



Ecological Mitigation, Enhancement and Management Plan

Premier Inn Merthyr Tydfil, Duffryn, Pentrebach, Merthyr Tydfil, CF48 4BB

Premier Inn Hotels

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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)

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1.0 Introduction

Arbtech Consulting Limited was instructed by Premier Inn Hotels to produce an Ecological Mitigation, Enhancement and Management Plan for Premier Inn Merthyr Tydfil, Duffryn, Pentrebach, Merthyr Tydfil, CF48 4BB (hereafter referred to as “the site”).

The plan was required to inform a planning application for the construction of an extension to the hotel for the construction of 16 additional rooms (hereafter referred to as “the proposed development”).

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 Planning Policy Wales (PPW).

This plan has been informed by a Preliminary Ecological Appraisal (“PEA”; Arbtech Consulting Ltd, May 2024).

2.0 Site Context and Survey Information

2.1 Site Location and Landscape Context

The site, situated at the National Grid Reference SO 06176 03795, has a site area of approximately 1.1ha. The grounds hold a large hotel, B1, and a public house/restaurant, B2. The buildings are surrounded by car parking, modified grass, introduced shrubs, scattered trees, and to the west of the site there is deciduous woodland.

The site is surrounded by residential buildings to the east, west and south, industrial units and warehouses to the north-west and south-east and the river Taff to the south-west in the wider landscape, west of the railway line and main roads. A small storm flow/tributary of the river is present along the west of the site to the south. There are no ponds within 500m. The river has priority habitat deciduous woodland along the embankments, likely a locally designated wildlife site and therefore the wider landscape has a moderate level of biodiversity. A site location map 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 the PEA (Arbtech, May 2024).

Table 1: Summary of baseline survey information, potential impacts, recommendations and biodiversity enhancement opportunities for the site (PEA; Arbtech, May 2024)

NB NOW SUPERCEDED BY TABLES 2 AND 3

Ref	Summary of Survey Findings	Foreseen Impacts	Recommendations <i>Measures required to adhere to guidance, legislation and planning policies.</i>	Biodiversity Enhancements <i>The Local Planning Authority has a duty to ask for enhancements under the PPW (2024)</i>
Designated sites	The site is not subject to any designation, and there are no known statutory sites adjacent to the site. Cwm Glo a Glyndyrys Site of Special Scientific Interest – SSSI (~1.2km northwest) – is designated for species-rich neutral grassland and acid grassland, and for the association of these habitats with others including woodland and heath. It is also of special interest for its assemblage of grassland fungi, including 32 species of waxcap.	No impacts on the SSSI are foreseen as a result of the proposed development.	Best practice measures to minimise the possibility of pollution must be implemented during construction.	None.

Habitats and flora	On site habitats comprise buildings, hard standing, modified grassland, introduced shrubs and scattered trees. Notable habitats are present within 2km of site, with the closest being deciduous woodland located to the west of the site, fenced off from the car park. The woodland is in close proximity to the site, but there is hard standing present. It is likely works in that area will not impact tree roots.	The proposed development will result in the loss of hard standing, but could impact some modified grass also. A silver birch and Scots pine will need to be removed to facilitate the works. This could result in a net loss in biodiversity at the site. However, the site has areas to improve and enhance. The proposed development is unlikely to impact the notable habitats due to the surrounding barriers in the form of carparks and secure fencing. The loss of habitat on site will not have a material impact on the much larger and better-quality habitats nearby as any species utilising both sites will still have ample habitat in the surrounding area. Pollution from works could impact the woodland and the watercourses.	Scrub, trees and flowering species will be retained, replacing with native species where possible. Best practice measures to minimise the possibility of pollution must be implemented during construction. Controlled working measures to prevent any diffuse pollution or waste to the deciduous woodland or canal.	The planting of native tree and shrub species will be beneficial for wildlife, through the provision of sheltering and foraging habitats.
Invasive Species	Immediately adjacent to the proposed extension of the building, Japanese knotweed is present on site.	Any disturbance or damage to the plant or the soil could result in the spread of the plant – which is an offence. The visible stands above ground can have rhizomes underground which spread as far as 7m.	Visible stands of JPK will have secure fencing installed with a buffer of 7m from the visible stands to prevent machinery, materials or persons entering the zones and to prevent accidental spread. An invasive species management plan will be required to control and/or eradicate Japanese knotweed which and will require a waste permit for removal of hazardous waste from site. Specialist contractors must be contacted for treatment and removal of JPK.	N/A.
Amphibians	A review of aerial imagery indicates the absence of ponds within 500m. The river and tributary are close to site, but	Hard standing and the building will be impacted during construction. When completing the rapid risk assessment	Owing to the nature of the proposed development and the low potential for impacts to	The site will be enhanced for amphibians' post-

	flowing water can act as a barrier to dispersal of amphibians. The hard standing and building are suboptimal for great crested newts and common amphibians due to a lack of refuge from predation, and lack of connectivity. However, the woodland and watercourse offer suitability.	published by Natural England (Natural England 2015), the proposed development produces a Green risk score, which states: Offence Highly Unlikely.	GCN, further surveys are considered to be disproportionate.	development through creation of amphibian hibernacula using rubble and logs from site clearance.
Reptiles	The proposed development site overall does not present high suitability for reptiles due to a lack of suitable habitat, in particular as the working area is only due to impact the hard standing and the existing building. The woodland and watercourse offer suitability for supporting reptiles, but not the habitats due to be worked within.	Buildings and hard standing will be impacted during construction. The loss of such habitats is likely to be inconsequential to local reptile populations owing to their low value and the presence of more extensive habitat locally.	Owing to the nature of the proposed development and the low potential for impacts to reptiles, further surveys are considered to be disproportionate.	The following habitat creation and enhancement opportunities will be incorporated into the proposed development which would be beneficial for reptiles but also small animals within the landscape such as hedgehogs: • Creation of reptile refugia and hibernacula using debris and brash from site clearance. • Planting of native scrub and grassland to increase foraging opportunities.
Roosting bats	Building 1 (B1) has low value for supporting roosting bats. The value is negligible in the area of the building proposed for development. B2 was also assessed to have low value for supporting roosting bats. T2, an alder has split bark on its limb. This crevice is open to the elements making this feature suboptimal. There	The buildings both have low value for roosting bats. B2 is not being impacted by the proposed development. The extension of B1 is not expected to impact the northern aspect of the building in which the only roosting feature was observed. Therefore, no impacts on bats are foreseen on these buildings during the proposed works. Trees T5-T8 are due to be removed as part of the development in addition to pruning of T10-13. The removal of T8 could potentially	No further surveys are recommended for the buildings on site. As per Tables 6.3 and 7.1 of the Bat Survey Guidelines (2023) trees with PRF-I's only do not require further survey effort, however compensation for lost features will be installed prior to tree felling works, and works will be carried out under a	The installation of two bat boxes at the site will provide additional roosting habitat for bats. The bat boxes will be installed on the hotel and integrated into the design. Bat boxes will be

	are no other features present on the tree. This tree is not due to be removed. T5 and T6 are both alder with no suitable features on this tree for supporting roosting bat species. T7, is a silver birch with no suitable features on this tree for supporting roosting bat species. T8 and T13 are Scott's pine. T8 has east facing stem approximately 3m up. This crevice is open to the elements making this feature suboptimal. In addition, the feature is easily inspected and therefore can be checked prior to felling. There are no other features present on the tree. This tree is rated PRF-I. T13 has no suitable features on this tree for supporting roosting bat species. T10 and T12 are common holly, with no suitable features on this tree for supporting roosting bat species. T11 is horse chestnut with no suitable features on this tree for supporting roosting bat species.	destroy a roost if any bats are roosting within T8. No impacts on bats are foreseen for T2 as this tree is not being removed. No impacts are foreseen on the remaining trees.	precautionary working method statement (PWMS). The PWMS includes: ▪ Prior to any PRF removal, suitable compensation will be provided onsite (i.e. bat boxes in appropriate locations) ▪ Felling to be done under supervision by an ecologist ▪ An inspection of any features to be carried out by the arborist under supervision of the ground-based ecologist on site ▪ Any identified PRF-I feature(s) will be soft felled in conjunction with an experienced arborist. This will involve sections of the tree with the PRF to be cut away and lowered to the ground and inspected by a licenced ecologist ▪ Any PRFs felled will be left in-situ on the ground within a 10m exclusion zone for 24 hours ▪ In the unlikely event that a bat or evidence of bats is discovered during the development all work must stop and a bat licensed ecologist contacted for further advice. An artificial lighting plan is recommended to prevent impacts on commuting and foraging bats.	positioned 3-5m above ground level facing in a south or south-westerly direction with a clear flight path to and from the entrance, away from artificial light. The bat box will be a specification suitable for crevice dwelling species such as Vivara pro building bat box, Integrated eco bat box for crevice dwellers, or a similar alternative. To compensate for the loss of tree T8, a woodstone or woodcrete bat box will be added to a suitable mature tree on site. The bat box will be positioned 3-5m above ground level facing in a south or south-westerly direction with a clear flight path to and from
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				the entrance, away from artificial light
Foraging and commuting bats	The River Taff and areas of mixed woodland are present within 2km and therefore the surrounding habitat is assessed to offer moderate habitat value for commuting and foraging bats. Bats could use the woodland and watercourse for foraging along the boundaries within the local landscape for foraging and commuting and could also be used by bats dispersing from nearby roosts outside of the site and commuting around the area.	The proposed development may lead to an increase in the amount of current lighting of surrounding habitats or the retained building without mitigation. This may disturb commuting bats.	An artificial lighting plan is recommended to prevent impacts on commuting and foraging bats.	N/A.
Badger	No evidence of badgers (e.g. latrines, snuffle holes, hairs) or badger setts were identified on or within influencing distance (30m radius) of the site. Furthermore, the topography of site (and surrounding area as viewed by google earth) is broadly level. Furthermore, the site itself is predominately hard standing which is suboptimal for badgers.	Modified grass and hard standing will be removed during the works. The loss of such habitats is likely to be inconsequential to local badger populations owing to their low value and the presence of more extensive habitat locally. However, with the canal and woodland, badgers may be present in the habitats adjacent to site.	A basic precautionary mitigation during works is recommended.	Planting fruit bearing trees and species-rich grassland to increase foraging opportunities.
Hazel dormouse	No evidence of dormice was found within the site. It is not anticipated that dormice are present on the site due to the lack of suitable habitats present. For isolated habitats in the UK, research indicates that dormice require 20ha of woodland habitat to support a viable population (Bright et al. 1994). There are no areas of woodland on the site that are big enough (20ha) to support a dormouse population.	No impacts are anticipated on hazel dormice as a result of the proposed development.	No further surveys or mitigation required.	None.
Hedgehog	The habitat recorded onsite provides a small area of suitable, albeit limited commuting and foraging opportunities	The proposed development will result in the loss hard standing. The loss of such habitats is likely to be inconsequential to local	Similar to the badgers, a precautionary working method	Creation of brash piles or installation of hedgehog houses in shady areas.

	for hedgehogs in the form of shrubs and a more optimal habitats with the fenced off woodland. However, this habitat is surrounded by main roads and residential housing with secure fencing. Although no evidence indicating the presence of hedgehogs was recorded, access to on-site habitats is available for hedgehogs. The future presence of foraging and commuting hedgehogs for transient periods cannot be discounted.	hedgehog populations owing to their low value. However, construction activities could result in the death or injury of hedgehogs, if present.	will be implemented during construction.	Installation of gaps under new boundary fencing which will enable hedgehogs to move freely through the site.
Riparian Mammals	The river tributary or storm flow to the south and west of the site has heavily shaded banks due to the woodland and has reduced suitability for water voles. However, the watercourse could be used for commuting otter, but as this is a branch off the main river and therefore reduced suitability for otters in the landscape being located next to the main road and landscaped adjacent to the development as likely urban drainage run-off channels.	No impacts are anticipated on riparian animals as a result of the proposed development as the works is impacting hard standing and B1.	Precautionary measures for pollution are required during construction.	None.
Birds	No evidence of nesting birds was identified on the building or hard standing; however, birds could use the vegetation adjacent for nesting or foraging. No habitat for schedule 1 birds was observed. Magpies, wood pigeon, blackbird, and carrion crows were observed on or flying over site. The site does not provide any suitable nesting sites for barn owls.	The proposed development could result in the destruction or the disturbance and subsequent abandonment of active bird nests adjacent to the building.	Precautions will be taken with machinery and noise levels when working close to any retained nests so as not to disturb any nearby nesting birds during construction works. At least a 3-5m buffer must be created between any machinery and active nests until the young have fledged.	The installation of two bird boxes at the site will provide additional nesting habitat for birds. The bird boxes will be installed on the newly constructed hotel extension and/or the mature trees in the woodland. General purpose bird boxes will be positioned 3m above ground level where they will be sheltered from prevailing wind, rain, and strong sunlight. Species-specific bird boxes will

				be installed in line with manufacturers specifications. Sparrow terraces or swift cups are advised to be installed and will be installed.
Invertebrates	No habitat for protected or notable invertebrates is found on site. The site will provide habitat value for common assemblages of invertebrates which could exploit the flowering shrubs onsite, woodland outside the fencing, watercourses, and trees.	None foreseen as the proposed works is due to impact the building and the hard standing for the works.	No further surveys.	To enhance the site for invertebrates, the following will be installed: • Bee bricks • Dead wood piles

NB* **Group G08 (woodland)** was partially removed following completion of the initial ecological survey undertaken in July 2024. As confirmed in the **Reactive Requirement Survey** (Tree Squadron Ltd, August 2024) and cross-referenced with the **Arboricultural Impact Assessment** (Arbtech TSR 01, April 2025), approximately **11 mature ash trees (*Fraxinus excelsior*) and one ash sapling** from within G08 were felled and stump-treated due to structural instability and early signs of ash dieback. In addition to this partial group clearance, two individual trees — **T30 (monkey puzzle, *Araucaria araucana*)** and **T32 (ash, *Fraxinus excelsior*)** — were also removed under arboricultural safety recommendations. Although several trees within G08 remain, this clearance has reduced the extent and ecological value of the previously identified woodland habitat. The loss has resulted in a local reduction of canopy cover, structural complexity, and shaded understory, which may have provided ecological functions for birds, invertebrates, and other fauna. It should be noted that all trees were removed solely on the grounds of health and safety, as identified in the arboricultural reports, due to structural concerns and the presence of ash dieback symptoms, and not for development purposes.

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 will 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 EMEMP are implemented including the provision of a toolbox talk prior to works commencing. Any queries with regards to the mitigation prescriptions must be addressed to the project ecologist and communication will 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) to avoid impacts on crepuscular and nocturnal species.
General Construction Activities	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 the hardstanding that makes up the northern part of the development. Materials will be stored on pallets to discourage animals from using them as shelter. Skips or similar containers may also be used in place of piles on the ground.
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	The measures given in the Arboricultural Method Statement (Arbtech, May 2024) will ensure that retained trees are protected during the construction phase.
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: <i>PPG6: Working at Construction and Demolition Sites</i> (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.

Buffer from construction activities:

A 15m buffer from retained mature trees, ditches and hedgerows will be retained from construction activity and material storage for the duration of the construction phase. This is in full accordance with current anti-pollution guidelines (Environmental Agency 2016).

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:

- 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.
- Use enclosed shutts 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 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 waste 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
	Sheet pile	Acoustically dampen sheet steel piles to reduce levels of resonant vibration		Drop hammer completely enclosed in box with opening at top for crane access
	Impact on pile	Use resilient pad (dolly) between pile and hammer head. Packing needs to be kept in good condition		Steel jacket completely enclosing drop hammer with dolly and polystyrene chips fed to impact surface to dissipate energy
	Cranes cables, pile guides and attachments	Careful alignment of pile and rig		Pressed-in piling which generates its driving force from the frictional restraint of other piles
	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	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
		Acoustically dampen metal casing Manufacturers' enclosure panels need to be kept closed		
	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
	Sheet pile	Acoustically dampen sheet steel piles to reduce levels of resonant vibration		Drop hammer completely enclosed in box with opening at top for crane access
	Impact on pile	Use resilient pad (dolly) between pile and hammer head. Packing needs to be kept in good condition		Steel jacket completely enclosing drop hammer with dolly and polystyrene chips fed to impact surface to dissipate energy
	Cranes cables, pile guides and attachments	Careful alignment of pile and rig		Pressed-in piling which generates its driving force from the frictional restraint of other piles
	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
Roosting Bats	Prior to the felling of T1, a close-up inspection of the roosting feature will be undertaken by a licensed ecologist to determine the presence or likely absence of roosting bats. In the unlikely event that a bat or evidence of bats is discovered during the development all work must stop and a bat licensed ecologist contacted for further advice.			
Commuting & Foraging Bats	All external lighting will be installed in accordance with Guidance Note 08/18 (BCT & ILP 2023). External lighting will be installed in a way as to limit artificial light spill over habitats of value to roosting, foraging, and commuting bats potentially using the site. Specifically, External lighting will be installed as to avoid excessive light spill over: • Retained woodland.			

	The following lighting design prescriptions are considered suitable for the type and scale of the proposed development to minimise the impacts of artificial lighting on bats. It is anticipated a lighting professional will produce a lighting specification and lux contour plan to demonstrate compliance with the below prescriptions: Reduce the operating time of lighting and associated unnecessary light spill The lighting specification will avoid the use of motion sensors where possible to allow lights to be turned off permanently whilst not in use. Where the use of motion sensors is desirable for security purposes, light sensors will be set to lighting periods of no longer than 1 minute to prevent unnecessary light spill. Avoiding upwards light spill towards the main roof space All external lighting installed will utilise a directional lighting design by using luminaires with rear shields and an upwards lighting ratio of zero. Avoid excessive light spill over mature vegetation in the rear garden - All external lighting will utilise lamps that lack UV elements. In particular, metal halide, compact fluorescent sources will not be used. - Use of warm white LED lamps only, whereby the Corrected Colour Temperature does not exceed 2700 Kelvin and a brightness of 500 lumens or less. Light sources will feature peak wavelengths higher than 550nm to avoid component light most disturbing to bats. - Installing lighting systems that deliver no greater than a 3lux average illuminance, with a maximum horizontal illuminance of 0.4 over the retained woodland.
Badgers, Hedgehogs & Other Terrestrial Mammals	A precautionary working method will be followed to protect terrestrial mammals: - Any excavations will be covered overnight, or a ramp will be installed to enable any trapped animals to escape. - The use of night-time lighting will be avoided, or sensitive lighting design will be implemented to avoid light spill on to retained habitats which hedgehogs may use. - Any chemicals or pollutants used or created by the development should be stored and disposed of correctly according to COSHH regulations. - If any hedgehogs are found in the working area these must be allowed to disperse of their own accord or, if at immediate risk, will be moved by hand to a sheltered, vegetated area away from disturbance.
Herpetofauna	A small area of grassland will be removed to facilitate the new extension. These works are best undertaken between April and June. During this timeframe, amphibians and reptiles are active and able to escape to adjacent areas when disturbed. If this timeframe cannot be achieved, works can be undertaken between June and September. During this timeframe, all refugia present will need to be subject to detailed finger-tip searches prior to removal. Clearance works must not take place between October and March when reptiles are mostly torpid and thus highly vulnerable to injury or death.

Vegetation removal will comprise a phased cutting method in addition to cutting in systematic patterns. The phased cutting method will be undertaken in two stages; the first cut will remove all vegetation to approximately 150mm from ground level and the second cut will be to ground level/ bare ground. Amphibians and reptiles are most likely to be present at or just below ground level; the phased technique allows any individuals present to disperse prior to reducing vegetation to ground level. The systematic vegetation cutting must be applied to both cutting phases and comprises cutting systematically towards areas of retained habitat to the south in an attempt to encourage any individual amphibians or reptiles to retreat to retained habitat unharmed. This method also prevents the creation of habitat islands during the second cutting phase which has potential to trap amphibians and reptiles in isolated pockets of habitat and thus increase the potential for injury or death during works. Two suitable systematic cutting techniques are schematically represented on **Figure 1**. Once the sensitive vegetation clearance has been completed, these areas will then be maintained at a short sward (sward length < 50mm) which is unsuitable to support amphibians and reptiles and is likely to prevent individuals from recolonising these areas of the site prior to construction works.

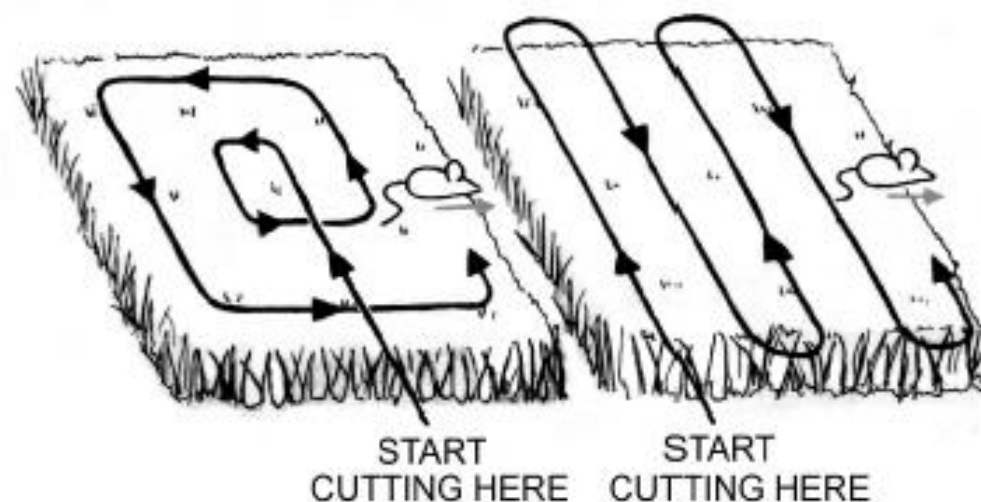


Figure 1: A schematic representation of vegetation cutting patterns as best to eliminate terrestrial opportunities for reptiles and amphibians within the construction zone.

If a common amphibian or reptile is found then this must be allowed to move away into adjacent habitats unharmed, of their own accord or, if at immediate risk, moved by gloved hand to an undisturbed and sheltered area of the site or adjacent land.

	In the unlikely event that a great crested newt is identified, works must cease and advice must be sought from a suitably qualified ecologist.
Birds	Vegetation removal is likely to be undertaken within the bird nesting season to protect herpetofauna. Therefore, a close inspection of the entire field will be undertaken, by the project ecologist or ECoW, within 48 hours 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). Any nests in the surrounding treelines, woodland and hedgerow are likely to remain unaffected by the works, given the distance (15m) between these features and the development area.

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.
Funding	The applicant will be responsible for the cost of implementing and maintaining the enhancement prescriptions.
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.
Maintenance and Monitoring	An ecologist will visit the site every five years post-development, for a total period of 30 years. They will check the enhancements, including retained habitats, new habitats/landscaping and species-specific enhancements, and produce a report outlining their findings. If any of the enhancements are not fit for purpose and not meeting the objectives outlined in this report, the applicant will be required to make appropriate changes, as outlined in the ecologist's report, within 6 months of the date of the report. This will ensure that the enhancements are effectively delivered and maintained for the lifetime of the development.
Retained Habitats	Retained woodland and grassland will be managed for wildlife. Any deadwood collected from pruning operations within the woodland will be retained in log piles kept in quiet corners; this will provide enhancement for a wide range of species including invertebrates, bats, birds, reptiles and amphibians.
Enhancement of Modified Grassland Surrounding the Development Area	Areas of grass will be allowed to grow long around the edges (away from amenity spaces) to allow new species to flourish, increasing the biodiversity of the site. The sward height will be >20cm for at least 10% of the grassland area. Objectives: - To create a successful and species rich wildflower grassland that will provide habitat for pollinating invertebrate species, that will in turn, provide foraging opportunities for notable species groups including bats, birds, badgers, and hedgehogs. - Ensure a healthy species diverse sward is maintained; - Employ techniques that use organic fertilizers and minimise the use of chemicals wherever possible.

Management Prescriptions:**Table 2.1:** Wildflower meadow management prescriptions.

Management	When	Rationale
Cut meadow twice annually	Late March / early April and– late August/ early Sept	This ensures the meadow does not grow excessively long and become rank but allows wildflowers to set seed and invertebrates to breed. This will also allow a diverse sward of varying lengths to naturally occur in accordance with growth characteristics of each species. Cutting twice annually will also prevent encroachment of scrub and bracken.
Cut grass as to provide a heterogeneous habitat structure aiming to maintain at least 20% of grass <7cm and 20% >7cm. As such, each cutting phase must cut 20% of the area to ground level, 60% of the area to 15cm, and the remainder to 30cm. These areas must be rotated each year to maintain a diverse sward.	Late March / early April and– late August/ early Sept	To retain a diverse sward whilst limiting impacts to protected species potentially present at ground level and ensuring the natural germination of seeds.
Remove any invading scrub between October to March (avoiding the bird-breeding season also) by either hand pulling or cutting.	October to March.	Scrub will shade out and out compete traditional meadow species.

	Scrub cover will be kept to <5%. Turn and dry the cut grass over 3-5 days before removing arisings off Site Post cut This allows the seeds to drop encouraging species diversity and invertebrates to relocate unharmed. Do not apply chemical fertilisers At all times. The use of chemical fertilisers will encourage vigorous grasses and weeds to grow or cause large areas of bare ground due to inhospitable growing conditions.
New Habitats	12 new trees will be planted across the developed site. In addition to this, to compensate for the loss of trees from G08 and the removal of T30 and T32, a 1:1 native tree planting scheme will be implemented. Species should include appropriate natives such as <i>Acer campestre</i> (field maple), <i>Betula pendula</i> (silver birch), and <i>Sorbus aucuparia</i> (rowan), planted near the original canopy locations where feasible. Objectives: • To create trees of moderate condition. • To plant native trees 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: • Species selection Fast-growing native species will be planted (e.g. lime, willow, silver birch). These will be purchased at a standard size. They will be kept in their protective bags during transportation and planted within 4 days, after being kept in a frost-free environment and watered regularly. • Ground preparation and planting

Planting will be completed between November and March. The soil preparation must include the removal any weeds or stones in the hedge path and to rotovate the soil and incorporate organic matter. The ground must not be frozen or waterlogged. In heavy clay or other difficult soils, a trench may need to be dug for planting.

Each tree will be planted within a hole three times as wide of the supplied pot and of a similar depth. Root balls will be soaked thoroughly in water before planting and root balls will be loosened to expose restricted roots before planting. The planted trees will then be backfilled ensuring there are no air pockets around roots or any roots protruding out of the ground.

Recommended management prescriptions over a minimum 30-year term:

Table 2.2: New tree planting management prescriptions.

Management	When	Rationale	BNG condition criteria compliance - Trees
Ensure the trees have a 1m circle free of weeds and grass growth	Before planting and for the first 3 years after planting	To ensure the trees can take up sufficient nutrients.	1
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.	1
Tree stakes (total of 2. one on either side of the rootball) are to be installed prior to back filling of the planting pit and situated so to make sure that they avoid the rootball.	Prior to back filling of planting pit and inspected every 6 months for the first 2 years	Maintain protection	3
Water each tree with c.20L of water	Every other week from March through September for first 10 years	To ensure the trees can take up sufficient nutrients.	1
Remove weeds	When required; checked twice annually in early spring and in Autumn.	Reduce competition for resources nutrients etc.by weeds	n/a
Application of bark mulch at a depth of 50 mm	Immediately after planting and then when	Reduce competition for resources nutrients etc.by	n/a

		required; checked annually in Autumn.	weeds	
	Do not apply chemical fertilisers	At all times.	The use of chemical fertilisers will encourage vigorous grasses and weeds to grow	4
	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.	6
	Removal of spent flowers from perennial plants will be removed through 'deadheading'	Twice annually, late spring and in the Autumn.	Allows plants to place more energy into re-growth.	n/a
	Watering must 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.	n/a
	Check and replace any plant failures once a year	For the first 5 years	To ensure no gaps form.	1
Removal of Non-Native Species	An invasive species specialist must be contracted to produce an invasive species management plan. This must be in place before any works begin on site. The plan must cover at least 30 years post-development.			
Hibernacula	Two hibernacula will be constructed using natural materials such as logs, stone and earth (refer to Figure 2). The hibernacula are to be installed at the corners of the site, away from busy areas.			

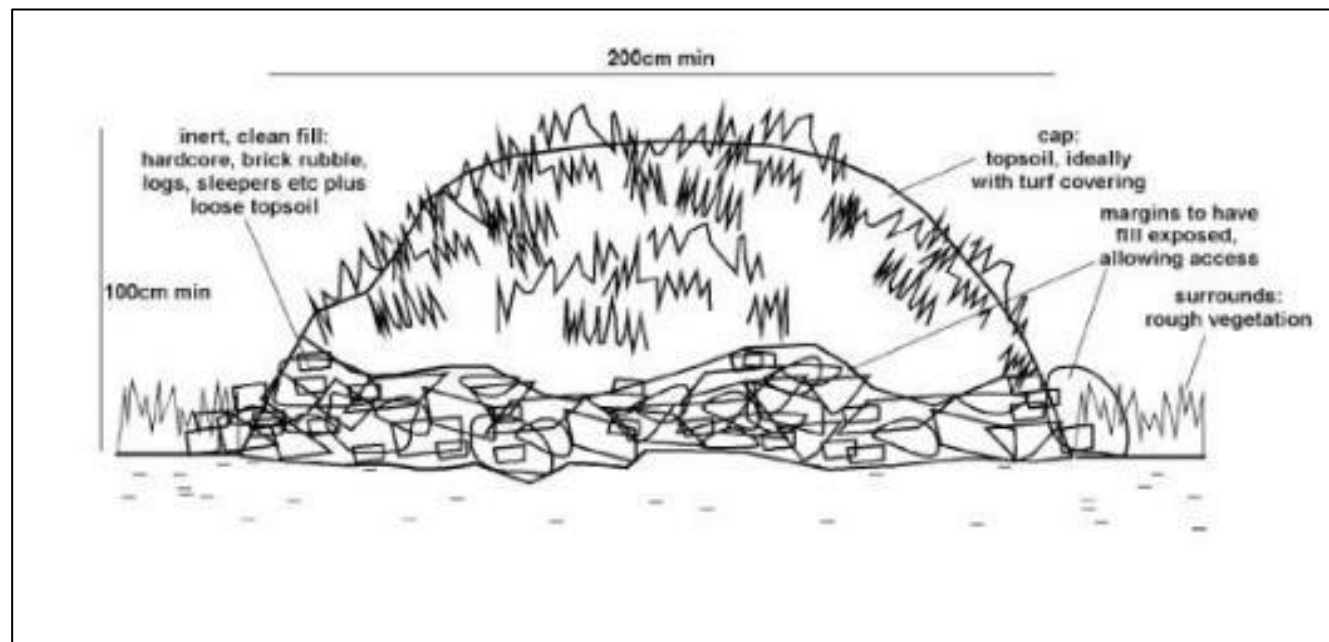


Figure 2: A schematic representation of a man-made hibernacula to provide suitable refuge.

Bat Boxes

Two bat boxes will be incorporated into the walls of the new extension. An additional 3 bat boxes will also be installed onto mature retained trees on site to compensate the loss of T8 and the removal of trees within the woodland along the western boundary of the site.

Bat boxes specification:

- Boxes are designed to require no maintenance and have a lifespan of 25 years plus.
- 2x Ibstock Enclosed Bat Box 'C' (or similar alternative brand) are recommended on the building.
- 3x Woodstone Harlech Bat Box (or similar alternative brand) are recommended on trees.
- Bat boxes will 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.



Figure 3: Ibstock Enclosed Bat Box 'C' (image credit <https://www.nhbs.com/>)



Figure 4: Ibstock Enclosed Bat Box 'C' (image credit <https://www.nhbs.com/>)

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	Two bird boxes will be incorporated into the new extension. Bird box specification: - Boxes are designed to require no maintenance and a lifespan of 25 years plus. 2x Ibstock Eco-habitat for Swifts (or a similar alternative brand) are proposed to be incorporated into the extension, as shown in Figure 4. - Woodstone Nest Boxes will be positioned approximately 3m above ground level where they will be sheltered from prevailing wind, rain and strong sunlight. Figure 5: Ibstock Eco-habitat for Swifts (image credit https://www.nhbs.com/) 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.
Insect Box	Three bee boxes will be installed at the site. These will be planted with native wildflowers. An example is provided in the figure below, and can be found here https://www.greenandblue.co.uk/products/beepot?pr_prod_strat=e5_desc&pr_rec_id=d002e624c&pr_rec_pid=2664094924900&pr_ref_pid=2664094826596&pr_seq=uniform.

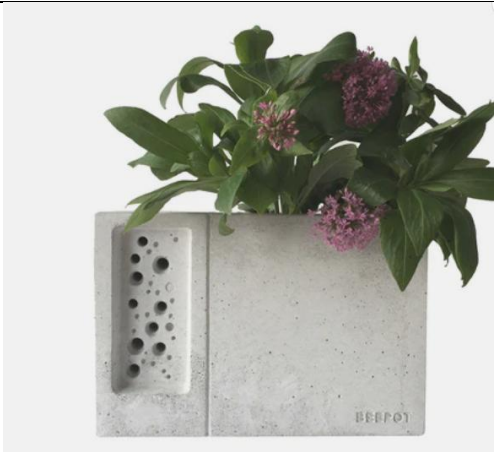


Figure 6: Bee box (image credit)

https://www.greenandblue.co.uk/products/beepot?pr_prod_strat=e5_desc&pr_rec_id=d002e624c&pr_rec_pid=2664094924900&pr_ref_pid=2664094826596&pr_seq=uniform

Hedgehog House

A hedgehog house will be installed adjacent to the retained hedgerow on the western site boundary (Figure 6). A hedgehog house suitable for the site (or a similar alternative brand) can be found here: <https://www.nhbs.com/hedgehog-house-with-feeding-shelter>

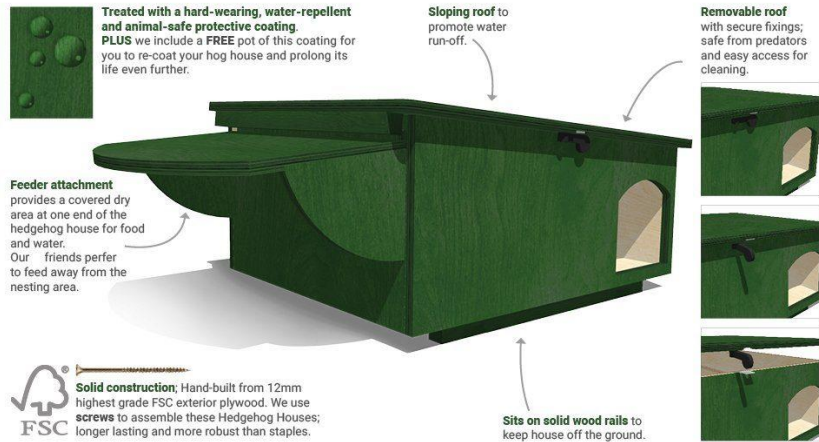
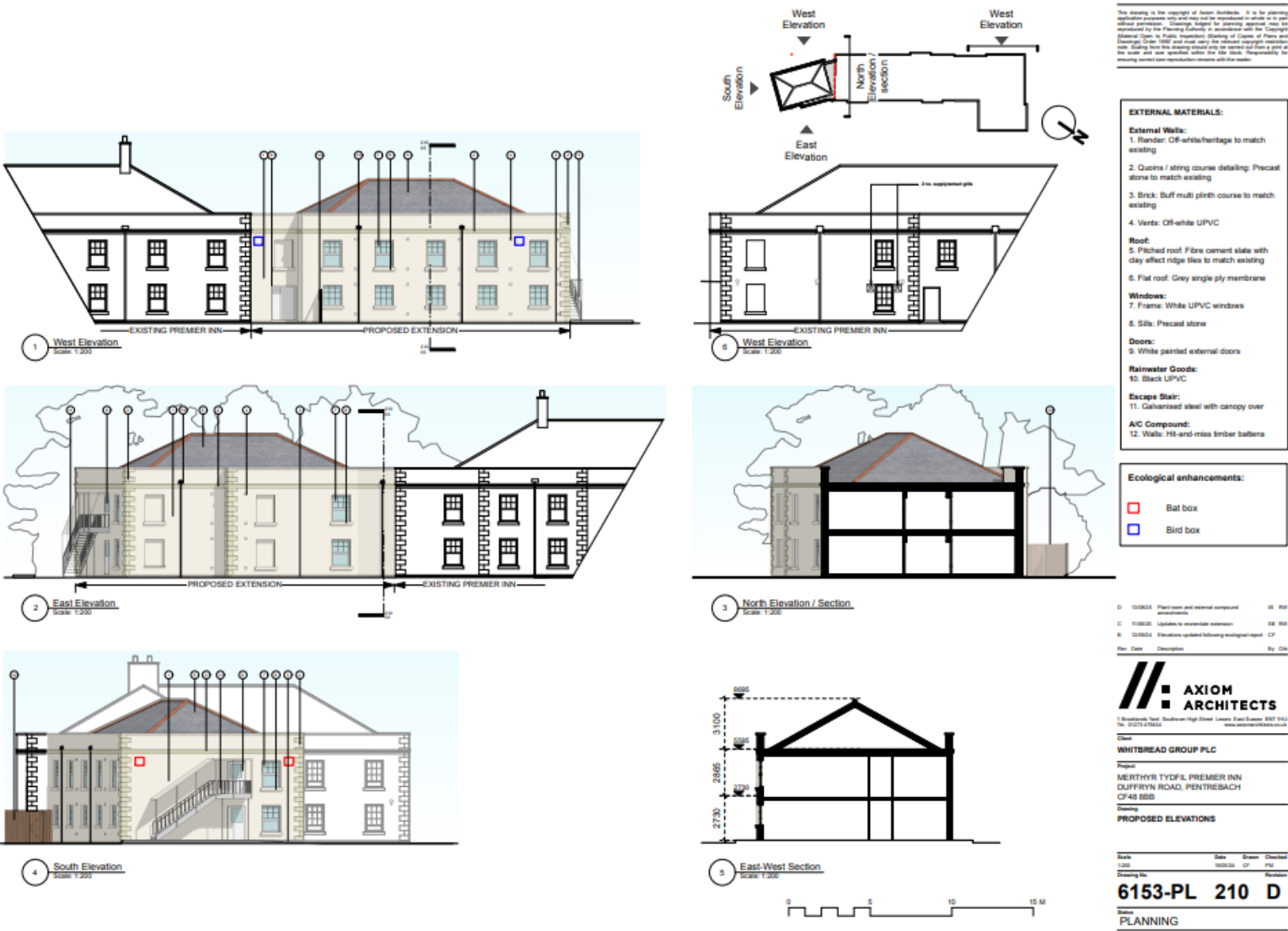


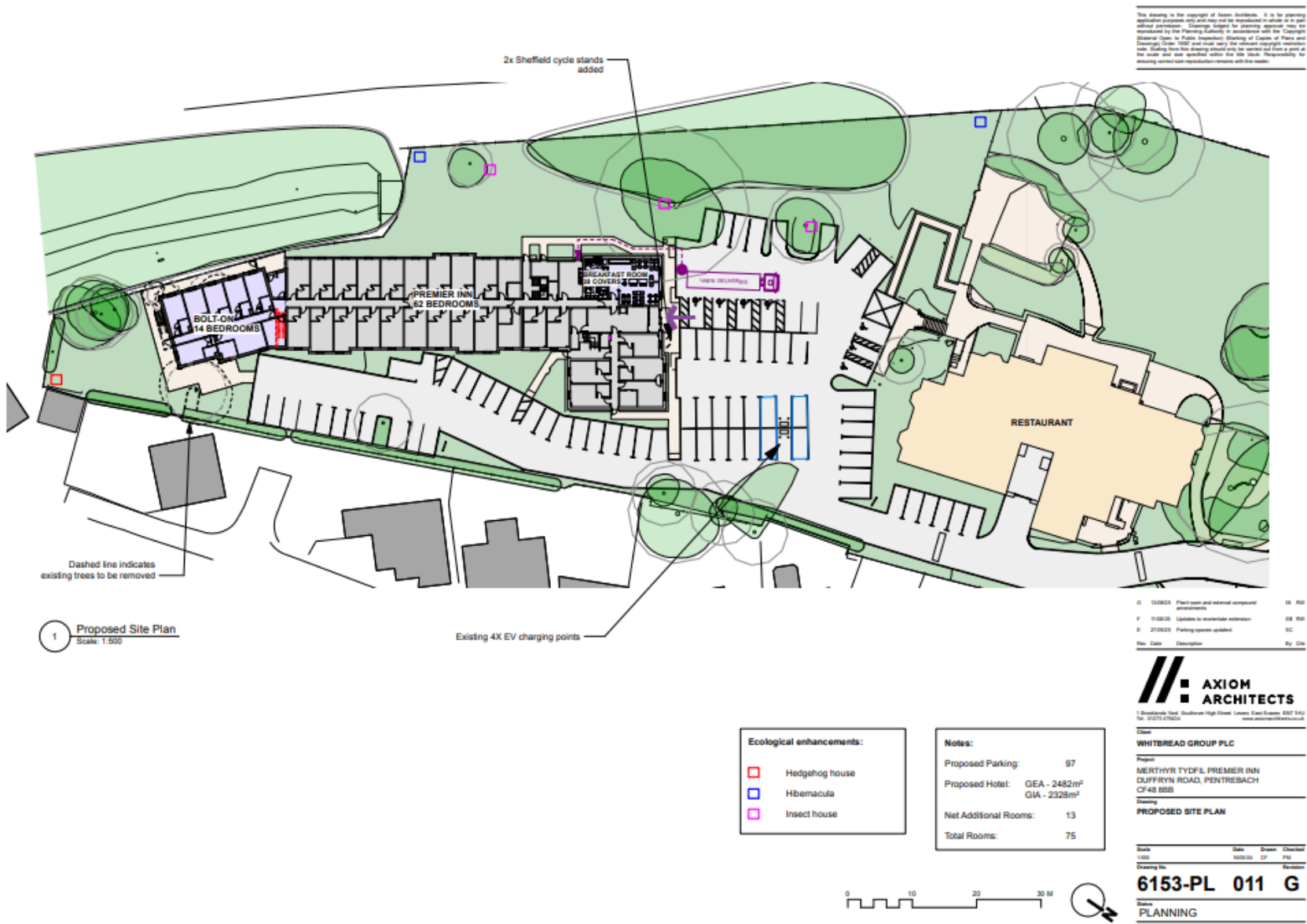
Figure 7: Hedgehog house (image credit) <https://www.nhbs.com/hedgehog-house-with-feeding-shelter>

Hedgehog Highway

Gaps of at least 13cm x 13cm will be created at the bottom of all boundary fences to allow hedgehogs free passage throughout the developed site.

Appendix 1: Proposed Development Plan





Appendix 2: Site Location Plan



Appendix 3: Existing Habitat Plan

