

**HEYFORD PARK, BICESTER,
Parcels 5C, 8A and Trenchard**

LANDSCAPE AND ECOLOGICAL MANAGEMENT PLAN

Phases 5D, 8C and Trenchard Circle, Heyford Park
Landscape Ecological Management Plan
(LEMP) : by 4 Acre ecology limited

January 2022

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Trenchard Circle,
Heyford Park
Landscape Ecological Management
Plan (LEMP)**

On Behalf of:
The Dorchester Group

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4 Acre Ecology Limited

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1. Background to the Project

Context and Purpose

- 1.1 4 Acre Ecology Limited have been commissioned by the client (The Dorchester Group) to produce a Landscape Ecological Management Plan (LEMP) for the Phases 5D, 8C and Trenchard Circle residential development at Heyford Park.
- 1.2 The purpose of the LEMP is to ensure that any ecological impacts are adequately mitigated and compensated for.
- 1.3 The report will describe measures to avoid, reduce, mitigate and compensate for likely adverse effects on ecological structures from the construction of the residential development.
- 1.4 Ecological structures incorporate sites, habitats, and floral and faunal species, which are the subject of international or national protection or are recognised as being of local rarity and sensitivity.
- 1.5 The LEMP will address the potential impacts of the proposed residential development on the existing ecology and nature conservation at the site and within the immediate surrounding land. Recommendations will be made with regard to avoidance, mitigation and compensation.
- 1.6 The aims of the LEMP are to:
 - Set out best practice working methodologies and mitigation measures in order to protect existing ecological valuable habitat plus any protected or notable species that may occur at the site, or within the immediate surrounding landscape.
 - Provide enhancement measures to increase the biodiversity value of the site.
 - Provide management and monitoring plans in order to maintain the ecological value of the site following the development.

Scheme Overview

- 1.7 The proposed Phases 5D, 8C and Trenchard Circle development at Heyford Park are part of the development to create housing, employment, education, retail and community use with associated landscaping.

2. Legislation and Planning Policy

2.1 There are a number of tiers of legislation protecting wildlife in England and Wales. The highest tier is for those species protected by European Legislation, such as the Dormouse, Great Crested Newt, Otter and all species of bat. These are known as European Protected Species (EPS), which gain their protection from the Conservation of Habitats and Species Regulations (Habitat Regulations) 2017, whereby under section 43 it is an offence to;

- deliberately capture, injure or kill an EPS
- deliberately disturb or take/destroy the eggs of an EPS
- damage or destroy a breeding site or resting place of an EPS

2.2 Nationally protected species are either fully protected (e.g. Water Vole) or partially protected (e.g. Adder or Smooth Newt) under the Wildlife and Countryside Act (WCA) 1981 and amendments, including the Countryside and Rights of Way Act (CRoW) 2000. Under the WCA it is an offence to:

- intentionally kill, injure or take any wild bird, take or destroy any wild bird egg or take, damage or destroy any nest while it is in use or being built
- intentionally or recklessly disturb any wild bird included in Schedule 1 while it is building a nest or is in, on or near a nest containing eggs or young; or disturb dependent young of such a bird
- intentionally or recklessly at any other time take, damage, destroy or otherwise interfere with any nest habitually used by any wild bird included in Schedule A1
- intentionally or recklessly kill, injure or take from the wild or possess all or any part of a Schedule 5 species
- intentionally or recklessly damage or destroy any structure or place which a schedule 5 species uses for shelter or protection, or disturb a schedule 5 species while it is occupying such a place
- obstruct access to any structure or place which a schedule 5 species uses for shelter or protection
- intentionally pick, uproot or destroy any wild plant included in Schedule 8

2.3 The CRoW Act 2000 added the term recklessly after intentionally in the Wildlife and Countryside Act 1981 and introduced a maximum custodial sentence of 6 months for offences.

- 2.4 The Natural Environment and Rural Communities Act 2006 (NERC) made provision about bodies concerned with the natural environment and rural communities and in connection with wildlife, sites of special scientific interest, National Parks and the Broads. Section 41 established a list of the living organisms and types of habitat which in the Secretary of State's opinion are of principal importance for the purpose of conserving biodiversity. This is known as the UK Biodiversity Action Plan (BAP) list.
- 2.5 Under the Protection of Badgers Act 1992 it is an offence to wilfully kill, injure or take a Badger and damage, destroy or obstruct a badger sett, cause a dog to enter a Badger sett or disturb a badger while it is occupying a sett.
- 2.6 The National Planning Policy Framework (NPPF) updated in 2021 states that Planning policies and decisions should contribute to and enhance the natural and local environment by:
- a) protecting and enhancing valued landscapes, sites of biodiversity or geological value and soils (in a manner commensurate with their statutory status or identified quality in the development plan);
 - b) recognising the intrinsic character and beauty of the countryside, and the wider benefits from natural capital and ecosystem services – including the economic and other benefits of the best and most versatile agricultural land, and of trees and woodland;
 - c) maintaining the character of the undeveloped coast, while improving public access to it where appropriate;
 - d) minimising impacts on and providing net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures;
 - e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans; and
 - f) remediating and mitigating despoiled, degraded, derelict, contaminated and unstable land, where appropriate.

2.7 To protect and enhance biodiversity and geodiversity, plans should:

- a) Identify, map and safeguard components of local wildlife-rich habitats and wider ecological networks, including the hierarchy of international, national and locally designated sites of importance for biodiversity; wildlife corridors and stepping stones that connect them; and areas identified by national and local partnerships for habitat management, enhancement, restoration or creation; and
- b) promote the conservation, restoration and enhancement of priority habitats, ecological networks and the protection and recovery of priority species; and identify and pursue opportunities for securing measurable net gains for biodiversity.

3. Baseline Information

3.1 The baseline information is used to provide the baseline conditions for the ecology of the site and an assessment of the impacts resulting from the proposed development.

3.2 The tables below identify the ecological sensitive areas associated with the proposed development. Further details are provided within the following reports:

- Trenchard Circle, Extended Phase I Habitat Survey. March 2016
- Trenchard Circle, Bat Emergence Surveys. September 2016
- Phase 8 Development, Heyford Park: Extended Phase I Habitat & Preliminary Bat Survey. January 2018
- Phases 5D, 8C and Trenchard Circle, Heyford Park: Extended Phase I Habitat Survey Update. February 2019

Table 1: Designations

Designation Level	Description
International	There are no International sites of importance within 5km of the site.
National	<p>Ardley Cutting and Quarry SSSI lies 1.9km to the north-east and is a section of disused railway line composed of calcareous grassland, ancient woodland and wetland. Arable land and existing development lie between the SSSI and the development site. The development site lies outside the zone of influence for this SSSI. Therefore, the proposed development is unlikely to have any impact on the SSSI site.</p> <p>Ardley Trackways SSSI lies 2.1km to the east and is a geological designated site within which are found fossilised sauropod dinosaur footprints. Arable land and existing development lies between the SSSI and the development site. The development site lies just inside the zone of influence for this SSSI. The zone relates to the construction of airports or helipads etc. proposals and from potential air pollution from pig/poultry units and slurry lagoons. Therefore, the proposed residential development is unlikely to impact on the SSSI.</p>
Local	<p>Rush Spinney Local Wildlife Site (LWS) lies 1.8km to the west and is comprised of a small area of marsh within improved pasture. The site is not accessible by car with no parking facilities. Therefore, it is considered that the site will not be impacted by the proposed residential development.</p> <p>Upper Heyford Airfield LWS is located 700m to the north-north-east and is a lowland calcareous grassland site, which is also utilised by a number of priority bird species including: Skylark, Curlew, Grey Partridge, Corn Bunting and Tree Sparrow. The site is on private land with access via a security-controlled entrance. Therefore, it is considered that the proposed residential development will not significantly increase recreational pressure on the site.</p>

Table 2: Main habitats/vegetation types identified within/adjacent to the sites

Phase 5D	
Flora/Habitats	Description
Hard-surfacing	Hard-standing occupies around 65% of the site, consisting mainly of a tarmac former car park for the shop, currently used as site parking and storage, with some paving. This is in relatively good condition with now vegetation present.
Bare Ground	The former petrol station has been removed and the land around the tanks remediated, leaving a large hole of bare soil that covers the south-eastern third of the site. There is no vegetation present.
Hedgerows	There is a short length of Cherry Laurel hedge on the western side of the site that bends around the south-western corner, where it is raised around 0.5m above the adjacent path (See Figure 2). This hedge is 1m high and 1m wide with some gaps within it. There is a section of clematis, but the hedge is dominated by Laurel.
Trees	There are two semi-mature Whitebeam in the south-western corner of the site, next to the hedge.

Phase 8C	
Standard Trees	There is a line of avenue trees along the eastern boundary of this site, consisting of Sycamore and Beech, one of which contains a bat hibernation box. Towards the south-eastern corner there is one semi-mature conifer. Beneath these trees is the amenity grassland.
Amenity Grassland	This forms around 30% of the site, consisting of tightly mown and well-maintained lawns beneath the avenue trees, with the more open area having been scraped off to form bare ground. Perennial Rye Grass is abundant throughout, with frequent Red Fescue, Yellow Oat Grass and Creeping Buttercup, occasional White Clover and Ribwort Plantain, plus rare occurrences of Self-heal, Tormentil, Cat's Ear and Bird's foot Trefoil.
Bare Ground	This forms the central south-western area of the site, covering around 30% of the area and is where the vegetation has been scraped from the open amenity area, now used as storage. There is no vegetation in the central area, but this feathers into the surrounding amenity grassland.
Hard Standing	This covers 40% of the area, with the majority being the tarmac former car park, now used to store materials on. In addition, there are paths along the eastern and south-western sides and a small path cutting across the southern corner.

Trenchard Circle	
Hard Standing	This covers around 7% of the site, consisting of the tarmac road and some of the drives from this that accessed the former bungalows on the site. This is in good condition with no vegetation.
Pioneer Vegetation	The site has been cleared of buildings (apart from the shell of a wooden shed on the southern boundary, covered in Ivy) and has had a top soil strip with around 300-500mm removed. This was carried out in 2016, but then development work was halted. There is a mound of top soil towards the southern end of the site.

	The mound is dominated by a Goosefoot species, with this and the remaining stripped area now partially covered by occasional Wall Flower, Ribwort Plantain, Cat's Ear and Daisy, with rarely Teasel, Broad-leaved Dock, Bristly Oxtongue, Yorkshire Fog, Cocksfoot, Red Fescue, Rosebay Willowherb, Chick Grass and Campion.
Ephemeral Water	In the north-eastern corner of the site the clay sub-soil has led to a small area of bunded water where the fence line on top of the adjacent ditch is higher than the subsoil level. The water level in this varied from 75mm to 150mm with mainly terrestrial vegetation in it, indicating it probably dries annually, but with some aquatic vegetation.
Buildings	<p>The bungalows are all of the same construction. They have prefabricated concrete panel walls that have been pebble-dashed on the outside. They have low-angled, twin pitched roofs with gables that contain a grilled air gap towards the apex of each.</p> <p>The roofs are covered by large interlocking concrete roof tiles with no chimneys, but they do have a flue in the rear of each dwelling.</p> <p>Internally there is an individual roof space to each semi-detached section, with an internal wall of concrete panelling sprayed with concrete separating the two. These are accessed through loft hatches that are located in store rooms separated from the rest of the accommodation by internal walls and mirrored at the centre and rear of each pair of bungalows.</p> <p>The roofs are a low collar construction with widely spaced trusses (every four rafters), but there is a central ridge board. However, the mineral felt lining goes over this board, sealing the roof space. There is 100mm of fibreglass insulation laid on the ceiling, generally with no boarding, but a few of the lofts have boards near to the loft hatches.</p>

Table 3: Faunal use of the sites

Fauna	Opportunities
Bats	<p>Brown Long-eared bat droppings were found in three of the bungalows on Trenchard Circle in 2016, with emergence surveys confirming these as minor occasional roosts. In 2016 and 2020 a single Brown Long-eared was found in two different open bungalows during renovation works, confirming that the site is also used opportunistically as occasional transitory roosts. Therefore, the site is occasionally used by commonly occurring species as day roosts.</p> <p>Phases 5D had no buildings with potential for roosting bats, so these were removed in 2019, while activity surveys confirmed there were no roosting bats in the two buildings on 8C, although bat boxes have been installed on trees in the adjacent avenue of trees to the east. Therefore, these two sites have negligible potential for roosting bats, but offer some potential for commuting and foraging bats.</p>
Birds	The habitats on-site offer some limited nesting opportunities for birds. During various site visits, all bird species recorded are common and widespread, with the habitats of similar ornithological value in the surrounding area. Therefore, the site is considered to be of low ecological value to birds at the local level.
GCN	<p>There are no water bodies on 5D or 8C and extensive surveys of the area have indicated that there are no Great Crested Newts in the central and southern areas of Heyford Park, so GCN are believed absent from 5D and 8C.</p> <p>However, an ephemeral pond was created when the work on Trenchard Circle was suspended for two years. Surveys in 2019 found a low population class of breeding GCN in the pond, so the pond was cleared under licence in 2020. Therefore the gardens and landscaping areas around Trenchard circle are likely to have GCN present at low levels. This is considered to have moderate ecological potential at the site level only.</p>

4. Assessment of Construction Activity Impacts without Mitigation

Construction Phase

- 4.1 Large areas of the site will be subject to construction works resulting in the loss of existing habitats. Any retained habitats such as trees and hedgerow will be subject to potential impacts such as dust deposition and compaction of tree roots or other damage to trees from construction vehicles, along with noise, vibration and light pollution from the site clearance, which may spread into the wider landscape without appropriate mitigation.

Fauna

- 4.2 **Bats:** During the construction works there is potential for commuting and foraging bats to be disturbed through the use of lighting on the construction area. This will particularly affect the Brown Long-eared and Natterer's bats that were identified as using the sites through various activity and emergence surveys. These species are light averse and light pollution will lead to the loss of these species from the local area, thus adversely affecting the conservation status of the local bat population.
- 4.3 Demolition or Upgrading of the buildings on Trenchard Circle will destroy occasional day and transitory roosts of Brown Long-eared bat. A licence is required for this.
- 4.4 **Birds:** the potential threats to bird species during the construction phase include the loss of nesting habitat through demolition of buildings and removal of trees and shrubs. The direct loss of active nests will directly affect the local population and constitute an offence under the 1981 Wildlife and Countryside Act (as amended). There is also potential for noise and visual disturbance through the construction activities to adversely affect the local bird population in the immediate surrounding area.
- 4.5 **Great Crested Newt:** No impacts are considered likely for 5D and 8C, but the ephemeral water body found on Trenchard Circle had a small population class of breeding GCN, part of a medium class size meta-population. A breeding pond and associated habitat for GCN would be destroyed by the development here, being an unlawful act.

Operational Phase

- 4.6 The operational phase covers the potential effects of loss of habitat due to the development including the potential effects resulting from the operation of the proposed development through recreational pressure, noise and light disturbance.
- 4.7 **Bats:** Without appropriate mitigation the three occasional roosts will be destroyed when the buildings on Trenchard Circle are demolished. The boundary habitats providing commuting and foraging areas around all three sites are to be retained. However, the foraging and commuting areas could be affected by lighting, particularly

at road junctions and crossings, thus adversely effecting bat activity, particularly from late emerging bats such as *Myotis* sp. and Long-eared bats.

- 4.8 **Birds:** Increases in anthropogenic activity leading to disturbance of nesting birds which may affect the survival rate of certain species, thus potentially reducing the species assemblage of birds on the development site.
- 4.9 **Great Crested Newt:** It is considered unlikely that GCN utilise 5D and 8C, so no impacts are envisaged here. However, Trenchard Circle has a confirmed breeding pond that will be removed under licence, including a Great Crested Newt working method statement, along with amphibian fencing. For the operational phase this will be removed, so GCN could be impacted by cat predation, trapped in the road system or gully pots and killed by traffic.

5. Development Impacts and Mitigation Measures

- 5.1 The potential impacts of the proposed residential development have been assessed and the following mitigation principles will be applied in order to avoid, reduce, mitigate or compensate for these impacts.

Habitats

- 5.2 The main impact of the residential development on the existing habitats will be the loss of amenity grassland, trees and shrubs, along with the destruction of buildings used as occasional bat roosts and by nesting birds.
- 5.3 The hedgerows on the northern and western boundaries of Trenchard Circle, along with the associated trees on all three sites, are to be retained following the development and will be adequately protected to ensure no unintentional damage occurs during construction activities.
- 5.4 In order to minimise the effects of the construction phase such as; compaction, dust deposition and damage to vegetation, standard mitigation measures will be put in place during the construction phase including:
- Erection of tree protection fencing around hedgerows and trees in accordance with BS5837:2012;
 - Storage of materials and vehicles away from watercourses.
 - Dampening down of potential sources of dust;
 - Adherence to Environment Agency pollution prevention guidelines;
 - Implementation of safeguards as part of construction works to control surface water run-off and avoid contamination of watercourses.
 - The storage of any chemicals on-site will be contained in such a way to ensure that they are not accessed or knocked over by animals.
 - Fires will only be lit in secure compounds and not allowed to remain lit at night.
- 5.5 Proposed landscaping of the site is set out in section 5.0.

Species Constraints and Protection Measures

- 5.6 All contractors will be briefed as to the possible presence of protected and notable species within the site, with particular reference to the implications of legislation and licencing.
- 5.7 **Bats:** The proposed development on Trenchard Circle will result in the loss of three occasional day roosts of Brown Long-eared bats, which are deemed to be minor roost under good practice guidelines (BCT 2016). However, each building which contains a roost will be demolished/renovated under an EPSL from Natural England along with ecological supervision. This will be via a site registration under a Bat Mitigation Class Licence.
- 5.8 The buildings will be demolished during the winter months (November to March) when the roosts are unlikely to be used. Alternatively, should the demolition take place between April to October then the buildings will be subject to a pre-demolition inspection by an experienced ecologist licenced to handle bats.
- 5.9 A tool-box talk will be carried out by a qualified ecologist to inform the contractors of the method statement, the protection afforded bats, how to recognise bats and what course of action they will need to follow if a bat is found during the demolition.
- 5.10 Three bat boxes will be erected prior to demolition starting, a Schwegler 1FF and two Schwegler 2FNs.
- 5.11 The bat ecologist will oversee the initial removal of bat features, such as ridge tiles and soffits. All features will be removed carefully by hand after inspection by the licenced bat ecologist.
- 5.12 If, in the unlikely event that a bat is encountered, it will be taken by hand by the ecologist, who is very experienced in handling bats. The bat will be stored in a cotton bag to keep it calm and secure and moved into one of the suitable roosting opportunities provided.
- 5.13 Any temporary lighting used during construction such as security lighting should be positioned to avoid sensitive areas on the northern and western boundaries. The lamps should be low wattage <70w to reduce glare and minimise impacts on bats. The lights could be fitted with movement sensors to only come on when the sensor is triggered thus only illuminating the area when needed.
- 5.14 To prevent any adverse impact on commuting and foraging bats within the site and in the surrounding landscape during the operational phase. Any lighting design must be functional and directional only. This can be achieved by using baffles and screens if necessary, to ensure that there is no light spill onto any retained or planted vegetated corridors.

5.15 A sensitive lighting plan can be achieved by utilising methods to target and minimise light and light trespass.

Prior to installation:

- Ensure a low beam angle of the lights ideally less than 70⁰ above the horizontal.
- Install full horizontal cut off units with no light more than 90⁰ above the horizontal.
- Avoid the use of upward light such as ground recessed luminaires or ground mounted floodlights up-lighting trees, building and vegetation.
- For security lighting use ‘variable aim’ luminaires which allow you to change the beam angle by moving the lamp.
- LED lamps allow for directional lighting as individual/groups of LED bulbs can be switched off to direct light to specific angles and most luminaires are full cut off.

Post Installation:

- Install directional accessories such as baffles, hoods or louvres to direct light away from sensitive areas and to minimise spill.
- Where possible change the angle of the lamp housing to reduce the angle of the beam below 70⁰ (*Stone E.L. 2013*)

5.16 **Birds:** Any building, scrub or tree works/removal will be carried out outside the bird nesting period, which is March to August. If this is not possible an ecologist will check the habitat to be removed for active birds’ nests up to 24 hrs prior to the work commencing. If nests are found they will be left in place, a buffer zone (e.g. 5m) will be placed around the nest location using brightly coloured tape. The ecologist will estimate the time until the chicks have fledged and will return to check the nest on completion of the set time with the tape remaining in place until the ecologist is content that all young have fledged.

5.17 The following characteristics help to define an active nest

- A nest containing eggs
- A nest containing young
- Bird incubating eggs
- Adult birds carrying food to a nest

- 5.18 If a nest is discovered during the building demolition/site clearance then all work must cease. The site manager and ecologist will then be contacted. The ecologist will check the nest to confirm if it is active. If confirmed active then the works will only continue by setting up of a buffer zone around the nest site using tape and will be left in place until the ecologist confirms that all young have fledged and left the nest.
- 5.19 The western and northern hedgerow with associated trees are to be retained. This will ensure that cover remains on-site for passerine birds.
- 5.20 **Great Crested Newt:** No Great Crested Newts (GCN) have been recorded within 500m of 5D and 8C, thus it is anticipated that there will be no adverse effects on the population status of GCN. As a precaution a GCN working method statement will be followed.
- 5.21 For Trenchard Circle there has been shown to be breeding GCN in the accidentally created water body there. Therefore, the area with suitable habitat, including a large pile of topsoil towards the southern end of it, requires fencing and a translocation exercise carried out. If the pond still holds water in late summer/autumn, then this will require bottle trapping, but if dry conventional pit trapping will suffice, with a usual requirement of 60 days trapping for a medium class size population.
- 5.22 However, due to the vegetation only just starting to form, this can be reduced to 45 days, with compartmentalised areas trapped out for a minimum of 45 days, including five concurrent days with no GCNs found. When suitable effort to trap the area out has been undertaken there will be a supervised strip of the topsoil, including removal of the stored top soil at the south of the site.
- 5.23 Mitigation for this will be the construction of two ponds, but due to future development proposals for the flying field likely to start in 2022, the mitigation will be tied into this master plan.
- 5.24 On-site mitigation for Trenchard circle to will include regular dropped kerbs around the roads for each driveway and pedestrian crossing to prevent GCN being trapped within the road and employing offset drains (50m solid walkway between drain and kerb stone) to prevent entrapping GCN in gully pots.

Precautionary GCN Method Statement (for 5D and 8C)

- 5.25 The footprint of the development will be maintained in its current condition until the application of the method statement.
- 5.26 Any existing habitat that will not be retained will be removed by cutting in two sweeps. The first will reduce vegetation to no lower than 150mm, cutting the rough area in the west of the site from north to south to allow reptiles and amphibians to move ahead of the strimmers. The following day a second cut of the vegetation will be made, taking the vegetation down to ground level. This will only be undertaken

between March and October inclusive, when reptiles and amphibians are active, and when temperatures are above 6 degrees centigrade, for the same reason.

- 5.27 The contractors will be given a tool-box talk before works commence. This will describe the legal protection for GCNs and reptiles, what they look like, what action should be taken if any are found and have the method statement explained to them clearly.
- 5.28 If GCNs or reptiles are found then work will stop and the ecologist will attend site to ensure that no harm comes to any GCNs or reptiles and that the work can continue within the law.
- 5.29 Ground-works will only take place in daylight hours when amphibians and reptiles are active and during the spring to autumn months of March to October.
- 5.30 Materials should be stored on pallets or tarpaulin sheeting to prevent the creation of habitat suitable for amphibians and reptiles to shelter in.
- 5.31 All construction vehicles will access the site via the existing road system and remain on the working footprint.
- 5.32 Excavations should be filled in as soon as possible after they are made. Excavations will be made when required, in a phased order, rather than all at the start of the development, to minimise the time holes are exposed for.
- 5.33 Any trenches, if left open, will always have ramp placed in it to allow GCNs, reptiles and other wildlife to climb out of the trench if they fall into it.
- 5.34 Any excavated holes will be checked for GCNs and reptiles if left open overnight. Any GCNs or reptiles found will be moved to the nearest suitable habitat.

6. Landscape Enhancements and Management

- 6.1 The landscaping plan and management will provide ecological enhancements to the development sites by providing the following:

Wildflower Grassland

- 6.2 Selected areas of grassland landscaping within the development site will be planted with a general-purpose meadow seed mixture such as Emorsgate EM3.

Planting

- 6.3 The seed should be sown in autumn or spring. However, the seed can be sown at other times of the year if there is sufficient warmth and moisture. The seed can be sown either by machine or by hand. The seed will then be firmed into the soil by using a roller, or by treading.

Management

- 6.4 In the first year the grassland should be mown regularly to a height of 40-60mm with the arisings removed as necessary if dense. This will control the annual weeds and maintain a balance between the faster growing grasses and the slower developing wild flowers.
- 6.5 In the second year and thereafter the grassland will be managed as a traditional hay meadow with the main cut being taken in July-early August. The cut grass will then be left on the ground for 1-7 days to allow the seed to be shed before removing the grass. The re-growth should then be cut in November to a height of 50mm with a further cut in March the following spring.

New Tree and Shrub Planting

- 6.6 Tree planting will incorporate native species of local occurrence. The trees will be planted in open green spaces and will include trees species such as Crab Apple and Bird Cherry as the blossom from these trees will encourage pollinating insects. Other nut and fruit yielding trees and shrubs which could be planted on the development site include: Oak, Sweet Chestnut, Walnut, Whitebeam and Wild Service. Shrubs to be used include Dogwood, Guelder Rose, Lavender, Privet, Thyme and Wayfaring tree.

Planting

- 6.7 Planting is to be carried out between October to April, but planting in waterlogged or frozen soil will be avoided.
- 6.8 The soil in the area to be planted will be loosened to a depth equivalent to the height of the root-ball to eliminate compaction and aid drainage.

- 6.9 Trees will be planted 3-5m apart with the shrubs planted 1-2m apart. The planting hole will be no deeper than the roots and three times the diameter of the root system.
- 6.10 A stake will be used if required however, small trees do not require staking but top heavy or larger trees will be staked. Tree spirals or tree guards will be used to protect the tree from deer or rabbit damage.

Management

- 6.11 The trees and shrubs will require watering during the growing season with a typical 30-50 litres of water a week per square metre in dry weather required for the first three years.
- 6.12 To prevent competition from weeds and other vegetation a vegetation free circle at least 1.4m in diameter is to be put in place around each tree and shrub. The circle is to be kept weed free through hoeing, using a mulching mat or appropriate herbicides. If a mulching mat is to be used a 10cm collar around the woody stem should be put in place to avoid the risk of rotting the bark.
- 6.13 The trees will be inspected in spring and autumn and any tree ties should be adjusted to prevent constriction of the stem. After five years the trees and shrubs should have a sufficient root growth to anchor the tree and the ties and stake can be removed.
- 6.14 General pruning is to be completed as necessary to remove damaged vegetation and to retain the natural shape of the plant.

7. Specific Species Enhancements

Bats

- 7.1 **Garden Planting for Bats:** Any garden planting will include night scented plants such as Aubretia, Field Poppies, Honesty, Michaelmas Daisy, Night-scented Stock, Mexican Aster and Verbena. These plants will attract nocturnal invertebrates thereby creating a foraging resource for bats.
- 7.2 **Bat Boxes:** The development allows for potential roost sites to be increased for bats with the inclusion of integrated bat boxes within each block of the new builds, such as the Istock, Schwegler or Weinerberger Integrated Bat Boxes (See Section 9).
- 7.3 The Istock Integrated Bat Box is designed for Pipistrelle bats with several roosting zones created inside the box. The Weinerberger Integrated Bat Box is large in size with no internal chambers but there are arrow head internal fixings which allow for groups of bats to congregate in different areas. This box is aimed at those bat species which are most commonly found in buildings such as Pipistrelle, Natterer's, Whiskered and Brandts.
- 7.4 Six integrated bat boxes will be incorporated into 8A, two into 8C, four in 5D. Under the licence for the demolition of the eastern and northern bungalows in Trenchard circle in 2016 it was agreed that an integrated bat box would be fitted into each of the 21 new builds.
- 7.5 In addition, the double garage planned for the north-eastern corner of the site (G352) will have a bat loft installed in it above the ceiling, with a cut roof construction to create a large roof void and two bat slates for access. This will act as a site enhancement as stated in the associated report. Details of the design are in the recommendations section of the report (Satinet, 2019).
- 7.6 Due to the discovery of bats in some of the bungalows being renovated within Trenchard Circle, but outside the current red line area, three integrated bat boxes will be built into the gables of buildings 28, 30 and 32.

Birds

- 7.7 **Bird Boxes:** Fourteen bird nest boxes will be erected around the three phases covered by this report;
- 7.8 Two bird nest boxes will be erected on retained trees or placed on buildings in Phase 5D. If trees are used then a Schwegler 1B and a Schwegler 2H will be used, but if placed on buildings one Swift box and one Sparrow terrace will be used.
- 7.9 Eight bird nest boxes will be erected around Trenchard Circle. These will be placed in retained trees, and/or on buildings. Boxes placed on buildings will be Sparrow

Terraces, Martin, Swallow and Swift boxes, while those erected in trees will be Tit/Sparrow/Nuthatch, Robin/Wren and Starling boxes (See Section 9)

- 7.10 Two Schwegler 1B and two Schwegler 2H bird nest boxes will be erected in the avenue of trees to the north and west of Phases 8a and 8c.

Invertebrates

- 7.11 **Wood Piles:** Any scrub or tree removals as part of the development will be used to create woodpiles (See Section 9) for Saproxylic invertebrates. The woodpiles will be placed at the bases of hedgerows or next to retained trees.
- 7.12 The woodpiles can be erected at any time of the year.
- 7.13 Six insect boxes (See Section 9) will be erected onto the new builds or retained trees to provide sheltering opportunities for invertebrates.

8. Management and Monitoring Programme

Habitat/Feature	Objective	Proposed Management	Proposed Monitoring	Performance Indicators		Remedial Actions
				Poor	Good	
Bats	Ensure no bats or bat roosts are negatively impacted upon during demolition and operational phases. Enhance the ecological value of the sites and maintain the conservation status of bats in the local area.	A precautionary approach with regard to the demolition of the buildings via site registration under a Bat Mitigation Class Licence for Trenchard Circle. Mitigation in the form of integrated bat boxes in each separate building and a bat roost above a double garage on Trenchard Circle.	Annual inspection of bat boxes to determine use. Bat Emergence survey and internal inspection of bat roost above double garage in third and fifth years following construction. Bat activity surveys around the sites to compare pre-and post-activity levels in third and fifth years after completion.	Additional bat roost recorded demolition delayed. No bats using the double garage bat roost or any of the integrated bat boxes	Different species using bat boxes and commuting and foraging around site. Brown long-eared bats using garage roost	Review lighting plan and provide further enhancements
Birds	Protection of nesting birds that may be present within the existing hedgerow, trees and shrubs.	Undertake any clearance or management work outside the bird nesting season between 1 st March to 31 st August, a pre-commencement check will be required by a suitably qualified ecologist	Ecologist to carry a pre-commencement check for active nests if required	Nesting bird activity is recorded leading to proposed works being delayed.	No nesting birds are present within the specified habitats	Works only to proceed outside the nesting season or where no active nests have been confirmed by a suitably qualified ecologist.
GCN	Protection of GCN in terrestrial habitat thus maintaining favourable conservation status within the area for 5D and 8C. Mitigate for loss of breeding pond on Trenchard Circle	Undertake site clearance and groundworks works under working method statement between 1 st March to 30 th October Obtain a Protected Species Licence for the Trenchard Circle site, covering the safe removal of GCN from the development footprint with off-site	GCN licenced ecologist to carry out pre-commencement check of grassland habitat and any rubble piles. Newly created compensation ponds to be monitored with aquatic surveys for five years following their construction.	GCN are found to be present delaying ground clearance works and demolition. Additional GCN are found following the site clearance delaying works.	No GCN are present within the specified habitats No GCN are present within the specified habitats but GCN start using the mitigation ponds.	Works only to proceed between 1 st March 30 th October when GCN are active and where no GCN have been confirmed by a suitably qualified ecologist. Enhance new ponds with additional planting, improving water levels and ensuring connectivity with surrounding GCN habitats.

New tree and shrub planting	Ensure satisfactory establishment and growth of new planting	Plant species listed in 5.21 protect with appropriate guards	Monitor successful establishment of individual plants	Poor growth of individual plants	Health plants with good habitat structure	Replace any trees that die in the first five years. Replace any shrubs that die within the first three years with the same species.
		Maintain a weed free 1.4m diameter area around the trees and shrubs through mowing, mulch mats or herbicide spray for first three years then as required. If mulch mats are used ensure there is a 10cm gap around the trunk of the tree to avoid the bark rotting.	Monitor growth of competitive weeds around individual trees and shrubs.	Excessive weed growth competing for resources	Lack of weed growth around new trees and shrubs	Review intensity of weed treatment increase/decrease as appropriate.
		Water new shrubs if they show signs of drought stress	Monitor health of individual trees and shrubs	Wilting plants with poor growth	Healthy plants with expected growth rate	Review frequency of watering
		Use of stakes, ties and guards are to be checked	Monitor efficiency of stakes, ties and guards during each visit for the first five years	Poorly supported or damaged plants	Well established plants	Stakes, ties and guards adjusted or replaced as necessary to prevent damage. To be removed after five years.
	Maintain planting in a healthy and attractive condition, to retain their contribution to the landscape structure, biodiversity, food source to wildlife and amenity value	General pruning completed as necessary to remove damaged vegetation limited to maintain the natural shape of the plant.	Monitor health and distribution of individual plants	Poor growth and structure	Desired structure and distribution	Review frequency and method of cutting. Re-plant any trees or shrubs lost.
Bird nest boxes, Bat boxes and invertebrate boxes	Create additional habitat for nesting birds, roosting bats and invertebrates.	Install-bird/bat/invertebrate boxes described in section 6	Annual monitoring of boxes for damage and use.	Damaged boxes/boxes not utilised by wildlife	Intact boxes used by intended species.	Repair/modify where necessary

10 Year Management Programme

Landscape Green Spaces	Year 1	Year 2	Year 3	Year 4	Year 5	Years 6-10
Existing Trees	Annual inspection by a qualified arborist for disease, damage and potential problems-remedial work to be carried out as required					
New trees and shrubs	Water between April and September as necessary		Water if showing signs of stress			
	Inspect trees annually in September and replace dead trees and shrubs in the next planting season					
	Annual inspection by a qualified arborist for disease, damage and potential problems – remedial work to be carried out as required					
	Check stakes, ties and guards monthly from March to October, inclusive and after frosts or high winds and adjust or replace as necessary		Remove stakes and ties if trees are self-supporting			
	Maintain 1.4m diameter area around trees and shrubs weed free through mowing, mulch mats or herbicide					
	Remove dead wood where necessary, and suckers as required					
EM3 Wildflower meadow grassland mix	Mow grassland in March, July and November to a height of 40-60mm with arisings removed if dense	Grassland managed as hay meadow with main cut in late July/early August. Arisings to be left on the grassland for 1-7 days to allow seed to be shed before removing. Re-growth to be cut back to 40-60mm in November with arisings removed. If required cut grassland in March to a height of 40-60mm with arisings removed				

Species Enhancements	Year 1	Year 2	Year 3	Year 4	Year 5	Years 6-10
Bat Boxes	Checked annually by a licenced bat ecologist.					
			Bat Activity Survey		Bat Activity Survey	
Garage Bat Roost			Internal and Emergence Survey		Internal and Emergence Survey	
Bird Nest Boxes	Checked annually between November and February, with repairs and modifications as necessary. Relocate bird boxes to a different area of the site in year 6 if boxes are showing no signs of use.					
Habitat Piles	Checked as part of general site maintenance and repairs undertaken. Additional material added regularly from hedgerow and grassland management.					
Invertebrate Boxes	Checked annually between November and February, with repairs and modification as necessary. Relocate invertebrate boxes to a different area in year 6 if boxes are showing no signs of use					

9. Figures

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>*



Bird Nest Boxes:

RSPB



Swallow



Martin



Swift



Tit/Sparrow/Nuthatch



Robin/Wren



Robin/Wren



Sparrow Terrace



Starling

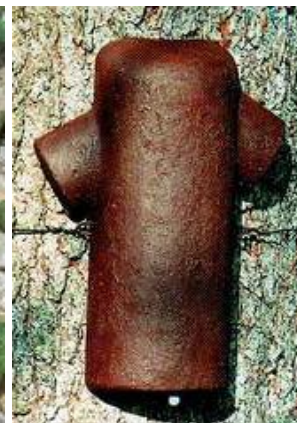
Schwegler



1B - Tit/Sparrow/Nuthatch



2H - Wren/Robin/Wagtail



2BN - Tree Creeper

Invertebrate and Small Mammal Wood Piles

Dead and decaying wood is an important habitat for a vast range of species, particularly beetles and other insects, but also providing cover for small mammals, such as Shrews, Woodmice and even Hedgehogs, where they can create dens and forage for their insect prey. The insects also provide food for other animals, such as bats and birds.



Log-piles are best created by sinking two stakes into the ground at either end to prevent the piles from collapsing. Logs are then stacked between these to create the log pile, using logs cut to roughly equal lengths. Do not stack the logs too high to prevent them drying out.

It is best to use logs that are broad-leaved and still have the bark on, but fruit trees, Oak and Beech provide for the richest invertebrate communities

There should be a buffer strip around the log-pile to protect the vegetation and soil from disturbance, avoiding cutting the immediate vegetation between May and September.

Allowing plants and moss to grow over the logs helps to maintain moisture in the log-pile and provides additional shading for insects

Examples of Insect Stacks



Insect Hotel
by Wildlife World



Woodstone Insect Block
by C J Wildlife



Schwegler Clay and Reed Insect House

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