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Figure 1 – Site Boundary

Figure 2 – Ecological Mitigation Area

Figure 3 – Indicative Pond Design

1 INTRODUCTION

1.1 Project Background

- 1.1.1 Marches Ecology was commissioned by Alpine Engineering Ltd to prepare an Ecological Mitigation Method Statement (EMMS) for the proposed construction of a light industrial unit at Plot B, Site 4000, Clywedog Road South, Wrexham Industrial Estate, Wrexham (approximate OS Grid Ref. SJ 370 488). The proposed mitigation measures are principally required due to the presence of, or potential presence of, legally protected species either on the site or close to it. The principal aim of this EMMS is to prescribe and guide implementation of the mitigation measures. Compensation/ enhancement measures are also provided.
- 1.1.2 The current application concerns a small industrial unit proposed to be constructed on the northern part of the site. It is also proposed to construct a similar unit on the southern part of the site though this would be the subject of a future planning application. The mitigation/ compensation measures proposed in this EMMS address the perceived impacts of the proposal across the whole site (*e.g.* construction of both units). The boundary of the site for the purpose of this EMMS is shown on *Figure 1* and includes both the application site and future development site. The whole site is henceforth referred to as 'the Site'.
- 1.1.3 This EMMS is informed by a background data search and an Extended Phase 1 Habitat Survey conducted at the Site. The findings of this survey and assessment work are provided in a Preliminary Ecological Appraisal (PEA) (Marches Ecology 2020). This EMMS should be read and used in conjunction with the information provided in the aforementioned report.
- 1.1.4 The PEA identified the following valued ecological resources (either present or potentially present) for which mitigation/ compensation measures are considered necessary:
- Habitat: unimproved neutral grassland.
 - Badgers: use of site/ surrounding area.
 - Bats: the habitat is of moderate to high value for commuting/ foraging. Trees within the woodland could be used for roosting.
 - Otters: the ditches could potentially be used for dispersal.
 - Great Crested Newts: potential use of terrestrial habitat.
 - Reptiles: potential use of habitat within the site.
 - Birds: the habitat is of value largely for scrub-nesting species some of which are of conservation interest.

The PEA also notes that the Site could be used by Hedgehog (*Erinaceus europaeus*).

Marches Ecology (2020) provides a brief summary of relevant legislation.

1.2 Author

1.2.1 This document was produced by Tom Knight of Marches Ecology. Tom Knight is an ecologist with over twenty years of consultancy experience. His relevant academic qualifications and professional memberships are as follows:

- Chartered Environmentalist (Society for the Environment).
- Full Member of the Chartered Institute of Ecology and Environmental Management (CIEEM).
- PgDip Conservation Management.
- BSc (Hons) Environmental Studies.
- C&G Biological Surveying.

2 USING THIS DOCUMENT

2.1 Structure of the EMMS

2.1.1 *Sections 3 to 11* of this EMMS present all of the proposed mitigation, compensation and enhancement measures. *Section 3* details 'general' measures while the subsequent *Sections (4 to 11)* apply to specific ecological resources (habitats/ species/ species groups). Each Section is generally divided under three main sub-headings as follows:

- Summary of Resource Status. This sub-section provides a brief summary of the status and value of the identified ecological resource within the Site or adjacent area where applicable. The PEA report mentioned in *Section 1.1* should be referred to for detailed information.
- Mitigation. This sub-section details all required mitigation measures during the relevant stage of the project as far as is reasonably possible.
- Compensation/ Enhancement. This sub-section, where included, details all proposed compensation measures.

2.1.2 All retained/ created ecological features will be subject to ongoing inspection as detailed in *Section 12*.

2.1.3 The proposed development will be the subject of a Great Crested Newt licence application to Natural Resources Wales (NRW). The licence application will include an 'Ecological Management Plan' for the proposed mitigation area. As such ongoing management of retained/ created ecological features will not be covered in this EMMS.

2.2 Implementation

2.2.1 This EMMS will be referred to throughout the pre-construction/ construction phases by all those responsible for works on the Site that may impact the ecological resource. It is envisaged that a consultant ecologist will be retained to co-ordinate and supervise as necessary the implementation of certain mitigation measures.

2.2.2 All site personnel will be made aware of the importance and sensitivity of identified ecological resources and the proposed ecological mitigation measures through this EMMS and a tool-box talk and will subsequently be responsible for their own actions completed under a watching brief or overseen by the consultant ecologist. A consultant ecologist will be appointed to ensure appropriate delivery of all requirements detailed in this EMMS. The consultant ecologist will only attend site where required to do so by measures prescribed in this EMMS or any protected species licence.

2.2.3 The consultant ecologist (in conjunction with the main construction contractor) will also be required to ensure the following:

- All appropriate wildlife legislation obligations are met;
- All necessary (wildlife) licensing requirements are met;
- Any requirements with regards wildlife related planning conditions are met;
- All (ecological) monitoring requirements are completed; and
- All temporary fencing/ signage requirements are established as detailed within this EMMS.

3 GENERAL

3.1 Introduction

3.1.1 This Section of the EMMS details best practice or 'generic' mitigation measures that are applicable for all operations during the pre-construction and construction phases. These generic measures will be achieved through the successful implementation of the detailed measures outlined in the following Sections.

3.1.2 Tasks that could impact the ecological resource include, but are not necessarily limited to:

- Site clearance works and soil stripping (vegetation (e.g. trees, shrubs, grassland), soil removal and handling);
- Site establishment (temporary contractors compound(s) and associated infrastructure, storage areas (including soil mounds), soil movement/ excavation, temporary lighting);
- Groundworks (site investigations, excavations, installation/ realignment/ connection of underground services and watercourses);
- Construction (dust, noise, vibration, traffic movements);
- Incidents (pollution (air, water and ground), erosion/ sediment run off (e.g. to watercourses); and
- Removal of temporary features post-construction.

3.2 Generic Mitigation Measures

3.2.1 Generic measures to mitigate potential impacts on ecological resources are as follows:

- where possible, the physical works would be designed to avoid or minimise impacts on features of ecological importance;
- where there is potential for impact on protected species, mitigation measures will be designed to ensure compliance with the law and licensing procedures;
- where possible, measures will be taken to minimise adverse impacts on other species;
- where possible, potential impacts will be avoided through seasonal timing of work, e.g. avoiding vegetation clearance during the bird nesting season;
- through implementation of best practice in relation to construction sites, disturbance to wildlife will be minimised as much as possible. Routine construction site practices will be implemented to control dust, spillages, releases to watercourses, vibration and noise;
- a consultant ecologist will be retained prior to, for the duration of the construction phase, and the post-construction phase, to ensure the necessary delivery of all ecological mitigation measures outlined in the EMMS and as required by any protected species licence;
- compliance and site awareness will be ensured through the provision (by the retained consultant ecologist) of a toolbox talk to all site personnel as required as well as direct monitoring where necessary. Further to the initial toolbox talk its contents will be included within all subsequent site inductions. The consultant ecologist will supervise works as detailed in the following Sections/ protected species licence method statement and would be available to attend site should unforeseen ecological issues arise;
- compliance with the mitigation measures required by any protected species licence will be ensured through monitoring and auditing by the retained consultant ecologist; and

- pre-construction surveys should be undertaken to provide up-to-date data to inform mitigation measures if required.

3.2.2 The general advice contained in the Guidance for Pollution Prevention (GPP) leaflets¹ produced by SEPA, EA and the Environment and Heritage Service (Northern Ireland) will be adhered to where applicable, particularly the following:

- PPG1: Understanding Your Environmental Responsibilities - Good Environmental Practices.
- GPP5: Works and Maintenance in or Near Water.
- PPG6: Working at Construction and Demolition Sites.

¹ <https://www.netregs.org.uk/environmental-topics/pollution-prevention-guidelines-ppgs-and-replacement-series/guidance-for-pollution-prevention-gpps-full-list/>

4 HABITAT AND FLORA

4.1 Resource Status

- 4.1.1 The Site supports largely species-poor unimproved neutral grassland with some stands of tall ruderal vegetation, patches of dense and scattered scrub particularly *Rubus fruticosus* agg. (Bramble), part of a semi-natural broad-leaved woodland and individual trees. Part of a ditch with running water is located close to the eastern boundary while a second ditch forms the northern boundary. The habitat within the Site is considered to be of site or local value².
- 4.1.2 No notable plants were recorded during the Extended Phase 1 Habitat Survey.

4.2 Mitigation Measures

Ecological Mitigation Area

- 4.2.1 The ecological mitigation area (EMA) is shown on *Figure 2*. It includes strips of land adjacent to the western, northern and eastern boundaries. By retaining corridors of habitat, the EMA seeks to maintain connectivity across the Site. The EMA will be provided principally for the benefit of Great Crested Newts but also for other valued ecological resources. The existing semi-natural broad-leaved woodland towards the northwest corner is included in the EMA.
- 4.2.2 The EMA will be subject to long-term management for the benefit of the valued ecological resources.
- 4.2.3 Further detail with regards habitat to be retained/ created within the EMA is provided in the following Sections, particularly *Section 8 – Great Crested Newts*.

Temporary Protective Fencing

- 4.2.4 Prior to the start of construction or preparatory operations temporary protective fencing will be installed around the inside of the EMA (see *Figure 2*). The fence is to be installed so as to avoid inadvertent disturbance of the retained habitat within the EMA which includes the broad-leaved semi-natural woodland in the northwest corner. This temporary protective fencing will be of a type that would halt the uncontrolled movement of any materials/ soils (e.g. heras).
- 4.2.5 The temporary protective fencing will be appropriately maintained throughout the construction period. It will be retained in-situ, and in an effective state of repair, for the duration of all the works. No work of any kind will be allowed within this (buffer) area (unless it is required as part of any licensed measures and would therefore be supervised by the consultant ecologist). A large, clearly visible sign will be attached to the top of this fence approximately every 10 - 20 m along its length facing into the site. These signs will measure at least 30 cm by 30 cm (as a minimum). The signs will take the format of normal construction site prohibition notices. The sign will state 'Ecology Area – Do Not Enter' or similar.

² CIEEM (2018) recommends the use of geographical context as a frame of reference for identifying the importance (value) of ecological features. The frame of reference has the following categories: International/ European - National - Regional - Metropolitan/County/Vice-county/ other local-authority wide area - Local. Within this report Local is defined as relating to district or parish; less than local refers to features of value at a Site level.

- 4.2.6 There will be no construction activities/ access by personnel/ lighting of fires/ use of machinery/ vehicles or storage of equipment/ materials/ tools/ chemicals on the opposite side of the fence to the construction site. Furthermore, no tools, machinery/ vehicles and equipment will be left within this area. Other materials and spoil, etc will not be stored outside the fenced area. The purpose of this fence and importance of not entering the fenced area will be reinforced through the toolbox talk. Should any work be deemed necessary inside the fenced buffer area then the retained consultant ecologist will be contacted for advice and may need to supervise such work if necessary.
- 4.2.7 A detailed soft landscaping plan will be produced in conjunction with a suitably qualified ecologist.

Biosecurity

- 4.2.8 A number of Ash saplings within the Site exhibited symptoms of 'Ash dieback' caused by the fungus *Hymenoscyphus fraxineus*. Due to the likely presence of Ash dieback on the Site basic biosecurity measures will be required particularly when undertaking initial vegetation clearance. Best practice guidance is available on the Natural Resources Wales/ Forestry Commission England websites³⁴.
- 4.2.9 A Biosecurity Risk Assessment and Method Statement will be provided as part of the Great Crested Newt licence application (see below). This document will consider potential risks to the local amphibian population as well as the spread of invasive non-native species and propose measures to minimise any perceived risks.

4.3 Compensation Measures

Habitat Retention/ Creation

- 4.3.1 Habitat retention/ creation within the EMA is covered in the following Sections, in particular with regards Great Crested Newts and Birds.
- 4.3.2 Part of the ditch corridor close to the eastern boundary will be included in the EMA. As this is on the site frontage it will be subject to a greater level of management than the remainder of the EMA. Approximately 25-50% of the existing scrub along the ditch corridor will be retained within the EMA with the remainder cleared. Management of this scrub will be reviewed at the end of the first 5-year Management Plan period and may be subject to coppicing on a long-term rotation (e.g. 15 years) if considered appropriate.
- 4.3.3 The areas of grassland will be cut two or three times a year (likely to be in May, July and August). When the grassland is cut the cutting blade will be set no lower than 10 cm at any time. All mowing will be completed in hot, dry conditions and not following overnight rain.
- 4.3.4 An area around the road access on to the site has been excluded from the EMA. This area will be subject to more intensive management as amenity grassland.

³ <https://naturalresources.wales/guidance-and-advice/environmental-topics/woodland-management/tree-health-and-biosecurity/biosecurity/?lang=en>

⁴ <https://www.forestryengland.uk/sites/default/files/pdf/Biosecurity%20Policy.pdf>

5 BADGER

5.1 Resource Status

- 5.1.1 No setts were recorded from the Site (Marches Ecology 2020). Potential sett excavation opportunities are limited. A well used path crosses the Site from west to east close to the northern boundary. The evidence also indicates that Badgers may forage across some parts of the Site which provides foraging habitat of moderate potential value. Evidence of Badger activity was recorded from the fields to the west of the Site and they also cross Clywedog Road South to the east.

5.2 Mitigation Measures

Pre-construction Survey

- 5.2.1 If site clearance/ construction work is not implemented within 12 months of the Extended Phase 1 Habitat Survey (in March 2020) a pre-construction survey will be completed by a suitably qualified ecologist to check that no new setts have been excavated within the Site or close to it. This survey would include all of the Site and land within approximately 30 m of the boundary where access permission is provided. Should a new sett be located the implications can be considered at that time.

Best Practice

- 5.2.2 Should the work include the excavation of deep holes or trenches, such features will be filled in over night or otherwise made safe by securely covering them or the provision of suitable ramps. The ramps can either be provided with a suitable piece of timber (e.g. scaffold planks are ideal) or the edge of the hole/ trench can be re-profiled in at least one location. The re-profiling will give a slope of around 45° or less. The plank will be placed in the excavation so that it is stable and provides a clear option for egress. This should allow any Badger that might become trapped in the excavation to escape.
- 5.2.3 All open ends of pipes (above approximately 150 mm diameter) or other materials (whether installed or stored) that Badgers may access must be securely capped/ plugged over night so as to prevent Badgers gaining access.
- 5.2.4 All liquids or other potentially harmful substances must be stored appropriately and securely. They will not be left uncovered and lids will be fastened.

Watching Brief

- 5.2.5 The requirement and detail of this watching brief will be incorporated into the toolbox talk/ all site inductions. Excavator buckets, other plant, pipes, etc will all be checked by construction personnel at the start of each day for any trapped animals. All trenches/ deep holes, should any be excavated, will be inspected each morning by construction personnel to check whether any Badgers have become trapped overnight. Should a Badger become trapped in a trench it may attempt to dig itself into the side of the trench and form a temporary sett. Should a trapped Badger be encountered at any time the retained consultant ecologist will be contacted immediately for advice.

5.2.6 Should a sett/ large animal hole (or suspected sett) be found during construction the following measures will be enacted:

- All work within 30 m of the sett will immediately cease.
- The retained consultant ecologist will be contacted for advice. The consultant ecologist will need to attend site to confirm the status of the sett/ animal hole.
- The consultant ecologist will identify any further mitigation measures/ licensing that might be required including the installation of temporary protective fencing around the sett.
- Work will not re-commence in this area until the consultant ecologist has confirmed that it is safe to do so.

Fencing

5.2.7 Any fencing that may be required during the construction and operation phases will consider Badger movements so that they are not unnecessarily obstructed. If security fencing is to be installed then a gap beneath such fencing (at least 25 cm high) should be provided where such fencing bisects any identified existing Badger paths.

5.2.8 As detailed in *Section 4*, temporary protective fencing is to be installed along the edge of the EMA. Where this fencing crosses identified Badger paths a gap of appropriate height will be excavated beneath the fence panel or the panel will be raised using four heras feet.

5.2.9 A suitably qualified ecologist will be consulted with regards the appropriate installation of all fencing and the ecologist will review its installation.

Ditch Crossing

5.2.10 There is a Willow tree at *Target Note 1* (Marches Ecology 2020) that is currently used by Badgers to cross the ditch that is aligned parallel with the eastern boundary. Marches Ecology (2020) recommends that this tree should be retained so that Badgers can continue to cross the ditch.

5.2.11 Should it not be possible to retain the Willow tree for whatever reason then an alternative crossing must be provided. The alternative crossing could be constructed using railway sleepers and fencing stakes to provide a simple bridge. The height of this feature should allow for reasonable increases in the water level of the ditch. It should be located as close to the location of the existing ditch crossing as is possible.

6 BATS

6.1 Resource Status

- 6.1.1 There are no trees that could provide potential roosting features located within the Site outside the woodland at *Target Note 7* (Marches Ecology 2020). The woodland at *Target Note 7* will not be directly impacted by the proposed development. The habitat within the Site provides a potential foraging/ commuting resource of moderate to high value.

6.2 Mitigation Measures

Best Practice - Lighting

- 6.2.1 Any external lighting at the proposed development site will follow guidance provided by The Bat Conservation Trust and Institution of Lighting Professionals (2018). The proposed EMA, particularly the habitat on the western side of the Site, will be kept as dark as possible. Measures to avoid/ minimise light spillage should include:
- 'Warm white' LED lamps should be used;
 - All luminaires should lack UV elements when manufactured and have an upward light ratio of 0%;
 - All luminaires used will be fully directional (e.g. LED) and will point straight down to where the light is required. They will be mounted on the horizontal, i.e. no upward tilt. Lighting that reduces vertical and horizontal light spillage will be used;
 - The number of poles/ bollards/ lamps installed will be kept to a minimum and will be as low (in height) as possible;
 - Low wattage lamps (<70W) will be used;
 - All external lighting will only be turned on when the area is in use wherever possible (and should be fitted with motion detectors, automatic timers and/ or dimmers);
 - Cowls/ hoods/ baffles or similar will be used where the light spillage is likely to cause an unacceptable light level increase in adjacent retained habitat; and
 - Lighting near the EMA should be avoided/ limited.
- 6.2.2 The ecologist will review the external lighting specification and layout. Any required amendments to this specification and layout in order to minimise impacts on the EMA will be adopted.
- ### 6.3 Compensation
- 6.3.1 The proposed EMA will include a new pond and a new hedge as well as habitat that will be managed in the long-term for wildlife (further information on this is provided in *Section 8*). This new habitat is likely to be of high potential value to foraging bats. The layout of the EMA provides potential foraging/ commuting routes across the Site. The western strip of the EMA includes the existing semi-natural broad-leaved woodland and is adjacent to open countryside. As such this may be of particular value for commuting/ foraging purposes.

6.4 Enhancement

- 6.4.1 The proposed development presents an opportunity to increase potential roost features within the Site. A small number of bat-boxes will be installed in the woodland at *Target Note 7* as an enhancement measure. A cluster of three Schwegler 2F-DFP⁵ type boxes will be provided. Schwegler⁶ boxes are made of wood-crete and as such are durable, provide a relatively stable internal temperature regime, have good insulation properties and allow respiration. The Schwegler 2F type is known to be attractive to the smaller British bats including the Common Pipistrelle (*Pipistrellus pipistrellus*). These bat-boxes will be installed either by, or under the direction of, a suitably qualified ecologist to ensure correct installation.
- 6.4.2 Bat-boxes should be sited no lower than 3 m from the ground and ideally between 3 m and 5 m above the ground on large tree trunks. They should be erected in clusters of three generally facing south, southwest and southeast wherever possible (so that they are not overly exposed). There should be no overhanging branches/ other vegetation and there should be direct and easy access to the entrances. Generally, the bat-boxes should be located in the darkest areas, away from artificial light sources. No paint or preservatives should be used on the box or the attachments. To facilitate easy maintenance the bat-boxes should be attached to the trees with wire or similar (and not nails).
- 6.4.3 The bat-boxes require annual maintenance. All maintenance should be carried out when bats have left the bat-box to hibernate in winter (late autumn to early spring). At this time the slotted entrance should be carefully brushed to remove any build-up of dust, dirt or cobwebs that could block the opening. Any branches or other vegetation that may have grown up around the bat-box should also be pruned/ removed. If any of the bat-boxes is not used after two years they should be re-sited.
- 6.4.4 It is important to remember that once discovered, a bat roost is legally protected and must not be disturbed. If a bat roost is suspected to be present a suitably qualified bat consultant or the local bat group should be contacted and may need to undertake the annual maintenance operations detailed below. To discover whether a bat-box is being used they can be watched at dusk during the summer to see if any bats emerge or a search can be conducted beneath the box entrance for the characteristic crumbly bat droppings. Again, should it be necessary to inspect the bat-box an appropriately licensed individual may be required to undertake this work. Occasionally a bat-box may be used by nesting birds. If this is the case cleaning should be undertaken between 1st August and 31st January in accordance with the *Wildlife and Countryside Act 1981*, as amended.

⁵ e.g. <http://www.nhbs.com/2f-schwegler-bat-box-with-double-front-panel>

⁶ <http://www.schwegler-natur.de/index.php?main=produkte&sub=fledermaus&psub=sommerquartiere>

7 OTTERS

7.1 Resource Status

- 7.1.1 No evidence of Otter activity was recorded during the Extended Phase 1 Habitat Survey though a full survey was not undertaken.
- 7.1.2 It is possible that Otters could travel along the ditches at *Target Notes* 3 and 5 (Marches Ecology 2020). The ditch at *Target Note* 3 flows into the River Clywedog approximately 515 m south of the Site though the final section beneath Bridge Road South and Five Fords Roundabout appears to be culverted. Neither of these ditches is likely to be of particular value for Otters (*e.g.* in providing a food source) however it is possible that animals could follow these corridors to reach other parts of their territory. This use is considered likely to be infrequent at most.

7.2 Mitigation Measures

Watching Brief

- 7.2.1 The vegetation along and adjacent to the ditches at *Target Note* 3 is likely to be impacted during site clearance works including the installation of the road access bridge/ culvert and also during the implementation of Great Crested Newt mitigation measures. As the consultant ecologist will be present during the implementation of the latter, a watching brief for Otters will be maintained at this time. All scrub/ dense vegetation along the ditch corridor will be checked by the consultant ecologist prior to its removal. Vegetation within the proposed development site is also likely to be removed during hand-/ destructive-searches for Great Crested Newts and such areas will again be checked by the consultant ecologist prior to its removal.
- 7.2.2 At times when the consultant ecologist is not on site all personnel will be responsible for maintaining the watching brief throughout the construction phase. Site personnel should check beneath any machinery/ materials if they have been left on site overnight before moving them. This requirement will be outlined in the toolbox talk. The toolbox talk will provide an appropriate procedure to be adopted should an Otter be found at any time.

8 GREAT CRESTED NEWTS

8.1 Resource Status

8.1.1 Short, ponded sections of the ditch at *Target Note 3* (Marches Ecology 2020) may be suitable though of sub-optimal (poor) quality for Great Crested Newts. There is no other aquatic habitat within the Site. Great Crested Newts have been recorded from the ditch network that runs through the Site, albeit from a location further to the north, and also from several waterbodies to the west and northwest. The closest of these waterbodies is approximately 128 m away.

8.1.2 The Site provides high quality potential terrestrial habitat for Great Crested Newts that is linked to further high quality habitat to the west and northwest.

8.2 Mitigation Measures

Licensed Translocation

8.2.1 As there is a risk of disturbing/ killing individual Great Crested Newts during any proposed development at the Site, a 'development' licence will be required from Natural Resources Wales (NRW) in order for any scheme to legally proceed. Further detail on proposed mitigation/ compensation/ enhancement measures for Great Crested Newts will be provided in the licence application documents. Mitigation to be included within the licence application will be as follows:

- Subject to granting of the licence Great Crested Newts/ other amphibians will be translocated from the proposed development site and part of the EMA prior to the commencement of development-related works. This will require fencing of the proposed development site along with those parts of the EMA within which physical works will be undertaken with temporary amphibian exclusion fencing and subsequently a minimum trapping period of 30 days in suitable weather conditions. All amphibians would be transferred to a suitable receptor site; that part of the EMA that will remain undisturbed by physical works. The proposed arrangement of the amphibian exclusion fencing will be included in the licence application document.
- The temporary amphibian fencing will be maintained throughout the construction phase to ensure that Great Crested Newts do not return to the proposed development site. The fencing will be removed following completion of the construction phase. The fencing around the future development site would remain in place.
- Hand-/ destructive searches of particular features within the proposed development site will be undertaken during the translocation period. This will be combined with phased removal of vegetation as required.
- Reasonable Avoidance Measures (RAMs) will be implemented during any small-scale works undertaken outside the amphibian exclusion fence (e.g. construction of the road access/ culvert). A RAMs Method Statement will be included as part of the licence application.
- An amphibian-friendly drainage scheme will be incorporated into the proposed development (e.g. if gully-pots are utilised they would be combined with a 'wildlife kerb' system⁷). The drainage scheme will be reviewed by the retained consultant ecologist.

⁷ e.g. http://www.aco.co.uk/product_detail.php?id=52

- A compliance audit will be implemented throughout the licensed scheme. Due to the small size of the proposal this will be an internal audit. Appropriate Key Performance Indicators (KPIs) will be identified in the licence application.
- The licence application will incorporate a biosecurity risk assessment and method statement. Any measures required by the method statement will be implemented throughout the construction phase. This document will propose measures for minimising the risk of introducing/ spreading amphibian diseases in accordance with the ARG UK Advice Note 4⁸.
- A toolbox talk will be provided by the licensed ecologist to all site personnel prior to the start of any preparatory or construction works. This is likely to be a requirement of the NRW licence.

8.3 Compensation Measures

Ecological Mitigation Area

- 8.3.1 An ecological mitigation area (EMA) is to be provided, predominantly on the western and northern sides of the Site. It will also include part of the ditch corridor on the eastern side of the Site. The EMA extends to approximately 1289 m². The EMA will be retained and managed for the benefit of Great Crested Newts as well as other valued ecological resources. The layout of the EMA has been designed to provide corridors of habitat across the site, maintaining connectivity. Whilst the EMA is not like-for-like in terms of surface area when compared with the habitat lost, the proposal does include for enhanced habitat provision.
- 8.3.2 The EMA will include areas of retained woodland, scrub and rough grassland that will be subject to minimal management. To provide enhancement of this habitat it is also proposed to create a small pond, provide two hibernacula and plant a native-species hedgerow along the northern boundary.
- 8.3.3 Long-term management of the EMA will be secured with an appropriate funding mechanism. This management would be undertaken by a suitable third-party nature conservation organisation with experience of managing such sites.
- 8.3.4 Long-term security of the EMA would be confirmed through a Unilateral Undertaking (s106 agreement) or similar legal agreement. The Applicant would retain ownership of this land. All development rights (to the EMA) would be relinquished by the landowner in perpetuity. Should the business/ property be sold at any time in the future the Applicant will be required to ensure that the new owner is aware of the requirements of maintaining the EMA and that they are subject to a new legal obligation to secure the ongoing management.

Pond

- 8.3.5 A new pond will be created towards the northwest corner of the EMA. The minimum size of this pond would be 7 m by 10 m and up to 2 m deep. *Figure 3* provides an indicative design for this pond. The actual design of the pond is likely to be determined by ground conditions and other practical factors.
- 8.3.6 It is currently proposed to connect surface water pipes with the existing network in Clywedog Road South. However, precipitation collected by the rainwater goods installed on the new

⁸ *Amphibian & Reptile Groups of the United Kingdom Advice Note 4 – Amphibian Disease Precautions: A guide for UK Fieldworkers*. Version 2, revised March 2017.

building could provide a source of clean water for the pond. The pond could include an overflow to the ditch located near the northern boundary. This has not been confirmed at present. The design for the surface water drainage arrangement is not currently available. As such the indicative design of the pond does not take into account any drainage requirements at present.

- 8.3.7 It is not currently proposed to line the pond. Should the substrate prove unsuitable for retaining the water then this may become necessary. It may be necessary to excavate a trial pit to check water retention. The water level will be monitored in the first two years to confirm whether the pond design achieves the desired depth profile. If required some re-sculpting of the pond edges and depths could be carried out in the second year.
- 8.3.8 It is not currently proposed to plant up the pond with suitable aquatic/ emergent vegetation. It is deemed appropriate to allow vegetation to colonise naturally. This will be reviewed after two years and if necessary, at this time the pond will be planted. Artificial egg-laying strips (Black plastic bin-liners cut into strips approximately 1 cm wide) will be provided in the new pond for the first two years.

Hedgerow

- 8.3.9 The hedgerow should be planted as a staggered, double row with five or six plants per metre. The species composition will reflect hedges near to the Site and include *Crataegus monogyna* (Hawthorn), *Prunus spinosa* (Blackthorn), *Corylus avellana* (Hazel), *Acer campestre* (Field-maple), *Ilex aquifolium* (Holly) and *Rosa canina* agg. (Dog-rose). This planting will utilise native species of certified British origin and local provenance (Local Seed Zone 304⁹). An appropriate mix might be: 50%: 20%: 10%: 10%: 5%: 5%. At the present time *Fraxinus excelsior* (Ash) should not be used.
- 8.3.10 The individual plants should be notch planted during October to November using a T- or L-shaped notch following initial removal of the turf. Each shrub should be protected with a tree-shelter attached to a stake. Frosty periods will be avoided as this may harm the shrubs and there is a risk of disturbing hibernating newts.
- 8.3.11 A suitably qualified ecologist will review any landscaping proposal/ planting schedule once available with their advice adopted as appropriate.
- 8.3.12 The young plants within the hedgerow should be cut back in the first year to approximately one-third of their height to promote bushy growth. Once the hedge has been planted it should be kept weed-free through appropriate application of glyphosate-based herbicide such as Roundup (although use of herbicide will be kept to a minimum). This maintenance operation should be undertaken once a year for the first three years during the growing season. Any losses should be replaced in the first five years after planting during October/ November.
- 8.3.13 A well established hedge will require trimming from about the sixth year. The hedge shape should be 1.8-2 m high and at least 1.8-2 m wide. Once established the hedgerow is likely to require annual management due to its proximity to the building and ditch. If possible, the top could be left uncut every other year. Otherwise cutting should be undertaken after January but before March.

⁹ Hubert, J. & Cundall, E. (2006). *Choosing Provenance in Broadleaved Trees*. Forestry Commission, Edinburgh.

- 8.3.14 Once established the hedge should be laid every 10-30 years between mid-November and early March. The best time to lay the hedge would be when stem growth reaches between 5-10 cm diameters at the base.

Hibernacula

- 8.3.15 As Great Crested Newts are known to spend a considerable proportion of their terrestrial phase either underground or just above ground under refuge sites, it is of great benefit to provide artificial sites, known as hibernacula, which they can utilise. The hibernacula will be created using material from the site wherever possible (e.g. logs/ root-plates from shrubs/ trees to be removed). A mixture of hardcore, brick rubble, logs, sleepers etc, and loose topsoil will be piled into a mound which will then be covered with a topsoil cap and, ideally, a turf covering. The lower margins of the mound should be exposed to facilitate access. The design can follow that provided in Langton, *et al.* (2001).
- 8.3.16 Two hibernacula will be provided in the EMA. They will measure at least 2 m length x 1 m width x 1m height.

Management of the EMA

- 8.3.17 The licence application documentation will include a Management Plan for the EMA. It will cover a 10-year period with a 5-year review mechanism. It is proposed that management of the EMA will be minimal. Detailed management prescriptions are not provided here but would broadly include the following:
- The grassland will be cut once a year (in August).
 - The grassland along the ditch corridor will be cut two or three times a year.
 - No management of most of the retained scrub/ woodland is proposed.
 - Approximately 25-50% of the existing shrubs along the ditch corridor will be retained and may be coppiced on a long-term rotation.
 - The hedge will be subject to annual management.
 - The pond will be subject to long-term rotational clearance of silt/ vegetation. Clearance of marginal vegetation may be required every 2-4 years once the pond is established. Removal of silt may be required approximately every 15 years.
 - The bird-boxes and bat-boxes will maintained/ cleaned annually.
 - Removal of litter.

9 REPTILES

9.1 Resource Status

- 9.1.1 The Site provides habitat of high potential value for reptiles. However, as there have been no recent records of any reptiles within the 1 km search area, or during surveys undertaken by Marches Ecology on the Industrial Estate, it is considered unlikely that any reptiles may be present.

9.2 Mitigation Measures

Watching Brief

- 9.2.1 As the risk to reptiles is negligible a purely precautionary approach will be adopted. The licensed ecologist will maintain a watching brief during the implementation of mitigation measures for Great Crested Newts. Should any reptiles be found at this time it may be necessary to temporarily halt work whilst appropriate reptile mitigation/ avoidance measures are designed and implemented.
- 9.2.2 If no reptiles are found during the implementation of mitigation measures for Great Crested Newts it will not be necessary for site personnel to maintain a watching brief during the construction phase.

10 BIRDS

10.1 Resource Status

- 10.1.1 The Site is likely to be of value, particularly for species that nest in patches of scrub and scattered shrubs/ trees. Such nesting birds include some species of conservation interest (e.g. Dunnock and Long-tailed Tit).

10.2 Mitigation Measures

Pre-construction Check

- 10.2.1 The destruction of any bird nests that are in use is illegal. The simplest option to avoid issues arising from the presence of nesting birds is to schedule work that affects nesting habitat (e.g. clearance of trees/ shrubs/ hedges) outside the nesting period (March to August inclusive). Such work should seek to ensure that, as far as is possible, all areas within the footprint of the proposed development remain unattractive to breeding birds for the duration of the work.
- 10.2.2 Should any occupied nests be found during the construction phase, a buffer zone (determined on the basis of the species concerned and the location of the nest in the context of the surrounding vegetation, but no less than 5 m) would be retained until it can be ascertained that the chicks have left the nest. The buffer zone will be appropriately fenced and signed. In the event that such a nest is found all work would immediately cease in the area and the consultant ecologist would be contacted to provide advice. Work will only recommence when the consultant ecologist has confirmed any avoidance measures to be implemented.
- 10.2.3 If it is not possible to clear vegetation/ fell/ prune trees outside the nesting season all such areas should be checked by a suitably qualified ecologist prior to commencement of works. If any active nests are found at this time a buffer zone as detailed above would be provided.

10.3 Compensation Measures

Habitat Creation/ Retention

- 10.3.1 As detailed in *Section 8* above some of the existing scrub is to be retained and a new hedgerow is to be planted. This scrub and hedgerow could be used by both the Dunnock and Long-tailed Tit for nesting.

Tree Planting

- 10.3.2 A soft landscaping plan is not currently available. However, it is proposed to plant a small number of trees close to the vehicular access to the Site. Locally native species of value to birds will be used. Appropriate trees could include *Betula pendula* (Silver Birch), *Alnus glutinosa* (Alder), *Sorbus aucuparia* (Rowan) and *Prunus avium* (Wild Cherry). Trees of certified British origin and local provenance (Local Seed Zone 304) should be used.

Nest-boxes

- 10.3.3 Six nest-boxes will be installed within the woodland at *Target Note 7* (Marches Ecology 2020). The following nest-boxes will be installed:
- 2 no. 1B Schwegler (with 32 mm hole).
 - 2 no. 1B Schwegler (with 26 mm hole).
 - 2 no. 1N Schwegler Deep nest-box.
- 10.3.4 The nest-boxes would be sited out of reach (though accessible for maintenance), 3m or more off the ground ideally on large tree trunks. All of the nest-boxes would be located somewhere between (facing) north through east to southeast; avoiding prevailing winds and direct sunlight where possible. The nest-box would generally be sited near shrubs/ other vegetation that will provide good cover for young birds. To facilitate easy maintenance the nest-boxes would be attached to the trees with wire or similar (and not nails). The wire can be inserted through short sections of garden hose to minimise damage to the trees. These nest-boxes will be installed either by, or under the direction of, a suitably qualified ecologist to ensure correct installation.
- 10.3.5 Bird nest-boxes require annual maintenance as they can become heavily infested with parasites. The nest-boxes will be maintained annually as part of the management of the EMA. All maintenance should be carried out when the last bird has left the nest-box; at least October. As such all nest-boxes should be cleaned in late-autumn (late October/ November). At least 2 to 3 weeks should be allowed after fledging before undertaking any cleaning. The *Wildlife and Countryside Act 1981*, as amended states that cleaning should only be carried out between 1st August and 31st January and that any eggs present should be destroyed immediately. All nest material should be completely removed and disposed of safely along with any other debris. To ensure that parasite build-up is controlled the inside of the nest-box should be cleansed with boiling water. For safety, this should be undertaken with the nest-box located on the ground. Care should be taken when opening nest-boxes as it is possible that they could be inhabited by bees, wasps or even bats.

11 OTHER SPECIES

11.1 Resource Status

11.1.1 A single record of Hedgehog in the area was provided by Cofnod.

11.2 Mitigation Measures

General

11.2.1 New fences can prevent Hedgehogs from accessing habitat and traversing across built-up areas. To facilitate access across the Site for Hedgehogs boundary fences should either incorporate a gap of 13 cm (in height) beneath them or otherwise a hole measuring 13 cm by 13 cm¹⁰ should be cut into the base of the fence. This can be achieved in conjunction with the holes to be provided for Badgers.

¹⁰ <http://www.hedgehogstreet.org/pages/link-your-garden.html>

12 MONITORING

12.1.1 The following monitoring is proposed:

- Great Crested Newt population monitoring.
- Site inspection.
- Monitoring/ maintenance of bird nest-boxes and bat-boxes.

12.1.2 The Great Crested Newt population monitoring will consist of two visits per year (in mid-April to mid-May) in Years 1, 2, 5 and 10 following the creation of the new pond. Each visit will involve a torch survey unless other techniques (*e.g.* bottle-trapping) are deemed necessary to obtain robust count data. During these survey visits the presence of Great Crested Newt eggs will be recorded at each pond. The results will be uploaded on to the Wales GCN Monitoring Database.

12.1.3 A single site inspection (of the EMA) will be undertaken in June-August annually in suitable weather conditions. The purpose of this inspection would be to review the success of management undertaken and subjectively assess the condition of the valued ecological resources. Any requirements for changes to the management regime or remedial measures would be identified.

12.1.4 The bird nest-boxes/ bat-boxes will be subject to maintenance annually in November/ December. The use of these nest-boxes/ bat-boxes will be recorded.

12.1.5 A brief annual report covering the results of these surveys/ site inspections and management undertaken in that year will be prepared and submitted for review by the WCBC ecologist in December of each year. This report will form the main component of the review process. The main purpose of this review will be to ensure that the EMA is being managed in accordance with the approved management plan and that the proposed habitat creation has been successful. Compilation of the report may require records to be maintained throughout the year. The management plan will be reviewed every five years or as deemed appropriate.

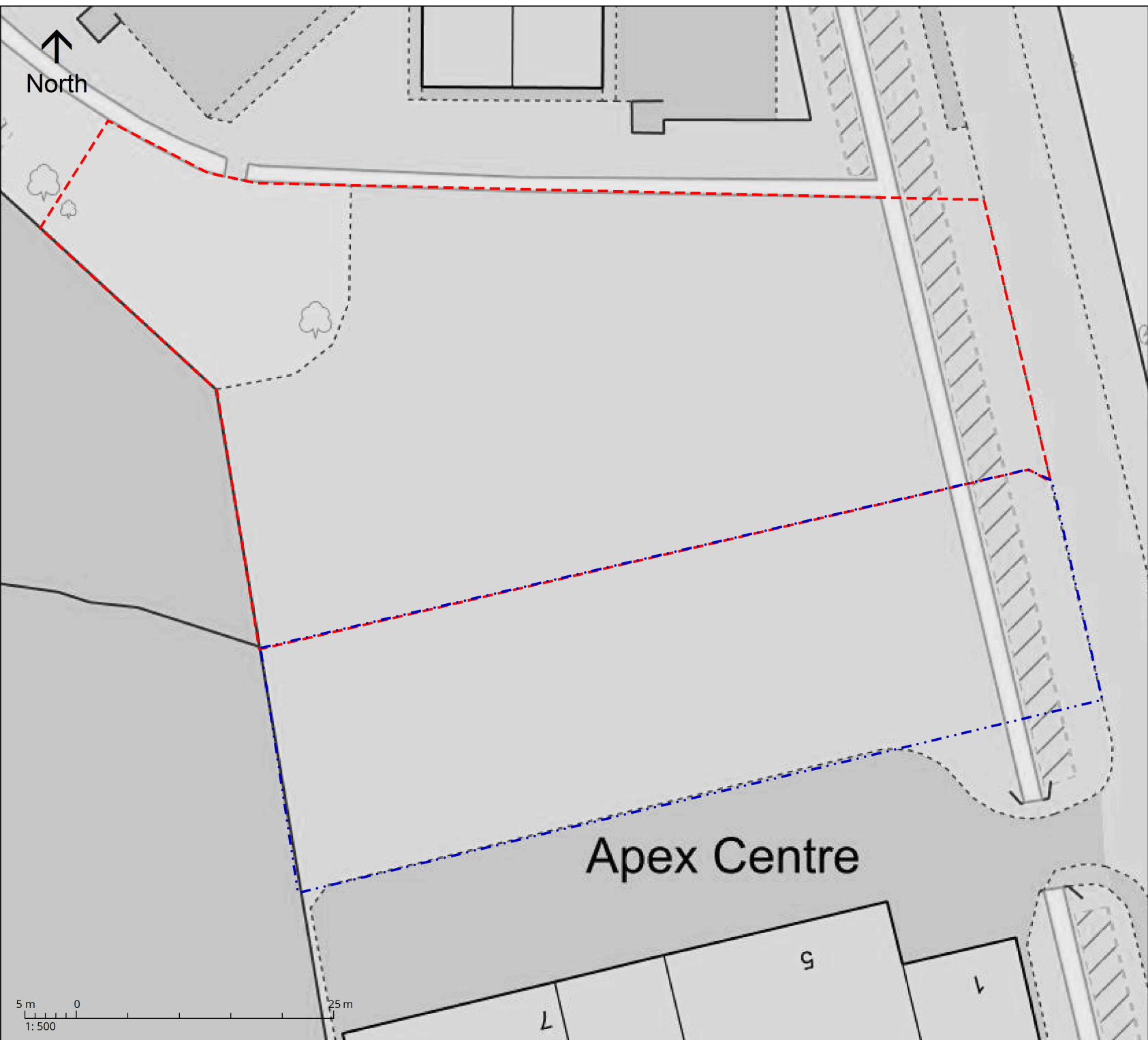
13 REFERENCES

Bat Conservation Trust and Institution of Lighting Professionals (2018). *Guidance Note 08/18. Bats and Artificial Lighting in the UK. Bats and the Built Environment Series.*

CIEEM (2018). *Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine.* Chartered Institute of Ecology and Environmental Management, Winchester.

Langton, T, Beckett, C. & Foster J. (2001). *Great Crested Newt Conservation Handbook.* Froglife, Halesworth.

Marches Ecology (2020). *Proposed Development, Plot B, Site 4000, Clywedog Road South, Wrexham Industrial Estate, Wrexham – Preliminary Ecological Appraisal.* Produced on behalf of Alpine Engineering Ltd.



-  Application site
-  Future development site

Boundaries are approximate only.
Whole boundary = The Site

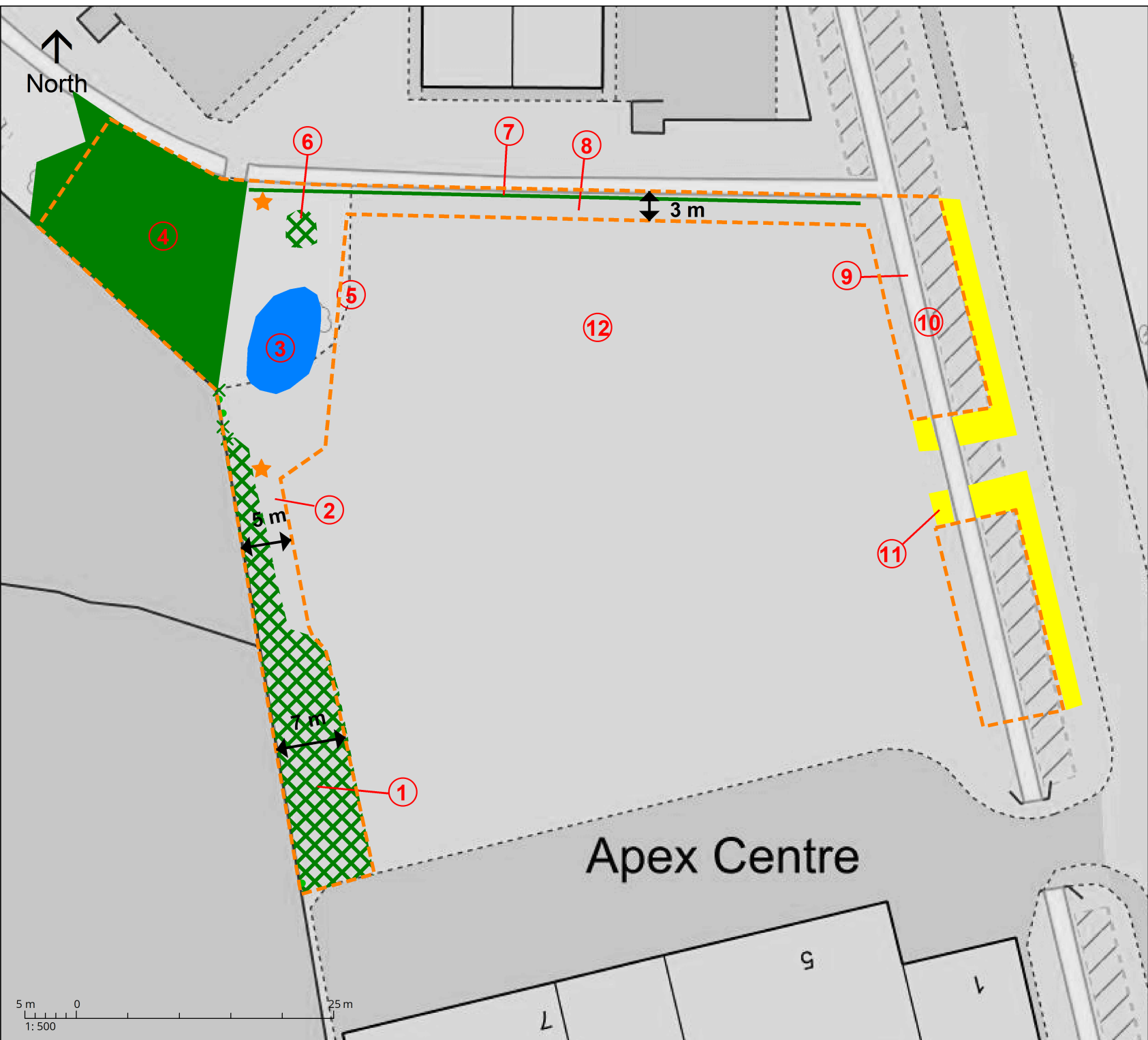
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Figure 1 - Site Boundary

Date: 17/06/2020



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- Ecological Mitigation Area (EMA) boundary
- ★ Hibernacula
- Notes

1. Dense scrub. Mostly existing, to be retained. Approx. 7 m at widest, and 5 m at narrowest.
2. Rough grassland. To be cut once a year.
3. New pond. Approx. 7 m by 10 m, and 2 m deep.
4. Retained woodland. Install and maintain 3 bat-boxes and 6 bird-boxes.
5. Gap between EMA and building (west elevation) approx. 3 m.
6. Existing scrub. Retained.
7. New hedge. To be planted with native species.
8. EMA to be 3 m wide along this boundary, where this allows 2 m clearance from the building.
9. Willow tree. Used by Badgers to cross ditch (either retained or alternative provided).
10. Ditch corridor. 25-50% of existing shrubs to be retained. Grassland to be cut 2 or 3 times a year.
11. Area excluded from EMA. To be managed as amenity grassland, approx. 3 m wide either side of culvert.
12. Any external lighting to be installed on building will be bat-friendly.

Note - mapping is for illustrative purposes only. No measurements should be taken from this plan.

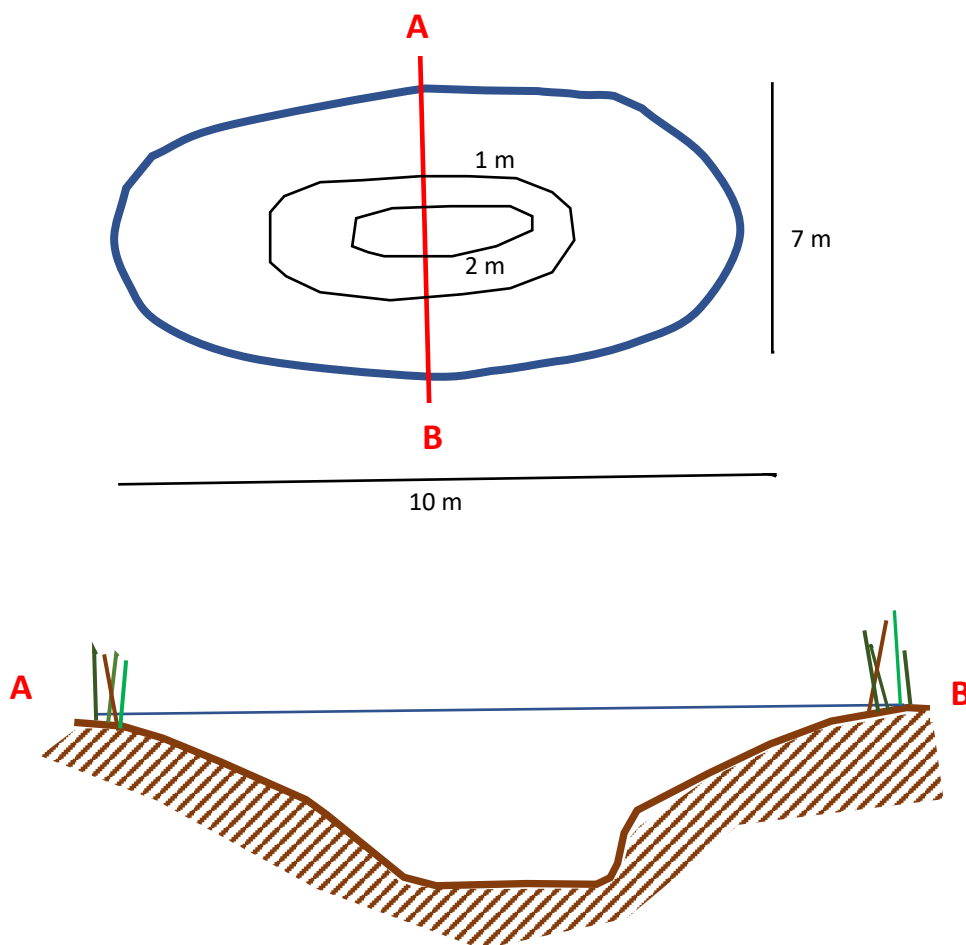
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Figure 2 - Ecological Mitigation Area

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Not to scale.

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Figure 3 – Indicative Pond Design

Drawn by: ME
 Checked by: TK
 Date: 18.06.20