



REDROW HOMES LTD

LAND AT ST NICHOLAS
VALE OF GLAMORGAN
APPLICATION NO:
2015/00249/FUL

**Environmental Management
Plan (EMP)**

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1. INTRODUCTION

- 1.1 This Environmental Management Plan (EMP) has been prepared by Ecology Solutions on behalf of Redrow Homes Ltd. It sets out the protection of features of ecological interest during the construction phase and management of those due to be retained and created within the development at St Nicholas here after referred to as the 'site'.
- 1.2 This EMP has been specifically produced to discharge comments 10, 11, 12, 13, 14 and 15 (reproduced below) received as part of the consultation response (dated 19th April 2016) for the planning application (2015/00249/FUL) related to residential development of 101 houses (see Appendix 1).
- 1.3 Comment 10 states that:
"Proposals demonstrating newt-friendly drainage on site"
- 1.4 Comment 11 states that:
"Strategy for working with respect to badgers (preventing entrapment and fragmentation of habitat)"
- 1.5 Comment 12 states that:
"Strategy for site clearance, particularly with respect to breeding birds, reptiles and amphibians"
- 1.6 Comment 13 states that:
"A lighting strategy to demonstrate the provision of vegetated dark flight corridors for bats"
- 1.7 Comment 14 states that:
"A scheme for biodiversity maintenance and enhancement on site (including indication of post development management / monitoring where appropriate)"
- 1.8 Comment 15 states that:
"Great Crested Newt European Protected Species Method Statement (as will accompany the licence application)"
- 1.9 This EMP provides a template for safeguarding wildlife during construction and future enhancements and guidelines for future management regimes. The plans cover a period of five years.
- 1.10 The plan is intended to be an iterative process that is subject to annual review. Any future amendments to the plan will be dependent on prevailing conditions and the opinion and judgement of land managers on the ground. Nevertheless, the spirit of the plan and its ultimate goal is to provide effective ecological enhancement, to benefit local wildlife interests and work towards national and local Species / Habitats of Principal Importance (Priority Species / Habitats) targets.

- 1.11 This EMP has been written with reference to published guidance from the Chartered Institute of Ecology and Environmental Management (CIEEM) and with regard to Natural Resources Wales (NRW) guidelines for protected species.
- 1.12 The document is set out as follows:
- Ecological baseline and evaluation of important features within the site;
 - Aims and objectives of the EMP in order to safeguard wildlife during construction and maximise the ecological potential of features due to be retained and created within the site;
 - Management prescriptions in order to achieve objectives. These include any monitoring requirements; and
 - The work program for a period of 5 years.
- 1.13 A copy of this report and the management plan should be provided to all interested parties as necessary to ensure compliance with its prescriptions and the protection and enhancement of the biodiversity interest.

2. ECOLOGICAL BASELINE AND EVALUATION

- 2.1 Habitat surveys were carried out by Ecology Solutions in April and October 2014 in order to ascertain the general ecological value of the site and wider study area and to identify the main habitats and associated plant species, with further update habitat surveys carried out in August 2016.
- 2.2 Habitat surveys were based upon an extended Phase 1 survey technique. The habitats and dominant plant species were recorded, together with conspicuous faunal activity and evidence of the presence, or potential presence, of protected species. Results from the habitat survey were then mapped (see Plan ECO2).
- 2.3 During the surveys undertaken, all obvious faunal activity such as birds or mammals observed visually or by call, was also recorded. Specific attention was paid to any potential use of the site by protected species, Priority Species, or other notable species.
- 2.4 Specific surveys were also carried out for bats, Badgers *Meles meles*, Dormice *Muscardinus avellanarius* and Great Crested Newts *Triturus cristatus*. Specific details of these surveys can be found within the Ecological Assessment (dated November 2014).

Existing Ecological Features and Wildlife Use of the Site

- 2.5 The site is situated to the northeast of St Nicholas and mainly comprises managed improved grassland, together with a series of hedgerows and occasional areas of ruderal vegetation, scrub, trees, amenity grassland, amenity planting, buildings and hardstanding (see Plan ECO2).
- 2.6 No buildings within the site are considered to be suitable to support roosting bats on account of their fabric, well sealed roofs, lack of suitable features and the fact that they were recently subject to regular use and disturbance. Furthermore, no evidence of bats was recorded within these buildings during the specific internal and external survey work.
- 2.7 One tree on the western boundary of the site was identified as having some potential to support roosting bats, due to rot holes and cracked limbs present. As such, two emergence surveys were carried out on this tree on the 30th June and 13th August 2014, during which no bats were recorded emerging from the tree.
- 2.8 During the activity surveys undertaken within the site and wider study area, low numbers of Common Pipistrelle and Soprano Pipistrelle were recorded foraging / commuting along the hedgerows, together with very occasional Myotis sp. and Serotine.
- 2.9 Surveys carried out in July 2014 and August 2016 by Ecology Solutions, recorded no specific evidence of Badger in the form of any setts, latrines, snagged hairs, snuffle holes, mammal push-through or footprints within or adjacent to the site or wider study area.

- 2.10 No ponds are located within the site. The majority of habitats within the site are not suitable terrestrial habitat for Great Crested Newts or other amphibians, due to being regularly managed, although the hedgerows do offer some terrestrial habitat for Great Crested Newts.
- 2.11 The results from the Great Crested Newt survey work indicate that there is a small population of Great Crested Newts in ponds P2 and P5.
- 2.12 Pond P2 is located approximately 175m west of the site and therefore Great Crested Newts could utilise the hedgerows in the east of the site to forage and commute on occasion, although more optimum habitat is located immediately adjacent to pond P2, which is located within the key habitat distance for Great Crested Newts.
- 2.13 Pond P5 is located approximately 340m northwest from the site, is separated by areas of unsuitable habitat, such as a country lane and intensively managed agricultural land. Given the distance that this pond is from the site and the habitats that separate them, no Great Crested from P5 are likely to utilise the habitats within the site.
- 2.14 The site supports a number of locally common breeding birds, although it is not considered to be of any special ornithological interest.
- 2.15 The majority of habitats within the site and wider study area are subject to regular management that creates a short sward height, even along the field margins, and as such does not provide suitable habitat for reptiles. The hedgerows within the site and wider study area do offer some limited foraging and commuting habitat for reptiles, although the surrounding habitats comprise largely residential and intensively managed agricultural land, which are not suitable for reptiles, reducing the likelihood of this faunal group being present.
- 2.16 The site is expected to support a range of common invertebrate species but there is no evidence to suggest that any other protected or notable species are likely to be present. The management regime of the site also reduces the suitability for this group.

3. AIMS AND OBJECTIVES

- 3.1 The aims and objectives of the EMP are to maintain and avoid any harm / damage to features of ecological interest during construction, in addition to safeguarding populations of protected species on site.
- 3.2 The aims and objectives of the EMP are also to maintain and enhance features of ecological interest retained within the development, in addition to maintaining populations of protected species on site, whilst providing for ecological / biodiversity enhancements within the proposed development.
- 3.3 The following objectives have been identified:
- Objective 1: Safeguard, maintain and enhance retained and newly created habitats within the development site;
 - Objective 2: Safeguard and maintain populations of protected species identified within the development site area at a favourable conservation status; and
 - Objective 3: Increase biodiversity by maximising opportunities for flora and fauna.

4. CONSTRUCTION MEASURES

- 4.1 Construction measures for activities undertaken during site preparation, earthworks and construction phase are described below.

Protective Measures for Habitats

- 4.2 Sensitive areas and retained habitat will be protected by provision of a physical separation from the construction operations. This will include heras fencing where appropriate to ensure no impact occurs during construction.
- 4.3 Standard engineering practice in respect of pollution control, as part of the development proposals will negate any potential effect on sensitive areas and any potentially detrimental effects through dust contamination during construction will be mitigated through standard industry best practice measures. Where mitigation measures rely on water, it is expected that only sufficient water will be applied to damp down the material. There should not be any excess to potentially contaminate local watercourses.
- 4.4 Avoidance of potentially dust-generating activities during periods when wind direction may carry dust into sensitive areas will be undertaken. The storage of any loose materials that may be susceptible to wind will also be covered or screened and located away from the sensitive habitats if possible.
- 4.5 Works will be carried out in accordance with British Standard BS5837:2012 which relates to the protection of retained trees during development.
- 4.6 The retained hedgerows within the site are to be fenced according to current British Standards before construction work commences in order to protect roots from compaction. Fences will remain in place until construction work is complete within the vicinity of the hedgerow. In addition, no activity, storage of materials, liquids of any sort or source will be permitted within the protective fencing at any time.
- 4.7 Any retained trees will be identified prior to the commencement of any works and appropriate measures will be undertaken to prevent any harm to these trees from construction activities. These measures include identifying root protection zones and implementing fencing and signage around these zones to avoid tracking of heavy machinery compacting the soils.
- 4.8 In the event that any arboriculture tree works (including felling) are required prior to or during construction, these will be undertaken by an appropriately qualified tree surgeon and with regard to roosting bats and nesting birds (see sections 4.14 and 4.37 below).

Protective Measures for Species

Bats

- 4.9 **Legislation.** All bats are protected under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) and included on Schedule 2 of the Conservation of Habitats and Species Regulations 2010 (“the Habitats Regulations”). These include provisions making it an offence to:
- Deliberately kill, injure or take (capture) bats;
 - Deliberately disturb bats in such a way as to be likely –
 - To impair their ability to survive, to breed or reproduce, or to rear or nurture their young, or to hibernate; or;
 - To affect significantly the local distribution or abundance of the species concerned;
 - Damage or destroy any breeding or resting place used by bats;
 - Intentionally or recklessly obstruct access to any place used by bats for shelter or protection (even if bats are not in residence).
- 4.10 The words deliberately and intentionally include actions where a court can infer that the defendant knew that the action taken would almost inevitably result in an offence, even if that were not the primary purpose of the act.
- 4.11 The offence of damaging or destroying a breeding site or resting place (which can be interpreted as making it worse for the bat) is an absolute offence. Such actions do not have to be deliberate for an offence to be committed.

Protective Measures

- 4.12 Normal construction activities will be limited to day time hours to reduce light pollution generated by construction activities on bats foraging within the area during the night. This is not applicable during winter months when days are shorter and bats are in hibernation.
- 4.13 Appropriate safety and security lighting will be employed during construction to minimise light spill onto the trees and hedgerows within the site and into adjacent off-site habitats. Lighting will be angled away from these features which are suitable foraging habitats for bats.
- 4.14 Checks for bats will be undertaken if the tree identified as having features to support roosting bats is to be removed (currently it is proposed that the tree is retained). In the event a roost is identified prior to felling, then an appropriate mitigation strategy and licence from NRW would be required.

Reptiles

- 4.15 **Legislation.** All six British reptile species receive a degree of legislative protection that varies depending on their conservation importance.
- 4.16 Smooth Snake *Coronella austriaca* and Sand Lizard *Lacerta agilis* receive 'full protection' under the Wildlife and Countryside Act 1981 as

well as protection under the Conservation of Habitats and Species Regulations 2010 (“the Habitats Regulations”). These receive protection from:

- Killing, injuring, taking;
- Possession or control (of live or dead animals, their parts or derivatives);
- Damage to, destruction of, obstruction of access to any structure or place used for shelter or protection;
- Disturbance of any animal occupying such a structure or place;
- Selling, offering for sale, possession or transport for purposes of sale (live or dead animal, part or derivative).

4.17 Common Lizard, Grass Snake, Slow Worms and Adder *Vipera berus* are only 'partially protected' under the Wildlife and Countryside Act 1981 (as amended) and as such only receive protection from:

- Deliberate killing and injuring;
- Being sold or other forms of trading.

4.18 The legislation relevant to common reptiles therefore protects the species, but not their habitat and any works that avoid killing or injuring any of these species, should ensure that an offence is avoided.

Protective Measures

4.19 The hedgerows are, in the main, being retained as part of the proposals, which will maintain the existing terrestrial habitat for reptiles post-development.

4.20 Due to the hedgerows limited suitability to support reptile species, a precautionary approach will be undertaken during any hedgerow removal. This will involve a hand search carried out by a qualified ecologist before the habitat is removed and once removed, the habitat will then be maintained in a cleared state to ensure that no reptiles re-colonise. Furthermore, the mitigation outlined for Great Crested Newts will further reduce any possible impacts and ensure no reptiles or Great Crested Newts are impacted during habitat removal.

Badgers

4.21 **Legislation.** The Protection of Badgers Act 1992 consolidates the previous Badgers Acts of 1973 and 1991. The legislation aims to protect the species from persecution, rather than being a response to an unfavourable conservation status, as the species is in fact common over most of Britain, with particularly high populations in the southwest.

4.22 As well as protecting the animal itself, the 1992 Act also makes the intentional or reckless destruction, damage or obstruction of a Badger sett an offence. A sett is defined as “any structure or place which displays signs indicating current use by a Badger”. ‘Current use’ of a Badger sett is defined by guidelines as “how long it takes the signs to

disappear, or more precisely, to appear so old as to not indicate “current use”.¹

- 4.23 In addition, the intentional elimination of sufficient foraging area to support a known social group of Badgers may, in certain circumstances, be construed as an offence by constituting ‘cruel ill treatment’ of a Badger.
- 4.24 Work that disturbs Badgers is illegal without a licence. Recent guidelines on the types of the activity it considers should be licensed within certain distances of sett entrances. For example, using heavy machinery within 30m of any entrance to an active sett, and lighter machinery within 20m, or light work such as hand digging within 10m, all may require a licence.
- 4.25 ‘Interim guidance’ issued in September 2007 specifically states “it is not illegal, and therefore a licence is not required, to carry out disturbing activities in the vicinity of a sett if no badger is disturbed and the sett is not damaged or obstructed.”
- 4.26 However, more recent guidance produced in 2009 states that Badgers are relatively tolerant of moderate levels of disturbance and that low levels of disturbance at or near to Badger setts do not necessarily disturb the Badgers occupying those setts. However, guidance continues by stating that any activity that will, or is likely to cause one of the interferences defined in Section 3 (such as damaging a sett tunnel or chamber or obstructing access to a sett entrance) will continue to be licensed.
- 4.27 In addition, this latest guidance no longer makes reference to any 30m/20m/10m radius as a threshold for whether a licence would be required. Nonetheless, it is stated that tunnels may extend for 20m so care needs to be taken when implementing excavating operations within the vicinity of a sett and to take appropriate precautions with vibrations and noise, etc. Fires / chemicals within 20m of a sett should specifically be avoided.
- 4.28 This interim guidance allows greater professional judgement as to whether an offence is likely to be committed by a particular development activity and therefore whether a licence is required or not. For example, if a sett clearly orientates southwards into an embankment it may be somewhat redundant to have a 30m-exclusion zone to the north.
- 4.29 It should be noted that a licence cannot be issued until the site is in receipt of a full and valid planning permission and that generally licences are not granted between December and June inclusive to avoid disruption to the Badger breeding cycle.
- 4.30 Local authorities are therefore obliged to consult NRW over any work which is considered likely to adversely affect Badgers.

¹ http://www.naturalengland.org.uk/Images/WMLG17_tcm6-11815.pdf

Protective Measures

- 4.31 As a precaution, prior to any construction works, a check for any evidence of Badgers will be conducted within the site and wider study area, also paying attention to the adjacent off-site habitats bordering. Should any setts be discovered within the site that would be impacted by the development, then an appropriate strategy for mitigation will be devised and a licence secured from NRW (disturbance/sett closure) if necessary.
- 4.32 To ensure that no impacts occur to Badgers during any construction activities all contractors working on the site will be briefed regarding the potential presence of Badgers.
- 4.33 Any trenches or deep pits within the site that are to be left open overnight will be covered or provided with a means of escape should a Badger enter. This could simply be in the form of a roughened plank of wood placed in the trench as a ramp to the surface.
- 4.34 Any trenches or pits will be inspected each morning to ensure no Badgers have become trapped overnight. Should a Badger become trapped in a trench it will likely attempt to dig itself into the side of the trench, forming a temporary sett. Should a trapped Badger be encountered Ecology Solutions will be contacted immediately for further advice.
- 4.35 The storage of topsoil or other 'soft' building materials on site should be given careful consideration. Badgers could adopt such mounds as setts, which would then be afforded the same protection as established setts. Such mounds should be regularly inspected to check for use by Badgers.

Birds

- 4.36 **Legislation.** Section 1 of the Wildlife and Countryside Act 1981 (as amended) is concerned with the protection of wild birds, whilst Schedule 1 lists species that are protected by special penalties. All species of birds receive general protection whilst nesting.

Protective Measures

- 4.37 Any vegetation clearance will be undertaken with due consideration for potential use by birds. Cutting of vegetation, particularly those features that provide important nesting habitats (including hedgerows and trees) will be undertaken outside of the bird breeding season (March to July inclusive). Should the above timing constraints conflict with any timetabled works, it is recommended that works commence only after a suitably qualified ecologist has undertaken checks to ensure no nesting birds are present. If nesting birds are found to be present during checks then clearance would need to be delayed until young have fledged.

Great Crested Newts

- 4.38 No licence is required for the clearance of vegetation within the site. A method statement detailing the survey results and the proposed works

has been submitted to NRW so that they can confirm whether a licence is required.

- 4.39 Although no licence is required, as a precautionary measure the clearance of habitat within 250m of pond P2 will be hand searched thoroughly by a licence ecologist prior to removal. Once the grassland has been searched and no Great Crested Newts have been found, then the topsoil will be removed slowly by a digger (this will also be supervised). Areas of hedgerow to be impacted within 250m of pond P2 will also be hand searched by a licence ecologist and removed using hand tools. If the root systems need to be removed this will be carried using a digger, in which the roots will be slowly pulled out under the supervision of a licence ecologist.
- 4.40 Once the habitat is cleared it will be maintained in a clear state and exclusion fencing will be installed around the retained hedgerows along the eastern boundary of the development site to ensure Great Crested Newts do not enter the development site. This fencing will be maintained in place until the development is completed. If the development requires areas of fencing to be removed this will be carried out slowly and under the supervision of a licence ecologist.
- 4.41 All clearance will stop immediately if Great Crested Newts are recorded during the hand search or within the development site during vegetation clearance. A Great Crested Newt mitigation licence application will then be completed and habitat clearance will resume once a licence is granted by NRW and the habitat has been cleared of Great Crested Newts.

5. MANAGEMENT MEASURES

- 5.1 How each habitat should be managed and monitored is described below, in relation to each of the three objectives.
- 5.2 The proposals include new landscape planting throughout the site, including new trees, hedgerow and shrub planting, and areas of grassland. This new planting together throughout the site will more than offset any losses to the existing habitats within the site pre-development.
- 5.3 A summary table of the post development management measures is set out in Chapter 6. This EMP and its management measure will be followed by the management company in charge of post development management of the habitat within the site.

Objective 1: Maintain and Enhance Retained and Created Habitats

Management of Habitat

Amenity Grassland

- 5.4 New areas of amenity grassland will be seeded or created with turf and laid in line with good horticultural practices.
- 5.5 The areas of amenity grassland will be cut on a regular basis. Checks will be made monthly and the grass will be cut when it reaches **100mm** long, back to a length of **35mm**. Cuttings will be removed from site or left in discrete habitat piles. Mowing will be required more frequently during the spring / summer seasons.

Shrub and Tree planting

- 5.6 New planting consisting of native species of local provenance, or those known to be of value to wildlife. This new landscape planting will provide additional habitats for a range of wildlife.
- 5.7 All retained and new trees within the site will be subject to appropriate arboriculture maintenance where necessary, to help prolong their life and ensure they are safe. The condition of mature trees within the site will be monitored during the first five years following completion of the development, to ensure a favourable condition is maintained.
- 5.8 Any arboricultural management e.g. pruning / lopping will be carried outside the bird nesting season (**March – July inclusive**) to avoid any potential offence, or after a suitably qualified ecologist has undertaken checks to ensure no nesting birds are present. Where possible any dead wood produced will be retained as an ecological feature, either as standing deadwood or as log piles, offering new habitat for saproxylic invertebrates.
- 5.9 Planting of new trees will be undertaken during the **autumn, winter or spring**. For the first five years after planting, regular health checks of the trees will be undertaken to ensure successful establishment especially during periods of dry weather, to ensure that they are not

affected by drought and to identify any potential gaps where plants have not survived.

- 5.10 Any failed new planting will be replaced with native species of local providence and of similar species content to that within the site.

Hedgerows

- 5.11 The majority of the existing hedgerows are to be retained with only minor losses, which will therefore retain existing foraging and navigational opportunities for wildlife.
- 5.12 New hedgerows are to be planted through the site and a large native hedgerow is to be planted along the north eastern boundary of the site and this will create additional foraging and commuting habitat for wildlife.
- 5.13 Appropriate management of the new and existing hedgerows will be undertaken in order to enhance their ecological value, and this will include trimming being only undertaken during **winter months**, when berries are no longer present to maximise foraging opportunities for birds in autumn. Cutting hedgerows in the winter months will maintain healthy growth and a good structure and to also avoid the main bird-nesting season, March-July (inclusive).
- 5.14 Existing and new hedgerows will be trimmed **every three years, or alternate sides of the hedgerow cut once every two years**, and the hedgerow maintained at a height of at **least 3-4m**. The hedgerows will be managed with a thick structure, and should the hedgerows become gappy or with sparse growth at their bases, the hedgerows will be subject to coppicing / laying to improve their structure.
- 5.15 For the first five years after planting, regular health checks of the hedgerows will be undertaken especially during periods of dry weather, to ensure that the hedgerows are not affected by drought. Any failed sections of existing hedgerows will be replaced with similar species content and size to that within the site.

Wildflower Meadow

- 5.16 Areas of wildflower meadow planting will be within the areas of public open space.
- 5.17 The meadow will be managed with a more intensive mowing regime in the first year to aid initial establishment of the wildflower species. The grassland will then only be cut to **150mm** and **mown once a year**. This grassland will be cut between **August and September**.
- 5.18 Any areas of failed wildflower meadow will be reseeded with a seed mix of similar species content.

Objective 2: Maintain Populations of Protected Species at a Favourable Conservation Status

Bats

- 5.19 The majority of hedgerows in the site are to be retained which will provide a continued corridor to the adjacent habitats. In addition the large new native hedgerows will offer further suitable foraging and commuting habitat.
- 5.20 The planting of new trees and hedgerows within the site will provide new and enhanced foraging opportunities for bats that will more than offset any minor losses resulting from the proposals.
- 5.21 A sympathetic lighting regime associated with the new proposals will be implemented to minimise light spillage into key areas such as along the areas of open spaces and new and existing hedgerows which are to provide suitable foraging and navigation opportunities for bats.
- 5.22 To maintain suitable conditions for light-sensitive species a number of measures could be implemented including the use of sodium, UV-filtered lights or LED lights, which produce less light spillage than other types of lighting, and have no low / no UV content to reduce light spillage on existing bat flight lines. In addition, the spillage of the light can be reduced further through use of reduced column heights and the employment of flat glass luminaires which will direct light below the horizontal plane, preferably at an angle less than 70 degrees.
- 5.23 Further reduction in light spillage will be achieved at the implementation stage through e.g. placement of lighting columns as far away from the key foraging / commuting areas / trees with potential to support roosting bats, by using timers on the lights, or by screening with natural vegetation.
- 5.24 New roosting opportunities will be created with the erection of 5 Schwegler 1FF boxes (see Appendix 2 for specifications), which will be erected on suitable retained semi-mature/mature trees within the site (see Plan ECO3). This model of bat box is known to be attractive to a number of the smaller bat species, including Pipistrelle bats, which are the most abundant species recorded within the site. This measure will provide enhanced roosting opportunities within the site.
- 5.25 Bat boxes will be checked **annually** to ensure they are in place and replacements supplied if necessary.
- 5.26 The local Bat Group / Wildlife Trust will be contacted and offered the opportunity to monitor and maintain the bat boxes within the site.
- 5.27 Bats will benefit from the proposed habitat enhancements, including the planting of grassland and the new tree and shrub planting which will diversify existing habitats at the site and encourage invertebrate food sources providing enhanced foraging resources for bats. The new tree and shrub planting will provide additional suitable foraging and navigational opportunities for bats.

Reptiles

- 5.28 The new hedgerows to be planted as part of the proposed development will increase the amount of suitable terrestrial habitat present for reptiles post-development. These new hedgerows will also improve connectivity throughout the site and to the wider area for reptiles.
- 5.29 The areas of wildflower meadow within the open space to be provided as part of the proposed development are subject to appropriate management in order to increase the available habitat for reptile species.

Badgers

- 5.30 The new shrub and tree planting will offer good potential foraging resources for Badgers through encouraging different varieties of invertebrates.
- 5.31 The road network has also been designed to keep road traffic speeds to a minimum such that any increase in road traffic accidents post-development are considered to be very unlikely.

Birds

- 5.32 The development proposals will retain many of the existing foraging and nesting opportunities for birds. The provision of a new native hedgerow, shrub and tree planting, as part of the landscape proposals will provide new suitable nesting and foraging opportunities for birds to offset any losses. The provision of new berry/fruit-bearing species will also provide seasonal resources for birds.
- 5.33 The proposed development will incorporate new opportunities for breeding birds. 5 Schwegler 1B bird boxes (see Appendix 3 for details of these bird boxes and Plan ECO3 for locations) will be erected on suitable retained trees. Old nesting material to be removed from bird boxes in **January** and boiling water to be used to remove remaining parasites. No insecticides to be used when cleaning boxes. These boxes will maximise the species complement attracted to the site. Any damaged or lost bird boxes will be replaced.
- 5.34 Birds in general will benefit from the proposed habitat enhancements, including the new trees, shrub and hedgerow planting. These features will offer new nesting and foraging opportunities for birds.
- 5.35 Management of habitats will be undertaken with due consideration for potential use by birds. Cutting of vegetation, particularly those features that provide important nesting habitats (including hedgerows and trees) will be undertaken during the winter months. Should the above timing constraints conflict with any timetabled works, it is recommended that works commence only after a suitably qualified ecologist has undertaken checks to ensure no nesting birds are present. If nesting birds are found to be present during checks then clearance would need to be delayed until young have fledged.

Great Crested Newts

- 5.36 The proposed development maintains the majority of the hedgerows within the development site, with only minor losses to facilitate roads. New areas of hedgerow planting will be carried out along the north eastern boundary of the development site which will offer new suitable habitat post development. Off-set gully pots will be incorporated into the site pending the Vale of Glamorgan highways approval.

Invertebrates

- 5.37 The proposed new grassland, tree and hedgerow planting will offer new opportunities for invertebrates. A variety of plant species will be used as part of the landscape scheme which will increase the attractiveness of the site for a range of different invertebrate species.

Objective 3: Increase Biodiversity by Maximising Opportunities for Flora and Fauna

- 5.38 The new trees and shrub planting within the proposed development will comprise native species of local provenance or those of benefit to wildlife and will increase the floristic diversity of the site. The new landscape planting will provide enhanced foraging and nesting resources for birds, foraging and navigational resources for bats and terrestrial habitats for Great Crested Newts, Badgers and reptiles.

6. SCHEDULE OF WORKS

Objective	Receptor	Management Prescription	Timing of Works	Responsible Person / Organisation
CONSTRUCTION MEASURES				
PROTECTION OF HABITATS DURING CONSTRUCTION	Habitats within the site	Fencing to protect sensitive areas and retained habitat from construction activities (such as heavy machinery).	During construction.	Redrow Homes
		Standard engineering practice in respect of pollution control will be set into place to prevent any dust contamination on the surrounding areas. Timing of construction activities will take into account wind directions and any loose materials will be stored appropriately to prevent dust being carried to surrounding areas.	During construction.	Redrow Homes
		Works will be carried out in accordance with BS5837:2012 with regard to retained trees. Root protection zones will be identified with the implementation of fencing and signage around these zones.	During construction.	Redrow Homes
		Any arboricultural management will be undertaken by a suitably qualified tree surgeon and carried out with regard to nesting birds and roosting bats.	During construction (outside March – July inclusive unless checks undertaken to ensure no nesting birds present).	Redrow Homes
PROTECTION OF SPECIES DURING CONSTRUCTION	Bats	Normal construction activities to be limited to day time hours to reduce light pollution on habitats used by bats.	During construction.	Redrow Homes
		A sympathetic lighting regime will be used for the development to minimise light spillage into key foraging areas used by bats and new bat boxes.	During construction.	Redrow Homes
		Checks of bat potential trees for roosting bats, if trees are to be felled.	Prior to construction.	Ecology Solutions / other professional ecologist
	Badgers	A check will be undertaken prior to any construction for the presence of Badgers. All contractors working	Prior to construction.	Ecology Solutions / other professional ecologist

		on the site will be briefed regarding the potential presence of Badgers.		
		Any trenches or deep pits within the site that are to be left open overnight will be covered or provided with a means of escape should a Badger enter. Any trenches or pits will be inspected each morning to ensure no Badgers have become trapped overnight. Should a trapped Badger be encountered Ecology Solutions will be contacted immediately for further advice. The storage of topsoil or other 'soft' building materials on site should be given careful consideration and should be regularly inspected to check for use by Badgers.	During construction.	Redrow Homes
	Birds	Any vegetation clearance will be carried outside the breeding bird season (March – July inclusive) or checks will be undertaken by a suitably qualified ecologist to ensure there are no nesting birds present.	During construction (outside March – July inclusive unless checks undertaken to ensure no nesting birds present).	Redrow Homes and Ecology Solutions / other professional ecologist
	Reptiles	A precautionary approach will be undertaken during the removal of vegetation, whereby the habitat is removed in a slow and systematic manner to ground level, before any habitat removal takes place, forcing any reptiles present (although unlikely) into retained habitat in the wider area.	During construction.	Redrow Homes and Ecology Solutions / other professional ecologist
	Great Crested Newts	A precautionary approach will be undertaken during the removal of vegetation within 250m of pond P2, whereby the vegetation to be cleared is hand searched and then removed in a slow and systematic manner.	During Construction.	Redrow Homes and Ecology Solutions / other professional ecologist
	Other Protected Species	Standard engineering practices will negate detrimental effects on other sensitive and Protected Species within the wider area.	During Construction.	Redrow Homes
MANAGEMENT MEASURES				
MAINTAIN AND ENHANCE	Grassland	The areas of amenity grassland will be cut on a regular basis. Checks will be made monthly and the	Regular periods each year.	Management Company

RETAINED AND CREATED HABITATS		grass will be cut when it reaches 100mm long, back to a length of 35mm . Cuttings will be removed from site or left in discrete habitat piles.			
		Any areas of failed grassland will be reseeded with a seed mix / turf of similar species content.	Annually	Management Company	
	Shrub and Tree Planting		New planting utilising native species of local provenance and those of benefit to wildlife will be planted during Autumn, Winter or Spring.	Prior to completion of the development	Management Company
			For the first five years after planting, regular health checks of newly planted trees and shrubs will be undertaken during periods of dry weather, to ensure that the trees are not affected by drought.	First five years – annually.	Management Company
			Retained trees will be monitored and subject to appropriate arboricultural maintenance where necessary to help prolong their life and ensure they are safe.	Annually where necessary.	Management Company
			Any arboricultural management, e.g. pruning / lopping, will be carried outside the breeding bird season (March – July inclusive) or checks will be undertaken by a suitably qualified ecologist to ensure there are no nesting birds present and to avoid any potential effects on roosting bats.	Annually following tree health checks (outside March – August inclusive unless checks undertaken to ensure no nesting birds present).	Management Company
			Replace any failed plants with similar / same species.	Annually.	Management Company
	Hedgerows		New hedgerow planting will be undertaken during the autumn, winter or spring .	Prior to completion of the development.	Redrow Homes
			For the first five years after planting, regular health checks of the hedgerows will be undertaken especially during periods of dry weather, to ensure that the hedgerows are not affected by drought.	First five years annually.	Management Company
			Replace any failed sections / gaps of new hedgerow with similar species content and size to that within the site.	Annually following annual hedgerow checks.	Management Company

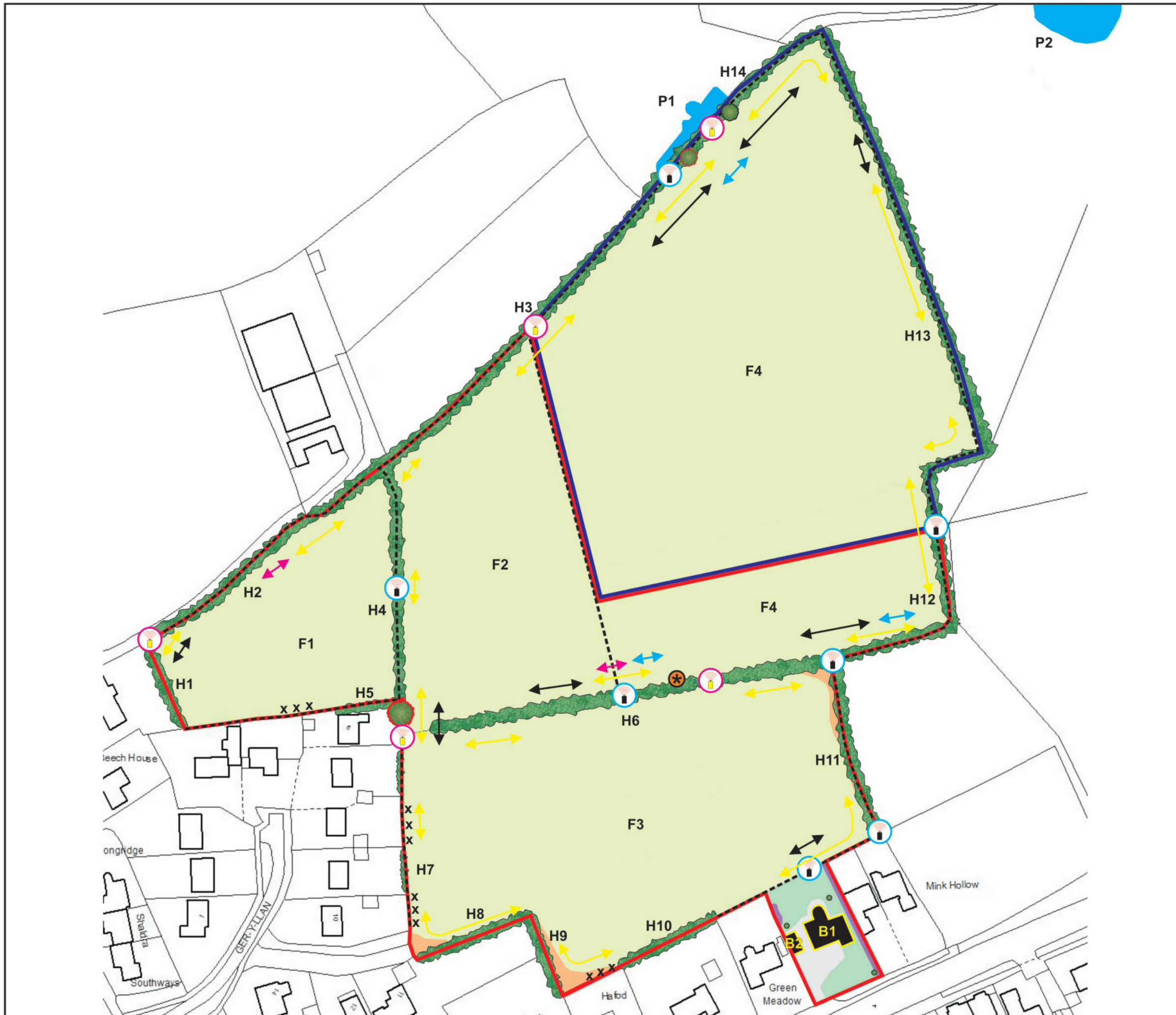
		Cutting of the hedgerows will be carried outside the breeding bird season (March – July inclusive) or checks will be undertaken by a suitably qualified ecologist to ensure there are no nesting birds present.	Every 2 years (outside March – August inclusive unless checks undertaken by an ecologist to ensure no nesting birds present).	Management Company
MAINTAIN POPULATIONS OF PROTECTED SPECIES AT A FAVOURABLE CONSERVATION STATUS	Bats	Bat boxes will be checked annually to ensure they are in place and replacements supplied if necessary.	Annually	Management Company
		New hedgerow and tree planting will provide new foraging and navigational opportunities for bats.	Prior to completion of development.	Redrow Homes
		A sympathetic lighting regime will be used for the development to minimise light spillage into key foraging areas used by bats and new roosting boxes.	Prior to completion of development.	Redrow Homes
		Checks of suitable tree for roosting bats, if trees are to be felled.	Prior to completion of development.	Ecology Solutions / other professional ecologist
	Birds	New hedgerow and tree planting will provide new nesting and enhanced foraging opportunities for birds.	Prior to completion of development.	Redrow Homes
		Any management of vegetation (in particular hedgerows and trees) will be carried outside the breeding bird season (March – July inclusive) or checks will be undertaken by a suitably qualified ecologist to ensure there are no nesting birds present.	Annually (outside March – August inclusive, unless checks undertaken to ensure no nesting birds present).	Management Company
		Bird boxes will be checked annually to ensure they are in place and replacements supplied if necessary. Bird boxes will also be cleaned annually in January .	Annually	Management Company
		Provision of new bird boxes to provide new nesting opportunities for birds over the existing situation.	Prior to completion of development.	Ecology Solutions / other professional ecologist
	Great Crested Newts	The wildflower meadow planting and retained and new hedgerows grassland will provide new foraging and commuting opportunities for Great Crest Newts.	Prior to completion of development.	Management Company
Badgers	The wildflower meadow, grassland, new shrub and tree planting will offer good potential foraging resources for Badgers through encouraging different varieties of invertebrates.	Prior to completion of development.	Redrow Homes	

		The road network has also been designed to keep road traffic speeds to a minimum such that any increase in road traffic accidents post-development are considered to be very unlikely.	Prior to completion of development.	Redrow Homes
	Reptiles	The wildflower meadow and areas of open space will offer good potential foraging resources for reptiles through encouraging different varieties of invertebrates.	Prior to completion of development.	Management Company
	Invertebrates	New hedgerow, tree and shrub planting will provide new opportunities for invertebrates.	Prior to completion of development.	Redrow Homes

PLANS

PLAN ECO2

Ecological Features & Survey Results



KEY:

- SITE
- WIDER STUDY AREA
- IMPROVED GRASSLAND
- AMENITY GRASSLAND
- AMENITY PLANTING
- RUDERAL VEGETATION
- x SCRUB
- HEDGEROW
- POND
- TREE
- BAT POTENTIAL TREE
- BUILDING
- HARDSTANDING
- FENCE
- i STATIC AUTOMATED BAT SURVEY DETECTOR LOCATIONS
- i BAT ACTIVITY SURVEY AUTOMATED DETECTOR LOCATIONS
- ↔ COMMON PIPISTRELLE
- ↔ SOPRANO PIPISTRELLE
- ↔ MYOTIS SP.
- ↔ SEROTINE
- * APPROXIMATE LOCATION OF BADGER ACTIVITY RECORDED BY DAVID CLEMENTS ECOLOGY LTD IN MARCH 2012



6283: LAND AT ST NICHOLAS, VALE OF GLAMORGAN

PLAN ECO2: ECOLOGICAL FEATURES & SURVEY RESULTS

PLAN ECO3

Bat and Bird Box Location Plan



KEY:

-  APPROXIMATE BAT BOX LOCATION
-  APPROXIMATE BIRD BOX LOCATION



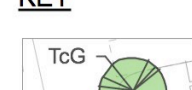


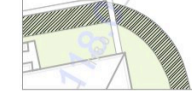
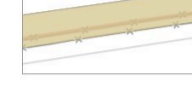





6283: LAND AT ST NICHOLAS,
VALE OF GLAMORGAN

PLAN ECO3:
BAT AND BIRD BOX LOCATIONS

APPENDICES

APPENDIX 1

Soft Works Layout

- KEY**
-  Tree - Proposed (Refer to Plant schedule for details)
 -  Ornamental Shrub Planting (Refer to Plant schedule for details)
 -  Wildflower Meadow Planting (Refer to Plant schedule for details)
 -  Front Boundary Hedge (Refer to Plant schedule for details)
 -  Native Hedgerow - New (Refer to Plant schedule for details)
 -  Native Hedgerow - Infill (Refer to Plant schedule for details)
 -  Turfed Lawn
 -  Public Open Space
 -  Existing Tree/Hedgerow - Canopy (Refer to Tree Survey for details)
 -  Existing Tree/Hedgerow - RPA (Refer to Tree Survey for details)



- PLANTING NOTES**
- 1.0 Generally**
 - 1.1 All setting out shall be subject to the final approval of the Landscape Architect/Contract Administrator (CA) on site.
 - 1.2 Where appropriate all relevant British Standards shall apply.
 - 2.0 Retained Vegetation**
 - 2.1 Existing trees and hedgerow to be retained where indicated are to be protected during construction works via a cleft chestnut pale fence to a min height of 1.2m to BS 1722 pt 4:1986 and/or to BS 5837:2012.
 - 2.2 Fencing shall be erected at the commencement of works and maintained in situ until construction has been completed. The fencing shall be erected to an alignment that shall be agreed with the CA on site. No trees are to be felled or understorey cleared unless indicated.
 - 2.3 The following will apply:
 - No work shall be permitted within the fenced enclosure.
 - No oil bitumen cement or other bituminous or deleterious material likely to be injurious to a tree shall be kept or discharged within 10.0m of the tree trunk.
 - No other material shall be kept or stacked within 5.0m of tree boles.
 - No tipping or storage of materials, nor any concrete mixing shall be carried out within 10.0m of any tree.
 - No fires shall be lit beneath or in close proximity to any tree canopy.
 - Notice boards telephone cables or other services shall not be attached to any part of the tree.
 - Care shall be exercised when using cranes or other mechanical plant and equipment near the spread of the canopy of the trees.
 - A notice shall be erected on the fence indicating that the area of the tree is a protected area and all activities associated with the works in that area shall be prohibited.
 - Remedial surgery shall be carried out to all trees that are to be retained as identified by the Tree Report. All remedial work shall be carried out in accordance with the requirements of BS 3998:1989 Recommendations for Tree Work.
 - 3.0 Soils**
 - 3.1 All subsoil within the areas of shrub planting shall be cultivated/ripped to alleviate any compaction prior to topsoiling. Subsoil's may be imported if the CA deems this appropriate.
 - 3.2 All imported topsoil's shall comply with BS 3882:2007 and shall be approved by the CA.
 - 4.0 Planting**
 - 4.1 All planting operations shall be carried out in accordance with the relevant sections of BS 4428:1989.
 - 4.2 All specimen trees shall be planted in topsoiled pits to minimum size 900 dia x 750mm deep and double staked and tied. Pits shall include drainage provision and irrigation.
 - 4.3 All shrubs shall be planted in topsoiled beds to a depth of 450mm.
 - 4.4 A slow release fertiliser shall be applied to each bed at the time of planting.
 - 4.5 Bark mulch shall be applied as a top dressing to each planting bed including tree planting pits in all soft landscape areas; a 1m diameter circle around each planted tree to be striped of turf or other surface vegetation. Mulch to be laid to a depth of 75mm after planting.
 - 4.6 Plant species shall be as specified.
 - 5.0 Seeding**
 - 5.1 Areas of Grass seeding shall be cultivated to their full depth prior to seeding and all stones in excess of 50mm removed.
 - 5.2 Grass Seed shall be A4 low maintenance mixture by British Seed Houses to roadside verge and open areas and Mixture A2 elsewhere for lawns and verges within the development area.
 - 6.0 Maintenance**
 - 6.1 All planted areas shall be subject to a maintenance programme, which shall include the replacement of failed plants at the time of practical completion and in each following year.
 - 6.2 Maintenance operations shall include:
 - Weeding and Watering
 - Litter Picking
 - Pruning / Coppicing
 - Top dressing with fertiliser and mulch annually
 - Replacing/Securing/Tightening/Loosening of Tree stakes as required. Stakes removed at the end of maintenance period.
 - Grass Cutting
 - 6.3 A full programme of maintenance operations shall be presented to the CA at the time of Practical Completion.

Plant Schedule

Hedgerow Planting - Reinforce Existing			
Abb	Species	Size	Density
Ca	Corylus avellana	40-60cm height, containerised, bushy, 2L	3 plants/m2 450mm centre in staggered rows *where required
Cm	Crataegus monogyna	40-60cm height, containerised, bushy, 2L	
Ia	Ilex aquifolium	40-60cm height, containerised, bushy, 2L	
Ps	Prunus spinosa	40-60cm height, containerised, bushy, 2L	
Vr	Viola riviniana	10-20cm height, 9cm Pot	
Hedgerow Planting - New			
Abb	Species	Size	Density
Ca	Corylus avellana	40-60cm height, containerised, bushy, 2L	5 plants/m2 450mm centre in staggered rows
Cm	Crataegus monogyna	40-60cm height, containerised, bushy, 2L	
Ia	Ilex aquifolium	40-60cm height, containerised, bushy, 2L	
Lp	Lonicera periclymenum	40-60cm height, containerised, bushy, 2L	
Ps	Prunus spinosa	40-60cm height, containerised, bushy, 2L	
Vr	Viola riviniana	10-20cm height, 9cm Pot	
Tree			
Abb	Species	Size	Density
Ac	Acer campestre	Selected Standard 10-12cm girth, 175-200mm clear stem, rootballed	3 plants/m2
Cd	Cedrus	Heavy Standard 12-14cm girth, 175-200mm clear stem, rootballed	
Pa	Prunus avium	Selected Standard 10-12cm girth, 175-200mm clear stem, rootballed	
Qr	Quercus robur	Heavy Standard 12-14cm girth, 175-200mm clear stem, rootballed	
Qr2	Quercus rubra	Heavy Standard 12-14cm girth, 175-200mm clear stem, rootballed	
TcG	Tilia cordata 'Greenspire'	Selected Standard 10-12cm girth, 175-200mm clear stem, rootballed	
Shrub Planting			
Abb	Species	Size	Density
Ea	Euphorbia amygdaloides var. robbiae	30-40cm height C 2L	4 plants/m2
Lp2	Lonicera pileata	30-40cm height C 2L	3 plants/m2
Pt	Pachysandra terminalis	20-30cm height C 1.5L	3 plants/m2
Hr	Hebe rakaiensis	30-40cm height C 2L	3 plants/m2
LaH	Lavandula angustifolia 'Hidcote'	30-40cm height C 2L	groups of 3/5
Vd	Viburnum davidii	20-30cm height C 2L Bushy	4 plants/m2
Vr2	Verbena rigida	30-40cm height C 2L	groups of 3/5
Front Boundary Hedge Planting			
Abb	Species	Size	Density
Cb	Carpinus betulus	40-60cm height, branched, bareroot, whip	4 per/m2 500/c rows staggered

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 planning & design

Client Redrow Homes South Wales
 Project Land at St Nicholas
 Title Soft Works Layout

Dwg No. 1537-06
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APPENDIX 2

Schwegler Bat Box Specifications

Bat Boxes

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

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

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



1FF Bat Box

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

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

Width: 27cm

Height: 43cm

Weight: 8.3kg

APPENDIX 3

Schwegler Bird Box Specifications

Bird Boxes

Schwegler bird boxes have the highest rates of occupation of all types of box. They are designed to mimic natural nest sites and provide a stable environment with the right thermal properties for chick rearing and winter roosting.

Boxes are made from 'Woodcrete'. This 75% wood sawdust, clay and concrete mixture is breathable and very durable making these bird boxes extremely long lasting.



1B Bird Box

This is the most popular box for garden birds and appeals to a wide range of species. The box can be hung from a branch or nailed to the trunk of a tree with a 'tree-friendly' aluminium nail.

Available in four colours and three entrance hole sizes. 26mm for small tits, 32mm standard size and oval, for redstarts.