



PROPOSED RESIDENTIAL DEVELOPMENT:

**LAND OFF CARDIFF ROAD / CROSS COMMON ROAD,
DINAS POWYS**

ECOLOGICAL DESIGN STRATEGY

AUGUST 2017

Edenstone Homes
First Floor, Building 102
Wales One Business Park
Magor
NP26 3DG



Celtic Ecology
Council Offices
Newport Road
Bedwas
Caerphilly
CF83 8YB
info@celtic-ecology.co.uk
www.celtic-ecology.co.uk

Page intentionally left blank

EDENSTONE HOMES

Land at Cardiff Road / Cross Common Road, Dinas Powys: Proposed Residential Development

Ecological Design Strategy

Document control

Issue	Stage	Author	Checked	Approved	Date
1	Issue	HD	JK	HD	31.08.2017

Contents Amendment Record

This report has been issued and amended as follows:

Issue	Revision	Description	Approved by	Date
1	A	Amendment to site area	HD	11.09.2017

Disclaimer

No part of this report may be copied or reproduced by any means without prior written permission from Celtic Ecology. If you have received this report in error, please destroy all copies in your possession or control.

This report has been prepared for the exclusive use of the commissioning party and unless otherwise agreed in writing by Celtic Ecology, no other party may use, make use of or rely on the contents of the report. No liability is accepted by Celtic Ecology for any use of this report, other than for the purposes for which it was originally prepared and provided.

Opinions and information provided in the report are on the basis of Celtic Ecology using due skill, care and diligence in the preparation of the same and no explicit warranty is provided as to their accuracy.

CONTENTS

NON-TECHNICAL SUMMARY	1
1 INTRODUCTION.....	2
1.1 OBJECTIVE	2
1.2 IMPLEMENTATION	2
1.3 MITIGATION STRATEGY	2
1.4 RESPONSIBILITES	4
1.5 SITE DESCRIPTION	4
1.6 PROPOSED DEVELOPMENT	5
2 REGULATORY FRAMEWORK.....	6
2.1 INTERNATIONAL	6
2.2 NATIONAL (UK)	6
2.3 NATIONAL (WALES)	6
2.4 LOCAL AND REGIONAL	7
2.5 PLANNING FRAMEWORK	7
3 ECOLOGICAL DESIGN.....	8
3.1 BATS	8
3.2 DORMOUSE	9
3.3 GREAT CRESTED NEWT	14
3.4 OTTER	15
3.5 BREEDING BIRDS	15
3.6 REPTILES	16
4 HABITAT MANAGEMENT	18
4.1 GRASSLAND	18
4.2 HEDGEROWS	18
4.3 TREES	19
4.4 WATERCOURSES	19
5 MONITORING	20
6 GENERAL MITIGATION AND CONSIDERATIONAS	21
7 REFERENCES	22
APPENDIX A	23
APPENDIX B	25
APPENDIX C	27

Drawings

P100 Planning Layout	
P100 Planning Layout (Ecology Annotations)	
10157-105-02 ACO Wildlife Kerbs detail	

NON-TECHNICAL SUMMARY

A planning application has been made to the Vale of Glamorgan Council requesting approval of all reserved matters and discharge of conditions relating to Outline Permission 2015/00392/OUT granted on 10th July 2017 for the construction of 50 private dwellings, gardens and associated infrastructure.

The relevant ecological conditions are:

- 1) Condition 15 requires that the development is undertaken in accordance with the Ecological Mitigation Strategy Rev C (Celtic Ecology, February 2016) and letter from Celtic Ecology November 2015).
- 2) Condition 17 of the outline permission required the production of an Ecological Design Strategy, including relevant method statements.
- 3) Condition 18 requires that the LPA be provided with a copy of a development licence issued by NRW in respect of dormice on the development site.

This document therefore provides the requested information to ensure the safety of protected species (reptiles, birds and amphibians) during the site clearance and construction phases, measures to maintain and enhance biodiversity and management of habitats post development.

It should be noted that mitigation and method statements in respect of dormice are not included in this document as these will be provided in a specific dormouse development licence application to Natural Resources Wales in order to fulfil condition 18.

1 INTRODUCTION

1.1 OBJECTIVE

The objective of this document is to:

- Ensure the safety of protected species in accordance with Policy MD9 of the Local Development Plan.

This will be achieved by providing method statements to ensure:

- that site clearance is undertaken in such a manner as to avoid harming protected species;
- that measures are implemented during the development to maintain and enhance biodiversity on the site following completion of the development; and
- that management prescriptions for retained and new habitats are provided.

A number of ecological reports and documents have been provided for the site and development. The relevant ecological documents are as follows:

- Preliminary Ecological Appraisal - land at Cross Common Road, Dinas Powys Rev A (Celtic Ecology, February 2015)
- Letter: Ecological Response to NRW (Celtic Ecology, November 2015)
- Ecological Mitigation Strategy - Cross Common Road, Dinas Powys: Proposed Road and Residential Development Rev C (Celtic Ecology, January 2016)
- Cross Common Road, Dinas Powys - dormouse licence method statement Rev C) Celtic Ecology, October 2016)
- Ecology Design Statement and Management Plan for Land off Cross Common Road, Dinas Powys for Edenstone Homes (TerrAqua Ecological Services Ltd, June 2017) (Unpublished)
- Land off Cross Common Road, Dinas Powys: Bat Tree Assessment for Edenstone Homes (TerrAqua Ecological Services Ltd, July 2017)

1.2 IMPLEMENTATION

This Ecological Design Strategy will implement the principles of the Ecological Mitigation Strategy as described in section 1.8 of that Strategy as the Construction Environment Management Plan (CEMP) as described in the planning permission does include matters relating to ecology.

1.3 MITIGATION STRATEGY

The following details are taken directly from the Ecological Mitigation Strategy.

1.3.1 Management Principles

Protected species are present on the site as are a number of ecologically valuable habitats. In order to protect these during the construction and operational phases of the development, this mitigation strategy has the following principles:

- 1) Avoidance and minimisation of adverse impacts at the design stage;

- 2) Establishment of ecological parameters and mitigation requirements in advance of detail planning design;
- 3) Minimisation of adverse impacts through the use of method statements;
- 4) Implementation of appropriate mitigation and compensation in advance of works;
- 5) Provision of a robust management plan;
- 6) Provision of robust and effective monitoring of mitigation and compensation; and
- 7) Provision of appropriate and timely remedial action should it be necessary.

1.3.2 Mitigation Strategy Focus

This strategy focuses on five specific ecological features: bats, dormice, great crested newts and reptiles and breeding birds.

This approach will provide an appropriate level of mitigation and protection. This approach is possible due to the improved (through grazing horses and ponies) nature of the site and the reduced ecological value of the majority of the site's total area i.e. the habitats and species present on the site are limited to specific areas as a result of the current land use and management practices in place across the site.

Additionally, there are certain species which would usually require mitigation as a result of this size and type of development. However, in this instance, the way in which they use the site and the features means that direct mitigation will not be required as the mitigation for the direct loss of a certain feature will benefit the species in question. For example, the loss of hedgerows would result in the loss of dormouse habitat and habitat suitable for foraging bats; The presence of dormice requires that mitigation is put in place for all the ecological impacts i.e. directly mitigating for the loss of hedgerows, functional dormouse habitat and bat foraging and commuting habitat.

The mitigation for each feature will be set out individually following a summary of the survey information / on-site information and impact assessment with a summary of the proposed mitigation.

Table 1 - mitigation subject and recipients

Mitigation subject	Additional ecological features covered
Dormouse	Hedgerows
	Bats
	Breeding birds
	Continuous and scattered scrub
	Reptiles
Bats	Hedgerows
	Dormouse
	Breeding birds
	Scattered trees
Otters	Cadoxton River & riparian corridor
Great crested newt	Open water (standing)
	Reptiles
Breeding birds	Breeding birds
Reptiles	Amphibians (great crested newt)

1.4 RESPONSIBILITES

The responsibility for the implementation of this strategy lies with Edenstone Homes and their respective employees, consultants, contractors, sub-contractors and agents employed for and involved in the delivery and management of the development during the site clearance and construction phases of the development.

Edenstone Homes will take responsibility for the establishment of the mitigation. Ongoing implementation of the mitigation and management plans will be taken over by the successful housing developer and included within a Section 106 agreement for the site to ensure its continued deliverability. There are various models of management which could be applied, for example the use of a Private Management Company established as part of the S106 agreement covering the site.

1.5 SITE DESCRIPTION

The site is approximately 2.16ha in size and is located in Dinas Powys, south west of Cardiff (centred on NGR ST 154704; Figure 1). The site comprises of three fields, field one is a poor semi improved grassland, currently used as horse turnout, with scrub/hedgerow boundaries. Field two is a semi –improved neutral grassland situated on a gently sloping aspect from east to west. The bramble (*Rubus fruticosus*) scrub boundaries consist predominantly of blackthorn (*Prunus spinosa*), with remnants of hazel (*Corylus avellana*), elder (*Sambucus nigra*) and pedunculate oak (*Quercus robur*). Field three is a semi-improved neutral grassland, fringed by woodland, the woodland consisting frequently of blackthorn and bramble, the occasional hawthorn (*Crataegus monogyna*), hazel, sycamore (*Acer pseudoplatanus*), and white poplar (*Populus alba*), with locally abundant patches of brooklime (*Veronica beccabunga*) and floating sweet-grass (*Glyceria fluitans*).

South of the site is Shortlands Wood (SINC), which leads to open fields with scrub/hedgerow boundaries, providing relatively intact connectivity towards the wider wooded landscape. To the west of the site is the A4055 which runs parallel with the Cadoxton River and neighbours Parc Bryn-Y-Don which again provides relatively good connectivity to the wider landscape to the west. North of the site is a large built up residential area.

Figure 1 - location of the site (individual numbered)



Imagery©2015, map data ©2015 Google

1.6 PROPOSED DEVELOPMENT

It is proposed to construct 50 dwellings, both private and social housing, on the site with gardens and associated infrastructure.

2 REGULATORY FRAMEWORK

2.1 INTERNATIONAL

European Union legislation requires that member states designate sites for the protection of habitats and species included in the annexes of both Council Directive 92/43/EC on the Conservation of Natural Habitats and of Wild Flora and Fauna (the Habitats Directive) and Council Directive 79/409/EEC on the Conservation of Wild Birds (the Birds Directive). This legislation is implemented in the UK by the Conservation of Habitats and Species Regulations 2010 (as amended) (“the Habitat Regulations”). This results in sites being designated as Special Areas of Conservation (SACs) and Special Protection Areas respectively (SPAs).

2.2 NATIONAL (UK)

The Wildlife and Countryside Act 1981 (as amended) allows sites to be designated as Sites of Special Scientific Interest (SSSI) for one or all of the following categories:

- Flora;
- Fauna;
- Habitat; and
- Geological importance.

European designated sites are automatically designated as SSSIs prior to their designation.

The relevant legislation includes:

- The Town and Country Planning (Environmental Impact Assessment) (England and Wales) Regulations 1999 (as amended);
- The Conservation of Habitats and Species Regulations 2010 (as amended);
- The Wildlife and Countryside Act 1981 (as amended);
- Countryside and Rights of Way Act 2000;
- Environment (Wales) Act 2016
- Wild Mammals (Protection) Act 1996;
- The Protection of Badgers Act 1992; and
- The Hedgerow Regulations 1997.

Section 40 of the Natural Environment and Rural Communities Act 2006 (as amended) requires all public bodies to have regard wherever possible to conserving biodiversity. Section 42 of the Act requires that a list of habitats and species of Principle Importance for the Conservation of Biological Diversity in Wales be produced.

Biodiversity Action Plans (BAPs) are tools which are used to monitor, manage and enhance those habitats and species which are of significance to an area or organisation, The United Kingdom BAP lists a number of priority habitats and species which are of conservation concern.

2.3 NATIONAL (WALES)

Planning Policy Wales (Welsh Assembly Government, 2002) and Planning Policy Wales Technical Advice Note 5: Nature Conservation and Planning (Welsh Assembly Government, September 2009) set out the protection given to wildlife (sites, habitats and species) by the planning system operational in Wales.

The Environment (Wales) Act 2016 requires that all public authorities, when carrying out their functions in Wales, seek to “maintain and enhance biodiversity” where it is within the proper exercise of their functions. In doing so, public authorities must also seek to “promote the resilience of ecosystems”.

This ensures that biodiversity is an integral part of the decisions that public authorities take in relation to Wales. It also links biodiversity with the long term health and functioning of our ecosystems, therefore helping to align the biodiversity duty with the framework for sustainable natural resource management provided in the Act.

In Wales, this legislation replaces and enhances the Natural Environment and Rural Communities Act (2006) which sought to raise the profile of biodiversity and to make sure that it is considered in all local authority decisions by ensuring that “Every public authority must, in exercising its functions, have regard, so far as is consistent with the proper exercise of those functions, to the purpose of conserving biodiversity.”.

Other elements of NERC 2006 may still apply.

2.4 LOCAL AND REGIONAL

The proposed development is wholly within the Vale of Glamorgan Council area of responsibility. Therefore, all policies adopted by the Council will apply.

Please note that there may be policies and sections of other policies which are not specific to nature conservation or the natural environment that may apply or be relevant and should be considered during the planning process.

2.5 PLANNING FRAMEWORK

The proposed development will be undertaken wholly under the auspices of the Town and Country Planning Act 1990 (as amended).

3 ECOLOGICAL DESIGN

The development will include a number of features designed to protect wildlife as required by the Ecological Mitigation Strategy and the relevant planning conditions.

These will be identified by species and species groups. Method Statements, where appropriate, will also be included.

Please note that measures in respect of dormice will be included within the development licence application to Natural Resources Wales.

3.1 BATS

3.1.1 Summary

Activity transect surveys of the site and emergence and dawn return to roost surveys of a number of trees were undertaken in July 2017 (TerrAqua Ecological Services Ltd).

There are no buildings on the site which could offer roosting sites for bats.

A number of trees were identified as being used by roosting bats. No classification of the roost type or status was provided; therefore, all trees will be treated as if they are probable maternity roosts.

A range of bat species were identified foraging over and commuting across the site.

3.1.2 Bats - mitigation measures

A number of mitigation measures are proposed in respect of bats. These are designed to retain bat roosting sites and maximise the availability of habitats post development for bats.

Mitigation features for bats are noted on Drawing 100 Planning layout as annotated by Celtic Ecology.

3.1.2.1 General

A total of seven (7 no.) bat boxes will be installed within the gable ends of selected properties with the entrances no less than 500mm below the apex height, thus allowing for installation at between 5-6m (as per guideline standards). These boxes will be of an integral design and will be installed during the build of each relevant property. The locations of the boxes are shown on drawing P100 Planning Layout (as annotated by Celtic Ecology). The boxes will be either Schwegler 1FR bat tubes integral to the construction of the house or if the box is mounted externally, will be a Schwegler 1WQ bat box.

Two (2 no.) American style bat boxes (design at Appendix A) will be erected on the line of the landscape planting immediately to the north of the attenuation pond.

3.1.2.2 Foraging and commuting bats

- All vegetation and tree clearance will be minimised;
- Retained hedges are currently gappy and will therefore be planted up and managed to provide dense continuous vegetation cover;
- Additional landscape planting will be provided to ensure a dark corridor across the site;
- Any and all lighting will be directed away from site boundaries and / or baffled to maintain them as dark flight lines and foraging areas for bats; and

- Lighting on the development site will be minimised and be of a type which causes least impact on bats;

3.1.2.3 Trees

The trees with confirmed roosts are all either on the development boundary or within the development site boundaries and are therefore under the control of the developer. None is within the garden of any proposed housing, although smaller branches may overhang.

- All trees with identified roosts will be retained;
- In the event that pruning of trees overhanging private gardens is required, it will not be allowed without full ecological investigation and the implementation of any necessary permissions; permission will have to be sought from the site managers (names / body to be advised, but in the first instance Edenstone Homes);
- The deeds of housing plots where identified tree roosts overhang gardens will state that there is to be no pruning or felling without the necessary ecological surveys and / or permissions being in place;

General mitigation measures in respect of trees and bats:

- As the availability of trees to bats can change rapidly e.g. due to weather (wind), lightning strike etc., all trees requiring felling or pruning will be subject of a ground based assessment followed if necessary by climb and inspect surveys to provide an accurate reclassification of the tree; emergence / dawn return to roost surveys may also be required. Licences will be sought should bats be discovered;
- All felling and pruning operations will be supervised by a licensed bat ecologist;
- A licensed bat ecologist will be "on call" for the duration of the project in the event that bats are discovered, in which case the work will cease immediately, Natural Resources Wales (NRW) will be contacted. A development licence may be required prior to any further work being carried out. No further work will be undertaken without the approval of NRW.

3.2 DORMOUSE

Please refer to the separate development licence application, method statement and associated documents. However, a summary of the proposed mitigation is provided below.

3.2.1 Habitat removal, retention and new planting

A combination of hedgerow retention, enhancement and buffering and new planting will ensure that functional dormouse habitat is provided on three of the four sides of the development. A wildlife corridor will be provided across the centre of the development. All existing woodland adjacent to the site will be retained and positive conservation land management instigated. This will make maintenance of the Favourable Conservation Status (FCS) of dormice easier compared to both the unmanaged and unbuffered retention of hedgerows within the development and the existing state of hedges on the development site, a large number of which while suitable for dormouse, are not connected or suitable for any purpose other than dispersal.

3.2.2 Retained hedgerows and habitat corridors

All gaps in the retained hedgerows will be planted using native local provenance species. The hedges will also be buffered, providing a strip of 3m wide between the existing hedge and the

new development. Housing units will preferentially back or side onto hedges and buffers with gardens bounded by close boarded fencing. The buffers will be used to increase the effective width of the hedge and add biodiversity value in excess of that currently available across the development site by planting hazel and other native shrubs as well as thorn bearing plants such as native roses, bramble, hawthorn and blackthorn in order to deter access by humans and also, as far as possible, domestic cats.

All road and path side hedges will be trimmed on their roadside faces only to a minimum of 3m high (winter cut level) no more frequently than every 2 years. Trimming will result in an angled face, encouraging thicker and denser growth at the base of the hedge

Once hedges have reached a minimum height of 3m, they may be laid.

Buffers will be coppiced on a rotation to be determined in year 5 based on conditions on site and assumed growth rates from thereon. It is assumed that the rotation will be of between 7 and 12 years. A longer rotation would allow better development but would result in "leggier" plants, thereby potentially allowing access by humans.

From Year 9, with the exception of road and path side hedges, the hedge laying rotation length will be 20 - 25 years, the exact length to be determined in response to on site conditions and growth rates.

3.2.3 Translocated vegetation

All translocated plants will be monitored for failures. All failed plants will be removed and replaced in the first available planting season.

3.2.4 New planting

All planting will be monitored for failures. All failed plants will be removed and replaced in the first available planting season.

The area of woodland planting will be included within the management plan for Shortlands Wood. However, the management of the planting for first 5 years following planting will be designed to ensure planting success and managed by the planting contractor. All failures will be replaced as soon as possible / appropriate.

A coppicing regime will be implemented; it is anticipated that this will be in year 7 following planting or once plants have reached a minimum height of 3m whichever is earlier.

3.2.5 Clearance methodology

Where hedgerow and scrub clearance is required, it will be supervised by a suitably experienced and licensed ecologist and undertaken in accordance with methods outlined in the *Dormouse Conservation Handbook* (Bright et al, English Nature 2006) to minimise risks to any dormice that might be present.

The work will all be undertaken under the auspices of a Natural Resources Wales development licence and associated Method Statement.

There will be a detailed search of both above ground vegetation and ground layers by the supervising ecologist immediately prior to the above ground clearance to check for animals / nests. In the unlikely event that a dormouse is found, it will be moved to a place of safety (nest box) in the nearest and / or best connected hedge, scrub or woodland vegetation. Should a nest be found, it will be moved to the nearest and / or best connected retained hedge, scrub or woodland vegetation. If it is occupied by dependant young (baby or juvenile dormice), it will be left in situ and works to coppice or clear the hedge will be postponed until such time as it is

vacated naturally; NRW will be informed immediately and consulted on as to the best way forward.

As dormice hibernate at or below ground level, all vegetation will be cut to 300 - 500mm above ground level using hand tools (chain saws and brushcutters) between mid November and early - mid March inclusive with all the arisings removed from the work area immediately. All coppicing of hedges in November will be preceded by a hand check for nests by a suitably licensed and experienced ecologist. Any hedges coppiced between December and March will not require a hand check. All coppicing and clearance operations will be supervised by the licensed ecologist. No ground breaking operations will be permitted at this stage.

Ground breaking operations will only be permitted in April (at the earliest) or once temperatures have warmed up sufficiently to allow dormice to come out of hibernation and move away to safe areas.

(This methodology also prevents any conflict with breeding birds as there will be no vegetation for them to breed and reptiles because there will be a fingertip search of nearly bare ground habitat during the reptiles' active season which will prevent reptiles being injured or killed during the process).

3.2.6 Woody vegetation translocation

Translocation of plants involves the excavation of the plants, retaining the maximum amount of root growth and associated soil as possible.

Translocations will take place in two phases in order to prevent harming or disturbing dormice during both the active and hibernation seasons. The initial coppicing of the hedges will take place in the winter (between December and March inclusive), with excavation and replanting only taking place after dormice have become active, usually during April. The coppicing of hedges during the winter also ensures that there will be no conflict with breeding birds.

It should be noted that year to year differences in weather patterns mean that it may not be possible to translocate hedges until later in the year.

At Natural Resources Wales' direction, only 100m of any one hedge may be translocated in any one year. However, it is considered that this will not be a factor as each section of hedgerow to be cleared is less than 100m.

As outlined in the clearance methodology above, to avoid killing, injuring or disturbing dormice during their active season, hedges will be coppiced in the winter months and excavated during the late spring.

- Hedgerow roots will extend laterally to obtain water and nutrients and roots will also extend along the line of the hedgerow. Where necessary roots will be cut by, or under the supervision of, the Ecological Clerk of Works during the lifting operations to prevent damage to the adjoining sections of the hedge;
- To compensate for the inevitable loss of roots the donor site hedgerow will be cut back to between 0.3 - 0.5m above ground level prior to removal. This coppicing will make the hedgerow easier to lift and handle. It is anticipated that although the 'instant' hedge effect will not be possible, the chances of successful translocation of the hedge are greatly increased and the time taken for reestablishment will be significantly quicker than establishing new planting with re-growth from the base of the plants reaching the original height within 3 years of translocation;
- The hedgerow sections will be removed and transported to their new location using appropriately sized machinery with appropriate buckets fitted. Each section will be

translocated to its new location immediately upon lifting. This will avoid roots, particularly fibrous roots, becoming desiccated;

- The replanting location (translocation site) will have been prepared prior to the commencement of the ground breaking exercise. This will comprise a trench mirroring the donor site's excavation depth. The base of the trench will be broken up to allow for free drainage and the quick establishment of new roots;
- Loose topsoil will be placed around the plant roots as they are positioned into the trench;
- Firming-in of the plants will be undertaken to ensure that air pockets do not exist around the roots that could prevent nutrient and water uptake and prevent root damage as a result of exposure;
- Immediately following the translocation, the hedgerow will be watered-in. This will assist in soil settlement around the roots;
- All operations will be undertaken under the guidance of suitably experienced ecological clerk of works (who must hold a dormouse licence or be an accredited agent of a licence holder);
- For a minimum of two years following the translocation the hedgerow will be watered during periods of excessive dry weather and any gaps will be in-filled with sapling hedgerow trees and shrubs (hazel, blackthorn, hawthorn);
- Any and all lighting will be directed away from hedgerows, woodland and scrub areas, and in particular the habitat corridors to reduce light pollution and disturbance to dormice;
- Protective fencing will be required to prevent any possibility of damage to new planting from construction related activities until the hedge is fully established. This will comprise post and stocknet fencing (where close boarded / feather edged garden fencing is not proposed for plot boundaries) which will be constructed on the outside edge of ecological buffer strips. This will be installed immediately after translocation and planting;
- Retained hedgerows and their buffers will be fenced in a similar fashion;
- Management of retained, translocated and newly planted hedgerows and other habitat will be sympathetic to dormice i.e. there will be no intensive flailing of hedges or aggressive scrub and woodland management wherever this does not conflict with other regulatory requirements (e.g. highways). The management will be in accordance with the recommendations contained in *Hedgerows a guide to wildlife and management* (PTES) and *Hedgerow management, dormice and biodiversity* (English Nature, Report 454, 2002); and
- Oscillating blade cutters will be used in preference to hammer flails).

3.2.7 Hedgerow planting

The species chosen will reflect the woody species diversity currently found on the site in the species rich and important hedges. Therefore, there will be a species list comprising the following:

- Hawthorn;

- Blackthorn;
- Holly;
- Field Maple;
- Dogwood;
- Wild privet;
- Honeysuckle; and
- Hazel.

Other species will be allowed to regenerate naturally.

NOTE: ash will not be planted due to the risk of spreading ash die-back disease. Oak trees will be planted as heavy standards next to retained, translocated and new planted hedges and in buffer strips.

3.2.8 Habitat connectivity

Currently, the site is well connected to other suitable dormouse habitat via dense, bushy hedgerows. This connectivity will be retained. Gaps in the existing hedges will be planted up and the hedges buffered thereby enhancing the overall habitat and connectivity.

Where there are breaks in a hedgerow, they will be infilled using native shrub and tree species typical of the hedge to ensure a continuous canopy over the break. This planting will take place at the same time as all other ecological and landscape planting.

Shorter gaps ($\leq 5\text{m}$) over footpaths and cycleways will be crossed using a simple rope bridge formed by a wooden pole at either end with four loosely twined natural fibre ropes between them. The poles will be stayed with natural fibre ropes. Again, Advanced Nursery Standard or Extra Heavy Standard trees will be used to provide canopy cover; if this is not possible, plants will be allowed to develop into hedgerow trees to provide that cover. Additional planting of climbing species will also be used at the base of the poles which will also have coils of natural fibre rope around them.

3.2.9 Lighting

The lighting design will ensure that there will be no lighting of any hedge, buffer or habitat corridor unless it is an absolute requirement (due to safety concerns and / or design standards). This is to be finalised by the lighting team at the Vale of Glamorgan Council.

Lights in the vicinity of vegetation likely to be used by dormice and road crossings will be positioned, directed appropriately and provided with baffles and / or shields to prevent light spill onto vegetation and up into the sky.

Light levels will be monitored and adjusted as necessary to benefit dormice and other protected species.

3.3 GREAT CRESTED NEWT

3.3.1 Summary

There are no records of this species from the site. There is no suitable breeding habitat (ponds or other water bodies) on the site; there is suitable terrestrial habitat present.

There are records of this species from within 500m, the closest being 254m to the west, indicating that animals are likely to use the site during the terrestrial phase of their life cycle.

There are anecdotal records of great crested newts in ponds in the rear gardens of houses on Cross Common Road within 50m of the site's north eastern boundary (pers. comm. Erica Dixon (VoG Ecologist)).

3.3.2 Mitigation

As there is no confirmed presence of the species on the development site, mitigation will be based on implementing precautionary measures and ensuring the provision of suitable terrestrial habitat.

- Retention of as much of the existing habitat, particularly boundaries with hibernation potential, as possible through design;
- The use of "newt friendly" drainage systems. Road gulley pots will not have sumps so amphibians do not drown. They will also be fitted with newt ladders which allow amphibians to escape;
- Kerbs adjacent to gulley pots will be ACO Wildlife Kerbs which provide amphibians with a bypass to avoid falling into gulley pots.
- The proposed attenuation basin which will act as a surface water treatment system (with a flood relief over flow facility built in). It is proposed that the basin will have a two stage profile i.e. shallow at the edges and a deeper central section. This will allow the pond to be dry through the majority of the year but retain water during the wetter times thereby providing amphibians with replacement habitat. This will also help to minimise open water health and safety issues for humans. with no emergent vegetation; with tall emergent vegetation
- The pond will be planted using a marshy grassland seed mix e.g. Emorsgate EG/EM8 at a supplier approved rate;
- The pond will be surrounded by shrub habitats which will provide any amphibians and reptiles which start using it with cover, hibernation sites and terrestrial foraging habitat;
- Retention of a terrestrial habitat buffer (of at least 3m wide) alongside the site boundaries to establish a no development and construction no go area along those boundaries;
- Managing the site boundaries as dispersal corridors to benefit great crested newts;

Measures to ensure great crested newt safety during site clearance will be based on:

- EITHER Maintaining a level of grazing on the site which prevents vegetation becoming suitable hibernation habitat and of a lower suitability for use by newts in their terrestrial phase;
- OR cutting the site in a manner which prevents harm to amphibians. This will be the same methodology as for reptiles; please refer to Appendix B below for the method statement;
- The site will be cleared during the winter when it the soils are more likely to be waterlogged and great crested newts are not likely to be present;

- Should a great crested newt or newts be seen at any time during the clearance and / or construction process, relevant works will cease until Natural Resources Wales have been consulted and an appropriate way forward has been agreed e.g. a development licence and mitigation.

3.4 OTTER

3.4.1 Summary

No otters were recorded on or adjacent to the site during any of the surveys. A dead otter was found on Cardiff Road and identified as part of the desk study.

Further evidence on the form of otter footprints was observed under the bridge carrying Cardiff Road over the Cadoxton River during the site supervision of hedgerow removal alongside Cardiff Road.

3.4.2 Mitigation measures

No specific mitigation is required. However, the following measures will be included in the construction methodologies and implemented:

- There will be a pre-commencement check of the site in respect of otters. In the unlikely event that an otter or otters or evidence of otters are found on site, Natural Resources Wales will be consulted. A development licence may be required prior to any further work being carried out. No work will be undertaken without the approval of NRW;
- There will be no lighting of the Cadoxton River channel and bankside vegetation;
- All retained scrub, hedge and woodland habitats will remain unlit;
- There will be no night working;
- Any excavations will be covered overnight or where this is not possible, a means of escape will be provided;
- All materials will be stored within a secure otter proof fenced compound;
- An appropriately experienced ecologist will be "on call" for the duration of the project in the unlikely event that an otter or otters are found on site, in which case the relevant work will cease immediately and Natural Resources Wales will be consulted. A development licence may be required prior to any further work being carried out. No further work will be undertaken without the approval of NRW; and
- Monitoring in respect of otters will be undertaken by the supervising ecological clerk of works.

3.5 BREEDING BIRDS

3.5.1 Summary

It should be assumed that breeding birds will use all scrub and tree habitats on the site. Existing areas of grassland on the site which will be lost are unlikely to be used by ground nesting birds as the management of the site has resulted in unsuitable habitats for these species.

3.5.2 Mitigation

The following measures will be implemented:

- Site clearance (vegetation removal) will only be undertaken outwith the breeding bird season (i.e. between October and March inclusive only). Where this is not possible, clearance may only take place following an ecological assessment and approval and

only in areas where no breeding birds are present. Where breeding birds are present, no clearance will be allowed within 20m of the nest site;

- Habitat enhancement of any retained boundaries to increase the floral diversity will increase the range of invertebrates; both measures would increase the amount of foraging habitat available to bird species;
- The post-development landscaping plan will provide replacement habitats to increase biodiversity levels;
- It is a requirement to install boxes on between 25 and 50% of the new dwellings. Therefore, twenty (20 no.) bird boxes will be erected on the gable ends of selected properties. The boxes will comprise the following:
 - 1) Five (5 no.) Schwegler 1SP sparrow terrace boxes
 - 2) Five (5 no.) Schwegler 17A swift nest boxes
 - 3) Five (5 no.) Schwegler 9A house martin nest boxes
 - 4) Five (5 no.) Schwegler starling boxes
- All nest boxes will be erected at a height of no less than 3m and no more than 6m above ground level; and
- Boxes will be finished in a manner appropriate to the house material i.e. either a brick or render finish.

Please refer to drawing P100 Planning Layout as annotated by Celtic Ecology.

3.6 REPTILES

3.6.1 Summary

No reptile survey was undertaken. This was permitted based on the assumption of presence of reptiles on the site, particularly slow worm, common lizard and grass snake.

3.6.2 Mitigation

It is considered that a full trapping and translocation exercise is not required as it would be expensive, difficult to implement on the site and increase the risks of harm (through stress) of animals caught and translocated. Instead, the mitigation will be based on habitat manipulation and denial with the following measures being implemented:

- Vegetation will be retained wherever possible. Site clearance will be minimised wherever possible; the retention of a 3m buffer between the existing boundaries and the edge of the development will provide foraging habitat for all the species of reptile likely to be found on the site;
- It is recommended that the initial vegetation clearance is undertaken EITHER by maintaining a level of grazing on the site which reduces the suitability of the vegetation for use by reptiles OR cutting the site in a manner which prevents harm to reptiles;
- Site clearance will be undertaken during the winter when the soils are more likely to be waterlogged and reptiles not present. This will also avoid the reptile active season thereby reducing the chances of animals being killed and injured;
- Trees, scrub and vegetation will be cut to ground level using hand tools or low ground pressure machinery and the stumps left in situ so as to avoid disturbing animals in hibernation i.e. root balls/stumps will be left in situ until reptile active season. Routes to access, fell trees and clear timber and brash will be designated by the supervising ecologist to minimise disturbance of potential hibernation features;
- There will be no ground breaking within 5m of site boundaries, scrub areas and rank grassland between November and March inclusive so as to avoid disturbing animals in hibernation;

- Clearance will be conducted in accordance with a Method Statement (Appendix B) under the supervision of a suitably experienced ecologist to ensure that should reptiles and / or amphibians be found during the course of site clearance or any other development activity, they will not be harmed and can be adequately cared for and released to a suitable area at a suitable time of year;
- Post development landscaping will provide two hibernacula (excavated pit infilled with logs and rubble, topped with brash and covered over with the soil arisings and turf) as described in Appendix D; the supervising ecologist will advise on the exact location on site at the time of creation. The best locations would be on slightly higher ground to the east of the development.

4 HABITAT MANAGEMENT

4.1 GRASSLAND

All retained and replacement grassland habitats will be subject of annual management to ensure that their biodiversity value is maximised. It will also prevent the deterioration of the habitats and their succession to scrub and / or woodland.

4.1.1 Meadow and marshy grassland

All new grassland areas will be established in line with the recommendations of the seed suppliers and the landscaping strategy and plans.

Following establishment all meadows will be subject of one annual cut to be undertaken no earlier than July 15th and no later than the 31st August every year. This will allow grasses and flowers to develop, set and distribute seed naturally.

Occasionally, there may be a need to cut the meadows again in October to be able to replicate aftermath grazing. This will be done no more frequently than once every two years.

All boundary features will have a 1.5m buffer between the base of the feature and the grassland. This strip will be cut no more frequently than once every two years. Where there is a buffer strip on both sides of the feature, the strips will be cut in alternate years.

All arisings will be left lying for at least 24 hours following the cut. They will then be gathered and either removed from site for disposal or placed in habitat piles in locations to be agreed with the ecological clerk of works / local authority ecologist. These habitat pile locations will be reused every year for the duration of the management.

The management of marshy grassland will be the same as for meadows. However, it should be noted that should the pond remain wet, the vegetation will change from that planted to a wetland species mix including common reed, yellow flag iris and other emergent plants. This will require an alternative management regime which will be determined as necessary in light of site conditions.

4.1.2 AMENITY GRASSLAND

The seed mixes used in these areas will be suitable for amenity use i.e. hardwearing and easy maintenance. The seed mixture will be over-sown with a native pollinator seed mix to include species such as common bird's-foot trefoil and red clover.

Management of amenity grassland will follow a more intensive cutting regime to be determined by the landscaping strategy. It is recommended that the usual regime of one cut per month between April and September is reduced to once every two months wherever possible.

4.2 HEDGEROWS

Management of hedgerows has been outlined in section 3.2 above and will be covered in detail in the method statement accompanying the dormouse development licence application.

It should be noted that the overall length of hedgerow on the site will not be reduced from the existing. All vegetation lost to the development will be as a result of scrub and in field tree removal.

4.3 TREES

All trees will be retained wherever possible.

All management will be based on maintaining and improving their condition for the benefit of wildlife. Felling and pruning will be avoided as far as is possible.

All trees will subject of periodic arboricultural assessment.

Health and safety concerns may require that management be undertaken, in which case the measures detailed in section 3.1.2.3 above will be followed prior to any work being undertaken.

All felling and pruning should be undertaken outwith the breeding bird season (i.e. between October and March inclusive). Should works be required to be undertaken during the breeding bird season the trees will be checked for the presence of breeding birds no more than 24 hours in advance of the works being undertaken.

4.4 WATERCOURSES

All existing watercourses will be retained.

No management is required other than to keep the channels clear of vegetation. This is best achieved by undertaking a single cut annually in the autumn (October). Only half the width of the watercourse will be cut in any one year, with the sides being alternated between years. All arisings will be removed for disposal off site in in the habitat piles.

The watercourses will be checked for the presence of non-native invasive species annually.

5 MONITORING

All mitigation will be subject of monitoring to ensure that it is successful. Where monitoring identifies that mitigation has not been successful remedial action will be required. The exact nature of that action will be dictated by the

6 GENERAL MITIGATION AND CONSIDERATIONAS

It is a requirement that all fencing includes a hole 100 x 100mm every 10m to allow hedgehogs and other small mammals access across the site.

Wherever possible, mitigation should not be placed within gardens of new houses. This is to ensure that mitigation cannot be removed (either deliberately or accidentally) and is available for monitoring and maintenance.

Management of mitigation features and measures will not be the responsibility of private householders unless there is no other option. Where this is the case, the relevant householders will be informed of their responsibilities by the developer (and all successors in title) and the details included as additions to the deeds of the relevant properties.

Separate legal agreements between the developer (Edenstone Homes) and the current landowner (The Lee Estate) will ensure the management of mitigation measures on land not owned or controlled by the developer.

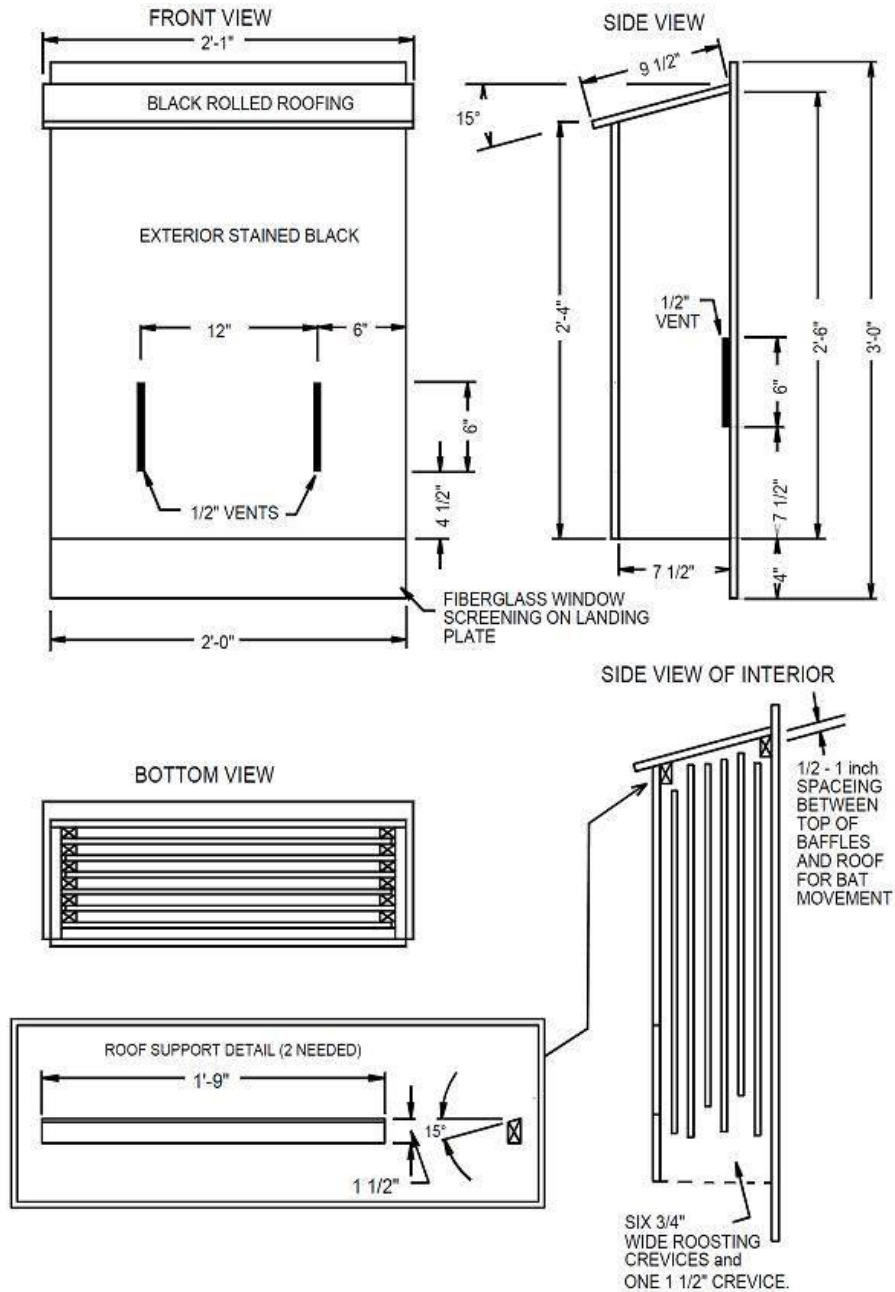
7 REFERENCES

- Battersby, J. (Edited and compiled), (2005), *UK Mammals: Species Status and Population Trends*, JNCC/Tracking Mammals Partnership.
- Battersby, J. (Ed) & Tracking Mammals Partnership. (2005). *UK Mammals: Species Status and Population Trends. First Report by the Tracking Mammals Partnership*. JNCC/Tracking Mammals Partnership.
- Bright P, Morris P, Mitchell-Jones T. (2006) *The Dormouse Conservation Handbook* (2nd Ed) English Nature, Peterborough.
- Collins, J (Ed). *Bat Surveys for Professional Ecologists - Good Practice Guidelines* (BCT, 2016).
- DEFRA (2007) *Hedgerow Survey Handbook. A standard procedure for local surveys in the UK*. DEFRA.
- EC Directive 92/43/EEC (The Habitats Directive) (1992). Annexes II and V.
- Joint Nature Conservation Committee (2001) *Handbook for phase 1 habitat survey: A technique for environmental audit*. JNCC.
- Joint Nature Conservation Committee (2003). *Herpetofauna Workers' Manual* JNCC
- Mitchell-Jones, A.J. & McLeish, A.P. (2004) *The bat workers' manual (3rd Edition)*. Joint Nature Conservation Committee.
- Multi-Agency Geographic Information for the Countryside* ('Magic') website: www.magic.gov.uk
- Natural Environment & Rural Communities Act 2006: *Section 42 List of Species of Principal Importance for Conservation of Biological Diversity in Wales*. Welsh Assembly Government
- Planning Policy Wales (2002).
- Protection of Badgers Act (1992).
- Stace, C A (1997) *New Flora of the British Isles* (2nd Ed) Cambridge University Press
- The Conservation of Habitats and Species Regulations 2010.
- The Hedgerow Regulations (1997).
- The Natural Environment and Rural Communities Act (2006) (as amended) (HMSO).
The Wildlife and Countryside Act 1981 (as amended).
- Welsh Assembly Government (2007). *Planning Policy Wales Technical Advice Note 5: Nature Conservation and Planning*.

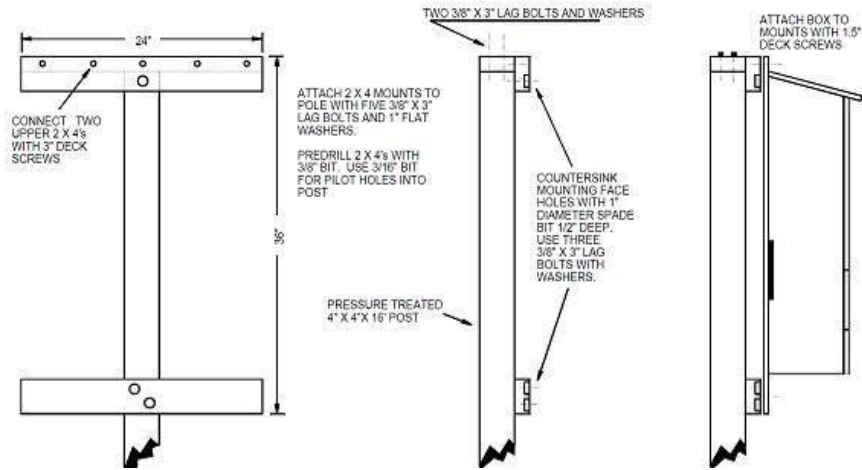
APPENDIX A

POLE MOUNTED AMERICAN STYLE BAT BOX

Detail of American style bat box enhancement to be mounted with the base of the box at least 3.5m above ground level (e.g. on a telegraph pole or similar)



Cont'd



APPENDIX B

METHOD STATEMENT: SITE CLEARANCE: REPTILES & GCN

1. Following habitat assessment, it was considered that the site has the potential to support reptiles (particularly slow worm (*Anguis fragilis*), common lizard (*Lacerta vivipara*) and grass snake (*Natrix natrix*)). The presence of these species should be assumed (unless otherwise determined by survey), hence the need for a Method Statement to ensure that works are carried out in such a way as to avoid harm to these species.
2. Vegetation will be maintained as short as possible through the use of horse and pony grazing. Rougher / ranker areas of the fields will be grazed preferentially with horses and ponies at more intense levels in order to reduce their overall height.
3. Trees and understorey vegetation will be cleared from directly affected areas only e.g. areas to be built on or forming part of any landscaping scheme where they cannot be retained. IT SHOULD BE NOTED THAT CLEARANCE OF TREES AND SCRUB WILL BE UNDERTAKEN UNDER THE AUSPICES OF A DEVELOPMENT LICENCE IN RESPECT OF DORMICE AND THEREFORE PARTICULAR CARE SHOULD BE TAKEN TO AVOID THIS WHERE IT HAS NOT BEEN PREVIOUSLY AUTHORISED
4. Trees and understorey vegetation will be cleared to ground level using chainsaws, brushcutters or specialised low ground pressure plant. Arisings will be saved to create two hibernacula on retained / unaffected land; excess material will be taken off site and disposed of appropriately. (This will be carried out during November-February to minimise impacts on roosting bats and nesting birds).
5. All ground breaking operations affecting potential or discovered hibernacula (e.g. rubble piles, tree stumps and roots) on site will only be cleared once day time temperatures are consistently over 12°C for a period of at least seven days as otherwise reptiles may be killed or injured as a result of inconsistent (low) temperatures (during the day and night) and low prey availability. Potential hibernacula will only be dismantled by hand unless the supervising ecologist gives the approval for machine dismantling.
6. Clearance of grassland (with the exception of potential hibernation features) will be undertaken in the winter months to avoid killing and injuring reptiles (and amphibians, including great crested newts). If this is not possible, then the orientation of the cutting will be designed to push reptiles into unaffected areas once the areas for clearance have been identified without having to undertake a full translocation exercise.
7. If for whatever reason vegetation cannot be removed in the winter months and has to be cleared between April and October inclusive, it will be cut and raked as short as possible, ≤ 30 mm wherever possible. Vegetation will be cut in three phases. The first phase will reduce the vegetation height to 75mm; the second will reduce it to ≈30 - 50mm; the third phase will reduce the height to as close to ground level as possible, but no higher than 30mm. There will be a minimum time delay of 24 hours and a maximum delay of 48 hours between the first and second cuts.
8. The vegetation will be maintained as close to bare ground as possible either by spraying or ongoing repeated cutting using brush cutters with knife blades to ensure that there is no potential for reptiles to utilise the site after the initial clearance. The use of tractor towed flails and mowers in the open fields will be permitted at the discretion of the supervising ecologist. Reptile fencing will not be required as long as the bare ground / short vegetation habitat is maintained.

9. If reptiles are observed within the clearance area during the works, a decision on how to deal with them will be made on site in light of the conditions on site at the time and the state of the animals themselves. There are three options for dealing with them:
 - It may be possible to leave the animals alone to find their own way into cover, depending on where they are seen, what they are doing and their apparent activity levels; or
 - Capture, remove from site and take into temporary captivity until such time as they can be released adjacent to the cleared area (a vivarium has been prepared in case it is required); or
 - Should conditions allow, capture and translocate the animals to a safe area immediately adjacent to the site.

10. Potential hibernacula will only be cleared once day time temperatures are consistently over 12°C for a period of at least seven days as otherwise reptiles may be killed or injured as a result of inconsistent (low) temperatures (during the day and night) and low prey availability. Potential hibernacula will only be dismantled by hand unless the supervising ecologist / and or LPA ecologist gives the approval for machine dismantling.

11. The vegetation clearance will be supervised by a suitably experienced ecologist. No work areas with the potential for reptiles to be present will be subject of any ground breaking without the implementation of this method statement unless the prior approval of the supervising ecologist and / or the LPA ecologist has been sought and obtained.

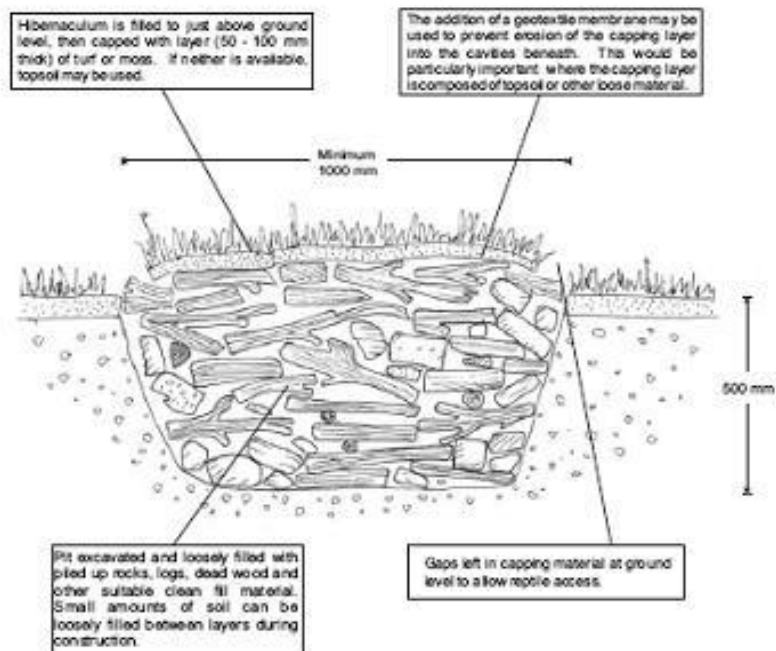
The supervising ecologist will have the facility to determine whether areas can or cannot be cleared and make alterations to the method statement on site based on the prevalent on-site conditions

APPENDIX C

REPTILE HIBERNACULA DESIGN OPTIONS

Hibernaculum on free-draining ground

Where ground conditions allow, the hibernaculum should be incorporated into a shallow pit. This design is more likely to remain frost-free, and will be less obtrusive and thus unlikely to be subject to interference.



Hibernaculum on impermeable ground

Where ground conditions are impermeable, then an 'above-ground' or mounded design should be utilised in order to prevent the hibernaculum from flooding. This design should also be used if it is not possible to excavate a pit for any other reason.

