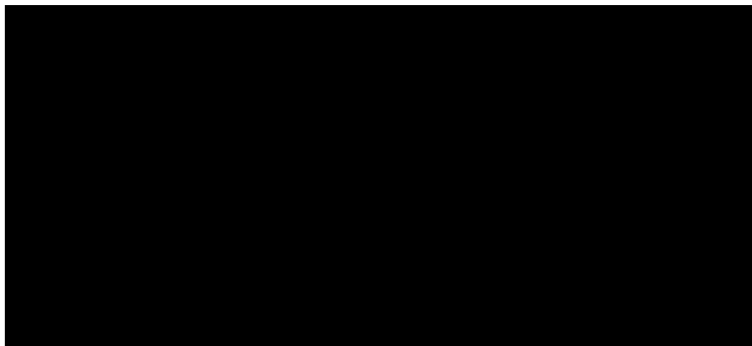
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1. INTRODUCTION

1.1. Background

- 1.1.1. Aspect Ecology is acting on behalf of Barratt Homes Southern Counties in regard to ecological issues at the site at Courtwick Lane, Littlehampton, West Sussex (see Plan 2927/EMP1).

1.2. Site Characteristics

- 1.2.1. The site is situated at the north-western edge of Littlehampton, adjacent to the A259, which bounds the site to the south, beyond which lies existing residential housing. Arable land lies to the west, with a farm and pasture to the north. Existing residential and industrial development lies to the east.
- 1.2.2. The site itself comprises a single large arable field which is sub-divided by Courtwick Lane running in a north-west/south-east direction across the north-eastern part of the site. A number of farm buildings are located within the site along Courtwick Lane. A residential property and associated outbuildings and garden are located adjacent to the farm buildings, although these are excluded from the site boundary.

1.3. Permitted Development

- 1.3.1. The site is in receipt of outline planning permission (ref: LU/355/10/) for mixed use development comprising up to 600 residential dwellings with industrial units, local facilities, structural planting and landscaping, green infrastructure, open space, children's play areas, allotments, surface water attenuation and new road access.
- 1.3.2. The planning permission is subject to a number of conditions. Of these, Conditions 14, 15 and 35 relate to ecology, and state:

Condition 14

"No development within any phase or sub phase shall commence until a detailed scheme of ecological enhancement and mitigation measures within that phase has been submitted to and approved in writing by the local planning authority. The measures shall be implemented in accordance with the approved scheme.

Reason: In order to secure adequate habitat enhancement and mitigation of potential impacts of the development."

Condition 15

"No development within any phase or sub phase shall commence until details of an ecological management plan for the construction phase of that element of the development has been submitted to and approved in writing by the local planning authority. The management plan shall be implemented in accordance with the approved plans.

Reason: In order to secure adequate habitat enhancement and mitigation of potential impacts of the development."

Condition 35

“No development hereby permitted shall commence until details of the design, siting and timescales for delivery of a permanent dedicated barn owl tower have been submitted to and approved by the local planning authority. The approved tower shall be erected in accordance with these approved details.

Reason: In order to secure adequate habitat enhancement and mitigation of potential impacts of the development.”

1.4. Purpose of This Report

- 1.4.1. This report addresses the requirements of Conditions 14, 15 and 35 of planning permission (ref: LU/355/10/), by setting out a mitigation and management scheme for the entire site. This scheme is based upon the previous survey work undertaken at the site, with particular reference given to the most recent survey undertaken by Aspect Ecology in December 2012. In addition, recommendations provided within the Ecology/Biodiversity chapter of the Environmental Statement which accompanied the planning application are taken into account.

2. SITE CONDITION AND ECOLOGICAL CONSTRAINTS

2.1. Previous Survey Work

- 2.1.1. The outline planning application (ref: LU/355/10/) was accompanied by an Ecological Appraisal ('Land at Courtwick Lane, Littlehampton – Updated Ecological Appraisal Report' – Hyder Consulting 2009) and Environmental Statement. This comprised a Phase 1 survey in 2008 and further specific surveys for over-wintering birds, Barn Owl and bats in 2009.
- 2.1.2. Following approval of outline planning permission, an initial visit to determine the scope of the mitigation and management plan was undertaken by Aspect Ecology in April 2012. Further detailed survey was undertaken by Aspect Ecology in December 2012, to provide an up-to-date assessment of the status of protected species and inform mitigation and management proposals. This included surveys of the buildings in order to fully document and map Barn Owl activity, and to provide an up-to-date assessment of roosting and nesting status. At the same time, buildings were inspected for any evidence of bats, to ensure that the findings of the previous Ecological Appraisal remained valid. In addition, existing areas of suitable reptile habitat were mapped in order to inform mitigation requirements in respect of this species group.

2.2. Site Description and Current Ecological Conditions

- 2.2.1. The site is dominated by arable land, with several farm buildings located along Courtwick Lane (identified as buildings B1-B3 and B5-B6 on Plan 2927/EMP2, together with off-site buildings B4 and B7-B10). The site is bordered by hedgerows, with areas of improved grassland and scattered Bramble around the farm buildings along Courtwick Lane, together with areas of rough grassland, ruderal vegetation and scrub habitat to the north-east. Habitats in 2012 were broadly similar to those surveyed in 2009, which are described in full within the report entitled 'Land at Courtwick Lane, Littlehampton – Updated Ecological Appraisal Report,' (Creswell Associates October 2009), which accompanied the outline planning application.

2.3. Ecological Constraints

- 2.3.1. Aside from the species-rich hedgerows which are largely retained under the proposals, the habitats present within the site are of low ecological value. However, the development works are subject to a number of potential ecological constraints in relation to bats, Barn Owl, other nesting birds and reptiles, as discussed below. A summary plan of faunal interest recorded at the site is given at Plan 2927/EMP2.

Bats

- 2.3.2. Bat surveys, incorporating both inspection and emergence surveys, were undertaken in 2009 and recorded no evidence of roosting bats. The update survey undertaken in 2012 included detailed internal and external inspections of all buildings proposed for demolition within the site. The inspection survey confirmed that there is no evidence of any of the buildings having been used by roosting bats, and none of the buildings held more than low potential for usage. As such, it is concluded that no bat roosts are

present and there are no constraints to development in respect to this species group.

Barn Owl

- 2.3.3. The 2009 survey recorded the presence of roosting Barn Owl within building B3. As such, update surveys were undertaken comprising an initial assessment in April 2012, followed by a detailed survey and mapping of Barn Owl evidence in December 2012. The survey concluded that three of the buildings held evidence of use. A summary of survey findings for each building is given below.
- 2.3.4. **Building B1.** Numerous scattered Barn Owl pellets were recorded at building B1 in April 2012, several of which were relatively fresh. Detailed survey in December 2012 found only one fresh pellet to be present, near the northern end. No evidence of nesting or suitable ledges was present. On this basis, it is considered that this building is used for occasional roosting.
- 2.3.5. **Building B2.** Fresh pellets and droppings attributable to Barn Owl were recorded during the initial survey in April 2012. The update survey in December 2012 recorded a Barn Owl exiting from the southwest corner of the building. In addition, a pile of c. 40 pellets was recorded near the western end, beneath steel support beams, with additional scattered pellets throughout the building. Two ledges are present above enclosed rooms at the northeast and northwest corners, but although they hold potential for nesting, no build-up of pellets or droppings was seen on either ledge. No other suitable nesting locations were present within the building, and the entire structure was fully accessible, such that evidence of nesting would have been readily apparent. On this basis, it is concluded that the building is not used for nesting by Barn Owl, although it is subject to regular use for roosting.
- 2.3.6. **Building B3.** The initial survey in April 2012 recorded no evidence of Barn Owl use. However, the updated survey carried out in December 2012 recorded three Barn Owl pellets at the western end, although none appeared to be recent. Two artificial nest boxes are present internally. A Barn Owl was recorded emerging from one of these boxes during Phase 1 survey in 2008, however this was unoccupied in 2012, holding some nesting material suggesting usage by Kestrel. On this basis, it is considered that this building is used for occasional roosting.
- 2.3.7. **Building B4.** This supports a Barn Owl box internally, although no evidence of Barn Owl use was recorded during the April or December 2012 surveys.
- 2.3.8. **Buildings B5 – B10.** None of the other agricultural buildings within the site held any evidence of Barn Owl occupation, and were generally considered to provide low potential. Buildings B5, B6 and B8 are large, open agricultural structures, building B7 is an occupied residential dwelling, B9 is a water tower on an open brick enclosure, and B10 is a derelict brick structure. None of these held any suitably undisturbed ledges of cavities suitable for nesting Barn Owl.
- 2.3.9. **Summary.** Evidence of Barn Owl was recorded at buildings B1, B2 and B3. However, no evidence of nesting was recorded, as such it is considered that

the buildings are used for roosting only, with a preference for building B2. The fresh nature of many of the droppings suggests that this building is regularly used by Barn Owl.

Other Nesting Birds

- 2.3.10. A number of habitats within the site have some potential to be utilised by other nesting birds, including buildings and areas of scrub. Buildings within the site have previously been recorded to hold Swallow *Hirundo rustica* and House Martin *Delichon urbicum* nests.

Reptiles

- 2.3.11. Small isolated areas of habitat within the site are potentially suitable for Common Lizard, Slow-worm and Grass Snake. In particular, Common Lizard was recorded during a search of natural refugia as part of the Ecological Appraisal in 2009. An update survey in December 2012 re-assessed the condition and extent of suitable reptile habitats within the site. This concluded that suitable habitat is confined to small areas of rough grassland, tall herb vegetation and scrub principally between the farm buildings, but also in the extreme northeast and southwest corners of the site (as shown on Plan 2927/EMP2). This small area of habitat, combined with its low quality and isolation within an intensive agricultural landscape, is not considered to hold more than a low population of common reptiles.

3. MANAGEMENT FRAMEWORK

3.1. Aims and Objectives

- 3.1.1. The main features of ecological interest supported by the site are the presence of roosting Barn Owls and small numbers of Common Lizards *Zootoca vivipara*, possibly in addition to Slow-worm *Anguis fragilis* and Grass Snake *Natrix natrix*.
- 3.1.2. Any enhancement and management strategy should be focused on these species, with secondary consideration given to other species which could potentially make use of the site from time to time.
- 3.1.3. The proposals also provide opportunities to create new habitats, thereby contributing to BAP objectives and providing diverse wildlife areas.

3.2. Areas Covered by the Ecological Mitigation and Management Plan

- 3.2.1. Section 4 of this document relates to construction safeguards which are relevant to the main development area subject to construction works. Sections 5 and 6 provide details of habitat creation and management, which primarily relate to the 'Ecology Areas' located in the western part and the northeast corner of the site. The extent of these 'Ecology Areas' are shown on Plan 2927/EMP3. This document sets out details for the creation, enhancement and long-term management of habitats within this area.
- 3.2.2. The management plan also includes reference to other areas of the site that, although primarily designed for amenity purposes, will provide habitats of some value for wildlife and are to be managed in accordance with ecological principles where possible, identified as 'Secondary Habitat Areas' on Plan 2927/EMP3. Key principles for these areas are set out within this management plan.

3.3. Responsibility

- 3.3.1. Barratt Homes Southern Counties will be responsible for the implementation of safeguarding measures during construction and the initial habitat creation and maintenance set out in this management plan. Following completion, it is anticipated that a management company will be established to undertake ongoing management works as detailed in this document.

4. CONSTRUCTION SAFEGUARDS (ADDRESSING CONDITION 15)

- 4.1.1. Safeguarding measures are proposed in relation to Barn Owl, nesting birds and reptiles, based on findings of the 2012 survey work, and to take into account the recommendations provided in the Ecology/Biodiversity chapter of the Environmental Statement which accompanied the planning application.

Barn Owls

- 4.1.2. Barn Owls are protected under Schedule 1 of the *Wildlife and Countryside Act 1981* (as amended), as such the occupied nests of the species are protected against destruction or disturbance. However, as the December 2012 survey concluded that no nests are present, it should be possible to proceed with demolition of the buildings without causing any offence in relation to this species. Nevertheless, to ensure the status of these buildings has not changed (i.e. no nests have established), an update check of all buildings will be carried out prior to demolition. Should any nests be recorded, they will be safeguarded until no longer occupied. These checks will be undertaken prior to demolition at any time of year, given that Barn Owl can breed throughout the year.

Nesting birds

- 4.1.3. The occupied nests of breeding birds are protected under the *Wildlife and Countryside Act 1981* (as amended). 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;
- Take or destroy an egg of any wild bird.

- 4.1.4. As such, a precautionary approach will be adopted to avoid any offence in relation to nesting birds during the construction phase and during habitat creation or management works. If possible, the removal of potential bird nesting habitat, i.e. scrub, trees and buildings, should be undertaken outside of the bird breeding season, which runs from March to August inclusive. Where works in during this season are unavoidable, works should not proceed until a nesting bird check has been undertaken by a suitably experienced ecologist, and any nests present safeguarded until they are no longer occupied.

Reptiles

- 4.1.5. Reptiles are protected from killing or injuring under the *Wildlife and Countryside Act 1981* (as amended). Reasonable measures should therefore be undertaken within areas of suitable habitat to avoid incidental mortality of reptiles during site clearance.
- 4.1.6. The presence of Common Lizard has been confirmed within the site, although suitable habitat for reptiles is limited to small, isolated areas. As such, it is considered appropriate to undertake vegetation clearance in a

phased approach to avoid incidental mortality to reptiles during site clearance. This is only considered necessary in the area of rough grassland and tall herb vegetation surrounding the farm buildings, and in the extreme north-eastern corner and south-western corner of the site (shown at Figure 2927/EMP2), with the remainder of the site not considered to provide suitable opportunities for reptiles.

- 4.1.7. Prior to works commencing, a search of suitable habitat will be undertaken by an ecologist, concentrating on natural refugia, such as stones, boulders and logs, by hand or using hand tools where necessary.
- 4.1.8. Following this hand search, clearance of suitable vegetation will be undertaken in a phased manner under ecological supervision. Vegetation will first be cut back to approximately 15cm height, followed by a further hand search of the area and cutting back of vegetation to ground level. A destructive search will then be carried out to remove any features and strip back vegetation to expose the soil. This approach will create controlled and directed disturbance which causes reptiles to endeavour to escape, which are then captured by the supervising ecologist. Once the vegetation has been physically removed, no suitable reptile habitat would remain within the development area and development can safely commence.
- 4.1.9. Any reptiles found during the exercise will be caught and moved to suitable areas of retained habitat at the site margins.

5. HABITAT ENHANCEMENT AND CREATION (ADDRESSING CONDITIONS 14 AND 35)

5.1. Under the permitted development, new areas of wildlife habitat will be created, providing replacement habitat for that to be lost and enhancing opportunities for wildlife currently present within the site.

5.2. The focus of new habitat creation and management will be within the 'Ecology Areas' within the western part of the site and the northeast corner of the site (shown at Plan2927/EMP3). The remainder of the site will principally be developed as residential and industrial development with associated infrastructure. However, a small number of habitats of some value for wildlife will be provided within the development area, largely in the form of private gardens and amenity planting.

5.3. Details of habitat creation and faunal enhancements to be provided within the Ecology Area are given below and are shown on Plan 2927/EMP3.

5.4. Habitats within the 'Ecology Areas'

5.4.1. Habitats to be created within the Ecology Areas will include:

- Species-rich grassland;
- Scattered groups of trees and shrubs;
- Continuous shrub planting;
- Surface water attenuation ponds.

5.4.2. The creation of these habitats is detailed below.

Species-rich grassland

5.4.3. The majority of the dedicated Ecology Areas will be established as a mosaic of species-rich grassland with scattered tree and shrub groups. This grassland will provide suitable shelter and foraging habitat for a range of wildlife including common reptile species, birds and mammals. The grassland will also be suitable for a range of invertebrate species, providing rich nectar and pollen sources, food for phytophagous (plant-eating) invertebrates, and shelter within plant stems and grass tussocks. In turn, these invertebrate populations will form a food source for a variety of wildlife species, including birds, amphibians, reptiles and small mammals.

5.4.4. Areas intended for wildflower grassland will be treated with a non-selective, non-persistent herbicide (such as Glyphosate) to reduce any colonising plants. Any surface vegetation will then be dug in using a rotovator, followed by harrowing or raking to produce a medium tilth, and rolling or treading to produce a firm surface. These areas will then be seeded with an appropriate wildflower grassland mix, such as Emorsgate EM2 (specification provided at Appendix 1). The seed must be surface sown and can be applied by machine or broadcast by hand at the rate specified by the supplier. 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.

Scattered tree and shrub planting

- 5.4.5. Tree and scrub species will be planted in small groups within the grassland in the western Ecology Area. Scattered individual trees and shrubs will also be planted throughout secondary habitat areas.
- 5.4.6. Scattered tree and shrub planting will add to the diversity of habitats within the western Ecology Area. Tree and shrub species will provide food sources for invertebrates in the form of nectar, sap runs and dead wood, and will provide shelter and hibernation sites under leaf litter and bark. Bird species will benefit from the provision of nesting sites, in addition to food sources formed by berries and other fruits. In the long-term, bats can be predicted to benefit from the provision of roost sites in trees.
- 5.4.7. The planting of scattered trees and scrub should be carried out between November and March, during periods when the ground is not frozen or waterlogged. Topsoil will be added to the immediate area of the planting as required, up to a depth of 50cm. Recommended species to be planted are listed at Appendix 2 and, where possible, should be of local provenance, sourced from local stock from an approved wildlife plant supplier.
- 5.4.8. Tree guards or shelters will be used to protect new tree and shrub planting from potential grazing damage (e.g. Rabbits) and weed control and watering will be undertaken during the initial management phase (as detailed in the Management Activities section) to ensure rapid establishment.

Continuous shrub planting

- 5.4.9. Continuous shrub planting will take place along the western boundary and part of the northern boundary of the development area. This will provide a continuous band of dense vegetation, providing potential cover and refuge opportunities for breeding birds, amphibians and small mammals, with marginal areas forming ideal basking sites for reptiles, as well as providing sheltered sunny spots for invertebrates. The species mix will be the same as that used for scattered shrub planting described above, which is provided at Appendix 2.
- 5.4.10. Future management will be designed to preserve this boundary feature, whilst preventing scrub encroachment into intended areas of open habitat.

Surface water attenuation ponds

- 5.4.11. Under the development proposals, two surface water attenuation ponds will be created, one within the western Ecology Area, and the other in the southwest corner of the development site (in a 'Secondary Habitat Area'). These will be designed to support emergent and submerged aquatic vegetation along the shorelines, by ensuring the margins are of a low gradient. The ponds will be permanent, taking surface water runoff from the development area. An indicative specification for pond creation is provided at Appendix 3, including suggested species.

Interpretation board

- 5.4.12. An interpretation board will be provided at the edge of the ecology area to inform members of the public the importance and value of the Ecology Area. The design of this interpretation board is provided at Appendix 7.

5.5. Habitats within the ‘Secondary Habitat Areas’

- 5.5.1. The remainder of the site will be developed for residential and industrial usage, with areas of open amenity space. Although not its primary purpose, this area will provide some opportunities for wildlife, within planted hedgerows, scattered trees and shrubs and amenity grassland. Further details are shown at Figure 2927/EMP3. In addition, private gardens will provide some wildlife opportunities, but are beyond the scope of this document.

5.6. Faunal Enhancements

- 5.6.1. The habitat creation specified above will provide notable new opportunities for a range of faunal species. In addition, a number of specific enhancements will be provided within the Ecology Area with respect to bats, nesting birds, Barn Owl and reptiles.

Roosting bats and nesting birds

- 5.6.2. As recommended in the Ecology/Biodiversity chapter of the Environmental Statement, bat and bird boxes will be provided on retained mature trees. This would be most appropriate along the north and east site boundaries, where a number of mature trees are present and will be reinforced by further shrub planting under the proposals. Proposed location of bat and bird boxes are shown at Figure 2927/EMP4, while recommended specifications of boxes are provided at Appendices 4 and 5.

Barn Owl

- 5.6.3. In order to deliver enhancements for Barn Owl, a number of Barn Owl boxes will be erected within the site (as shown at Figure 2927/EMP4), within the dedicated ecology area. Originally it was intended that a ‘Barn Owl tower’ would be erected in this location, however, as the ecology area has now been established, this is not possible without damaging notable extents of wildflower grassland habitat (and potentially risking injury to reptiles utilising this habitat). As such, it is necessary to explore alternative options for Barn Owl nesting provision.
- 5.6.4. The Barn Owl Conservation Trust provides three options for providing nest boxes for Barn Owls, with these being (in order of preference);
- Inside a building (typically an existing barn or similarly large building, as well as custom built towers);
 - In a tree; or
 - On a pole.

- 5.6.5. The above order of preference is primarily based on a combination of the ease of provision, cost and the durability of the nest box. The uptake of boxes by Barn Owl does not appear to alter on the construction type.
- 5.6.6. Given that other suitable options are available, it is considered that the provision of one or multiple Barn Owl boxes within mature trees at the periphery of the site would be a suitable alternative option to the provision of a tower. Indeed, given that Barn Owl home ranges overlap (i.e. they do not defend 'territories' but, instead, where sufficient habitat and hunting opportunities are available, multiple birds can co-exist in the same area) two boxes could be provided at the site boundaries, thereby doubling the nesting opportunities that would otherwise be afforded to this species by a single stone-built tower.
- 5.6.7. It is acknowledged that such boxes are unlikely to have the longevity of a dedicated tower, and so the developer will provide a dedicated sum for the monitoring and replacement of the Barn Owl box(es), with this allowance covering the replacement of the box(es) once every ten years for an 80-year period.
- 5.6.8. It is considered that the provision of two nest boxes, and a commitment to maintain and replace these boxes for at least an 80-year period, will act as a suitable alternative to a dedicated stone tower, and provide a notable enhancement for Barn Owl in the local area.
- 5.6.9. In addition, enhancements to Barn Owl foraging habitat will be provided by the habitat creation measures described above, in particular the areas of species-rich grassland.

Reptiles

- 5.6.10. It is also proposed that at least two reptile hibernacula are created within the species-rich grassland in the western Ecology Area, using inert rubble and brash arising from tree and scrub clearance. These will provide hibernation, shelter and basking habitat for reptiles. The proposed location of hibernacula are shown at Figure 2927/EMP4, whilst a specification is provided at Appendix 6.

6. MANAGEMENT ACTIVITIES (ADDRESSING CONDITION 14)

6.1. Following the completion of development works at the site, including the creation and enhancement of habitats as set out above, areas of wildlife habitat will be subject to ongoing management and maintenance operations to ensure that habitats continue to develop so as to maintain the ecological value of the site in the long term.

6.2. Management and maintenance operations are outlined for each habitat type below, with a schedule of activities provided at Appendix 8. Management areas are shown at Figure 2927/EMP5.

6.3. Species-rich Grassland

6.3.1. The majority of the Ecology Area will be managed as wildflower grassland.

Initial Management

6.3.2. Intensive management/aftercare of the newly seeded grassland areas will take place during the first 6-12 months to ensure the establishment of a healthy sward. This may include cutting the grassland areas on a bi-monthly basis, as appropriate, depending on establishment success, and weed control if required.

6.3.3. Any failed areas of grassland will be re-seeded/over-seeded as required using an appropriate wildflower mix comprising native species.

Ongoing Management

6.3.4. The areas of wildflower grassland will be maintained at a long sward, with mowing undertaken once or twice a year outside of the flowering season. Introduction of lower intensity mowing regimes along the margins with the scrub and around the trees will allow establishment of a longer grassland sward providing cover for wildlife and encouraging flowering of grasses and wildflowers.

6.3.5. Arisings from cutting of grassland areas will be removed to prevent the build-up of nutrients and smothering of new growth, promoting a species-rich sward. Small piles of grass cuttings (approximately 1m in diameter, and 0.5m in height) can be created using the arisings to form additional wildlife opportunities, although no more than 10 should be created annually.

6.3.6. The diversity of the sward will be monitored every 5 years, and overseeding will be undertaken with an appropriate seed mix if required.

6.3.7. No fertilisers or herbicides should be applied to the area, except to specifically spot treat unwanted species, or as necessary or for tree establishment (see below).

6.4. Trees and Shrubs (Scattered and Continuous)

6.4.1. Tree and shrub planting will be provided under the proposals. These habitats will be subject to management activities as detailed below.

Initial establishment

- 6.4.2. Newly planted trees and scrub will be subject to weed control to promote their growth. This will be achieved through the application of mulch in early summer (April), the use of mulch mats around the base, or use of herbicides in a 1m diameter around the base.
- 6.4.3. New tree and scrub growth will be monitored 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.

Ongoing Management

- 6.4.4. Trees and scrub will generally only be subject to 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 non-native species (e.g. Buddleia). Newly planted areas in particular will not be subject to any substantial works in the short-term to allow them to establish. Once established, tree shelters should be removed and stakes provided if required.
- 6.4.5. Arisings from any management works will be used to create further habitat piles, with excess material disposed of as appropriate through chipping or removal from site.

6.5. Ponds

- 6.5.1. Ponds will principally be managed for drainage, however management works will also seek to benefit opportunities for wildlife, through the removal of non-native invasive species when required, and cutting of marginal and emergent vegetation on rotation, to retain some habitat and cover for wildlife species. In addition, any submerged vegetation or silt that is dredged from the pond will be left overnight prior to removal, to allow pond animals to return to the pond.

6.6. Secondary Habitat Areas

- 6.6.1. Management of the secondary habitat areas will aim to maintain opportunities for wildlife as part of the overall maintenance of these areas as amenity and recreation spaces. Management activities will incorporate the following principles where appropriate:
- Use of fertiliser and pesticides to be avoided where possible, and targeted to specific areas if required, e.g. spot treatment of weeds with pesticides.
 - Introduction of lower intensity mowing regimes where appropriate, e.g. along margins of shrub planting. This will allow establishment of a longer grassland sward providing cover for wildlife and encouraging flowering of grasses and wildflowers.
 - Cutting of amenity planting to take place outside the flowering season to maximise the wildlife value of these habitats.
 - Maintain additional areas of wildlife habitat through the creation of habitat piles using leaf litter or grass cuttings.

6.7. General Management Procedures

- 6.7.1. Given the close proximity of the Ecology Areas to areas of built development, it may be necessary to remove any litter that has been left or blown into this area and as such, frequent and regular checks will be undertaken to remove litter. However the provision of areas of amenity grassland with trees and shrubs between residential development and the Ecology Areas (see Figure 2927/EMP3), will aid in minimising the spread of any potential littering and / or fly-tipping. The interpretation board will be repaired as and when necessary.

6.8. Management of Faunal Enhancements

- 6.8.1. The condition of faunal enhancement features will be monitored and repairs or replacement undertaken as necessary.

7. SUMMARY AND CONCLUSIONS

- 7.1.1. Aspect Ecology is acting on behalf of Barratt Homes Southern Counties in regard to ecological issues at the site Courtwick Lane, Littlehampton.
- 7.1.2. The site is in receipt of outline planning permission (ref: LU/355/10/) for mixed use development comprising up to 600 residential dwellings with industrial units, local facilities, structural planting and landscaping, green infrastructure, open space, children's play areas, allotments, surface water attenuation and new road access. In addition, specific areas dedicated to ecology will be created in the west and the northeast of the site. The planning permission is subject to a number of conditions. Of these, Conditions 14, 15 and 35 in particular relate to ecology, requiring the details of enhancement and mitigation measures and a management plan.
- 7.1.3. **Current Ecological Conditions.** The site currently supports a single large agricultural field with a complex of agricultural buildings surrounded by small areas of tall herb and rough grassland. The site supports roosting Barn Owl, nesting birds and low numbers of common reptiles.
- 7.1.4. **Construction Safeguards, Habitat Enhancement and Creation.** Under the proposals, some habitat areas supporting Barn Owl, nesting birds and common reptiles will be lost. New areas of wildlife habitat will therefore be created, principally in dedicated 'Ecology Areas' in the west and northeast of the site. This management plan provides details of habitat creation and enhancement measures to be provided together with safeguarding measures to be implemented during the construction phase. Habitat creation and enhancement measures within this 'Ecology Area' include the establishment of species-rich grassland, new scrub and tree planting and surface water attenuation ponds. Faunal enhancements include the creation of reptile hibernacula, erection of bat and bird boxes and the provision of barn owl boxes.
- 7.1.5. **Management Activities.** This report sets out measures for the long-term management of habitats to facilitate suitable management of the Ecology Area for the benefit of biodiversity in general and in particular for reptiles, nesting birds and Barn Owl.
- 7.1.6. **Conclusion.** It is considered that this report addresses the requirements of Conditions 14, 15 and 35 of the planning permission for the site, and subject to the implementation of the habitat creation, enhancement and management measures set out, will ensure that the value of the site for ecology is maintained. It is anticipated that in the long-term, following implementation of these measures and establishment of wildlife habitats, the proposals will provide significant enhancements for wildlife, including reptiles, Barn Owl and other nesting birds.

PLANS

PLAN 2927/EMP1

Site Location



KEY:



SITE LOCATION

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Horn Way - Banbury - Oxfordshire - OX15 2AF
01235 275585 - info@aspectecology.com - www.aspect-ecology.com

COURTWICK LANE,
LITTLEHAMPTON

SITE LOCATION

REF: 2011

TITLE

2927/EMP1

DATE: 10/12/11

REV:

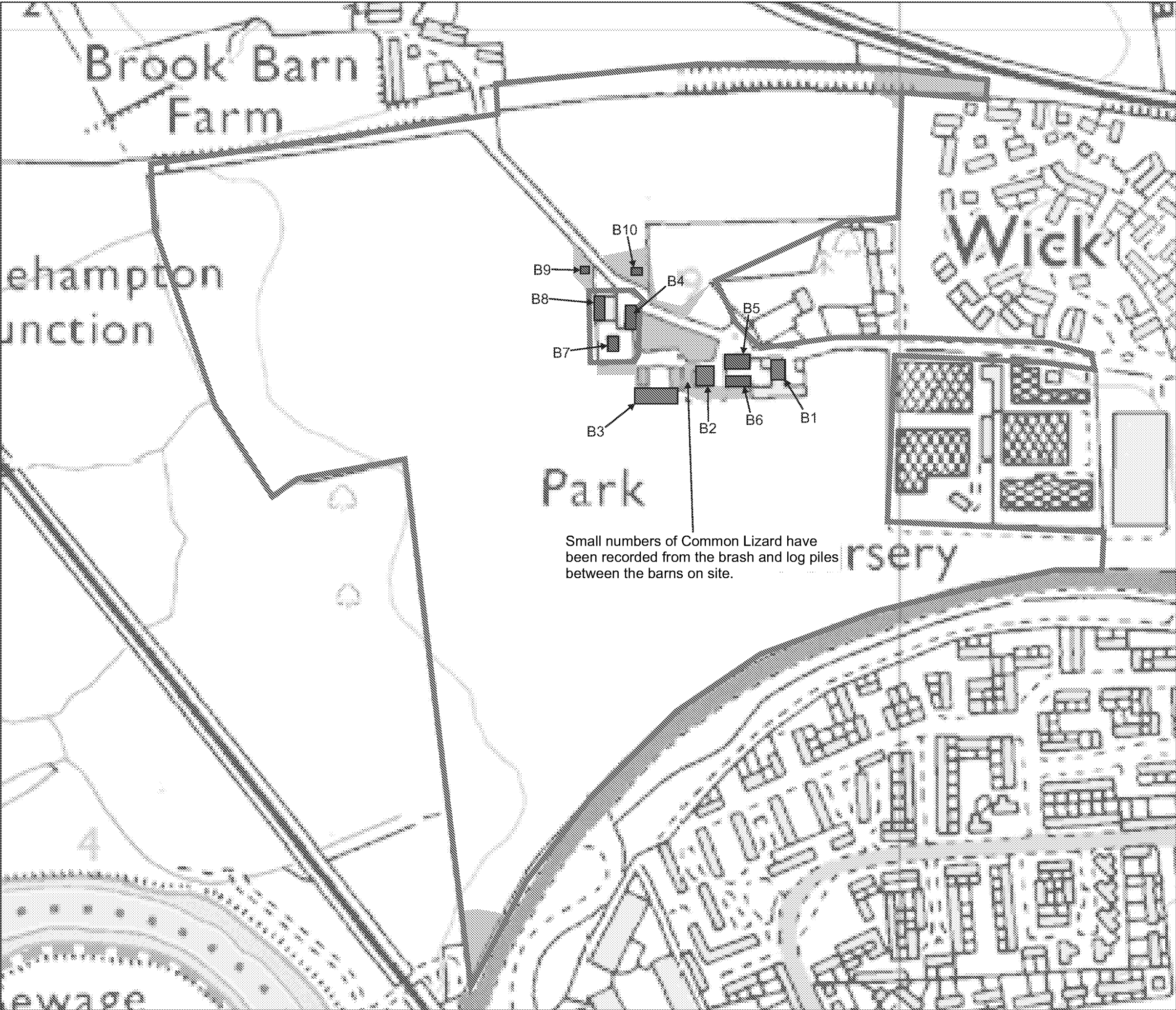
FEBRUARY 2013

DATE



PLAN 2927/EMP2

Summary Plan of Faunal Interest



- KEY:
- SITE BOUNDARY
 - BUILDING
 - BUILDING WITH EVIDENCE OF BARN OWL
 - SUITABLE REPTILE HABITAT

COURTWICK LANE,
LITTLEHAMPTON

SUMMARY PLAN OF
FAUNAL INTEREST

PROJECT

TITLE

2927/EMP2

DRAWING NO

REV.

LATE



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PLAN 2927/EMP3

Habitat Creation and Enhancement

Interpretation board

A board will be erected to inform members of the public as to the importance and value of the Ecology Area.

Species-rich grassland

This will be seeded with a native grass mix, to provide suitable habitat for common reptile species, foraging Barn Owl and a variety of other wildlife. Intensive management will ensure establishment.

Surface water attenuation ponds

These will be designed with low-gradient margins to support emergent and marginal vegetation along the shorelines. This will provide habitat for amphibians and foraging birds.

Scattered trees and shrubs

Small groups of trees and shrubs will be planted within the grassland to create a mosaic of habitats. This will provide habitat for nesting birds and reptile refuge areas.

Continuous shrub planting

This continuous band of dense vegetation along the western and part of the northern boundary will provide cover and refuge for breeding birds, with marginal areas ideal for reptiles.

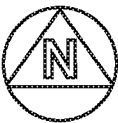
Secondary habitats

Areas of amenity grassland with hedgerows and scattered trees and shrubs will provide additional opportunities for wildlife, such as breeding birds.

- KEY:**
- SITE BOUNDARY
 - ECOLOGY AREAS
 - SECONDARY HABITAT AREAS
 - SPECIES-RICH GRASSLAND
 - SCATTERED TREE AND SHRUB PLANTING
 - CONTINUOUS SHRUB PLANTING
 - SURFACE WATER ATTENUATION POND (PERMANENT)
 - SURFACE WATER ATTENUATION POND (TEMPORARY)
 - AMENITY GRASSLAND
 - HEDGEROW
 - PRIVATE GARDEN
 - ★ INTERPRETATION BOARD

COURTWICK LANE,
LITTLEHAMPTON

HABITAT CREATION
AND ENHANCEMENT



2927/EMP3

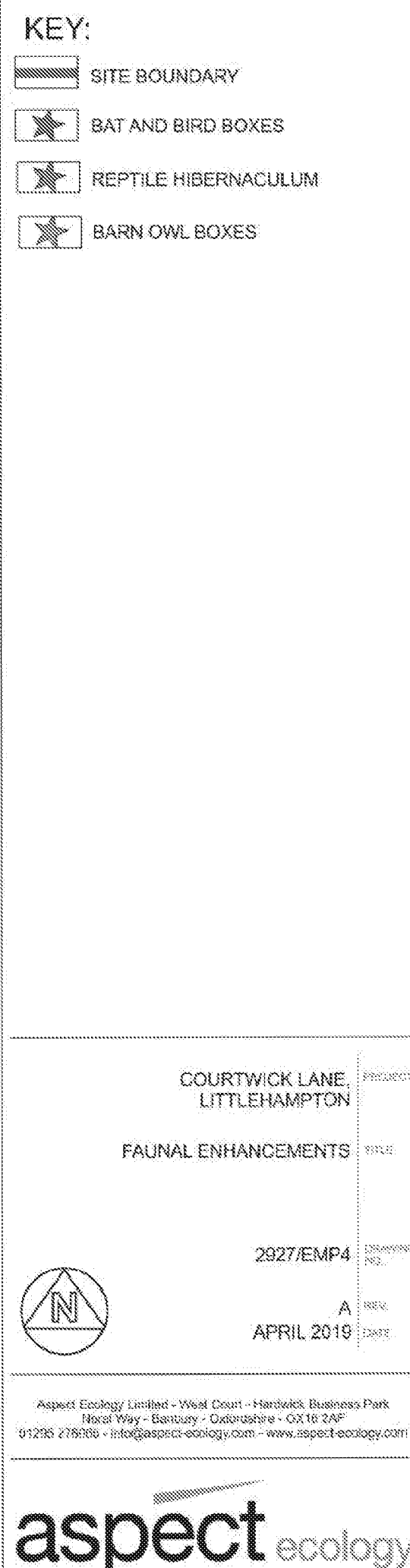
MARCH 2013

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PLAN 2927/EMP4

Faunal Enhancements


BARN OWL BOXES

PLAN 2927/EMP5

Habitat Management Areas

Ecology Area general management

General management will include the removal of litter and dumped waste from the Ecology Area and repairing of the interpretation board.

Faunal enhancements

Bird boxes will be cleared out annually outside the breeding period. All boxes and reptile hibernacula will be repaired or replaced where necessary.

Tree and shrub planting

New plantings will be monitored and subject to weed control, guard replacement and planting replacement when necessary. Long-term management may include thinning or pruning and removal of non-native species.

Species-rich grassland

Intensive management will occur over the first 6-12 months to ensure the establishment of a healthy sward. Ongoing management will include cutting once or twice a year and re-seeding if required.

Secondary habitats

Management of amenity areas will include the avoidance of fertiliser and pesticides where possible, lower intensity mowing regimes where appropriate and creation of habitat piles from leaf litter and grass cuttings.

KEY:

-  SITE BOUNDARY
-  ECOLOGY AREAS
-  SECONDARY HABITAT AREAS
-  SPECIES-RICH GRASSLAND
-  SCATTERED TREE AND SHRUB PLANTING
-  CONTINUOUS SHRUB PLANTING
-  SURFACE WATER ATTENUATION POND (PERMANENT)
-  SURFACE WATER ATTENUATION POND (TEMPORARY)
-  AMENITY GRASSLAND
-  HEDGEROW
-  PRIVATE GARDEN
-  BAT AND BIRD BOXES
-  REPTILE HIBERNACULUM
-  BARN OWL BOXES
-  INTERPRETATION BOARD

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HABITAT MANAGEMENT AREAS



2927/EMP5

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APPENDICES

APPENDIX 1

Emorsgate EM2 Seed Mix Specification

EMORSGATE SEED MIX SPECIFICATION:

EM2 – STANDARD GENERAL PURPOSE MEADOW MIXTURE

Composition

This meadow mixture contains species that are characteristic of traditional meadows across a wide range of soil types.

Wild Flowers

%	Latin name	Common name
0.5	<i>Achillea millefolium</i>	Yarrow
0.3	<i>Centaurea nigra</i>	Common Knapweed
1	<i>Daucus carota</i>	Wild Carrot
2.5	<i>Gallium verum</i>	Lady's Bedstraw
1	<i>Knautia arvensis</i>	Field Scabious
2	<i>Leucanthemum vulgare</i>	Oxeye Daisy
0.3	<i>Lotus corniculatus</i>	Birdsfoot Trefoil
1	<i>Plantago lanceolata</i>	Ribwort Plantain
1.6	<i>Primula veris</i>	Cowslip
2.5	<i>Prunella vulgaris</i>	Selfheal
3	<i>Ranunculus acris</i>	Meadow Buttercup
2	<i>Ranunculus bulbosus</i>	Bulbous Buttercup
1.5	<i>Rhinanthus minor</i>	Yellow Rattle
0.3	<i>Rumex acetosa</i>	Common Sorrel
26		

Grasses

%	Latin name	Common name
8	<i>Agrostis capillaris</i>	Common Bent
40	<i>Cynosurus cristatus</i>	Crested Dogstail
28	<i>Festuca rubra</i>	Slender-creeping Red-fescue
4	<i>Phleum bertolonii</i>	Smaller Cat's-tail
60		

Total Species Count: 24

Sowing Rates

kg/ha	kg/acre	g/m ²
40	16	4

Available from: <http://wildseed.co.uk>

APPENDIX 2

Shrub Species Mix

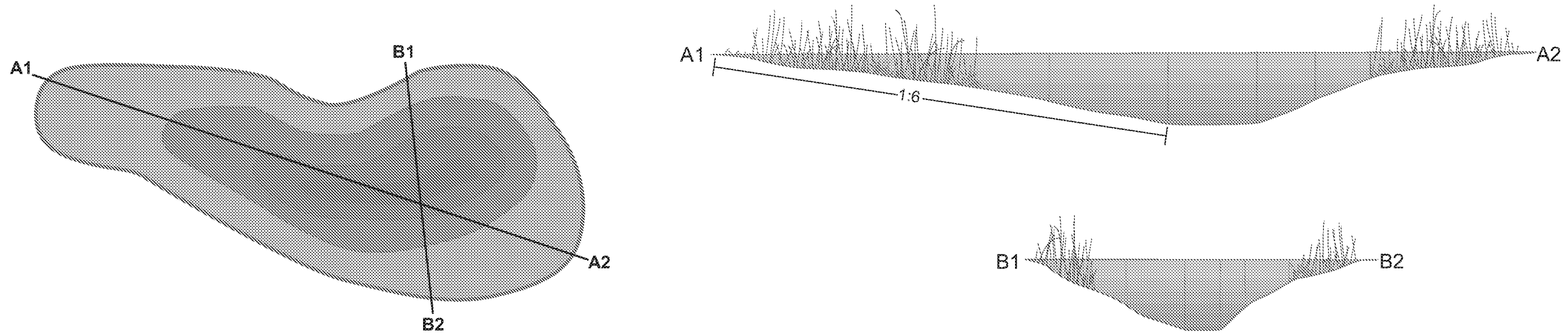
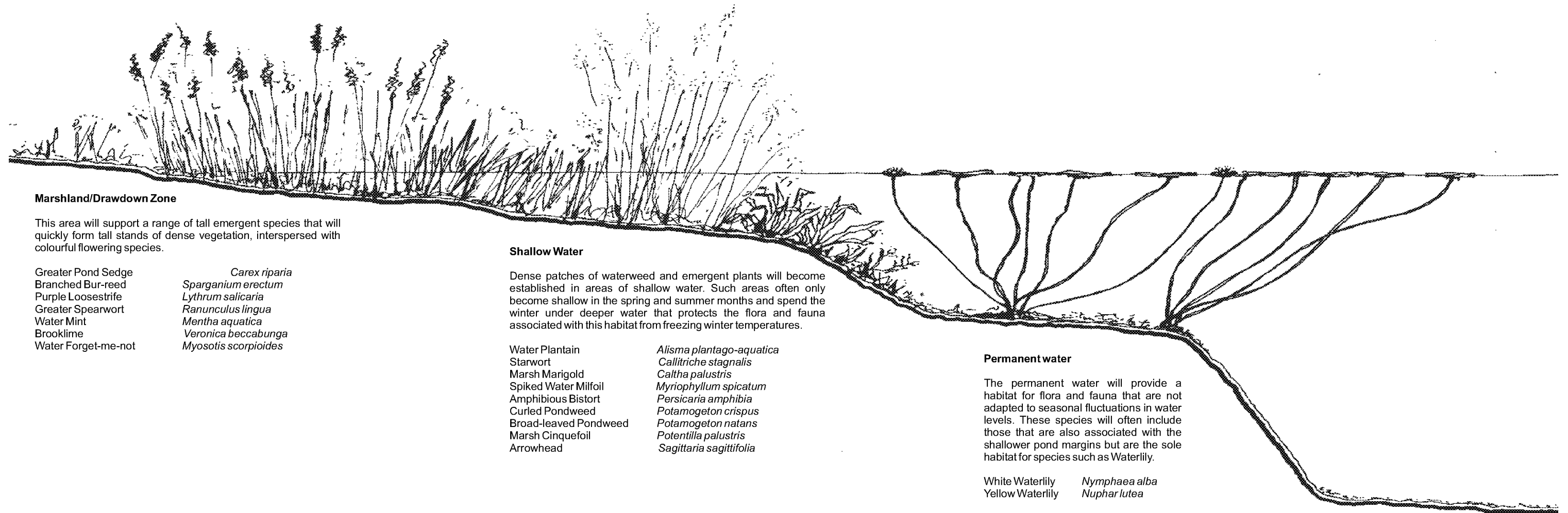
GENERAL PURPOSE NATIVE SHRUB MIX

Shrubs	
Field Maple	<i>Acer campestre</i>
Dogwood	<i>Cornus sanguinea</i>
Hazel	<i>Corylus avellana</i>
Hawthorn	<i>Crataegus monogyna</i>
Spindle	<i>Euonymus europeas</i>
Holly	<i>Ilex aquifolium</i>
Wild Privet	<i>Ligustrum vulgare</i>
Crab apple	<i>Malus sylvestris</i>
Blackthorn	<i>Prunus spinosa</i>
Elder	<i>Sambucus nigra</i>
Gorse	<i>Ulex europaeus</i>
Wayfaring-tree	<i>Viburnum lantana</i>
Guelder Rose	<i>Viburnum opulus</i>
Climbers	
Ivy	<i>Hedera helix</i>
Honeysuckle	<i>Lonicera periclymenum</i>
Field rose	<i>Rosa arvensis</i>
Dog rose	<i>Rosa canina</i>

NB. Use native varieties, not cultivars

APPENDIX 3

Pond Specification



APPENDIX 4

Example Specification for Bat Boxes

Bat Boxes

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

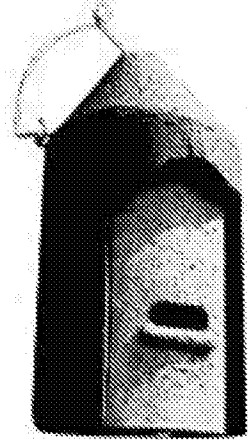
The 75% wood sawdust, clay and concrete mixture is ideal, being durable whilst allowing natural respiration and temperature stability. These boxes are rot and predator proof and extremely long lasting.

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

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.



2FN Bat Box

A large bat box featuring a wide access slit at the base as well as an access hole on the underside. Particularly successful in attracting Noctule and Bechstein's bats.

Woodcrete construction, 16cm diameter, height 36cm.

1FF Bat Box

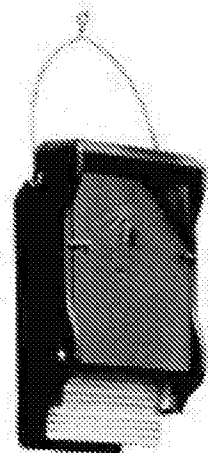
The rectangular shape makes the 1FF suitable for attaching to the sides of buildings or in sites such as bridges, though it may also be used on trees. It has a narrow crevice-like internal space to attract Pipistrelle and Noctule bats.

Woodcrete (75% wood sawdust, concrete and clay mixture)

Width: 27cm

Height: 43cm

Weight: 7.3kg



APPENDIX 5

Example Specification for Bird Boxes

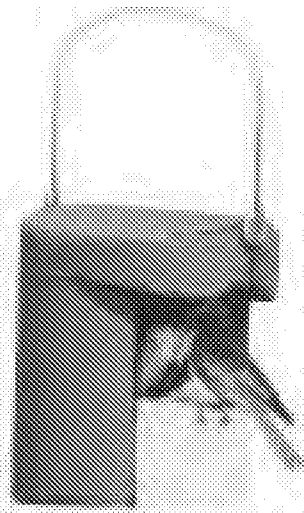
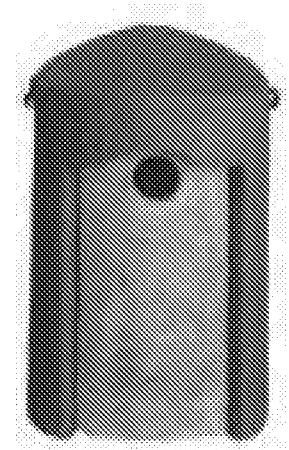
Bird Boxes

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.*



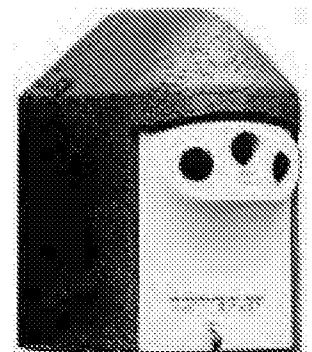
2H Open Fronted Nest Box

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.*



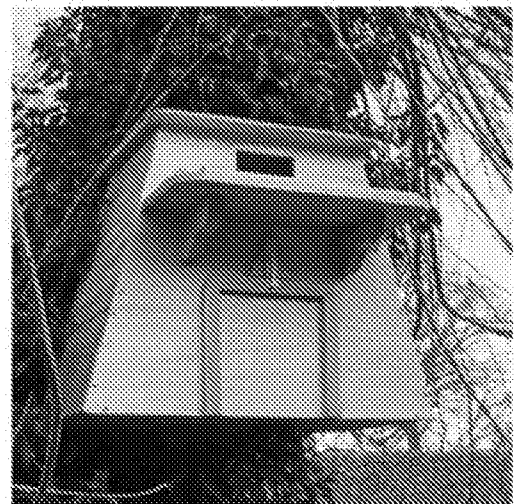
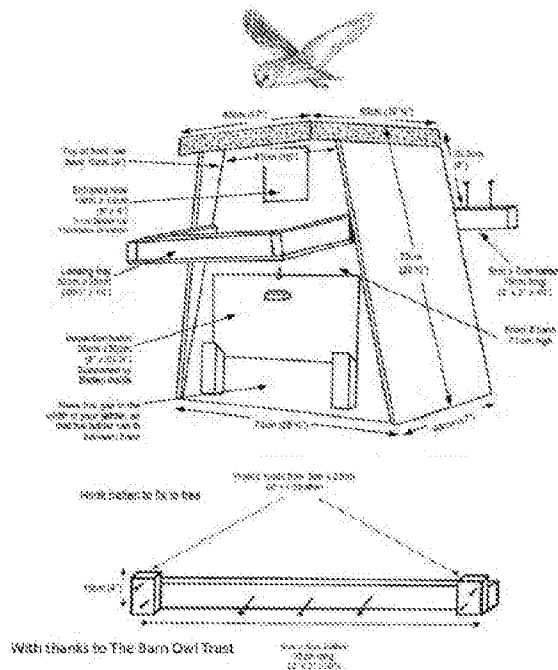
Bird Boxes

Barn Owl Box

The box must face open ground so that the entrance hole is obvious to a passing owl. Do not hide it behind the tree - if the hole cannot be seen the box is unlikely to be used. Try to avoid facing the entrance into the prevailing wind and rain. Generally this means avoiding the west or south-west. South-east is generally a good direction.

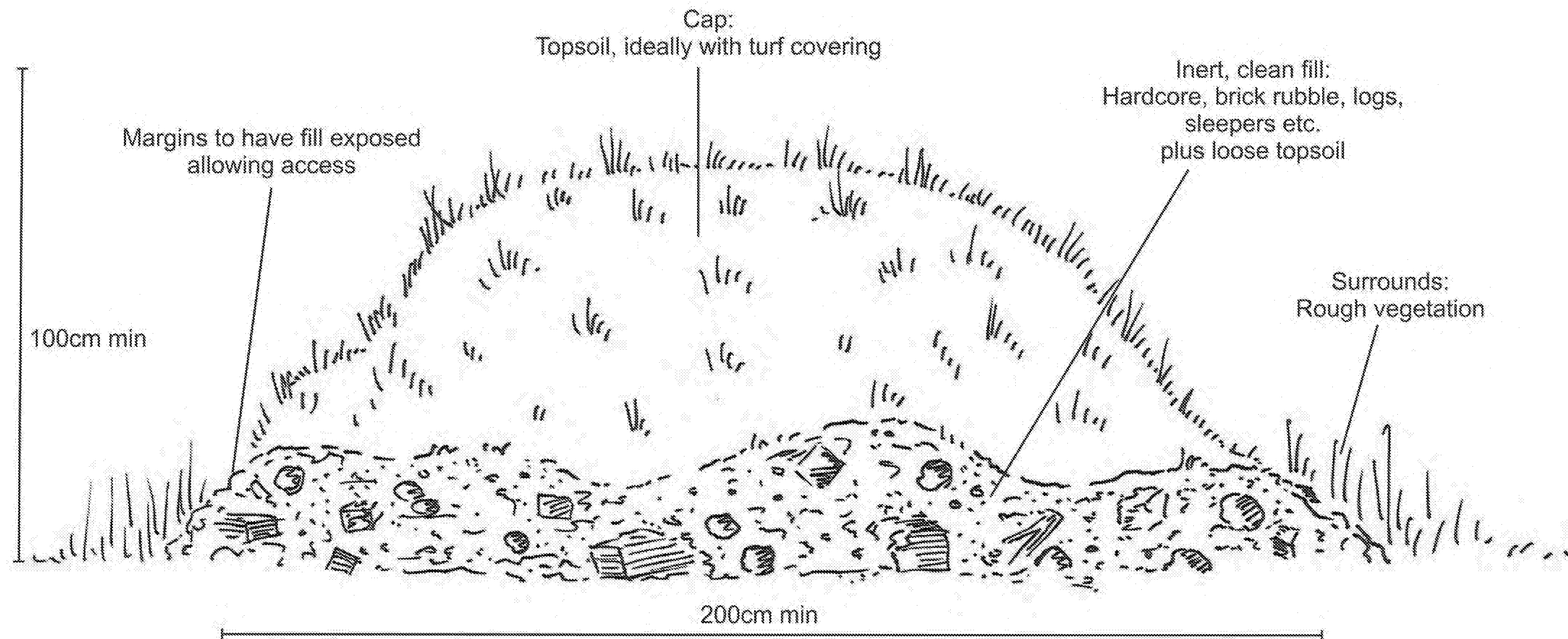
The nest box should be placed as high as possible to minimise human interference (ideally a height in the region of 4.5-m). It is a good idea to ensure that, when erected, the box is slightly lower at the front. This will help prevent rain water splashing in through the entrance hole.

Tanalised 50mm x 50mm (2"x 2") timber and galvanised nails can be used to secure the box. Alternatively you can drill holes and use nylon bolts, or use ratchet straps. A piece of tanalised timber 50mm x 50mm x 750mm (2" x 2" x 30") should be attached to the trunk of the tree, making sure that it is level and VERY secure. This should have 'hooks' made out of 25mm x 50mm (1"x 2") tanalised timber attached to each end. These should be approximately 75mm (3") long and the top 25mm (1") will protrude above the top of the ends of the 50mm x 50mm timber (see diagram). The purpose of this is to enable the box to be placed so that it is held in place by the hooks, allowing the person erecting the box to have both hands free whilst attaching it. A second piece of 50mm x 50mm tanalised timber should be attached firmly to the back of the box approximately 200mm (8") from the top (see diagram). Screw from the inside of the box through to the timber. This joint will take all the weight of the box so it needs to be very secure. The piece that is attached to the box will rest on the piece that is attached to the tree. Holes should be drilled to enable the two pieces to be nailed or screwed together when the box is in position.



APPENDIX 6

Example Specification for Reptile Hibernaculum



The design mimics artificial and natural conditions in which reptiles have frequently been found over-wintering. Dimensions should not be below 2m length x 1m height. The illustration design would be suitable for locating on an impermeable substrate. On free-draining substrates, the design is largely similar but the bulk of the fill is sited in an excavated depression in the ground.

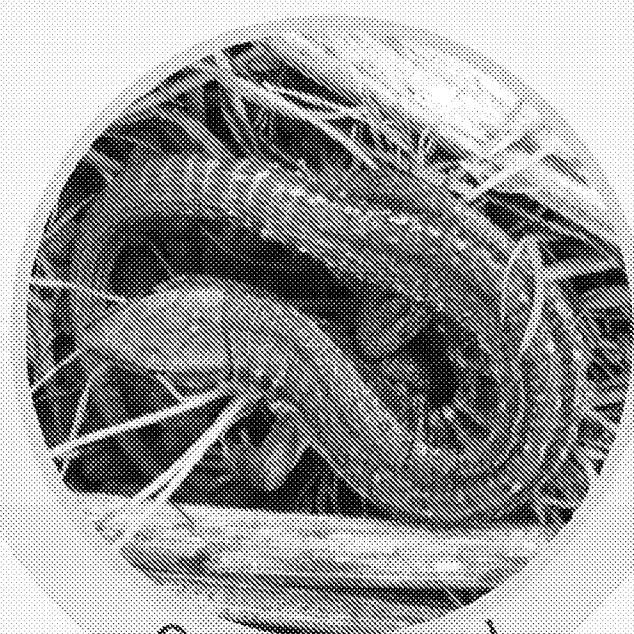
APPENDIX 7

Ecology Area Interpretation Board

Welcome to Courtwick Lane

Ecology Area

This area of Courtwick Lane has been specially designed with wildlife in mind, to ensure that insects, mammals, amphibians and birds can all live alongside people. You might think that the grass looks a bit long and untidy, but this is perfect for wildlife! Have a closer look in the early summer and you will see a variety of wildflowers that provide food and shelter for many animals. It is also worth coming out in the evening to try and catch a glimpse of one of the resident Barn Owls hunting for food.



Common Lizard



Common Frog



Meadow Brown Butterfly



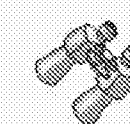
Common Blue Butterfly



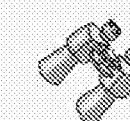
Great Tit



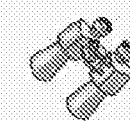
Smooth Newt



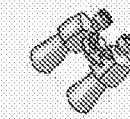
The stillness of the pond masks the presence of amphibians such as frogs, toads and newts.



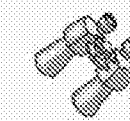
Beneath deadwood, beetles make their homes.



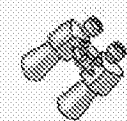
As twilight falls bats fly and forage along the tree lines.



Barn Owls nest in boxes on the surrounding trees. Keep a look out for these birds at dusk when they fly above the long grass looking for prey.



There are many insects to look out for such as butterflies, and around the pond keep an eye out for dragonflies.



Reptiles move amongst the long grass during the height of summer, and bask on the bare ground and rocks at noon on cooler days.



Barn Owl

- Wildflower Grassland
- Scrub
- Tree
- Pond
- Dry Pond
- Dry Ditch
- Footpath
- Road



YOU ARE HERE

APPENDIX 8

Schedule of Management Activities

Schedule of Management Activities

Habitat / feature	Activity	Month												Notes
		J	F	M	A	M	J	J	A	S	O	N	D	
<i>Species-rich grassland</i>	Regular cutting of newly seeded grassland areas.													As required up to 2 times a month for first 6-12 months.
	Reseed or overseed any substantial failed areas of grassland using an appropriate native wildflower mix.													
	Control of invasive weeds using spot treatment of herbicides or cutting.													As required.
	Cutting, 1-2 times a year.													Cut to 7cm height. Remove arisings from site or create grass habitat piles.
<i>Trees and shrubs (scattered/continuous)</i>	Weed control using mulch applications, mulch mats, handweeding or herbicide application.													Mulch application (if used) to be applied in early summer (April).
	Undertake watering of new areas of tree planting as required during dry periods.													
	Replace tree shelters as required.													
	Replace any failed planting.													-
	Undertake cutting back of scrub on a 5-8 year rotation to maintain low, dense, bushy growth.													Cut approx. 15% of scattered trees and scrub annually. Arisings used to create habitat piles or removed from site.
	Control of non-native species (e.g. Buddleia).													As required, arisings removed from site.
<i>Ponds</i>	Control or removal of any invasive/alien plant species.													As required.
<i>Faunal enhancements</i>	Repair or replacements of bat boxes, bird boxes, Barn Owl tower and reptile hibernacula.													As required. Monitor throughout year.
	Create new habitat piles using arisings from other management activities.													-
<i>General management</i>	Litter inspections and remove and suitably dispose of any litter/arisings.													Throughout year.
	Repair or replace interpretation board													As required.

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