Buena Vista, Foxes Lane, Mendham, Harleston, IP20 0PF

ECOLOGICAL CLERK OF WORKS, BIODIVERSITY ENHANCEMENT STRATEGY AND LIGHTING STRATEGY

Preface

This strategy is to be read in conjunction with the ***Preliminary Ecological Appraisal And Impact Assessment – Buena Vista, Foxes Lane, Mendham, Harleston, IP20 0PF*** *(June 2022),* submitted to Mid-Suffolk District Council with planning application DC/22/03599 for the "demolition of two agricultural buildings and construction of two detached dwellings, garages, gardens and a shared access." This document aims to satisfy Conditions 3 & 4 of the planning consent DC/22/03599 which states:

Condition 3:

ACTION REQUIRED IN ACCORDANCE WITH ECOLOGICAL APPRAISAL RECOMMENDATIONS
All mitigation measures and/or works shall be carried out in accordance with the details contained in the Preliminary Ecological Appraisal (Eco-Check Consultancy Ltd., June 2022) as already submitted with the planning application and agreed in principle with the local planning authority prior to determination. This includes a Non-Licensed Great Crested Newt Method Statement which avoid impacts on European Protected Species. This will include the appointment of an appropriately competent person e.g. an ecological clerk of works (ECoW) to provide on-site ecological expertise during construction. The appointed person shall undertake all activities, and works shall be carried out, in accordance with the approved details.

Reason for Condition: - To conserve protected and Priority species and allow the LPA to discharge its duties under the Conservation of Habitats and Species Regulations 2017 (as amended), the Wildlife & Countryside Act 1981 as amended and s40 of the NERC Act 2006 (Priority habitats & species).

Condition 4:

PRIOR TO SLAB LEVEL: BIODIVERSITY ENHANCEMENT LAYOUT
A Biodiversity Enhancement Layout, providing the finalised details and locations of the enhancement measures contained within the Preliminary Ecological Appraisal (EcoCheck Consultancy Ltd., June 2022) shall be submitted to and approved in writing by the local planning authority. The enhancement measures shall be implemented in accordance with the approved details prior to occupation and all features shall be retained in that manner thereafter.

Reason for condition: - To ensure protected species are not harmed as a result of the proposals in accordance with policy NE1 of the Vale of Aylesbury Local Plan and aims of the NPPF.

Eco-Check were commissioned to produce this document in relation to the approved planning consent for the demolition of existing agricultural buildings and erection of two new residential units in two phases (as alternative to Prior Approval DC/20/02792) at Buena Vista, Foxes Lane, Mendham, Suffolk, IP20 0PF. The proposed replacement dwellings are situated primarily within a mosaic of habitats including arable land, buildings, broad-leaved scattered trees, hedging, improved grassland, standing water (pond) and tall ruderal vegetation. Due to the presence of six ponds within a 250m radius of the proposed working areas, including one pond P1 within the proposed development site, a great crested newt scoping survey was conducted in June 2022 and eDNA tests from a survey in 2020 were provided by Greenlight Ecology.

There are six ponds within 250m. eDNA tests for great crested newt were undertaken on P1 by Greenlight Ecology in 2020 and returned negative for this species. Whilst the tree lines, ditch (D1) and hedges provide some suitable terrestrial habitat the construction area comprises short mown grassland and buildings which does not constitute suitable shelter / refuge habitat, though may potentially be used for foraging and / or dispersal by individual newts. The terrestrial habitats within the site interior are of limited value dominated by patchy short, improved grassland (June 2022) and tall ruderals. The boundary habitats of hedgerows, trees, scrub and ditches provide suitable habitat and there are frequent earth banks and rabbit diggings providing potential refugia and hibernaculum for this species.

Conservation and Enhancement Measures

As noted within the Preliminary Ecological Appraisal '*The findings of the assessment are that habitats on the site are assessed as being of local value (low) only; the pond, mature trees and hedging are of moderate (parish) ecological value."*

Also noted: *'The impact of the development on nearby statutory designated sites is considered to be neutral as there are no designated sites within a 2km radius. The impact on non-statutory sites, namely County Wildlife Sites (CWS), is considered also to be neutral on account of the separation distance, from site with no direct access from public rights of way and so no increase in recreational disturbance.'*

*The report concludes that: '*In the absence of mitigation, the proposed development would give rise to a moderate adverse impact on breeding/nesting birds, a moderate-minor on terrestrial mammals and a minor-adverse neutral impact on habitats, amphibians, invertebrates and foraging/commuting bats." However, with the recommended mitigation and suggested enhancements incorporated into the layout, there is an opportunity to enhance the value of the site for local wildlife, resulting in a net gain for biodiversity, as is encouraged by the National Planning Policy Framework.

The following table summarises the recommended mitigation and enhancements made within the ecological scoping survey, along with the measures taken within the design in order to meet - and in some cases exceed - these recommendations.

Protected habitats/species	Status	Potential effect	Recommended mitigation and enhancements	Design Intent to meet recommendations
Protected habitats and habitats subject to conservation designations	There are no UK Priority Habitats within the application areas although the wider field hedgerows may be classed as important or protected under the Hedgerows Regulations 2017. The footprint of the proposed replacement dwellings comprises a mosaic of habitats including arable land, buildings, broad-leaved scattered trees, hedging, improved grassland, standing water (pond) and tall ruderal vegetation. Three trees on site are assessed as having the following potential for bat roosting features: T1- Lombardy Poplar- Mature tall specimen with dense foliage and creeping ivy- **Moderate** T2- Crack Willow- Mature specimen on pond edge, splits, tears and cracks-**Moderate/High** T3- Crack Willow- Mature specimen on west boundary with splits, tears and cracks-**Moderate/High** The site is bordered by some hedgerows and ditches providing some connectivity to the wider landscape. Our assessment found the application site interior to be of low ecological value typical of nutrient enriched grassland, the pond, trees and hedges are of greater ecological significance.	Low-scale loss of habitats for wildlife. Boundary hedgerows and trees not to be directly affected by proposed works (with the exception of a self-set elder bordering building B2 which will be removed). Infill hedge planting.	*Mitigation* Boundary hedgerows and trees to be protected (where required) by Heras fencing in accordance with *BS:5837 (2012) Trees in Relation to Design, Demolition and Construction.* Construction work to be carried out in accordance with BSI (2012), BS 5837:2012, to protect trees and their root protection areas. Soft landscaping scheme to include planting of new native trees, and hedgerows on site. *Enhancement* Use of native species-rich seed mixes. WFG20-Germinal Amenity OR Emorsgate EM2F. Gaps in the hedgerows will be planted up with native species and/or species of known ecological value. As a biodiversity enhancement new hedgerow planting is proposed along the east and south boundaries with the arable fields. Planting of native broad-leaved trees. Suggested species include; blackthorn (*Prunus spinosa*), crab apple (*Malus sylvestris sens.str),* elder (*Sambucus nigra*), field maple (*Acer campestre*), guelder rose (*Viburnum opulus*), hawthorn (*Crataegus monogyna*), honeysuckle (*Lonicera periclymenum*), holly (*Ilex aquifolium*) and English oak (*Quercus robur*) could be used to provide known benefit to wildlife.	The proposed replacement dwelling is in a location subject to historical disturbance and modification and its habitats easily replaced. We suggest that any habitat loss associated with the proposal can be adequately mitigated through landscaping, planting and other biodiversity enhancement measures. The existing hedgerows and trees will be retained and protected during the course of the development with suitable tree and root protection measures. A 3m standoff along the hedgerows (Heras fenced) near to construction or ground works will be implemented. The built scheme will take the opportunity to enhance vegetation connectivity in the locale and provide landscape planting (native species or species which are attractive to insects, and thus enhance foraging opportunity).

Protected habitats/species	Status	Potential effect	Recommended mitigation and enhancements	Design Intent to meet recommendations
Bats	The value of the Site to bats is assessed as Low at the Parish/ Neighbourhood scale due to the probability of minor use and connectivity to the wider environment. The survey area offered some suitable roosting opportunities for bats with some trees supporting potential roost features. The site contains suitable habitat for foraging and commuting bats along tree and hedge lines and pond area to the south-west, it is considered likely that foraging or commuting bats use the site to a certain extent. Whilst the proposed works are unlikely to have any direct impacts on bats as no notable trees are being removed and the buildings both have negligible roost potential. There are no trees that require removal to facilitate the development. The unmitigated impact of the proposed development is provisionally assessed as being **neutral** subject to retention and protection of the trees and hedging. The proposed works have a low likelihood of impacting on bats so the requirement for a European Protected Species Mitigation License EPSM is very unlikely.	No direct impacts on any bat roosts predicted from works. Any additional lighting such as security lights, flood lights etc will potentially impact foraging and commuting bats. Low-scale loss and potential disturbance through artificial light on commuting and foraging habitats on site (if required).	*Mitigation* Planting of new native trees and hedgerows within and around the site. Any new lighting scheme to avoid facing suitable bat habitats and to comply with Bat Conservation Trust and CIE 150:2003 guidance. *Enhancement* • 2 x Eco-Roost Double chamber bat boxes (on the gable apex of the south elevation of the new building) • 2 x Eco-Roost Double chamber bat boxes (on the boundary trees) • 1 x Eco-Roost Hibernation Box on west gable wall The boxes to be installed on the boundary trees within the site should ideally be one on each elevation to provide the best variation in temperature, shelter and flight lines. If only one elevation is used this should be south-east facing as this provides the most shelter and warmth.	The soft landscaping scheme will include the planting of new trees and species-rich hedgerows within the site, using native species as specified. The landscape lighting scheme will follow guidance from the Bat Conservation Trust and CIE 150:2003. No lighting will directly face existing or newly planted commuting and foraging habitats. New lighting systems will have a minimal spread of light only directed at the area requiring lighting and will include warm-white (long wavelength) lights with UV filters fitted as close to the ground as possible, with lighting units angled below 70° and equipped with movement sensors, baffles, hoods, louvres and horizontal cut off units at 90°.
Breeding birds	Nesting and foraging opportunities within boundary trees and hedging, and within existing building. Waterfowl visit the existing pond P1. The likely presence of ground nesting birds is low.	Low-scale loss of nesting and foraging habitats on site. Potential disturbance and harm to breeding/nesting birds between 1st March and 31st August.	*Mitigation* Works to the trees and hedgerows on site to be conducted outside bird nesting season or if not possible, immediately following a nesting bird check by a qualified ecologist. Planting of new native trees and hedgerows on site, and areas of tall grassland to be retained on site. *Enhancement* • 1 x Eco-Roost (32mm) in boundary trees • 1 x Eco-Roost (28mm) in boundary trees • 1 x Eco-Roost starling box on 1 of the north apex gables • 1 x Eco-Roost house sparrow box on 1 of the north apex gables • 1 x Eco-Roost deep nest box for robins in hedge	Any works affecting or in close proximity to bird nesting habitats (including hedgerows and trees) will be conducted outside the main nesting season, which lasts from March to end of August. If this is not possible, a check of these habitats will be conducted by the qualified ecologist (ECoW) immediately prior to starting any works. If any nesting birds are found, an appropriate protection zone from the nest, as determined by the ECoW, will be required and maintained until the young have fledged. To compensate for the minor loss of nesting and foraging habitats and enhance the value of the site for birds, new species-rich native hedgerows and trees will be planted within and around the site in addition to the bird nesting boxes as detailed.

Protected habitats/species	Status	Potential effect	Recommended mitigation and enhancements	Design Intent to meet recommendations
Great crested newts	The surrounding land use is predominantly large open arable and pasture fields bordered by trees and hedging and post and wire fencing. There are 5 ponds within 250m of the site and two ditches (D1 & D2). Ponds P1 & P2 inaccessible on private land. There are no records of great crested newt (*Triturus cristatus)* within 1km of the site but with records within the 1km-2km radius. The habitat on site has low potential to support great crested newts in their terrestrial phase. Pond P4 on site has poor potential for GCN. eDNA tests of ponds P3, P4 and P5 (Appendix 1) all returned negative for this species.	Potential low-scale loss of GCN terrestrial habitat. Potential disturbance to the marginal vegetation around P4. Stocking with fish has made the pond unsuitable for GCN. Risk of harming GCN if present on site during works.	*Mitigation* No specific mitigation required other than to take care when removing any potential refugia or hibernaculum such as brash piles, wood piles, rubble and sheeting materials. Annual grass mowing to not cut shorter than 100mm in case of use by herpetofauna. Heras fencing installed around pond P4. Any spoil or debris arising from works to be moved straight into a skip or removed from site to prevent use by herpetofauna.	To maintain and protect areas of suitable terrestrial habitat and the pond.
Water voles, otters, white-clawed crayfish	No suitable habitats present on site. Pond P1 lacks steep well-vegetated banks for burrowing and also riparian vegetation for grazing.	No direct impacts predicted.	N/A	All construction works will be carried out in accordance with British Standards Institution (2013), *BS 42020:2013, Biodiversity – Code of Practice for planning and development*, water runoff and pollution.
Reptiles	Rough grassland field margins. The habitats on the site are considered predominantly unsuitable for reptiles, consisting of short mown grassland and buildings. The boundary hedging, trees and pond area provide some suitable reptile foraging and hibernating habitats. Records of grass snake and slow-worm were returned in the area.	Low-scale loss of habitat. The majority of the development area is poor improved grassland and bare ground of low value to reptiles. Stored materials on site could supply cover for basking reptiles. Risk of injuring or killing individual reptiles if present on site during works.	*Mitigation* Owing to small size of site, further reptile surveys are not necessary, but mitigation measures are recommended: Grassland on site to be maintained at maximum height of 10cm before and during works. Any refuge created on site to be removed off site within the same day. Any excavations on site to be covered overnight or have a ramp. Construction materials to be stored off the ground on pallets. Areas of rough grassland to be retained around site edges. To provide a shelter for small mammals and herpetofauna an artificial refugia/hibernaculum to be created in south-west corner of site.	Any site clearance (such as the removal of scrub and piles of brash, compost and building materials will be undertaken by hand and with special care to ensure that no animals potentially sheltering underneath are harmed. The removal of these features will be conducted outside the hibernating season (which typically lasts from October to March). To discourage animals from the site during the works, the following measures will be taken: Grassland maintained at height of 10cm; any refuge created on site to be removed off site within the same day; any excavations on site to be covered overnight, or have a ramp; construction materials to be stored off the ground on pallets and areas of rough grassland to be retained on site edges where possible.
Badgers	No badger presence signs on site but habitats suitable for commuting and foraging badgers. No badger records within 2km were returned. It is possible that badgers could cross the site during works if they are present within the wider area.	Field margins, permanent grassland. No significant impacts predicted.	*Precautionary mitigation* Any trenches and open pipework over 200mm in diameter to be covered and/or capped off overnight to prevent animals from falling in. In the event that any badgers are found during the course of the proposed works, work should be halted immediately, Natural England should be informed and allowed time to advise on the best way to proceed.	Badgers receive specific protection under the Protection of Badgers Act 1992. This means that it is unlawful to knowingly kill, capture, disturb or injure any individual or intentionally damage, destroy or obstruct an area used for breeding, resting, or sheltering badgers.

Protected habitats/species	Status	Potential effect	Recommended mitigation and enhancements	Design Intent to meet recommendations
Invertebrates	Due to the common habitats present within the site, it is considered unlikely that the proposed works will significantly impact important populations of invertebrates. Mature trees within and adjacent to the site may provide some suitable habitat for saproxylic invertebrates, however the site lacks the required diversity of deadwood to support significant populations of saproxylic invertebrates and is therefore not considered to be of importance to saproxylic invertebrates outwith the zone of immediate influence. Other habitats within the application area are not considered botanically or structurally diverse enough to support protected or nationally/locally rare invertebrate species and as such are not considered to be of importance to nature conservation outwith the immediate zone of influence.	Low-scale loss of habitat.	A habitat pile of rocks and deadwood logs to be created in the south-west corner. This will also serve as a receptor site in the event any wildlife needs relocating away from the working areas. The following planting and landscaping provides additional habitat that will benefit a wide variety of invertebrate species: • planting of native trees and shrubs as detailed above • planting species-rich wildflower grassland mix • relaxing the cutting regime and establishing wildflower areas within the site will also be beneficial	Habitat piles (one to be created in the south-west corner) provide sheltering/hibernation opportunities for a variety of invertebrates.

Appointment Of Ecological Clerk of Works ECoW

An ECoW must be appointed to supervise the planning of works on this site. This is because protected species may be present within the site and avoidance of harm can be ensured by the correct ‘best practice’ working methodology, which includes hand-searching and correct checking procedures by an ECoW. The ECoW will be responsible for delivering a toolbox talk and for identifying any proposed works to hedging, scrub, trees etc. Direct mortality during the clearance and construction phase can be avoided through implementation of Best Practice, and a TOOLBOX TALK to all contractors will be undertaken immediately prior to any works in order to ensure this. This will include advice on the mitigation and/or protection required during works.
The talk will emphasise the need for the following actions:

1. Brash, timber and rubble piles will be hand searched prior to clearance as they may potentially support amphibians, reptiles and hedgehogs. This work will either be done by or under the supervision of a the ECoW. Care will also be taken if lighting any bonfires as these may be potential as refugia/hibernation sites.
2. Care will also be taken to ensure that no trenches or ground excavations are left open without a means of reptiles/ amphibians being able to find their way out.
3. All piles of spoil, timber, or rubble will be kept clear of the ground, by removal either to a skip, or by being elevated, to ensure that potential refugia sites are not inadvertently created.
4. Any dug pits or unfilled deep foundation work will either be covered or have mammal ramps positioned in them to allow any trapped animals to escape.
5 A copy of this ecological mitigation plan will be provided to the contractors for use during the works. Contractors will be briefed on the potential ecological constraints and implications for working methods and timing of works.
6. A copy of this ecological mitigation plan will be kept on site for the duration of works.
7. Prior to commencement of works a walkover should be carried out to check for badger presence due to high activity within the wider area.
8. In the event that any ecological concerns arise during the works, the contractor or the site operator shall be required to contact Eco-Check Ltd:

Eco-Check Ltd
White House Cottage
Knapton Green
North Walsham
Norfolk
NR28 0RU
Tel: 01263 722199/ 07914 130493

Remedial action will be implemented, where appropriate, which may require the supervision of a suitably licensed ecologist. Those in charge of the development must ensure that clear instructions are given to the entire workforce with regards to this method statement. Care and regards will be taken when carrying out each of the methods and protective measures listed. The removal of sensitive ecological features will be supervised by a suitably licensed and qualified Ecologist (ECoW).

Activity Code	Summary of Development Activity
A	Site set-up including location of temporary storage areas, site compounds
B	Site vegetation clearance (mostly restricted to pasture habitat), arboricultural works, hedge works, earth bunds and banks. Demolition of existing building (mostly timber), removal of materials.
C	Groundworks, including (not limited to): excavations, trenching works, drainage systems, services, new access/driveways/parking
D	Construction works above ground level

Table 2: Summary of development activities

Biodiversity Feature	Potential Ecological Impacts	Development Activity Type	Risk of Impact on Biodiversity
Habitats and Vegetation	The proposed replacement dwellings and access is across managed improved grassland and bare/disturbed ground of low value. In terms of ground disturbance some excavation and leveling is required for the building foundations. At certain times of year, and if left unmown, areas of rank grassland and ruderal vegetation will provide cover and forage for insects, birds, herpetofauna and small mammals. The greatest risk to wildlife is groundwork for the access, foundations and parking areas, primarily the risk to small mammals, herpetofauna and nesting birds.	Activities B, C & D Activities A, B & C	Low Low
Amphibians	Amphibians, if present, could be killed/injured as a result of demolition of existing building where animals may be present beneath the structure; ground works as well as construction activities on site if commuting through the site or using the adjacent habitats for resting or hibernating at the time of works.	Activities A, B & C	Moderate
Badger	Badgers, if present, could be injured as a result of site clearance and construction works. Sustained night illumination of the site may affect the foraging and commuting behaviour of badgers	Activity B, C & D Activity D	Low Low
Bats	Bats, if present, could be killed/injured during demolition works, especially as opportunistic bats could be present and undetected prior to commencement of demolition. No bat roosts were found within the trees but have potential roost features and only surveyed from ground level so would be impacted if arboricultural works conducted (if required). Sustained night illumination of trees/hedges/ponds etc. may alter the roosting, foraging and commuting behaviour of bats within and adjacent to the site.	Activity B Activity D	Low Low Moderate

Birds	Destruction of in-use nests or harm to adult birds caused by demolition, ground works, removal/disturbance of trees/hedgerows on site during the main breeding bird season (1st March to 31st August). Risk of noise disturbance causing nesting failure during the main breeding bird season	Activity B Activity B, C & D	Moderate/High Moderate
Reptiles	Reptiles, if present, could be killed/injured as a result of demolition, ground works and construction activities on site. Creation of storage areas or material stockpiles may provide suitable resting habitat for occasional transient reptiles and there is therefore a risk of harm during the movement of materials.	Activities A, B, C & D Activity D	Low Low

Detailed Designs

Bat Boxes

The double chamber hibernation box and double chamber Kent boxes (See Figure 1) will be located in accordance with the following requirements (as recommended by the Bat Conservation Trust):

- Where bats are known to feed close to pond, hedges and tree lines (some bats use tree lines or hedgerow for navigation, putting boxes near these features may help the bats find the box).
- On trees: boxes should be placed on the trunk of a mature tree, where there is a clear flight line/accessible entrance.
- As high as possible (ideally, at least 3 to 4m above the ground, where safe installation is possible).
- In sunny places, sheltered from strong winds (usually between south-east and south-west).
- Hibernation boxes to face north where possible so subject to minimal temperature changes from solar gain. Kent boxes south facing where possible to maximise solar gain.

Bird Boxes:

Six bird boxes (28mm, 32mm, starling, house sparrow and robin) will be located in accordance with the following requirements (as recommended by British Trust for Ornithology and Manthorpe): The highest priority when siting a nest box must be to provide a safe and comfortable environment in which birds can nest successfully:

- Boxes will be sited 1-3m from the ground (to avoid potential predators eg domestic cats), ideally on a tree trunk but can be placed on the side of a shed or wall. Areas where foliage obscures the entrance hole will be avoided.
- Boxes won't be placed too close to another nest box of the same type.
- Boxes will be sheltered from prevailing wind, rain and strong sunlight. Facing northeast through to south-east and angled slightly downwards to prevent rain entering is preferred.
- Boxes located away from bird feeders.
- Boxes to be fitted to tree using galvanised wire to tie the box to the trunk or hang it from a branch. To be regularly inspected (every two or three years), to ensure the box remains securely attached.

Tree and Hedge Planting

New infill boundary hedging to be planted along the south-east boundary with the arable field as indicated. Hedging will be planted between October and April when the ground is moist and free from frost, set out in a staggered pattern in two rows 40cms apart. The native species will consist of 50% Hawthorn (*Crataegus monogyna*) with a mixture of at least five of the following species: - Blackthorn (*Prunus spinose*), Field Maple (*Acer Campestre*), Hazel (*Corylus Avellana*), Hornbeam (*Carpinus Betulus*), Holly (*Ilex aquafolium*), Dogwood (*Cornus Sanguinea*) and Guelder Rose (*Viburnum opulus*), See Table 1. The hedgerow shrubs will be planted as a mixture, but with the supplementary species (Guelder Rose, Spindle and Dog Wood) distributed in groups of 3 or 4 ensuring that the plants are incorporated into both rows and not in a single line within one row. The hedgerow shrubs will be individually protected by 0.6 m Tubex wide mouthed shrub guards supported by a 0.75 m pressure treated softwood stake, or by 0.6m spiral guards supported by a cane. The hedges will be maintained until fully established with losses replaced annually, and then managed by biennial flailing to achieve the characteristic low box profile shape. The hedgerow mix is beneficial to wildlife and planting to the following specification;

PLANTING SCHEDULE				
HEDGEROW MIX (As necessary)				
SPECIES	DENSITY	AGE	ROOT	HEIGHT
10% Blackthorn (*Prunus spinosa)*	0.45m	1+1 or 1/1	BR	40-60cm
50% Hawthorn (*Crataegus monogyna)*	0.45m	1+1 or 1/1	BR	40-60cm
10% Guelder Rose (*Viburnum opulus)*	0.45m	1+1 or 1/1	BR	40-60cm
10% Dog Rose (*Rosa Canina)*	0.45m	1+1 or 1/1	BR	20-30cm
5% Dog Wood (*Cornus sanguinea)*	0.45m	1+1 or 1/1	BR	20-30cm
5% Holly (*Ilex aquifolium)*	0.45m	1+1 or 1/1	CG-3l	40-60cm
10% Hazel (*Corylus avellana)*	0.45m	1+1 or 1/1	BR	40-60cm

Table 1.- Hedgerow Planting Mix

Habitat Bank/Pile

To provide a shelter for small mammals and herpetofauna, an artificial refugia/hibernaculum to be created in the south-west corner of the site. This will also serve as a receptor site in the event any wildlife needs relocating away from the working areas.

Grassland Seeding

Areas of bare soil and disturbed ground (bunds, spoil piles etc.) to be seeded with a species rich wildflower grass seed mix such as Emorsgate EM-4, EM-2F or WFG20 species rich amenity grass. This would make a positive contribution towards a biodiversity net gain as the existing grassland is predominantly nutrient enriched improved grassland.

Lighting Strategy

Any new external lights within the site or attached to the replacement building will be set on a motion detector and positioned in such a way that they do not shine on any of the proposed bat box access points or the likely commuting and foraging routes of bats (hedgerows and trees). Low intensity lighting should be used where possible in place of high intensity discharge or sodium lamps; this will minimize disturbance to foraging and commuting bats.

In accordance with the Bat Conservation Trust's publication *Bats and lighting in the UK* (ILP/BCT, 2018) light pollution by artificial lighting will be kept to a minimum and light spillage avoided. The following specific mitigation will be put in place to minimise disturbance to bats caused by the lighting of the site:

- Lights will be pointed away from major bat flyways and foraging areas (tree lines, hedgerows);
- Screen planting will be wide and tall to maintain natural light conditions away from the site;
- LED light will be used instead of mercury or metal halide lamps;
- The light will be directed only to where it is needed, for example, by the use of hoods;
- The lighting levels will be as low as possible without compromising safety;

LIGHTING:

No additional lighting has been proposed or specified for the site. It is anticipated that some low wattage LED mood lights may be used within amenity areas (e.g. patio/decking areas). In the event that any security or flood lights are required on the building or other structures then a lighting calculation must first be submitted and approved by the LPA which would show luminescence and lux contours to demonstrate that any potential bat foraging/commuting areas won't be impacted. The recommendations contained within this report are based on the latest guidance: *Bat Conservation Trust (BCT) Guidance Note 08/18 Bats and artificial lighting in the UK: Bats and the Built Environment* series. The main habitat features likely to be used by bats is the hedgerow and trees running along the east field boundary, as such any new external lighting must be designed to avoid illuminating these areas.

Legal Requirements for Lighting

It is important to remember that there is no legislation requiring an area or road to be lit. The building regulations for domestic buildings specify that 150 watts is the maximum for exterior lighting of buildings but this does not apply to private individuals who install their own lighting. There are a number of British Standards that relate to various components of lighting – BS5489 for road lighting, BS12164 for outdoor workplaces, BS12193 for sports lighting – and there are also guidelines that relate to crime prevention, prevention of vehicular accidents and amenity use. BS5266-1:2011 relates to the design of emergency lighting and specifies that the minimum lighting level within an escape route from a building is 1 lux. While this represents an increase in lighting, because of the nature and infrequent use of emergency lighting (as most systems are non-maintained – off unless an emergency occurs) this should not pose an issue to bats.

Appropriate Luminaire Specifications

The following guidance was considered when choosing luminaires:

• All luminaires should lack UV elements when manufactured. Metal halide, fluorescent sources will not be used.
• LED luminaires will be used due to their sharp cut-off, lower intensity, good colour rendition and dimming capability.
• A warm white spectrum (ideally <2700 0Kelvin) will be adopted to reduce blue light component.
• Luminaires will feature peak wavelengths higher than 550nm to avoid the component of light most disturbing to bats (Stone, 2012).
• Internal luminaires will be recessed where installed in proximity to windows to reduce glare and light spill.
• The use of specialist low-level downward directional luminaires to retain darkness above will be used (See Figure 3.0)
• Column heights will be carefully considered to minimise light spill.
• Only luminaires with an upward light ratio of 0% and with good optical control will be used – See ILP Guidance for the Reduction of Obtrusive Light.
• Luminaires will be mounted on the horizontal, i.e no upward tilt.
• The external lights will be set on motion-sensors (PIR) and short (1-2min) timers.
• As a last resort, accessories such as baffles, hoods or louvres can be used to reduce light spill and direct it only to where it is needed.

Proposed Lighting Locations and Specification of Lights

In accordance with the Bat Conservation Trust's publication *Bats and artificial lighting* (BCT, 2018) light pollution by artificial lighting will be kept to a minimum and light spillage avoided. The following specific mitigation will be put in place to minimize disturbance to bats caused by the lighting of the site. The following mitigation strategies have been taken from Bat Conservation Trust Landscape and Urban Design for Bats and Biodiversity (Gunnell et al., 2012) and other referenced sources:

- Minimise light spill by eliminating any bare bulbs and upward pointing light fixtures. The spread of light should be kept near to or below the horizontal plane, by using as steep a downward angle as possible and/or shield hood. Flat, cut-off lanterns are best;
- Use light sources that emit minimal ultra-violet light (van Langevelde and Feta, 2001) and avoid the white and blue wavelengths of the light spectrum, so as to avoid attracting insects and thus potentially reducing numbers in adjacent areas;
- Limiting the height of lighting columns to eight metres and increase the spacing of lighting columns (Fure, 2006) can reduce the spill of light into unwanted areas;
- Avoid using reflective surfaces under lights or light reflecting off windows (e.g. on to trees);
- Only the minimum amount of light needed for safety and access should be used and or turned off when the site is not in use;
- Artificial lighting proposals should not directly illuminate boundary habitats, which may be of value to foraging or commuting bats and birds (e.g. green corridors);
- Lighting that is required for security reasons should use a lamp of no greater than 2000 lumes (150 Watts) and be PIR sensor activated, to ensure that the lights are not on only when required (Jones, 2000; Collins, 2016);

Responsibility for Implementing Enhancement Measures

The implementation for the enhancement measures will be the responsibility of the site owner. A letter of compliance with the above recommendations to be submitted to the LPA prior to the replacement buildings first being brought into use in accordance with Condition 4.

Contingency Procedures

In the event that breeding birds, roosting bats, herpetofauna or other protected species are found during the works the following procedures would be followed:

- An appropriately qualified ecologist would be contacted immediately and all work in the vicinity should cease until the ecologist has been able to make an assessment of the situation.
- If nesting or ground nesting birds are found within the working area following commencement of works, a buffer zone would be marked around the nest using high-visibility fencing and the nest subsequently monitored by an ecologist to ensure that the nest is not disturbed, damaged or destroyed by operations.

Proposed Activity	Comments	2023												2024											
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Key Works - timings permissible with regards to Great Crested Newts and reptiles																									
Method Statement Timings																									
Pre-construction																									
Ground flora in clearings	Maintain short throughout all works stages of the development																								
Scrub removal																									
Debris removal	Under supervision of ecologist, outside hibernation period																								
Tree felling (if undertaken)	To ground level but leaving stump																								
Stump removal (if undertaken)	To be supervised by ecologist																								
Construction Phase																									
Fencing, if required																									
Construction	Following site clearance works																								
Material storage	Throughout construction																								
Appropriate Incident Controls																									
Post construction																									
Habitat Creation																									

Table 2- Management Plan and Timings

Task	Month	Comments
Enhancement		
Installation of bat boxes	Any	To be installed following manufacturers specification, prior to occupation of the building. Location in Figures 1.
Installation of bird boxes	Any	To be installed following manufacturers specification, prior to occupation of the building. Location in Figures 1.
Seed wildflower	March until October	Sow according to suppliers specifications.
Plant trees	October until April	Trees and shrubs to be planted, protected and supported following industry best practice. Mulch to be provided around tree base.
Habitat Management		
Check bat boxes externally	October to February	Replace lost or damaged boxes. Ecologist to check damaged bat box prior to removal if it can't be seen from the ground that it is empty.
Mow wildflower	Spring Autumn	Grasses will start to grow before the wildflowers, a spring cut in April down to 10cm will reduce competition from grasses. Remove all grass cuttings to avoid adding fertility back to soil. Make a 'hay cut' to 10cm, leave cuttings to dry on surface for a week allowing cut flowers to shed their seed. Rake cuttings. Annual seeds need to reconnect with the soil, vigorous raking is required to break the surface.
Watering of trees	May to September	Provide ample weekly watering during long hot periods.
Check trees	October to March	Dead or unhealthy trees to be replaced before end of subsequent April. Mulch, supports and protective measures to be replaced if required

Table 3- Management Plan and Timings

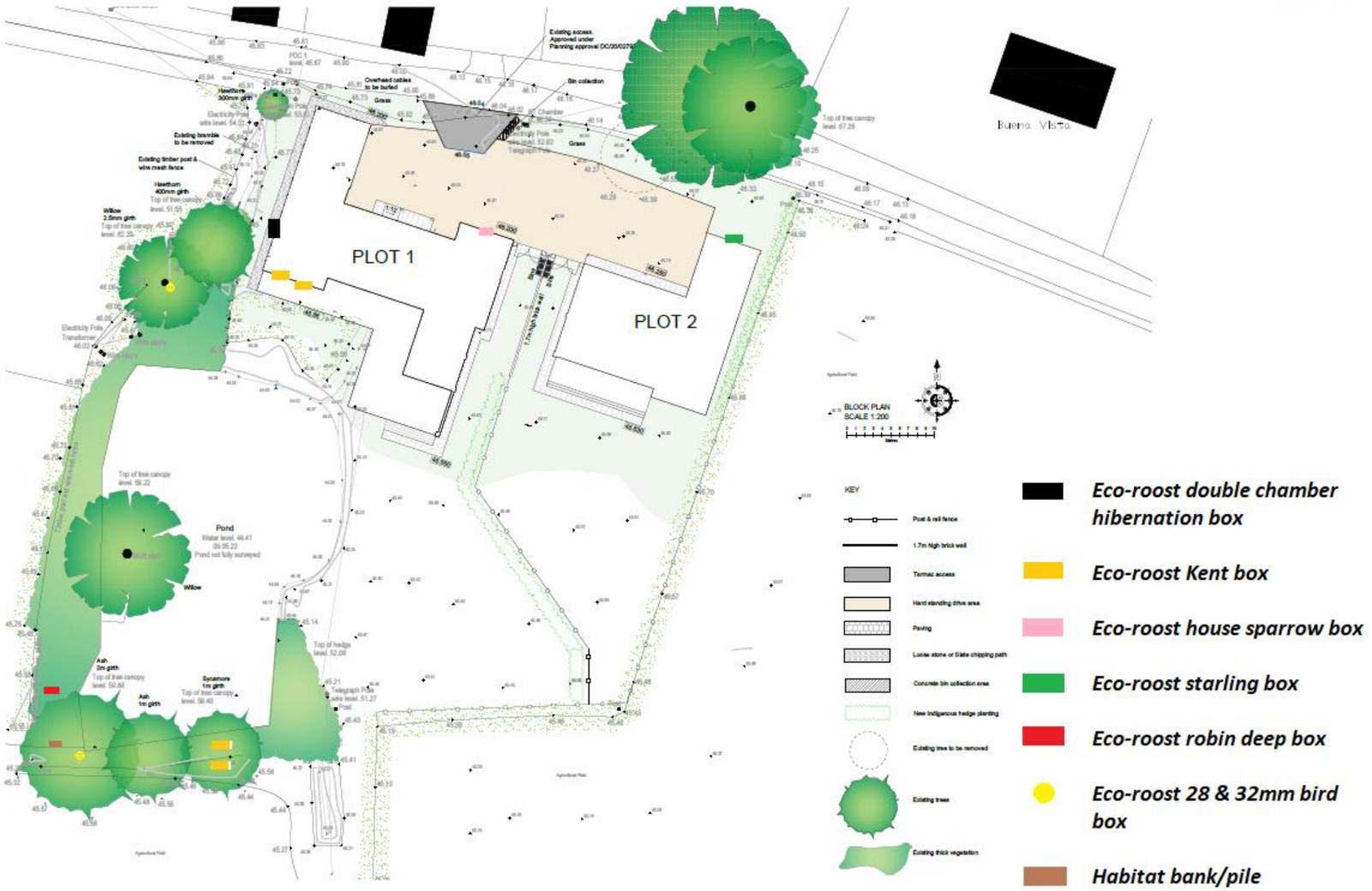

Figure 1- Proposed biodiversity enhancement measures.

Eco-Roost Bat Brick	
Eco-Roost Double Chamber Hibernation Bat Box	
Eco-Roost Double Kent Box	
Eco-Roost 28mm, 32mm and Open fronted bird boxes	
Double House Sparrow Box	

Figure 2- Bird and Bat Boxes to be Installed on-site

SureScreen Scientifics

Folio No: [illegible]
Report No: 1
Purchase Order: [illegible]
Client: GREENLIGHT
Contact: [illegible]

TECHNICAL REPORT

ANALYSIS OF ENVIRONMENTAL DNA IN POND WATER FOR THE DETECTION OF GREAT CRESTED NEWTS (TRITURUS CRISTATUS)

SUMMARY

When great crested newts (GCN), *Triturus cristatus*, inhabit a pond, they continuously release small amounts of their DNA into the environment. By collecting and analysing water samples, we can detect these small traces of environmental DNA (eDNA) to confirm GCN habitation or establish GCN absence.

RESULTS

Date sample received at Laboratory: 05/03/2020
Date Reported: 14/03/2020
Matters Affecting Results: None

Lab Sample No.	Site Name	O/S Reference	SIC	DC	IC	Result	Positive Replicates
2147	Pond 1, Buenavista	TM 28325 81176	Pass	Pass	Pass	Negative	0
2148	Pond 2, Buenavista	TM 28408 81313	Pass	Pass	Pass	Negative	0

If you have any questions regarding results, please contact us: ForensicEcology@surescreen.com

Reported by: Chris Troth **Approved by:** Sarah Evans

Forensic Scientists and Consultant Engineers
[illegible]
Page 1 of 2

Greenlight Environmental Consultancy Limited
Company Registration 07440122
VAT Registration 102692537

Figure 3- great crested newt eDNA results report May 2020