Ecological Mitigation, Enhancement and Management Plan

Garage Opposite Church Road, Church View, Worthenbury, Wrexham, Wales, LL13 0AW

Graham Mcloughlin

Status	Issue	Name	Date
Final	1	Elen Griffin BSc (Hons)	01/08/2024

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Industry Guidelines and Standards

This report has been written with due consideration to:

- Chartered Institute of Ecology and Environmental Management (2017). Guidelines for Preliminary Ecological Appraisal. 2nd edition. Chartered Institute of Ecology and Environmental Management, Winchester.
- Chartered Institute of Ecology and Environmental Management (2018). Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine. Version 1.1. Chartered Institute of Ecology and Environmental Management, Winchester.
- Chartered Institute of Ecology and Environmental Management (2017). Guidelines on Ecological Report Writing. Chartered Institute of Ecology and Environmental Management, Winchester.
- Chartered Institute of Ecology and Environmental Management (2020). Guidelines for Accessing, Using and Sharing Biodiversity Data in the UK. 2nd Edition. Chartered Institute of Ecology and Environmental Management, Winchester.
- British Standard 42020 (2013). Biodiversity – Code of Practice for Planning and Development.
- British Standard 8683:2021 (2021). Process for Designing and Implementing Biodiversity Net Gain.

Proportionality

> The work involved in preparing and implementing all ecological surveys, impact assessments and measures for avoidance, mitigation, compensation and enhancement should be proportionate to the predicted degree of risk to biodiversity and to the nature and scale of the proposed development. Consequently, the decision-maker should only request supporting information and conservation measures that are relevant, necessary and material to the application in question. Similarly, the decision-maker and their consultees should ensure that any comments and advice made over an application are also proportionate.
>
> The desk studies and field surveys undertaken to provide a Preliminary Ecological Appraisal (PEA) might in some cases be all that is necessary.
>
> (BS 42020, 2013)

Contents

1.0 Introduction 5

2.0 Site Context and Survey Information 6

2.1 Site Location and Landscape Context 6

2.2 Ecological Information 6

3.0 Construction Ecological Management Plan (CEMP) 8

4.0 Provision of New Landscaping and Species-Specific Enhancements 15

Appendix 1: Proposed Development Plan 23

Appendix 2: Site Location Plan 24

Appendix 3: New Landscaping and Species-Specific Enhancements Plan 25

1.0 Introduction

Arbtech Consulting Limited was instructed by Graham Mcloughlin to produce an Ecological Mitigation, Enhancement and Management Plan for Garage Opposite Church Road, Church View, Worthenbury, Wrexham, Wales, LL13 0AW (hereafter referred to as "the site").

A planning application for the construction of two new two storey dwellings (hereafter referred to as "the proposed development") was granted approval, with conditions, by Wrexham County Borough Council in August 2022 (P/2021/0032). This plan has been produced to inform the discharge of 3, which states:

Development shall not comment until a scheme of biodiversity enhancement has been submitted to and approved in writing by the Local Planning Authority. The scheme shall include details of:

i) Details of the location and specification of the habitat enhancement for

bats outlined in the Arbtech Bat Emergence Survey dated 23/06/2021;

ii) Native species planting;

iii) A timetable for the implementation of the scheme.

Biodiversity enhancement shall thereafter take place in strict accordance with the scheme as approved

A plan showing the proposed development is provided in Appendix 1.

The aim of this plan is to outline mitigation measures required to minimise impacts on biodiversity as well as to outline habitat creation and enhancement opportunities and long-term management which will ensure that a net gain in biodiversity is achieved and maintained on the site, in accordance with the Planning Policy Wales (PPW).

This plan has been informed by a Preliminary Roost Assessment which was completed by Arbtech Consulting Ltd on June 2021 (Arbtech, 2021).

2.0 Site Context and Survey Information

2.1 Site Location and Landscape Context

The site is located at National Grid Reference SJ 41944 46240 and has an area of approximately 0.01ha. The site surveyed consists of one single-storey garage building. The site lies within the village of Worthenbury, located south east of Wrexham. The landscape is dominated by residential properties with associated gardens and agricultural fields. There are small, scattered woodland copses and tree lines around the area, which could be used for foraging and commuting. Worthenbury Brook is located to the west of the site which is likely to provide abundant insect foraging for bat species. A site location plan is provided in Appendix 2.

2.2 Ecological Information

Table 1 summarises the survey findings for the site and outlines any potential impacts as a result of the proposed development along with recommendations and biodiversity enhancement opportunities, as detailed in Preliminary Roost Assessment and Bat Emergence and Re-entry Surveys (Arbtech Consulting Ltd, 2021).

Table 1: Summary of baseline survey information, potential impacts, recommendations and biodiversity enhancement opportunities for the site (PRA & BERS, Arbtech Consulting Ltd, 2021)

Feature	Summary of Survey Findings and Impacts	Recommendations	Biodiversity Enhancement Opportunities
B1	No bat roost confirmed in B1. No bats were seen to be emerging from B1. Bat activity by common and soprano pipistrelles was recorded within the area surrounding B1.	In the unlikely event that bats are unexpectedly found during any stage of the development, work should stop immediately, and a suitably qualified ecologist should be contacted to seek further advice.	The installation of a minimum of **two Woodcrete bat boxes or similar** on each of the proposed dwellings will provide additional roosting habitat for bats e.g. • 2F Schwegler Bat Box • 1FF Schwegler Bat Box • 2FN Schwegler Bat Box. Bat boxes should be positioned 3-5m above ground level facing in a south/south-westerly direction with a clear flight path to and from the entrance. OR The installation of **two bat tubes** into each of the proposed dwellings e.g. • Habibat bat box • Schwegler 1FR bat tubes Bat tubes should be inserted into the fabric of the building during construction positioned at the eaves on the southern ends of the east and west elevations, so they are facing the surrounding greenery.
B1	Evidence of nesting birds in the form of disused swallow nests were identified within B1. Active nests could be destroyed during the	Demolition works should be undertaken outside the period 1st March to 31st August. If this timeframe cannot be avoided, a close inspection of the building and	Install three Schwegler or similar bird boxes on the retained building on site e.g. • Schwegler No 17 swift nest box • Schwegler 1SP Sparrow Terrace

	works.	vegetation should be undertaken immediately, by qualified ecologist, prior to the commencement of work. All active nests will need to be retained until the young have fledged.	• Schwegler 1B nest boxes • Schwegler 2H Robin Boxes Schwegler 1B and Schwegler 2H nest boxes should be positioned approximately 3m above ground level where they will be sheltered from prevailing wind, rain and strong sunlight. Small-hole boxes are best placed approximately 1-3m above ground on an area of a tree trunk where foliage will not obscure the entrance hole.

3.0 Construction Ecological Management Plan (CEMP)

Table 2: Mitigation Measures

Works	Specification
Persons Responsible and Lines of Communication	It is recommended that a Development Biodiversity Champion is selected for the construction phase of the development. The Biodiversity Champion should be someone with significant influence during construction, such as the contract or project manager. The Development Biodiversity Champion is responsible for ensuring all actions outlined in this CEMP are implemented including the provision of a toolbox talk prior to works commencing. Any queries with regards to the mitigation prescriptions should be addressed to the project ecologist and communication should be retained between the Development Biodiversity Champion and project ecologist or a suitably qualified Ecological Clerk of Works (ECoW) throughout the construction phase of the development where necessary to ensure the mitigation is applied and impacts to adjacent ecological receptors are effectively minimised. The project ecologist's contact details are located on the title page of this report. It is recommended that the Biodiversity Champion informs the project ecologist or ECoW of the commencement of construction works and provides updates where necessary.
Timing of Works	Construction activities will be restricted to the normal working day (7am-7pm). Demolition of the garage and any vegetation removal (suitable for nesting birds) should be undertaken outside the period 1st March to 31st August. If this timeframe cannot be avoided, a close inspection of the building and vegetation should be undertaken immediately, by qualified ecologist, prior to the commencement of work. All active nests will need to be retained until the young have fledged.
General Construction Activities	Heras fencing (or similar) will be installed around the perimeter of the construction zone to prevent any vehicle or construction encroachment onto habitats / species of ecological value. Any machinery used should be made safe or temporarily fenced off when not in use. Storage of construction materials will be kept to a minimum. Where materials must be stored, they will be restricted to inert objects and located on hardstanding away from hedgerows, ponds, badger sett. Materials will be stored on pallets to discourage animals from using them as shelter. Skip or similar containers may also be used in place of piles on the ground. Trenches or open excavations will be covered at the end of each working day, or include a means of escape such as a sloping ramp for any animals that may fall in. Any temporarily exposed open pipe systems or ducts will be capped at the end of each working day in such a way as to prevent animals from gaining access.
Toolbox Talk and Pre-commencement Inspection	An ECoW will provide toolbox talk prior to the works within the development footprint commencing. This talk will indicate an appropriate procedure for working within this area to minimise disturbance on site and the risk of inadvertently harming retained habitats or wildlife. Immediately prior to construction works, an ECoW will carry out a fingertip search of the area for vulnerable species. This will include turning over and removing objects or debris from the area, by hand.
Site Visit and Reporting	The ECoW will produce a report outlining the actions taken under the CEMP.
Tree Protection	No trenches or ground works will be completed within 5m of any trees on site. Trees will be appropriately protected in accordance with BS 5837:2012 - "Trees in relation to design, demolition and construction – Recommendations". As such, it is recommended that the trees are separated from construction works by protective fencing throughout the duration of the construction phase of the development. A fencing specification is included within **Figure 1** below.

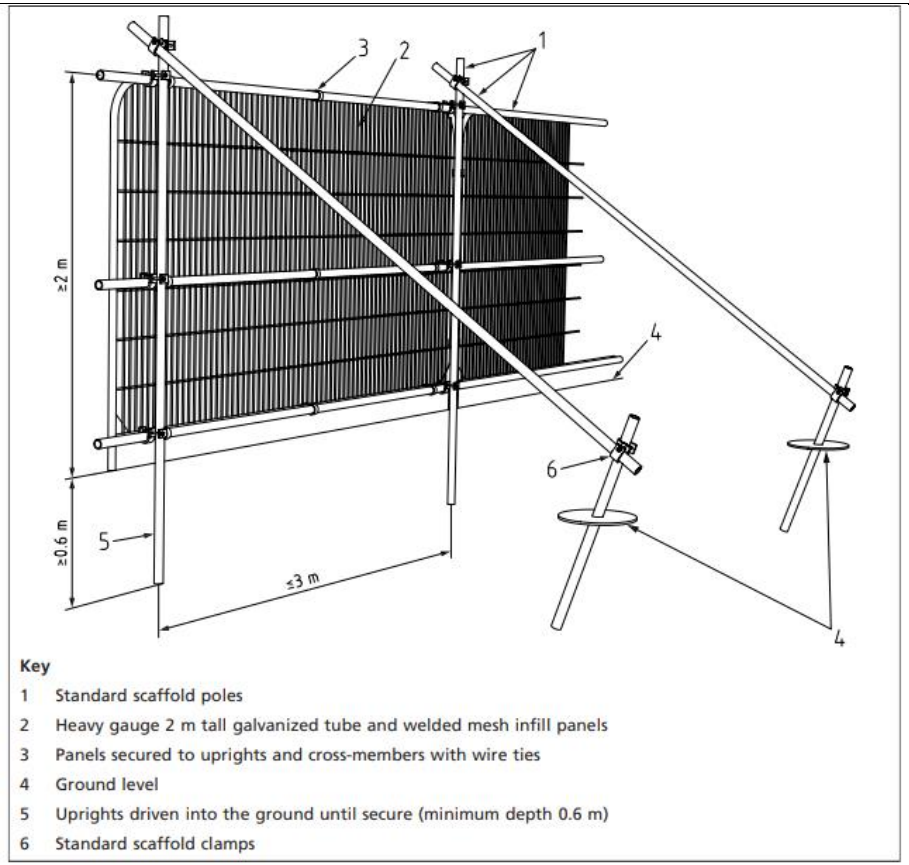


Figure 1: Default protective barrier specification (British Standards Institute 2012).

Pollution Prevention

To limit impacts of pollution resulting from the construction phase of the development, construction works must be completed in accordance with current statutory guidelines relating to pollution prevention (Environmental Agency 2016). Furthermore, although withdrawn in 2015, pollution prevention guidelines detailed within guidance document: *PPG6: Working at Construction and Demolition Sites* (Environment Agency 2010) remain applicable to the site. Considering both the relevant statutory requirements and best practice measures detailed within guidance document PPG6, the below mitigation prescriptions are considered suitable to mitigate impacts of pollution during the construction phase of the development. The allocated Biodiversity Champion will be responsible for ensuring the below mitigation recommendations are undertaken successfully during the works.

Site drainage:

It is recommended that the Biodiversity Champion ensures that:

- Pollution risks are identified pre-construction.

	• Pollutants are prevented from entering drains where possible. • If any pollutant enters a drain, immediately stop the pollution with a physical block, stop the activity causing the pollution, then notify the Environment Agency for surface water drains or the local sewerage provider for foul water drains. If there's a spill, accident, or emergency, try and prevent pollutants entering the drains. • Report all pollution incidents to site management and the Environment Agency. • Inspect drains and protection measures frequently and maintain them during the construction activity. Well maintained drains will also reduce risks of flooding and subsequent surface water run-off. • As a last resort, should any pollutants be required to enter the drainage system on site, permission from Environment Agency or the local sewerage provider must be sought before discharging anything other than clean uncontaminated surface water to a drain and other surface waters or groundwater. Apply for permission early, as authorisation can take up to four months. ***Airborne particle suppression:*** It is recommended that the Biodiversity Champion ensures that: • Effective water suppression is used during demolition operations. Handheld sprays are more effective than hoses attached to equipment as the water can be directed to where it is needed. In addition, high volume water suppression systems, manually controlled, can produce fine water droplets that effectively bring the dust particles to the ground. • Avoid explosive blasting, using appropriate manual or mechanical alternatives. • Bag and remove any biological debris or damp down such material before demolition. • Carry out regular site inspections to monitor compliance. • Ensure all vehicles switch off engines when stationary. • Avoid the use of petrol- or diesel-powered generators and use mains electricity or battery power where possible. • Only use cutting, grinding, or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction. • Ensure an adequate water supply on the site for effective dust/ particulate matter suppression/ mitigation, using non-potable water where possible and appropriate. • Use enclosed shuts and conveyors and covered skips. ***Materials storage and water run-off:*** It is recommended that the Biodiversity Champion ensures that: • No stockpiles are created on exposed ground areas and ensure that all materials and chemicals are stored securely and safely on site in accordance with current Control of Substances Hazardous to Health (COSHH) regulations (HSE 2002). • Stockpiles are located as far away as possible from any open drains and on level ground to prevent any accidental run-off. • Contaminated materials, chemicals, and other hazardous substances must be stored on an impermeable surface, in a bunded area, within any area of the site.

- All chemicals and hazardous substances are stored away from areas where there is heightened risk of damage from impact or collision such as site traffic.
- All chemicals and hazardous substances are labelled, containers are sealed when not in use and inspected regularly and fit for purpose.
- Any damaged or old containers are replaced in line with the duty of care requirements. Note such containers may be considered hazardous waste.
- Staff are trained in use of spill kits and emergency procedures.
- Ensure there is a designated 'responsible person' on site at all times.
- Lock storage facilities when not in use.

Implementation of the Waste Hierarchy:

The Biodiversity Champion must ensure that all construction activity is completed in accordance with the Waste Hierarchy (Defra 2011) in an attempt to reduce the amount of waster produced during the construction phase of the development. As such, the construction phase must be completed in accordance with the below core principles:

In the first instance:

- Re-use products and materials where possible.
- Recycle and compost material resources where possible.
- Attempt to recover energy from waste.

Where none of the above options offer an appropriate solution, waste disposal is the final option:

- Only transfer controlled waste to an “authorised person” (Waste Collection Authority, the holder of an Environmental Permit, Registered Water Carrier or Waste Disposal Authority).
- Ensure that non-hazardous waste is transferred under a Waste Transfer Note which must be retained for two years.
- Hazardous waste is moved under a waste consignment note that provides a clear description of the waste material. The consignment note must be retained for three years.
- The waste is the responsibility of the company until it has been fully recovered or finally disposed of.

Noise:

The Biodiversity Champion must ensure that noise levels are kept to a minimum in accordance with best practice as defined in the Control of Pollution Act 1974 to avoid unacceptable levels of noise and vibrations. Further guidance can be found in British Standard 5228-1:2009. Such measures applicable to the proposed development primarily include agreed working hours limiting night work, using the quietest equipment and plant available, shutting down equipment when not in use, and completing deliveries during working hours only. Most notably, prescriptions as to limit noise of plant machinery as detailed within **Table B.1** within the code of practice for noise control (British Standards Institution, 2014) is likely to have the most significant impact during construction activity. Table B.1 is shown below.

Table B.1 **Methods of reducing noise levels from construction plant**

Plant	Noise reduction of plant			Alternative plant
	Source of noise	**Possible remedies** (to be discussed with machine manufacturers)	**A-weighted sound reduction** dB	
Hammer drive piling equipment	Pneumatic/diesel hammer or steam winch vibrator driver	Enclose hammer head and top of pile in acoustic screen	5 to 10	Bored piling Vibratory system Drop hammer completely enclosed in box with opening at top for crane access Steel jacket completely enclosing drop hammer with dolly and polystyrene chips fed to impact surface to dissipate energy Pressed-in piling which generates its driving force from the frictional restraint of other piles
	Sheet pile	Acoustically dampen sheet steel piles to reduce levels of resonant vibration		
	Impact on pile	Use resilient pad (dolly) between pile and hammer head. Packing needs to be kept in good condition		
	Cranes cables, pile guides and attachments	Careful alignment of pile and rig		
	Power units or base machine	Fix more efficient sound reduction equipment or exhaust. Acoustically dampen panels and covers. When intended by the manufacturer, engine panels need to be kept closed. Use acoustic screens when possible		
Earth-moving plant: • bulldozer • compactor • crane • dump truck • dumper • excavator • grader • loader • scraper	Engine	Fit more efficient exhaust sound reduction equipment Manufacturers' enclosure panels need to be kept closed	5 to 10	Alternative super silenced plant might be available. Consult manufacturers for details

Table B.1 **Methods of reducing noise levels from construction plant** *(continued)*

Plant	**Noise reduction of plant**			**Alternative plant**
	Source of noise	**Possible remedies** (to be discussed with machine manufacturers)	**A-weighted sound reduction** dB	
Compressors and generators	Engine Compressor or generator body shell	Fit more efficient sound reduction equipment Acoustically dampen metal casing Manufacturers' enclosure panels need to be kept closed	Up to 10	Super silenced plant is available. Consult manufacturers for details Electric-powered compressors are available as opposed to diesel or petrol Sound-reduced compressor or generator can be used to supply several pieces of plant. Use centralized generator system
	Total machine	Erect acoustic screen between compressor or generator and noise-sensitive area. When possible, line of sight between top of machine and reception point needs to be obscured	Up to 10	
		Enclose compressor or generator in ventilated acoustic enclosure	Up to 20	
Pneumatic concrete breaker, rock drills and tools	Tool	Fit suitably designed muffler or sound reduction equipment to reduce noise without impairing machine efficiency	Up to 15	Hydraulic and electric tools are available For large areas of concrete, machine designed to break concrete in bending can be used Thermic lance
		Ensure all leaks in air line are sealed		
	Bit	Use dampened bit to eliminate ringing		
	Total machine	Erect acoustic screen between compressor or generator and noise-sensitive area. When possible, line of sight between top of machine and reception point needs to be obscured	Up to 10	
		Enclose breaker or rock drill in portable or fixed acoustic enclosure with suitable ventilation	Up to 20	
Rotary drills, diamond drilling and boring	Drive motor and bit	Use machine inside acoustic shed with adequate ventilation	Up to 15	Thermic lance

Table B.1 **Methods of reducing noise levels from construction plant**

Plant	Noise reduction of plant			Alternative plant
	Source of noise	**Possible remedies** (to be discussed with machine manufacturers)	**A-weighted sound reduction** dB	
Hammer drive piling equipment	Pneumatic/diesel hammer or steam winch vibrator driver	Enclose hammer head and top of pile in acoustic screen	5 to 10	Bored piling Vibratory system Drop hammer completely enclosed in box with opening at top for crane access Steel jacket completely enclosing drop hammer with dolly and polystyrene chips fed to impact surface to dissipate energy Pressed-in piling which generates its driving force from the frictional restraint of other piles
	Sheet pile	Acoustically dampen sheet steel piles to reduce levels of resonant vibration		
	Impact on pile	Use resilient pad (dolly) between pile and hammer head. Packing needs to be kept in good condition		
	Cranes cables, pile guides and attachments	Careful alignment of pile and rig		
	Power units or base machine	Fix more efficient sound reduction equipment or exhaust. Acoustically dampen panels and covers. When intended by the manufacturer, engine panels need to be kept closed. Use acoustic screens when possible		
Earth-moving plant: • bulldozer • compactor • crane • dump truck • dumper • excavator • grader • loader • scraper	Engine	Fit more efficient exhaust sound reduction equipment Manufacturers' enclosure panels need to be kept closed	5 to 10	Alternative super silenced plant might be available. Consult manufacturers for details

Lighting

A low impact lighting strategy will be adopted for the site during and post-development, which will include the following measures:

- Lighting of retained and ajacent trees and hedgerows will be avoided.
- Use narrow spectrum light sources to lower the range of species affected by lighting.
- Use light sources that emit minimal ultra-violet light.
- Avoid white and blue wavelengths of the light spectrum to reduce insect attraction and where white light sources are required in order to manage the blue shortwave length content they should be of a warm / neutral colour temperature <4,200 kelvin.
- Not use bare bulbs and any light pointing upwards. The spread of light will be kept in line with or below the horizontal.
- Light spill will be reduced via the use of low-level lighting used in conjunction with hoods, cowls, louvers and shields. Lights will also be directional to ensure that light is directed to the intended areas only.
- External lighting will be on PIR sensors that are sensitive to large objects only (so that they are not triggered by passing bats) and will be set to the shortest time duration to reduce the amount of time the lights are on.

	• Wall lights and security lights will be 'dimmable' and set to the lowest light intensity settings. There are several products on the market that allow the control of the light intensity and the duration that the lights are on. All lighting on the developed site will make use of the most up to date technology available.
Birds	Demolition of the garage and any vegetation removal (suitable for nesting birds) should be undertaken outside the period 1st March to 31st August. If this timeframe cannot be avoided, a close inspection of the building and vegetation should be undertaken immediately, by qualified ecologist, prior to the commencement of work. All active nests will need to be retained with a species-appropriate buffer until the young have fledged (species specific but typically 4-6 weeks).

4.0 Provision of New Landscaping and Species-Specific Enhancements

Table 3: Provision of New Landscaping and Species-Specific Enhancements

Works	Specification
Persons Responsible	The Biodiversity Champion will be responsible for the provision of the new landscaping and species-specific enhancements. The occupier of the proposed development (i.e. the landowner or managing agent) will be responsible for the management of these features post development.
Management Term	The management prescriptions outlined within this table must be implemented over a period of at least 30 years.
Site Visit and Reporting	The ECoW will make a final site check and sign off once the landscaping and installation of species-specific enhancements are complete.
Tree and Shrub Planting	***Overview:*** Multiple areas of proposed landscaping will be created through new tree and shrub planting including • Planting of a minimum of four new trees within the rear garden areas of the new dwellings, as shown in **Appendix 3** • Areas of introduced shrubs are suggested around the entrances to both new dwellings, as shown in **Appendix 3** ***Objectives:*** • To plant native trees and shrubs that will provide pollinating, foraging, and refuge opportunities for protected and/ or notable species groups including amphibians, bats, birds, hedgehogs, invertebrates, and reptiles. • Ensure that good horticultural practice is employed to encourage long-term health and vitality of all trees and shrubs. • Ensure well-balanced crowns and/ or natural shape by preventing over competition. ***Creation Method:*** • **Ground preparation and planting** Each tree and shrub should be panted within a hole three times as wide of the supplied pot and of a similar depth. Root balls should be soaked thoroughly in water before planting and root balls should be loosened to expose restricted roots before planting. The planted trees and shrubs should then be backfilled ensuring there are no air pockets around roots or any roosts protruding out of the ground.

- **Timing**

  It is best to prepare the land during the summer ready for planting between November and March. Planting trees and shrubs before the new year helps ensure better rooting and subsequent establishment including faster growth during the first growing season.

Management Prescriptions:

Table 3.3: New tree and shrub planting.

Management	When	Rationale
At the end of each growing season all plant failures are to be 100% replaced	When required; checked annually in Autumn.	To maintain amenity and wildlife value.
If required, provision of stakes and guards. Guards to be left on for a minimum of 5 years	N/A	Protect from damage
Stakes should be checked and any broken or damaged stakes during this time would be removed (as above) and replaced with ties re-fixed	When required; checked annually in Autumn.	Maintain protection
Remove weeds	When required; checked twice annually in early spring and in Autumn.	Reduce competition for resources nutrients etc.by weeds
Application of bark mulch at a depth of 50 mm	Immediately after planting and then when required; checked annually in Autumn.	Reduce competition for resources nutrients etc.by weeds
Do not apply chemical fertilisers	At all times.	The use of chemical fertilisers will encourage vigorous grasses and weeds to grow
Apply a light dressing of	Annually in the winter	Note the overuse of manure fertilisers will encourage

		well-rotted manure		vigorous grasses and weeds to grow.
		Removal of spent flowers from perennial plants should be removed through 'deadheading'	Twice annually, late spring and in the Autumn.	Allows plants to place more energy into re-growth.
		Watering should be undertaken before and after planting out and as necessary for the continued thriving of all planting.	When required; provide more water during periods of draught and less water during times of prolonged rain.	Ensures plants do not dry out and subsequently fail.
		Check and replace any plant failures once a year	For the first 5 years	To ensure no gaps form.

Native Hedgerow Planting

Overview:

It is proposed to create 0.008km of native hedgerow, as shown in **Appendix 3**.

~0.027km of existing hedgerow is to be retained, as shown in **Appendix 1 & 3**

Objectives:

- To create dense hedgerows that will provide foraging, commuting, and refugia opportunities for notable species groups including bats, birds, badgers, and hedgehogs.
- To ensure native species only are planted.
- Ensure cultural techniques are employed which use a variety of mulches and organic fertilisers and which minimise the use of chemicals and peat wherever possible.

Creation Method:

- **Ground preparation**
  Prepare the ground by digging over a strip approximately 60-90cm (2-3ft) wide and one spit (or spade blade) deep. Soils that become waterlogged in winter may require a permanent drainage system. Alternatively, form the soil into a ridge about 15-20cm (6-8in) high and 50-70cm (20-28in) across to plant into.
- **Planting**
  Plants should be positioned set back from hardscaped boundaries to allow space for the hedgerow to develop and mature prior to requiring any significant management/ cutting back. Plant density should focus on achieving a hedgerow width >1m; as such, plants should be planted in a staggered double row approximately 45-60cm apart, where individual plants are planted 90cm apart within each row.
- **Timing**

It is best to prepare the land during the summer ready for planting between November and March. Planting before the new year helps ensure better rooting and subsequent establishment including faster growth.

Management Prescriptions:

Table 3.4: New hedgerow planting hedgerow.

Management	When	Rationale
At the end of each growing season all plant failures are to be 100% replaced	When required; checked annually in Autumn.	To maintain amenity and wildlife value.
If required, provision of stakes and guards. Guards to be left on for a minimum of 5 years	N/A	Protect from damage
Stakes should be checked and any broken or damaged stakes during this time would be removed (as above) and replaced with ties re-fixed	When required; checked annually in Autumn.	Maintain protection
Remove weeds	When required; checked twice annually in early spring and in Autumn.	Reduce competition for resources nutrients etc.by weeds
Application of bark mulch at a depth of 50 mm	Immediately after planting and then when required; checked annually in Autumn.	Reduce competition for resources nutrients etc.by weeds
Apply a light dressing of well-rotted manure	Annually in the winter	Note the overuse of manure fertilisers will encourage vigorous grasses and weeds to grow.
Watering should be undertaken before and after planting out and as necessary for the continued thriving of all planting.	When required; provide more water during periods of draught and less water during times of prolonged rain.	Ensures plants do not dry out and subsequently fail.
Check and replace any plant failures once a year	For the first 5 years	To ensure no gaps form.
Once the hedgerow reaches an average height of 1.5m or above along the hedgerow length, this	To be checked annually once hedgerow reaches 1.5m in	To ensure the hedgerow is not maintained at a low level of

		height or above must be retained.	height.	worse value to biodiversity.
		Once the hedgerow reaches an average width of 1.5m or above along the hedgerow length, this width or above must be retained.	To be checked annually once hedgerow reaches 1.5m in width.	To ensure the hedgerow is not maintained at a thin density of worse value to biodiversity.

Bat Boxes

Two bat boxes are recommended to be installed within the facade of the new dwellings/garages.

Bat boxes specification:

- The recommended bat boxes will be constructed of woodcrete/ woodstone. Boxes of this construction are designed to require no maintenance and have a lifespan of 25 years plus.
- 2x Ibstock Enclosed Bat Box (or similar alternative brand) are recommended on the trees, as shown in **Figure 2**.
- Bat boxes should be positioned 3-5m above ground level facing in a south, southeast, or southwest aspect with a clear flight path to and from the entrance, away from artificial light.
- Boxes are to be installed during the build process due to their integrated nature but should not be left exposed to allow use until such a time the development is completed to avoid indirect or direct disturbance of any bats utilising the boxes.



Figure 2: Ibstock Integrated Bat Box (image credit https://www.nhbs.com/ibstock-enclosed-bat-box-c?bkfno=208936&ca_id=1495&adlocale=uk&gad_source=1&gclid=CjwKCAjwnqK1BhBvEiwAi7o0X5-HSlV1jVNVASC4-zG1gsr2qZvAOLf8WBgax-m8nVWRkM15fwm1ExoCqUgQAvD_BwE)

	Recommended Management: The proposed bat boxes are designed to require no management or maintenance. Furthermore, preventing physical disturbance of bat boxes will increase the chances of occupation by roosting bats. However, it is recommended that the bat boxes are inspected annually for the first five years outside of the typical active season for bats (May to September inclusive) following installation. Bat boxes must be replaced if they are damaged, removed, or have fallen from their recommended location.
Bird Boxes	Four bird boxes are recommended to be installed on site, one upon mature trees on the retained tree line along the southern site boundary and the others onto the façade of the new dwellings. ***Bird box specification:*** • The recommended bird boxes will be constructed of woodcrete/ woodstone. Boxes of this construction are designed to require no maintenance and a lifespan of 25 years plus. • 2x Woodstone Nest Boxes (or a similar alternative brand) with 28mm entrance holes are proposed on the retained tree and on plot 2, as shown in **Figure 3**. • 2x 1SP Schwegler Sparrow Terrace (or a similar alternative brand) is proposed on the building, as shown in **Figure 4**. • Woodstone Nest Boxes should be positioned approximately 3m above ground level where they will be sheltered from prevailing wind, rain and strong sunlight. • 1SP Schwegler Sparrow Terrace should be positioned at the eaves of the building. • Boxes are to be installed prior to the first nesting bird season once the works are completed  **Figure 3**: Woodstone Nest Box (image credit arkwildlife.co.uk)

	 **Figure 4**: 1SP Schwegler Sparrow Terrace (image credit https://www.nhbs.com/1sp-schwegler-sparrow-terrace?bkfno=185099&ca_id=1495&adlocale=uk&gad_source=1&gclid=CjwKCAjwnqK1BhBvEiwAi7o0XziQlpSuEDnpwjx5va4ASVn0JJtDXuc_tKn4z3D63fyjCaKHT18ySxoC7nQQAvD_BwE) ***Recommended Management:*** The proposed bird boxes are designed to require no management or maintenance. Furthermore, preventing physical disturbance of bird boxes will increase the chances of occupation by nesting birds. However, it is recommended that the bird boxes are inspected annually for the first five years outside of the typical nesting bird season (March to September inclusive) following installation. Bird boxes must be replaced if they are damaged, removed, or have fallen from their recommended location.
Hedgehog House	A hedgehog house **(Figure 5).** will be installed within the area of planting along the southeastern boundary of plot 2. Gaps/hedgehog highways should be installed within any boundary fencing to allow dispersal into and from the wider environment. A hedgehog house suitable for the site (or a similar alternative brand) can be found here: https://www.nhbs.com/hedgehog-house



Figure 5: Hedgehog house (image credit https://www.nhbs.com/hedgehog-house)

Appendix 1: Proposed Development Plan



Appendix 2: Site Location Plan



Appendix 3: New Landscaping and Species-Specific Enhancements Plan

