

**Penstrowed Quarry,
Caersws, Powys, SY17 5SG**

*Proposed change of use and construction of holiday
lodges*

Biodiversity Enhancement Plan

For: Mr G. Grigg (GF Grigg Construction Ltd)

14 October 2022 (ver.03)

This report is released for this client (**Mr G. Grigg (GF Grigg Construction Ltd)**) and site (**Penstrowed Quarry, Caersws, Powys, SY17 5SG**) only. It may not be copied or quoted or its results used in another report or used for any other application without the written consent.



Prepared by.

Gerald Longley Ecological Consultants

© www.geraldlongley.co.uk

Modified by:

Whitcher Wildlife Ltd.

www.whitcher-wildlife.co.uk

CONTENTS

1.0 INTRODUCTION

1.1 Background – Gerald Longley	3
1.2 Background – This Report	3
1.3 Site location	4

2.0 PROTECTION AND MANAGEMENT OF EXISTING HABITATS

2.1 Broadleaved woodland and Bracken with scattered trees and scrub	6
2.2 Native species hedgerows	6
2.3 Plans of existing habitats to be retained and protected	7
2.4 Management of existing habitats	9

3.0 NEW HABITAT CREATION

3.1 Creation of pond	10
3.2 Creation of long grass/wildflower meadow areas	11
3.3 Native tree and shrub planting	11
3.4 Creation of bat roosting habitat	12
3.5 Bird nest boxes	13
3.6 Proposed biodiversity enhancements plan	15

4.0 MONITORING 16

5.0 APPENDICES

5.1 Temporary newt/reptile fencing	17
5.2 Translocation of hedgerows	18
5.3 New Dedicated Bat Building (DBB) specifications	20
5.4 Meadow creation	25

1.0 INTRODUCTION

1.1 Background - Gerald Longley/Derek Whitcher

Gerald Longley Ecological Consultants (GLEC Ltd) has been commissioned to produce a Biodiversity Enhancement Plan for a proposed development at Penstrowed Quarry, Caersws, Powys, SY17 5SG (Grid reference SO067908). They previously carried out a Preliminary Ecological Appraisal (PEA) (GLEC-1120-01, Dec 2020) of the site and a Bat Survey (GLEC-1145-01, July 2021) Gerald Longley has over three decades of experience of wildlife surveying and, prior to working as an independent ecological consultant, held posts as Conservation Officer with Montgomeryshire Wildlife Trust and Head of Shrewsbury Countryside Unit.

Due to illness this document has been modified by Derek Whitcher, Whitcher Wildlife Ltd.

1.2 Background – This Report

It is proposed to develop the quarry site as a holiday lodge park.

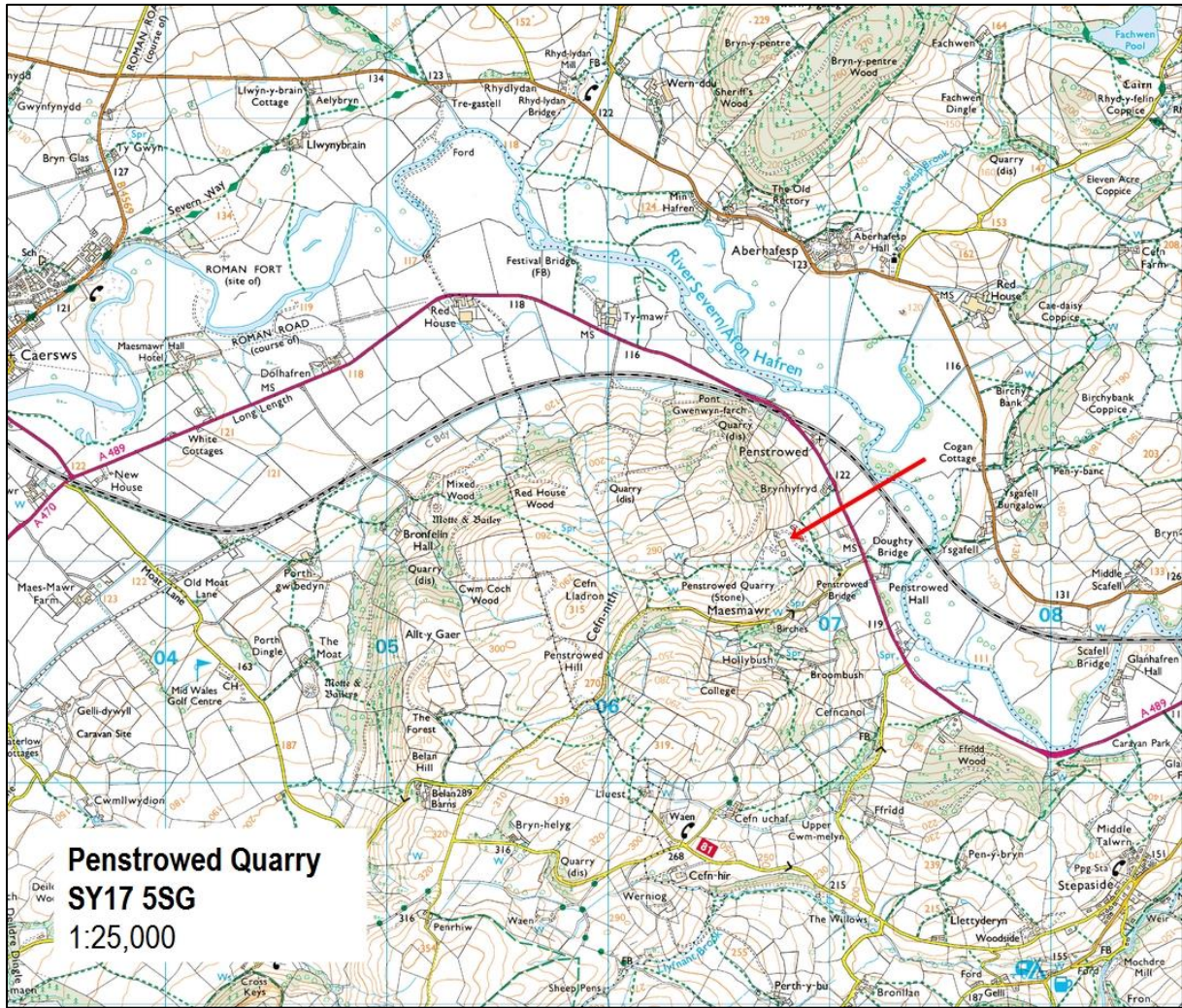
Pre-planning consultation with the Local Planning Authority (Powys Council) confirmed that they required biodiversity enhancement measures to be incorporated into the proposal and that a Biodiversity Enhancement Plan should be submitted to the Authority.

The PEA report also recommended that a range of biodiversity enhancement works be undertaken around the site, that these be separately detailed in a Biodiversity Enhancement Plan and that measures should include bird boxes, bat boxes, future management of the pond/lake proposed on the site and the southern bracken slopes and the sowing and management of new wildflower grassland.

The bat surveys across the quarry site indicated a good level of bat use by a range of species and enhancement of bat habitat was recommended to encourage bats to roost at the site and forage more. Provision of a purpose designed Dedicated Bat Building (DBB) erected close to the proposed pond and high levels of native plant landscaping to link the DBB to existing vegetation around the margins of the site were recommended to enhance a range of bat foraging and roosting opportunities where there were currently no roost features and only meagre habitat due to the quarry being an active site.

This report sets out proposals for biodiversity enhancement across the proposed development sit and should be read in conjunction with the site landscaping plans once finalised.

1.3 Site location





2.0 PROTECTION AND MANAGEMENT OF EXISTING HABITATS

The PEA of the site identified areas of habitat with value for wildlife and biodiversity which will be permanently retained and protected during development works. These areas are detailed below and shown on the aerial photograph and site plan in section 2.3.

2.1 Broadleaved woodland and Bracken with scattered trees and scrub

Semi-natural broad-leaved woodland and bracken with scattered trees and scrub on the south and southeast facing slopes was suitable habitat for reptiles, potential habitat for dormice, potential suitable breeding habitat for pearl bordered and small pearl bordered fritillary butterflies and suitable breeding habitat for birds that favour patchy scrub, particularly migrant warblers such as black cap, willow warbler and whitethroat.

The southern slopes also formed a buffer area between the proposed holiday park and the Gweunydd Penstrowed SSSI meadows to the south.

Three smaller areas of broadleaved semi-natural woodland within the quarry area provided some foraging habitat for bats and potential nesting habitat for birds. An area of well-established planted woodland on the northeast edge of the site was also suitable foraging and commuting habitat for bats and feeding and nesting habitat for a range of birds.

These areas of habitat will be retained. **NO** development, tipping of soil or any other works will take place in these areas and they will be marked on plans and protected with suitable Heras fencing during development works.

To protect reptiles and amphibians that may be present on the southern slopes during construction works, suitable temporary amphibian/reptile fencing (see appendix 5.1) will be erected on the northern boundary of the southern slopes along the edge of this habitat along the line of the Heras fencing.

2.2 Native species hedgerows

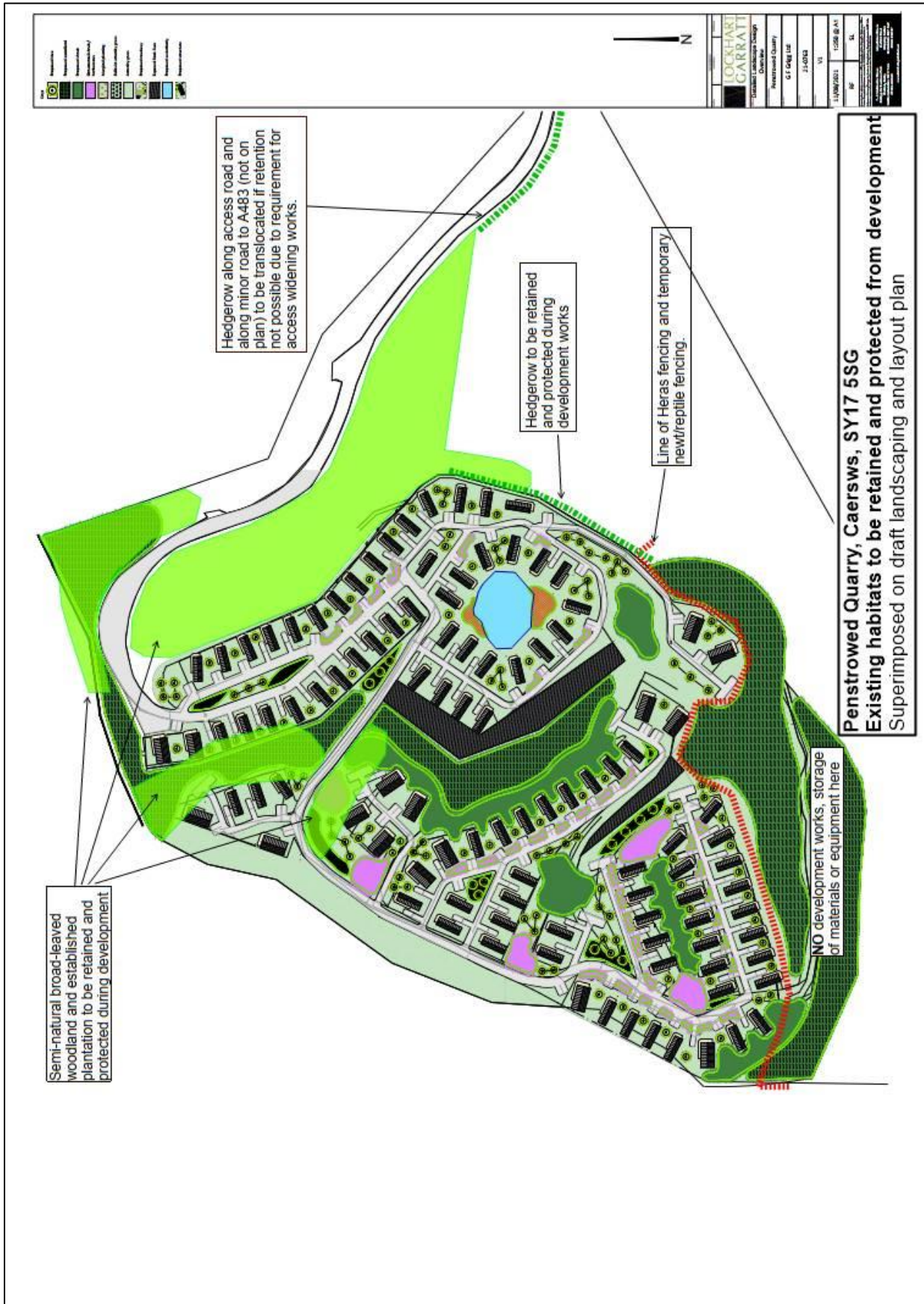
Hedgerows on the site boundaries below the woodland on the south eastern slopes and along the access road near the A483 were well-established, native species hedgerows with few gaps, and some mature hedgerow trees. Hedgerows are important to a wide variety of species as refuges, breeding and feeding sites and as links between habitats

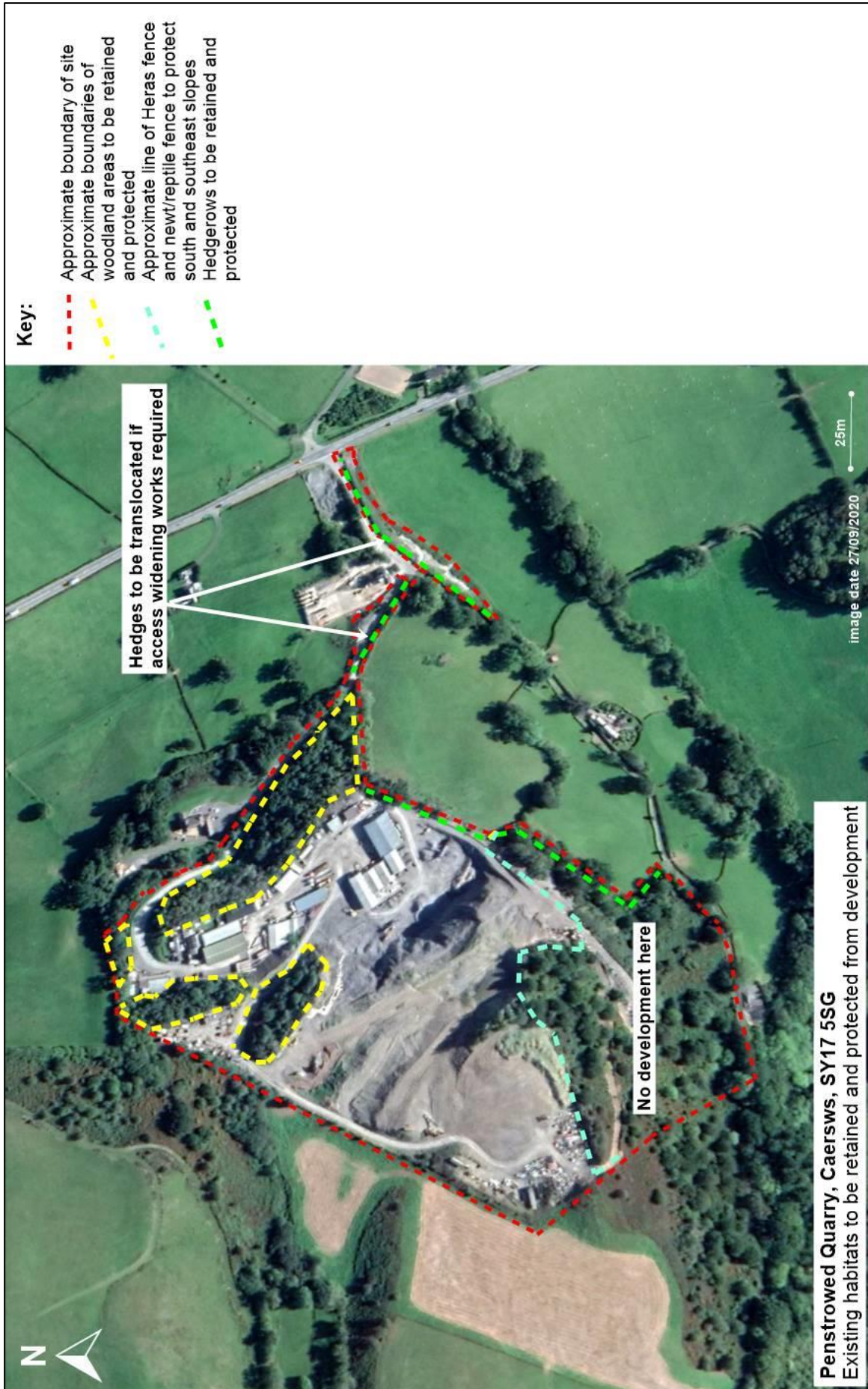
All hedgerows will be permanently retained and protected during development works with suitable Heras fencing. If road widening along the access road near the A483 and new access works that require hedgerows to be removed take place the hedge affected will be translocated back rather than removing it and planting a new hedge.

Translocating the hedge rather than removing it and planting a new one means that important flight lines for bats will be re-established much more quickly. It would take years for a newly planted hedge to attain the maturity, complexity and value to wildlife of the existing hedge.

The method for translocating hedgerows is outlined in appendix 5.2.

2.3 Plans of existing habitats to be retained and protected laid over a draft landscaping plan which has been superseded but the retention and areas of existing habitat are the same





2.4 Management of existing habitats

Broadleaved semi-natural and plantation woodland

Minimal intervention is required for these areas with just occasional works for safety reasons around the edges, for example, to remove damaged branches overhanging roads and paths through the holiday park.

Bracken with scattered trees and scrub

The habitat value of bracken, trees and scrub on the south and southeast slopes was largely in its varied structure and the range of different habitat niches suitable for different species that this created.

This area would benefit from management work every 3-5 years to cut some scrub and trees to maintain the varied structure and mix of different habitats. With no intervention, the slope would gradually become dominated by scrub and trees which would make the habitat less varied and less suitable for the uncommon bird, reptile and invertebrate species that it currently provides good habitat for.

Native species hedgerows

Details of aftercare and management of any translocated sections of hedgerow are in appendix 5.2.

For existing hedgerows that are retained in-situ, establish a hedge trimming regime so that each section of hedge is only cut every two years so that berry bearing wood develops.

3.0 NEW HABITAT CREATION

See also Proposed Biodiversity Enhancements plan in section 3.6 below.

The creation of interconnecting belts of shrub, scrub, trees, long grass and water across the site will, once established, provide habitat for wildlife on the parts of the site that as a working quarry have very little vegetation and also links between areas of existing habitat.

3.1 Creation of pond

To increase the range of habitats on the site and, in particular, enhance foraging habitat for bats, new ponds, one of which will be a dedicated wildlife pond will be created as part of the landscaping of the holiday park.

The new dedicated bat building (see section 3.4) shall be built in the eastern corner of the site beside this wildlife pond adjoining existing woodland and hedgerow – good foraging habitat.

The wildlife pond will be 1.5m max depth with gentle slopes (less than 1 in 5 and less than 1 in 20 right at the margins to maximise the shallow areas most favoured by plants and animals). The pond has been designed so that surface water and road drain runoff from the development, and any runoff from field drains do not flow directly into it to reduce the amount of sediment and other pollutants, for example, oil from vehicles, reaching the pond.

The wildlife pond will cover an area of approximately 800m² and have a minimum permanent (i.e. summer) water surface area of 600m². Un-compacted mounds and banks, mixed with soil, will be created with the excavated rock at least 3-4m away from the edge of the pool to provide habitat for newts and other amphibians.

As the pond will be on a rocky substrate, a clay liner may not be necessary. This will be confirmed by site investigations.

Ongoing management:

- a) Consider not adding plants, including wetland/water plants, animals or 'sludge' from other ponds to the new pool. Planting water plants in ponds can often lead to accidental invasions of non-native invasive plants. Water bodies will naturally colonise with wetland plants surprisingly quickly.
- b) Monitor for invasive species particularly:
 - New Zealand swamp-stonecrop (*Crassula helmsii*),
 - Parrot's-feather (*Myriophyllum aquaticum*),
 - Floating pennywort (*Hydrocotyle ranunculoides*),
 - Water primrose (*Ludwigia grandiflora*), and
 - Water fern (*Azolla filiculoides*) and remove and dispose of any as soon as it is found. Controlling invasive plants is much easier and more effective if they are tackled when there is still only a small amount.
- c) Keep the southern edge of the pond free from shading by cutting any woody species that establish on an annual basis.
- d) Monitor colonisation by plant and invertebrate species. An ecologist will carry out an annual assessment for the first five years after completion and make recommendations about management. After the fifth survey the ecologist will make recommendations regarding monitoring and management for the following five year period.

3.2 Creation of long grass/wildflower meadow areas

To increase the diversity of habitat on the site areas of longer vegetation/meadow, as shown on the plan in section 3.6. As well as providing vegetation links across the site, areas of long

grass provide habitat for invertebrates, amphibians and small mammals and foraging habitat for bats and birds.

These areas will be soiled and seeded as a meadow with appropriate subsoil and seed mix (see appendix 5.4 for details of seed mix) and, once established, managed with an annual cut and removal of cut material by raking into piles at the edges of the meadow areas to create habitat for grass snakes.

Ongoing management:

- a) Spot treat 'weeds' (creeping and spear thistle, broad-leaved dock, stinging nettle) in meadow with approved herbicides.
- b) Cut meadow each year in July/August. Rake cuttings into snake piles around perimeter.
- c) Weed native shrub planted areas and replace any dead plants for the first five years after planting.
- d) Monitor the development of the meadow areas. An ecologist will carry out an annual assessment of condition for the first five years after completion and make recommendations about management. After the fifth survey the ecologist will make recommendations regarding monitoring and management for the following five year period.

3.3 Native tree and shrub planting

All planting will be native species which are considered native to Mid Wales and will not include trees/shrubs/climber species which are native to the Midlands of England but which do not occur in Mid Wales.

Shrubs/climbers in this category and not to be used are:

Perfoliate honeysuckle *Lonicera caprifolium*
Midland hawthorn *Crataegus laevigata*.

Native honeysuckle, *Lonicera periclymenum* and hazel (*Corylus avellana*) will be used instead if these are considered.

Trees/woodland planting not to be used are:

beech (*Fagus sylvatica*)
whitebeam (*Sorbus aria*)
lime (*Tilia europaea*),

Native silver birch (*Betula pendula*), downy birch (*Betula pubescens*) and rowan (*Sorbus aucuparia*) will be used instead if these are considered.

3.4 Creation of bat roosting habitat

Bat surveys across the quarry site indicated a good level of bat use by a range of species despite the relatively small amount of foraging habitat and complete lack of roosting habitat.

Provision of a purpose designed Dedicated Bat Building (DBB) erected close to the proposed lake and the installation of bat boxes across the site will provide roosting places for bats where there are currently none. High levels of native plant landscaping to link the DBB to existing vegetation around the margins of the site will encourage bats to use the DBB and provide bat foraging habitat across the site

Dedicated bat building (DBB)

The proposed location is close to a new wildlife pond and existing established vegetation on the eastern edge of the site.

Details for the construction of the DBB are in appendix 5.3

Ongoing management:

- Monitor to see if bats are present/using the DBB. A suitably licensed bat ecologist will carry out a monitoring survey visit each year in summer for the first five years after completion. After the fifth survey the ecologist will make recommendations regarding monitoring and management for the following five year period.
- Standard building maintenance may be required from time to time, for example, replacing any slates that fall off.

Bat boxes

Installing bat boxes supplements the natural roosting places available and can contribute to retaining and increasing populations in an area where suitable feeding and foraging habitat is available.

The following will be installed:

12 no. crevice design bat boxes suitable for bat species such as pipistrelles and whiskered bats installed in threes on suitable trees on the edges of the existing woodland areas. Boxes will be installed approximately 4m above ground and facing southeast, south and southwest so they receive as much sunshine as possible.

12 no. cavity design bat boxes suitable for bat species such as Daubenton's and brown long-eared bats installed as for the crevice boxes but on different trees.

The eco bat box is recommended and comes in crevice and cavity designs.

<https://www.nhbs.com/eco-bat-box>

As new trees planted as part of the landscaping of the development mature more bat boxes can be added in threes on trees of adequate size across the site to enhance the roosting opportunities available. It will be many years before the new trees are large enough to develop cracks and crevices and holes that would provide natural roosting places for bats.

3.5 Bird nest boxes

As with bat boxes, installing bird boxes supplements the natural nesting places available and can contribute to retaining and increasing populations in an area where suitable feeding and foraging habitat is available. There was good feeding and foraging habitat for a variety of small birds in the woodland, grassland, river and lake habitats close to the site.

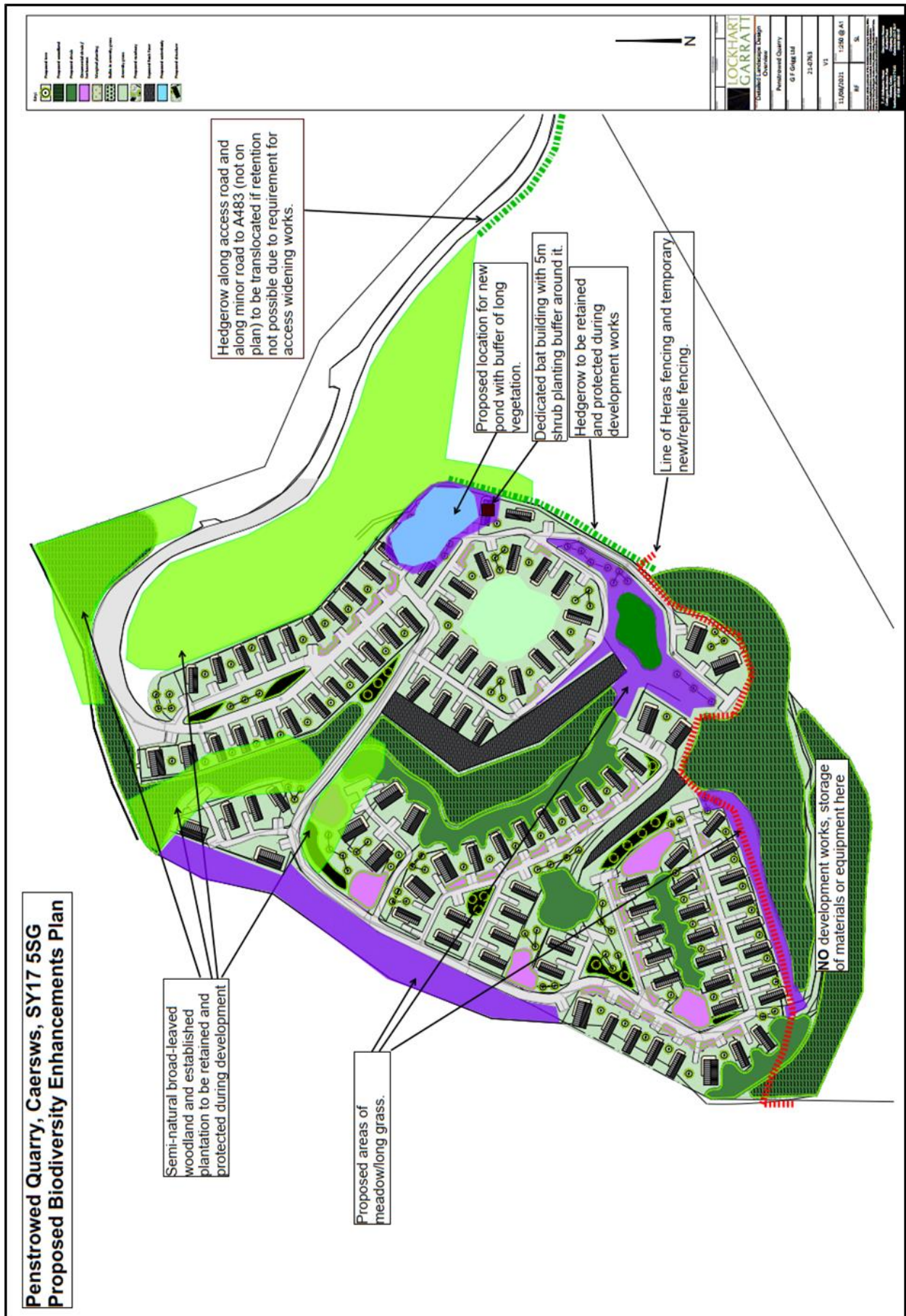
20 no. general purpose nest boxes suitable for robins and other small birds will be installed on trees in the areas of retained woodland and bracken and scrub. These will be 8 open-fronted boxes and 12 hole boxes (6 of each diameter 28mm and 32mm). See

https://www.birdfood.co.uk/nest-boxes/general-nest-boxes?p=2&product_list_limit=54 for examples.

Open-fronted boxes for robins and wrens need to be low down, below 2m, well hidden in vegetation. Other boxes need to be 2-4m high, sheltered by vegetation but with a clear outlook. Nest boxes are best put up during the autumn. Many birds will enter nest boxes during the autumn and winter looking for a suitable place to roost or perhaps to feed. They often use the same boxes for nesting the following spring. Tits will usually not investigate nesting sites until February or March.

As with bat boxes, once new trees planted across the site are of sufficient size more boxes will be installed to increase the nesting opportunities for birds.

3.6 Proposed biodiversity enhancements plan laid over a draft landscaping plan which has been superseded but the enhancements are the same in locations shown



4.0 MONITORING

A suitably licensed ecologist/s will be appointed to carry out the habitat and species monitoring works connected with newly created habitats (see section 3) and any translocated hedgerows (see appendix 5.2).

The ecologist/s will make remedial or ongoing management recommendations as required each year based on the results of their assessments and monitoring.

5.0 APPENDICES

5.1 Temporary newt/reptile fencing

Temporary newt/reptile fencing is constructed with heavy duty polythene and wooden stakes. The top section of the polythene is rolled over to create an overhang which makes it more difficult for animals to climb over. The bottom of the polythene is dug into the ground so that animals cannot pass underneath the fence. An example of temporary newt/reptile fencing is shown in the photograph below. A useful source of information on newt fencing installation and the materials required is:

<https://www.legacy-habitat.co.uk/newt-fencing.html>



5.2 Translocation of hedgerows

- (i) An ecological survey of the hedgerow to be translocated will be carried out in the spring prior to translocation to record both woody and herbaceous species and provide a baseline against which post-translocation monitoring can be measured.
- (ii) The length of hedgerow to be translocated will be cut to a height of 300 – 500mm no more than three weeks before it is to be moved. If cutting work is being carried out in the bird breeding season (March to September inclusive) a comprehensive assessment of the hedge must be made by a suitably qualified ecologist immediately prior to the works, to ensure active nests are not present or disturbed. Any trees will be reduced to about one metre in height. Cutting will be done with a circular or chain saw (not a flail) to ensure clean cuts.
- (iii) The translocation will be undertaken no earlier than 1 October and be completed by mid-January. Habitats are best translocated in the autumn when the soils are warm and moist and new root growth is possible before winter. No translocation work will take place in very wet or freezing conditions.
- (iv) A trench will be dug at the receptor area immediately prior to the hedge translocation. It will not be dug in advance or the soil may dry out or the trench may fill with water, depending on the weather. The trench will be approximately 1000mm wide x 900mm deep. Topsoil and subsoil from the trench will be stored in separate piles nearby, avoiding any valuable habitats – consult the ecologist if in doubt.
- (v) Some additional excavation work may be required to ensure that the profile of the trench matches the size and shape of the root ball of the relocated shrubs and trees.
- (vi) The base of the receptor trench will be loosened to a depth of 250mm and slow-release fertilizer (20:4:10 N:P:K with mycorrhizal additive) spread along the trench.
- (vii) The hedgerow will be dug out in sections (approx. 1.5m width x 1m length) across the line of the hedge to a depth of at least 1m using a tracked 360 degree excavator (to avoid compaction of the receptor site) with the largest ditching bucket available.
- (viii) During the excavation, a chainsaw will be used to free roots and branches where necessary to prevent them being torn.
- (ix) Hedge sections will be placed in the receptor trench in the order in which they were removed, ensuring that all of the rootball is contained within the trench, and soil used to backfill any voids and gaps after each section is placed. Manual backfilling and firming may be required.
- (x) Water the translocated hedge immediately following translocation.

Aftercare and monitoring

- (i) The relocated section of hedge will be protected by a netting stock fence erected approximately 1m from the edge of the trench immediately following the translocation.
- (ii) Water the translocated hedge during the six months following translocation if conditions are dry.
- (iii) The translocated hedge will be monitored for re-growth in May and July of the year following the translocation and again in the August of the second and third years after translocation.

- (iv) Gaps created by any sections of the translocated hedge that fail to survive during the first three years after translocation will be identified by the monitoring and will be planted up with appropriate species specified by this plan.
- (v) Re-growth on the translocated hedgerow will be lightly trimmed in the first winter to encourage vigour during re-establishment
- (vi) A maintenance/defects period of at least 36 months will be applied to failed sections of hedge. This will cover 100% of the cost of replacement for failed sections, where failure is attributable to bad practice, negligence or lack of maintenance on the part of the contractor.

References:

1. Atkins (2012) Translocation Wildlife Habitats: A Guide for Civil Engineers
2. Hanson (July 2012) Hedgerows
3. Monmouthshire CC (June 2011) Advice note: Hedge Translocation

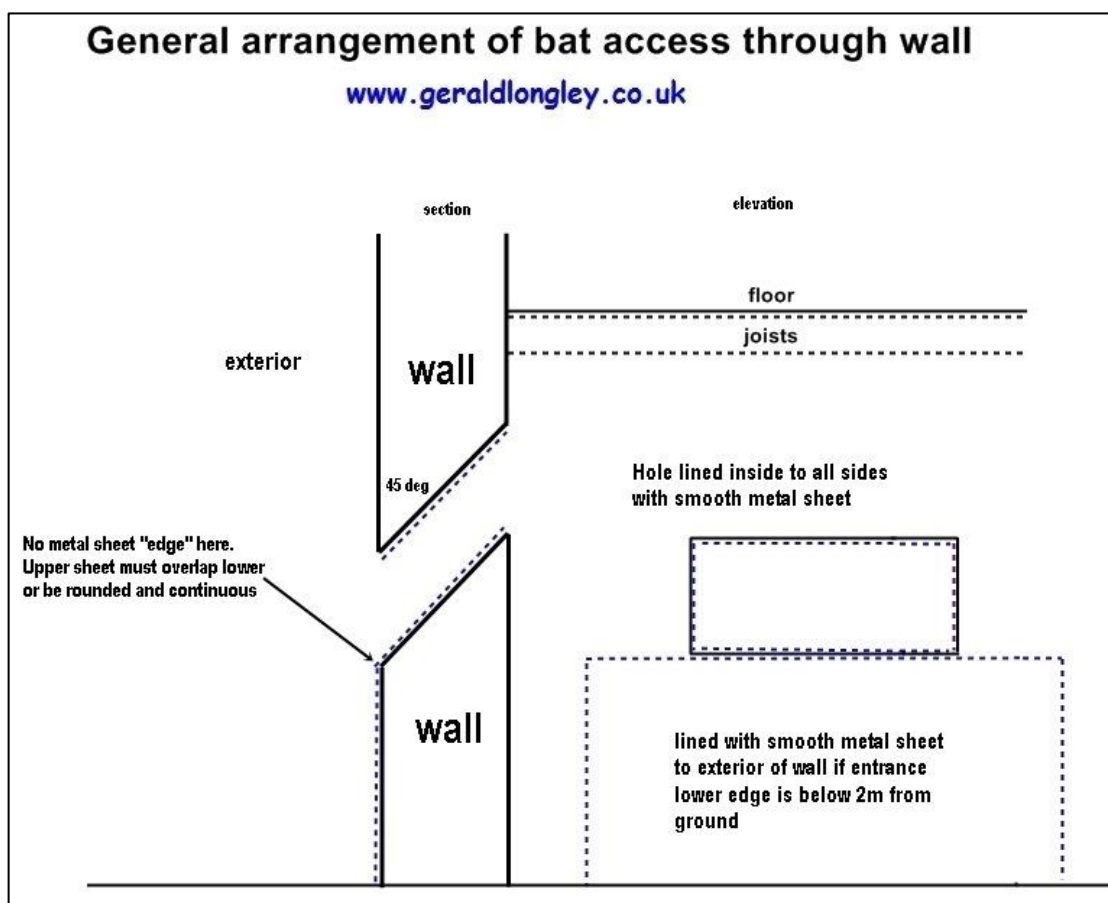
5.3 New Dedicated Bat Building (DBB) specifications

**New Dedicated Bat Building (DBB) for a range of bat species
With no human use for the building at all
(no storage, no electric power, lighting, solar panels or water installed)**

1. The design of the new dedicated bat building provides an upper loft with a floor and “cool room” below with a range of temperature regimes within the building, but with a minimum afternoon, mid-summer loft apex temperature of 30°C. The loft will be subject to solar gain providing the energy for the warm conditions in the loft part; the ideal roof pitch for this is 52°. The lower room will be much cooler with a floor left as earth for moist conditions and shall be further enhanced by digging it out below ground level, to create a type of cellar, to a depth of at least 1m to provide more stable temperatures in the winter. It will have no actual floor at ground level.
2. Of traditional gabled, “cut roof” construction with no trusses, the alignment of the roof ridge will be east west. One roof pitch will have a southerly aspect to maximise solar gain to the loft space and ideally a roof pitch of 52°. The bat building will be close (within 3m) to existing shrubs/scrub (proposed location is marked on plan in section 3.6). New low shrubs/scrub or low hedges of native species will be planted at 2m spacing to join to existing vegetation to enhance the flight lines for bats and be planted in a stock-proof fenced buffer around the DBB of at least 5m. Tall tree species will NOT be planted as these will shade the roof and cause unwanted cooling. A list of suitable shrub/scrub species is included at the end of this information sheet. Vegetation inside the fenced enclosure will be left long and rank.
3. It will have a minimum loft height of 2.8m with minimum internal dimensions of 5m long, and width between 4m (roof pitch 55° for 2.8m high loft) to 5m (52° degrees gives a loft height of 3.2m). Eaves’ height to the underside of the floor joists inside will be a minimum of 2m. It will ideally avoid having an A frame or similar to support its purlins and have a single, open loft. If the building is over 8m long it can have a hipped roof which focuses heat better.
4. It is to be a permanent structure and will be constructed of concrete block, brick or stone and clad in horizontal timber weather boarding in Tanalyth E tanalised boards.
5. The pointing mortar work on the inside of the stone, brick or block work walls will, in around 20 random places on each wall (i.e. 80 in total) of its footing walls, be left out in small sections, 150mm long and 100mm deep into the wall and mortar depth (not open to the exterior though).
6. The roof will be constructed with a traditional cut and pitch method to form an unobstructed open space using tanalised (Tanalyth E), rough sawn/un-planed timbers to aid bats to hang and grip. Ancient timbers can be fixed in the roof structure with cracks, splits, open mortises, slots etc. in them; these do not have to be structural. It will ideally be roofed with slate (must be natural slate), but can be roofed with black or very dark clay tiles using traditional bitumastic roofing felt BS8747:2007 TYPE 1F under. Breathable ‘Tyvek’ type products will not be used. Ridge tiles will be dark or black coloured to absorb heat.
7. To the underside of the rafters on both pitches fix 6 number rough sawn battens, about 25mm x 25mm in dimension, the length of the building excluding in the hot box (see below). The highest placed within 100mm of the apex beam and the other 5 at approx.

200mm spacing down the roof pitches. The lower parts therefore have no underside battens.

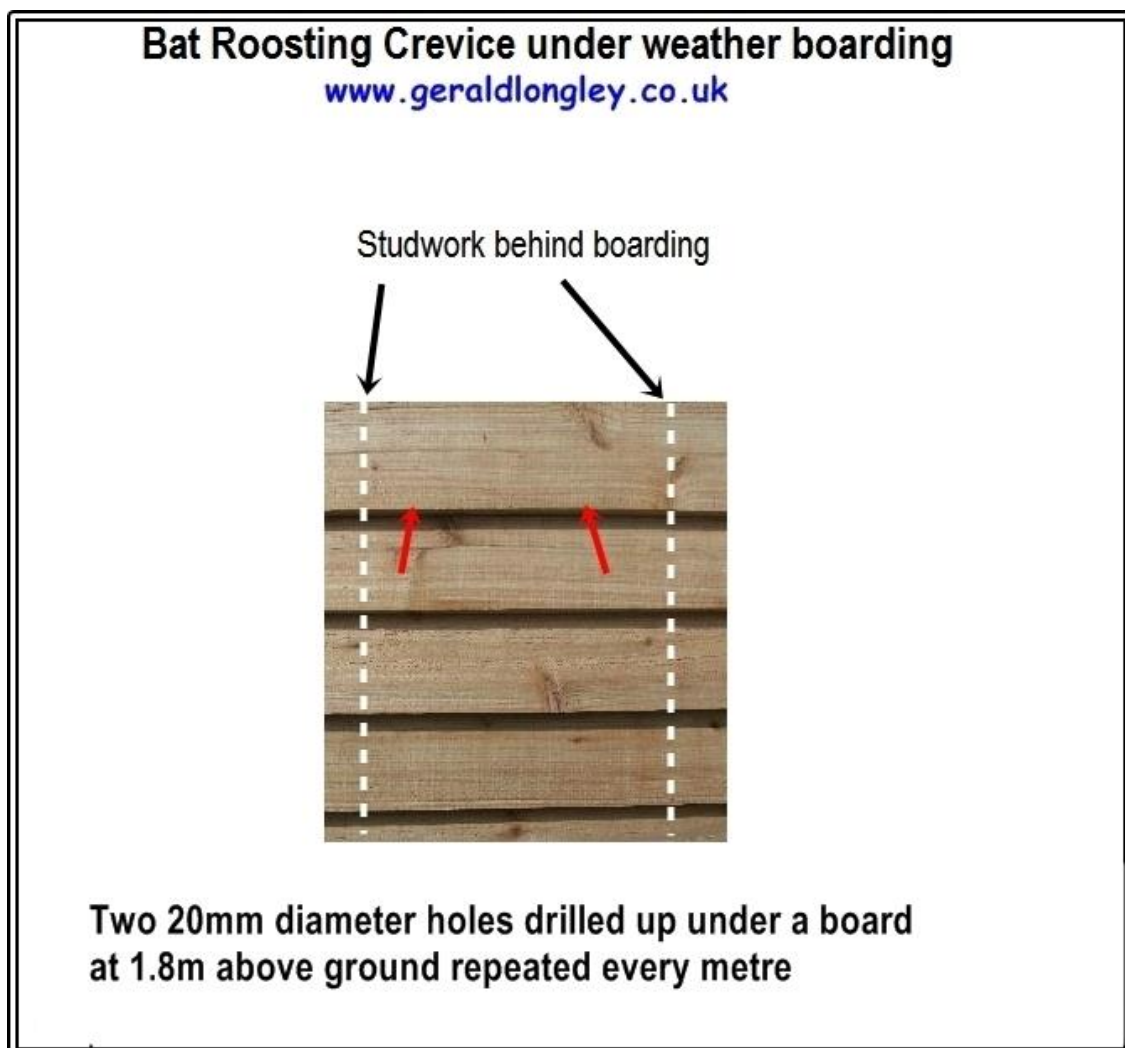
8. Five evenly spaced ridge tiles (more on buildings longer than 5m) will be “notched” to their lower edges to provide a slot 100mm long and an effective depth, when the ridge tile is in situ, of 20mm (and no larger or smaller) to both lower edges to provide access for bats under the ridge tiles, with a cavity left inside at this point. The ridge will be a mortared not “dry system” ridge.
9. A rectangular bat entrance/exit will be provided as a hole usually in the east facing wall. East is best but it must also be unaffected by artificial light spilling into it from outside or by window lighting elsewhere at the site so other elevations are possible. The entrance will be 500mm in width and 200mm in depth. It will be angled up through the wall at 45° in section. It will be installed with its upper edge at about 1.7m from ground level. If the eaves’ height is greater than 2m it can be higher. It is to enter the interior in the ground floor room (not into the loft) just below the loft floor. To deter cats jumping/climbing in the entrance, the bat entrance will be lined to all 4 sides in smooth metal sheeting. The area of exterior wall below the bat entrance will also be covered in a smooth metal sheet 1m wide over the timber cladding from ground level bending into the entrance hole with no “edge” there. The sheet will be as smooth as possible with any sheet overlaps being upper sheet over lower sheet.



10. In the centre of the loft, a “hotbox“ will be constructed of sterling/OSB and untreated timber, to be approximately 2m long and 1m deep, sealed with mastic at its joints, painted black on the outside with a bat access hatch through its “floor“ of 45cm by 45cm. See illustrative photo of a “hotbox“ installed and a drawing with roof and slates removed for clarity (below).



11. An alternative bat entrance/exit slot, intended to be used in an emergency if the main bat access is blocked by a predator for example, will be provided in the opposite gable wall to the main entrance. A horizontal slot 300mm wide by 100mm high set with its upper edge 1.8m from the ground.
12. A human load bearing ceiling/floor will be installed at eaves level with rough sawn/un-planed timber joists and suitable timber flooring. An access hatch, 600mm by 600mm without a hatch door, no safety rail above and no access ladder will be installed in the centre of the ceiling/floor to allow bat access to the loft and human bat monitoring access.
13. A secure, lightless exterior door will be provided on one of the walls that does not have a bat access hole for human access to monitor bats. This door will be kept locked and will be labelled: "This building has no access. The door is locked. This building must not be used for any human purpose e.g. no storage. It is a Dedicated Bat Building."
14. The tanalised, horizontal exterior timber cladding will be on battens 50mm deep and will have holes, 20mm in diameter, at approximately 1m spacing, drilled up vertically at the bottom edge of a cladding board, at approximately 1.8m from the ground on each elevation to allow access for bats behind the cladding into the cavities between the battens.



- 15.** At the eaves and along the gables soffit boxes will be built with rectangular bat access slots at their wall edge about every metre. Similar slots will be made at the apex of the gables. All slots will be 100mm long and 20mm deep (and no larger) giving access to the soffit boxes and the wall tops.
- 16.** It will have no lighting inside it or fixed to the outside of it and will have no exterior lighting within 20m of it at all and no exterior lighting directed at it. No electrical power will be wired in or supplied to the building or water supplied to it. It will have no human use, i.e. no storage, animal housing or any other human use.
- 17.** It will have no solar panels of any sort placed over or on the roof or walls or contain any wiring, inverter or controller from any other panels nearby.

5.4 Meadow creation

Supplier	Mix	Sowing rate
Emorsgate Seeds http://wildseed.co.uk/home	EM1 Basic General Purpose Meadow Mixture	4g/m ²

Meadow creation method

1. Minimum soil requirements: 350mm depth of loosened subsoil. No topsoil. The meadow species will grow better and suffer less weed competition if the soil is of low fertility.
2. Grading and cultivation: When subsoil is reasonably dry and workable, grade to smooth flowing contours removing all minor hollows and ridges. Cultivate soil to full depth and break up any compacted topsoil.
3. Weed control: Apply approved herbicide to control pernicious weeds (e.g. dock, thistle, nettle) and allow period of time to elapse as recommended by manufacturer before final cultivation.
4. Final cultivation and sowing: Reduce top 25mm of soil to a fine tilth by further cultivation. Remove stones exceeding 5.0mm in any dimension. Roll or tread to produce firm surface.
5. Sow approved meadow seed mixture in accordance with supplier's recommendations during appropriate season and weather conditions: Seed is best sown in the autumn or spring but can be sown at other times of the year if there is sufficient warmth and moisture. The seed must be surface sown and can be applied by machine or broadcast by hand. To get an even distribution and avoid running out divide the seed into two or more parts and sow in overlapping sections.
6. Do not incorporate or cover seed, but firm in with a roller, or by treading, to give good soil/seed contact.
7. Watering is to be carried out as necessary to ensure establishment and to maintain a healthy sward.