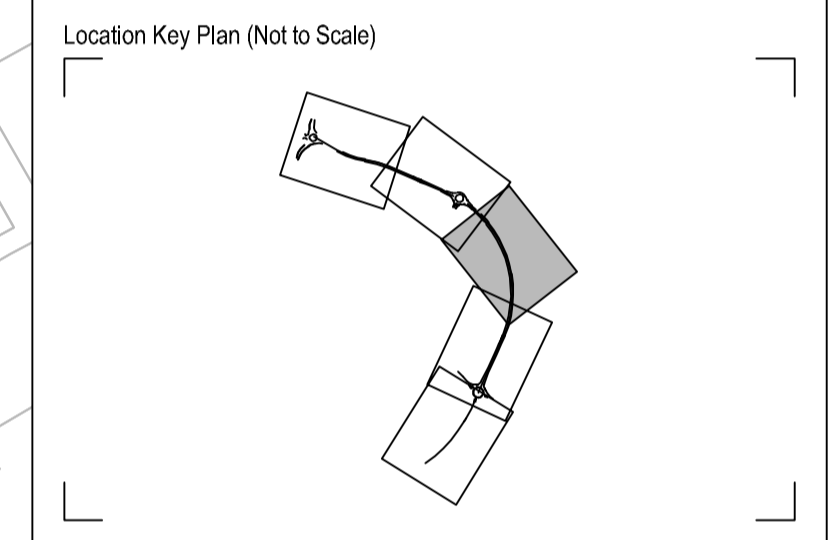


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Rev	Drawn	Checked	Appr	Description	Date
P07	KS	KS	AB	KEY UPDATED AND LABELS ADDED	23.04.21
P06	JD	KS	AB	REDLINE BOUNDARY UPDATED, LANDSCAPE AND FENCING DETAILS ADDED	30.03.21
P05	LR	KS	AB	LABELS AMENDED	21.10.20
P04	LR	KS	AB	HIGHWAY LAYOUT AND REDLINE BOUNDARY UPDATED	16.10.20
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P02	LR	KS	AB	LABELS ADDED / AMENDED	28.08.20
P01	PD	DAH	KS	FIRST ISSUE	12.08.20

Purpose of Issue  
**For Planning** S0

Classification  
**Public**



Project  
**A29 Realignment Scheme**

Drawing  
**Site Plan Sheet 3 of 5**

Scale @ A1	Drawn	Checked	Approved
1:500	PD	RP	KS

Project No.	Date
CS099505	12.06.20

Drawing Identifier  
 Project - Originator - Zone - Level - File Type - Role - Number  
**A29-CAP-HPN-00-DR-C-0134** P07



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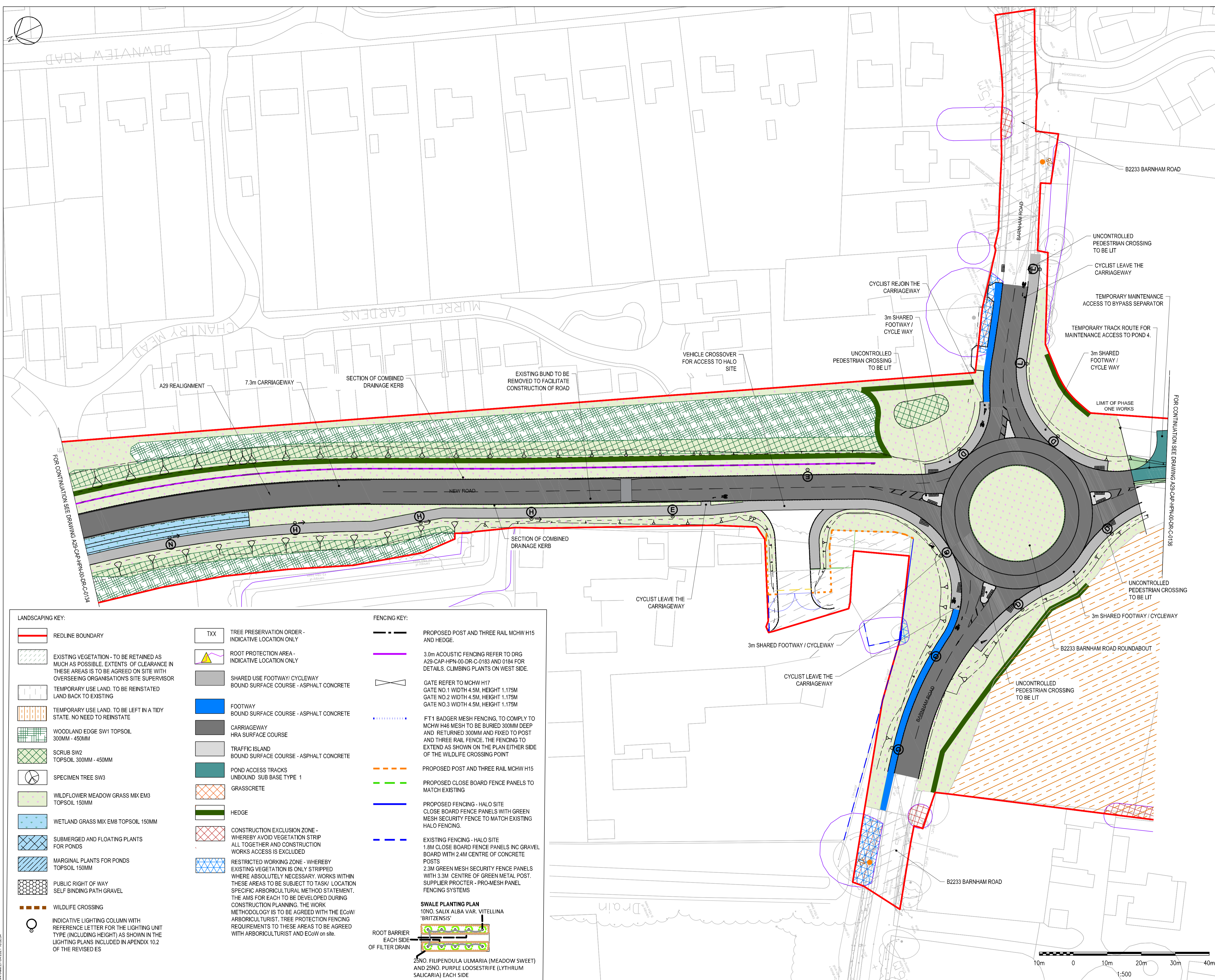
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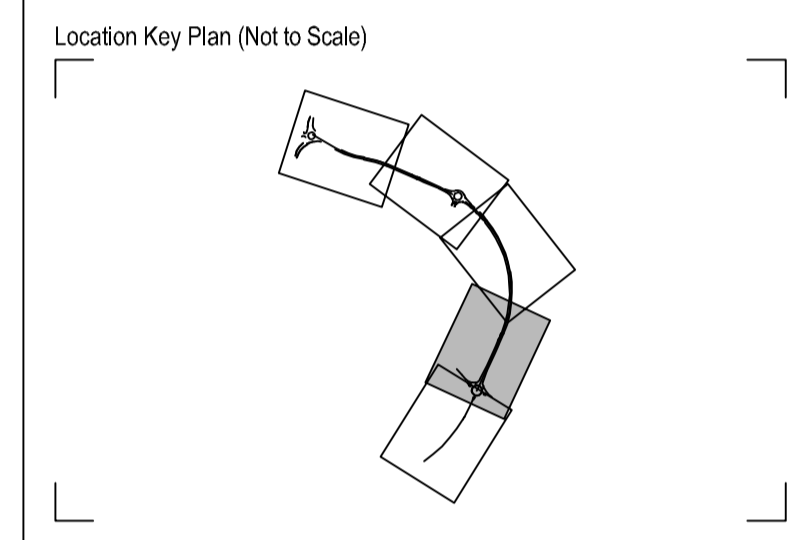
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Purpose of Issue  
**For Planning** **S0**

Classification  
**Public**



Project  
**A29 Realignment Scheme**

Drawing  
**Site Plan**  
**Sheet 4 of 5**

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Project No. **CS099505** Date **14.06.20**

Drawing Identifier **A29-CAP-HPN-00-DR-C-0135** revision **P08**



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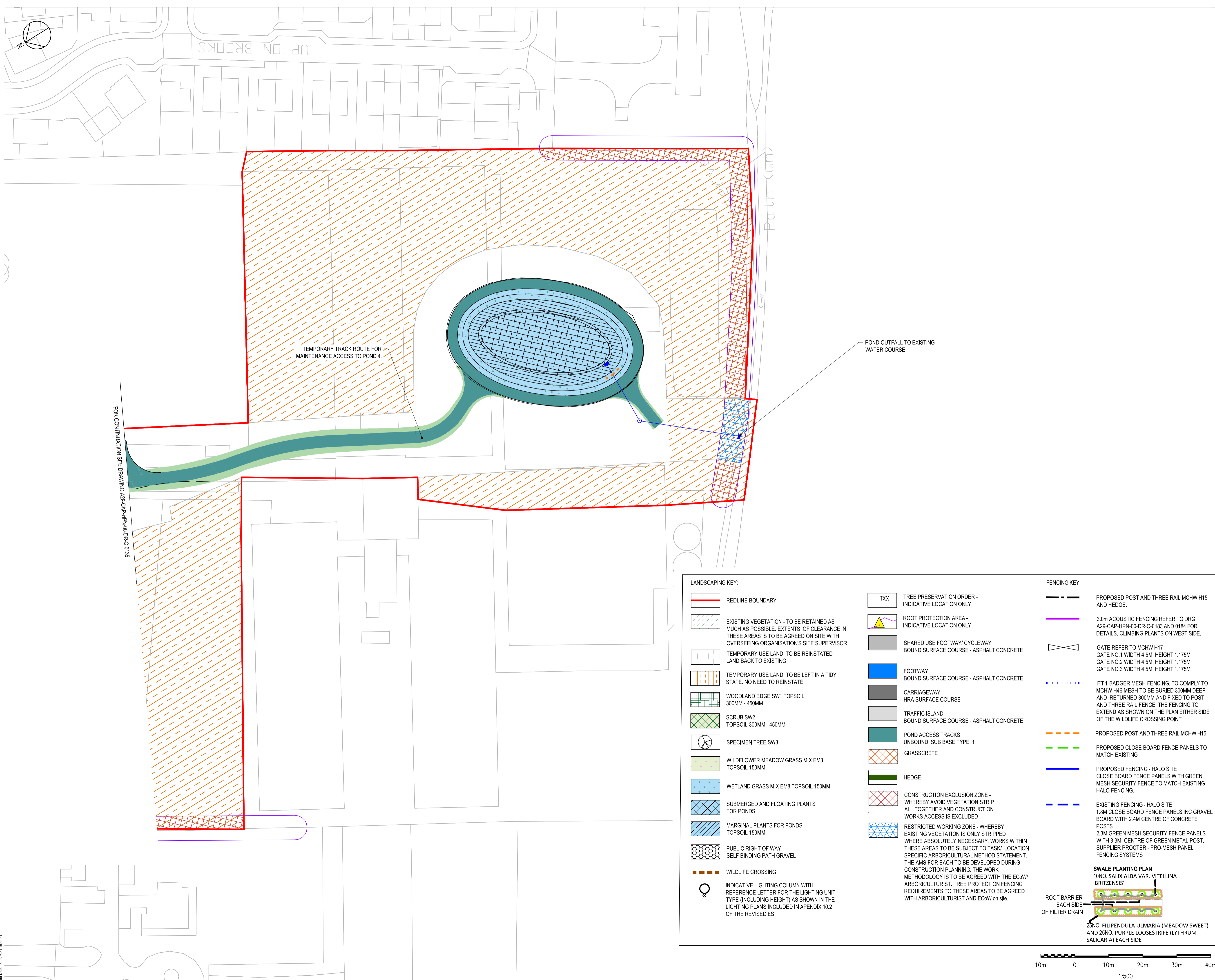
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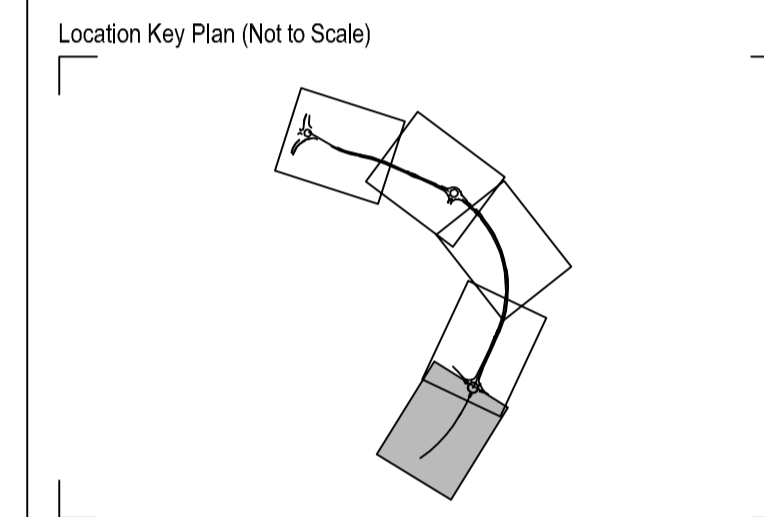
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Purpose of Issue		
For Planning		S0
Classification		Public
Client		 



Project  
**A29 Realignment Scheme**

Drawing  
**Site Plan**  
**Sheet 5 of 5**

Scale @ A1	Drawn	Checked	Approved
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Project No.	Date		
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**ROOT BARRIER EACH SIDE OF FILTER DRAIN**

Scale: 10m 0 10m 20m 30m 40m  
 1:500

# Appendix F

ECOLOGY MANAGEMENT PLAN



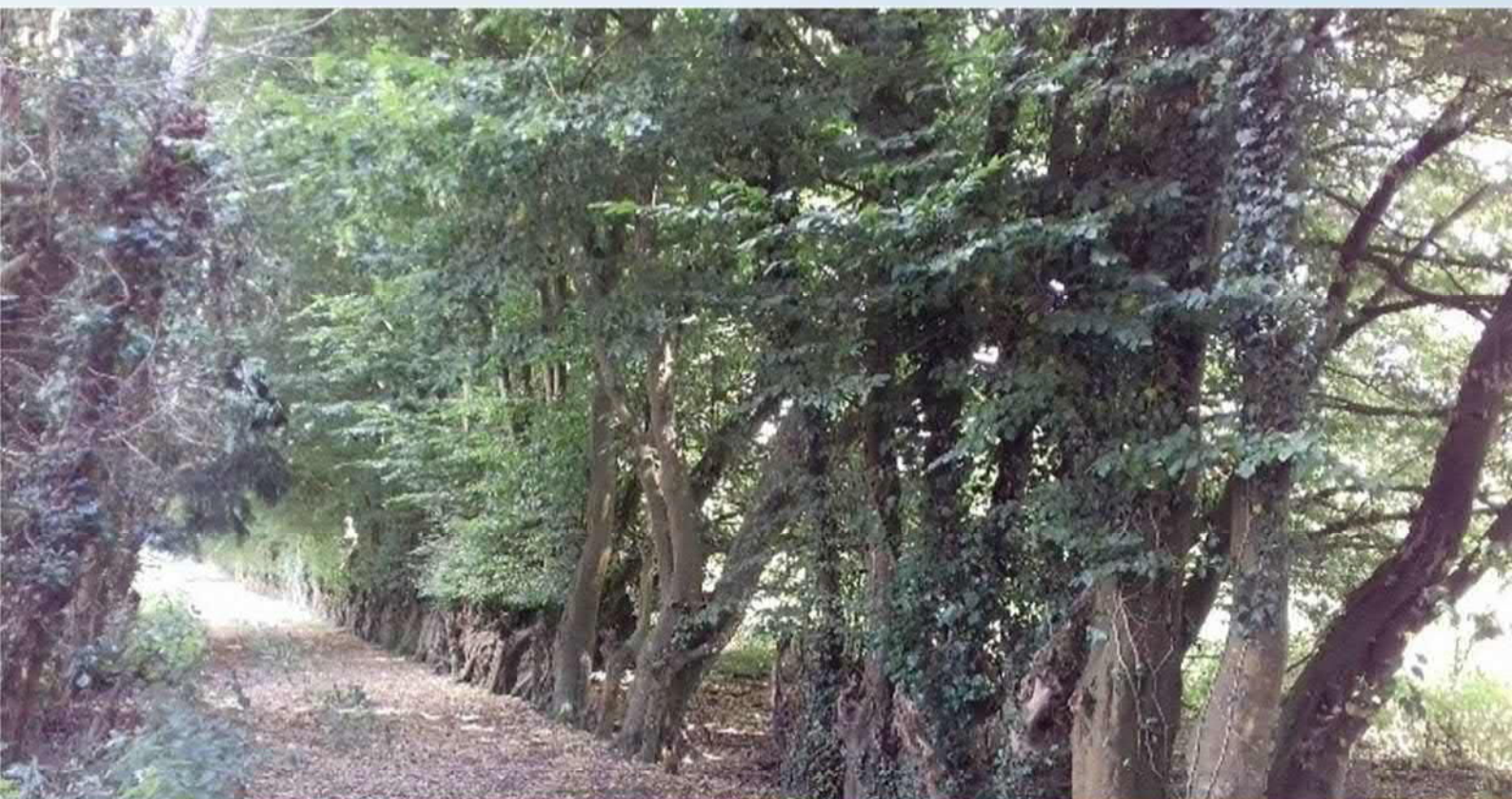


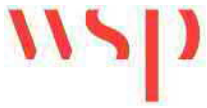
West Sussex County Council

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# A29 REALIGNMENT

Outline Ecological Management Plan





West Sussex County Council

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## **A29 REALIGNMENT**

### Outline Ecological Management Plan

**TYPE OF DOCUMENT (VERSION) PUBLIC**

**PROJECT NO. 70060779**

**OUR REF. NO. OUTLINE EMP**

**DATE: APRIL 2021**

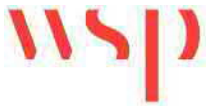
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# QUALITY CONTROL

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Issue/revision	First issue	Revision 1	Revision 2	Revision 3
Remarks	First Draft	Updated landscape drawings added		
Date	September 2020	April 2021		
Prepared by	Bradley Williams	Bradley Williams		
Signature				
Checked by	Verity Dickie	Verity Dickie		
Signature				
Authorised by	Adrian Hutchings	Adrian Hutchings		
Signature				
Project number	7006779	7006779		
Report number	Outline EMP	Outline EMP		
File reference	\\uk.wspgroup.com\central data\Projects\700550xx\70055091 - WSCC - A29 Phase 1 Planning Application\03 WIP\10 Ecology\05 Reports\EMP			

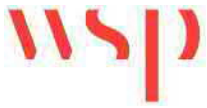
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**APPENDICES**

APPENDIX A

RELEVANT LEGISLATION

# 1 INTRODUCTION

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## 1.1 PROJECT BACKGROUND

- 1.1.1. West Sussex County Council (referred to as 'the Applicant') is seeking to obtain detailed planning permission for Phase 1 of the realignment of the A29 (referred to as the 'Scheme'), to the north of Eastergate and the north-west of Barnham, villages north of Bognor Regis (as shown in Figure 1).
- 1.1.2. The proposed planning application will seek permission for:  
*The construction of a 1.3km single carriageway with a 3m wide shared cycleway / footway, 2.5m wide central island, four uncontrolled crossings, three roundabouts, landscaping, noise barriers and other associated works.*
- 1.1.3. The planning application boundary for the Scheme, the area which it encompasses, will hereafter be referred to as 'the Application Site'.
- 1.1.4. The Application Site is currently greenfield agricultural land which is used as an orchard. A wooded Public Right of Way (PRoW) runs in a north-to-south direction and connects between Eastergate Lane and the B2233 Barnham Road. To the west of the Application Site is the current route for the A29. To the north of the Application Site is Eastergate Lane. There is a self-storage facility on the northern side of Eastergate Lane, opposite and residential dwellings on the south side of Eastergate Lane. The B2233 Barnham Road runs along the southern side of the Application Site. On the eastern side of the Application Site is a residential complex.

## 1.2 AIMS AND OBJECTIVES

- 1.2.1. WSP was commissioned by the Applicant to support the planning application with the implementation of an outline Ecological Management Plan (EMP) for inclusion within the Construction Environmental Management Plan (CEMP) (WSP 2020a). This document intends to:
- Provide an overview of the baseline ecological information for the Scheme and a surrounding area.
  - Provide a mitigation plan to be implemented during construction and operation, based on the recommendations of baseline ecological assessments and the Chapter 9 Ecology and Nature Conservation of the associated Environmental Statement (ES) (WSP 2020b).
- 1.2.2. The ecological mitigation strategy will enable compliance with relevant nature conservation legislation and planning policy and to avoid the killing/injury of notable and protected species.

## 1.3 LEGISLATION AND POLICY OVERVIEW

- 1.3.1. The outline EMP has been compiled with reference to the following relevant nature conservation legislation and planning policy, and the UK Biodiversity Framework from which the protection of sites, habitats and species is derived in England. The relevant legislation discussed within this report includes (detailed further within Appendix A):

### National Legislation and Policy

- The Conservation of Habitats and Species Regulations 2017 (as amended) (Habitats Regulations);
- The Wildlife and Countryside Act 1981 (as amended) (WCA);

- Countryside Rights of Way Act 2000;
- The Natural Environment and Rural Communities (NERC) Act 2006 (England);
- The Protection of Badgers Act 1992;
- The Hedgerow Regulations 1997;
- The Wild Mammals (Protection) Act 1996;
- UK Government's 25 Year Environment Plan (DEFRA, 2018);
- The UK Post-2010 Biodiversity Framework (2011-2020) (JNCC and DEFRA, 2012);
- Biodiversity 2020: A strategy for England's wildlife and ecosystem services (DEFRA, 2011);
- UK Biodiversity Action Plan (UKBAP)<sup>1</sup>; and
- The National Planning Policy Framework (NPPF) 2019 (Ministry of Housing Communities & Local Government, February 2019).

### **Local Policy**

- West Sussex Transport Plan 2011 – 2026 (WSCC, 2011);
- West Sussex Structure Plan 2001-2016 (WSCC, 2005); and
- Adoption Arun Local Plan 2011-2031 (Arun District Council, 2018).

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<sup>1</sup> The UK BAP has now been replaced by the UK Post-2010 Biodiversity Framework, however, it contains useful information on how to characterise important species assemblages and habitats which is still relevant.

## 2 ECOLOGICAL BACKGROUND

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### 2.1 OVERVIEW

- 2.1.1. Habitats within the Application Site are considered to be of low to high ecological value including hedgerows, grasslands, woodland and scrub. Habitats of Principal Importance (HPI) were identified within the Application Site including traditional orchard and hedgerow.
- 2.1.2. Habitats within the Application Site and surrounding area are considered suitable to support a number of notable and protected species. After completion of specific ecological surveys, the following species/species groups are considered likely to be present to varying degrees within the Application Site; bats (foraging, commuting and roosting), badger *Meles meles*, other small mammals, wintering birds, breeding birds, common reptile species and invertebrates.

### 2.2 ECOLOGICAL RECEPTORS

- 2.2.1. The Scheme will result in a loss of habitat and disturbance to retained habitats within the “Survey Area” (defined within the A29 Preliminary Ecological Appraisal (PEA), WSP 2020c). In the absence of mitigation, habitat loss and disturbance could have negative effects on notable and protected habitats and species.
- 2.2.2. Table 2-1 provides details of the ecological receptors located within the Scheme and surrounding habitats. Information included within Table 2-1 is derived from the A29 Realignment PEA (WSP 2020c), bat report (WSP 2019a), badger report (WSP 2019b), hazel dormouse report (WSP 2019c), breeding bird report (WSP 2019d) wintering bird report (WSP 2019e), reptile report (WSP 2019f), great crested newt report (WSP 2019g) and invertebrate report (WSP 2019h), as well as the Habitat Regulations Screening Assessment (2019i).

**Table 2-1 – Ecological Baseline**

Ecological Receptor		Detail	Relevant Legislation and Policy
Designated Sites	Statutory Designated Sites	<p>No statutory designated sites were recorded within the Application Site.</p> <p>The Application Site was however found to be within 10km of five statutory sites of international importance (Habitats Sites), including Pagham Harbour Ramsar, Pagham Harbour Special Protection Area (SPA), Ducton to Bignor Escarpment Special Area of Conservation (SAC), Chichester to Langstone Harbours Ramsar and Solent and Dorset Coast Special Protection Area (SPA). Two additional SACs designated for bats were located within 30km, The Mens and Ebernoe Common.</p> <p>A Habitats Regulations Screening Assessment (HRSA) was undertaken for the Scheme. The HRSA concluded that the Scheme alone is not considered to have likely significant effects any of the five designated sites.</p> <p>No UK statutory designated sites are within 2km of the Scheme.</p>	<p>The Conservation of Habitats and Species Regulations 2017 (as amended) (“Habitats Regulations”) provide strict protection to sites of European and/or international importance. This includes requiring projects or plans to be screened for likely significant effects upon Special Protected Area (SPA), Special Area of Conservation (SAC) and candidate SACs (cSACs). Guidance also requires potential SPAs (pSPAs) and Ramsars are subject to the same assessment.</p>
	Non-Statutory Designated Sites	<p>No non-statutory designated sites were recorded within the Scheme.</p> <p>Non-statutory designated sites have been scoped out of the ES.</p>	
Habitats	Habitats (including HPI)	<p>The following HPI are present within 2km of the Application Site:</p> <ul style="list-style-type: none"> <li>■ Coastal and floodplain grazing marsh – two parcels</li> </ul>	<p>Semi-natural broadleaved woodland (deciduous woodland) and hedgerow are identified as HPI in accordance with Section 41 of the NERC Act 2006. Under Section 40 of this legislation, every public body (including</p>

Ecological Receptor	Detail	Relevant Legislation and Policy
	<ul style="list-style-type: none"> <li>■ Lowland meadows – two parcels</li> <li>■ Lowland fens – one parcel</li> <li>■ Deciduous woodland – 79 parcels</li> <li>■ Traditional orchard – 12 parcels, some of which fall within the Scheme itself<sup>2</sup>.</li> </ul> <p>Within the Application Site itself, there are a number of habitats that qualify as HPI, including:</p> <ul style="list-style-type: none"> <li>■ Three species poor hedgerows, which from an ecological perspective are considered unlikely to meet the criteria for important hedgerows.</li> <li>■ One parcel of plantation broadleaved woodland that is likely to qualify as Traditional orchard HPI.</li> </ul> <p>Given the widespread nature of hedgerow HPI within the local area, it is considered to be of value at up to Local conservation value. Within the local area, traditional orchard occurs less frequency, with areas previously identified as traditional orchard HPI becoming scrubbed over that they no longer meet the criteria for HPI. As such, traditional orchard is considered to be of up to District conservation value.</p>	<p>planning authorities) must, <i>'in exercising its functions, have regard so far as is consistent with the proper exercise of those functions, to the purpose of conserving biodiversity'</i>.</p> <p>At a local level, Policy CP7 Green Infrastructure Network of the core strategy states <i>'the integrity of the existing network of green infrastructure will be protected and enhanced through the lifetime of the Core Strategy. Planning permission for development that would harm the network will only be granted if it can incorporate measures that avoid the harm arising or sufficiently mitigate its effects.'</i></p>

<sup>2</sup> although the desk study shows several parcels of traditional orchard HPI falling within the Scheme, the Phase 1 habitat survey confirmed only one parcel present within the Scheme itself.

Ecological Receptor		Detail	Relevant Legislation and Policy
Protected and Notable Species	Bats (Foraging and Commuting)	<p>Habitats within the Application Site include orchard, semi-improved neutral grassland, scrub and hedgerows. Bat activity surveys focussed on linear features within the Application Site, such as hedgerows, with four static detectors deployed monthly between April and October.</p> <p>At least eight species of bat were recorded, however common and soprano pipistrelle <i>Pipistrellus pipistrellus</i> and <i>Pipistrellus pygmaeus</i> which are widespread and common bat species (BCT 2017a and 2017b) accounted for over 75% of all bat activity recorded. Ecobat analysis revealed these were the only two species that recorded high activity levels.</p> <p>The remaining recordings were made by a range of species, including greater horseshoe bat <i>Rhinolophus ferrumequinum</i>, barbastelle bat <i>Barbastella barbastellus</i> and Leisler's bat <i>Nyctalus leisleri</i>. Other species recorded included noctule <i>Nyctalus noctule</i>, serotine <i>Eptesicus serotinus</i> and Nathusius' pipistrelle <i>Pipistrellus nathusii</i>. Other genus were also recorded that could not be identified to species level including <i>Plecotus</i> sp. and <i>Myotis</i> sp.</p> <p>Location 3 alongside a row of hornbeam trees recorded the highest activity levels, with Location 2, alongside the footpath that bisects the Application Site is considered to be important for barbastelle bats.</p> <p>Overall, the Application Site is regarded to be conservation importance at up to a District level for its assemblage of bats.</p>	<p>All species of bats recorded within the UK are protected from killing, injury and disturbance and their roosts protected from damage or destruction under the Habitats Regulations. Protection is also afforded under the WCA with respect to disturbance of individuals occupying places of rest or shelter and obstruction of access to these. Activities that would otherwise constitute an offence under this legislation may be licensed by Natural England for certain purposes.</p> <p>Certain species of bats, including noctule bat <i>Nyctalus noctula</i>, brown long eared bat <i>Plecotus auritus</i> and soprano pipistrelle bat are also listed as Species of Principal Importance (SPI) for the conservation of biodiversity in England in accordance with Section 41 of the NERC 2006. Section 40 obliges public bodies (including local planning authorities) to have regard for the conservation of biodiversity (including SPI) when discharging their duties (including determining planning applications).</p>

Ecological Receptor	Detail	Relevant Legislation and Policy
	<p>Bats (Roosting)</p> <p>The PBRA identified a number of buildings / trees with the potential to support roosting bats:</p> <ul style="list-style-type: none"> <li>■ Three buildings with bat roosting potential, including one with low potential (B2) and two with moderate (B5 and B7).</li> <li>■ Forty-four trees with bat roosting potential, including eight with low potential (T5, T7, T11-12, T14, T29, T31 and T43), 26 with moderate potential (T1, T4, T6, T8-10, T13, T15-16, T18, T21, T23-24, T27-28, T20, T32-33, T35-40, T42, T44), nine with high potential (T2, T17, T19, T20, T22, T25-26, T34, T41) and one confirmed bat roost (T3) (via the presence of droppings).</li> </ul> <p>For the buildings, subsequent dusk emergence and dawn re-entry surveys were undertaken. During which, B5 was confirmed as a roost for soprano pipistrelle <i>Pipistrellus pygmaeus</i> and serotine <i>Eptesicus serotinus</i>. The likely absence of roosting bats was confirmed at buildings B2 and B7.</p> <p>For trees with moderate or high potential, at-height inspections were conducted, during which five trees were assessed as negligible (T3<sup>3</sup>, T15, T16, T33 and T41),</p>	

<sup>3</sup> T3 was confirmed as a roost during the PBRA survey but was subsequently downgraded to negligible during the at-height surveys. This is due to branch damage that was sustained between the PBRA and at-height survey, exposing the features where the droppings had previously been recorded, and no longer provided the same protection and shelter for bats.



Ecological Receptor	Detail	Relevant Legislation and Policy
	<p>eight trees with low potential (T1, T6, T9, T13, T27, T32, T36 and T42), 18 trees with moderate potential (T2, T4, T8, T10, T18-19, T21-26, T30, T35, T37-38 and T40) and one confirmed roost (T20) (via the presence of droppings).</p> <p>One tree, T44 could not be climbed due to health and safety reasons. Instead, this tree was subject to a dusk emergence and dawn re-entry survey. The likely absence of roosting bats was confirmed during this survey.</p> <p>Overall, the Application Site is regarded to be conservation importance at up to a Local level for roosting bats.</p>	
Badger	<p>A badger survey, undertaken in April 2019, identified a number of setts within the Application Site and surrounding area, including a main sett located within the alignment of the Scheme. A second potential main sett was subsequently identified though an extension of the survey area.</p> <p>A badger bait marking survey was undertaken in September / October 2019 to identify whether multiple clans were present within the area.</p> <p>The results of the surveys identified one badger clan residing within the Badger Bait Marking Survey Area, with at the time of the survey, this clan had three very active setts (Sett 1-3) likely comprising a main, annex and subsidiary. Several outlier setts were also identified within the Application Site.</p> <p>Badgers are widespread within Sussex and southern England and are afforded legal protection for reasons of</p>	<p>The Protection of Badgers Act 1992 makes it illegal to wilfully kill, injure or take any badger, or attempt to do so. It also makes it an offence to intentionally or recklessly damage, destroy or obstruct access to any part of a badger sett.</p> <p>Activities that would otherwise constitute an offence under this legislation may be licensed by Natural England for certain purposes.</p>

Ecological Receptor	Detail	Relevant Legislation and Policy
	<p>animal cruelty, not rarity. However, given the presence of a main, annex, subsidiary and outlier setts, the Application Site and surrounding area is considered to be of Local importance for badgers.</p>	
Hazel Dormouse	<p>A hazel dormouse survey was undertaken during 2019. No evidence of this species was identified within the Application Site.</p> <p>As such, this species is considered likely absent from the Application Site.</p>	<p>Hazel dormice are protected from killing, injury and disturbance and their places of rest or shelter (occupied habitat) protected from damage or destruction under the Habitats Regulations. Protection is also afforded under the WCA with respect to disturbance of individuals occupying places of rest or shelter and obstruction of access to these. Activities that would otherwise constitute an offence under this legislation may be licensed by Natural England for certain purposes.</p> <p>Hazel dormice are also listed as SPI in accordance with Section 41 of the NERC Act 2006. Public bodies have an obligation under Section 40 to have regard for these species when carrying out their functions.</p>
Other Species of Principal Importance (SPI)	<p>As detailed in the PEA (Technical Appendix 9.1), records of other SPI were returned in the desk study, including hedgehog <i>Erinaceus europaeus</i> and polecat <i>Mustela putorius</i>, with suitable habitat for these species present within the Scheme. Further, although not identified within desk study records, the open grassland habitat has the potential to support brown hare <i>Lepus europaeus</i> and areas of hedgerow and unmanaged grassland have the potential to support harvest mice <i>Micromys minutus</i>. SPI are considered of importance at up to a Local level.</p>	<p>These species are listed as SPI in accordance with Section 41 of the NERC Act 2006. Public bodies have an obligation under Section 40 to have regard for these species when carrying out their functions.</p>

Ecological Receptor		Detail	Relevant Legislation and Policy
	Breeding Birds	<p>A total of 44 species were recorded during the breeding bird surveys, of these, 15<sup>4</sup> are legally protected or species of conservation concern, including:</p> <ul style="list-style-type: none"> <li>■ three Wildlife and Countryside Act Schedule 1 species;</li> <li>■ eight Species of Principal Importance (SPI) listed under the Natural Environment and Rural Communities (NERC) Act 2006;</li> <li>■ six Birds of Conservation Concern (BoCC) red list species; and</li> <li>■ seven BoCC amber species.</li> </ul> <p>No specific barn owl surveys have been undertaken; however, a barn owl was recorded incidentally during a bat survey foraging within the Application Site and therefore may have a breeding site locally.</p> <p>Given the species records and the habitats present, the breeding bird community within the Application Site is considered to be of District conservation importance.</p>	<p>The Habitat Regulations 2017 Part 1 Regulation 10(2) &amp; (3) state that local authorities <i>'must take such steps in the exercise of their functions as they consider appropriate to contribute to...the preservation, maintenance and re-establishment of a sufficient diversity and area of habitat for wild birds in the UK including by means of the upkeep, management and creation of such habitat...'</i>. The legislation continues to state that economic and recreation requirements must be taken into consideration in considering which measures are appropriate.</p> <p>Under the WCA all wild birds are protected from killing and injury, and their nests and eggs protected from taking, damage and destruction whilst in use. Additional protection is extended to species listed under Schedule 1 of the Act, meaning it is also an offence to disturb these species at or near the nest, or whilst they have dependent young.</p> <p>Some bird species are also listed as SPI in accordance with Section 41 of the NERC Act 2006. Public bodies have an obligation under Section 40 to have regard for these species when carrying out their functions.</p>
	Wintering Birds	<p>A total of 40 species were recorded during the wintering bird surveys, of these, 16<sup>4</sup> are legally protected or species of conservation concern, including:</p> <ul style="list-style-type: none"> <li>■ three Wildlife and Countryside Act Schedule 1 species;</li> </ul>	

<sup>4</sup> It should be noted that these categories are not exclusive, and a species can be listed in more than one conservation category (for example listed as both a SPI and BoCC red list species).

Ecological Receptor	Detail	Relevant Legislation and Policy
	<ul style="list-style-type: none"> <li>■ eight Species of Principal Importance (SPI) listed under the Natural Environment and Rural Communities (NERC) Act 2006;</li> <li>■ eight Birds of Conservation Concern (BoCC) red list species; and</li> <li>■ seven BoCC amber species.</li> </ul> <p>No SPA qualifying species / assemblages (gulls) were recorded foraging in significant numbers, as such the wintering bird assemblage is considered to be of Local conservation importance.</p>	
Reptiles	<p>The reptile survey confirmed the presence of two reptile species within the Application Site; slow worm <i>Anguis fragilis</i> and common lizard <i>Zootoca vivipara</i>, with low populations of both species present. Additionally, records of grass snake <i>Natrix helvetica</i> were returned in the desk study as within 150m of the Application Site. Due to the close proximity of these records and also the suitability of the habitats present on Application Site, it is considered that a low population of grass snake may also be present.</p> <p>Overall, the population of reptiles within the Survey Area is considered to be of importance at a Local level. This is because of widespread habitat within the local area and the low population size recorded of a relatively widespread species within West Sussex.</p>	<p>Native widespread reptile species (common or viviparous lizard, adder, grass snake and slow worm) are partially protected under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended). This includes protection from killing and injury.</p> <p>All reptile species are also listed as SPI in accordance with Section 41 of the NERC Act 2006. Public bodies have an obligation under Section 40 to have regard for these species when carrying out their functions.</p>
Amphibians (Great Crested Newt)	<p>A great crested newt (GCN) <i>Triturus cristatus</i>, Habitat Suitability Index (HSI) was undertaken within the Application Site and within 500m, during 2019. No</p>	<p>Great crested newts are protected from killing, injury and disturbance and their places of rest or shelter (occupied habitat) protected from damage or destruction under the Habitats Regulations. Protection is also afforded under the</p>

Ecological Receptor	Detail	Relevant Legislation and Policy
	<p>waterbodies were identified which were considered suitable to support GCN within the Application Site.</p> <p>As such, GCN species is considered likely absent from the Application Site.</p>	<p>Wildlife and Countryside Act 1981 (as amended) with respect to disturbance of individuals occupying places of rest or shelter and obstruction of access to these. Activities that would otherwise constitute an offence under this legislation may be licensed by Natural England for certain purposes.</p> <p>Great crested newts and common toad are also listed as SPI in accordance with Section 41 of the NERC Act 2006. Public bodies have an obligation under Section 40 to have regard for these species when carrying out their functions.</p>
Terrestrial Invertebrates	<p>Due to the presence of orchard habitat within the Application Site, invertebrate surveys were undertaken, with a particular focus on noble chafer <i>Gnorimus nobilis</i> found in traditional orchards. During the surveys, noble chafer were not identified so their likely absence from the Application Site is assumed.</p> <p>The surveys recorded six species of conservation concern including:</p> <ul style="list-style-type: none"> <li>■ three nationally scarce species (an ant <i>Lasius brunneus</i>, longhorn beetle <i>Prionus coriarius</i> and flower beetle <i>Mordellistena humeralis</i>);</li> <li>■ three SPI (small heath butterfly <i>Coenonympha pamphilus</i>, ghost moth <i>Hepialus humuli</i> and cinnabar moth <i>Tyria jacobaea</i>).</li> </ul> <p>Additionally, stag beetle <i>Lucanus cervus</i> a SPI which are of high conservation concern were recorded incidentally on Application Site, with suitable habitat present, and are considered of importance at up to a Local level.</p>	<p>Some invertebrate species (including stag beetle) are listed as SPI in accordance with Section 41 of the NERC Act 2006. Public bodies have an obligation under Section 40 to have regard for these species when carrying out their functions.</p> <p>Stag beetle are also protected under Schedule 5 of the Wildlife and Countryside Act.</p>

## 3 ECOLOGICAL MANAGEMENT PLAN

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### 3.1 OVERVIEW

- 3.1.1. Ecological mitigation measures are required to avoid and reduce potential effects that could occur during the operation and construction phases of the Scheme. The Scheme will integrate a landscape strategy to mitigate effects upon protected species and achieve 10% Biodiversity Net Gain (BNG), a drainage strategy that promotes habitat diversity and a lighting strategy that is sensitive to ecological features such as foraging and commuting bats.
- 3.1.2. Further measures are also outlined to ensure the protection of retained habitats, protection of notable species and avoidance of habitat degradation during the construction phase.
- 3.1.3. Figure 3 provides indicative locations for ecological mitigation measures including bat boxes, bird boxes and refugia piles.

### 3.2 DESIGN MEASURES

#### AVOIDANCE MEASURES

- 3.2.1. The Scheme designs will ensure retention and protection of woodland and hedgerows as far as possible in order to minimise effects upon a range of protected species (bats, badgers, other mammals, breeding birds, reptiles, and invertebrates). This includes retention and maintenance of HPI (woodland, hedgerows and waterbody) for their intrinsic value.
- 3.2.2. Where habitat loss is unavoidable, compensation will be required in line with local and national policy as discussed below in the landscape strategy.

#### LANDSCAPE STRATEGY

- 3.2.3. To compensate for the loss of habitat during construction of the Scheme, a strategic landscape strategy has been designed, as detailed within Chapter 10 of the ES, Landscape and Visual Assessment (WSP 2020d). The layout of habitats is shown in the landscape general arrangement plans (shown in Figure 2 - Drawing ref A29-WSP-LA-GA-005).
- 3.2.4. The landscape strategy creates new habitat and enhances habitats within the Scheme to provide greater opportunities for protected and notable species such as bats, badger, birds, amphibians and invertebrates. The key features of the proposed landscape mitigation include:
- New woodland planting to provide green visual containment in addition to creating habitat for wildlife.
  - New specimen tree planting to enhance visual appeal and integrate the Scheme into the surrounding landscape.
  - New hedgerow planting to enhance visual amenity of the Scheme, respond positively to the local character and screen the nearby residents from the proposed noise barrier.
  - Areas of wildflower grassland and bulb planting to enhance the biodiversity along with visual appeal.
  - Established areas of existing vegetation are proposed to be retained and enhanced where possible.
- 3.2.5. The landscape strategy proposes to create eight habitat types, broadly categorised as below:

- shrub;
- scattered specimen trees;
- woodland core;
- woodland edge planting;
- native hedgerow;
- species-rich grassland; and
- species-rich wet grassland.

- 3.2.6. These habitats will provide suitable foraging opportunities for a variety of species including bats, terrestrial mammals (such as badger), birds, reptiles, common amphibians and invertebrates. Woodland and scrub creation will provide nesting opportunities for birds as well as refuge for mammals, amphibians and invertebrates.
- 3.2.7. The landscape strategy should utilise a native and species-rich mix of plants for all habitat types, mirroring surrounding retained semi-natural habitats including species-rich grassland and broadleaved woodland. Utilising native species, flowering species and berry bearing shrubs will benefit a range of wildlife, providing food source throughout the year.
- 3.2.8. In line with local and national policy, the Scheme aims to achieve at least a 10% gain in biodiversity post-development, as supported by a BNG assessment (WSP 2020e). The final figures and results of the assessment are detailed in the BNG report, however it is understood that a net gain in biodiversity of at least 10% has been reached.

#### **Landscape Management/Maintenance**

- 3.2.9. Specific detail of habitat management (e.g. grassland mowing regime etc.) is provided in the Landscape Maintenance and Management Plan (LMMP) (WSP 2020f). Appropriate landscape planting recommendations are provided within the LMMP to ensure:
- correct planting/sowing seasons;
  - correct soil conditions are created for specific species/habitats;
  - sufficient spacing is provided between standard trees to prevent future oversharing; and
  - viability of trees, bulbs and grassland mixes.
- 3.2.10. New and retained landscaped areas should be subject to low-intensity management regimes. This should include:
- Sensitive timed grass cutting, as to avoid the peak flowering season and retain a species-rich sward.
  - Grass cuttings/arising should be left in situ for a few days to drop seeds as appropriate, prior to removal. Arisings should be removed to prevent an increase in soil fertility and retain the species-rich grasslands.
  - No more than one cut/prune of hedgerow and standard trees per year. This should also be undertaken only once specimens have fruited in order to maximise food availability for a range of wildlife.

#### **LIGHTING STRATEGY**

- 3.2.11. Artificial lighting may affect sensitive fauna within the Scheme, most notably bat species. Lighting can affect bat roosts, commuting routes and established and created dark corridors. The lighting strategy for the Scheme should therefore be developed to be sensitive to bats. A bat sensitive

lighting strategy will also reduce the effect of lighting upon other light sensitive and nocturnal species, such as badger, crepuscular birds and invertebrates.

- 3.2.12. Bat activity surveys within the Application Site identified Folly Foot Farm Barn, Land to south of Eastergate Lane and the PRow (Footpath 318) as being sensitive areas for bat species.
- 3.2.13. In accordance with best practice guidance (Institution of Lighting Professionals (IPL) (2018)), the lighting strategy (WSP 2020g) aims to:
- Avoid light spill onto confirmed or suspected roosts, in addition to new bat boxes, primarily through good design and secondarily by physical shields, where necessary.
  - Avoid, light spill onto trees and hedgerows, minimised through good design, with physical shields installed where necessary, and maintain dark corridors along retained areas of retained woodland and hedgerows, to ensure continued connectivity, notably along the PRow (Footpath 318). A 15m buffer will be utilised along the PRow in which there will be no lighting.
  - Creation of a 'buffer zone' of very low illuminance (if any) adjacent to established or proposed key habitats, such as adjacent to treelines.
  - Landscaping measures in the form of shrubs and tree planting to further act as secondary mitigation to screen and soften the effects of installed artificial light sources should be considered.
  - Use the minimum light levels necessary for the relevant task / function, this may equate to reducing light intensity, and/or using the minimum number or light sources or minimum column height.
  - Use hoods, louvres or other luminaire design features to avoid light spill onto retained and newly created areas of vegetation likely to be used by foraging and commuting bats. In particular, light spill on to any trees with bat roost potential from the construction or operational phase lighting should be avoided to minimise the risk of disturbance.
  - Use narrow spectrum light sources where possible to lower the range of species affected by lighting, specifically avoiding shorter wavelength blue light, using instead warm/neutral colour temperature lighting.
  - Use light sources that emit minimal ultra-violet light to avoid attracting night-flying invertebrate species which in turn may attract bats to the light.
- 3.2.14. It is understood that the lighting strategy will utilise Mayflower smart control lighting, a control that makes it is possible to establish a site-specific switching regime, whereby each lighting unit fitted with a Mayflower external node can be controlled individually and set to dim at any time of day during operation. Furthermore, the dimming regime can be adjusted at any time to suit seasons. By using this control, it will be possible to reduce the lighting at the times when bats are active.

## **DRAINAGE STRATEGY**

- 3.2.15. A sensitive drainage strategy will be implemented for the operation of the Scheme. Details of the drainage strategy are set out within Chapter 11 Water Resources and Flood Risk of the ES (WSP 2020h), the Flood Risk Assessment (FRA) (WSP 2020i) and the Surface Water Drainage Strategy (SWDS) (Capita 2020).
- 3.2.16. A combination of Sustainable Drainage Systems (SuDS) features will be designed into the Scheme to provide mitigation for the potential effect of increases in physical contamination (i.e. sedimentation) of surface water bodies. Whilst the drainage strategies will primarily aim to mitigate the potential impacts upon groundwater and surface water, a number of these features will also



create valuable wetland habitats for notable and protected species. These features will include swales and lined attenuation ponds for the eastern portion of the Scheme.

- 3.2.17. The SuDS features should be appropriately enhanced to increase their ecological value and subsequently benefit wildlife. Section 3.4 provides enhancement measures for SuDS features.

## **SPECIES-SPECIFIC MITIGATION**

### **Bat Foraging and Commuting**

- 3.2.18. An appropriate lighting strategy will be created for the Application Site as discussed above. In particular, the lighting strategy will require that new permanent lighting is the minimum required and will avoid light spill directly onto retained and newly created ecological features (e.g. hedgerows and woodland) within the Scheme.

- 3.2.19. Bat activity surveys within the Application Site the PRow (Footpath 318) as being sensitive areas for rare bat species, including barbastelle bat. As such, no lighting will be placed within a 15m buffer of the PRow.

### **Bat Roosting**

- 3.2.20. To mitigate for the loss of roosting opportunities across the Application Site, and to enable future monitoring, new roosting opportunities in the form of bat boxes will be installed on retained mature trees in suitable locations, either within the Application Site itself, or within nearby land under the ownership of WSCC.
- 3.2.21. The number of bat boxes installed will at least replicate the number of Potential Roost Features (PRFs) lost from the six moderate/high potential trees (12 PRFs in total), with another five additional PRFs provided as an enhancement measure. Bat boxes should be targeted towards species likely to use the Survey Area, namely tree/woodland dwelling species such as common pipistrelle or noctule. Indicative designs to be included in the mitigation include:
- 2F Schwegler Bat Box – for general purpose;
  - 2FN Schwegler Bat Box – suited to noctule roosting requirements;
  - 1FF Schwegler Bat Box – for general purpose and maternity colonies; and
  - 1FW Bat Hibernation Box – for hibernation.
- 3.2.22. Bat boxes should be installed on mature trees at approximately 4 metres above the ground and placed in a range of locations at slightly different heights and facing in slightly different directions to give a choice of roost site options (Mitchell-Jones, 2004). The direction of the boxes should be selected to avoid facing them into the prevailing weather and will preferably be positioned facing in a southerly direction (i.e. south-west through south to south-east) where they will receive a good degree of sunlight. Bat boxes should be installed in positions where they are out of reach of people from the ground and high enough to deter cats and other predators.
- 3.2.23. Recommended locations for bat box installation include retained orchard and woodland habitat within habitat immediately south of the west of the Application Site as well as along the retained and dark corridor of the PRow (Footpath 318).

## Badger

- 3.2.24. As the use of the Application Site by badgers will likely change over time, with some setts likely to become inactive and new setts likely to be created, a walkover survey will be undertaken prior to commencement of works, and the licence application being submitted.
- 3.2.25. It will be necessary to close the setts under a licence from Natural England. These licences are typically only issued for activities affecting setts to occur between 1st July and 30th November inclusive, in order to avoid the badger breeding season. A suitable mitigation strategy will need to be in place to obtain the licence and is likely to include the installation of one-way badger gates, kept in place for a minimum of 21 days, monitoring of the sett for signs of badgers entering or leaving the sett and destruction of the sett once badgers are excluded to reduce the risk of badgers re-occupying the sett. The area will also be secured against re-entry by badgers by using heavy-gauge chain link fencing.
- 3.2.26. As one of the setts to be lost is a main sett, it will be necessary to install an artificial sett, which will need to be proven to have been occupied by badgers, prior to the closure of their main sett. A preliminary design has been discussed with Natural England through the discretionary advice service, with final design to be refined during the application of the Natural England sett closure licence. This artificial sett is currently scheduled for construction later in 2020 and should be installed at least six months prior to sett closure.
- 3.2.27. Permanent badger fencing will be installed either side of the new road, with an underpass located to the west of the Scheme, close to the current main sett to allow badgers to forage on either side of the road and therefore reducing the risk of vehicle collision. The fencing design will be refined during the application for the sett closure licence, however will be dug deep to prevent badgers tunnelling underneath and also designed to persuade badgers to utilise the underpass.

## Birds

- 3.2.28. To mitigate for the loss of nesting opportunities across the Application Site, at least six bird boxes will be installed in suitable locations within retained habitat.
- 3.2.29. Bird boxes designs should reflect the nesting requirements for species known to use the Scheme and that are local conservation priorities such as house sparrow *Passer domesticus* and starling *Sturnus vulgaris*, as well as common and widespread woodland species. Box dimensions and placement should be tailored to the target species. Indicative designs to be included in the mitigation include:
- 1B Schwegler Nest Box – cavity nest box;
  - 2H Schwegler Robin Box – open fronted box;
  - CedarPlus Triple Sparrow House– for sparrow species; and
  - 3S Schwegler Starling Nest Box– for use by starling and other cavity nesters.
- 3.2.30. In general, boxes should be installed on mature trees 2-4m high and placed to avoid strong sunlight and the wettest winds (usually north to east, depending on the shade level), and the entrance should face slightly downwards to protect from the rain. Boxes should have a clear flight path on the approach and be relatively undisturbed.
- 3.2.31. Indicatively the boxes should be placed within retained woodland and orchard habitat to the south of the Application Site, or within the retained PRow (Footpath 318).

## Reptiles

- 3.2.32. To mitigate for the loss of reptile refuge across the Application Site, at least six refugia/hibernacula will be installed in suitable locations within retained habitat.
- 3.2.33. Refugia piles should be installed within retained grasslands on the edge of scrub habitat. They should be built in line with the Reptile Habitat Management Handbook (Edgar, Foster and Baker 2010), and include brush and log piles to create cover, provide additional structure to existing habitat and enhance prey availability.
- 3.2.34. It is recommended that at least one of the refugia piles also functions as a hibernacula. This hibernacula should also be built in line with the Reptile Habitat Management Handbook (Edgar, Foster and Baker 2010), to provide hibernation opportunities throughout the winter season.

## Invertebrates

- 3.2.35. Dead wood will be retained within woodland habitats where possible to mitigate for the loss of suitable stag beetle habitat. The deadwood should be retained in line with Buglife guidance (Buglife 2011), by leaving standing deadwood in situ, creating log piles and leaving fallen deadwood on the ground.
- 3.2.36. Log piles created as reptile refugia will also serve as invertebrate habitat. These should be placed in grassland and scrub habitats, within sunny positions to benefit invertebrate species.

## 3.3 CONSTRUCTION MEASURES

- 3.3.1. The following measures are recommended during the construction phase of the Scheme to ensure the avoidance and reduction of killing/injury of notable and protected species as well as the protection of retained habitats. This section should be read alongside the CEMP.

### GENERAL CONSTRUCTION MEASURES

- 3.3.2. General environmental protection measures must be implemented during the construction phase of the Scheme as included within the CEMP. Such measures include best environmental practice guidance outlined in the Government's Pollution prevention for businesses (DEFRA, 2019) and those outlined by the Construction Industry Research and Information Association guidance (CIRIA, 2015). The following minimum standards must be adhered to prevent negative ecological effects beyond the Scheme boundary:
- Measures must be taken to prevent dust and other emissions from construction affecting the retained habitats and land beyond the Scheme.
  - Chemicals and fuels must be stored in secure containers located away from watercourses or water bodies. Spill kits must be available.
  - Implementation of a construction-phase drainage strategy to intercept, capture and attenuate surface water runoff.
  - Excavations must be covered or securely fenced (with no potential access points beneath fencing) when the construction site is closed (e.g. overnight) to prevent entrapment of animals, specifically badgers.
  - Retained trees and hedgerow must be protected in accordance with British Standard BS5837:2012 Trees in Relation to Construction, including the erection of robust protective fencing encompassing root protection areas.

- Noise and vibration must be controlled and kept to the minimum necessary, especially with regard to working in close proximity to known active badger setts.
- Lighting used for construction must be kept to a minimum and switched-off when not in use.
- Lighting should be positioned so as not to spill on to adjacent land or retained vegetation within the Scheme.
- Night works should be avoided where possible to reduce lighting of sensitive habitats and disturbance to species.

## **SPECIES SPECIFIC CONSTRUCTION MEASURES**

### **Badger**

3.3.3. Badgers use the wider area for foraging and commuting purposes and therefore measures need to be put in place during the construction phase to minimise effects upon badger movement and foraging activity. These will include measures such as:

- fencing dangerous areas of the construction site (e.g. deep excavations) or providing a means of egress from shallow excavations;
- avoidance of storage of plant and materials on areas of potential foraging habitat (e.g. retained grassland);
- noise reduction measures during construction;
- avoidance of night works, unless specifically required, to avoid disturbance by artificial lighting; and
- where required use of lighting hoods, cowls or shields to avoid light spill onto setts or badger paths.

3.3.4. For setts that are located outside the Scheme extent, to ensure they are not affected by the works, a 30m buffer around each sett in which no construction activities can take place will be clearly marked.

### **Bats**

3.3.5. All retained trees will be protected in accordance with British Standard BS5837:2012 Trees in Relation to Construction, including the erection of robust protective fencing encompassing root protection areas.

3.3.6. To avoid disturbance to retained trees and buildings with suitability to support roosting bats, the CEMP will include best practice construction measures to minimise the effects of noise pollution, dust and air pollution and visual intrusion during construction, as above.

3.3.7. Lighting during the construction phase will be kept to a minimum to avoid light spillage on retained habitat that bats will use for foraging and commuting purposes, in line with the measures outlined above.

3.3.8. Prior to tree removal, as bats may use PRFs on a transient basis and there will be at least a 12-month time lapse between the most recent surveys (2019) and construction commencing, an updated ground level inspection will be completed to confirm the level of potential for bat roosts to be present. This is to ensure that mitigation is appropriate and based on information current at the time of works. The following approach will then be taken:

- Trees assessed as having low potential to support bat roosts will be soft-felled by suitably qualified arborists, following an at-height inspection of any potential roost features to confirm the absence of roosting bats (and evidence of roosting bats). Contractors with basic bat awareness

should be employed and guidance within British Standard BS8596:2015 Surveying for Bats in Trees and Woodland should be adhered to. In addition, where it is not possible to thoroughly assess PRFs, sectional soft felling methods should be used to remove those features. This involves lowering the whole section of branch with the PRF to the ground, not cross-cutting or fracturing it. The PRF section should then be placed in a suitable location (e.g. within retained woodland) and should be left overnight, with the PRF facing upwards, with free routes of dispersal, for any bats to disperse naturally. As the trees are not likely to offer hibernation potential to bats, felling works should be undertaken in the winter (November – March depending on weather conditions) where possible, when bats can reasonably be assumed to be absent.

- Trees assessed as having moderate or high potential to support bat roosts will be subject to a climbing inspection to enable a thorough assessment of potential and to search for evidence indicating the presence of roosting bats. If at this stage the potential is downgraded to low, the trees will be soft felled by suitably qualified arborists as above.
- In the event that the presence of a bat roost is highlighted at this stage, the requirement for works affecting the roost would be reconsidered to identify whether adverse effects can be avoided. Where possible, in this scenario proposals would be updated to enable retention and protection of the bat roost. In the event that retention is not possible, a licence would be sought from Natural England to permit works to proceed, the licence application would be subject to a detailed method statement.

- 3.3.9. If it is not possible to avoid disturbance effects to Building B5 via careful timing of works, then it may be necessary to obtain a licence from Natural England to permit works to proceed, which would be subject to a detailed method statement. As Building B5 has been assessed as having negligible potential to support hibernating bats, avoidance of impacts would include timing the works to take place between November – February (weather dependent) when bats are likely absent from the roost.
- 3.3.10. In the unlikely event that any bats are encountered or PRF's of moderate/ high suitability for supporting roosting bats are identified during the construction phase, felling works should cease and further professional ecological advice should be sought.

### **Birds**

- 3.3.11. Suitable bird nesting habitat clearance should be undertaken outside of the bird nesting season (indicatively March to September). Where clearance of habitat is not possible outside of the breeding bird season, all areas to be affected will be checked for evidence of nesting birds by an ecologist. The check will be undertaken a maximum of 24 hours prior to the vegetation removal taking place.
- 3.3.12. If any active bird nests are discovered these will be cordoned off with a buffer of at least 5m (this may increase depending on species, proposed works and location) where no potentially disturbing works will take place. The buffer will remain in place until the young have fledged and the nest vacated. Upon fledging, a second nesting bird check would then be undertaken to ensure the vegetation does not contain any further active nests prior to felling or removal works taking place.

### **Small Mammals, Reptiles and Amphibians**

- 3.3.13. Should the removal of any rubble, brash or log piles be required as part of the Scheme then a precautionary methods of work (PMoW) should be employed. This is to ensure compliance with

legislation and planning policy regarding small mammals (including hedgehog), common reptile species and amphibian species listed as NERC priority species.

- 3.3.14. It is advised that all areas of suitable habitat will be treated as potentially supporting reptiles. In all areas of suitable habitat, mitigation will entail the clearance of vegetation outside of the sensitive hibernation season (indicatively November-February inclusive, but weather dependent). Where tall herbaceous vegetation is cleared during the active season for reptiles, then it will be undertaken in two stages over at least two consecutive days and include an initial cut down to 150mm, with the second cut reducing vegetation as close as possible down to ground level in order to progressively render habitat unsuitable for reptiles. Any refugia will be dismantled by hand with all works undertaken under the supervision of a suitably qualified ecologist to minimise the risk of killing or injury to reptiles. Works will be temporarily halted if individual animals are encountered to allow the animal to disperse from the work site.

## 3.4 ECOLOGICAL ENHANCEMENT

### HABITAT CREATION

- 3.4.1. In accordance with national and local planning policy, the Scheme should aim to enhance retained habitats. The landscape strategy will ensure that a variety of habitats will be created including for a diverse species mix. In addition to this the following measures should be considered:
- Inclusion of nectar-rich plant species in soft landscaping areas that are attractive to night-flying insects to enhance foraging opportunities for bats (BCT 2015). For example, these could include oxeye daisy *Leucanthemum vulgare*, knapweed *Centaurea nigra*, primrose *Primula vulgaris*, common mallow *Malva neglecta*, wild marjoram *Origanum vulgare* and wild thyme *Thymus polytrichus*.
  - Creation of refugia/hibernacula - habitat, brash or rubble piles installed in landscaped areas in order to provide refuge and hibernation opportunities small mammals such as hedgehog.
  - Purpose built invertebrate “hotels” could be installed in landscaped areas to provide refuge for specific taxonomic groups, i.e. provision of nesting boxes for solitary bees.
  - Standing water to be incorporated within the SuDs features should provide a permanent source of water for species such as badger, hedgehog, birds, amphibians and invertebrates, where drainage conditions allow. This should incorporate varying depths and slopes within the standing water to provide varying water depths and conditions. A suitable planting regime should also be used, comprising a native species rich mix of submerged, emergent and marginal vegetation to promote aquatic floristic diversity. The swales/ species-rich wet grassland should be planted with an appropriate mix of native marshy grassland species.

## 4 CONCLUSION

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- 4.1.1. This mitigation strategy provides a summary of the ecological baseline for the Scheme. As supported by ecological survey and desk study data, the habitats within the Scheme are considered suitable to support:
- bats (foraging, commuting and roosting);
  - badgers;
  - other small mammals;
  - wintering birds;
  - breeding birds;
  - reptiles; and
  - invertebrates.
- 4.1.2. Ecological mitigation measures required to fulfil legislation and local/national planning policy are outlined. These include:
- a detailed landscape strategy that promotes habitat diversity and with the aim to achieve 10% Biodiversity Net Gain (BNG);
  - a drainage strategy that promotes habitat diversity;
  - a lighting strategy sensitive to ecological features such as foraging and commuting bats;
  - further ecological enhancement measures including bird boxes, bat boxes and habitat features for small mammals, amphibians and invertebrates; and
  - construction measures to avoid the damage/disturbance to notable habitats and killing/injury of notable and protected species.

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