

**DAVID CLEMENTS ECOLOGY LTD**

**LAND AT HERBERT ROAD, NEWPORT**  
**WILDLIFE PROTECTION PLAN (WPP)**  
**&**  
**ENVIRONMENTAL MANAGEMENT PLAN (EMP)**

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## 1.0 INTRODUCTION

- 1.1 This report has been prepared by David Clements Ecology Ltd (DCE) on the instructions of Asbri Planning, on behalf of Keepmoat, and refers to land off Herbert Road, Newport (NGR ST 31736 8933). Its purpose is to set out a proposed Wildlife Protection Plan (WPP) for the protection of identified features of wildlife and conservation significance during the development phase, and also an Ecological Management Plan (EMP) for the on-going post-development management and enhancement of retained and new features of wildlife and conservation significance.
- 1.2 The area within the control of Keepmoat measures approximately 5 ha, and lies at approximately 7m AOD. Part of the site (2.83ha) is included in Newport's Local development Plan (2013-2026) (LDP) allocated under Policy H1(5). The western boundary of the site lies adjacent to the River Usk, the eastern boundary lies adjacent to the main railway. The southern boundary lies adjacent to housing while the northern boundary lies adjacent to Glan Usk Primary School. A single track road runs from south to north, currently used as emergency access to Glan Usk Primary School. It is proposed to develop the site in four phases; the WPP and EMP outlined within this document are required to satisfy condition 9 of the Planning Application 13/1279 which is associated with part of the Enabling Works and Phase 1 of the development. This is outlined below:

### *Condition 9*

*No work shall commence on the approved scheme (unless otherwise agreed in writing in relation to specific works as agreed with the local planning authority) until an ecological management scheme for the site has been submitted to and approved in writing by the local planning authority. Following the local planning authority's written approval of the ecological management scheme, the scheme shall be fully implemented as approved following the occupation of the last house within each phase of the scheme as identified in Condition 7 to which the measures pertain. In the event the phase contains no houses the scheme shall contain a timetable for implementation of the proposed measures The Ecological Management Scheme shall contain details in regard to the short (5 years) and long term (10 years) ecological management of the site and shall have regard to the landscape management scheme submitted under condition 19. The scheme shall contain details regarding the management of the sensitive riverfront area and the otter mitigation area (unless otherwise submitted under conditions 15 & 16) as well as the wider site.*

*Reason: to retain features of ecological interest within the site and to enhance the overall sustainability of the scheme.*

- 1.3 The location of the site is shown at Plan 1 and the phases of development are shown in Plan 2. For the purpose of this report the land associated with Phase 1 of the works will be referred to as 'the site'.

1.4 The Enabling Works are due to be carried out between November 2016 and April 2017 which include offsite otter mitigation works and off-site habitat enhancement works, to the north of the site, as part of condition 5 of the planning permission 13/1279. The offsite otter mitigation works, in respect of the creation of an undisturbed area for otters and the installation of an otter holt, are available in a separate report (DCE, 2017); the offsite habitat enhancement works are included in this report. Phase 1 of the works is scheduled to be undertaken between May 2017 and July 2018. The proposals for Phase 1 include 3 blocks of 20 apartments in the south of the site, remedial works along the riverbank and improvements to the ree to receive the development's surface water. Full details of the works included in Phase 1 are shown in Plan 3.

## 1.5 Designated Wildlife Sites

1.5.1 The River Usk Special Area of Conservation (SAC) lies adjacent to the proposed development site. The SAC is primarily designated for several species, including otter, Atlantic salmon and twaite shad, listed on Annex II of the EC Habitats Directive. The River Usk with its adjacent salt-marsh habitat, adjacent to the western boundary of the site, is also protected through its Site of Special Scientific Interest (SSSI) designation as part of the River Usk (Lower Usk) (Abergavenny-Newport) SSSI. Full details of the aforementioned designations can be found in the Environmental Statement, section 7.43-7.49, prepared by Sturgess Ecology in 2013, (see Addendum collated by Asbri Planning Ltd, 2014).

1.5.2 For the purpose of this EMP and WPP the River Usk is assessed as having **International** value for nature conservation.

1.5.3 There are four Sites of Importance for Nature Conservation (SINC) within 1km of the site. Three of which, Glebelands SINC approximately 460m to the north of the site, Crindau Field SINC approximately 770m to the north west of the site and Crindau Pill Sinc, approximately 310m to the west of the site have been designated as they are known to support otters. The fourth SINC Brynglas Wood, 849m to the north west of the site is an area of Ancient Semi-natural Woodland.

## 1.6 Ecological Survey & Assessment

1.6.1 The site has been subject to a number of ecological surveys conducted by Sturgess Ecology in 2013 which are reported in the Environmental Statement, Chapter 7 Ecology and associated appendices (Asbri Planning Ltd, 2014).

1.6.2 The site was subject to a walkover survey on January 25th 2017 by David Clements Ecology Ltd, the purpose of the visit being to assess the habitats currently present on site and compare them to those reported in 2013. The outcome of this visit determined there had been no significant changes to the habitats in the Phase 1 area of the site since surveys carried out in 2013 by Sturgess Ecology.

1.6.3 The phase 1 site currently contains the wet ditch, scrub, and species poor grassland.

1.6.4 The wet ditch, known as Lottery's Reen has limited botanical value being dominated by bramble scrub and willow. However, the more open sections of the ditch are

dominated by common reed with a wider range of marginal aquatic plants. Reedbed is a priority habitat in the UKBAP and the Newport LBAP, and even small stands of reeds are recognised as having value for wildlife. While the extent and diversity of the reedbed and ditch habitat in the site is limited and the habitat quality poor due to the relatively shallow depth of water, the crowded, unmanaged nature of the reed vegetation, large amounts of litter and disturbance by dogs and people, it still provides suitable habitat for breeding birds, including reed warbler (*Acrocephalus scirpaceus*). This particular reed habitat appears to have a relatively low value for invertebrates and amphibians. In this instance the reed, as it will be referred to, is assessed as having District value for nature conservation.

- 1.6.5 Grassland and dense scrub within the site are considered to be of no more than Local value for nature conservation. These habitats are likely to be of some value to fauna such as nesting birds, common amphibians, invertebrates and slow-worms, the latter species being recorded in low numbers in the previous surveys by Sturgess Ecology.
- 1.6.6 Habitats within the off-site habitat enhancement area include scrub and trees with reed beds adjacent to the river.
- 1.6.7 In addition, two invasive non-native species, Himalayan Balsam (*Impatiens glandulifera*) and Japanese knotweed (*Fallopia japonica*), are present on site both of which are listed as Schedule 9 species under the Wildlife & Countryside Act 1981. As such, these regulations prevent their spread, either deliberately and or recklessly from the site.

## 1.7 **Proposed Development**

### *Enabling Works*

- 1.7.1 Enabling works relevant to ecology include the creation of an undisturbed area, incorporating an artificial otter holt, along the riverbank to the north of the site, details of which can be found in a separate report (DCE, 2017). Off-site habitat enhancement is also part of these works, again along the riverbank north of the site, between Glan Usk Primary School and the M4 bridge, and involves the eradication of Japanese knotweed, and the replanting of the 'gaps' with native trees and shrubs.

### *Phase 1*

- 1.7.2 Phase 1 of the site has full planning permission (13/1279) for 20 apartments in three blocks (see Plan 3) with associated infrastructure i.e. road and drainage and landscaping. Modifications to the ditch/reen will also be made during Phase 1 of the development. This will involve enlarging and lining the reed to receive the development's surface water with landscaping suitable to retain and improve its ecological value.

## 1.8 **Potential Impacts**

- 1.8.1 All habitats within the site will be lost as a result of the proposed development, with exception of the reed/ditch although this is to be modified to accommodate surface water from the development.

- 1.8.2 The River Usk SAC/SSSI whilst not within the site, lies adjacent to the western boundary. There will be no direct loss of habitat within the SAC due to the development and water-borne pollutants will be controlled within NRW consent limits. However, the presence of construction staff and machinery are likely to increase noise levels, especially when piling and excavations are taking place. This disturbance has the potential to impact on otter and migratory fish, the primary features of the SAC, construction lighting also has the potential to affect otters using the river.
- 1.8.3 Measures to mitigate and compensate for potential adverse impacts to species and habitats which are legally protected, and/or which have conservation significance, have been set out in principle in the Environmental Statement Addendum Chapter 7 (Asbri Planning Ltd, 2014). This document is intended to amplify these recommendations and proposals, and give specific detail as to how and when these measures will be implemented, by whom, and in which areas of the site.
- 1.8.4 The remainder of this document therefore sets out a Wildlife Protection Plan (WPP) to cover all of ecological mitigation and protection measures which will be required in the pre-construction and construction phases, and also an Ecological Management Plan (EMP) to cover the subsequent future maintenance and management of retained and new habitats in the post-development phase.
- 1.8.5 The WPP & EMP will therefore consider the following key issues;

*Species*

- The presence of commuting and potentially nesting otters
- The presence of nesting birds and common reptiles which are either confirmed or likely to be present in various habitats affected by the development
- Himalayan balsam and Japanese knotweed

*Habitats*

- The protection of the River Usk SAC, which lies adjacent to the site, during construction.
- Future maintenance, management and enhancement of retained habitats (ie, including the enhancement of habitats of ‘District value’ and lower)
- The creation of new habitats and wildlife features, within the site, including the otter holt, and the future maintenance, management and enhancement of this
- Management of the potential impacts of lighting, including the incorporation of ‘wildlife friendly’ lighting

1.9 **Programme**

- 1.9.1 Development across Phase 1 of the development is covered in this document as is the offsite habitat enhancement works. The Enabling works including the otter mitigation is set to be carried out between November 2016 and April 2017. Phase 1 of the works is due to be carried out between May 2017 and July 2018.

## 2.0 WILDLIFE PROTECTION PLAN (WPP)

### 2.1 Introduction

2.1.1 The following section sets out details of the mitigation and protection measures which are to be implemented during the pre-construction and construction phases of the development. The WPP applies to the off-site habitat enhancement area and Phase 1 of the development.

### 2.2 Wildlife Protection Zones

2.2.1 The River Usk SAC/SSSI will be contained within a physically demarcated 'Wildlife Protection Zone' (WPZ). The WPZ is shown on Plan 4. The WPZ will be approximately 5m wide, stretching from the western boundary of the site to the new footpath. Within the WPZ a continuous bund will be constructed (2.0m x 1.0m) and retained using soil from within the site, which is free from contamination, well drained and with a high proportion of stones/rubble, and suitable for a range of native plants (see Plan 3). A mesh weld dog-proof fence will also be installed, immediately to the east of the bund, to the height of at least 1m. These measures will restrict access to the riverbank by people and dogs: provide shading from artificial lighting and reduce noise at river level, and prevent the possibility of diffuse run-off to the river during construction and in the long term.

2.2.2 The WPZ and associated bund/ fencing will be constructed before the main construction period begins. Fencing will be provided around the WPZ throughout the construction phase, to allow the vegetation to establish and to provide additional protection to the SAC.

2.2.3 Once modifications to the reën have been completed this area will also be fenced off and classed as a WPZ. These measures will restrict access to the reën and allow the vegetation to establish.

2.2.4 Fencing will be installed around the whole development site at the start of the site clearance phase, to prevent accidental damage to the SAC during construction. The existing footpath will be diverted to keep pedestrians and dogs away from the SAC boundary and the construction site.

#### ***Protection of the WPZ***

2.2.5 The barrier fencing will remain *in situ* until all development operations have been completed on the site. If temporarily removed prior to this time (i.e. in order to allow the completion of defined works agreed in writing with the LPA) the fences will be replaced immediately upon completion of those works.

2.2.6 Construction vehicles and site personnel will be prohibited from entering a WPZ unless specifically authorised by the site operations manager assigned with responsibility for the implementation of the WPP (hereinafter referred to as the 'Ecological Clerk of Works' or ECW) for the purposes of carrying out any defined works.

2.2.7 Construction compounds, materials storage areas, mixing areas and vehicle refuelling areas etc will not be located anywhere within 10m of a WPZ, and all such areas will be drained and bunded in accordance with current requirements and best practice so as to prevent any incidental or accidental spillages of potential contaminants (e.g. mixing slurry, washdown, oil and diesel etc) entering a WPZ.

2.2.8 Where lighting is required during clearance and construction works, measures will be put in place to ensure that no habitats within the WPZs will be artificially illuminated at night. These areas must remain dark to avoid disturbance or disruption to any nocturnal protected species which may be using these habitats for shelter, foraging or as commuting routes etc.

### 2.3 **Mitigation for Otters**

2.3.1 The site and/or adjacent habitats have the potential to be used by otters, either for commuting, resting up or for building holts. Otters and their resting places/holts are fully protected under the EU Directive on the Conservation of Natural Habitats and of Wild Flora and Fauna (92/43/EEC; the 'Habitats Directive'), which is implemented in the UK via the Conservation of Habitats & Species Regulations 2010 (the 'Habitats Regulations') which lists otters in the UK as 'European Protected Species'.

2.3.2 Site compounds and storage or waste dumping facilities will be located away from potential otter habitat. This will avoid disturbance to the otters' routine and also minimise pollution risks.

2.3.3 Any trenches required in any areas accessible to otters will not be left open overnight, or an escape route will be provided for them (e.g. a plank of wood or sloping end trench). Similarly, any open pipework will be capped overnight to prevent access by otters. All machinery e.g. diggers, stored on site will be checked each morning to make sure otters are not using them for resting up.

2.3.4 All construction works carried out within 10m of the top of the riverbank will be restricted to daylight hours to minimise disturbance to otters.

2.3.5 Details of otter mitigation in respect of the creation of an undisturbed area and the building of an artificial holt can be found in the separate report prepared by David Clements Ecology 2017, (DCE, 2017). Other mitigation i.e. off-site habitat enhancement is dealt with in the following report.

2.3.6 If otters are found during works all work must stop immediately and the supervising ecologist must be contacted.

### 2.4 **Mitigation for Nesting Birds**

2.4.1 Various nesting birds have been recorded on the site, where they utilise trees and scrub, as well as potentially rough grassland throughout the site for nesting. Nearly all species of bird are protected against killing or injury as individuals under UK legislation, and this protection extends to their nests, eggs and young. A number of especially rare species are subject to enhance protection under the UK law by virtue of

their listing on the schedule 1 of the Wildlife & Countryside Act 1981, and may not be disturbed whilst nesting.

2.4.2 Any works affecting potential nesting habitats, including the felling, lopping and clearance of trees and scrub, will avoid the main bird nesting season which runs approximately from March to August inclusive. Alternatively, any works that must be carried out during this period will be preceded by a survey to ensure that no nesting birds are present and any present will be allowed to complete their nesting cycle unmolested within a buffer zone of at least 5m radius around the nesting site. This restriction will also apply to any other habitats which are found to support nesting birds, including ground-nesting species in grassland etc.

## 2.5 **Mitigation for Reptiles**

2.5.1 The scrub/grassland interfaces offer potential for common reptiles such as slow-worm and common lizard.

2.5.2 Clearance of these habitats could potentially cause harm to these species, which is an offence under the Wildlife and Countryside Act, 1981. A precautionary approach towards common reptiles should concentrate primarily on minimising the potential for causing the death and injury of individuals during site clearance and building operations, which is a statutory requirement.

2.5.3 Scrub will require removal to facilitate Phase 1 In this instance it is considered that adequate mitigation could be achieved through localised destructive searching (DS).

2.5.4 The scrub to be removed will be cleared using hand tools such as chainsaw, brush-cutter and strimmer etc, with the arisings being collected and removed from the site immediately. This work will take place outside of the bird-nesting season (ie not between March to August), or where this is not possible will be preceded by a survey as outlined in 2.3.2 above. Tree and shrub roots will then be extracted using a small excavator under the supervision of an appropriately experienced reptile handler who will stop the works, and rescue and remove any reptiles which are found during the operation.

2.5.5 Collected reptiles and amphibians will be removed to suitable containers (eg steep-sided buckets with lids) with the different species being kept separate. Any adders will initially be collected to a snake-bin using tongs, snake-stick and/or gloved hands, and both adder and grass snake will be transferred to large hessian holding sacks with a drawstring rope at the top.

2.5.6 Captured reptiles will be translocated to the retained habitat to the north east of the site.

2.5.7 The digging up of scrub and tree roots cannot be carried out during the hibernation period, which runs approximately from mid-October to March inclusive, when there would be a significant risk of encountering hibernating or torpid individuals in the soil which would be unable to rouse themselves and escape from the area of the works. The works are therefore to be carried out outside of the hibernating period, ie between April to mid-October inclusive.

## 2.6 **Fish Mitigation**

- 2.6.1 No construction works that would result in ground vibration affecting the river, (e.g. boring/piling) will take place between 1<sup>st</sup> March and 30<sup>th</sup> June, when shad and lamprey would be migrating past the site. If any such works are unavoidable at this time of year, they would be regulated so that migration can occur during this period.

## 2.7 **General Mitigation Measures**

### *'Toolbox Talks'*

- 2.7.1 All contractors carrying out clearance and construction works on the site will be warned of the *possible* presence of otters, nesting birds and or common reptiles, and of their protected status etc, through the undertaking of a 'Toolbox Talk' immediately prior to the commencement of works. Contractors will be issued with a written method statement setting out the general principles and things to look out for etc that will be circulated to all site personnel including any new workers. Contractors will be required to sign a copy of the method statement to indicate that they have seen it.

## 2.8 **Invasive Non-Native Plant Species**

- 2.8.1 Himalayan balsam (*Impatiens glandulifera*) and Japanese knotweed (*Fallopia japonica*), invasive non-native species are present on site (see Environmental Statement, Appendix 7.4, Asbri Planning Ltd, 2013 ) both of which are listed under the Wildlife & Countryside Act 1981 and as such the deliberate or accidental but preventable spreading of which is subject to statutory regulation. A strategy will be implemented to prevent the accidental spread of this species during clearance and construction phases will be implemented as follows, prior to any clearance and or construction activities commencing on site:
- 2.8.2 All areas supporting these species will be clearly demarcated on the ground prior to treatment, be carried out by the appropriately trained persons with relevant certificates/licences and have relevant permissions from NRW etc.
- 2.8.3 Annual monitoring should be undertaken and re-treatment where necessary for a 5-10 year period.

### Chemical control

#### *Himalayan Balsam*

- 2.8.4 Himalayan balsam can be treated effectively through the use of an approved herbicide which can be applied in late spring when the plants are nearing maximum height but before flowering.
- 2.8.5 The spray must be applied late enough to ensure that germinating seedlings have grown up sufficiently to be adequately covered by the spray. Small infestations and individual plants can be controlled by using a suitable herbicide in a weed wiper. Treated stems can be left to decay after chemical treatment, or burnt or composted, if left on site. **Use of a herbicide in or near water requires consultation with NRW.**

*Japanese knotweed*

- 2.8.6 Herbicide treatment is also an effective method to control Japanese knotweed. Herbicides can either be applied early in the growing season and or later in the season. Prior to treatment all stands should be cut and cleared, and then any regrowth sprayed with herbicide. Spraying can take place from May onwards. Stems must not be pulled, which tends to remove highly infectious crown material with the stem. Where it is the intention to spray regrowth with herbicide, cut material should be removed from the area to allow effective spray contact with the emergent growth.
- 2.8.7 Cut stems should be left in a situation to allow drying. This can be achieved by laying the cut stem on the cut stumps of the knotweed (cut at about 200mm) thus preventing contact between the stems and the soil. Once the stems have dried to a deep brown colour they are dead, this is not however the case with the crown or rhizome. All dried stems should be collected and burnt, reapplying herbicide when regrowing shoots reach a height of 0.5m in height.
- 2.8.8 Spraying can take place late in the season, i.e. August to September, to uncut foliage and stems at the end of the growing season. The foliage should be comprehensively wetted with herbicide during a period of dry weather before the first frosts have begun to wilt the foliage, for example using a knapsack sprayer.
- 2.8.9 Where there is risk of contamination to a watercourse, choice of herbicide is limited to formulations of Glyphosphate and 2,4-D amine that are approved for use in or near water. **Use of a herbicide in or near water requires consultation with NRW.** Other herbicides may be used in areas which are away from water and or which pose no risk of contamination. Advice can be sought from a BASIS-registered pesticides advisor prior to commencement of a spraying programme.
- 2.8.10 To avoid harm to any invertebrates particularly bees and other pollinators, herbicide spraying should take place early in the morning or evening in the summer months. Chemical control can only be carried out by approved persons under pesticides regulations. Any person handling and or applying herbicides must hold a certificate of competence from the National Proficiency Tests Council (NPTC).

Manual or non-chemical control

*Himalayan balsam*

- 2.8.11 Himalayan Balsam can also be controlled by hand pulling or machine cutting, provided there is access and the plant can be cut at ground level. A cut above the lowest node will cause the plant to regrow and flower later in the season. Pulling or cutting should be carried out before the end of June, i.e. before the flowers have set seed. Frequent cutting will prevent the plant flowering although cutting too early will result in the regrowth and formation of the flower heads with a greater number of seeds.
- 2.8.12 Mechanical control is likely to be effective only in those locations where good access is available and the ground smooth enough for close mowing and free of shrubs and bushes. Himalayan balsam can also be controlled by regular grazing of infested areas by cattle and sheep, which through intensive grazing will prevent the spread of balsam by grazing

young seedlings and trampling. This is only feasible however where this does not conflict with recreational use.

- 2.8.13 Plant stems can be moved off site and disposed of at landfill or composting facilities if material can be guaranteed free of seeds. To avoid all risk, transport off site should only be carried out before the flowering period. All disposal operations should take place prior to flowering times with the relevant exemptions for burning. When burning, other considerations such as local by-laws and potential pollution etc will need to be accounted for. Otherwise balsam material can be taken to an approved licensed disposal facility, taking care to ensure that all materials are well sealed during transit.

*Japanese knotweed*

- 2.8.14 The entire root and stem system should be excavated up to 7m laterally and 2m deep in areas of infestation. Excavators with caterpillar tracks should be avoided in infested areas to reduce the risk of transferring infestations. On site burial should be to a depth of 5m. The contaminated soil material should be laid in layers less than 1m in depth and covered with a geotextile layer or a heavy gauge polythene sheet, prior to infilling
- 2.8.15 *Combined mechanical and herbicide treatment* can be effective, particularly for the treatment of Japanese knotweed. Using an excavator, the plant material should be scraped into a pile, together with the upper 50cm topsoil containing the crowns and rhizomes, and stockpiled separately from other materials. An excavator can be used to scrape surface crowns and rhizomes into a pile. The exposed ground can be then cultivated to a depth of 50cm, and the piled material spread over this area. The process stimulates the rhizome to produce a higher density of stems, which renders it more vulnerable to herbicide treatment. Subsequent herbicide treatment has been observed to eradicate knotweed after only two applications, which may be performed within the same growing season.
- 2.8.16 Digging can be carried out during the winter months, and then regrowth treated during the spring and summer. Soil contaminated with knotweed should be stockpiled in area that will be undisturbed and regular regrowth treated with herbicide, the upper 50cm should be stockpiled separately from the other less infested material. Where it is intended to bury infested materials on site – a non-persistent herbicide such as glyphosate must be used.

Containment and eradication

- 2.8.17 Access to an infested site should be via a single designated point, where a hygiene facility for personnel and a wheel washing facility is provided. Areas of Japanese knotweed and Himalayan balsam must be securely fenced off, preferably with a high visibility Netlon fencing, prior to treatment. Effective control measures must be implemented before there is any gross disturbance to the soils of the site.
- 2.8.18 Extreme care must be taken to ensure that all equipment used on site is free of material contaminated by either Japanese knotweed or Himalayan balsam – before leaving the site. To reduce the risk of contaminating vehicles, excavators with caterpillar tracks should be avoided.
- 2.8.19 The onsite disposal will require a Landfill Tax exemption for contaminated soil from

customs and excise and a registered exemption of the waste management regulations 1994, as it is considered to be a soil contaminant. NRW will also require notification prior to any burial/burning being carried out. The location of any burial must be recorded, as further chemical treatment may still be required in the future.

## 2.9 **Programming of Works (See Appendix 1)**

### *Works Affecting Trees & Scrub*

2.9.1 There is a high probability that these habitats could be used by nesting birds during the spring and summer months, and also a very small risk of adventitious use by roosting bats during these months. Clearance works must therefore be undertaken in the autumn and winter months (i.e. between about September to March inclusive) in order to minimise the risk of encountering these species. However, there should be no clearance below 100-150mm above ground level, and no ground disturbance, at this time in order to avoid the risk of causing harm to reptiles which may be hibernating at the roots. Subsequent clearance of the roots should then take place in the following spring and summer months (see below).

2.9.2 The felling or clearance of trees and scrub at other times of the year will be preceded by a survey to ensure that no nesting birds are present. Where nests are found, the works will be postponed until after the current nesting cycle is completed.

### *Clearance at Ground Level*

2.9.3 Ground clearance operations, including the extraction of tree roots and removal of brush piles etc, could potentially cause impact to hibernating reptiles if carried out in the winter period. As a general principle, ground level clearance will avoid the main winter hibernation period of November to February inclusive unless the site has previously been cleared of reptiles, in which case the clearance timing is unconstrained.

2.9.4 In the absence of advance clearance of reptiles, ground level clearance in the late summer/autumn (ie September to October) is preferred, when there is also least risk of encountering nesting birds. Clearance at other times of the year is also possible, but must need to be preceded by a survey to ensure that no nesting birds are present.

## 2.10 **Additional Surveys**

2.10.1 Should more than a year elapse between the latest ecological survey, conducted during 2017 by DCE Ltd and the commencement of clearance and development works, the surveys for certain protected species will be updated in accordance with the advice of the Supervising Ecologist.

### **3.0 ENVIRONMENTAL MANAGEMENT PLAN (EMP)**

#### **3.1 Introduction**

- 3.1.1 This section sets out details of the maintenance, management and enhancement measures to be implemented in the retained and new habitats following construction (i.e. the post-development phase). This EMP only applies to Phase 1 of the development site.
- 3.1.2 Unless otherwise agreed with the LPA, the habitats referred to in the EMP will be retained within the ownership and management of the landowner or some other duly appointed body
- 3.1.3 Development of the site is anticipated to occur between the beginning of May 2017 and the end of July 2018. Development of Phase 1 will be the first to commence in May 2017. The management of new and retained wildlife habitats will commence following the occupation of the last house within each phase of the scheme.

#### **3.2 Site Design: Wildlife Features**

- 3.2.1 The proposed site design is shown on Plan Detailed Soft Landscape Proposals, Drawing Number TDA, subject to any subsequent revisions. The plan indicates the location and extent of the habitat features to be either retained/modified or created within the developed site. The design takes into account a number of criteria that have emerged from the ecological surveys, which can be expressed in the following design masterplanning principles.
- 3.2.2 The layout of the developed site will retain/modify a number of the existing habitat features and will also incorporate newly created semi-natural habitats, as well as specific habitat features for protected species known to be present within the site, particularly otters.

##### ***Habitat Features***

- 3.2.3 The newly constructed bund along the riverbank/boundary of SAC will be planted with a continuous hedgerow along its top. Species will be indigenous species, such as hawthorn, blackthorn, hazel and holly. The western slope of the bund will also be planted up with alder, willow and bramble to provide shelter and resting places for otters.
- 3.2.4 The reed, currently of 'District value' is to be retained but modified in order to facilitate the surface water runoff from the development site. Modification will entail dredging to remove silt and litter as well as enlarging. Enhancements to the reed and immediate surrounding area will be through the planting of a reedbed within the wider, eastern section of the reed and the planting of indigenous species in the immediate vicinity to provide suitable bird nesting. New habitats within/around the reed will be subject to the 10 year management plan.

- 3.2.5 All areas of scrub/grassland will have been treated and cleared of non-native species including Japanese knotweed and Himalayan balsam (as detailed in section 2.8 of the WPP) which are present within the scrub along the south eastern boundary and along the western boundary. A large stand of Japanese knotweed exists within the off-site habitat enhancement area, near the M4 bridge. After eradication of the knotweed within this area, the gaps are to be replanted with thorny trees and shrubs e.g. blackthorn and hawthorn to provide suitable resting places for otter. A small stand of Himalayan balsam is present on the northern bank of the ditch/reen. Their eradication from the site, will reduce the risk of spreading either of these Schedule 9 species from the site, as a statutory requirement but will also benefit the area of scrub in the off-site habitat enhancement area by allowing the scrub to become more floristically diverse and increasing its ecological value as scrub.
- 3.2.6 All grassland/scrub habitats within the site will be lost during the development of Phase 1. As such newly planted grassland areas within the new development will be seeded with a suitable flowering lawn mix (e.g. Emorsgate EL1). The planting of native trees within the grassland areas will also be implemented. These newly planted areas will be subject to the 10 year management plan to ensure they retain/enhance their ecological value to at least local level.
- 3.2.7 Measures will also be implemented to the relevant NRW standards to ensure that the water quality of the existing watercourses is not compromised by the development, for example by run-off from the new roads and developed areas. General surface run-off from the development will not be directed towards these areas, and any emergency or flood run-off will pass through storm by-pass interceptors.

#### ***Bat & Bird Box Scheme***

- 3.2.8 Bat and bird boxes will be provided in the design of the new buildings to include 4 swift, 4 house martin boxes and 3 bat boxes on the eaves of the buildings near the river. These will be of woodcrete construction, such as Schwegler models, as these are more durable and require minimal after-maintenance – see Appendix 4. It is recommended that swift boxes be installed in pairs/groups as this aids the rapid formation of swift colonies, similarly with house martin boxes.

#### ***Pollution Control***

- 3.2.9 It will be necessary for appropriate pollution control measures to be implemented, in accordance with NRW standards, to ensure that the river and reen are not adversely affected during construction works. Works compounds should not be sited near to the river or the reen, and contingency measures for unforeseen incidents such as spillages should be set in place prior to commencement of construction works.

#### ***Lighting Strategy***

- 3.2.10 Careful consideration will be given to the design and layout of the lighting in the developed parts of the site, in order to avoid excessive disturbance to nocturnal fauna, particularly bats and otters. Light spillage onto the bund and around the ditch/reen will be kept to the lowest permissible level in developed areas. External lighting on the new houses on the street adjacent to the river would have bulkhead fittings that

would restrict the illumination to the area immediately around the doors. The lighting would be controlled by movement sensors, so that it cannot be left on permanently. No details of lighting are currently available.

#### **4.0 POST DEVELOPMENT MANAGEMENT**

- 4.1 The retained/modified and new habitats of the site including the bund, grassland, trees, scrub and ditch/reen, otter holt etc. will be subject to a management plan designed to maintain and enhance their value to wildlife.
- 4.2 The management of the site, which is the responsibility of the developer, will be ‘in perpetuity’ although the plan itself will cover a period of 10 years. It will be reviewed and revised at 5-yearly intervals. Adequate resources will be made available by the developer to ensure that all elements of management, in accordance with the plan, will be delivered in perpetuity.
- 4.3 A summary of the identified management tasks are detailed below and a full draft timetable is included at Appendix 2.

4.4 Management Plan Schedule

| <b>Key Features/Habitats/Species etc</b>  |                 |                      |   |
|---|-----------------|----------------------|---|
| <b>Habitats</b>   |                 |                      |   |
| <ul style="list-style-type: none"> <li>Newly created species-rich grassland.</li> <li>Hedgerows</li> <li>Trees and scrub habitat</li> <li>Reen</li> <li>Bat and bird boxes</li> </ul>   |                 |                      |   |
| <b>Species</b>  |                 |                      |   |
| <ul style="list-style-type: none"> <li>Roosting bats (Protected species)</li> <li>Nesting birds (Protected species).</li> <li>Himalayan Balsam and Japanese knotweed (Schedule 9 plant subject to statutory regulation).</li> </ul>   |                 |                      |   |
| <b>Existing Management Conditions</b>   |                 |                      |   |
| <ul style="list-style-type: none"> <li>Maintenance of bare ground within cleared, development areas</li> <li>Presence and further spread of non-native invasive species, listed on Schedule 9 of the W&amp;C Act 1981</li> <li>Siltation, encroachment of scrub and rubbish dumping within reen</li> <li>Bird and bat boxes situated on buildings</li> <li>Public Rights of Way (PROW) and other paths through the site</li> </ul>  |                 |                      |   |
| <b>Management Aims</b>  |                 |                      |   |
| <b>Post development/completion of construction</b>  |                 |                      |   |
| <ul style="list-style-type: none"> <li>Maintain permanent fencing along interior boundaries of habitats where they abut development ie along bund, around reen</li> <li>Manage grassland to encourage species diversity</li> <li>Manage reen to encourage species diversity</li> <li>Maintain absence of non-native invasive species from the site</li> <li>Maintain short grassland along pedestrian pathways, where these occur within grassland and encourage use by residents</li> <li>Maintain bird and bat boxes</li> </ul> |                 |                      |   |
| <b>Management Tasks</b>   | <b>Method</b>   | <b>Start Year</b>    | <b>Return</b>                           |
| <b>Hedgerow</b>   |                 |                      |   |
| <ul style="list-style-type: none"> <li>Manage hedgerow through rotation coppice</li> <li>Inspect trees and scrub for possible birds prior to management</li> <li>Monitor hedgerows, trees and scrub and undertake replanting where necessary</li> </ul>   | D<br>-<br>C & D | 1-10<br>1-10<br>1-10 | 2-4 yr rotation<br>As req'd<br>Annually |
| <b>Species rich grassland</b>   |                 |                      |   |
| <b>Newly created grassland</b>  |                 |                      |   |
| <ul style="list-style-type: none"> <li>Maintain diverse sward within grassland, mowing once or twice a year in later summer/autumn, and removing all arisings</li> </ul>  | B               | 1-10                 | Annually                                |
| <b>Reen edges</b>   |                 |                      |   |
| <ul style="list-style-type: none"> <li>Maintain diverse sward within grassland, mowing once or twice a year in later summer/autumn, and removing all arisings</li> </ul>  | B               | 1-10                 | Annually                                |
| <b>Formal path through grassland</b>  |                 |                      |   |
| <ul style="list-style-type: none"> <li>Keep grassland along formal pathways through the linear park short, cutting regularly to an average height of 100-150mm</li> </ul>   | B               | 1-10                 | All year round                          |
| <b>Trees &amp; Scrub</b>  |                 |                      |   |
| <ul style="list-style-type: none"> <li>Remove encroaching scrub from open grassland areas</li> <li>Monitor trees and scrub and undertake replanting where necessary</li> <li></li> </ul>  | F<br>E          | 1-10<br>1-10         | all<br>year round<br>as req'd           |
| <b>Reen</b>   |                 |                      |   |

|   |     |      |                |
|---|-----|------|----------------|
| <ul style="list-style-type: none"> <li>• Maintain water levels</li> <li>• Monitor proportions of vegetation and open water within the pond, and remove vegetation where necessary</li> <li>• Monitor for build-up of sediment and leaf litter, desilt where necessary</li> </ul>  | -   | 1-10 | All year round |
|   | H   | 1-10 | Annually       |
|   | I   | 1-10 | Annually       |
| <b>Bat &amp; Bird Boxes</b> <ul style="list-style-type: none"> <li>• Monitor bat and bird boxes for occupation</li> <li>• Clean out bat and bird boxes*</li> </ul>  | L   | 1-10 | Annually       |
|   | L   | 5    | Year 10        |
| <b>Development areas</b> <ul style="list-style-type: none"> <li>• Keep areas, which have been cleared and compacted for future development, free from vegetation</li> <li>• Protect adjacent habitats during and post development of plots, by securely fencing off with appropriate fencing i.e. Heras, preventing access and incidental damage by site vehicles etc as well as from by residents</li> </ul> | -   | 1-10 | All year round |
|   | -   | 1-10 | All year round |
| <b>All areas</b> <ul style="list-style-type: none"> <li>• Monitor for invasive non-native species and remove as required*</li> <li>• Clearance of litter</li> <li>• Review and revise EMP</li> </ul>  | J/K | 1-10 | Annually       |
|   | -   | 1-10 | All year round |
|   | -   | 5&10 | As req'd       |

\*Task needs to be undertaken by specialised contractors/surveyors with appropriate experience and or licences

## 4.5 MANAGEMENT METHODS

### *A) Creation of Grassland*

- 4.5.1 The eastern slope of the newly created bund, as well as the newly created areas for soft landscaping including road and pavement verges, will be sown with a mix of native grasses and wildflowers. Seeds will be sown in spring or autumn, into low nutrient soil. Details of grassland creation and preferable species are detailed in Appendix 3. All planting stock will be of local, or at least UK, provenance.

### *B) Management of Grassland*

- 4.5.2 Newly created areas of grassland such as those within the bund, around the reen, verges and landscaped areas around the developed site, will be managed by mowing once or twice a year to maintain a diverse tall grassland sward. These areas of grassland will be mown to 100-150mm once or twice a year, in the late summer or autumn (September to October) with all arisings being removed from the site.
- 4.5.3 Where there are formal paths through these areas a 1m wide strip of grassland will be kept mown to an average height of 150mm all year round. Mowing will be by means of a strimmer and gang mower will not be used.
- 4.5.4 Grassland planted Between 1-5m strips of grassland around the ditch/reen will be left uncut, to provide a dense cover to sheltering fauna throughout the year.

### *C) Planting of New Hedgerow*

- 4.5.5 A new hedgerow will be established, along the top of the bund, by planting whips of appropriate native species which are indigenous to the region, during the late autumn period (Sep-Oct). Whips will be planted in two off-set ranks 30cm apart, and protected from browsing by rabbits. Standard forestry aftercare measures will need to be applied. Beating-up of gaps should occur at two years and 5 years. Watering-in using a bowser may be necessary in the first season after planting. Appropriate species are listed in Appendix 2. Planting will favour hawthorn, blackthorn and hazel, with other species making up no more than about 15-20% of the mixture in total. All planting stock will be of local, or at least UK, provenance.

### *D) Trimming of Hedgerow*

- 4.5.6 The hedge will not be trimmed every year as its purpose is to provide a barrier to deter humans and dogs from disturbing the riverbank. Ideally, the hedge should be cut on an approximately four-year rotation. The hedge will be lightly trimmed in late winter (Jan-Feb) and all arisings collected and either removed from the site or used in the creation of 'eco-piles'. Burning on site will be avoided if possible but if unavoidable will be done on metal sheets with the subsequent removal of ash to prevent nutrient enrichment.

***E) Planting of Trees and Scrub***

- 4.5.7 The western slope of the bund will be planted up with whips of appropriate native species which are indigenous to the region, during the late autumn period (Sep-Oct). Whips will be planted in groups and protected from browsing by rabbits. Areas of ground between the groups of trees will be left to regenerate by grasses already present within the river bank. Standard forestry aftercare measures will need to be applied. Beating-up of gaps should occur at two years and 5 years. Watering-in using a bowser may be necessary in the first season after planting. Appropriate species are listed in Appendix 2. Planting will favour alder, willow and bramble, with other species making up no more than about 15-20% of the mixture in total. All planting stock will be of local, or at least UK, provenance.
- 4.5.8 The off-site habitat enhancement area will be planted up with whips of appropriate native species which are indigenous to the region, during the late autumn period (Sep-Oct). Whips will be planted in the gaps left by the eradication of the Japanese knotweed. Areas of ground between the trees will be left to regenerate by scrub species e.g. bramble already present. Standard forestry aftercare measures will need to be applied. Beating-up of gaps should occur at two years and 5 years. Watering-in using a bowser may be necessary in the first season after planting. Appropriate species are listed in Appendix 2. Planting will favour hawthorn and blackthorn, with other species making up no more than about 15-20% of the mixture in total. All planting stock will be of local, or at least UK, provenance.

***F) Maintenance of trees and Scrub (where required)***

- 4.5.9 The tree and scrub area will not require much maintenance, although the scrub may need to be removed if found to be encroaching into grassland areas.

***G) Modification of Reen***

- 4.5.10 The modified reen/ditch will be planted with native water plants e.g. common reed, the area surrounding the reen will be planted with an appropriate seed mix of grasses and wildflowers. The grassland area will be interspersed with native tree species which will stand within the tall grassland, which will remain uncut around the reen/ditch.

***H) Maintenance of Reen Vegetation (where required)***

- 4.5.11 Wetland vegetation will not need much maintenance, but may need occasional clearance to maintain open water. Where this is required, clearance will be undertaken back from the leading edge using either hand clearance or toothed ditching bucket on swing arm of an appropriate excavator. Clearance will be undertaken during the winter months to avoid harming nesting birds. Cleared material will be left on the reen/ditch bank for 24 hours, and any invertebrates present allowed to escape back into the water, before removing from site for disposal. Where large areas require clearance, this will be undertaken in stages and spread over several seasons.

***I) De-siltation of Reen (where required)***

- 4.5.12 The reen/ditch may require de-silting to encourage the development of open water and emergent vegetation. Care will be taken to ensure a reasonable proportion of marginal and emergent vegetation remains in the reen. All reen clearance works will be undertaken during the winter (November to January) to avoid disturbing amphibians and nesting birds, preferably by hand with care being taken to ensure that any pond linings are not damaged. An excavator may be required if large amounts of silt are removed. This will need to be a tracked excavator with hinged arm than can swivel 360 degrees. Chemicals will not be used unless they are required for the treatment of invasive 'alien' species and, in which case, should be used as a final resort.

***J) Clearance of Invasive Aquatic Species (where required)***

- 4.5.13 It is possible that species such as Canadian pondweed (*Elodea canadensis*) New Zealand pigmyweed (*Crassula helmsii*) or water fern (*Azolla filiculoides*) may be introduced, and become problematic.
- 4.5.14 Large species such as Canadian pondweed will be mechanically removed from small areas using rakes or grapples during the winter (November to February). Clearance is likely to be required at 2-3 year intervals where there is a severe infestation. Removed material will need to be left on pond bank for 24 hours to allow invertebrates to escape back into water, before removing from site for disposal. Large areas may require chemical treatment (see below).
- 4.5.15 New Zealand pigmyweed is extremely difficult to eliminate, and can be very destructive to other pond vegetation and fauna. Bankside material will be treated with Glyphosate formulated for use in aquatic environments. Emergent material in the water will be treated with both Glyphosate and "Midstream" if access is possible. Submerged material will be treated with "Midstream" at least twice per growing season at intervals of between 3 and 5 weeks. Covering with black plastic or carpet will also eliminate small patches of this plant, but the shade material will need to remain in place for at least 8 weeks or, preferably, up to 6 months. These methods may also be suitable for other problematic species.
- 4.5.16 Mechanical control methods will not be used for New Zealand pigmyweed, since cutting and tearing produces small plant which can rapidly re-grow. In this way, treatment of an area may lead to infestation of downstream areas or rapid re-infestation of the treated area.

***K) Treatment of Non Native (Terrestrial) Species (across the site)***

- 4.5.17 It is also possible that non-native invasive species may appear on other terrestrial habitats within the site. Species listed on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended) including Japanese knotweed and Himalayan Balsam, which have been recorded on the site, will need to be cleared using appropriate measures (See section 2.8) ensuring their safe disposal and that of any materials that may be contaminated by this species in accordance with regulations. Further advice from an appropriately experienced contractor will be required if any of these species appear within the site.

4.5.18 Other species, such as non-native plants growing within the adjacent gardens, may also spread into the adjacent habitats. Where these are found near the reën or the vicinity of the river they will be removed as soon as possible.

***L) Installing Bat & Bird Boxes***

4.5.19 Bat and bird boxes will be of 'woodcrete' construction, such as those manufactured by Schwegler Ltd, as these are more robust and longer-lived than traditional wooden boxes and require minimal after-maintenance. Bat boxes will be mounted at least 4m from the ground (preferably 5m) in locations where they cannot be readily accessed by predators such as cats or humans (e.g. away from footpaths). Entrances to boxes will not be obscured by overhanging vegetation and will not be illuminated at night. Bird boxes will be installed in groups or pairs on the eaves of the buildings. Bird boxes suitable for swift and house martin should be installed. Further details are provided in Appendix 5.

4.5.20 The occupation of boxes will be monitored annually by means of ground level observations carried out at an appropriate time of year. Cleaning out will be undertaken by appropriately experienced and, for bats, licensed personnel at approximately 5-yearly intervals.

## **5.0 POST DEVELOPMENT MONITORING**

- 5.1 Post development monitoring will be required to monitor the condition of modified habitats as well as those newly created as part of the development.
- 5.2 In addition, retained and newly created habitats and habitat features within the site will be monitored to ensure that they are providing the intended ecological role, and as such adequate mitigation for development within Phase 1. Specific habitats requiring maintenance and monitoring, and the actions required to carry out monitoring are included in the EMP, and detailed in the management schedule (4.5) and programme (Appendix 2). This will include the annual monitoring of the site for the presence of non-native species such as Japanese knotweed and Himalayan balsam, which will be cleared from the site prior to any development activities commencing. Appropriate actions will be undertaken to address any issues arising from monitoring for example the presence of non-native species and or failed planting, in consultation with Supervising ecologist and EMP amended accordingly.

## 6.0 RESPONSIBILITIES

### 6.1 Wildlife Protection Plan

- 6.1.1 Responsibility for the implementation of the WPP will rest with Pobl Housing Association, who will appoint an appropriate site management operative to act as the 'Ecological Clerk of Works' (ECW) for the duration of the clearance and construction phases. The ECW will be based at the site and will be at an appropriately senior grade so that they may readily influence and direct the clearance and construction operations on the site in accordance with the requirements of the WPP.
- 6.1.2 Pobl Housing Association will also retain the services of an appropriately qualified ecological contractor to act as 'Supervising Ecologist'. The Supervising Ecologist will advise and support the ECW, and will also provide any necessary licensed presence which may be necessary on the site. The Supervising Ecologist will act as the primary link between the developer, the statutory body (NRW) and the LPA Ecologist.
- 6.1.3 The services of a Supervising Ecologist will be retained on an 'on-call' basis for the duration of the WPP so that they will be available to deal rapidly with any protected species or other emergencies which may arise as the development operations progress.
- 6.1.4 Pobl Housing Association will be responsible for delivery of the mitigation and enhancement measures required by the WPP across the site.

### 6.2 Environmental Management Plan

- 6.2.1 Responsibility for the implementation of the EMP will rest with Pobl Housing Association, who may appoint an appropriately qualified landscape management contractor to undertake the physical works required on the site by the EMP.
- 6.2.2 Pobl Housing Association will also retain the services of an appropriately qualified ecological contractor to act as 'Supervising Ecologist' and to advise on, and where necessary, supervise the implementation of the maintenance and management tasks set out in the EMP. The Supervising Ecologist will liaise directly with the body carrying out the physical works and will be in a position to amend or direct those works as required in order to ensure that statutory obligations and/or the objectives of the EMP are met.
- 6.2.3 The Supervising Ecologist, or some other appropriately qualified and licensed contractor, will undertake the monitoring tasks set out in the management plan contained within the EMP.
- 6.2.4 Pobl Housing Association will provide all of the resources and funding necessary to implement the EMP in perpetuity for as long as they are the landowner of the site, and where or if the ownership is transferred any new landowner will be responsible for such provisions. This will include the monitoring requirements, as well as revisions to the management plans and the delivery of any additional management measures or changes to management practices, which may be identified at a later date through monitoring.

## 7.0 REFERENCES

**Asbri Planning Ltd (Asbri Planning Ltd, 2013)** *Land South of Glan Usk, Newport, Environmental Statement, Unpublished Report*

**Asbri Planning Ltd (Asbri Planning Ltd, 2014)** *Land South of Glan Usk, Newport, Environmental Statement, Addendum, Unpublished Report*

**South Wales Wildlife Sites Partnership (SWWSP 2004)** *Guidelines for the Selection of Wildlife Sites in South Wales.* Gwent Wildlife Trust.

**United Kingdom Steering Group (UKSG 1995)** *Biodiversity: The UK Steering Group Report.* Vols 1-2. HMSO, London.

**Wales Biodiversity Partnership (WBP 2008)** *Criteria for the Selection of Sites of Importance for Nature Conservation in the County Boroughs of Blaenau Gwent, Caerphilly, Merthyr Tydfil & Rhondda Cynon Taff (The 'Mid-Valleys Area').* Wales Biodiversity Partnership/Welsh Assembly Government.

**Wales Biodiversity Partnership (WBP 2016)** *Section 7: Interim List of Living Organisms & Habitats of Principal Importance for the Purpose of Maintaining and Enhancing Biodiversity in Wales.* Wales Biodiversity Partnership/Welsh Government.

**APPENDIX 1: TIMING OF WORKS (PRE & DURING CONSTRUCTION)**

**Table 1: showing suitable time for carrying out works in relation to protected species**

|   | Jan   | Feb | Mar   | Apr | May | Jun | Jul | Aug | Sep                     | Oct | Nov                                    | Dec |  |
|---|---|-----|---|-----|-----|-----|-----|-----|-------------------------|-----|--|-----|--|
| <b>Reptiles (trees, scrub and grassland)</b>  | Above ground clearance (down to 300mm)  |     | Stump and root removal  |     |     |     |     |     |                         |     | Above ground clearance (down to 300mm) |     |  |
| <b>Nesting birds (Trees, hedge and scrub)</b> | <ul style="list-style-type: none"> <li>• Clearance of vegetation</li> <li>• Erection of nest boxes</li> </ul> |     | Avoid clearance of vegetation unless confirmed no nesting birds |     |     |     |     |     | Clearance of vegetation |     |  |     |  |

**APPENDIX 2: INDICATIVE BIODIVERSITY MANAGEMENT PLAN TIMETABLE PHASE 1 (2018-2028 – to be confirmed)**

| Management Areas/Tasks   | Year (when Enabling works/Phase 1 development commence) | Return   | 2017 (tbc) |     |     |     |     | 2018 (tbc) |     |     |     |     | 2019 (tbc) |     |     |     |     | 2020 (tbc) |     |     |     |     | 2021 (tbc) |     |     |     |     | Method | Constraints |     |     |       |                    |                     |                |
|--|---|----------|------------|-----|-----|-----|-----|------------|-----|-----|-----|-----|------------|-----|-----|-----|-----|------------|-----|-----|-----|-----|------------|-----|-----|-----|-----|--------|-------------|-----|-----|-------|--------------------|---------------------|----------------|
|  |   |          | J-F        | M-A | M-J | J-A | S-O | N-D        | J-F | M-A | M-J | J-A | S-O        | N-D | J-F | M-A | M-J | J-A        | S-O | N-D | J-F | M-A | M-J        | J-A | S-O | N-D | J-F | M-A    | M-J         | J-A | S-O | N-D   |                    |                     |                |
| <b>1) HEDGEROW</b>   |   |          |            |     |     |     |     |            |     |     |     |     |            |     |     |     |     |            |     |     |     |     |            |     |     |     |     |        |             |     |     |       |                    |                     |                |
| 1.1 Manage hedgerow and scrub through rotation coppice   | 1-5   | 2-4yrs   |            |     |     |     |     |            |     |     |     |     |            |     |     |     |     |            |     |     |     |     |            |     |     |     |     |        |             |     |     |       | D                  | Nesting birds, bats |                |
| 1.2 Inspect trees and scrub for possible birds and bats (where necessary) prior to management                          | 1-5   | As req'd |            |     |     |     |     |            |     |     |     |     |            |     |     |     |     |            |     |     |     |     |            |     |     |     |     |        |             |     |     | *     | nesting bird, bats |                     |                |
| 1.3 Monitor hedgerows, trees and scrub and undertake replanting where necessary  | 1-5   | Annually |            |     |     |     |     |            |     |     |     |     |            |     |     |     |     |            |     |     |     |     |            |     |     |     |     |        |             |     |     | C & D |                    |                     |                |
| <b>2) SPECIES RICH GRASSLAND</b>   |   |          |            |     |     |     |     |            |     |     |     |     |            |     |     |     |     |            |     |     |     |     |            |     |     |     |     |        |             |     |     |       |                    |                     |                |
| <i>Newly created areas of grassland</i>  |   |          |            |     |     |     |     |            |     |     |     |     |            |     |     |     |     |            |     |     |     |     |            |     |     |     |     |        |             |     |     |       |                    |                     |                |
| 2.1 Maintain diverse sward within grassland mowing once or twice a year in late summer/autumn, and remove all arisings | 1-10  | Annually |            |     |     |     |     |            |     |     |     |     |            |     |     |     |     |            |     |     |     |     |            |     |     |     |     |        |             |     |     |       |                    | B                   | Nesting birds? |
| <i>Reen edges</i>  |   |          |            |     |     |     |     |            |     |     |     |     |            |     |     |     |     |            |     |     |     |     |            |     |     |     |     |        |             |     |     |       |                    |                     |                |
| 2.2 Maintain diverse sward within grassland mowing once or twice a year in late  | -   | -        |            |     |     |     |     |            |     |     |     |     |            |     |     |     |     |            |     |     |     |     |            |     |     |     |     |        |             |     |     |       |                    |                     |                |







### APPENDIX 3: SUITABLE NATIVE SPECIES FOR PLANTING

#### Grassland

New or existing low-fertility topsoil should be lightly harrowed and raked to create a moderately fine tilth. No fertiliser should be added to any of these areas. Areas should be seeded either by hand (broadcasting) or by using a light tractor-mounted spinner or drill with drills at 5cm centres, 5mm maximum depth, immediately after preparation which should ideally occur in late summer (ie Aug-Sep). The seed rate should be 4g/m<sup>2</sup> (ie 40kg/ha). The seed mixture in new soil areas should comprise an 80:20 mix of native grass to native wildflower seed.

All seed material should be of Welsh, or at least UK, native origin. Seed suppliers should be signatories to the *Flora Locale* Code of Practice for collectors, growers and suppliers of native plants and seed.

**Flowering lawn mixture** (allowing regular maintenance to create a relatively short sward) (eg Emorsgate Seeds EL1)

|                             |                    |
|-----------------------------|--------------------|
| <i>Galium verum</i>         | Lady's bedstraw    |
| <i>Leontodon hispidus</i>   | Rough hawkbit      |
| <i>Leucanthemum vulgare</i> | Oxeye daisy        |
| <i>Lotus corniculatus</i>   | Birds-foot trefoil |
| <i>Primula veris</i>        | Cowslip            |
| <i>Prunella vulgaris</i>    | Self-heal          |
| <i>Ranunculus acris</i>     | Meadow buttercup   |
| <i>Rumex acetosa</i>        | Common sorrel      |
| <i>Trifolium pratense</i>   | Red clover         |
| <i>Agrostis capillaris</i>  | Common bent        |
| <i>Cynosurus cristatus</i>  | Crested dog's-tail |
| <i>Festuca rubra</i>        | Red-fescue         |
| <i>Phleum bertolonii</i>    | Smaller cat's-tail |

A sward of this type may take longer to form a dense turf than more conventional grass lawns. **Once established the lawn should be mown regularly (as any other lawn) to a sward height of between 25-40mm. Reduce mowing in April to allow cowslip to flower and from late June to allow further flowering of the other species - next cut once the sward again becomes untidy. Cuttings should be collected and removed from site.**

**Wildflower meadow** (creating a more 'traditional' meadow with a long sward) (eg Emorsgate Seeds EM3)

|                             |                  |
|-----------------------------|------------------|
| <i>Achillea millefolium</i> | Yarrow           |
| <i>Centaurea nigra</i>      | Common knapweed  |
| <i>Centaurea scabiosa*</i>  | Greater knapweed |

|                             |                     |
|-----------------------------|---------------------|
| <i>Daucus carota</i>        | Wild carrot         |
| <i>Galium mollugo</i>       | Hedge bedstraw      |
| <i>Galium verum*</i>        | Lady's bedstraw     |
| <i>Knautia arvensis*</i>    | Field scabious      |
| <i>Leontodon hispidus</i>   | Rough hawk-bit      |
| <i>Leucanthemum vulgare</i> | Ox-eye daisy        |
| <i>Lotus corniculatus</i>   | Bird's-foot trefoil |
| <i>Origanum vulgare*</i>    | Wild marjoram       |
| <i>Plantago media*</i>      | Hoary plantain      |
| <i>Primula veris</i>        | Cowslip             |
| <i>Prunella vulgaris</i>    | Self-heal           |
| <i>Ranunculus acris</i>     | Meadow buttercup    |
| <i>Rhinanthus minor</i>     | Yellow rattle       |
| <i>Rumex acetosa</i>        | Common sorrel       |
| <i>Sanguisorba minor*</i>   | Salad burnet        |
| <i>Silene dioica</i>        | Red campion         |
| <i>Silene vulgaris</i>      | Bladder campion     |
| <i>Vicia cracca</i>         | Tufted vetch        |
| <i>Primula veris</i>        | Cowslip             |
| <i>Prunella vulgaris</i>    | Selfheal            |
| <i>Ranunculus acris</i>     | Meadow buttercup    |
| <i>Rumex acetosa</i>        | Common sorrel       |
| <i>Trifolium pratense</i>   | Red clover          |
| <i>Agrostis capillaris</i>  | Common bent         |
| <i>Cynosurus cristatus</i>  | Crested dog's-tail  |
| <i>Festuca rubra</i>        | Red-fescue          |
| <i>Phleum bertolonii</i>    | Smaller cat's-tail  |

\* *For calcareous soils*

For the first year of growth, mowing should take place at 6-8 weeks after sowing, with the cuttings collected and disposed of off-site. This should be repeated at two-monthly intervals, with the last cut being made in October.

In the second and subsequent years, the grass should be mown twice each year, with a first cut to 50mm in April and a second cut to 100mm in September. All cuttings should be collected and removed for off-site disposal.

### **Trees and shrubs**

All planting stock should be of native species which are indigenous to the region and will be of Welsh or at least UK, provenance.

**New Woodlands**

| <i>Canopy Species</i>        |                 | <b>Percentage</b> |
|------------------------------|-----------------|-------------------|
| <i>Quercus robur</i> and/ or | Pedunculate oak | 40                |
| <i>Quercus petraea</i>       | Sessile oak     | 40                |
| <i>Fraxinus excelsior</i>    | Ash             | 30                |
| <i>Acer campestre</i>        | Field maple     | 20                |
| <br>                         |                 |                   |
| <i>Understorey</i>           |                 |                   |
| <i>Corylus avellana</i>      | Hazel           | 30                |
| <i>Crataegus monogyna</i>    | Common hawthorn | 30                |
| <i>Betula pendula</i>        | Silver birch    | )                 |
| <i>Cornus sanguinea</i>      | Dog wood        | )                 |
| <i>Ilex aquifolium</i>       | Holly           | )                 |
| <i>Malus sylvestris</i>      | Crab apple      | )                 |
| <i>Prunus avium</i>          | Wild cherry     | ) 40              |
| <i>Prunus spinosa</i>        | Blackthorn      | )                 |
| <i>Rosa canina</i>           | Common dog-rose | )                 |
| <i>Sorbus aucuparia</i>      | Rowan           | )                 |
| <i>Taxus baccata</i>         | Yew             | )                 |
| <i>Viburnum opulus</i>       | Guelder rose    | )                 |

Planting should be carried out using 600mm bare-rooted transplants in spiral plastic guards (rabbit/vole protection) where appropriate. Standard tree aftercare should be applied.

**New Hedgerows (a minimum of seven species)**

| <i>Canopy Species</i>     |                 | <b>Percentage</b> |
|---------------------------|-----------------|-------------------|
| <i>Crataegus monogyna</i> | Common hawthorn | 30                |
| <i>Prunus spinosa</i>     | Blackthorn      | 10                |
| <i>Corylus avellana</i>   | Hazel           | 20                |
| <i>Acer campestre</i>     | Field maple     | )                 |
| <i>Cornus sanguinea</i>   | Dogwood         | )                 |
| <i>Euonymus europaeus</i> | Spindle         | )                 |
| <i>Fraxinus excelsior</i> | Ash             | )                 |
| <i>Ilex aquifolium</i>    | Holly           | ) 40              |

|                         |                 |   |
|-------------------------|-----------------|---|
| <i>Prunus avium</i>     | Wild cherry     | ) |
| <i>Quercus robur</i>    | Pedunculate oak | ) |
| <i>Rosa canina</i>      | Common dog-rose | ) |
| <i>Sambucus nigra</i>   | Elder           | ) |
| <i>Sorbus aucuparia</i> | Rowan           | ) |
| <i>Viburnum opulus</i>  | Guelder rose    | ) |

**Climbers**

|                              |                 |                             |
|------------------------------|-----------------|-----------------------------|
| <i>Clematis vitalba</i>      | Traveller's-joy | ) Alternate at 3m intervals |
| <i>Lonicera periclymenum</i> | Honeysuckle     | )                           |
| <i>Solanum dulcamara</i>     | Bittersweet     | )                           |
| <i>Tamus communis</i>        | Black bryony    | )                           |

Ideally plant in late autumn, after mid-November, although anytime between October and March is appropriate if the ground is not frozen. Plant 60-125mm high whips in trenches (300mm depth x 600mm width) in two lines 300mm apart to form a staggered, double row. Whips in each line should be 450mm apart, giving a total of five plants per running metre. Use a spiral guard to protect the whip from rabbits with a cane to support them. Back fill with a mixture of the topsoil excavated from the pit, mixed with organic matter.

Newly planted hedges are vulnerable to damage by wind, drought and severe weather for the first 2-3 years. Keep moist and mulch with a 50-75mm layer of composted bark to stop weed growth and retain moisture in the soil.

**Wildlife friendly plants for formal landscaping**

The species listed below are primarily non-native species, which are commonly found in gardens and formal landscape areas. Those native species included are aesthetically pleasing and suitable for formal planting schemes.

**Woody Species**

|  |  |
|--|--|
| Bodnant viburnum ( <i>Viburnum x bodnantense</i> ) | Lilac ( <i>Syringa vulgaris</i> )              |
| Californian lilac ( <i>Ceanothus spp.</i> )        | Mahonia ( <i>Mahonia spp.</i> )                |
| Firethorn ( <i>Pyracantha spp.</i> )               | Mock orange ( <i>Philadelphus spp.</i> )       |
| Laurustinus ( <i>Viburnum tinus</i> )              | Serviceberry ( <i>Amelanchier canadensis</i> ) |
| Japanese quince ( <i>Chaenomeles japonica</i> )    | White jasmine ( <i>Jasminium officinale</i> )  |

**Herbs**

|  |   |
|--|---|
| Alpine rock-cress ( <i>Arabis alpina</i> ) | Orpine ( <i>Sedum telephium</i> )                     |
| Angelica ( <i>Angelica archangelica</i> )  | Perennial cornflower ( <i>Centaurea montana</i> )     |
| Annual honesty ( <i>Lunaria annua</i> )    | Perennial honesty ( <i>Lunaria rediviva</i> )         |
| Aubretia ( <i>Aubretia deltoidea</i> )     | Perennial sunflower ( <i>Helianthus decapetalus</i> ) |

Autumn Stonecrop (*Sedum* 'Purple Emperor')  
 Borage (*Borago officinalis*)  
 California poppy (*Eschscholtzia californica*)  
 Canadian Fleabane (*Erigeron canadensis*)  
 Candytuft (*Iberis sempervirens*)  
 Christmas rose (*Helleborus niger*)  
 Common mallow (*Malva sylvestris*)  
 Common poppy (*Papaver rhoeas*)  
 Cosmos (*Cosmos bipinnatus*)  
 Evening primrose (*Oenothera biennis*)  
 Wood forget-me-not (*Myosotis sylvatica*)  
 French marigold (*Tagetes spp.*)  
 Globe thistle (*Echinops ritro*)  
 Great mullein (*Verbascum thapsus*)  
 Grecian windflower (*Anemone blanda*)  
 Heart-Leaf Ice-plant (*Aptenia cordifolia*)  
 Hollyhock (*Althaea rosea*)  
 Hyssop (*Hyssopus officinalis*)  
 Ice plant (*Sedum spectabile*)  
 Lacy phacelia (*Phacelia tanacetifolia*)  
 Late Michaelmas-daisy (*Aster x versicolor*)  
 Lavender (*Lavandula angustifolia.*)  
 Lenten rose (*Helleborus orientalis*)  
 Ox-eye daisy (*Leucanthemum vulgare*)  
 Marjoram (*Origanum vulgare*)

Phlox (*Phlox paniculata*)  
 Poached-egg plant (*Limnanthes douglasii*)  
 Purple coneflower (*Echinacea purpurea*)  
 Purple-top vervain (*Verbena bonariensis*)  
 Red campion (*Silene dioica*)  
 Red valerian (*Centranthus ruber*)  
 Rosemary (*Rosmarinus officinalis*)  
 Sage (*Salvia officinalis*)  
 Shrubby Veronica (*Hebe recurva*)  
 Snapdragon (*Antirrhinum majus*)  
 Soapwort (*Saponaria officinalis*)  
 Spear mint (*Mentha spicata*)  
 Spring crocus (*Crocus chrysanthus*)  
 Sunflower (*Helianthus annuus*)  
 Sweet alyssum (*Lobularia maritime*)  
 Sweet bergamot (*Monarda didyma*)  
 Sweet rocket (*Hesperis matronalis*)  
 Sweet William (*Dianthus barbatus*)  
 Tickseed (*Coreopsis spp*)  
 Tobacco plant (*Nicotiana affinis*)  
 Wallflower (*Cheiranthus cheiri*)  
 Winter aconite (*Eranthis hyemalis*)  
 Yellow alyssum (*Alyssum saxatile*)  
 Yellow loose-strife (*Lysimachia vulgaris*)

Wall plants

**Low growing plants (that will grow in shallow, free draining soil ie in gaps in stone walls)**

|                     |                               |
|---------------------|-------------------------------|
| Spurges             | <i>Euphorbia sp</i>           |
| Saxifrages          | <i>Saxifraga</i>              |
| Sedums              | <i>Sedum sp</i>               |
| Ivy leaved Toadflax | <i>Cymbalaria</i>             |
| Yellow Corydalis    | <i>Pseudofumaria lutea</i>    |
| Polypody fern       | <i>Polypodium sp</i>          |
| Wall rue (fern)     | <i>Asplenium ruta-muraria</i> |

**Climbing plants (that require support from trellis etc)**

|              |  |
|--------------|--|
| Clematis     | <i>Clematis sp.</i> There are numerous non native climbing clematis plants |
| Golden hop   | <i>Humulus lupulus</i>   |
| Star jasmine | <i>Jasminum officinale</i>   |
| Honeysuckle  | <i>Lonicera percicylymenum</i> as well as other non native species         |
| Wisteria     | <i>Wisteria sp</i>   |
| Ivy          | <i>Hedera helix</i>  |
| Hydrangea    | <i>Hydrangea petiolaris</i>  |
| Potato vine  | <i>Solanum jasminoides</i>   |
| Pyracantha   | <i>Pyracantha sp</i>   |
| Roses        | <i>Rosa sp.</i> There are numerous non native climbing rose plants         |

**Sources:** *Plants for wildlife friendly Gardens* (Natural England), *Planting Gardens for Birds* (RSPB), *Gardening for Bats* (Bat Conservation Trust) and *Starting a Butterfly Garden* (School Garden Company).

## **APPENDIX 4: BAT & BIRD BOXES & BAT ACCESS POINTS**

### ***Selection of Trees***

Selected trees should be a minimum of 300mm diameter at the height of fixing. Trees should not be obviously unstable or badly rotted. The timber and bark at the point of fixing should be sound. Species of tree is not important, although broadleaved trees should be favoured.

If not enough trees of suitable size are available on the site it will be necessary to attach boxes onto the top of railway sleepers or wooden posts. These should be a minimum of 200mm diameter, and project at least 5m above ground level after piling.

### ***Location of Selected Trees***

Trees immediately adjacent to highways should generally be avoided, so as to avoid drawing bats and birds into the carriageway where they may be killed by traffic. Selected trees should ideally be set back from the highway edge by at least 5m, preferably more.

Bat boxes are more effective when mounted in clusters of, say, 4-5 in an area of about 50m square, but this is not essential. Otherwise, boxes can be scattered fairly randomly throughout the scheme, wherever there are suitable trees available.

### ***Position of Boxes on Trees***

Boxes should be mounted on tree trunks, rather than on boughs or branches. The mounting location should not be heavily shaded. Boxes should be mounted vertically on the tree.

Boxes should be mounted a minimum of 4m from the ground, preferably 5m, and as far as possible placed on the SE or SW-facing surfaces of the tree trunk.

Bat boxes should ideally be mounted in groups of 2-3 around the Se, S and SW faces of the same tree, so as to provide a wide range of microclimatic conditions.

The entrance to the box should be clear of obstructions and obstacles in the flight-path towards it. An 'open airspace' of about 3m square should be preserved in front of and below the entrance, and elsewhere any overhanging branches should be at least 1m away. The entrances of bat boxes should not be directly illuminated at night.

The mounting location should be readily and safely accessible by ladder, but not accessible by someone climbing up the trunk or onto an adjacent tree or wall etc; some lower branches may need to be trimmed below the box to remove ready handholds or footholds for would-be tree-climbers (as well as any small branches crowding the entrance).

As far as possible, boxes should be placed in locations which are not conspicuous from the ground, so as not to attract unwanted attention from passer-by. This objective is obviously assisted by selecting locations which are on private land, or which are not visible/accessible from public footpaths, byways etc.

### ***Fixings***

Schwegler 1B, 2H and 2F boxes come with a single point-of-attachment wire which benefits from modification. The wire should be cut through at centre top of the loop, and opened-out to provide two separate fixing straps, one on either side of the box (see graphic). A new fixing loop should be twisted at the end of each strap, and these used to nail up the box using two nails, one on either side of the box, rather than just the one nail as provided for. The two-nail fixing gives greater stability, allows the box to be fitted more closely to the tree trunk, and gives a second point of fixture in the event that one should fail in the future.

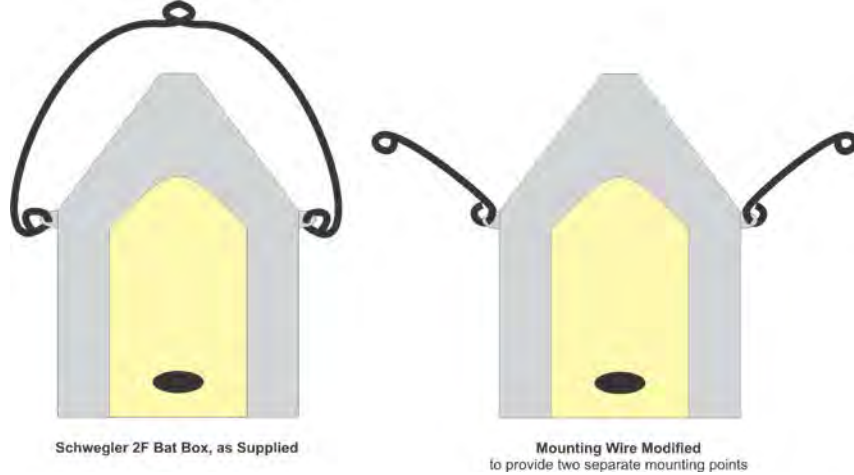
Fixing nails should be galvanised, or similar non-rusting type; a minimum of 85mm long by 5mm in diameter. Aluminium nails are preferred as they will present less of a chainsaw hazard in the future.

Fixing nails should be passed through a non-rusting metal washer of about 20mm diameter, and then through the loop of the fixing wire; nails should be driven into the tree trunk at an angle of about 45-50° from vertical.

Some 'slack' should be allowed in the fixing wires when mounting the box, to allow the tree continue to grow.

***Recording of Box Locations***

The location of each individual box should be carefully recorded on a suitable plan at a scale which is sufficient to indicate individual trees. A GPS position should be taken wherever possible.





Schwegler 2F bat box



Schwegler 1FR wall integrated bat box,  
can be rendered over, just leaving entrance



Schwegler 27 wall integrated bat box,  
can be rendered over



Schwegler 1FQ wall-mounted bat box



Schwegler 2FF wall-hanging bat box



Schwegler 1WI integral wintering  
bat box, can be rendered over

**EXAMPLES OF INTEGRATED BAT BOXES**

**Suitable for rendering over, leaving just the entrance exposed**



Schwegler 1FR



Schwegler 1FE



Schwegler 1WI  
(Hibernation box)

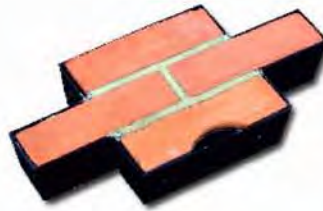


ACO Integrated

**Brick or custom-faced boxes**



Habibat Custom Face  
(Can have any facing)



BirdBrickHouse  
Brick-faced bat box



**Wall cavity boxes**



Ibstock Type B



Ibstock Type B  
(Small)

Small Red  
215 x 215 mm



Wildex Wall Cavity  
(Large)



Wildex Wall Cavity  
(Small)



Vivara Pro  
Woodstone Built-in

**Exposed at surface**



Schwegler 27



Ibstock Type C



Schwegler 9A-1 House Martin Nest Box



Schwegler 9A House Martin Nest Box

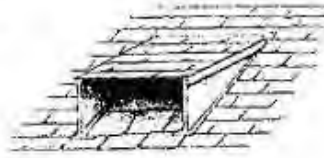
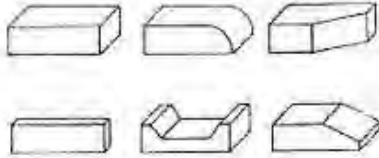


Schwegler 1A Lightweight Swift Box



Schwegler 17A Swift Nest Box (Triple Cavity)

### New access points



WALLING BRICKS FOR CREATING BAT ACCESS POINTS - A STANDARD BRICK IS SHOWN TOP LEFT



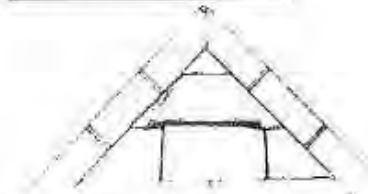
DORMER ENTRANCE PARTICULARLY SUITABLE FOR HORSESHOE BATS



ACCESS SLITS IN SOFFITS



RIDGE VENTILATORS CAN BE ADAPTED AS BAT ACCESS POINTS - IT MAY BE NECESSARY TO REMOVE INTERNAL MESH OR PLASTIC MOULDING



LEAD SADDLE IN PLACE OF A SLATE TO ALLOW BATS ACCESS TO RIDGE OR ROOF VOID

REDRAWN FROM THE BAT WORKERS' MANUAL (JNCC, 1999)

Land off Herbert Road, Newport  
WWP & EMP

Plan 1: Site Location



DCE 908

NTS

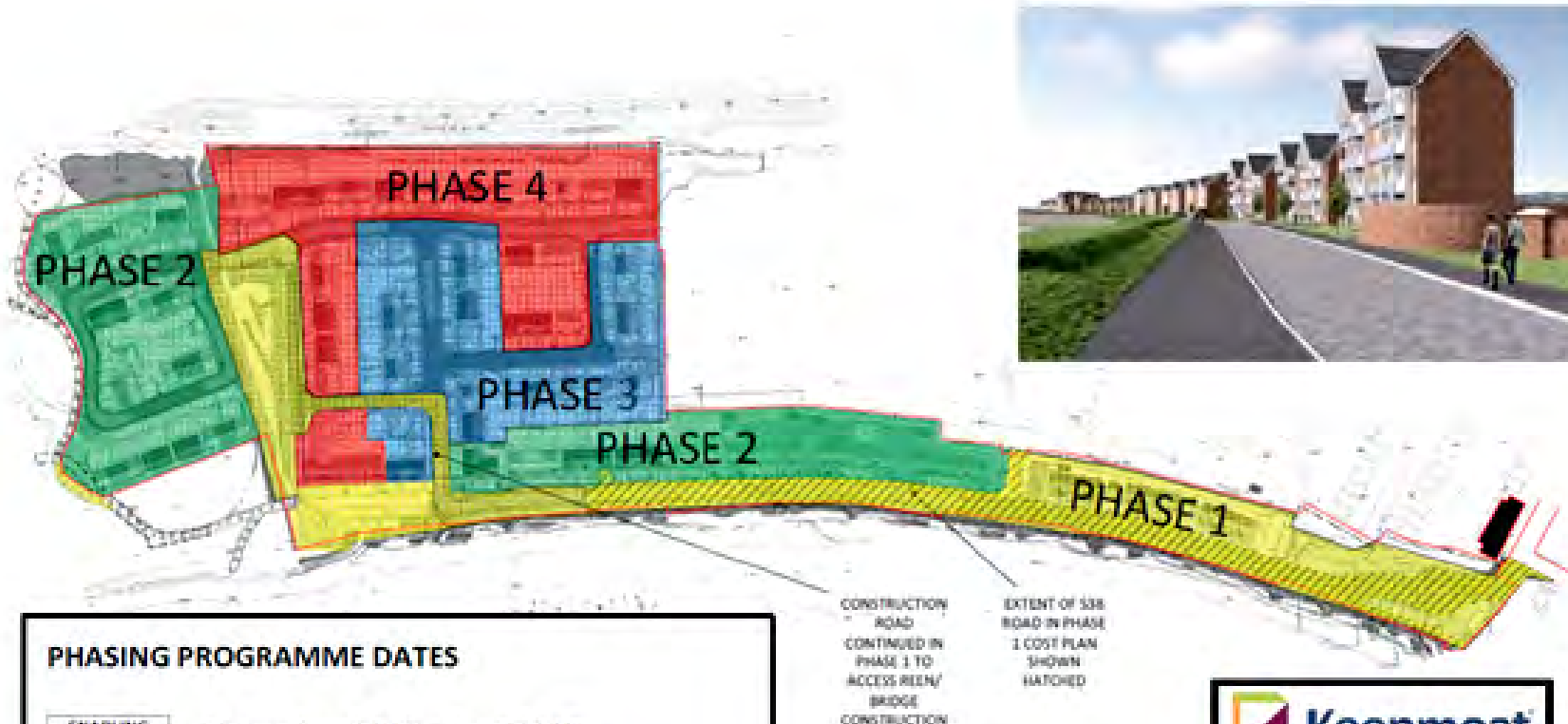
March 2017



**Key**

-  Site Boundary
-  Off-site habitat enhancement area





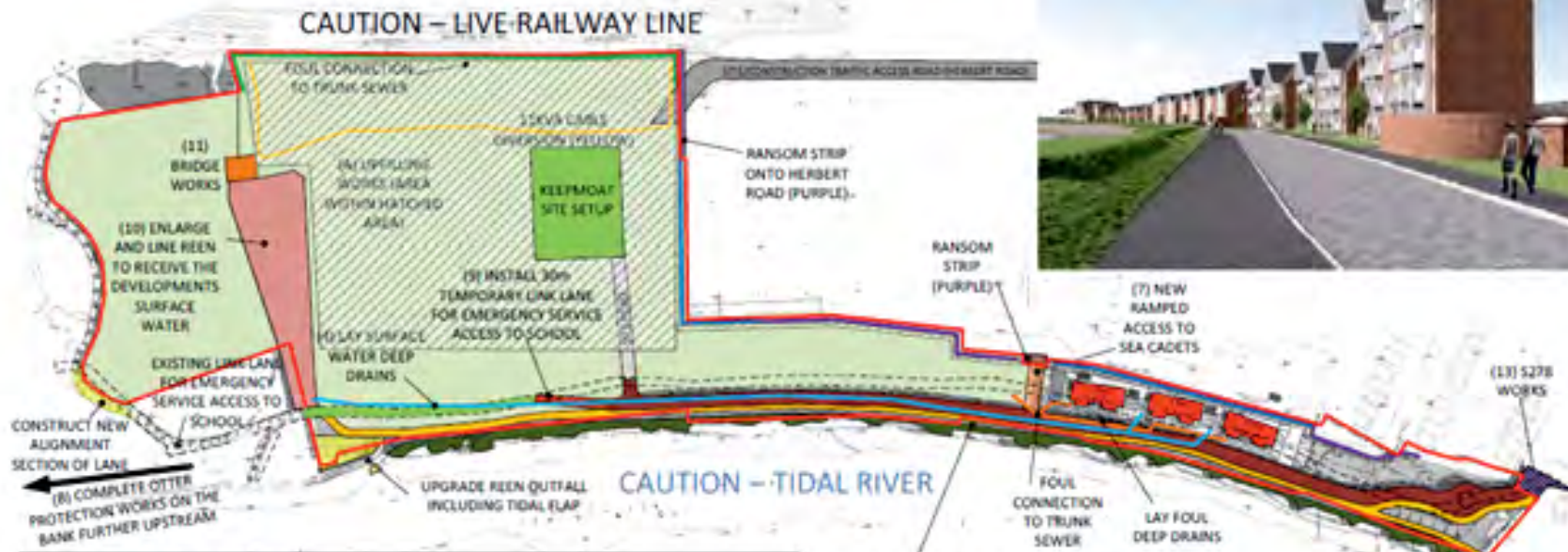
CONSTRUCTION ROAD CONTINUED IN PHASE 1 TO ACCESS REEF/ BRIDGE CONSTRUCTION

EXTENT OF 538M ROAD IN PHASE 1 COST PLAN SHOWN HATCHED

**PHASING PROGRAMME DATES**

|                |  |
|----------------|--|
| ENABLING WORKS | November 2016 – April 2017                                   |
| PHASE 1        | 2 <sup>nd</sup> May 2017 – 25 <sup>th</sup> July 2018        |
| PHASE 2        | 22 <sup>nd</sup> January 2018 – 10 <sup>th</sup> August 2019 |
| PHASE 3        | 5 <sup>th</sup> November 2018 – 30 <sup>th</sup> March 2020  |
| PHASE 4        | 1 <sup>st</sup> July 2019 – 18 <sup>th</sup> December 2020   |

  
**HERBERT ROAD  
NEWPORT**  
**PHASING**  
REVISION: 0    07/11/2016



**SCOPE OF WORKS**

**ENABLING WORKS**

- (A) Filling to make up levels to 8.8m AOD (Cut and fill including land north of reen) with geotextile and 400mm stone piling mat finishing at 9.2m AOD.
- (B) Offsite other works.

**PHASE 1 SCOPE OF WORK**

- (1) 20 apartments in three blocks (shown red).
- (2) Road to first proposed new planning turning on new residential planning proposal with turning head (shown brown).
- (3) Foul drainage to extent of S38 road to discharge into existing foul outlet.
- (4) Surface water drain discharging to reen (shown as light blue line).
- (5) Retaining structures to perimeter of whole site where required (reinforced earth banks shown green; gabions shown dark blue; concrete shown purple).
- (6) Main infrastructure services from Courtney Street to service first three blocks.
- (7) Vehicular and pedestrian access to the Sea Cadets TS Resolute land.
- (8) Works to river bank including form bund, planting & fence, extinguish and create new public right of way.
- (9) Maintain emergency access lane to adjacent school.
- (10) Form reen including concrete lining, outfall, flap & planting.
- (11) Form eastern bridge crossing reen.
- (12) Adjust existing manholes to suit new levels.
- (13) Section 278 works (shown hatched purple).
- (14) Reen and site perimeter fencing including acoustic fence.
- (15) Procure services and diversions for Phase 1 and 11kV diversion towards eastern boundary.

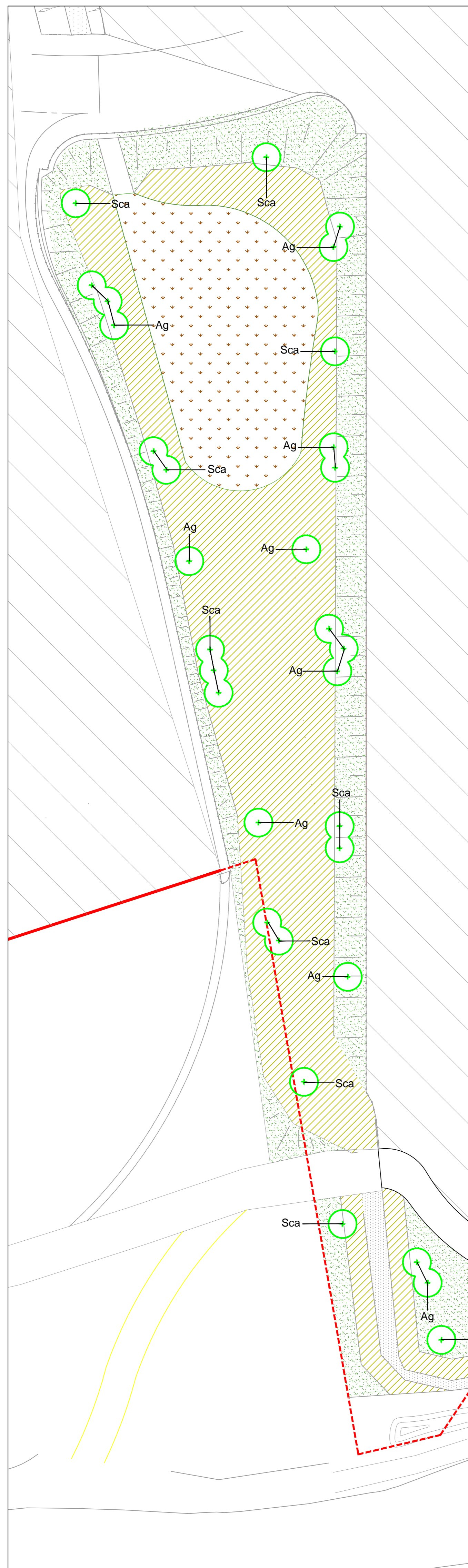
**CONSTRUCT PLANTED BUND AND UPGRADED PUBLIC FOOTPATH AND ROAD**




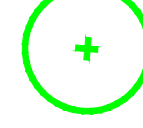



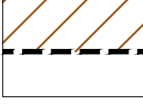
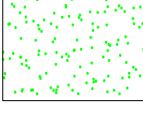



**HERBERT ROAD  
NEWPORT**

**PHASE 1**

REVISION: K (02/11/2016)



**SOFT LANDSCAPE KEY:**

-  **PROPOSED NATIVE TREE PLANTING**  
(Refer to schedule for species)
-  **PROPOSED NATIVE TREE PLANTING**  
(Refer to schedule for species)
-  **PROPOSED ORNAMENTAL TREE PLANTING**  
(Refer to schedule for species)
-  **PROPOSED SHRUB PLANTING**  
(Refer to schedule for species/densities)
-  **PROPOSED NATIVE HEDGEROW**  
(Refer to schedule for species/densities)
-  **PROPOSED 2.0 x 1.0m EARTH BUND**  
(To be constructed in consultation with project engineer & ecologist)
-  **PROPOSED GRASS SEEDING**  
(Emorsgate EL1 - Flowering Lawn, or similar approved)
-  **PROPOSED WETLAND MEADOW SEEDING**  
(Species to be confirmed by project ecologist)
-  **PROPOSED NATIVE RIVERBANK BUFFER PLANTING**  
(Refer to schedule for species / densities)
-  **PROPOSED REED PLANTING**  
(Refer to schedule for species / densities)

**PLANT SCHEDULE**

**ORNAMENTAL & NATIVE TREE PLANTING**

| ABBREV | SPECIES                            | DENSITY | HEIGHT/GIRTH (m) | ROOT COND. | POT SIZE | TOTAL |
|--------|------------------------------------|---------|------------------|------------|----------|-------|
| Ag     | <i>Alnus glutinosa</i>             | AS SHDN | 12-14 (g)        | ROOTBALLED | --       | --    |
| AcS    | <i>Acer campestre</i> Streetwise   | AS SHDN | 12-14 (g)        | ROOTBALLED | --       | --    |
| Lt     | <i>Linderoth saligna</i> Parkgate  | AS SHDN | 12-14 (g)        | ROOTBALLED | --       | --    |
| PtC    | <i>Pinus Caledonia</i> Chemister   | AS SHDN | 12-14 (g)        | ROOTBALLED | --       | --    |
| Sa     | <i>Sorbus aucuparia</i> Streetwise | AS SHDN | 12-14 (g)        | ROOTBALLED | --       | --    |
| Sca    | <i>Salix caprea</i>                | AS SHDN | 12-14 (g)        | ROOTBALLED | --       | --    |
| TcS    | <i>Tilia cordata</i> Streetwise    | AS SHDN | 12-14 (g)        | ROOTBALLED | --       | --    |

**NATIVE HEDGEROW PLANTING**

| ABBREV | SPECIES                       | DENSITY  | HEIGHT/GIRTH (m) | ROOT COND. | POT SIZE | TOTAL |
|--------|-------------------------------|----------|------------------|------------|----------|-------|
| AS KEY | <i>Corylus avellana</i> (20%) | 3 per 1m | 40-80(N)         | BARE ROOT  | --       | --    |
|        | <i>Salix purpurea</i> (20%)   | 3 per 1m | 40-80(N)         | BARE ROOT  | --       | --    |
|        | <i>Ulex europaeus</i> (20%)   | 3 per 1m | 40-80(N)         | CON-PP     | --       | --    |
|        | <i>Prunus spinosa</i> (20%)   | 3 per 1m | 40-80(N)         | BARE ROOT  | --       | --    |

**SHRUBS/PERENNIALS**

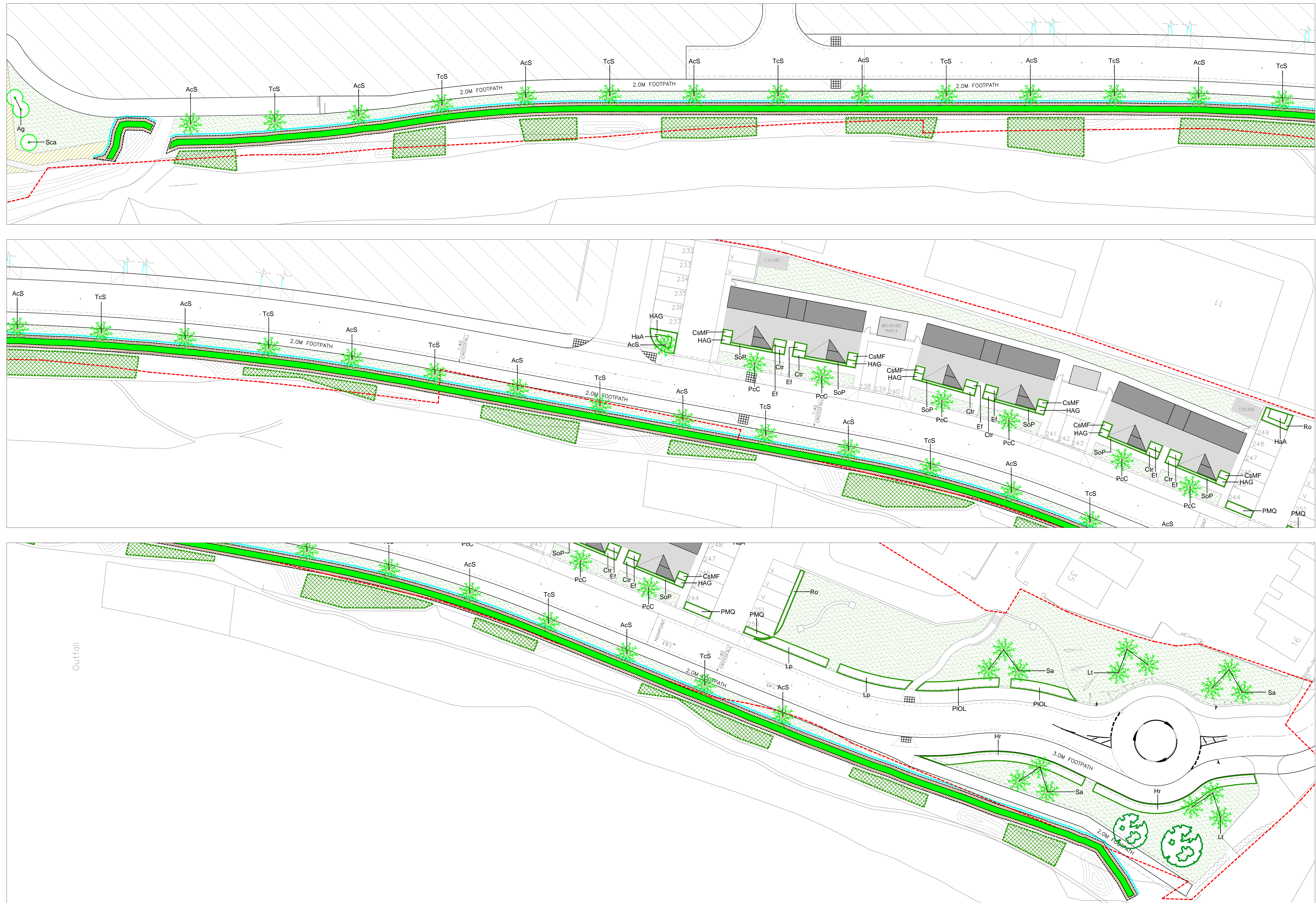
| ABBREV | SPECIES                                  | DENSITY | HEIGHT/GIRTH (m) | ROOT COND. | POT SIZE | TOTAL |
|--------|--|---------|------------------|------------|----------|-------|
| CsMF   | <i>Cornus sanguinea</i> M. Frey          | 3 spm   | 40-60 (N)        | CON        | --       | --    |
| Clr    | <i>Coronilla varia</i> Streetwise        | 4 spm   | 30-40 (N)        | CON        | --       | --    |
| SECD   | <i>Syringa vulgaris</i> 'Etna' Greeny    | 4 spm   | 30-40 (N)        | CON        | --       | --    |
| HsA    | <i>Hydrangea arborescens</i> 'Annabelle' | 2 spm   | 40-60 (N)        | CON        | --       | --    |
| HAG    | <i>Hale 'Autumn Glory'</i>               | 4 spm   | 30-40 (N)        | CON        | --       | --    |
| Hr     | <i>Hibiscus 'Hakalensis'</i>             | 4 spm   | 30-40 (N)        | CON        | --       | --    |
| PHL    | <i>Prunus laurocerasus</i> 'Olio-Luxlan' | 4 spm   | 30-40 (N)        | CON        | --       | --    |
| PMQ    | <i>Prunus laurocerasus</i> 'Queen'       | 3 spm   | 30-40 (N)        | CON        | --       | --    |
| Ro     | <i>Rosa rugosa</i> 'Officialis'          | 4 spm   | 30-40 (N)        | CON        | --       | --    |
| Sop    | <i>Salix officinalis</i> 'purpurascens'  | 5 spm   | 30-40 (N)        | CON        | --       | --    |


**REED PLANTING**

| ABBREV | SPECIES                     | DENSITY  | HEIGHT/GIRTH (m) | ROOT COND. | POT SIZE | TOTAL |
|--------|-----------------------------|----------|------------------|------------|----------|-------|
| AS KEY | <i>Phragmites australis</i> | 1 per 1m | 60-80 (N)        | CON        | --       | --    |

**NATIVE RIVERBANK BUFFER PLANTING**

| ABBREV | SPECIES                       | DENSITY  | HEIGHT/GIRTH (m) | ROOT COND. | POT SIZE | TOTAL |
|--------|-------------------------------|----------|------------------|------------|----------|-------|
| AS KEY | <i>Alnus glutinosa</i> (60%)  | 2 per 1m | 80-100 (N)       | BARE ROOT  | --       | --    |
|        | <i>Rubus fruticosus</i> (10%) | 2 per 1m | 80-100 (N)       | BARE ROOT  | --       | --    |
|        | <i>Salix caprea</i> (40%)     | 2 per 1m | 80-100 (N)       | BARE ROOT  | --       | --    |



|   |       |                            |      |
|---|-------|----------------------------|------|
| REV   | NOTES | BY                         | DATE |
| <br><b>TDA</b><br>Environment   Landscape   Design |       |                            |      |
| CLIENT<br><b>KEEPMOAT</b>   |       | SCALE<br><b>1:500 @ A0</b> |      |
| DRAWING NUMBER<br><b>TDA</b>  |       | DATE<br><b>FEB 2017</b>    |      |
| PROJECT<br><b>HERBERT ROAD, NEWPORT (PHASE 1)</b>   |       |                            |      |
| DRAWING TITLE<br><b>DETAILED SOFT LANDSCAPE PROPOSALS</b>   |       |                            |      |