PROPOSED RESIDENTIAL DEVELOPMENT:

LAND OFF CARDIFF ROAD / CROSS COMMON ROAD, DINAS POWYS

ECOLOGICAL DESIGN STRATEGY

AUGUST 2017

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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	DRAFT FOR COMMENT	HD	JK	HD	31.08.2017
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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
1	B	Technical amendments from site design constraints	HD	11.10.2017

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Drawings

Number	Title
Unnumbered	Cross Common Road Concept Plan
1628 100	Planning layout
1628 P100	Planning Layout (Ecology Annotations – bat & bird boxes)
1628 104D	Enclosure Layout
994/PA/01F	Landscape proposals and tree constraints (Sheet 1)
994/PA/02F	Landscape proposals and tree constraints (Sheet 2)
994/PA/03C	Dormouse mitigation proposals
10157-105-02	ACO Wildlife Kerbs detail
Unnumbered	Tree Retention & Removal Plan

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 (and are provided separately):

- Preliminary Ecological Appraisal - land at Cross Common Road, Dinas Powys Rev A (Celtic Ecology, February 2025)
- 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)
- Ecological Mitigation Strategy – Cross Common Road, Dinas Powis: Proposed Road and Residential Development ISSUE 2 (Celtic Ecology, October 2017)
- Cross Common Road, Dinas Powys - dormouse licence method statement ISSUE 2) Celtic Ecology, October 2017)
- 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 not 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 compromises 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 popular (*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 DEVLOPMENT

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 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 1628 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 of trees suspected of providing bat roosting habitat will, where necessary, 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 wherever possible, providing a strip of ≈3m wide between the existing hedge and the new development; however, this is likely to be limited by current design standards and the physical constraints of the land available. Where this is not possible, complementary planting will be undertaken in a location as close as possible. Housing units will preferentially back or side onto hedges and new and retained vegetation with gardens bounded by close boarded fencing. The gapping up and buffers will be used wherever possible 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.

Scrub and screen planting will be coppiced on a rotation to be determined in year 5 after planting 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 to the east of Shortlands Wood will be included within the Shortlands Wood management plan. 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 winter 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 vegetation 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 vegetation 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 vegetation 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. No more than 500m2 of scrub will be cleared in any one day.

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

- Roots will extend laterally to obtain water and nutrients and roots and 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 minimise damage to plants;

- To compensate for the inevitable loss of roots the donor site vegetation will be cut back to between 0.3 - 0.5m above ground level prior to removal. This coppicing will

make the vegetation easier to lift and handle. It is anticipated that although the 'instant' vegetation effect will not be possible, the chances of successful translocation of the plants 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 anticipated to reach the original height within 3 years of translocation;

- The vegetation will be removed and transported to the new location (receptor site) 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 receptor site will have been prepared prior to the commencement of the ground breaking exercise. This will comprise a trench and / or holes mirroring the donor site's excavation depth. The base of the excavations will be broken up to allow for free drainage and the quicker establishment of new roots;

- Loose topsoil will be placed around the plant roots as they are positioned into the trenches / holes;

- 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 vegetation 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 vegetation 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 vegetation 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), *Managing Small Woodlands for Dormice* (PTES) and *Hedgerow management, dormice and biodiversity* (English Nature, Report 454, 2002); and

- Oscillating blade cutters will be used in preference to hammer flails wherever possible.

3.2.7 Hedgerow and wildlife 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. These will be retained, thereby maintaining connectivity. Gaps in the existing hedges will be planted up and the hedges buffered wherever possible 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 (≤5m) 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). The designs will be finalised by the lighting teams at the Vale of Glamorgan Council and Edenstone Homes.

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 (drawing 10157-105-02);
- 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 be a simple basin (single stage basin) which will allow the pond to be dry through the majority of the year but retain water during the wetter times. The area will be planted up as marshy grassland.
- 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 wherever possible) alongside the site boundaries to establish a no development and construction no go area along those boundaries. (If this buffer is not possible, shrub vegetation will be planted as close as possible to features which might be used by great crested newts);
- 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 follow 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(s) 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 for bird enhancement feature locations.

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 wherever possible and appropriate. 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 or, in their absence, the 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 composition of 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 and will in fact be increased. 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 with the exception of those scheduled for removal (Tree retention & Removal Plan (Treescene)).

All management of retained trees will be based on maintaining and improving their condition for the benefit of wildlife, balancing this against any health and safety requirements, particularly those trees containing confirmed bat roosts as described in section 3.1.2.3 above. 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.

Shortlands Wood will be subject of a separate and detailed woodland management plan.

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 requirements of that action will be dictated by the nature of the failures identified by the monitoring.

6 GENERAL MITIGATION AND CONSIDERATIONAS

It is a requirement that all close boarded fencing and fencing with fitted kick / toe boards includes a hole 100 x 100mm every 10m to allow hedgehogs and other small mammals continued access across the site (refer to drawing 1628 104D Enclosure Layout).

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) by a third party 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

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Collins, J (Ed). *Bat Surveys for Professional Ecologists - Good Practice Guidelines* (BCT, 2016).

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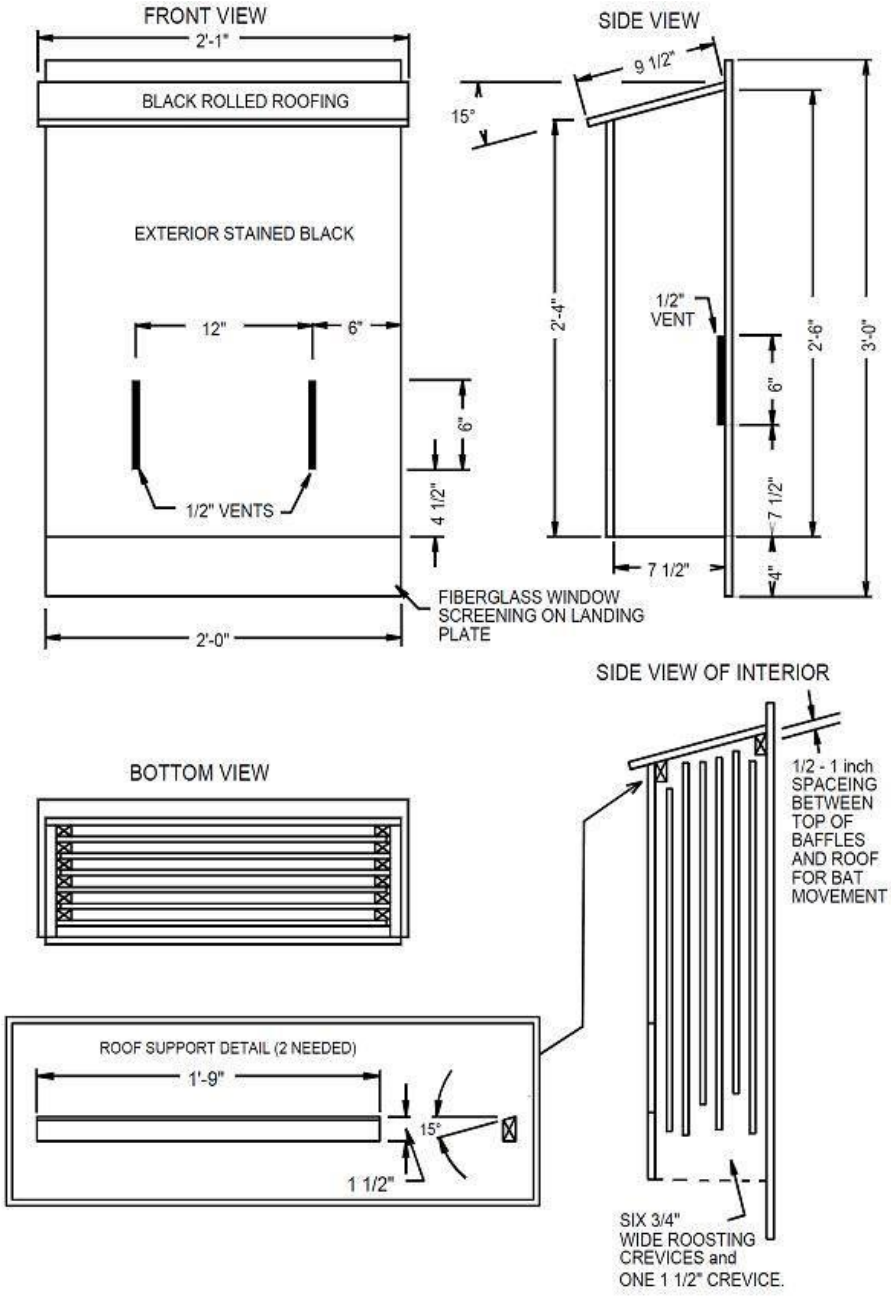
APPENDIX A

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)



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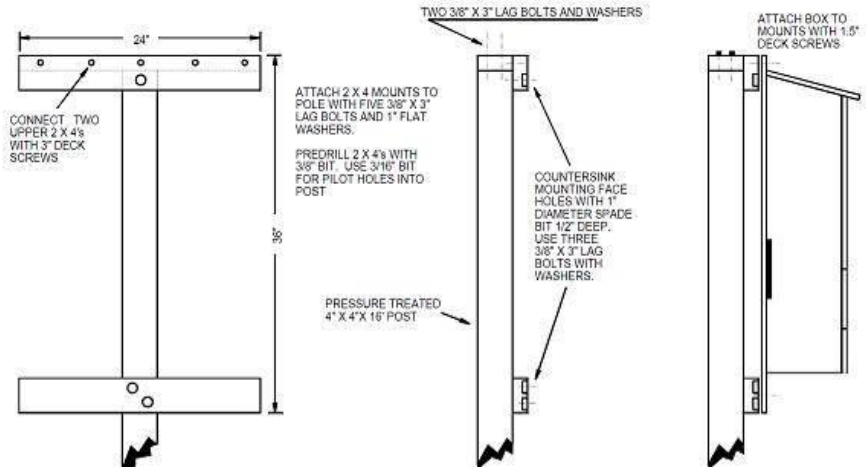

24"
CONNECT TWO UPPER 2 X 4's WITH 3" DECK SCREWS
36"
ATTACH 2 X 4 MOUNTS TO POLE WITH FIVE 3/8" X 3" LAG BOLTS AND 1" FLAT WASHERS.
PREDRILL 2 X 4's WITH 3/8" BIT. USE 3/16" BIT FOR PILOT HOLES INTO POST
TWO 3/8" X 3" LAG BOLTS AND WASHERS
COUNTERSINK MOUNTING FACE HOLES WITH 1" DIAMETER SPADE BIT 1/2" DEEP. USE THREE 3/8" X 3" LAG BOLTS WITH WASHERS.
PRESSURE TREATED 4" X 4"X 16' POST
ATTACH BOX TO MOUNTS WITH 1.5" DECK SCREWS

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 teh 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.

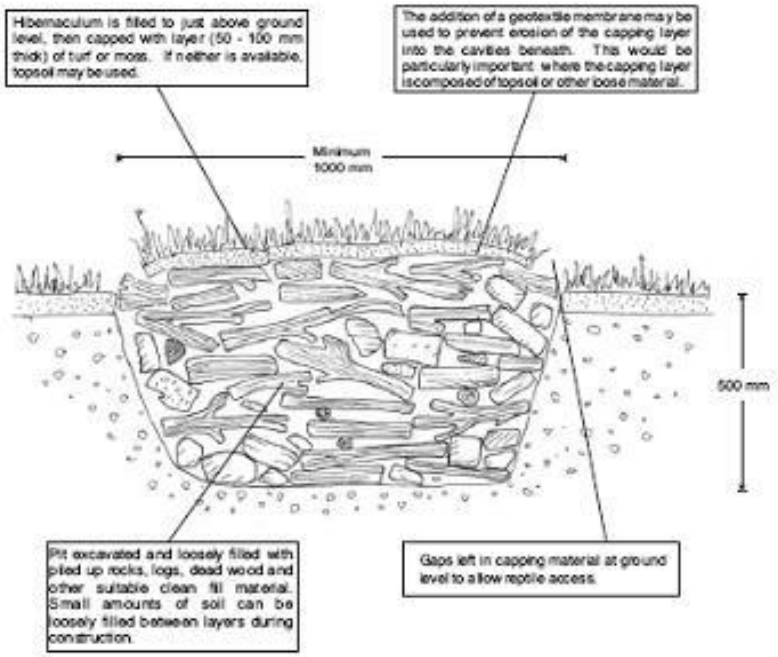
The supervising ecologist will have the facility to determine whether areas can or cannot be cleared and make alterations to the method statement on site based on the prevalent on-site conditions

APPENDIX C

REPTILE HIBERNACULA DESIGN OPTIONS

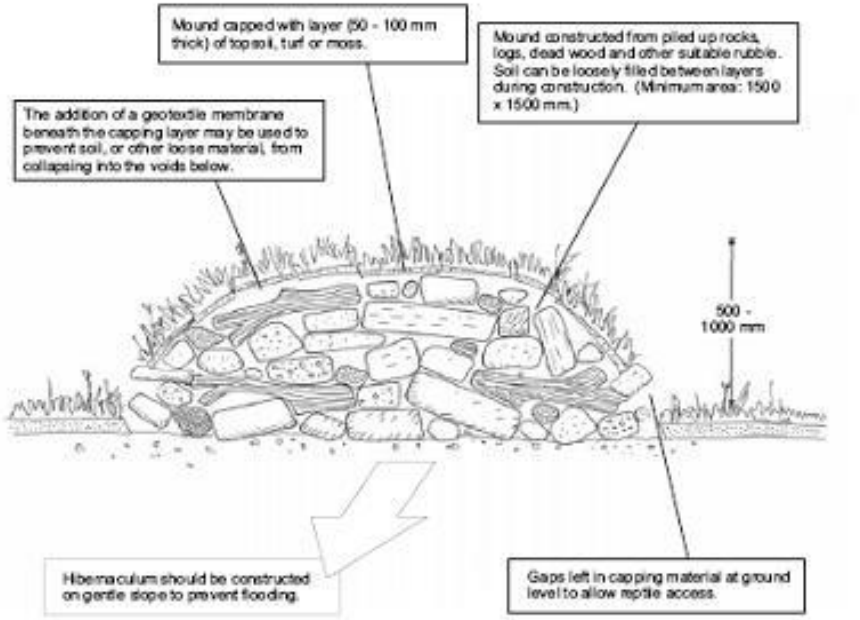
Hibernaculum on free-draining ground

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.



EXTERNAL WORKS LEGEND

	PLANNING APPLICATION BOUNDARY
19	PLOT NUMBERS
19	CAR PARKING ALLOCATION
#	AFFORDABLE UNITS
	GATE POSITION
	DUEL ASPECT / FOCAL WINDOW
	TIMBER FENCE - REFER TO ENCLOSURE PLAN 104
	1.1m VERTICAL RAILINGS
	1.1m HORIZONTAL TIMBER FENCE
	1.8m BRICK SCREEN WALL
BCP	BIN COLLECTION POINT
	PUBLIC FOOTPATH LINK FROM POS
	BLOCK PAVING / ALTERNATE ROAD SURFACE TBA
	INDICATIVE ON STREET PARKING
	EQUIPPED PLAY AREAS

LANDSCAPING LEGEND REFER TO LANDCAPING DETAILS

	INDICATIVE PROPOSED TREES
	PROPOSED HEDGE
	EXISTING TREES TO BE RETAINED
	EXISTING ROOT PROTECTION ZONE

HOUSE TYPE ACCOMMODATION SCHEDULE

House Name	Ref.	Beds	Size	Number
Farnham	Fa	05	1515	05no
Bonvilston	Bo	04	1321	08no
Tenbury	Te	04	1320	04no
Bamford	Ba	04	1215	05no
Carcroft	Ca	04	1075	04no
Broughton	Br	03	1008	04no
1 Bed Apartment	1B	01	460	06no
Ogmore	Og	02	936	11no
Wye	Wy	03	1063	02no
4 bed	4B	04	1167	01no
Site Total				**50 no**

THE CONTRACTOR IS TO COMPLY IN ALL RESPECTS WITH CURRENT BUILDING BUILDING LEGISLATION, N.H.B.C AND BUILDING REGULATIONS WHETHER OR NOT SPECIFICALLY STATED ON THIS DRAWING.

THIS DRAWING MUST BE READ & CHECKED AGAINST ANY STRUCTURAL GEOTECHNICAL OR OTHER SPECLIST DOCUMENTATION OR PLANS PROVIDED.

THIS DRAWING IS NOT INTENDED TO SHOW DETAILS OF FOUNDATIONS, GROUND CONDITIONS OR GROUND CONTAMINANTS. EACH AREA OF GROUND RELIED UPONTO SUPPORT ANY STRUCTURE DEPICTED (INCL. DRAINAGE) MUST BE INVESTIGATED BY THE CONTRACTOR. A SUITABLE METHOD OF FOUNDATION SHOULD BE PROVIDED ALLOWING FOR EXISTING GROUND CONDITIONS. ANY EARTHWORK CONSTRUCTIONS SHOWN INDICATE TYPICAL SLOPES FOR GUIDANCE ONLY AND SHOULD BE FURTHER INVESTIGATED BY A SUITABLE EXPERT.

WHERE EXISTING TREES ARE SHOWN TO BE RETAINED THEY SHOULD BE SUBJECT TO A FULL ARBORICULTURAL INSPECTION FOR SAFETY. A SUITABLE METHOD OF FOUNDATION IS TO BE PROVIDED TO ACCOMMODATE PROPOSED TREE PLANTING.

General Notes

Rev	Date	By	Comment

RESIDENTIAL DESIGN
PLANNING
CIVIL ENGINEERING
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Client
Edenstone Homes Ltd

Project Title
Land Off Cardiff Road
Dinas Powys

Drawing Title
Planning Layout

Drawing Status

Drawn By	Scales		Date
DA	1:500	A1	Feb 2017

Job No.	Drawing No.	Rev.
1628	100	

EXTERNAL WORKS LEGEND

	PLANNING APPLICATION BOUNDARY
19	PLOT NUMBERS
1B	CAR PARKING ALLOCATION
#	AFFORDABLE UNITS
	GATE POSITION
	DUEL ASPECT / FOCAL WINDOW
	TIMBER FENCE - REFER TO ENCLOSURE PLAN 104
	1.1m VERTICAL RAILINGS
	1.1m HORIZONTAL TIMBER FENCE
	1.8m BRICK SCREEN WALL
BCP	BIN COLLECTION POINT
	PUBLIC FOOTPATH LINK FROM POS
	BLOCK PAVING / ALTERNATE ROAD SURFACE TBA
	INDICATIVE ON STREET PARKING
	EQUIPPED PLAY AREAS

LANDSCAPING LEGEND

REFER TO LANDCAPING DETAILS

	INDICATIVE PROPOSED TREES
	PROPOSED HEDGE
	EXISTING TREES TO BE RETAINED
	EXISTING ROOT PROTECTION ZONE

HOUSE TYPE ACCOMMODATION SCHEDULE

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Farnham	Fa	05	1515	05no
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Tenbury	Te	04	1320	04no
Bamford	Ba	04	1215	05no
Carcroft	Ca	04	1075	04no
Broughton	Br	03	1008	04no
1 Bed Apartment	1B	01	460	06no
Ogmore	Og	02	936	11no
Wye	Wy	03	1063	02no
4 bed	4B	04	1167	01no
Site Total				**50 no**

10 5 0 10 20 30 40 50

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Client
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Project Title
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Drawing Title
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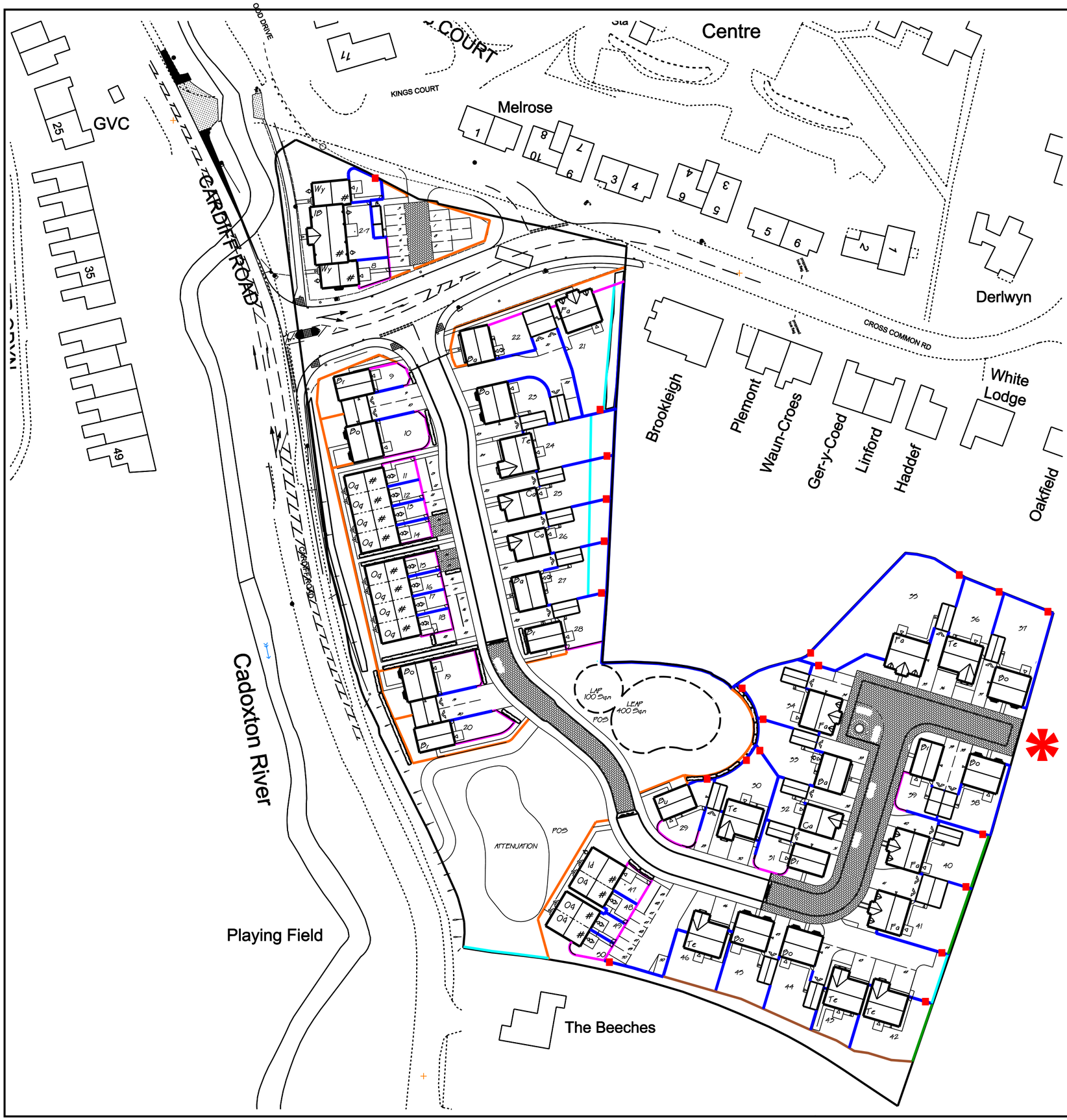
Drawing Status

Drawn By	Scales		Date
DA	1:500	A1	Feb 2017

Job No.	Drawing No.	Rev.
1628	100	



ENCLOSURE LEGEND - NTS

1.8m Close Board Fence
■ = 100mm X 100mm Hole (Access for Hedgehog garden to garden)

1.8m Brick Screen Wall

1.1 Ball Top Railings + Gate

1.2m High Timber Post & 3 Rail Fence -With Native Hedging

1.2m High Stock Proof Fence -With Native Hedging

1.2m High Palisade Fence

1.8 Timber Gate To All Plots *

1.2m 5 Bar Gates *

THE CONTRACTOR IS TO COMPLY IN ALL RESPECTS WITH CURRENT BUILDING BUILDING LEGISLATION, N.H.B.C. AND BUILDING REGULATIONS WHETHER OR NOT SPECIFICALLY STATED ON THIS DRAWING.

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General Notes

Rev	Date	By	Comment
D	06.10.17	DA	Updated to layout 100 Rev D
C	04.10.17	DA	Updated to layout 100 Rev C
B	20.09.17	DA	Updated to layout 100 Rev B
A	24.08.17	DA	Updated to layout 100 Rev A

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Client
Edenstone Homes Ltd

Project Title
Land Off Cardiff Road
Dinas Powys

Drawing Title
Enclosure Details

Drawing Status

Drawn By	Scales		Date
	1:NTS	A2	March 2017

Job No.	Drawing No.	Rev.
1628	104	D


LANDSCAPING LEGEND
Melrose
CROSS COMMON ROAD
CARDIFF ROAD
White Lodge
Plemont
Waun-Croes
Ger-y-Coed
Linford
Haddef
Oakfield
G2
G3
G7
G12
T9
T10
TPO1
TPO2
0m 5m 10m 20m
Existing bay and bamboo retained (OFF SITE)
Rev. F. Minor amendment to text for clarity. 10-10-17
Rev.E. Amendments to Site layout. Landscape updated to co-ordinate. Drawing cross referenced with dwg No.994/PA/03, Dormouse Mitigation. 8-10-17
Rev D. Revised Site Layout, planting and maintenance program updated in accordance with ecology recommendations. 18/9/17
Rev C. Minor amendments to Site Layout, plot 27 garage relocated outside RPA, bin collection point added. Planting updaetd. 19-5-17
Rev.B House shade layers omitted. Minor amendments to Site Layout. Planting updated. 5-5-17
Rev.A Tree protection omitted - refer to arboricultural report ref. Treescene. Minor amendments to Site Layout. Planting updated. 30-4-17
All setting out dimensions to be site confirmed prior to works commencing and any discrepancies confirmed to architect. This drawing is to be read in conjunction with all other architectural and structural engineers drawings.
PROPOSED RESIDENTIAL DEVELOPMENT
LAND OFF CARDIFF ROAD, DINAS POWYS for
EDENSTONE LTD
LANDSCAPE PROPOSALS AND TREE CONSTRAINTS2
PLANNING SHEET 1 OF 2
1:200 (AO)
M D LANDSCAPE ARCHITECTS
3 HANOVER TERRACE, BATH BA1 6LJ
E-MAIL mdd@mdd-land.co.uk
Date: 3/3/17
Drawn:
Checked:
994/PA/02F

Access Blocked
Offsite Visitor Parking
Site & Signage
9A

LANDSCAPING LEGEND

EXISTING TREES TO BE RETAINED AND PROTECTED
Refer to updated Tree Report by Jarmits ref., Treescene
Protected Area maintained as long grass for wildlife refuge during construction

EXISTING TREE TO BE REMOVED
Refer to Evolve Tree Consultancy Report for details.

EXISTING TREE ROOT PROTECTION AREA
Refer to Evolve Tree Consultancy Report for details

TPO TREE: Refer to Vale of Glamorgan TPO No.5, 2014 for Land at Dinas Common Road Dinas Powys

PROPOSED TREE / SPECIMEN SHRUB

SHRUB BED / IMPACT PLANT

PROPOSED HEDGE

NATIVE SCREEN WHIPS

ORNAMENTAL CLIMBER

TURF - FRONT GARDENS, CLOSE MOWN

REAR GARDEN - ROTOVATE AND LEVEL

COMMUNAL AREAS WILDFLOWER GRASS SEED / Ref. Emorsgate EL1 Flowering Lawn mix.

COMMUNAL AREAS WILDFLOWER GRASS SEED Ref. Emorsgate EM8 Meadow Mix for Wetlands

GRAVEL. Golden knapped flint

NOTES
Refer to Architects/Engineers drawing for details of levels, buildings, hard surfaces, retaining structures, visibility splay, services and fences.
Building foundations with regard to trees to be in accordance with the NHBC Guidelines Chapter 4.2
Refer to Arboricultural Tree Survey Report, Impact Assessment and Protection Plan (Treescene(J. Wilkes 4021 17) for details of existing trees to be retained, removed and protection measures.
All tree surgery carried out in accordance with BS3998:2010 Tree Works.
Refer to Ecologist Survey and Recommendations for details of mitigation measures required prior, during and after completion of construction works, bat and bat box type and location and aftercare management of on site vegetation. Ref. Celtic Ecology.
Drawing to be read in conjunction with 994/PA/03 Dormouse Mitigation Plan.

Maintenance Programme. 15 year summary sheet.
To be read in conjunction with Ecologist recommendations ref. Celtic Ecology./

Operation	Time in years 1	2	3	4	5	> 15yr
Lawn - Front and back gardens close mown	*	*	*	*	*	*
Cutting @ 75mm-35mm(March-Nov)	*	*	*	*	*	*
Weedkilling (April-Sept, twice a year)	*	*	*	*	*	*
Edging (Twice a year)	*	*	*	*	*	*
Wildflower Grass,						
a) Close mown; 2-6 cuts/year						
Eradication of unwanted weeds		*	*	*	*	*
Cut early Spring (Not April)-November	*	*	*	*	*	*
Remove cuttings, leaves and litter	*	*	*	*	*	*
Repair compaction/bare areas	*	*	*	*	*	*
(b) Water attenuation area. Alternate sides cut each year. Remove cuttings & litter*						
Trees						
Existing. Safety assessment every 3y				*	*	*
Restaking and tying (Twice yearly check)	*	*	*	*	*	*
Watering (during dry spell of 14 days)	*	*	*	*	*	*
Replace Defects						*
Hedge						
Prune roadside hedge annually to 3M ht, *			*	*	*	*
Prune 50% of alternate sides of existing hedge to 3M ht. each year.						*
Maintain new native hedges @ 0.9, 1.2M by annual cut once established	*	*	*	*	*	*
Remove litter and obstructions	*	*	*	*	*	*
Layd on 12-15 year cycle subject to Ecologist review and recommendations						*
Shrubs						
Prune annually and to remove obstructions when growth exceeds 450mm	*	*	*	*	*	*
Fertilizer, slow release (annually),	*	*	*	*	*	*
Hoeing (14 occasions annually)	*	*	*	*	*	*
Cultivate/fork over to relieve compaction*				*	*	*
Weeding/remove litter (14 x annually) *	*	*	*	*	*	*
Replace Defects						*
Stream, pond and attenuation area,						
Clear litter debris and obstructions	*	*	*	*	*	*
Clear silt from from 50% of area in alternate years						*
Mulching						
Top Up to 75mm in March	*	*	*	*	*	*
Hard Surfaces						
Brush (Twice a year)	*	*	*	*	*	*
Remove litter / leaves (14 x anually)	*	*	*	*	*	*
Eradicate weeds (once a year)	*	*	*	*	*	*

Note: * Denotes year in which tasks are undertaken.
All work to be undertaken in accordance with BS4428:1989 and BS3720-4 1993

OUTLINE PLANTING SPECIFICATION

EXISTING TREES. Refer to Updated arboricultural method statement for details of proposed treatment and protection measures ref. Treescene.

Services. No trees to be planted within 3 meters of proposed foul or surface water drain. Planting adjacent to other services shall be in accordance with the guidelines laid down by the relevant service authority.

Subsoil. Rip to 500mm depth using the teeth of a JCB back bucket to break up compaction and allow free drainage.

Topsoil. Existing topsoil to be excavated to an agreed depth and stored in site stockpiles for re-use. Stockpile height 2M MAX. Location to be agreed. All topsoil to comply with BS 3882:2007, pH 6-8, free of stone greater than 50mm in any dimension, perennial weed roots, toxic materials, glass and contamination. Supply and spread by loose tipping to the following depths (after settlement);
Tree pits 1.2 x 1.2M x 750mm depth
Ornamental shrubs and hedge - 400mm depth.
Garden Turf - 150mm depth
Wildflower seed - Low fertility topsoil or subsoil with N,P,K,Mg and conductivity index of <2.
Lightly firm without compacting, Grade to an even surface and marry in with adjacent soft landscape areas. Finished levels adjacent to hard surfaces to be level with kerb unless otherwise instructed. Cultivate to a fine tilth removing all stones over 50mm that come to the surface. Allow to settle and make good defficiencies, humps and hollows. Remove any weeds before planting.

Tree Irrigation System. Wavinccol plastic perforated pipe 2.5M length with T piece and plastib top or similar approved. Supply and install to all trees in accordance with manufacturers recommendations.
Root deflector.Supply and install to all trees in communal areas ref. Greenleaf RD640A or similar.

Bark mulch. 75mm depth over shrub beds and 0.8M wide strip benetih new hedge. Main constituent conifer bark, maximum of 15% wood content and 5% fines, particle size 5-65mm, free of pest disease or weed contamination. 2L sample to be submitted for approval with tender.

Water all plants after planting and before mulching. If planted between April and October include for soaking thoroughly after planting and then for dry spells of 7 days duration. Allow for provision of water from a bowser during periods of hosepipe ban to maintain uniform healthy growth.

FRONT GARDENS - TURF, Ref Rowlawn ' Medallion or similar. Cultivate to a fine tilth, grade, marry in with adjacent areas and remove all stones and rubble over 25mm dia.
COMMUNAL AND RESTORED OFF SITE AREAS - WILDFLOWER GRASS SEED MIX ref Emorsgate Seeds, EL1 Flowering Lawn mix (or similar agreed). Supply, sow and maintain until establishment or handover in accordance with manufacturers recommendations.
Swale - EP1 Pond edge Mix or similar. Alternate sides cut each year.
MAINTENANCE until handover by client instruction; Include for removal of weeds and litter, maintenance of bare ground beneath planted areas, pruning dead/damaged branches and edge trimming as required. Shrubs and hedgbes trimmed to remove obstructions or when extension growth exceeds 450mm. Grass areas to be reseeded, scarified and overseeded to remove hollows and troughs which develop and watered to avoid turf shrinkage. Soil level flush with adjacent kerb after settlement. Mowing; lawn kept neat and trim at between 35 and 70mm ht, at all times and free of broadleaf weeds. Communal area of grass established in accordance with seed suppliers recommendations with mowing time/to encourage natural seeding. All grass cuttings, leaves and weeds to be removed. All plant defects to be replaced including trees for 5 years after planting. All fencing and tree stakes re-secured als necessary. Top up bark mulch including beneath trees in grass to 75mm prior to handover./

0m 5m 10m 20m

PLANT SCHEDULE. All to BS3936 Part 1 from;

STRUCTURE TREES: Container grown (CG) 60L. Input if planted outside the recognised planting season (Nov.– end March). All trees in communal areas planted with irrigation system and root deflector. Min distance from back footpath 1M. Trees in lawn and wildflower/grass planted with 1M diameter bare earth circle with bark mulch. All with double short stake and rubber ties.

abrev.	species	common name	size
A	Acer campestre	(Field maple)	EHS 14-16cm 4-4.5M
B	Betula pendula	(Silver birch)	HS 12-14cm 3.5-4M
M	Malus domestica domestica	(Crab apple)	EHS 14-16cm 4-4.5
P	Prunus Snow Goose	(Flowering cherry)	HS 12-14cm 3.5-4M
PcN	Prunus cerasifera Nigra	(Purple cherry)	HS 12-14cm 3.5-4M
Py	Pyrus calleryan Chanticleer	(Flowering pear)	EHS 14-16cm 4-4.5M
S	Sorbus aucuparia	(Rowan)	EHS 14-16cm 4-4.5
Q	Quercus robur	(Oak)	80L EHS 14-16cm 4-4.5
T	Tilia cordata Rancho	(Lime)	HS 12-14cm 3.5-4M

SPECIMEN SHRUBS; Container grown

Ag	Abelia grandiflora	(Abelia)	5L 450-600mm
AL	Arnelacherier lamarkii	(Snowy mespilus)	30L 1.5M Multem
Bd	Buddleia Black Knight	(Butterfly bush)	5L 600-900mm
CS	Choisya ternata Sundance	(Yellow Mex. orange)	5L 450-600mm
CG	Cotinus coggy grace	(Purple smoke bush)	5L 600-900mm
Bs	Buxus sempervirenss	(Box ball)	5L 450-600mm dia
EG	Elaeagnus Gilt Edge	(Varigated oleaster)	5L 450-600mm
H	Ilex aquifolium	(Holly)	30L 1.5-1.8M
GK	Ilex Green King	(Variegated holly)	30L 1.5-1.8M
Ln	Laurus nobilis	(Bay)	10L 0.8-1.0M
ML	Magnolia Leonard Messel		30L 1.2-1.5M
Ob /	Osmanthus burkwoodii		5L 450-600mm
PA	Philadelphus Aureum	(Yellow/mock orange)	5L 450-600mm
Pf	Photinia Red Robin		10L 750-900mm
Sy	Syringa Palibin	(Lilac, purple)	10L 0.8-1.0M
V	Viburnum juddii	(Scented viburnum)	5L 600-900mm
PG	Pittosporum gamelii	(NZ ironwood varieties)	5L 450-600mm
PT	Pittosporum Tiny Tim	(dwarf ironwood, purple)	5L 450-600mm
Pt	Phormium Dazzler/purpureum	(NZ flax)	5L 8 leaf
WV	Weigela florida Variegatum		5L 600-900mm

NATIVE SHRUBS/ HEDGE. Supply and plant @ 5/m.M in a double staggered row 400mm between plants in a row, 500mm between rows in single species groups of 3-15 group. All with square post and and wire fence through the centerline except where there is a post and rail or metal fence. All with requirements(not spiral guards) and support cane. * = cut back by 1/3 on planting.

Ac	Acer campestre	400-600mm Root Cell
Cs	Cornus sanguineum	400-600mm Root Cell
Cav	Corylus avallana	400-600mm Root Cell
Cm	Crataegus monogyna	(hawthorn) 400-600mm Root Cell
Fs	Fagus sylvatica*	(Beech) Br. 1.0-1.2M 1+1
Ilex	aquifolium	(Holly) 400-600mm Root cell
Lv	Ligustrum vulgare	(Wild privet) 400-600mm Root Cell
Ps	Prunus spinosa	(Blackthorn/sloe) 400-600mm Root Cell
	Rubus fruticosa	(Wild Blackberry) 400-600mm Root Cell
Sc	Salix Cinerea	(Grey willow) 400-600mm Root Cell

ORNAMENTAL HEDGES; Supply and plant in staggered row(s) No./sq.M

Bs	Buxus sempervirens Suffruticosa	(Dwalf box)	3L 200-300mm 5
LH	Lavandula Hidcote	(Lavender)	3L 200-300mm 5
Esc	Escallonia Red Hedger		5L 750-900mm 3
Fs	Fagus sylvatica	(Beech)	Br. 900-1.2* 5
LoA	Ligustrum oval Aureum	(Golden privit)	10L 750-900m 3
LnBG	Lonicera nitida / Baggesons Gold	(Shrub honeysuckle)	5L 750-900mm AS

ORNAMENTAL SHRUBS, Eventual growing height over 1.0M, 3 strong breaks from the base. Container grown, if planted outside the recognised bare root season.

			size	No./sq.M
Ag	Abelia grandiflora	(Abelia)	3L 300-450mm	3
Aj	Aucuba japonica	(Spotted laurel)	3L 450-600mm	1
CaS	Cornus alba Sibirica	(Pink dogwood)	3L 600-900mm	3
CMi	Cornus Midwinter Fire	(Orange dogwood)	3L 600-900mm	3
Ct	Choisya ternata'	(Mexican Orange Blossom)	3L 300-450mm	3
Ee	Elaeagnus ebbingei	(Oleaster)	5L 450-600mm	2
HH	Hypericum Hidcote	(Rose of Sharron)	3L 450-600mm	4
LWB	Lonicera Winter Beauty	(Shrub honeysuckle)	3L 600-900mm	3
MW	Mahonia Winter Sun		3L 450-600mm	3
POL	Prunus Otto Luyken	(Dwalf laurel)	3L 300-450mm	4
Vt	Viburnum tinus Eve Price	(Laurustinus)	5L 600-900mm	3

GROUND COVER 3 strong breaks from base.

AW	Anemone Wild Swan	(Japanese Anemone	3L	5
BtA	Berberis thun Atropurpurea Nana	(Dwarf Purple barberry)	3L 450-600mm	5
B	Bergenia cordifolia	(Elephants ears)	2L	6
CiR	Ceonothus Repens	(California lilac)	3L 300-450mm	3
CS	Cistus Silver Pink	(Rock rose)	3L 300-450mm	4
EG/	Euonymus Emerald & Gold (E&G)		5L 300-450mm	6
Er _	Euphorbia Robbiae	(Spurge)	9*pot 200-300mm	7
Fm	Fuchsia Versicolor	(Varigated fuchsia)	3L 750-900mm	5
Ha	Hebe angustifolia	(Veronica)	3L 300-450mm	4
Hr	Hebe rackaiensis/ Red Edge	(Veronica)	3L 300-450mm	5
HG	Hedera helix / Glacier	(Ivy / Varigated)	9*pot 200-300mm	6
HA	Hydrangea Annabelle/ Black Stem Zambia		3L 300-450mm	4
LM	Lonicera Maigreen	(Shrub honeysuckle)	3L 300-450mm	4
Ma	Mahonia Aqolio	(Grape of Oregon)	3L 300-450mm	4
PE	Potentilla Elizabeth	(Shrubby white/yellow)	3L 300-450mm	4
Ro	Rosemarinus officionalis	(Rosemary)	3L 300-450mm	5
Sc	Sarcococca confusa	(Christmas box)	3L 300-450mm	4
Sm	Senecio greyii		3L 300-450mm	4
Sk	Skimmia japonica Rubella		3L 300-450mm	3
SF	Spiraea Firelight		3L 300-450mm	4
ScH	Symphoricarpos Hancock		Br. 300-450mm	2-3
VE	Vinca minor Elegantissimae	(Periwinkle)	9* pot. 7	

CLIMBERS planted 300mm from vertical structure with taught line wire and vine eye supports at 450/mm centres. Pit planted with support cane.

CM	=Clsenomdes Moerloosei	(Quince, pink)	3L 300-450mm AS
Jo	Jasminum officionale	(Summer jasmine, white)	3L 600-900mm AS
Jn	Jasminum nudiflorum	(Winter jasmine, yellow)	3L 600-900mm AS
Lp	Lonicera periclymenum	(Beedbine)/Honeysuckle)	3L 600-900mm AS
Py	Pyracantha rogorsiana	(Firethorn)	3L 600-900mm AS
Ws	Wisteria sinensis	(japanese wisteria)	3L 600-900mm AS

NOTES:
abbreviations. (cd) = climber, (B)=back, (E)=entrance, (F) = against fence, (H)=hedge, (I)=inside, (U)=underplant, (M)=margin, (S) = side, (W) = wall, AS = As indicated.
Plant numbers to be checked prior to ordering and planting.
ALL PLANT SUBSTITUTIONS TO BE AGREED before ordering and planting

Existing bay and bamboo retained (OFF SITE)

EXISTING TPO TREES - OAK
RETAIN AND PROTECT RPA.
STREAM CLEARED OF DEBRIS AND BLOCKAGES AS ECOLOGY RECOMMENDATIONS

EXISTING TREES AND HEDGEBANK (OFF SITE) RETAINED AND PROTECTED TO UPDATED ARB. ASSESMENT RECOMMENDATIONS

Rev. F. Minor amendment to text for clarity. 10-10-17
Rev.E. Amendments to Site layout. Landscape updated to co-ordinate. Drawing cross referenced with dwg No.994/PA/03, Dormouse Mitigation. 8-10-17
Rev D. Revised Site Layout, planting and maintenance program updated in accordance with ecology recommendations. 18/9/17
Rev C. Minor amendments to Site Layout, plot 27 garage relocated outside RPA, bin collection point added. Planting updated. 19-5-17
Rev.B House shade layers omitted. Minor amendments to Site Layout. Planting updated. 5-5-17
Rev.A Tree protection omitted - refer to arboricultural report ref. Treescene. Minor amendments to Site Layout. Planting updated. 30-4-17

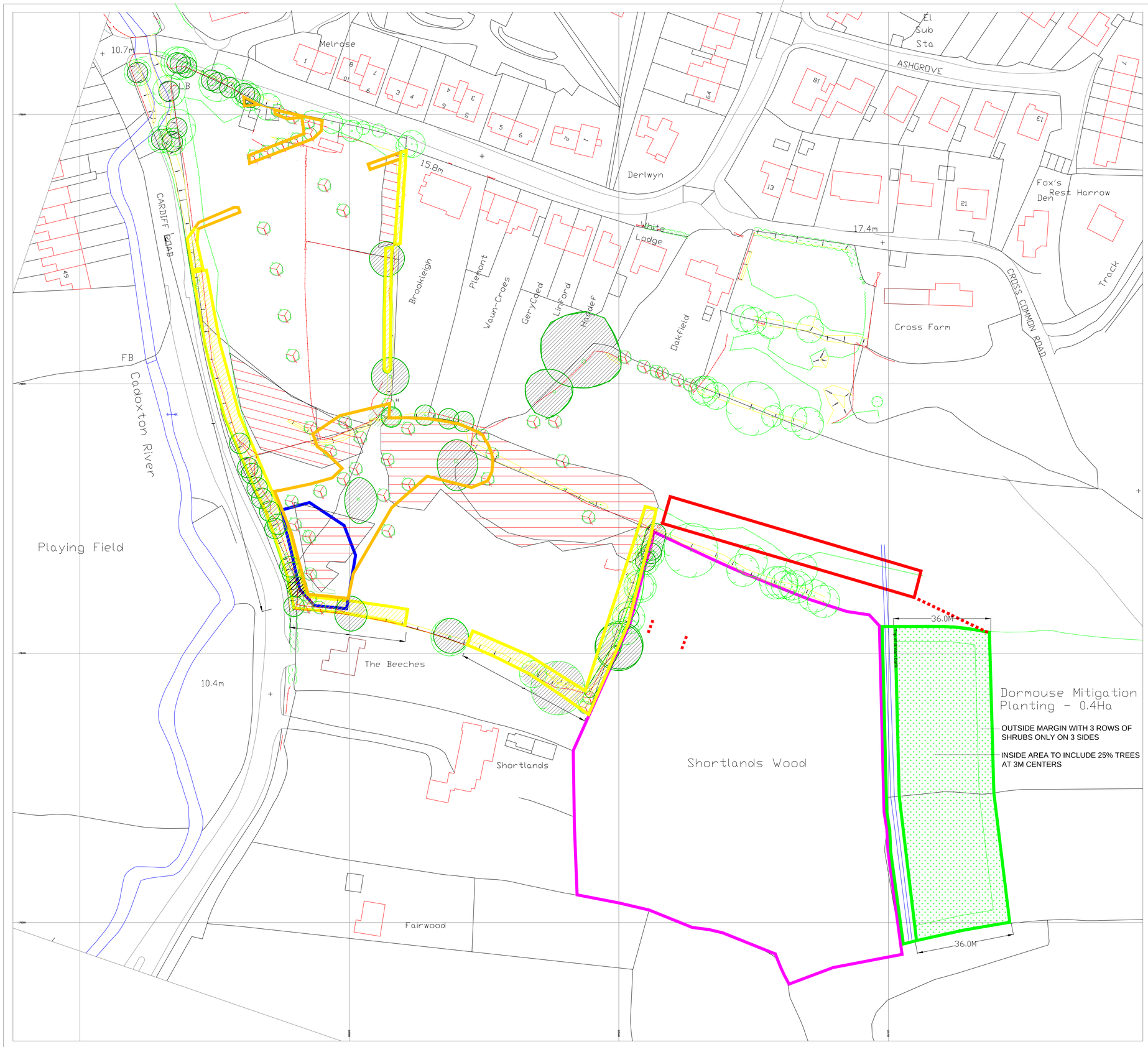
All existing dimensions to be site confirmed prior to works commencing and any discrepancies to be referred to architect. This drawing is to be read in conjunction with all other consultants and structural engineers drawings.

PROPOSED RESIDENTIAL DEVELOPMENT
LAND AT THE BUNGALOW, DINAS POWYS for
EDENSTONE LTD

LANDSCAPE PROPOSALS AND TREE CONSTRAINTS2
PLANNING SHEET 37 OF 2 1:200 (AO)

M D LANDSCAPE ARCHITECTS
19 HANDOVER TERRACE, BATH BA1 6LJ
E-MAIL: enquiries@mdla.co.uk

Date: Drawn: Checked:
994/PA/02F



KEY

PREVIOUS DORMOUSE PLANTING MITIGATION CARRIED OUT BY VALE OF GLAMORGAN (1012sq.M)

AREA OF HOUSING DEVELOPMENT PLANTING
New Trees - 50 No.
New Native Hedge - 480 lin.M
Native Screen whips - 425 sq.M
Ornamental/Wildlife value shrubs - 585 sq.M
Grass/Wildflower Area - 2,400 sq.M
Attenuation/stream - 600 sq.M
Refer to Landscape Proposal drawings 994/PA/01F and 02F

PROPOSED POND / ATTENUATION BASIN OUTLINED BLUE

AREA OF VEGETATION REMOVAL FOR HOUSING DEVELOPMENT (Approx. 4,575 sq.M)

AREA OF SHORTLANDS WOOD FOR HABITAT MANAGEMENT (1700M Sq.M DEVELOPER)

HEDGE TO BE IMPROVED AS PART OF MITIGATION STRATEGY 390 lin.M. Refer to Landscape Proposal drawings 994/PA/01F and 02F

AREA OF PROPOSED EXTENSION PLANTING TO SHORTLANDS WOOD FOR DORMOUSE MITIGATION (4000 M SQ BY DEVELOPER). See Detail below for plant setting out. DORMOUSE MITIGATION PLANTING. APPROX 1800 NO. PLANTS
Plants to be at 1.5M centers from the back of existing stream bank
All grown in root cells, size 40-60cm from local provenance stock.
Planted with a new square post and sheep net fence on three sides.
All plants to be given plastic spiral rabbit guards with support cane.

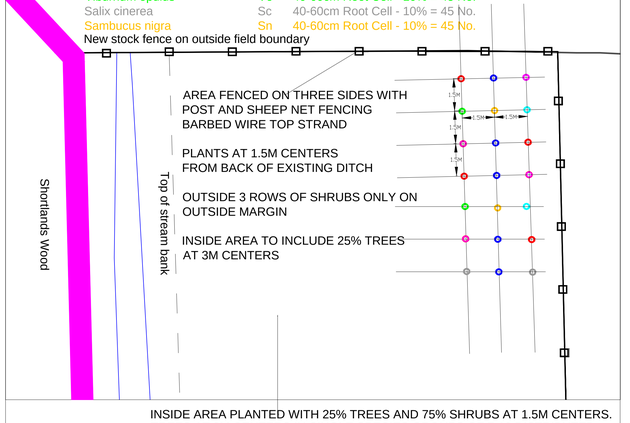
EXISTING TREES AND NATIVE HEDGE TO BE RETAINED WITHIN HOUSING DEVELOPMENT

0 5 10.0m 20.0m 30.0m 40.0m 50.0m
SCALE 1:500

DORMOUSE MITIGATION PLANTING;
OUTSIDE 3 ROWS OF SMALL TREES / LARGE SHRUBS AT 1.5M CENTRES ON 3 SIDES.
APPROX 450 PLANTS.

Crataegus monogyna	Cm	40-60cm Root Cell - 20% = 90 No.
Corylus avallana	Ca	40-60cm Root Cell - 20% = 90 No.
Cornus sanguineum	Cs	40-60cm Root Cell - 20% = 90 No.
Prunus spinosa	Ps	40-60cm Root Cell - 10% = 45 No.
Viburnum opulus	Vo	40-60cm Root Cell - 10% = 45 No.
Salix cinerea	Sc	40-60cm Root Cell - 10% = 45 No.
Sambucus nigra	Sn	40-60cm Root Cell - 10% = 45 No.

New stock fence on outside field boundary



INSIDE AREA PLANTED WITH 25% TREES AND 75% SHRUBS AT 1.5M CENTERS.
TREES AT 3M CENTERS IN SINGLE SPECIES GROUPS OF 7-10 DISTRIBUTED EVENLY THROUGHOUT = 1360 PLANTS

Betula pubescens	Bp	40-60cm Root Cell - 5% = 70 No.
Carpinus betulus	Cb	40-60cm Root Cell - 5% = 70 No.
Prunus avium	Pa	40-60cm Root Cell - 5% = 70 No.
Quercus robur	Qr	40-60cm Root cell - 10% = 135 No.
Crataegus lavigata	Cm	40-60cm Root Cell - 20% = 270 No.
Corylus avallana	Ca	40-60cm Root Cell - 40% = 540 No.
Viburnum opulus	Vo	40-60cm Root Cell - 10% = 135 No.
Sambucus nigra	Sn	40-60cm Root Cell - 5% = 70 No.

DORMOUSE MITIGATION - WOODLAND EXTENSION TO SHORTLANDS WOO.
PLANTING DETAIL. 1:200

Rev.C. Dormouse mitigation area extended. Trees included in planting mix. 20-10-17
Rev.B. Dormouse Mitigation Areas (existing and proposed) linked to Shortlands Wood, contours omitted, grid square colour changed. 15-10-17
Rev.A Areas updated to co-ordinate with proposed Housing Development planting, vegetation to be removed indicated and planting quantified. 10-10-17

All setting out dimensions to be site confirmed prior to works commencing and any discrepancies confirmed to architect. This drawing is to be read in conjunction with all other architectural and structural engineers drawings.

PROPOSED RESIDENTIAL DEVELOPMENT
LAND OFF CARDIFF ROAD, DINAS POWYS for
EDENSTONE LTD

DOORMOUSE MITIGATION PLANTING
PLANNING 1:500 (AO)

M D LANDSCAPE ARCHITECTS
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Date:	Drawn:	Checked:	Drawing No.
6/10/17	MDD		994/PA/03C

KEY

1. 50 x 150 mm Precast concrete bullnosed edging, Type " EBN ", conforming to BS EN 1340 ; 2003, laid on C6 / 8 or ST1 concrete bed and haunch (Note :- EBN to be replaced with Type " EF " fronting driveways.)

2. 25mm thickness of 6mm dense asphalt concrete surface course conforming to BS EN 13108-1 and clause 909 of the specifications for Highway Works, amended November 2008,with a minimum aggregate PSV value of 65 and a maximum AAV of 14. (AC6 dense surf 100/50 - PSV 65, AAV 14).
Note Limestone aggregate will NOT be permitted in any surface course.

3. 60mm thickness of 20mm dense base and binder course asphalt concrete (recipe mixtures) conforming to BS EN 13108-1 And clause 906 of the specifications for Highway Works, amended November 2008 with a minimum aggregate PSV value of 65 and a maximum AAV of 14. (AC20 dense bin 160/220 rec - PSV 65, AAV 14).

4. Hanson or similar approved by the Local Highway Authority Precast Concrete Block Paving 200mm x 100 x 80mm thick, colour " Red Brindle " unless otherwise instructed by the Local Highway Authority, - *(Raised Junctions / Mews Court & Shared Surfaces)*

5. 50mm thickness (minimum) of bedding Sand 50mm compacted to 30mm, comply with BS 7533 Part 3 : 1997, Table D1 and D2 which shall be hard, sound and resistant to derogation and maintain an even moisture content (not wet) which will give maximum compaction during the laying process. Soft or calcareous sand shall not be used.

6. 130mm thickness (minimum) of 20mm Open Graded Dense Base / Binder Course, Asphalt concrete (recipe mixtures) Layed in two layers, conforming to BS EN 13108-1 and clause 906 of the Specifications for Highway Works, amended November 2008 with a minimum aggregate PSV value of 65 and a maximum AAV of 14. (AC20 dense bin 160/220 rec - PSV 65, AAV 14). - Temporary Running Surface.

6a. 190mm thickness of 20mm Open Graded Dense Base / Binder Course, Asphalt concrete (recipe mixtures) Layed in two layers, conforming to BS EN 13108-1 and clause 906 of the Specifications for Highway Works, amended November 2008 with a minimum aggregate PSV value of 65 and a maximum AAV of 14. (AC20 dense bin 160/220 rec - PSV 65, AAV 14). - Raised Junction and Plateau Area.

7. 125 x 255 mm Precast concrete Bullnosed kerb, Type BN conforming to BS EN 1340 ; 2003, laid with a 50mm upstand, laid on C6 / 8 or ST1 concrete bed and haunch. Where a concrete edge beam has been laid, kerbs shall be bedded down in accordance with BS 7533-6:1999 on a layer 12 - 40 thick of 1:3 cement and sand mortar (by volume) and backed up with a grade C6/8 or St1 concrete haunch

7a. 125 x 150 mm Precast concrete Bullnosed kerb, Type BN conforming to BS EN 1340 ; 2003, laid flush, laid on C6 / 8 or ST1 concrete bed and haunch. Where a concrete edge beam has been laid, kerbs shall be bedded down in accordance with BS 7533-6:1999 on a layer 12 - 40 thick of 1:3 cement and sand mortar (by volume) and backed up with a grade C6/8 or St1 concrete haunch

8. 125 x 255 mm Precast concrete half battered kerb, Type HB2 conforming to BS EN 1340 ; 2003, laid with a 125mm upstand, laid on C6 / 8 or ST1 concrete bed and haunch. Where a concrete edgebeam has been laid, kerbs shall be bedded down in accordance with BS 7533-6:1999 on a layer 12-40 thick of 1:3 cement and sand mortar (by volume) and backed up with a grade C6/8 or St1 concrete haunch.

9. " Hanson " or similar approved by the Local Highway Authority Precast Concrete, Colour " Natural " (Grey) Blocks laid in a Low Rise Position 50mm upstand) in associated with Vehicular Crossover Blocks, Radii Blocks etc from the " Hanson" or similar approved range to achieve the required configuration.

10. 150mm thickness of Type 1 Unbound Granular material conforming to BS EN 13285 : 2003 and Clause 803 of the specifications for Highway Works, amended November 2007 and transported, laid, compacted and trafficked in accordance Clause 802 of the specifications for Highway Works, amended November 2004.

11. 300mm thickness of Type 1 Unbound Granular material conforming to BS EN 13285 : 2003 and Clause 803 of the specifications for Highway Works, amended November 2007 and transported, laid, compacted and trafficked in accordance Clause 802 of the specifications for Highway Works, amended November 2004.

12. Capping Layer. Where capping layer is required in addition to the required minimum thickness of Sub Base Layer (note 4) based on CBR values, the contractor shall provide the required thickness identified in the attached CBR table of Type 1 Unbound Granular material conforming to BS EN 13285 : 2003 and Clause 803 of the specifications for Highway Works.

13. 40mm thickness of Stone Mastic Asphalt Surface Course, 10mm aggregate with a minimum PSV of 68 and a 1.3mm surface texture conforming to BS EN 1308- 5 and Series 900 of the Specifications for Highway Works, amended August 2008. (SMA 10 Surface Course, 40 / 60 Binder, PSV Surface Texture 1.3mm AAV 14). Note Limestone aggregate will NOT be permitted in any surface course.

14. 60mm thickness of 20mm Binder Course Asphalt Concrete (recipe mixture) conforming to BS EN 1308- 1 and Clause 906 of the specifications for Highway Works, amended November 2008 with a minimum PSV of 65 and a maximum AAV of 14. (AC20 Dense Bin 45 / 60 rec - PSV 65, AAV 14).

15. 130 mm thickness of 32mm Base Course Asphalt Concrete (recipe mixture), Layed in two Layers, conforming to BS EN 1308- 1 and Clause 906 of the specifications for Highway Works, amended November 2008 with a minimum PSV of 65 and a maximum AAV of 14(AC32 Dense Bin 100 / 150 rec - PSV 65, AAV 14).

16. All verges shall be top soiled (minimum depth of topsoil of 200mm) , stone picked and then seeded. Seeding specifications to be agreed with the Vale of Glamorgan Councils Highway Maintenance Department prior to seeding.

KEY
(Vehicular / Pedestrian Crossovers)

HB2 - Standard Half Battered Precast Concrete Concrete Kerb, 255 x 125mm cut to suit width of crossing

BN - Standard Bullnosed Precast Concrete Kerb, 150 x 125mm, Laid with a Maximum Kerb upstand of 6mm for pedestrians and 25mm upstand for vehicles

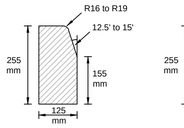
DL1 - Standard Left Hand Precast Concrete Transition Dropper Kerb, Half Battered to Bullbosed 255 x 125mm.

DR1 - Standard Right Hand Precast Concrete Transition Dropper Kerb, Half Battered to Bullbosed 255 x 125mm.

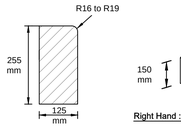
EF - Standard Flat Top Precat Concrete Edging Kerb, 150 x 50mm.

EBN - Standard Bullnosed Precat Concrete Edging Kerb, 150 x 50mm

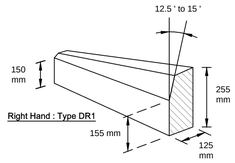
BN1 - Standard Bullnosed Precast Concrete Kerb,150 x 255mm, Laid at 125mm upstand on full height footways and 50mm upstand at raised junction

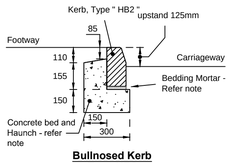


Half Battered Kerb
Type HB2

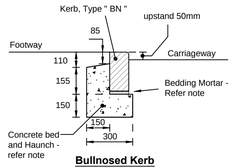


Bullnosed Kerb
Type BN2

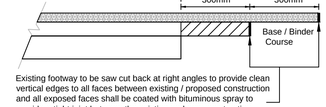




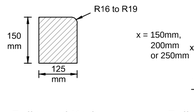
Bullnosed Kerb Type HB2



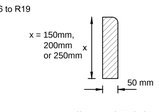
Bullnosed Kerb Type BN2



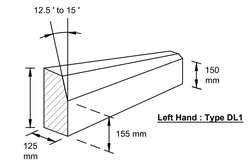
Typical Footway Tie in Detail

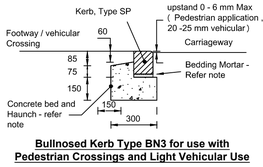


Bullnosed Kerb
Type BN3

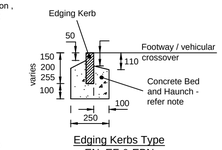


Bullnosed Edging
Type EBN



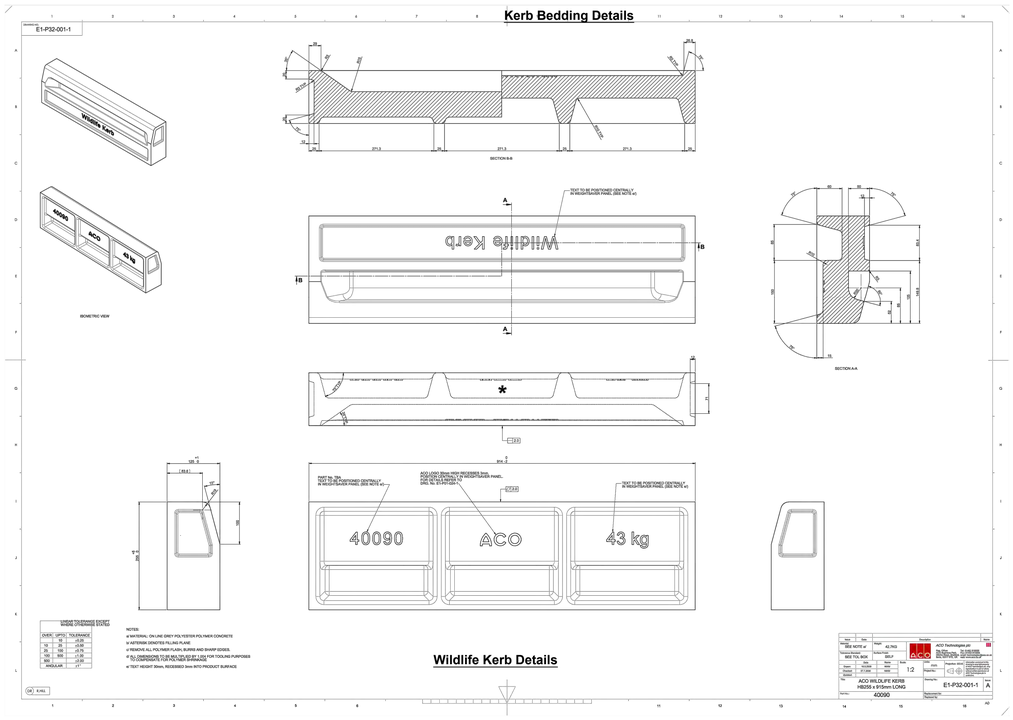


Bullnosed Kerb Type BN3 for use with Pedestrian Crossings and Light Vehicular Use

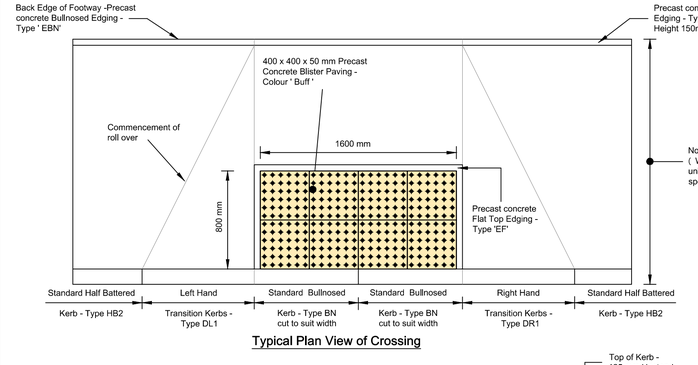


Edging Kerbs Type
EN, EF & EBN

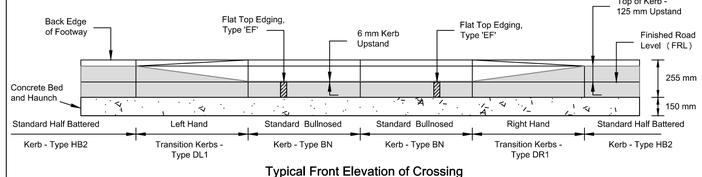
Kerb Bedding Details



Wildlife Kerb Details

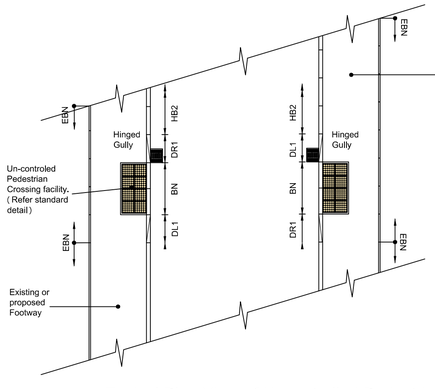


Typical Plan View of Crossing



Typical Front Elevation of Crossing

Construction Detail of Uncontrolled Crossing



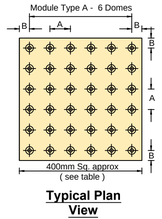
Typical Plan View of Uncontrolled Pedestrian Crossing Facility Away from Junction

Specifications for new footway

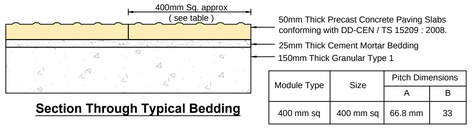
Surface Course -
25mm thickness of 6mm dense asphalt concrete surface course conforming to BS EN 13108-1 and clause 909 of the S.H.W. - amendment November 2008 with a minimum aggregate PSV value of 65 and a maximum AAV of 14. (AC6 dense surf 100/150 - PSV 65, AAV 14) - N.B - Limestone aggregate will not be permitted in any surface course.

Binder Course -
60mm thickness of 20mm dense base and binder course asphalt concrete (recipe mixtures) conforming to to BS EN 13108-1 and clause 906 of the S.H.W. - amendment November 2008 with a minimum aggregate PSV value of 65 and a maximum AAV of 14. (AC20 dense bin 160/220 rec - PSV 65, AAV 14)

Sub Base -
150mm thickness of type 1 unbound mixture granular materials conforming BS EN 13285 : 2003 and clause 803 of the S.H.W. - amendment November 2007 and transported, laid, compacted and trafficked in accordance with clause 802 of the S.H.W. - amendment November 2004.



Typical Plan View



Section Through Typical Bedding

Module Type	Size	Pitch Dimensions	
		A	B
400 mm sq	400 mm sq	66.8 mm	33

NOTES :-

1. All dimensions are to be checked prior to construction or manufacturing, Any discrepancy must be reported to the Engineer or his representative immediately.
2. Do not scale this drawing, work to figured dimensions only.
3. This drawing should be read in conjunction with all other relevant Engineering, Architectural, landscaping details, drawings and specifications and all relevant Vale of Glamorgan Council Standard Engineering Details.

Surfacing

4. The minimum carriageway thickness shall be 530mm, However greater construction depth may be required (capping Layers) depending on individual CBR values. (Refer table within drawing) .
5. CBR values are to be obtained at road formation levels.
6. All Bituminous surfacing works shall be machined layed unless other agreed in writing with the Local Highway Authority.
7. No wearing course shall contain and Limestone or Slag aggregate.
8. The specifications for Type 1 unbound granular material shall conform to BS EN 13285 : 2003 and Clause 803 of the Specification for Highway Works amended November 2007.
9. The transportation, laying and compacting and trafficking of Type 1 unbound granular material shall comply with the requirements of BS EN 13285 : 2003 and Clause 802 of the Specification for Highway Works, amended November 2004.
10. All bituminous material specifications for Asphalt Concrete shall conform to BS EN 13108 - 1 : 2006 and Clause 909 of the Specification for Highway Works amended November 2008.
11. All bituminous material specifications for Stone Mastic Asphalt (SMA) shall conform to BS EN 13108 - 5 : 2006 and Series 900 of the Specification for Highway Works amended August 2008..
12. The Testing for bituminous mixtures, material specifications shall conform to BS EN 13108 - 20 : 2006.
13. The specifications for Transporting, laying & compacting and type testing protocols for asphalt for roads and other paved areas shall conform to BS EN 4987 : 2007
14. Where gradients are steeper than 1 in 12, grit stone aggregate must be used.
15. Where it is envisaged that the Binder or Base Course materials within both the carriageway and footways areas are to be trafficked for more than 4 weeks before the application of the Surface Course, then a grit stone aggregate shall be used within the Binder content of 5,7 +/- 0,6% (Slag aggregate will not be permitted) .
16. In situations where the Binder or Base Course materials are not covered immediately with the Surface or Binder Course respectively the Binder and Base Courses shall be sprayed with a hot sealing tack coat of bituminous splay in accordance with Clause 920 of the Specification for Highway Works amended November 2007 prior to laying of the Surface or Binder courses.

Kerbing and Edging

17. All precast concrete kerbing, channels, edgings and quadrants shall comply with BS EN 1340 : 2003 and their dimensions unless otherwise stated.
18. All precast concrete kerbing, channels, edgings and quadrants shall be layed in accordance with BS 7533 Part 6 : 1999 unless otherwise instructed by the Highway Authority's representative.
19. All insitu concrete for foundations & Haunch shall be grade C6 / 8 or ST1 concrete in accordance with BS EN 206 - 1 & BS 8500 - 2 : 2006.
20. The foundation thickness shall be increased as necessary to rest on the carriageway sub-base.
21. Concrete edge beams shall have a minimum depth of 150mm & sufficient width to accommodate the unit & the concrete haunch.
22. Where precast concrete kerbs are to be laid on existing concrete edge beam, a hardened concrete foundation / haunch or existing carriageway base, Units shall be bedded down in accordance with BS 522 - 6 : 1999 in a layer of 12 - 40 mm thick of 1 : 3 cement and sand mortar (by Volume) and backed with C6 / 8 or ST1 concrete haunch.

Concrete Block Paving

23. All precast concrete block paving and associated kerb setts (where specified) shall be " Hanson Formpave " or similar approved, conforming to BS EN 1338 : 2003 which shall be laid in accordance with the manufacturers recommendations.
24. All precast concrete block paving shall be 200mm long x 100 wide x 80mm thick, colour " Red Brindle " unless otherwise instructed by the Local Highway Authority,
25. All standard precast concrete kerb setts (where specified) shall be laid in a " Low Rise " position (50mm upstand) and Natural in colour grey , unless otherwise instructed by the Local Highway Authority,
26. All block paving sand to be used as bedding course shall comply with BS 7533 Part 3: 1997, Table D1 and D2 which shall be hard, sound and resistant to degradation and maintain an even moisture content (not wet) which will give maximum compaction during the laying process. Soft or calcareous sand shall not be used.
27. All sand for jointing shall comply with BS 7533 Part 3 : 1997, Table D3.
28. All block paving shall be plate vibrated with a plate area 0.35 - 0.5m2 , force range 75-100 KN/m² and a frequency range of 75 - 100 Hz.
29. Any area of paving which settles must be related to the satisfaction of the Highway Authority.
30. Where early trafficking leads to migration of the jointing sand , areas to be re-sanded to refill the open joints.

Revisions

Project: Cross Common Road
Dinas Powys

Client: Eden STONE HOMES

Drawing: Highway Construction Details
Sheet 2 of 4

Scale: N.T.S. @ A1 Date: June 2017 Drawn by: SD

Drawing No: 10157-105-02 Rev:

PHOENIX DESIGN Partnership Ltd.
Unit 9, Westway Garage, Marksbury, Bath. BA2 9HN
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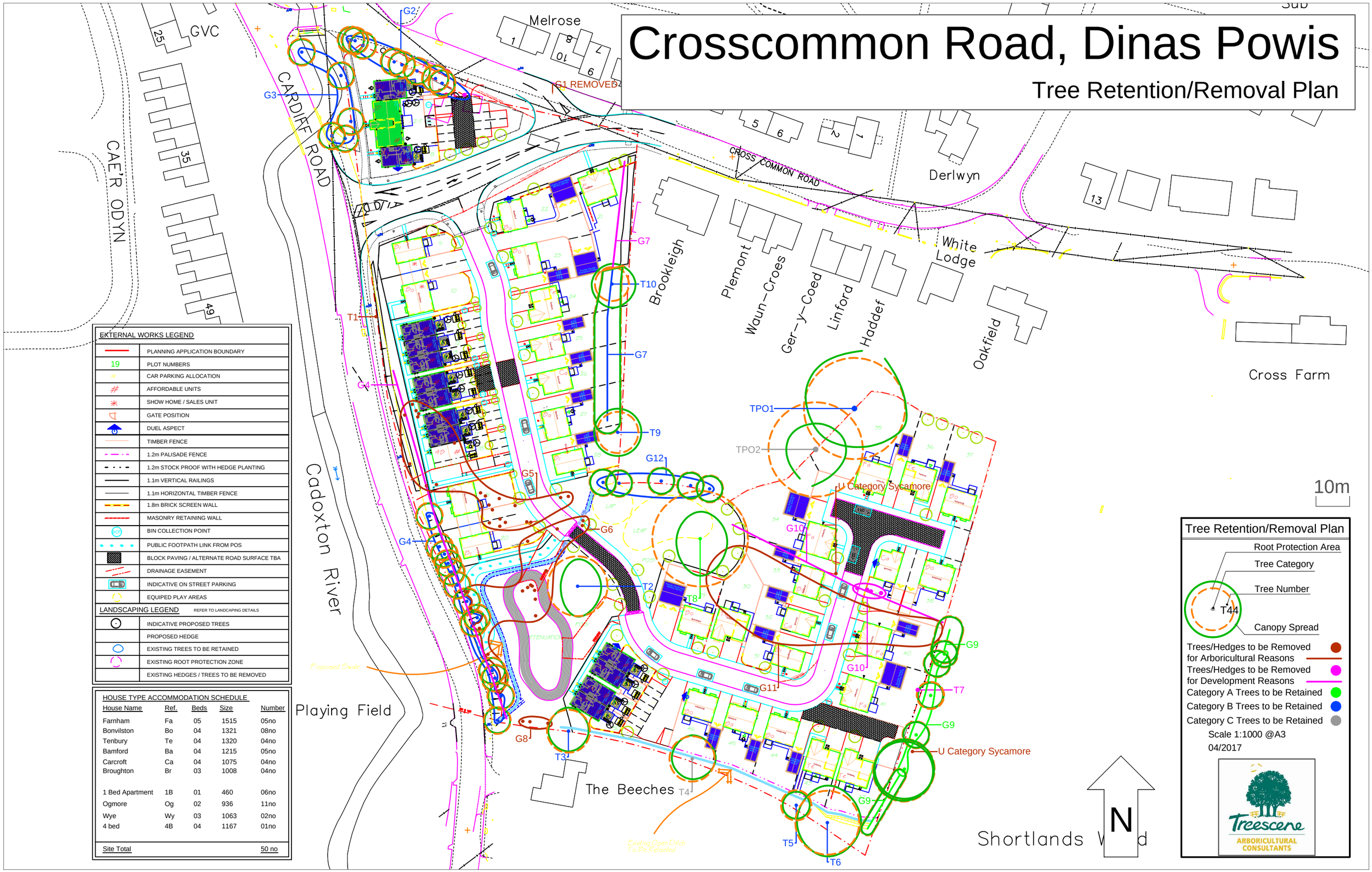
email. enquiries@phoenixdp.co.uk
Titan House, Lewis Road, Cardiff. CF24 5BS
tel. 029 2049 0771
www.phoenixdp.co.uk

Drg.Status:

Crosscommon Road, Dinas Powis

Tree Retention/Removal Plan



EXTERNAL WORKS LEGEND	
	PLANNING APPLICATION BOUNDARY
19	PLOT NUMBERS
	CAR PARKING ALLOCATION
#	AFFORDABLE UNITS
	SHOW HOME / SALES UNIT
	GATE POSITION
	DUEL ASPECT
	TIMBER FENCE
	1.2m PALISADE FENCE
	1.2m STOCK PROOF WITH HEDGE PLANTING
	1.1m VERTICAL RAILINGS
	1.1m HORIZONTAL TIMBER FENCE
	1.8m BRICK SCREEN WALL
	MASONRY RETAINING WALL
BIN	BIN COLLECTION POINT
	PUBLIC FOOTPATH LINK FROM POS
	BLOCK PAVING / ALTERNATE ROAD SURFACE TBA
	DRAINAGE EASEMENT
	INDICATIVE ON STREET PARKING
	EQUIPED PLAY AREAS
LANDSCAPING LEGEND	REFER TO LANDCAPING DETAILS
	INDICATIVE PROPOSED TREES
	PROPOSED HEDGE
	EXISTING TREES TO BE RETAINED
	EXISTING ROOT PROTECTION ZONE
	EXISTING HEDGES / TREES TO BE REMOVED

HOUSE TYPE ACCOMMODATION SCHEDULE

House Name	Ref.	Beds	Size	Number
Farnham	Fa	05	1515	05no
Bonvilston	Bo	04	1321	08no
Tenbury	Te	04	1320	04no
Bamford	Ba	04	1215	05no
Carcroft	Ca	04	1075	04no
Broughton	Br	03	1008	04no
1 Bed Apartment	1B	01	460	06no
Ogmore	Og	02	936	11no
Wye	Wy	03	1063	02no
4 bed	4B	04	1167	01no
Site Total				50 no

Tree Retention/Removal Plan

Trees/Hedges to be Removed for Arboricultural Reasons
Trees/Hedges to be Removed for Development Reasons
Category A Trees to be Retained
Category B Trees to be Retained
Category C Trees to be Retained

Scale 1:1000 @A3
04/2017

Treescene ARBORICULTURAL CONSULTANTS

Crosscommon Road, Dinas Powis

Tree Retention/Removal Plan

G1 REMOVED

G2

G3

G4

G7

G7

T1

T10

TPO1

CARDIFF ROAD

CROSS COMMON ROAD

Melro

Brookleigh

Plemont

Waun-Croes

Ger-y-Coed

Linfor

10m

N

Tree Retention/Removal Plan

Root Protection Area

Tree Category

Tree Number

T44

Canopy Spread

Trees/Hedges to be Removed for Arboricultural Reasons

Trees/Hedges to be Removed for Development Reasons

Category A Trees to be Retained

Category B Trees to be Retained

Category C Trees to be Retained

Scale 1: 500 @A3

04/2017

Treescene ARBORICULTURAL CONSULTANTS

Crosscommon Road, Dinas Powis

Tree Retention/Removal Plan

G4
G7
T9
G12
G5
G6
G4
T2
T8
TPO1
TPO2
U Category Sycamore
G10
G11
G10
N
10m

Tree Retention/Removal Plan

Root Protection Area
Tree Category
Tree Number
T44
Canopy Spread

Trees/Hedges to be Removed for Arboricultural Reasons
Trees/Hedges to be Removed for Development Reasons
Category A Trees to be Retained
Category B Trees to be Retained
Category C Trees to be Retained

Scale 1: 500 @A3
04/2017

Treescene
ARBORICULTURAL CONSULTANTS

Field

Crosscommon Road, Dinas Powis

Tree Retention/Removal Plan

TPO2

G12

G5

G6

G10

G9

T2

T8

G11

T7

G9

G8

T3

U Category Sycamore

The Beeches T4

T5

T6

G9

Existing Open Ditch
To Be Retained

10m

N

Tree Retention/Removal Plan

Root Protection Area

Tree Category

Tree Number

T44

Canopy Spread

Trees/Hedges to be Removed for Arboricultural Reasons

Trees/Hedges to be Removed for Development Reasons

Category A Trees to be Retained

Category B Trees to be Retained

Category C Trees to be Retained

Scale 1: 500 @A3

04/2017

Treescene
ARBORICULTURAL CONSULTANTS