



Biodiversity Enhancement Scheme And Reptile Mitigation Strategy Land off Elm Tree Grove Twynnyrodyn Merthyr Tydfil

Discharging Condition 26 & 27 (Part of) of Planning Decision Notice P/21/0358

On Behalf of Persimmon Homes

NOVEMBER 2022



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1 Introduction

1.1 General

TerrAqua Ecological Services have been commissioned by Persimmon Homes East Wales to produce an Biodiversity enhancement strategy, including a mitigation method statement for the protection of reptiles, for the proposed development at land off Elm Tree Grove, Twynyrodyn, Merthyr Tydfil. The following document has been produced in order to discharge Conditions 26 and 27 (Part of) of Decision Notice P/21/0358

1.2

Client Details

The following Biodiversity Enhancements and reptile mitigation strategy has been developed for the proposed Twynyrodyn residential development for Persimmon Homes East Wales, Persimmon House, Llantrisant Business Park, Llantrisant, Rhondda Cynon Taf, CF7 8YP.

1.3

Site Description

Site Name: Land off Elm Tree Grove, Twynyrodyn, Merthyr Tydfil

Authority: Merthyr CC

Development Description: Residential Development (Persimmon Homes)

2

Reptile Mitigation Strategy

2.2 Current Reptile Status

A Phase I Habitat Survey/Preliminary Ecological Assessment of the site was undertaken in January 2019 by TerrAqua Ecological Services Ltd and updated 2022.

The results of the Phase I Survey/Preliminary Ecological Assessment highlighted habitats present within the site boundary, including those with the potential to support common reptile species. Habitats identified as suitable for reptiles included rough unimproved grassland, bracken, scrub, broadleaf plantation woodland, and dry ditch. The Phase I Survey/Preliminary Ecological Assessment recommended that a reptile survey of all suitable habitats was undertaken, and this was completed by TerrAqua Ecological Services in June 2019 and

repeated in spring 2022 (**Land at Twynyrodyn, Merthyr Tydfil Reptile Survey Report, TerrAqua Ecological Services. July 2022**). The survey was undertaken using appropriate and recognised survey methodologies and completed under optimal weather conditions.

The results of the survey confirmed that reptiles are present within the survey boundary. A good population of Slow worm (*Anguis fragilis*) was recorded during the survey along with a single common lizard (*Zootoca vivipara*) observed immediately outside the survey area.

All common species of reptile are protected against killing or injury under Schedule 5 (sections 9 (1) and 9(5) of the Wildlife and Countryside Act 1981 (as amended). In practice this means that developers are expected to take all reasonable steps to ensure that reptiles are protected from injury or death throughout the construction and development process.

The proposed development works have the potential, if appropriate action is not taken, to cause injury or death to any reptiles present on the site. As a result, a strategy to prevent any such injury or death during the proposed works will be required. In addition, proposals for the site will result in the permanent loss of reptile habitat and the temporary loss during construction of remaining habitats. Therefore, a mitigation strategy will be required in order to ensure animals within the site can be moved to a safe location during construction and that the receptor area is suitable for the long term occupation of reptile species.

2.3 Proposed Strategy Introduction

Natural England requires two main aims to be met when considering appropriate actions for reptile mitigation on development sites (English Nature, 2004) and this approach is supported by all statutory bodies including Natural Resources Wales (NRW) across the United Kingdom:

1. to protect reptiles from harm that might arise during development works
2. ensure sufficient quality and connectivity of habitat is provided to accommodate the reptile population, either on site or at an alternative site, with no net loss of local reptile conservation status

The mitigation proposals for the site will set out a methodology to achieve these aims. It is proposed in this instance that reptiles will be trapped from site where development is proposed and moved to suitable areas outside the development zone. Due to the limited amount of habitat suitable for reptiles that will remain undisturbed during the construction period it will be necessary in this instance for reptiles to be moved from within the site boundary to an alternative suitable receptor area and allowed to disperse naturally into adjacent habitats. In this instance it is proposed that reptiles will be moved to an area immediately south of the development onto reclaimed land with similar habitats to those present within the development site (Subject to consent from MCC Landowner). The strategy will include a programme of trapping combined with sensitive habitat manipulation.

2.4 Proposed Works

Proposals for the site include the construction of residential properties with associated garages and infrastructure. During the construction process a significant percentage of existing reptile habitats will be lost or affected by the development. On completion of the development some areas within domestic gardens and within areas of soft landscaping are likely to be suitable for use by reptiles once these have matured.

3 Development Mitigation Proposals (Reptiles)

3.1 Introduction

In order to protect the reptile population present on the site it is proposed that animals will be excluded from the construction footprint and a programme of habitat manipulation, trapping and translocation to a receptor site will be undertaken. The programme will use best practise guidelines for reptile translocation and capture (Gent & Gibson, 1998).

The successful translocation of reptiles requires both careful planning and implementation. In order to ensure that the mitigation proposals are effective in successfully excluding reptiles from the site the following works will be carried out, or supervised by, an appropriately qualified ecologist:

- Selection and demarcation of proposed reptile exclusion fence lines

- Searching of fence line path and removal of reptiles in these areas prior to fence installation
- Selection of exclusion fencing type and supervision of installation of reptile exclusion fencing to appropriate specifications
- Placement of artificial refugia within the construction footprint to facilitate reptile capture
- Identification of suitable receptor site
- Supervision of any habitat enhancements required at the selected receptor site
- Trapping of reptiles and their transport to the selected receptor site
- Destructive hand search of rubble piles and other habitats to facilitate the location and trapping of reptiles
- Supervision of habitat, manipulation and vegetation stripping required on site

3.2 Fencing

Reptile exclusion fencing will be installed in order to assist in the translocation of reptiles. This fence line will ensure that no reptiles can re-enter the working footprint following the translocation and provide a clear demarcation of the working area.

The minimum specification and type of reptile fencing to be used is shown in Appendix II. However following consultation with the developer the exact specification and route of the fencing may be amended in order to allow the fence to be effectively installed. This will depend on factors such as the need to protect tree roots and respect tree root protection zones, length of time the fencing will remain in place, the potential for vandalism and to ensure the integrity of the fence can be maintained and to allow access to working areas. This will allow the

appropriate standard of fencing to be installed and remain reptile proof throughout the construction period.

Prior to installation of the exclusion fencing, the path of the fence line will be searched and vegetation removed to ensure no reptiles are harmed during the installation.

The fencing will be installed by a contractor with experience in reptile exclusion fencing installation. An ecologist will be on site during the installation process.

The fencing will be checked daily throughout the trapping and relocation programme, and during the construction phase, in order to ensure the fencing remains in good condition and reptiles do not find their way back onto the development site.

The fencing will be removed on completion of the development.

3.3 Artificial Refuga

Artificial refuga will be used as a tool to trap reptiles for relocation away from the construction footprint. Each refuga will consist of a mix of 500mm x 500mm square of roofing felt and onduline corrugated sheets. A minimum of 50 artificial refuga will be placed across the site. These will be positioned within areas of habitat considered most suitable for use by basking reptiles. The number of refuga used will be amended if capture rates are higher than anticipated to ensure the maximum numbers of animals as possible are moved from potential harm and the translocation merits increased trapping effort.

Habitat manipulation is a recognised methodology by which reptiles can be encouraged to congregate in specific areas, thereby facilitating their effective capture. Specific blocks of vegetation will be trimmed when capture rates in these areas drop to zero. This will result in these trimmed areas becoming unsuitable for reptiles and encourage the reptiles to congregate beneath refuga within the remaining islands of vegetation for ease of capture.

3.4 Trapping

The effectiveness of reptile trapping can be greatly influenced by survey timing and weather conditions. It is intended that trapping will be carried out during the optimal autumn period (March/May-September/October) under suitable weather conditions and will be suspended should weather conditions deteriorate significantly within the proposed trapping period, either through the arrival of cold and wet conditions or exceptionally warm days. Suitable conditions for reptile trapping are given in table 1.

Table 1 Suitable Reptile trapping conditions

Temperature range	9° - 18°C
Sunny-bright	Suitable
Cloudy	Suitable
Wind strength	Low-calm

It is proposed that the trapping period will extend over a period of thirty days. In the event that no reptile species are caught within the first fifteen days of the programme trapping will cease. If reptiles are caught within this period then trapping will continue for the full 30 days. If no reptiles are recorded for five consecutive days and weather conditions have remained suitable throughout this period then it will be assumed that the site is clear and trapping will cease. In order to ensure that the site has been effectively cleared trapping will continue for five days after a nil result even if this extends beyond the initial planned thirty days of trapping.

3.5 Destructive Search

After five days of negative returns any potential reptile habitat remaining, such as rough grass, debris piles, and scrub will be subject to a destructive search, in order to ensure no reptiles remain concealed in these areas. This will involve the careful destruction of such areas and the capture of any reptiles found. The search will be directly supervised by an on-site ecologist.

3.6 Habitat Manipulation

Habitat manipulation will be used to discourage reptiles from specific areas prior to the translocation. The technique will also be used to ensure that all areas within the immediate

construction footprint are made unsuitable for reptiles following completion of the translocation programme.

Any woodland/scrub areas requiring clearance notably along the perimeter of the site will be cleared using hand tools (chain saws brush cutters etc.) while the trapping programme is ongoing across the site. The woodland will be cleared from east to west forcing any reptiles present into the more open areas of the site for trapping and collection. Immediately the woodland is clear the land will be cleared of debris leaving a bare area unsuitable for recolonization by reptiles. The woodland clearance will be undertaken under ecological supervision and any reptiles found will be moved to the receptor area.

Specific areas of vegetation will be trimmed to encourage reptiles to move to certain areas to enhance the effectiveness of the trapping. The vegetation will be trimmed from east to west encouraging reptiles to move to the periphery. This vegetation manipulation will commence once reptile trapping numbers in the main central grassland reach zero or in areas where trapping is difficult.

After the translocation programme is completed and following any necessary destructive searches the first 110mm of soil and vegetation will be scrapped from the vegetated areas of the site where construction is planned. Any reptiles located during this procedure will be captured for relocation. The works will be overseen by the onsite ecologist.

3.7 Handling

All reptiles caught will be placed in a suitable secure container for transport to the new location. Each container will be allowed to allow air to circulate to prevent overheating and will contain a layer of vegetation to provide cover. Different species of reptile will be transported in separate containers. All containers will be labelled and show the species of animals held in each. All animals will be immediately released on the day of capture at the selected receptor site.

The total number of animals caught per day, including species, sex and location of capture will be recorded. This will permit the decline in capture rates to be observed, and for decisions as to areas suitable for habitat manipulation to be made.

3.8 Receptor Site

A requirement of any translocation programme is to ensure that the receptor site provide sufficient quantity and quality of habitat to accommodate the population of animals being moved. The reptile survey report (TerraAqua 2022) concluded that a good population of slow worm, and low population of common lizard, was present within the site boundary. The proposed development will lead to the permanent loss of significant areas of grassland, plantation woodland and scrub. Areas of wildflower grassland will be created within areas of open space towards the southern end of the site close to the proposed attenuation ponds. These area will, in time, create suitable habitats for reptile species but initial works will lead to existing vegetation in these areas being lost. It is therefore proposed that with appropriate consents reptiles are translocated from the development footprint to land immediately south of the site **Drawing TQ/pers:Twyn.Rep.Receptor v1**. This area will be provide a suitable safe and long term receptor area for reptiles affording similar habitats to those present within the site. The habitats present within this area have direct links to the adjacent countryside south of the development all of which provide high quality habitats suitable for reptiles. In addition the close proximity to the southern boundary of the proposed development site means that translocated reptiles will in time be able to easily recolonise suitable areas within the final development. It is therefore intended that any animals captured will be released into these southern areas, where exclusion fencing will prevent them returning to the construction zone. Reptiles will then be allowed to disperse naturally into the extensive adjacent habitats. A management plan detailing all proposed habitat enhancement at the immediate release site and the long term management of the receptor area has been produced (TerraAqua Ecological Services 2022. Land off Elm Tree Grove, Twynyrodyn, Merthyr Tydfil, Reptile Receptor Site Management Plan. Planning Application No P/21/10358 Discharge Condition 27 (Part) For Persimmon Homes)

Due to the close proximity of these habitats to the proposed development area, and the interconnecting habitats, it is likely that reptiles already move between these locations. As a result the translocation of animals to the selected receptor area will increase the probability that the moved animals will survive, retain genetic integrity and eliminate the possibility of the spread of disease.

The retention of the animals within relatively close proximity to their initial habitat should allow for re-colonisation of the development site including new domestic gardens once works have been completed.

The retention of the animals within relatively close proximity to their initial habitat should allow for re-colonisation of the development site including new domestic gardens once works have been completed.

3.9 Receptor Site Habitat Enhancements and Management

The proposed receptor site has direct links to the extensive good-quality habitats provided by the very extensive bracken, scrub and rough grassland, south of the development site. The proposed development site forms the periphery of this larger area of countryside. Prior to the trapping programme habitat enhancements in the form of the construction of reptile hibernacula and refugia will be created at the receptor site. This area will also be fenced to prevent translocated reptiles from returning to the construction zone. This fencing will be removed on completion of the development. to be made prior to the movement of animals to these areas. The location of the proposed reptile receptor site is shown in **Drawing TQ/pers:Twyn.Rep.Receptor v1**. This Document is intended to discharge conditions 26 and 27 of approved application P/21/10358 including contributing to the discharge of condition 23.

3.10 Monitoring

The success of the translocation programme will be monitored. This monitoring will comprise a one-day visual survey of the site during April and September respectively of each year. Commencing the year after the completion of the development and continuing for a period of three years.

3.11 Timetable of Works

The expected timetable for the reptile exclusion works is given below. The timetable is based upon the assumption that the programme will be carried out during the appropriate window and during appropriate weather conditions namely between March to October with the earliest option being Autumn 2022. The timings are subject to change, however, the order or duration of the works should not change significantly. All trapping will be completed under appropriate weather conditions.

Task	Aug	Sept	Oct	Nov	
Installation of reptile fencing	translocation works				
Trapping and translocation		✓*	✓**		
Habitat manipulation		✓	✓**		
Destructive search		✓**	✓**		
Release of site for development			✓**	✓**	
Removal of reptile fencing					Following development completion

* Dependent upon weather conditions

** Dependent upon number of reptiles caught determining length of trapping period

Ecological enhancements for the site include the installation of bird and bat boxes, the creation of an area of wet grassland and the creation of wildflower Meadow grasslands, new hedgerow and tree planting. The location of the proposed enhancements are shown in **Ecological Enhancement Plan TQ/Pers:Twyn. Enhancement Plan.2022 v2** (Appendix III).

4.1 **New Wildflower Grasslands**

The soft landscaping proposals for the site include the creation of new wildflower grasslands. These include grasslands typical of neutral soils and those common to damp areas. The location of each grassland type is shown in Drawing **Ecological Enhancement Plan TQ/Pers:Twyn. Enhancement Plan.2022 v2**

The created grassland will represent three different sward types and will be created from commercially prepared seed mixes. The extent of each newly created grassland habitat will

be: Area of wildflower seeding 1: **1794.4m²**

Area of wildflower seeding 2: **6561.9m²**

Area of wildflower seeding 3: **1105.29m²**

Grassland Area (1) in areas of heavy amenity use and along verges and path edges

Emersgate EL1 flowering lawn mix will be planted. This grassland contains a mix of slow growing grasses and wildflowers tolerant of regular short mowing. The seed mix is tolerant of a range of soil conditions and includes a mix of 20% wildflower and 80% slow growing grasses. The species composition of the grassland is as follows:

Betony 1%

Common Knapweed 2.4%

Lady's Bedstraw 1.2%

Rough Hawkbit 0.8%

Birdsfoot Trefoil 2.4%

Ribwort Plantain 2.8%

Cowslip 0.8%

Meadow Buttercup 1.2%
Pepper Saxifrage 0.4%
Tufted Vetch 0.4%
White Clover 5%
Common Bent 8%
Glaucous Sedge 1%
Crested Dogs Tail 39%
Red Fescue 28%
Small Cats Tail 4%

Grassland (Area 2) The most extensive new grassland will be created by seeding of Emersgate EM1 General Purpose Meadow Mix. The seed mix is suitable for a wide range of soil types and includes a mix of 10% wild flower and 90% slow growing grasses. The species composition of the grassland is as follows:

Common Knapweed 2.5%
Wild Carrot 0.5%
Oxeye Daisy 1%
Ribwort Plantain 2.5%
Self Heal 0.5%
Meadow Buttercup 1%
Tufted Vetch 2%
Common Bent 9%
Crested Dogs Tail 36%
Red Fescue 27%
Meadow Grass 18%

Grassland Area (3). Soil condition within and around the main attenuation structures are likely to vary according to rainfall amounts and the amount and time water is retained within the structures. The proposed wildflower planting within these areas will reflect these damper conditions. The attenuation areas will be seeded with Emersgate EM8 mix. This mix is suitable for seasonally wet soils that may flood during heavy rainfall but dry out during summer months. EM8 represents a mix of 20% wildflowers and 80% slow growing grasses. The species composition of the grassland is as follows:

Yarrow 0.1%
 Betony 1.5%
 Common Knapweed 4%
 Meadowsweet 1.5%
 Ladies Bedstraw 0.5%
 Rough Hawkbit 0.1%
 Oxeye Daisy 0.5%
 Birdsfoot Trefoil 2%
 Ribwort Plantain 2.5%
 Cowslip 0.5%
 Self Heal 0.2%
 Meadow Buttercup 0.9%
 Common Sorrel 0.1%
 Pepper Saxifrage 0.2%
 Devils Bit Scabious 0.2%
 Dandelion 0.1%
 Goats Beard 0.1%
 Tufted Vetch 5%
 Common Bent 4%
 Sweet Vernal 4%
 Quaking Grass 4%
 Crested Dogs Tail 54%
 Tufted Hair Grass 4%
 Red Fescue 10%

4.2 **Native Hedgerow Planting**

Soft Landscaping proposals include the planting of a native hedgerow through the site and extending around the perimeter of the attenuation areas. The new hedgerow planting will link the development to the open countryside to the south.

The hedgerow will be double planted with each row 1m apart. Planting will be staggered with each plant 0.5m apart. The new hedge will be created with saplings of the following native species:

Hawthorn, Hazel, Holly, Guelder rose, elder and dog rose.

The location of the proposed hedgerow is shown in drawing **Ecological Enhancement Plan TQ/pers:Twyn. Enhancement Plan.2022 v2** and will extend to a length of 563m.

4.3 Native Tree Planting

Native trees will form an important part of the soft landscaping proposals. The location of new tree planting is shown in drawing **Ecological Enhancement Plan TQ/Pers:Twyn. Enhancement Plan.2022 v2**. The following native tree species will be included within the landscaping:

Silver Birch

Field Maple

Common Oak

Bird Cherry

Mountain Ash

4.4 Bat Boxes

A total of twenty three (23) integral bat boxes will be built into the gable ends of buildings at apex height thus allowing for installation at between 5-6m. The boxes will be Schwegler 1FE or Istock type B or similar and finished in the line with the external finish of the properties. These are considered the most suitable location for the boxes with access from the roosts into dark feeding and foraging areas adjacent to the development.

The bat boxes are self-cleaning and therefore require no maintenance from the Management Company or individual house holders.

All bat boxes will remain functional during the life of the properties, and all property owners will be informed of the legal and planning requirements of the retained functionality of the bat

boxes. Property owners will be told that no bat boxes can be blocked or access to those bat boxes blocked by any works or structures.

4.5 **Bird Boxes**

A total of forty-four (44) boxes will be installed on the gable ends of properties.

The selected boxes will allow for use by different bird species and will include sparrow terraces and swift boxes.

Bird Box 26mm Hole: Total number: six (6)

Bird Box 32mm Hole: Total number: six (6)

Bird Box Open Fronted: Total number: six (6)

Sparrow Terrace: Total number: fifteen (15)

Swift Box Plots: Total number: eleven (11)

The location of bird and bat boxes is shown in Appendix IIII Drawing **Ecological Enhancement Plan: TQ/Pers:Twyn. Enhancement Plan.2022 v2**

References

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Hereptofauna Groups of Britain and Ireland. Evaluating Local Mitigation/Translocation Programmes. Maintenance of Best Practise and Lawful Standards. HGBI Advisory Group Notes for Amphibian and Reptile Groups.

TerrAqua Ecological Services Ltd (2019) Extended Phase I Habitat Survey/Preliminary Ecological Assessment Land at Twynyrodyn, Merthyr Tydfil. Persimmon Homes

TerrAqua Ecological Services Ltd (2022) Extended Phase I Habitat Survey/Preliminary Ecological Assessment Land at Twynyrodyn, Merthyr Tydfil. Persimmon Homes

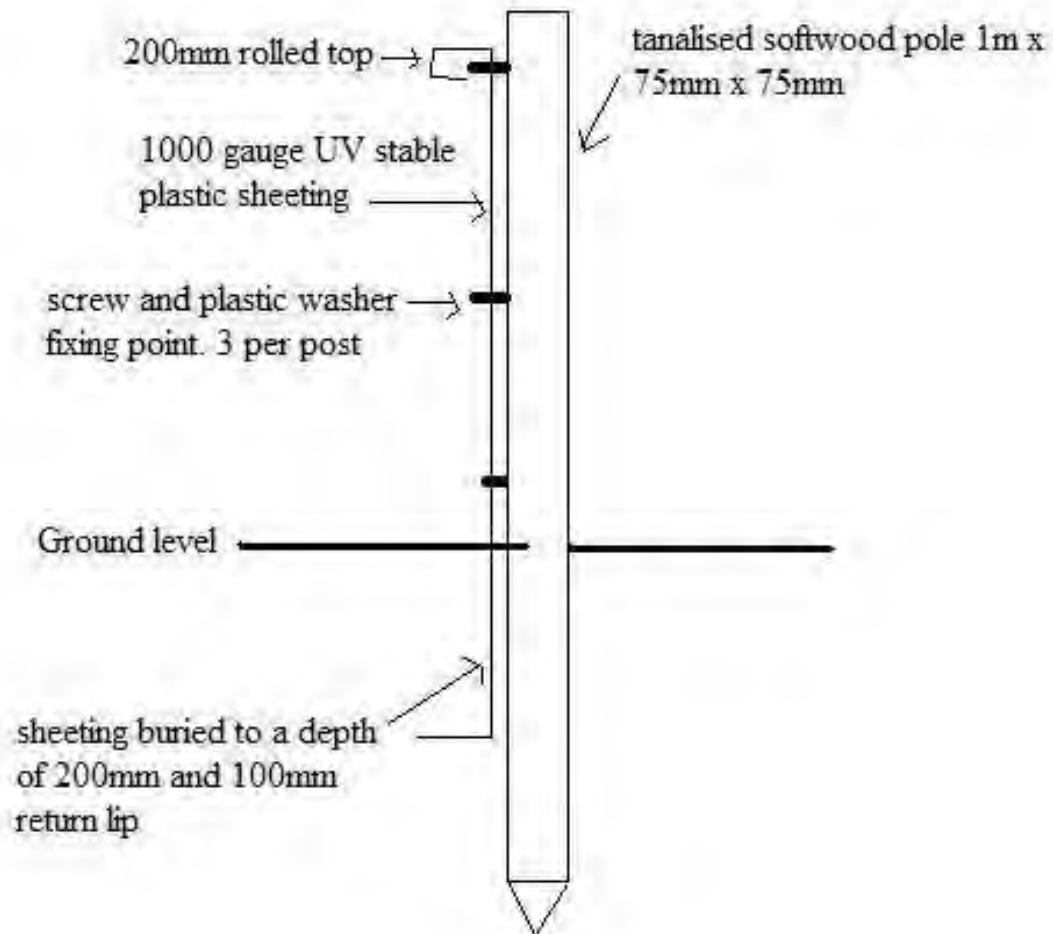
TerrAqua Ecological Services Ltd (2019) Land at Twynyrodyn, Merthyr Tydfil, Reptile Survey Report. Persimmon Homes

TerrAqua Ecological Services Ltd (2022) Land at Twynyrodyn, Merthyr Tydfil, Reptile Survey Report. Persimmon Homes

TerrAqua Ecological Services 2022. Land off Elm Tree Grove, Twynyrodyn, Merthyr Tydfil, Reptile Receptor Site Management Plan. Planning Application No P/21/10358 Discharge Condition 27 (Part) For Persimmon Homes)

Appendix I

Exclusion Fence Specification



Appendix II

**Proposed Location of Receptor Area South of Development
(Following Consents)**

TerrAqua Ecological Services Ltd

Twynyrodyn
for Persimmon Homes East Wales

Reptile Receptor Site

SCALE :
1 : 2500

@ A2

DATE :
6/29/2022

MAP FILENAME :
TQ/Pers: Twyn.Rep. Receptor v1



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Legend

- Site Boundary
- Reptile Receptor Site



Appendix III

Drawing Ecological Enhancement Plan

Ecological Enhancement Plan TQ/pers:Twyn. Enhancement Plan.2022 v1



SOFT LANDSCAPE KEY

- EXISTING TREES & VEGETATION TO BE RETAINED (Refer to schedule for species)
- PROPOSED ORNAMENTAL TREE PLANTING (Refer to schedule for species)
- PROPOSED NATIVE TREE PLANTING (Refer to schedule for species)
- PROPOSED SHRUB PLANTING (Refer to schedule for species)
- PROPOSED NATIVE HEDGEROWS (Refer to Plant Schedule for species)
- PROPOSED WILDFLOWER SEEDING 1 (Seeding to be Emongilla EU)
- PROPOSED WILDFLOWER SEEDING 2 (Seeding to be Emongilla EU)
- PROPOSED WILDFLOWER SEEDING 3 (Seeding to be Emongilla EU)
- PROPOSED GROUND COVER PLANTING (Refer to Plant Schedule for species)
- EXISTING GRASS / SCRUB TO BE RETAINED
- PROPOSED RAIN GARDEN PLANTING (Refer to Planting Module for species)

PLANT SCHEDULE

NATIVE TREE PLANTING						
ABBRV	SPECIES	DENSITY	HEIGHT	BIRTH	ROOT CON	POT SIZE TOTAL
Ac	Acer campestre	12-14 (g)	12-14 (g)	ROOT TALL	12-14 (g)	12-14 (g)
Ba	Betula pendula	12-14 (g)	12-14 (g)	ROOT TALL	12-14 (g)	12-14 (g)
Pr	Prunus avium	12-14 (g)	12-14 (g)	ROOT TALL	12-14 (g)	12-14 (g)
Qs	Quercus petraea	12-14 (g)	12-14 (g)	ROOT TALL	12-14 (g)	12-14 (g)
Sa	Sorbus aucuparia	12-14 (g)	12-14 (g)	ROOT TALL	12-14 (g)	12-14 (g)

ORNAMENTAL TREE PLANTING						
ABBRV	SPECIES	DENSITY	HEIGHT	BIRTH	ROOT CON	POT SIZE TOTAL
Ac	Acer campestre 'Streetwise'	12-14 (g)	12-14 (g)	ROOT TALL	12-14 (g)	12-14 (g)
Ba	Betula pendula	12-14 (g)	12-14 (g)	ROOT TALL	12-14 (g)	12-14 (g)
Qs	Quercus petraea 'Strata Street Wise'	12-14 (g)	12-14 (g)	ROOT TALL	12-14 (g)	12-14 (g)
Pr	Prunus avium 'Street Wise'	12-14 (g)	12-14 (g)	ROOT TALL	12-14 (g)	12-14 (g)
Sa	Sorbus aucuparia	12-14 (g)	12-14 (g)	ROOT TALL	12-14 (g)	12-14 (g)

GROUND COVER PLANTING						
ABBRV	SPECIES	DENSITY	HEIGHT	BIRTH	ROOT CON	POT SIZE TOTAL
Ac	Antennaria dioica	30-40 (n)	30-40 (n)	CON	30-40 (n)	30-40 (n)

NATIVE HEDGEROW PLANTING						
ABBRV	SPECIES	DENSITY	HEIGHT	BIRTH	ROOT CON	POT SIZE TOTAL
Co	Corylus avellana (20%)	40-60 (n)	40-60 (n)	BR	40-60 (n)	40-60 (n)
Cr	Cornus monspeliensis (20%)	40-60 (n)	40-60 (n)	BR	40-60 (n)	40-60 (n)
Fr	Fragaria vesicaria (15%)	40-60 (n)	40-60 (n)	CON	40-60 (n)	40-60 (n)
Ra	Rosa arvensis (15%)	40-60 (n)	40-60 (n)	BR	40-60 (n)	40-60 (n)
Vi	Viburnum opulus (15%)	40-60 (n)	40-60 (n)	BR	40-60 (n)	40-60 (n)

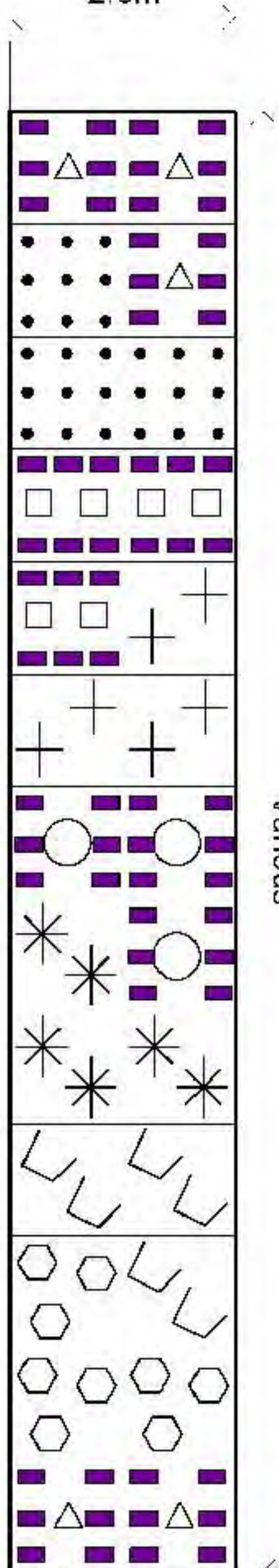
SHRUB PLANTING						
ABBRV	SPECIES	DENSITY	HEIGHT	BIRTH	ROOT CON	POT SIZE TOTAL
Ac	Acer campestre	40-60 (n)	40-60 (n)	CON	40-60 (n)	40-60 (n)
Co	Corylus avellana	40-60 (n)	40-60 (n)	CON	40-60 (n)	40-60 (n)
Cr	Cornus monspeliensis	40-60 (n)	40-60 (n)	CON	40-60 (n)	40-60 (n)
Fr	Fragaria vesicaria	40-60 (n)	40-60 (n)	CON	40-60 (n)	40-60 (n)
Pr	Prunus avium	40-60 (n)	40-60 (n)	CON	40-60 (n)	40-60 (n)
Qs	Quercus petraea	40-60 (n)	40-60 (n)	CON	40-60 (n)	40-60 (n)
Sa	Sorbus aucuparia	40-60 (n)	40-60 (n)	CON	40-60 (n)	40-60 (n)
Vi	Viburnum opulus	40-60 (n)	40-60 (n)	CON	40-60 (n)	40-60 (n)
Ac	Acer campestre	40-60 (n)	40-60 (n)	CON	40-60 (n)	40-60 (n)
Co	Corylus avellana	40-60 (n)	40-60 (n)	CON	40-60 (n)	40-60 (n)
Cr	Cornus monspeliensis	40-60 (n)	40-60 (n)	CON	40-60 (n)	40-60 (n)
Fr	Fragaria vesicaria	40-60 (n)	40-60 (n)	CON	40-60 (n)	40-60 (n)
Pr	Prunus avium	40-60 (n)	40-60 (n)	CON	40-60 (n)	40-60 (n)
Qs	Quercus petraea	40-60 (n)	40-60 (n)	CON	40-60 (n)	40-60 (n)
Sa	Sorbus aucuparia	40-60 (n)	40-60 (n)	CON	40-60 (n)	40-60 (n)
Vi	Viburnum opulus	40-60 (n)	40-60 (n)	CON	40-60 (n)	40-60 (n)
Ac	Acer campestre	40-60 (n)	40-60 (n)	CON	40-60 (n)	40-60 (n)
Co	Corylus avellana	40-60 (n)	40-60 (n)	CON	40-60 (n)	40-60 (n)
Cr	Cornus monspeliensis	40-60 (n)	40-60 (n)	CON	40-60 (n)	40-60 (n)
Fr	Fragaria vesicaria	40-60 (n)	40-60 (n)	CON	40-60 (n)	40-60 (n)
Pr	Prunus avium	40-60 (n)	40-60 (n)	CON	40-60 (n)	40-60 (n)
Qs	Quercus petraea	40-60 (n)	40-60 (n)	CON	40-60 (n)	40-60 (n)
Sa	Sorbus aucuparia	40-60 (n)	40-60 (n)	CON	40-60 (n)	40-60 (n)
Vi	Viburnum opulus	40-60 (n)	40-60 (n)	CON	40-60 (n)	40-60 (n)

INFILL NATIVE UNDERSTORY PLANTING						
ABBRV	SPECIES	DENSITY	HEIGHT	BIRTH	ROOT CON	POT SIZE TOTAL
Co	Corylus avellana (20%)	40-60 (n)	40-60 (n)	ROOT CELL	40-60 (n)	40-60 (n)
Cr	Cornus monspeliensis (20%)	40-60 (n)	40-60 (n)	ROOT CELL	40-60 (n)	40-60 (n)
Fr	Fragaria vesicaria (15%)	40-60 (n)	40-60 (n)	ROOT CELL	40-60 (n)	40-60 (n)
Ra	Rosa arvensis (15%)	40-60 (n)	40-60 (n)	ROOT CELL	40-60 (n)	40-60 (n)

BULB PLANTING						
ABBRV	SPECIES	DENSITY	HEIGHT	BIRTH	ROOT CON	POT SIZE TOTAL
Ac	Adonis vernalis (20%)	20-40 (n)	20-40 (n)	BULB	20-40 (n)	20-40 (n)
Hy	Hyacinthus non-scriptus (10%)	20-40 (n)	20-40 (n)	BULB	20-40 (n)	20-40 (n)
Np	Narcissus pseudonarcissus (50%)	20-40 (n)	20-40 (n)	BULB	20-40 (n)	20-40 (n)

RAIN GARDEN PLANTING MODULE

2.0m



KEY TO PLANTING MODULE (TYPICAL 2.0m x 10.0m SQUARE MODULE BASED ON 1.0m GRID)

- Calamagrostis brachytricha (30-40 Con 2-3L)
- Zantedeschia aethiopica (30-40 Con 2-3L)
- Dryopteris filix-mas (30-40 Con 2-3L)
- Iris pseudacorus (30-40 Con 2-3L)
- Helleborus foetidus (30-40 Con 2-3L)
- Lycchnis flos-cuculi (30-40 Con 1L)
- Carex pseudocyperus (30-40 Con 2-3L)
- Juncus effusus (30-40 Con 2-3L)
- Ajuga reptans 'Atropurpurea' (Con 9cm)

TerrAqua Ecological Services Ltd

Twynyrodyn
for Persimmon Homes East Wales

Ecological Enhancement Plan

SCALE : 1 : 2500 @ A2 DATE : 9/2/2022

MAP FILENAME : TQ/Pers: Twyn. Enhancement Plan. 2022.v2

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NOTE:
Native trees, hedgerows and infill planting to be protected with biodegradable spiral guards
Bare-root planting within native infill planting to be staked with 900mm bamboo canes & Holdfast Natural Tree Ties
Trees within 2m of hard surfacing or services to be planted with GreenBlue Urban ReRoot root barriers
This is a colour drawing produced at a scale of 1:500 @ A0. Do not rely on monochrome or reduced copies

F	Amended site layout	AMP	28.06.22
TDA	THE GRANARY NEWLAND FARM LLANGAN CF35 5DN TEL: 01446 789367	TDA	Environment Landscape Design
CLIENT	PERSIMMON HOMES EAST WALES	DRAWING NUMBER	TDA 2538 01
SCALE	1:500 @ A0	DRAWN	RH/CIAMP
DATE	MARCH 2020	PROJECT	TWYN YR ODYN
DRAWING TITLE	DETAILED SOFT LANDSCAPE PROPOSALS		