



THE
ENVIRONMENT
PARTNERSHIP



BRYN LANE WREXHAM ECOLOGICAL MITIGATION PLAN

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G7215.005A Pond Locations & GCN Distribution Plan

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1.0 Introduction

- 1.1 This Ecological Mitigation Plan has been prepared by The Environment Partnership (TEP) on behalf of Net World Sports Ltd for the site known as Bryn Lane, within Wrexham Industrial Estate. This report has been prepared to support a planning application for the creation of two wildlife ponds (and surrounding landscaping) on the site and sets out mitigation considerations for protected species, in particular, identifying methods that will be used to ensure no great crested newts (GCN) will be affected by the works.

Background

- 1.2 The Bryn Lane site has outline planning consent (P/2011/0891) for the development of a single commercial unit. Previous surveys and ongoing monitoring within Wrexham Industrial Estate confirms the presence of a large meta-population of GCN on site. To facilitate the proposed commercial scheme, both terrestrial and aquatic habitat will be lost.
- 1.3 The outline development footprint will impact predominantly upon arable and improved grassland, this is low quality GCN habitat which offers no hibernation potential. There will be removal of internal hedgerows and some scattered broad-leaved trees. These offer some suitable hibernation and foraging opportunities. To accommodate the scheme, there will be the loss of one GCN breeding pond. Two replacement ponds are required to mitigate for the loss of this one pond (in addition to providing terrestrial compensation measures).
- 1.4 A Natural Resource Wales (NRW) GCN mitigation licence will be necessary to permit future development at Bryn Lane. In advance of a reserved matters application, and subsequent GCN licence application, a separate planning application is being submitted by Net World Sports Ltd for creating the on site ponds. This approach has been agreed by Wrexham County Borough Council (WCBC) to allow new ponds to be built over the winter period, minimising the risk of harm to GCN, in addition to ensuring the programme of works is not compromised by allowing for the required six month establishment period.

Status of GCN

- 1.5 GCN and their habitat (aquatic and terrestrial) are afforded full protection by Wildlife and Countryside Act 1981 (Section 9, Schedule 5). This Act is the domestic implementation of the Convention on the Conservation of European Wildlife and Natural Habitats (the Bern Convention) and was amended by the Countryside and Rights of Way Act 2000.
- 1.6 Great crested newts are also listed on Annex II and Annex IV of the Conservation of Natural Habitats and Wild Fauna and Flora (the Habitats [and species] Directive). This is transposed into UK law by the Conservation of Habitats and Species Regulations 2010. The great crested newt is a Section 7 (S7) priority species (Environment [Wales] Act 2016) and is listed on the Wrexham Biodiversity Action Plan (LBAP).

Site Description

- 1.7 The application area for the forthcoming reserved matters application incorporates three fields (arable and improved grassland), divided by hedgerows, with a strip of woodland along the whole southern boundary (bordering a watercourse) and a small area of poor semi-improved grassland/ tall ruderal/ scrub mosaic within the south eastern part of the site. The extent to which this Ecological Mitigation Plan relates, only covers the necessary pond creation and immediate surrounding grassland area (within the eastern arable field) and will henceforth be referred to as 'the site'. Drawing G7215.004A shows the scope to which each application relates.
- 1.8 The site lies north east of Wrexham Industrial Estate, in North Wales. Ridley Wood Lane sits north of the site, where access onto the arable field can be obtained via a pre-existing gate off this B-road. The site, shown in Figure 1, is centred on grid reference SJ 39401 50794.

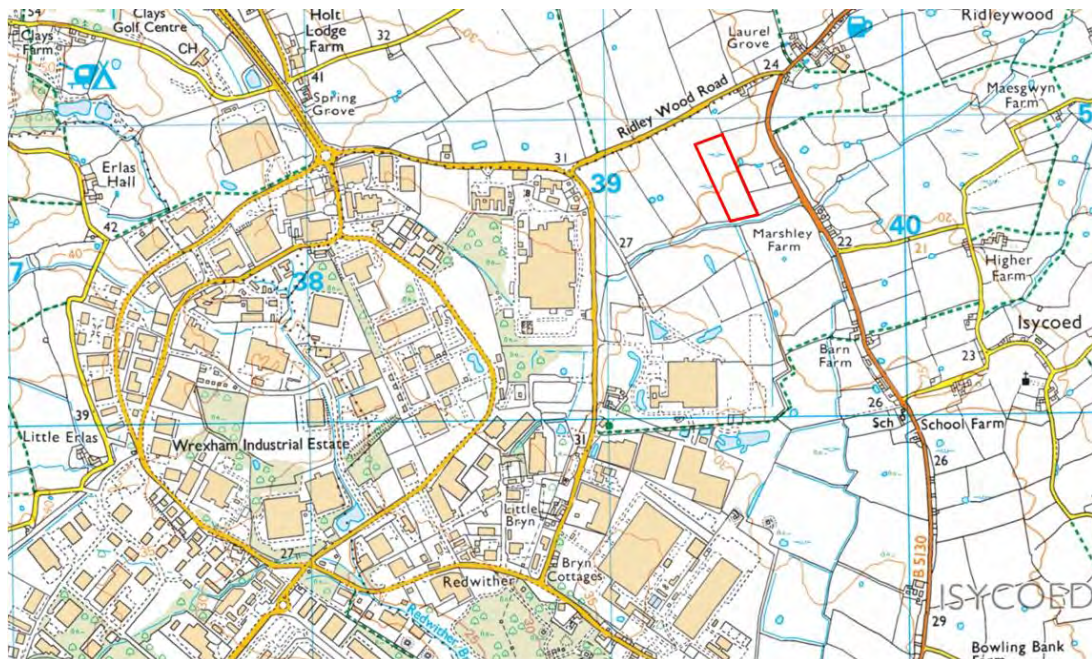


Figure 1: Site Location - red line to which the application for pond creation relates.

2.0 Methods

Desktop Study

- 2.1 Information regarding designated sites, notable habitats and historic records of protected species within 1km radius of the site was gathered from the sources listed in Table 1.

Table 1: Ecological Information

SOURCE OF INFORMATION	SOURCE OF INFORMATION
MAGIC Map: Mutli-Agency Geographic Information for the Countryside.	Online mapping system for England for priority habitats and protected species.
Google Maps	Satellite imagery
Cofnod	Identification of records for protected species within local area (serving North Wales).

Habitats and Walkover Survey

- 2.2 In order to support both the application for pond creation and forthcoming reserved matters application, an updated extended Phase 1 habitat survey was carried out across the whole extent (the site and the adjacent land). The extended Phase 1 was undertaken by TEP ecologist Fleur Wilson (BSc, MSc, FISC Level 4) on 31st August 2018. The survey was carried out using the methods outlined by JNCC (2010¹) and CIEEM (2013²), to map habitat types present and any incidental evidence of protected or invasive species. The habitats were also assessed for their potential to support protected species.

Fauna

- 2.3 To aid the planning application for the full site, the commencement of additional species specific surveys is underway, with methods detailed below. Data from these additional surveys have been used to support this ecological mitigation plan.

Badger

- 2.4 During the Phase 1 survey conducted on 31st August 2018, a survey for badger *Meles meles* was also undertaken, covering the site and boundaries. Field evidence was searched for including tracks, dung pits and latrines and signs of foraging as well as setts (Harris et al., 1989³). The locations of any individual holes and other field evidence was to be recorded with GPS coordinates.

¹ Committee, Joint Nature Conservation (2010) Handbooks for Phase 1 Habitat Surveys - A technique for environmental audit., Peterborough

² Chartered Institute of Ecology and Environmental Management (2013) Guidelines for Preliminary Ecological Appraisal (CIEEM <http://cieem.net/>).

³ Harris, S., Cresswell, P., and Jefferies, D. (1989) Surveying Badgers. The Mammal Society.

Birds

- 2.5 A breeding and wintering bird habitat assessment was conducted on 14th September 2018 by experienced ornithologist Dr Mike Walker. The site was walked and all habitats present were evaluated in terms of their suitability for breeding and wintering birds. Adjacent habitats to the site, including habitats within 500m of the site were also viewed.

Bats

Ground Based Tree Assessment

- 2.6 A full ground based assessment of the trees on and bordering the site (including the adjacent site) was conducted by licenced bat ecologist Lizi Pimlott on 31st August 2018. The survey was done in accordance with the current guidelines⁴.
- 2.7 The criteria for roost assessment for trees and buildings are listed within Table 3.

Table 2: Tree roost suitability assessment

Suitability	Description of potential roost features (PRF)
Negligible	No/exceptionally poor habitat features on site likely to be used by roosting bats.
Low	A tree of sufficient size and age to contain potential roost features (PRF) but with none seen from the ground or features seen with only very limited roosting potential.
Moderate	A tree with one or more PRF that could be used by bats due to their size, shelter, protection, conditions and surrounding habitat but unlikely to support a roost of high conservation status.
High	A tree with one or more PRF that are suitable for use by larger numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions and surrounding habitat.

Static Bat Activity Surveys

- 2.8 Static monitoring and transects were undertaken to understand the species assemblage and assess the value of the site for commuting and foraging bats. One recording event has been completed so far; three detectors were deployed (one along the southern woodland edge, and one within each of the internal hedgerows) for five consecutive nights from 13th September to 18th September 2018. Sonogram analysis was performed after retrieval of the detector by Fleur Wilson (Analook Analysis Advanced Level 3) utilising Analook W4.2d software.

⁴ Collins, J. (ed) (2016) Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edition). The Bat Conservation Trust, London

3.0 Overview

Impact of Commercial Development

- 3.1 One pond lies within the developable area for the commercial unit on the adjacent site. Loss of this aquatic habitat is certain and the loss is unavoidable to facilitate the development. There will therefore be a permanent loss of 1,017m² (including large draw down zone) of aquatic GCN breeding habitat. This pond forms part of a large metapopulation of GCN. Masterplanning studies concluded that the pond could not be retained within the development with the necessary connective habitat and still deliver the scheme.

Mitigation Proposals

- 3.2 In order to mitigate for the impacts of the future development at Bryn Lane, a GCN strategy will be produced and submitted alongside both the NRW GCN mitigation licence application and reserved matters application. This strategy will ensure Favourable Conservation Status (FCS) is maintained. The strategy will include the creation of two ponds to compensate for the loss of the onsite pond. The requirement for two for one pond creation, as per NRW guidelines, is a direct result of the presence of GCN in the onsite pond. The new ponds will act as a receptor site for GCN that will be trapped as part of the planning application associated with the proposed commercial development. The design and location of these ponds is shown on drawing D7215.001A, with specific landscape details provided on Drawing D7215.002A.

Designated Sites

- 3.3 Tables 2 and 3 provide desktop results for designated sites. There are no designated sites on site, but three internationally designated sites within 10km of the site. This includes Johnstown Newt Site SAC, designated for GCN. There is also a locally designated site within 250m.
- 3.4 The distance from the site, as well as timing and nature of the works during pond construction, ensure there will be no direct or indirect impacts on any of the designated sites.

Table 3: Statutory Designated Wildlife Sites within 10km of the Site. Source MAGIC map

Name of Site	Designation	Distance from Site	Reason for Designation
River Dee and Bala Lake	SAC	2.2km west	Watercourse supporting Annex II species such as Atlantic salmon and floating water-plantain
Midland Mere and Mosses Phase 2	Ramsar,	4km north, northwest	Wide range of habitats from open water to raised bogs supporting nationally important flora and fauna

Name of Site	Designation	Distance from Site	Reason for Designation
Johnstown Newt Site	SAC	8.4km south west	Large population of great crested newts

Table 4: Non-Statutory Designations within 1km of the Site: Source Cofnod.

Name of Site	Designation	Distance from Site	Reason for Designation
Wrexham Industrial Estate	Wildlife site	240m south	Species rich unmanaged grassland and ancient broadleaf woodland

Protected Habitats

- 3.5 The southern band of woodland is listed on the Habitat Forest Inventory as broadleaved woodland. This is considered a Habitat of Principal Importance under Section 7 of the Environment [Wales] Act 2016. The works on the site will not result in any adverse impacts, direct or indirect, upon the closest protected habitats.

Site Description

- 3.6 The results of the habitat survey are illustrated in TEP Drawing G7215.004A. Presented drawings include habitats outside the redline boundary, reflecting the scope of the survey extent necessary for the reserved matters application. Brief descriptions of the habitats on and adjacent to the pond application site are summarised below.

Arable

- 3.7 The site lies within an arable field, which at the time of survey had been cropped leaving bare ground to dominate the area. The species present are occasional/ rare in frequency and are typical arable weeds which establish on disturbed, nutrient rich soil; these include spear thistle *Cirsium vulgare*, scarlet pimpernel *Anagallis arvensis*, common fleabane *Pulicaria dysenterica*, greater plantain *Plantago major* and bristly oxtongue *Helminthotheca echioides*. The creation of the ponds and surrounding mitigation area will completely lie within the arable habitat.

Semi-natural broadleaved woodland

- 3.8 A woodland strip lies along the southern site boundary. Approximately 20m wide, the structure of the semi-natural broadleaved woodland is fairly young with some mature trees on the field boundary. Species present include hazel *Corylus avellana*, ash *Fraxinus excelsior* and sycamore *Acer pseudoplatanus*. Bramble *Rubus* species and ivy *Hedera helix* dominate the understorey. The woodland will remain unaffected by the creation of the ponds, with design ensuring the root protection zone (RPZ) of the trees along the periphery are not impacted by any ground works.

Hedgerows with scattered broad-leaved trees

- 3.9 The site is bounded to the east by a hedgerows with scattered trees. The species poor, intact hedge is dominated by hawthorn *Crataegus monogyna*. A species-rich intact hedge lies along the arable field boundary to Ridley Wood Road (access road onto site). In addition to hawthorn, field rose *Rosa arvensis*, blackthorn *Prunus spinosa* and willow *Salix* species are scattered throughout. The hedgerow and trees will be retained within the proposals for new pond creation, with the RPZ avoided. Access from the site will be through an existing gate, ensuring the northern hedge remains.

Potential for protected species

- 3.10 This section summaries data obtained from the desktop search, as well as results from the walkover and species specific surveys completed in August/September 2018.
- 3.11 Records of protected species within 1km of the site include European Protected Species (EPS), species listed under Section 7 (S7) of the Environment [Wales] Act 2016, the Local Biodiversity Action Plan (LBAP), Protection of Badgers Act 1992 (PBA), Schedules 5, 8 and 9 of the Wildlife and Countryside Act 1981 (as amended) (WCA5, WCA8, WCA9) and Birds of Conservation Concern Red and Amber status lists (BoCCRd and BoCCAm).

Amphibians

- 3.12 There are 8 ponds within 250m of the site, and several more within a 500m radius (as shown within drawing G7215.005A). Data from ponds regularly monitored (Cofnod) across the Wrexham Road Industrial Estate confirms a nationally important, large, metapopulation of GCN *Triturus cristatus* (EPS, S7, LBAP).
- 3.13 There are no waterbodies/ breeding habitat on the site (i.e. within the area in which ponds will be created). The closest GCN populated pond lies within the adjacent site (i.e. the developable outline and future reserved matters application), approximately 200m west of the mitigation area. Ponds are present directly east of the site, within 20m of the boundary hedge. Historic data indicates a GCN absence from these ponds.
- 3.14 The arable, dominantly bare ground field, is sub-optimal for amphibians, offering no hibernation or foraging habitat. The bordering hedges, broad-leaved trees and woodland edge, provide good quality terrestrial habitat for GCN and other amphibians, offering hibernation, refuge, foraging and ranging opportunities.
- 3.15 The footprint for which the ponds will be created impact solely upon the arable habitat, of low/ negligible quality for GCN. There will be no impact upon the hedges and trees.

Badger

- 3.16 There are records of badger *Meles meles* (PBA), including setts, within 1km of the site. Evidence of foraging was noted within the scrub/ wood strip adjacent to Bryn Lane, over 400m west of the pond development. No setts were found during the survey and there was no field evidence within the site. There are no limitations to this development with regard to badgers.

Birds

- 3.17 A number of protected bird species, including Schedule 1 birds, have been recorded within 1km from the site. Barn owl *Tyto alba* have been recorded on the edge of the site and the bird survey assessment identified a number of trees along the southern boundary which have roosting potential for barn owl. Evidence of presence (pellets) were noted at the base of one of these trees. The ground works will not impact upon any of these trees however, if works don't commence until February a 30m buffer is required.
- 3.18 The main value of the site for breeding birds is associated with the woodland, hedges and trees within and bordering the site. These habitats will be retained and unaffected by proposals.
- 3.19 The arable field is dry with no waterbodies present, making it unsuitable for feeding wading birds. With the presence of tall, mature trees along field boundaries, it is unlikely that the site would be used by flocks of waders or wildfowl.
- 3.20 There is therefore no limitation with regard to breeding and nesting birds, wintering birds.

Bats

- 3.21 An updated ground based assessment of trees identified a number of trees around the site boundaries offering suitability for roosting bats. Drawing G7215.004A illustrates the presence and categories of these potential bat roost trees. None will be affected by the construction of the ponds and surrounding groundworks.
- 3.22 The hedgerows, trees and woodland provide good foraging and commuting habitat for bats, in accordance with BCT (Collins, 2016⁵). Records show the presence of a range of bat species within the wider area. Historic data is supported by results from the bat activity surveys, conducted across the wider site in September 2018. Common pipistrelle *Pipistrellus pipistrellus*, soprano pipistrelle *Pipistrellus pygmaeus*, noctule *Nyctalus noctula*, brown-long eared bat *Plecotus auritus* and myotis species *Myotis* sp, all listed as EPS, WCA5, S7, were all found commuting along the woodland edge and internal hedgerows. The woodland strip showed the highest level of activity. These habitats will be retained and remain unaffected by proposals for the new pond creation on site.

5 Collins, J. (ed) (2016) Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edition). The Bat Conservation Trust, London

- 3.23 Design has taken into account these habitats of high importance and provides a sufficient buffer, avoiding the RPZ of the bat roost potential trees and commuting/foraging features. There will therefore be no limitations with regard to bats.

Reptiles

- 3.24 One record of adder *Vipera berus* and one record of slow-worm *Anguis fragilis*, both within Wrexham Industrial Estate, were returned from the Cofnod database. The site offers some limited sheltering and foraging habitat within the bordering hedge and woodland, but with no varying topography or transitional habitats there are inadequate basking opportunities. The arable field on which ground works will take place offers no value for reptiles. There are therefore no limitations to this application with regard to reptiles.

Water vole & Otter

- 3.25 There are no recent records of water vole *Arvicola amphibius* or otter *Lutra lutra* within the locality of the site. There is a stream running to the south of the site, along the southern side of the broadleaved woodland. This stream was nearly dry at the time of survey, heavily shaded with no aquatic vegetation or bankside cover. For these reasons, the stream is considered sub-optimal for water vole and otter. The footprint of the new ponds is over 20m from the stream. There are therefore no limitations to this proposal with regard to water vole and otter.

Conclusion

- 3.26 Pond creation will be conducted in winter minimising the risk of killing or injuring GCN. The area impacted by the ponds solely resides on the arable field, habitat considered to have no hibernation potential. GCN will likely be hibernating within the hedgerows and southern woodland strip. Ground works carried out over the winter months, on the arable field, will therefore avoid any GCN impact.
- 3.27 If works delay and fall into the barn owl breeding season of February to September, a 30m from the southern treeline should be applied.
- 3.28 Due to the low risk of impacts upon GCN, pond construction can be conducted under Reasonable Avoidance Measures (RAMs), set out within Section 5.0.

4.0 Mitigation Area Design Objectives

- 4.1 The design of the mitigation area will incorporate two new ponds with both marginal and aquatic planting. A neutral wildflower grassland mix will be sown and four hibernacula constructed. This will provide both aquatic habitat and favourable terrestrial habitat for GCN as well as providing additional sheltering and hibernation opportunities. The design and location of the mitigation ponds is shown within drawing D7215.001A, with further specific details provided in D7215.002A. Along with this statement, these drawings illustrate the key objectives of landscape and ecology.
- 4.2 These can be summarized as follows:
- Creation of a receptor site for the translocation of GCN;
 - Creation of two new ponds;
 - Aquatic planting and seeding of wet meadow mix to ensure sufficient GCN egg laying material and refuge/ foraging cover around the pond edge;
 - Creation of four hibernacula to provide hibernation habitat, which the majority of the site is currently lacking;
 - Seeding of species rich meadow mix around the ponds, improving the foraging and ranging opportunities for GCN;
 - Retention of mature trees (including those with bat and barn owl roosting potential) and hedgerows;
 - Creation of an area which will not only serve to preserve GCN but also support other amphibians, birds, bats and invertebrates;
 - Enhancement of biodiversity across the site through the planting of locally supplied native species to create a sustainable, high quality and low maintenance landscape framework.

5.0 Reasonable Avoidance Measures

- 5.1 This section sets out the design and working methods to achieve the conservation objectives set out in Section 4, including Reasonable Avoidance Measures (RAMs) to be undertaken for the creation of the mitigation ponds.

Creation of aquatic habitats

- 5.2 Two new ponds will be created within the mitigation area and designed in line with the Great Crested Newt Mitigation Guidelines (2001)⁶, to benefit GCN and other amphibians located within the area. The design of the newly created ponds will result in the net doubling of surface water of the pond that will be lost to the adjacent commercial development. The ponds will achieve a depth of at least 1.25m and will have marginal shelves between 1.5m and 1.9m around the margins. A shallow draw zone will be established for each pond that will create a marshy area suitable for foraging by amphibians and birds. Standing open water in the new ponds will total 2,064m², including shelves/draw zone drawdown zone. Ponds will measure 1,022m² and 1,042m² each (of which 592m² and 564m², respectively, will be permanent waterbodies). The ponds and the draw zone will be lined, if ground conditions indicate that lining will be required to maintain water levels.
- 5.3 The ponds will be planted up with native species grown under biosecure conditions (both aquatic and marginal vegetation) following their creation in the appropriate planting season (April/ May).
- 5.4 Management of the ponds is incorporated into the management plan for the GCN mitigation area (TEP report ref: 7215.005).

Timing of habitat creation

- 5.5 The ponds should be created during winter, when GCN will not be active within the arable field. This should be when night time air temperatures have consistently fallen below 5°C. December to February is the core period to ensure amphibians are in hibernation.

Creation of terrestrial habitats

- 5.6 Four hibernacula will be constructed alongside the pond creation (December - January) and located between the ponds and western hedge boundary. The hibernacula will be produced from felled timber/ brash and chippings and be no less than 3m x 1m x 1m. This will provide hibernation habitat and increase suitability of the terrestrial habitat.

⁶ Great crested newt mitigation guidelines (2001), English Nature
7215.005
Version 1.0

- 5.7 The arable field will be enhanced via seeding with a native species-rich meadow mix, an area, which including the ponds, will total ~2ha. The soil on the site has been improved through intensive agriculture. Prior to seeding, the soil will be inverted to aid the reduction of high nutrient levels currently present. Lower nutrient rich soil will provide better conditions for a diverse, species rich grassland to establish. Soil inversion will be done alongside the creation of the ponds (over winter), to reduce the risk of harm to GCN. The soil from the lowest depths from the pond excavation will be spread evenly. The soil will then be compacted and prepared for seeding at a later date, ensuring there are no large gaps and crevices within the soil - potential GCN hibernation features.
- 5.8 A walkover by a suitably qualified ecologist will be conducted to prior to sowing of grassland seed in late April/ early May. Advice on any pre-commencement works will then be advised (i.e. cutting of vegetation).
- 5.9 Once the grassland has established, cutting will be timed to ensure that flowering is maximised throughout the spring and summer. Less frequent cutting will also encourage wildlife and provide suitable foraging habitat for GCN. Management of the grassland is incorporated into the management plan for the GCN mitigation area (TEP report ref: 7215.005).

Non-licensed method statement

- 5.10 Considering that the habitats to be disturbed are almost negligible for GCN, as there are no breeding or hibernating habitats and limited areas for shelter within the arable field, the risk that GCN will be encountered within the working areas is therefore minimal based on knowledge of ground conditions and current use of the site. The pond works will also be undertaken during winter, when GCN will not be active within the working areas.
- 5.11 A trapping and translocation exercise under licence is therefore considered disproportionate to the risk of encountering GCN and other amphibian species given the sub-optimal habitat present and timing of proposed works. It is therefore considered appropriate that in this instance, the works can be carried out using non-licensed methods and in accordance with Reasonable Avoidance Measures (RAMs) for amphibians including GCN.
- 5.12 All staff working on the creation of the mitigation area and ponds will be made aware of the potential for presence of GCN on site and their status as a UK and European Protected Species.
- 5.13 Appendix A (UK Amphibian Guides), is to be handed to staff so that they are aware of what these animals look like. If a great crested newt is identified at any point, it must not be moved or handled and works in the area must cease until advice from a TEP ecologist is obtained, unless the individual GCN is at immediate risk of injury or death. The TEP Ecology Team can be contacted on 01925 844 004.
- 5.14 Should a GCN be identified on site, and a licence is considered necessary, a detailed method and mitigation principles would be incorporated into a development licence application for submission to Natural Resources Wales.

- 5.15 The following precautionary working measures will be undertaken, to minimise the risk of killing or injuring GCN and other amphibian species.

Habitat Management prior to proposed works

- 5.16 Prior to any works the area should be checked by an ecologist then cleared to ground level to avoid the risk of killing or injuring amphibians, including GCN. No arisings will be moved onto the site to prevent refuge opportunities being created.

Reasonable Avoidance Measures (RAMs) during proposed works

- 5.17 An Ecological Clerk of Works (ECoW) will be employed to provide site supervision/advice as required throughout the duration of the works. The appointed ECoW will be an experienced amphibian ecologist holding a Natural Resource Wales Great Crested Newt Survey Licence.

Pre-construction Vegetation Removal

- 5.18 The areas of arable land to be affected will have been managed to be of low suitability for amphibians such as great crested newt. Whilst it is extremely unlikely that these species will be present, as a precaution, these areas will be intensively hand searched by an ECoW to identify if any amphibians are present immediately prior to vegetation removal and ground works. Any amphibians other than GCN will be translocated to a suitable Receptor Site. The Receptor Site will be within the woodland strip in the south of the site. If a GCN is identified during these works, all works must stop and a GCN development licence is likely to be needed for works to continue.
- 5.19 Any amphibians, other than GCN, will be transported in a suitable, ventilated container to the Receptor Site by the ECoW. Amphibians will be released the same day, as soon as possible after capture.
- 5.20 Any vegetation that has been removed will be moved outside of a 5m buffer of the working area.

Construction Phase

- 5.21 The following methods will be implemented during the construction phase on site:
- A toolbox talk will be given to contractors by the ECoW prior to works commencing, detailing all measures outlined in this RAMs.
 - Excavations or trenches must be checked for the presence of amphibians before they are backfilled.
 - Any soil piles or materials will be stored off the ground (just in case temperature rises above 5 degrees and amphibians start to move);
 - Should any animals be found within the site at any point during the works, all activity in the area will be suspended and the ECoW contacted for further advice.

6.0 Timetable of Works

Table 5: Timetable of works required for mitigation area.

TASK	PLANNED TIMETABLE	COMMENTS
Creation of two new ponds	December 2018 - January 2019	Ground breaking work on arable field - Conducted over winter to ensure no negligible/ low risk to GCN
Creation of four hibernacula	December 2018 - January 2019	Ground breaking work on arable field - Conducted over winter to ensure no negligible/ low risk to GCN
Soil inversion and ground preparation for subsequent grassland planting	December 2018 - January 2019	Ground breaking work on arable field - Conducted over winter to ensure no negligible/ low risk to GCN
Aquatic planting and seeding of wet meadow mix	Late April/ early May 2019	Should be done in spring (or early Autumn).
Seeding of species rich meadow mix	Late April/ early May 2019	Should be done in spring (or early Autumn).

APPENDIX A: UK Amphibian Guide



♂

Great crested newt
Triturus cristatus



♀



♂ underside



♀



♂



♂ underside

Palmate newt
Triturus helveticus



♂ underside

Smooth newt
Triturus vulgaris



♂



♀

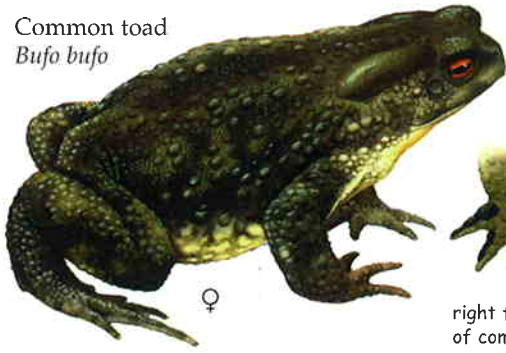
Guide to the *reptiles and* *amphibians of* Britain and Ireland



All approximately life size unless otherwise indicated



Common toad
Bufo bufo

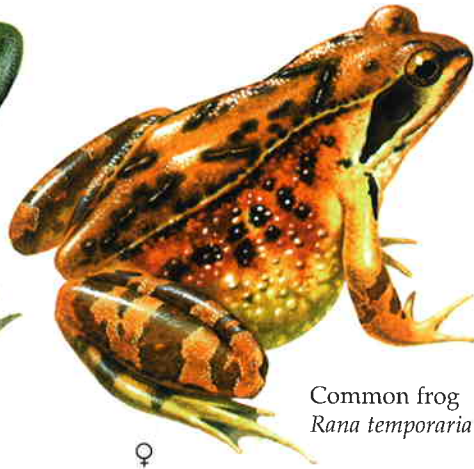


right forefoot
of common toad



Natterjack
Bufo calamita

Green frogs:
Rana ridibunda/esculenta/
lessonae



Common frog
Rana temporaria



Frog



Toad(s)



Common natterjack

Great crested newt



Smooth/Palmate



eggs and tadpoles shown approximately life size

FROGLife



FSC

Newt Eggs and Larvae

Amphibian and
Reptile Groups
of the UK
www.arguk.org

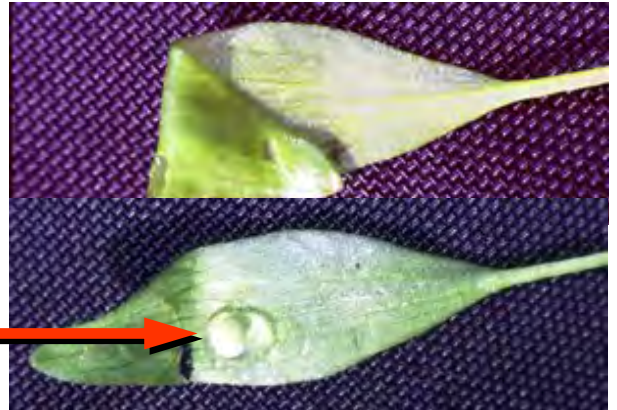


Newt eggs

Newt eggs are usually wrapped, singly, in vegetation. Leaves folded around great crested newt eggs are particularly conspicuous. To identify, unfold the leaf. Identification of undeveloped eggs is easiest.



Great crested newt eggs are white, sometimes with a tint of green or orange.

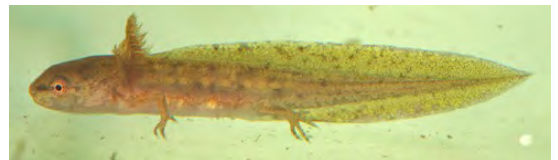


Eggs of smooth and palmate newts cannot be distinguished by eye, but they are smaller than great crested newt eggs and are grey or beige when newly laid.



Several great crested newt eggs folded into a single blade of flote grass, to give a concertina effect.

Newt larvae Examine well-developed larvae (late May to July, or to August for great crested newts).



Great crested newt larvae (above) have long toes and blotches of dark pigmentation on tail fins. Grow to approximately 5 cm.

Palmate and smooth newt larvae (above) are indistinguishable in the field—but do not have the long toes or spotted tail fins of great crested newt larvae. Grow to approximately 3 cm.

Young newts usually leave the water in late summer or autumn, although sometimes they remain as larvae over the winter (smooth newt right).



Further information Howard Inns (2009). *Britain's Reptiles and Amphibians*. WILDGuides.

Produced by Amphibian and Reptile Conservation

Images provided by Phyl King and Duncan Sweeting.
Funded by the Esmée Fairbairn Foundation.

amphibian and reptile
conservation

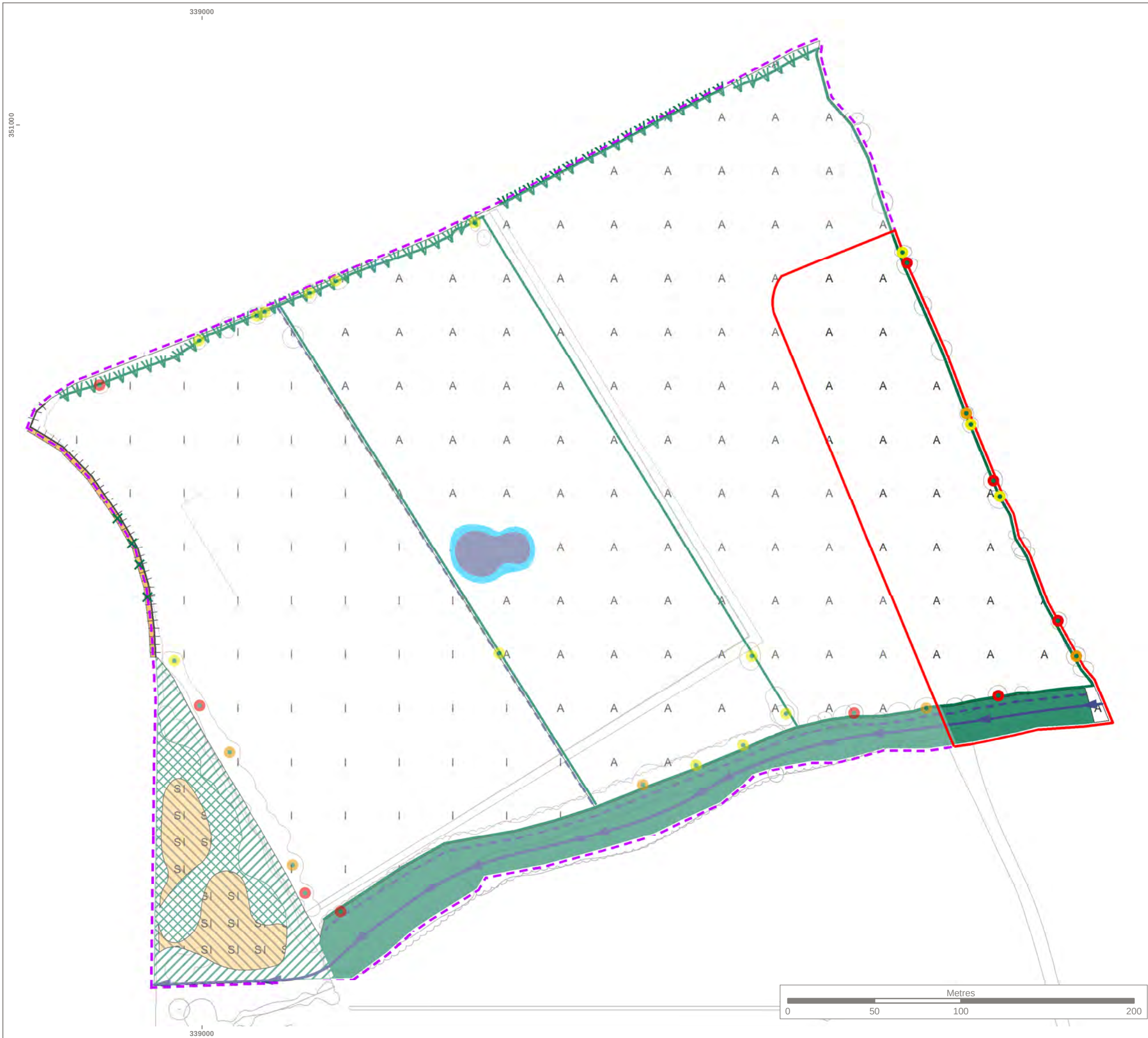


ef Esmée
Fairbairn
FOUNDATION

Amphibian and Reptile Conservation Registered Charity No. 1130188. www.arc-trust.org.uk
655A Christchurch Road, Boscombe, Bournemouth, Dorset BH1 4AP, 01202 391319.

DRAWINGS

G7215.004A Phase 1 Habitat Survey and Bat Roost Potential Trees
G7215.005A Pond Locations & GCN Distribution Plan
D7215.001A Landscape Proposals
D7215.002A Pond and Hibernacula Details



KEY

- Application boundary for pond creation and landscaping
- Application boundary for commercial development - 2019 reserved matters
- Scattered scrub
- Broad-leaved tree with low bat potential
- Broad-leaved tree with moderate bat potential
- Broad-leaved tree with high bat potential
- Running water
- Species-poor intact hedge
- Species-poor intact hedge and dry ditch
- Native species-rich hedge and trees
- Fence
- Dry ditch
- Semi-natural broad-leaved woodland
- Plantation broad-leaved woodland
- Dense/continuous scrub
- Semi-improved neutral grassland
- Semi-improved neutral grassland/tall ruderal mosaic
- Improved grassland
- Swamp
- Standing water
- Arable

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Base mapping provided by client



A	Revision of application boundary	CR	FW	30/10/2018
Rev	Description	Drawn	Approved	Date

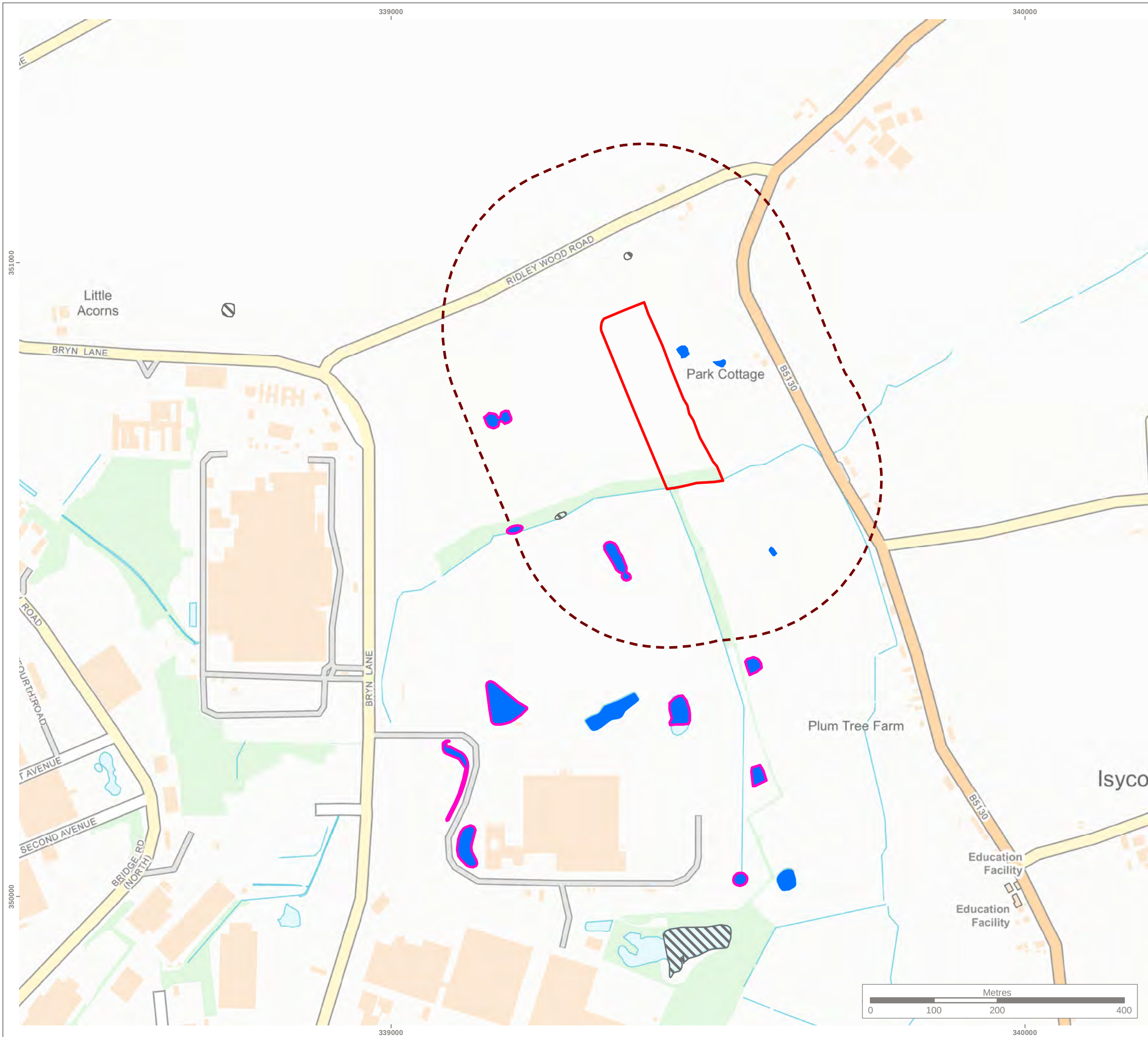
TEP | **THE ENVIRONMENT PARTNERSHIP**
Genesis Centre, Birchwood Science Park, Warrington WA3 7BH
Tel 01925 844004 e-mail tep@tep.uk.com www.tep.uk.com

Project
Bryn Lane, Wrexham

Title
Phase 1 Habitat Survey and Bat Roost Potential Trees

Drawing Number
G7215.004A

Drawn	Checked	Approved	Scale	Date
CR	MK	FW	1:2,200 @ A3	30/10/2018

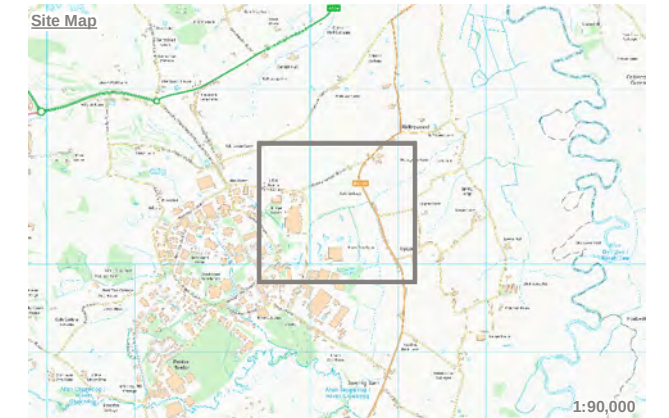


KEY

- Application boundary
- 250m offset from application boundary
- GCN Desktop Data**
- Pond with GCN presence
- Pond with GCN likely absence
- No data



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Rev	Description	Drawn	Approved	Date
A	Revision of site boundary	CR	FW	30/10/2018



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Project
Bryn Lane, Wrexham

Title
Pond Location and GCN Distribution Plan

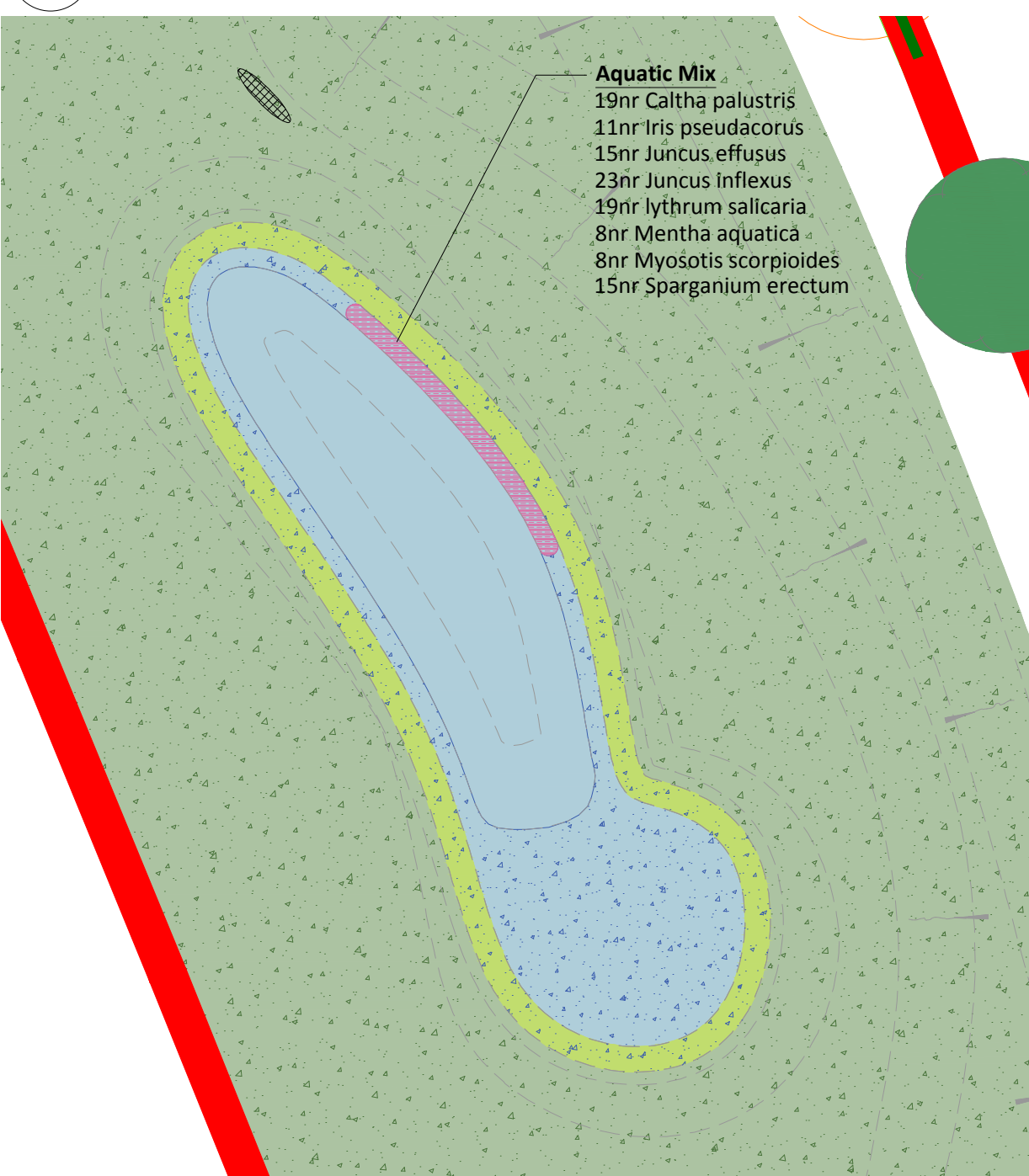
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Drawn	Checked	Approved	Scale	Date
CR	MK	FW	1:6,000 @ A3	30/10/2018

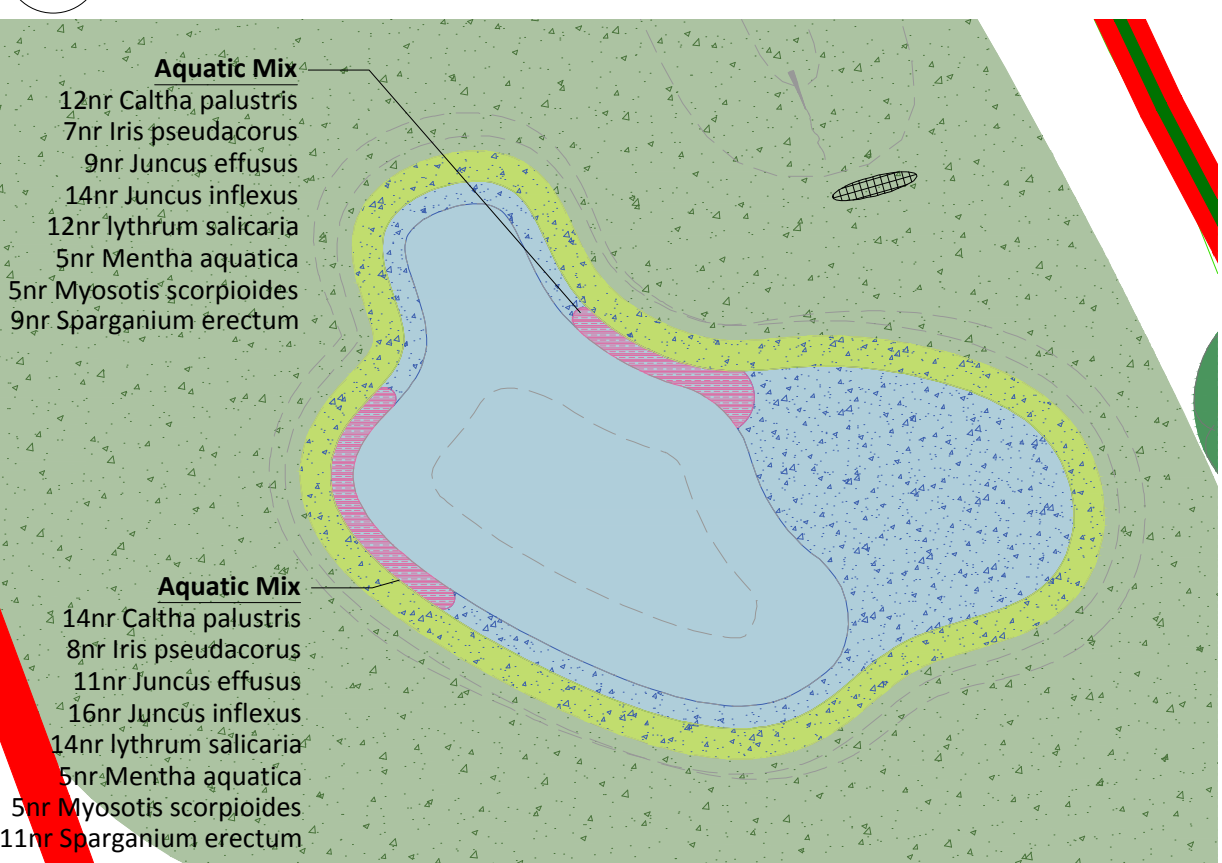
1 Layout
1:1000



2 Detail A
1:500



3 Detail B
1:500



The following seed mixes will be included in the development to enhance biodiversity:

Wet Meadow Mix

Supplier: Germinal Seeds Limited
Mix: RE3 Riverflood Plain/Water Meadow (MG8 Grassland)
Sowing rate: 5.00 g/m2

- 0.5% Caltha palustris (Marsh Marigold)
- 3% Centaurea nigra (Common knapweed)
- 2% Filipendula ulmaria (Meadow Sweet)
- 2% Leontodon autumnale (Autumn Hawkbit)
- 1% Leontodon hispidus (Rough Hawkbit)
- 0.5% Leucanthemum vulgare (Ox-eye Daisy)
- 0.5% Lotus corniculatus (Birdsfoot Trefoil)
- 0.5% Lychins flos cuculi (Ragged Robin)
- 2% Plantago lanceolata (Ribwort Plantain)
- 1% Prunella vulgaris (Self-Heal)
- 3% Ranunculus acris (Meadow Buttercup)
- 1% Rhinanthus minor (Yellow Rattle)
- 3% Sanguisorba officinalis (Greater Burnet)
- 2% Agrostis stolonifera (Creeping Bent)
- 26% Cynosurus cristatus (Crested Dogstail)
- 32% Festuca rubra ssp litoralis (Slender Creeping Red Fescue)
- 20% Poa trivialis (Rough-Stalked Meadow Grass)

Species Rich Meadow Mix (inc reinstatement areas)

Supplier: Germinal Seeds Limited
Mix: RE1 Traditional Hay Meadow (MG5 Grassland)
Sowing rate: 5.00 g/m2

- 1.5% Achillea millefolium (Yarrow)
- 4.5% Anthoxanthum odoratum (Sweet Vernal Grass)
- 1.5% Centaurea nigra (Common knapweed)
- 1% Leontodon hispidus (Rough Hawkbit)
- 2.5% Leucanthemum vulgare (Ox-eye Daisy)
- 3% Lotus corniculatus (Birdsfoot Trefoil)
- 2% Plantago lanceolata (Ribwort Plantain)
- 1% Agrimonia eupatoria (Agrimony)
- 1.5% Prunella vulgaris (Self-Heal)
- 1.5% Ranunculus acris (Meadow Buttercup)
- 1% Rhinanthus minor (Yellow Rattle)
- 1.5% Filipendula ulmaria (Meadow Sweet)
- 0.5% Sanguisorba minor (Salad Burnet)
- 14% Agrostis capillaris (Common Bent)
- 21% Cynosurus cristatus (Crested Dogstail)
- 14% Dactylis glomerata (Cocksfoot)
- 22% Festuca rubra ssp litoralis (Slender Creeping Red Fescue)
- 6% Festuca pratensis (Meadow Fescue)

Aquatic Planting

Specification: 1L container
Planting rate: 4n/m2

- 12.5% Caltha palustris
- 7.5% Iris pseudacorus
- 10% Juncus effusus
- 15% Juncus inflexus
- 12.5% Lythrum salicaria
- 5% Mentha aquatica
- 5% Myosotis scorpioides
- 10% Sparganium erectum

Landscape Key

- Application boundary
- Existing Features
 - Trees
 - Vegetation
 - Hedgerow
 - Waterbody
 - Fencing
 - Contours
- Proposed soft landscape features
 - Aquatic planting
 - Species-rich grassland
 - Wet grassland seeding
 - Waterbody
 - Contours
 - Low mounding (max 1:6 gradients)
 - Amphibian hibernacula

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A	Red line boundary amended	RJC	FW	30.10.18
Rev	Description	Drawn	Approved	Date

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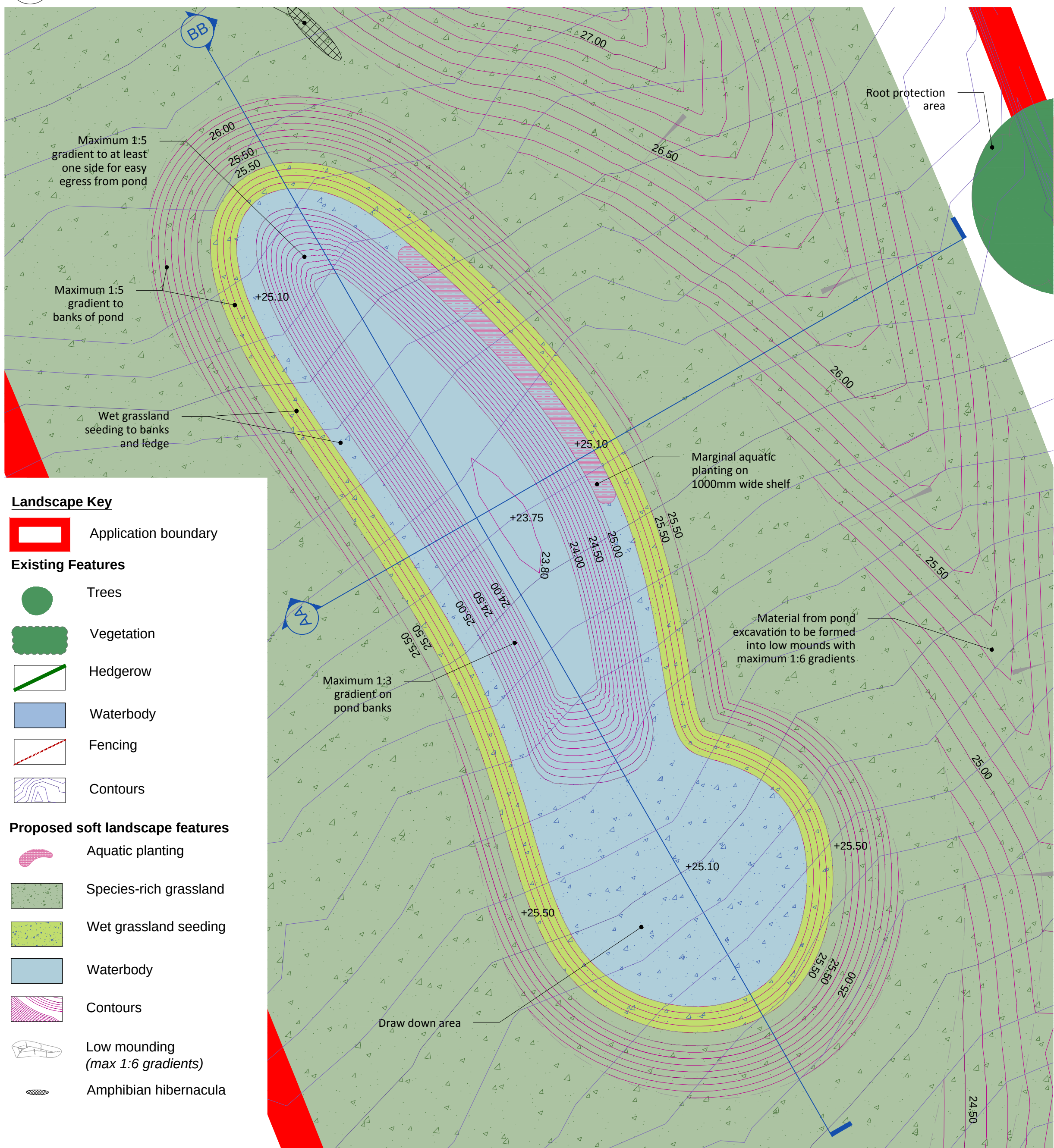
Title
Landscape Proposals

Drawing Number
D7215.001A

Scale SEE DWG @ A1	Date 22/10/2018	
Drawn RJC	Checked FW	Approved FW

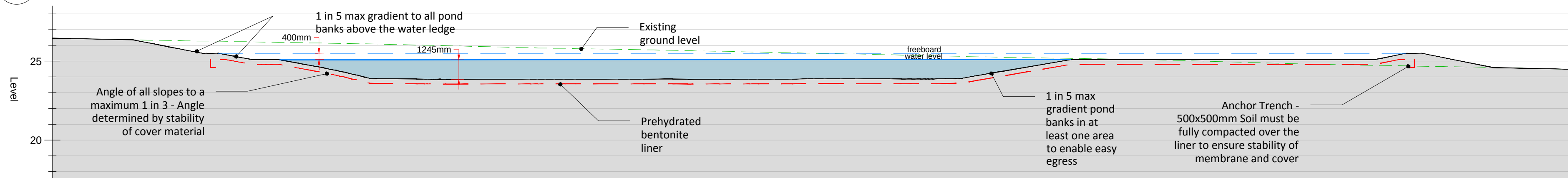
1 Detail A

1:250



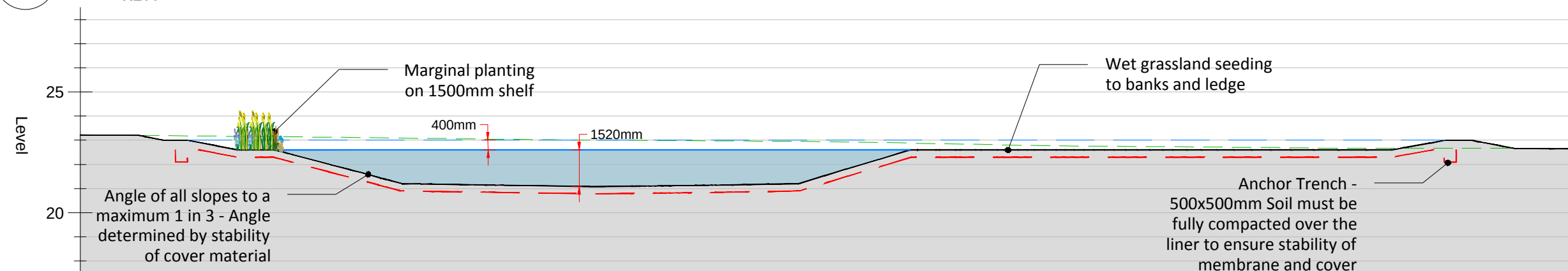
4 Section BB

1:200



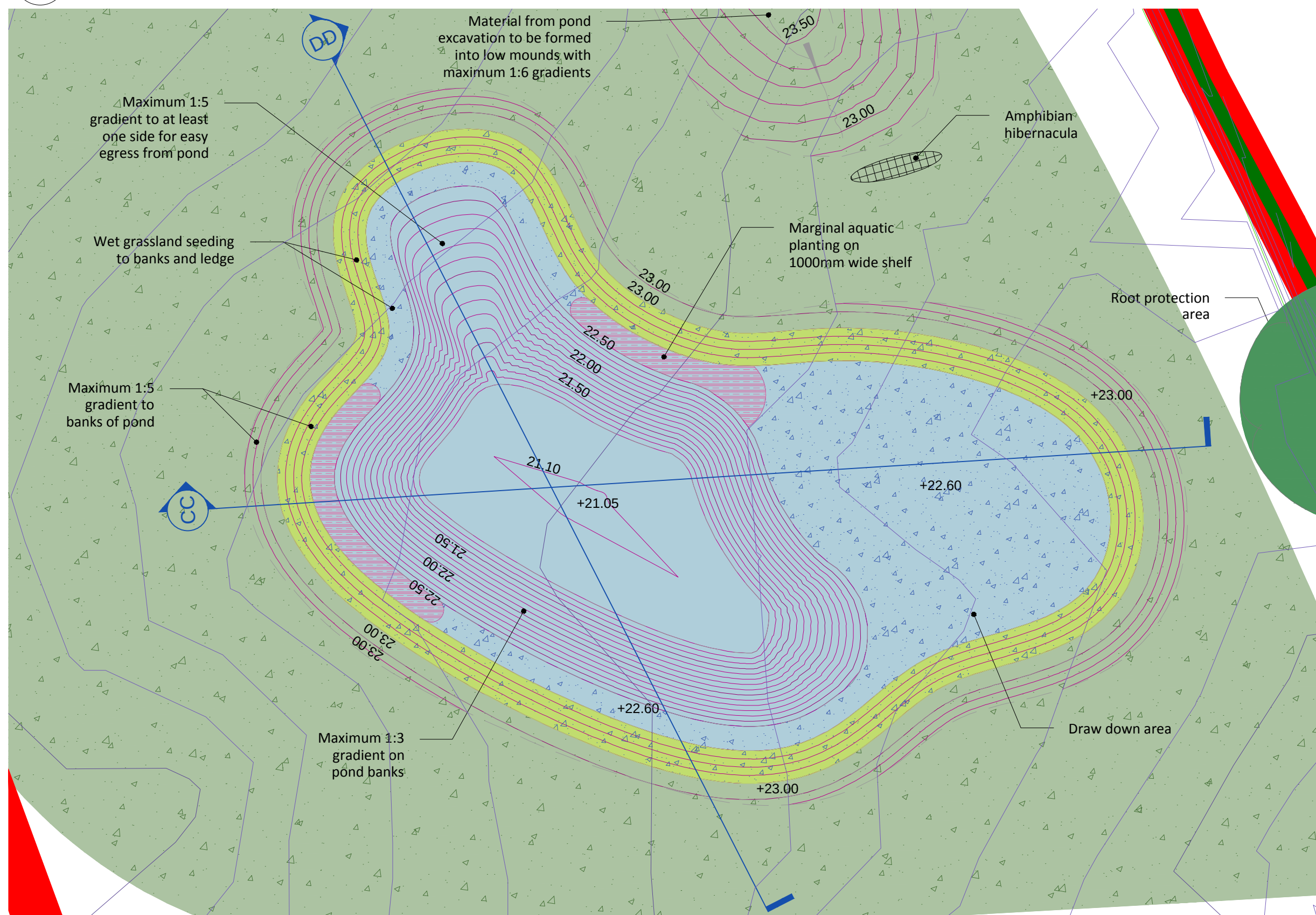
5 Section CC

1:200



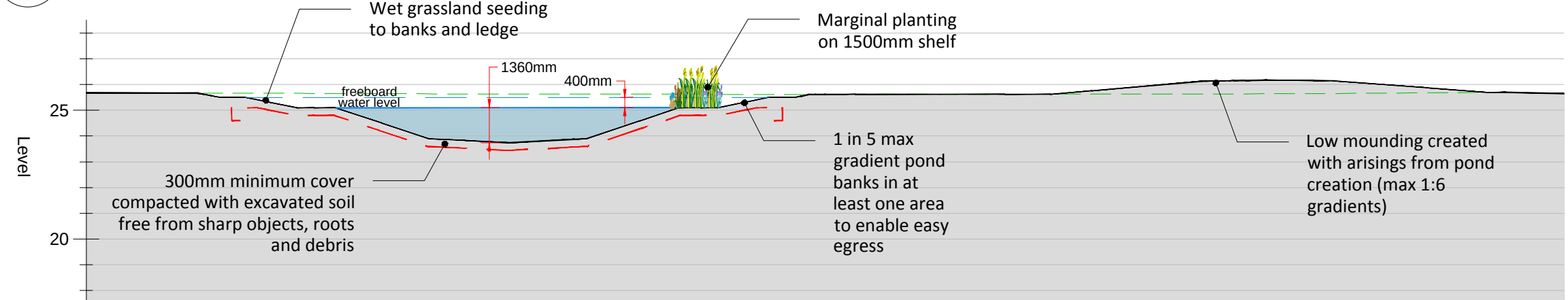
2 Detail B

1:250



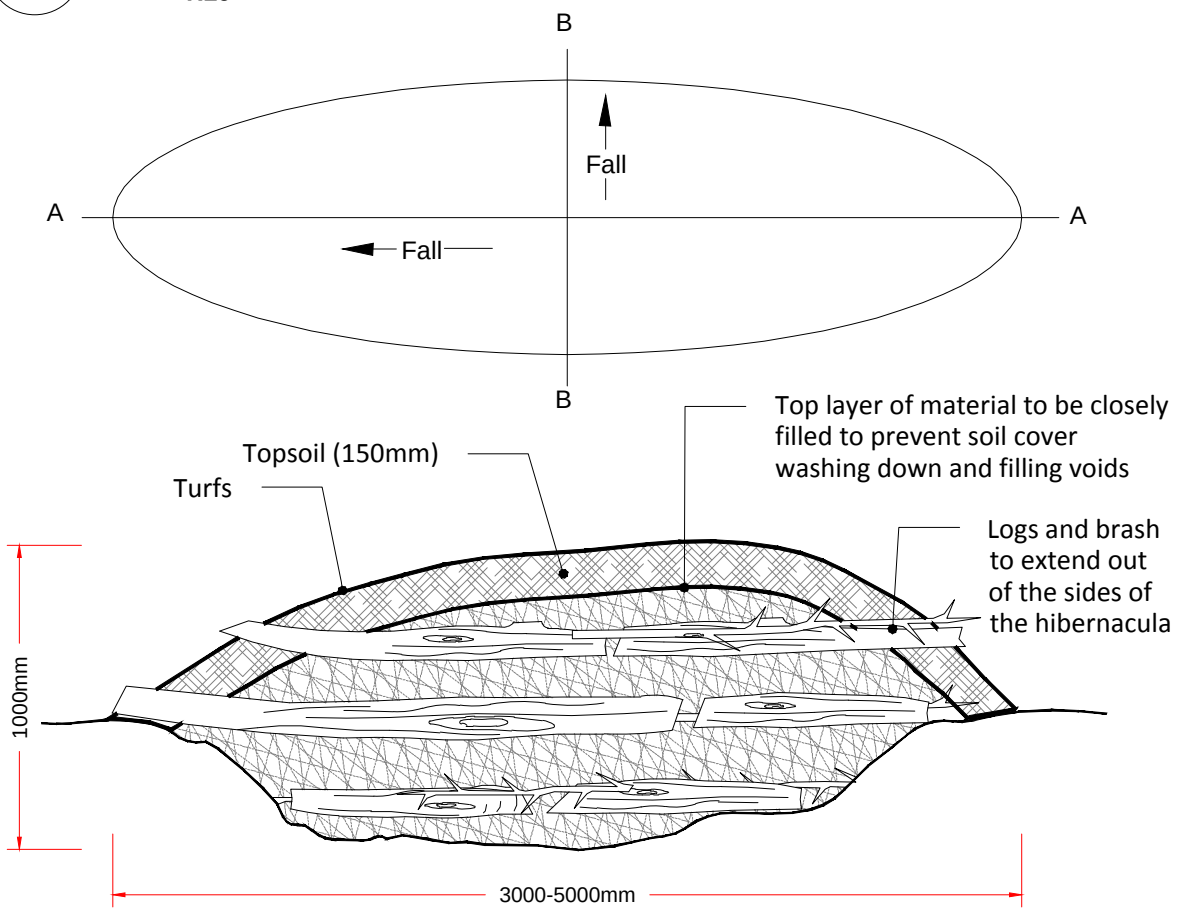
3 Section AA

1:200



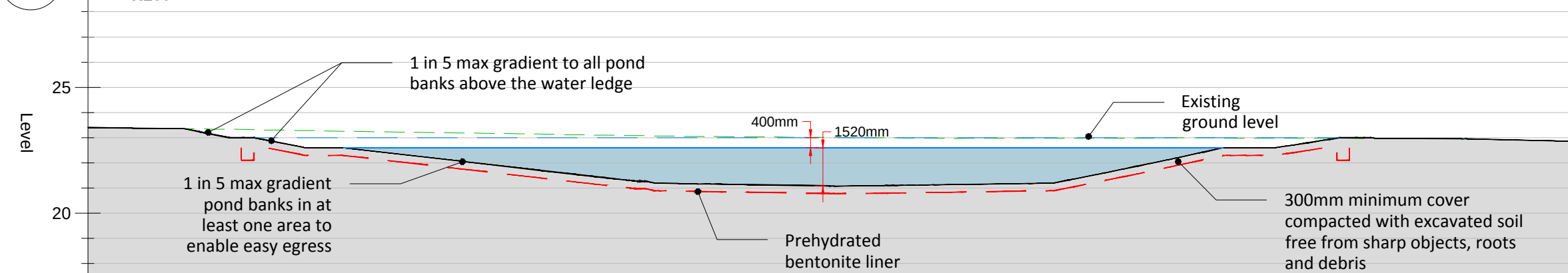
7 Amphibian hibernacula detail

1:25



6 Section DD

1:200



Notes

Earthworks Notes

- Slope gradients to be determined by geotechnical properties of the soils.
- Maximum gradients to be 1:3 for soft landscaped areas for safe maintenance
- Soil management, handling and placement to be in accordance with BS3882 and Defra guidance 'Construction Code of Practice for the Sustainable Use of Soils on Construction Sites'
- No excavation works to be undertaken within root protection areas.

Pond notes

Client / Drainage engineer to determine the following prior to construction:

- Water level
- Requirement for water outlet
- Freeboard (attenuation) requirements to prevent flooding
- Safety signage

Bentonite Liner

- The subgrade should be rolled or tracked to remove any wheel ruts, footprints, or other abrupt grade changes.
- Protrusions extending more than 12mm from the subgrade surface shall either be removed, crushed, or pushed into the surface.
- The finished surface must be firm and unyielding, without abrupt elevation changes, voids, cracks, ice or standing water.
- The ground cover layer may be installed on a frozen subgrade, but the subgrade soil in the unfrozen state should meet the above specification.
- The bottom 300mm of the covering material is to be free of all debris, roots, sharp objects and any stones larger than 32mm.
- Plant: At no time during or subsequent to installation of the liner, or placing of protective layer, will plant equipment be permitted to travel on the liner or protective layer.
- Repairs: In the event of damage occurring to the RAWMAT HDB Type P1 the damaged area shall be cleaned and overlain by a patch of RAWMAT HDB Type P1 at least 150mm larger in all directions than the damaged area. The patch should have the non-woven geotextiles removed and be laid with the black side uppermost. If the damage is on a slope, the patch piece must be secured in the anchor trench.

Product: Rawmat HDB Type P
(Natural Sodium Bentonite)
High Density Bentonite

Supplier: Rawell Environmental Ltd
Carr Lane
Hoylake
Wirral
Merseyside
CH47 4AZ
Tel: 0151 632 5771
Fax: 0151 632 0252

Hibernacula notes

- The hibernacula is to be no less than 3m length x 1m width x 1m height.
- Turfs are removed prior to excavation for re-use.
- The hibernacula is to be constructed felled timber / brash and the chippings
- Vertical gaps to be no more than 50% filled with soil / vegetative matter so that voids are created for amphibians.
- Logs to be hand placed, roughly coursed with some logs placed at 45° to the ground and locally found soil / dead leaves / mulch to be placed in 300mm layers between courses.
- The mound is to be covered with 150mm topsoil and turfs.

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Rev	Description	Drawn	Approved	Date
A	Red line boundary amended	RJC	FW	30.10.18

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Title
Pond and Hibernacula Details

Drawing Number
D7215.002A

Scale
SEE DWG @ A1

Date
23/10/2018

Drawn
RJC

Checked
FW

Approved
FW



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