Tritax Symmetry (Hinckley) Limited

HINCKLEY NATIONAL RAIL FREIGHT INTERCHANGE

The Hinckley National Rail Freight Interchange Development Consent Order

Project reference TR050007

Landscape Ecological Management Plan (LEMP)

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Planning Act 2008

The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 Regulation 5(2)(a)

The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 Regulation 14

This document forms a part of the Development Consent Order (DCO) for the Hinckley National Rail Freight Interchange project.

Tritax Symmetry (Hinckley) Limited (TSH) has applied to the Secretary of State for Transport for a DCO for the Hinckley National Rail Freight Interchange (HNRFI).

Further details about the proposed Hinckley National Rail Freight Interchange are available on the project website:

http://www.hinckleynrfi.co.uk/

The DCO application and documents relating to the examination of the proposed development can be viewed on the Planning Inspectorate's National Infrastructure Planning website:

https://infrastructure.planninginspectorate.gov.uk/projects/east-midlands/hinckley-national-rail-freight-interchange/

Section 1 ◆ Introduction, Context and Purpose

INTRODUCTION

1.1 This Landscape and Ecology Management Plan (LEMP) has been prepared by The Environmental Dimension Partnership Ltd (EDP) on behalf of Tritax Symmetry (Hinckley) (hereafter referred to as 'TSH'). It has been produced in relation to the Hinckley National Rail Freight Interchange (HNRFI) on land north-east of Hinckley, which is to be the subject of a Development Consent Order (DCO) application. The full extent of the DCO Order Limits is hereafter referred to as the 'DCO Site'.

PURPOSE

1.2 This LEMP describes a scheme of habitat creation/enhancement and subsequent maintenance and management, which is required to ensure that the ecological and landscape framework is sustained. This will enable all benefits of a rich environment to be delivered successfully throughout the lifetime of the scheme.

1.3 The actions described in this LEMP directly relate to the Biodiversity Impact Assessment (BIA) completed for the scheme, which identified how biodiversity net gain would be achieved. A separate BIA report has been written by EDP (Appendix 12.2, document reference 6.2.12.2). The actions required for retention, protection, creation and enhancement of habitats to achieve net gain are described in this report.

1.4 This LEMP will extend over the lifetime of the development, requiring subsequent monitoring and review of all operations. It sets out how the habitats will be created and managed through the operational phase of the development and how they will benefit wildlife and biodiversity. The Ecological Mitigation and Monitoring Plan (document reference 17.5) submitted alongside the LEMP relates to the protection and management of species and habitats through the construction phase. The LEMP will be reviewed after an initial 5-year period, so as to take account of any changes to the site or other influencing factors that may become evident as the landscape and ecological features become established and approach maturity. Additional reviews will be carried out as detailed in Section 5 of this report.

1.5 It should be noted that this is an outline LEMP, based on the Illustrative Landscape Strategy and Landscape is not based on detailed landscape design proposals. The habitat creation proposals and proposed species mixes described in this management plan give an indication of the likely nature of the proposals but may be subject to changes at the detailed design stage. Final detailed proposals will be agreed with the local authorities as part of the discharge of relevant DCO requirements.

1.6 The overall aims of this LEMP are:

- to outline measures required to establish the proposed habitat and landscape

features within the Main Order Limits;

- to provide a management framework for the conservation and enhancement of habitats and other features of ecological and landscape interest associated with the Proposed Development; and

- to ensure the delivery of appropriate long-term management works to all features of ecological and landscape importance, within the Proposed Development, to ensure they continue to deliver benefits for local wildlife, biodiversity, recreation and visual amenity.

Section 2 ◆ Scope, Aims and Responsibilities

SCOPE AND TIMESCALES

2.1 The management scheme detailed within this LEMP will cover the provision, management, inspection, maintenance, repair and replacement of ecological and landscape features as necessary.

2.2 This LEMP will cover the first 30-years following the completion of the development (taken to be the completion of the last building to be constructed) and will be subject to an appropriate regime of inspection, monitoring and review of all operations set out within this LEMP at suitable intervals, including an initial formal review at the end of year five, with subsequent reviews every five years after this. The LEMP will be implemented through a Private Management Company appointed by TSH.

2.3 At year 30 of the timetable covered by this LEMP, it is expected that habitats will be at or approaching a stage of maturity such that the management proposals in this LEMP are no longer appropriate. At the end of the 30-year plan period, the final review of the LEMP will identify if and where habitats have not achieved their desired status (as defined by this LEMP and the BIA (document reference 6.2.12.2). Future management and monitoring measures from year 31 onwards will be determined in consultation with the Private Management Company and LPAs, with a new LEMP written and approved as necessary.

2.4 The area of the DCO Site which is subject to this LEMP comprises the Main Order Limits, as illustrated on Figure 2.1, document reference 6.3.2.1 and includes the 22 hectare (ha) proposed extension to Burbage Common and Woods Country Park as illustrated on Figure 11.22 (document reference 6.3.11.22).

2.5 The LEMP includes management recommendations for all soft landscape and ecological features of interest as illustrated on the following Figures:

- Figure 11.20 – Illustrative Landscape Strategy (document reference 6.3.11.20); and
- Figure 12.24 – Ecological Mitigation Proposals (document reference 6.3.12.24).

2.6 The management scheme defined within this LEMP is structured to take into account the habitat creation measures required during the construction phase of the development, and the long-term management and maintenance post-construction.

2.7 The actions described in this document promote the stewardship of the land from a public and private amenity perspective as well as ensuring the maximum biodiversity credits are achieved in accordance with the Biodiversity Impact Assessment (BIA) completed for the scheme. A separate BIA report has been written by EDP (Appendix 12.2, document reference 6.2.12.2). The detailed LEMP will include specific habitat management

prescriptions which will be informed by Defra's Biodiversity Metric Habitat Condition Assessment criteria. Regular monitoring will be undertaken, and remedial actions recommended where appropriate to ensure target habitat conditions are met.

2.8 The general scope of this LEMP includes the following:

- to ensure the successful delivery and appropriate management of all new and retained features of ecological value or interest; and
- the long-term management and maintenance of the scheme post-construction seeks to ensure that the ecological and landscape framework is sustained and enhanced, such that all benefits to ecological biodiversity are delivered successfully throughout the lifetime of the scheme.

AIMS AND OBJECTIVES

2.9 The overall aims of this Management Plan are to ensure appropriate maintenance and management of all semi-natural habitats which are to be retained, enhanced or created as part of this development phase, to ensure that they continue to deliver benefits for local wildlife and the protected and Priority Species present on the Main Order Limits as well as provide public and private amenity for users.

RESPONSIBILITIES

2.10 The responsibility for delivering the protection and enhancement activities described in this LEMP, during and immediately after the construction period, will be with TSH. TSH will be assisted by a combination of one or all of the following: a Principal Contractor; a suitably experienced Landscape Contractor; and a suitably experienced ecologist.

2.11 The responsibility for delivering the ongoing maintenance and management activities at described in this LEMP during the operational phase (i.e. post-construction) will be with TSH/Principal Contractor, via instruction of a management/stewardship body or a suitably experienced Landscape Contractor as instructed by the management/stewardship body.

Section 3 ◆ Existing and Proposed Ecological/Landscape Features

ECOLOGICAL FEATURES

3.1 During the baseline ecological investigations undertaken by EDP, the following valued ecological features were identified within or adjacent to the Main Order Limits.

- Designated Sites – Burbage Wood and Aston Firs Site of Special Scientific Interest (SSSI) and the overlapping Burbage Common and Woods Local Nature Reserve (LNR) are located immediately adjacent to the Main Order Limits. In addition, two Local Wildlife Sites (LWSs) and seven potential Local Wildlife Sites (pLWSs) lie within the Main Order Limits and four LWSs and four pLWSs lie immediately adjacent. A candidate Local Wildlife Site (cLWS) also lies immediately north of the railway in north-east;

- Habitats (see Figure 12.3, document reference 6.3.12.3) – Principally comprise arable, improved, semi-improved grassland, buildings and hardstanding, marshy grassland and tall ruderal vegetation of low ecological value. However, the semi-improved neutral grassland, pond network, plantation woodland and ditches are of higher (Local level) nature conservation value. In addition, the hedgerow/tree line network demarcating the field boundaries, the scattered mature trees across the Main Order Limits, the parcels of broadleaved semi-natural woodland and the unnamed stream are considered to be of high (District level) nature conservation value;

- Birds – The diversity and density of wintering and breeding birds recorded within the Main Order Limits is considered to be mostly typical for a lowland urban edge farmland site in central England. Diversity and abundance are slightly higher than is generally found, although given the size of the Main Order Limits, this is not surprising. Farmland indicators were recorded in moderate numbers, including yellowhammer (*Emberiza citronella*), linnet (*Linaria cannabina*), grey partridge (*Perdix perdix*), lapwing (*Vanellus vanellus*) and yellow wagtail (*Motacilla flava*);

- Bats: Roosting – The Main Order Limits contain 33 buildings/built structures, all of which were assessed for their potential to support roosting bats. Five of these buildings (B2, B3a, B12, B20 and B21) were found to support bat roosts in 2021. B12, B20 and B21 were found to support only single common pipistrelle (*Pipistrellus pipistrellus*) bats in 2021 and no roosts had been recorded in these buildings previously. B2 was found to support a roost of two common pipistrelle bats in 2021 and supported three bats of this species during the previous surveys. Building B3a was found to support eight common pipistrelle bats in 2021 and in previous surveys was found to support three common pipistrelle and six long-eared bats (*Plecotus sp*.). In addition, a total of 83 trees were found to have bat roost potential (8 with high,

22 with moderate and 53 with low potential) within the Main Order Limits. No trees were confirmed as roosts during the ground level visual assessment or subsequent general activity surveys;

- Bats: Commuting/foraging – The activity surveys across the Main Order Limits recorded low to moderate levels of commuting and foraging bat activity, mainly associated with the species-rich hedgerows, woodland edge, waterbodies and mature trees. This activity was fairly evenly spread across the Main Order Limits, and species diversity is fairly low, being dominated by common pipistrelles (86.3% of all static detector recordings made) with at least eight other species recorded (*Myotis sp*. Not identified to species level) during the transect and automated detector surveys, including a few passes from two rarer species locally and nationally – Nathusius' pipistrelle ((*Pipistrellus nathusii*); six recordings spread between April to September) and barbastelle (*Barbastella barbastellus*) (two recordings). The bat assemblage recorded within the Main Order Limits is typical of an urban edge farmland site in central England, with common and widespread generalist species accounting for the vast majority of foraging and commuting activity, and a small amount of activity from several rarer species;

- Badger – During the detailed walkover surveys in 2018, 2019 and 2021, a number of badger (*Meles meles*) setts were discovered across the Main Order Limits and immediate surroundings, comprising one main sett just off-site to the west, one subsidiary sett, and an outlier sett within the Main Order Limits. Evidence of foraging and dispersal across the Main Order Limits was also found. The survey confirms the presence of badgers and active setts within the Main Order Limits, and suggests that the Main Order Limits form a core part of the territory of at least one badger clan;

- Otter - A single record for otter *(Lutra lutra*) from 2002 from 400m to the north-east of the Main Order Limits, nearby to the stream which runs through the Main Order Limits was returned from Leicestershire and Rutland Environmental Records Centre (LRERC) during the desk study. During the two detailed walkover surveys in 2018, an old otter spraint was found immediately adjacent to the Main Order Limits, along the wet ditch on the north-western corner of the Main Order Limits. The update surveys in 2021 found no evidence of the species and as such the evidence found is not considered to be indicative of a permanent population on-site and is more likely to indicate the overspill of populations from the adjacent Burbage Common and Woods LNR;

- Water Vole – Seven records of water vole (*Arvicola amphibius*) were returned, dated between 1998 and 2003, from around the Burbage Common area. During the two detailed surveys for water vole in 2018, no water voles or confirmed evidence of this species was found, apart from a single instance of possible feeding remains, found on the wet ditch on the north-western edge of the Main Order Limits. The 2021 surveys found no evidence of use by the species;

- Brown Hare – Brown hare (*Lepus europaeus*) were recorded commonly across arable land within the Main Order Limits, including a juvenile on one occasion;

- Great Crested Newt – In 2018, an eDNA survey returned a positive result for the presence of great crested newt (*Triturus cristatus*) DNA in three on-site ponds and one off-site pond, but was negative for all other surveyed ponds within the Main Order Limits. No great crested newts (or eggs or larvae) were recorded during the course of the six conventional pond surveys undertaken of these ponds in 2018. A second eDNA test was carried out on these four ponds following this result, resulting in a positive result for just one on-site pond. In 2019, only one off-site pond returned a positive eDNA result and in 2021 all sampled ponds tested negative. As such, it is assumed that a potential small population of non-breeding great crested newt was present within the area but has now declined to an undetectable population;

- Reptiles – 'Low' populations of grass snake (*Natrix helvetica*) and slow worm (*Anguis fragilis*) were found during the refugia-based reptile survey undertaken across the Main Order Limits during the 2018, 2019 and 2021 seasons; and

- Invertebrates – The majority of the Main Order Limits are not considered to support important populations of invertebrates, given the dominance of arable and improved/semi-improved grassland habitats. However, habitats including the hedgerow network, scattered mature trees, woodland, waterbodies and watercourse provide opportunities for terrestrial and aquatic invertebrates. It is considered that the mitigation relating to these habitats will act as a surrogate to safeguard such interests.

CHANGES TO ECOLOGICAL FEATURES

Ecological features to be removed

3.2 Burbage Common Road Railway Bridge pLWS will be lost to the proposals. Burbage Common Road Hedgerows pLWS will be retained but will be subject to permanent direct impacts through its severance in several places to facilitate new internal road access points. Freeholt Meadow pLWS will also be permanently lost to facilitate the provision of a new access road from Junction 2 of the M69.

3.3 Large losses of on-site hedgerows and trees are unavoidable and anticipated to facilitate the Proposed Development. Areas of hedgerow and broadleaved plantation woodland will also be lost to facilitate the Proposed Development.

3.4 The unavoidable loss of five ponds is anticipated to facilitate the Proposed Development. Although not directly lost to the Proposed Development the on-site stream corridor will be re-routed along its length to facilitate the Proposed Development. The stream will also need to be culverted at certain points along its length to pass beneath new roads. The stream will, however, be reinstated along a new course, allowing for a naturalistic profile and the establishment of vegetation which is currently absent.

3.5 A minor loss of grassland on the road verge to the south of Freeholt Meadow to allow the construction of a new access road is expected as part of the Proposed Development.

3.6 These habitats have been found to support over-wintering and breeding birds, badger and roosting, foraging and commuting bats, and common reptiles. The Main Order Limits also has potential to support otter, water vole, great crested newts, brown hare and an assemblage of invertebrates. Such species are considered capable of being supported by the retained, enhanced and newly created areas comprising grassland, scrub, hedgerow/tree planting and wetland habitat, as described further below.

Ecological features to be retained and enhanced

3.7 The development has been designed to protect and enhance, where possible, key woody habitats and associated protected species populations within the scheme. It has also been designed to incorporate additional features and enhancements to deliver a long-term net gain in biodiversity. This has been achieved through three main design principles:

- the retention of valued features within the Proposed Development;
- enhancement of habitats, which are currently of low value; and
- the creation of new habitat features within the Proposed Development.

Enhancement, creation and management measures

3.8 In summary, the proposals of this LEMP include:

Hedgerows

- Retained hedgerows restored where relevant through selective trimming/laying (in traditional Midlands Style) and planting with native species in gaps;
- Planting new native species-rich hedgerow within the Proposed Development's open spaces that connect green spaces in order to offset some of the losses incurred through the construction of the Proposed Development; and
- Sensitive management of new and retained hedgerows, such as trimming on a rotation to allow plants to develop flowers and fruit in order to enhance value to a variety of wildlife.

Woodland, scrub and trees

- New native tree and shrub planting within the Proposed Development's wildlife and amenity areas and along the internal roads and boundaries;
- Ongoing viability and safety of tree stock on-site maintained including arboricultural inspections in accordance with industry best practice;
- Pruning of retained and new tree stock as necessary and in accordance with industry best practice; and
- Management of retained woodland parcels (excluding woodland adjacent to Aston

Firs, which is covered above in the non-statutory designations section) through ongoing viability/safety of tree stock maintenance, pruning as necessary, clearance of successional scrub, creation of deadwood piles, litter picking and fencing where appropriate.

Sustainable Drainage System (SuDS) attenuation features and wildlife ponds

- Creation and management of SuDS that will not only ensure the rate of surface water run-off from the Proposed Development matches current levels, but would also intercept pollutants and provide habitat for a variety of wildlife;
- Planting and management of the attenuation features, including the creation of reed beds, to enhance their ecological value and effectiveness at intercepting pollutants, including permanent ponds designed for wildlife; and
- In addition to the attenuation features new ponds will be constructed specifically designed for wildlife as part of the proposals, situated within or near new grassland and woodland habitats.

Stream

- Re-profiling of banks following redirection to create a more naturalistic channel, suitable for a range of riparian species;
- The addition of riffles and lags in order to create a variety of niches suitable for a range of invertebrate and fish species; and
- Planting and management of riparian vegetation along the stream corridor.

Grassland

- Sowing of new species-rich meadow grassland across open spaces and sensitively managed to benefit birds, bats, badgers, other small mammals, amphibians, reptiles and invertebrates; and
- Sensitive management of retained semi-improved neutral grassland along the M69 corridor.

Birds

- Management of areas of the wildlife area and other green infrastructure areas to ensure that habitats suitable for nesting skylark, linnet and yellowhammer as well as foraging barn owls (*Tyto alba*) are provided;
- Durable bird boxes, including a range of designs to suit different species, will be erected on retained mature trees; and
- Bird nesting features (e.g. swallow/swift ledges and sparrow terraces) will be incorporated into selected new buildings within the Proposed Development.

Bats

- Durable bat boxes, including a range of designs to suit different species, will be erected on retained mature trees;
- Bat roosting features will be incorporated into selected new buildings; and
- A sensitive lighting scheme, which ensures retained and new bat habitats are not illuminated to a level where bat activity is deterred (typically considered to be 1 lux).

Badger

- Traffic calming schemes near the retained off-site sett on the western edge of the Main Order Limits with speed restrictions and/or fencing along the road to reduce the risk of collisions with traffic.

Otter

- A sensitive lighting scheme, which ensures the new stream corridor and associated habitats are not illuminated to a level where otter activity is deterred (up to 1 lux);
- Restricting public access to the stream corridor through the provision of clear footpaths, fencing and strategic landscape planting to minimise disturbance; and
- Creation of new wetland habitat along the stream corridor.

Amphibians

- The retained and new waterbodies across the Proposed Development and wider landscape that support toads (*Bufo bufo*) will be connected via green corridors to ensure they do not become isolated by the Proposed Development, as well as to ensure sufficient carrying capacity for any populations present. In addition, these green corridors will be enhanced through the provision of swales and other attenuation features, installation/maintenance of hibernacula and management to promote a rank grassland sward; and
- A number of the newly created ponds will be enhanced and managed specifically for their potential to support amphibians and other species.

Other fauna

- Creation of wood piles to enhance opportunities for invertebrates, amphibians, reptiles and small mammals such as hedgehogs (*Erinaceus europaeus*); and
- Low level management of marshy/meadow grassland to create rank and tussocky areas that provide opportunities for reptiles, amphibians, invertebrates and other wildlife.

Section 4 ◆ Habitat Creation

4.1 This section sets out the appropriate habitat creation and landscape planting to be completed within the enabling and construction phases (up to the first available planting season following completion of construction), to ensure that appropriate measures to provide biodiversity enhancement and visual amenity are implemented from the early stages of the scheme.

4.2 The development will result in the loss, damage and/or destruction of suitable habitats for wintering and breeding birds, roosting and foraging/commuting bats, badger, water vole, otter, amphibians, reptiles and brown hare. These habitats include arable fields, areas of poor semi-improved grassland, hedgerows, trees, scrub and ponds.

4.3 To compensate for such losses and provide long-term enhancement, the following measures are proposed (refer to Illustrative Landscape Strategy at Figure 11.20, document reference 6.3.11.20):

- New native planting and other habitat features along the boundaries and through the Main Order Limits (as detailed within the Illustrative Landscape Strategy in Figure 11.20, document reference 6.3.11.20) to maintain habitat connectivity, with large areas of public open space created in the west of the Main Order Limits. Features to be created include the following:

  - o new native species-rich hedgerow at various locations throughout the Main Order Limits, to increase connectivity with other woody habitat both on- and off-site, as well as increasing refuge and foraging for birds and green corridors for bats, badger and other fauna;

  - o scattered native tree, and woodland planting (including wet woodland) and scrub/shrub planting throughout the Main Order Limits to enhance areas of green open space, buffer and strengthen the existing vegetation and to maintain habitat connectivity and structural variation for a range of fauna throughout the Main Order Limits;

  - o wildflower meadow/species-rich grassland scattered throughout the Main Order Limits, with distinct areas within the main expanses of public open space, particularly the open space west of the A47 link road and Western Amenity Area, as well as wide strips alongside the boundaries of the Main Order Limits. This will provide habitat for fauna including birds, bats, badger, reptiles and invertebrates, foraging/commuting within the proposed green open spaces;

  - o wetland habitat creation along the stream corridor and subsequent management will be designed to prevent over-shading and encourage growth of aquatic and marginal vegetation, which in turn will provide potential habitat for fauna and assist in maintaining bank stability;

- seasonally wet grassland surrounding the attenuation basins and wildlife ponds to further diversify habitat structure and function for fauna such as reptiles, amphibians, invertebrates and other species; and

- marginal and aquatic planting within and surrounding permanently wet areas within the attenuation basins and ponds, to provide an intrinsically valuable habitat as well as habitat for fauna such as reptiles, amphibians, invertebrates and other fauna.

- attenuation features to be created throughout the Main Order Limits, with a series of wildlife ponds to be created within the open space in the south-west of the Main Order Limits;

- bird and bat boxes to be installed on existing mature trees (see Figure 12.24, document reference 6.3.12.24);

- insect hotels to be installed in newly created wildflower grassland; and

- refugia (log piles and hibernacula) to be constructed in newly created wildflower grassland, close to retained woody habitat (see Figure 12.24, document reference 6.3.12.24), of benefit to a range to fauna such as amphibians, reptiles, invertebrates and European hedgehog.

4.4 The following paragraphs detail the ground preparation and establishment procedures to follow in creation of the proposed landscape features and habitats. This should be read in conjunction with the landscape proposals referred to above.

4.5 In addition, measures to ensure successful establishment of new habitats and ecological features throughout their establishment phase and in the long-term are detailed within Section 6.

GENERAL MEASURES

4.6 All work to be carried out in accordance with the following:

- all materials and workmanship are to be to the highest possible standards in accordance with relevant good practice and British Standards;

- all work to be carried out by appropriately skilled, qualified and experienced operatives for the type and quality of the work, and in accordance with good horticultural practice and contemporary Legislation, Regulations and Codes of Practice;

- ground preparation and planting to be carried out work while soil and weather conditions are suitable, avoiding moving, handling and tracking over very wet soils. Soil for planting to be moist, friable and not waterlogged;

- only tools suited to site conditions and work carried out are to be used. Hand tools

to be used around existing and newly planted trees and shrubs. Boards to be used where required while working, to protect grass/plant beds;

- work is only to be carried out while soil and weather conditions are suitable. Do not undertake planting, turfing, seeding, etc., during periods of frost, strong winds, when topsoil is frozen, snow-covered or waterlogged, or in drought conditions;
- materials are not to be stock-piled adjacent to newly planted trees or shrubs;
- all waste materials, including plant wrappings and temporary labels, to be removed off-site at the contractor's own expense. No waste materials to be buried or burnt on-site;
- all hard and soft landscape materials to conform to the relevant British Standards and Codes of Practice. All plants to be true to name, type, and character, and to comply with the National Plant Specification;
- plants to be vigorous, weed, pest and disease free, and not suffering from drought, waterlogging, windburn, damage or nutrient deficiency. Fresh grass seed and turf produced for the current growing season are to be used. Any substitutes to be approved by the landscape architect;
- transport and handling of plants shall comply with 'Handling and Establishing Landscape Plants' (Horticultural Trades Association), including protection from desiccation or any other damage prior to planting out;
- prior to undertaking planting or seeding, all rubbish, debris and surface stones exceeding 75mm in any direction are to be removed from site. Any substance or materials injurious to plant growth including any rubble, fuel or lubricants are to be removed; and
- in planted beds, compaction of soil to be relieved to a minimum depth of 450mm, or the full depth of compaction, whichever is the greater, taking special care in any areas of underground services. Soil to be uplifted and fractured through the profile to the full treatment depth. Soil to be cultivated to loosen, aerate and break it up into particles of 2-8mm in the top 150mm of planting beds within a few days before planting. Areas to be planted are to be graded to smooth contours and slopes avoiding depressions. Soil levels to planted beds to finish 125mm below adjacent kerbs/edgings/grassed lawns, to allow incorporation of bark mulch as set out in this document.

BROADLEAVED WOODLAND, WET WOODLAND AND MIXED SCRUB

4.7 The location of proposed Broadleaved Woodland, Wet Woodland and Mixed Scrub referenced in this document is detailed on the Illustrative Landscape Strategy included in Figure 11.20, document reference 6.3.11.20. Planting to be carried out to the following outline specification:

- trees and shrubs to be planted as transplants/whips at 40-60cm in height using the 'notch' planting method, ensuring roots are evenly spread out and the plant well heeled in.

- plants to be spaced randomly within a range to be agreed at the detailed design stage in accordance with Requirement 21.

- ground preparation is key to establishment. Soil testing, tilling and aeration will be required as part of a detailed specification to be prepared in accordance with Requirement 21.

- areas of open ground/glades/rides to be incorporated within woodlands to diversify the woodland flora and structure.

- major tree species within woodland to be more concentrated towards the centre of the woodland and minor tree species and shrubs to be planted on woodland edges and ride and glade edges.

- planting to be carried out in the dormant season between mid-November and the end of February.

- plants to be protected with deer/rabbit proof fencing/guards to be agreed at the detailed design stage.

4.8 The Broadleaved Woodland planting mix includes native species to complement surrounding native vegetation whilst providing opportunities for foraging and shelter for a range of fauna. Suggested species are listed in Table 4.1 below. Percentage species mixes will be detailed as part of the discharge of Requirement 21.

Table 4.1: Species to be included in Broadleaved Woodland

Latin name	**Common name**
Acer campestre	Field Maple
Betula pendula	Silver Birch
Malus sylvestris	Crab Apple
Populus Tremula	Aspen
Prunus Avium	Wild Cherry

Latin name	Common name
Quercus Robur	Common Oak
Sorbus torminalis	Wild Service Tree
Tilia cordata	Small-leaved Lime

4.9 A 'Woodland Railway mix' has been developed to plant along the earth bunds to the north of the railway. This mix conforms to guidance issued by Network Rail and The Tree Council (2015). Species are listed in Tables 4.2 and 4.3 below.

Table 4.2: Species included in 'Woodland edge railway mix' >5m from Network Rail boundary

Latin name	Common name
Acer campestre	Field Maple
Cornus sanguinea	Dogwood
Corylus avellana	Hazel
Prunus spinosa	Blackthorn
Sambucus Nigra	Elder

Table 4.3: Species included in 'Woodland planting mix' >10m from Network Rail boundary

Latin name	Common name
Acer campestre	Field Maple
Carpinus betulus	Common Hornbeam

Latin name	Common name
Pinus sylvestris	Scots Pine
Populus trenula	Aspen
Quercus robur	Common Oak

4.10 The Wet Woodland planting mix includes native species to complement surrounding native vegetation whilst providing opportunities for foraging and shelter for a range of fauna within a damper environment. Suggested species are listed in Table 4.4 below. Percentage species mixes will be detailed as part of the discharge of Requirement 21.

Table 4.4: Species to be included in Wet Woodland

Latin name	Common name
Alnus glutinosa	Alder
Betula pubesens	Downy Birch
Salix Alba	White Willow
Salix fragilis	Crack Willow

4.11 Mixed scrub will provide structural interest within the meadow areas and transitional ecotones at woodland edges whilst providing opportunities for foraging and shelter for a range of fauna. Species are selected to provide suitability across a range of conditions. Suggested species are as listed in Table 4.5. Percentage species mixes will be detailed as part of the discharge of Requirement 21.

Table 4.5: Species to be included in Mixed Scrub/Woodland Edges

Latin name	**Common name**
Acer campestre	Field Maple
Cornus sanguinea	Common Dogwood
Corylus avellana	Hazel
Crataegus monogyna	Hawthorn
Euonymus europeaus	Spindle
Frangula Alnus	Alder Buckthorn
Ilex aquifolium	Holly
Salix caprea	Goat Willow
Salix Viminalis	Osier
Sambucus Niger	Elder
Viburnum Opulus	Guelder Rose

4.12 In addition, specific woodland buffer planting will be provided on the western edge of the Main Order Limits, which will provide a level of screening for off-site ancient woodland and Sites of Special Scientific Interest (SSSI). The woodland buffers will comprise tree and shrub species which are known to possess properties which help disperse emissions and reduce atmospheric nitrogen deposition, using the UK Centre for Ecology and Hydrology Ammonia Reduction Calculator[1]. The species will also be selected to be complimentary to the existing species composition of off-site ancient woodland, with a preference to those

[1] https://farmtreestoair.ceh.ac.uk/ammonia-reduction-calculator

of local provenance.

4.13 It is proposed that 10% of the overall screening mix is trees and 90% shrub species. Trees will be provided in a range of sizes and forms (e.g. 85% feathered, 5% multi stem and 10% standards). Suitable species may include:

- Alder (*Alnus glutinosa*);
- Scots pine (*Pinus sylvestris*);
- Silver birch (*Silver Birch*);
- Downey birch (*Downey Birch*);
- Sessile oak (*Quercus petraea*); and
- Rowan (*Sorbus aucuparia*).

4.14 Where possible, shrubs can be provided as pot grown shrubs and bare root transplants and whips. Suitable species may include:

- Hazel (*Corylus avellana*);
- Hawthorn (*Crataegus monogyna*);
- Alder buckthorn (*Frangula alnus*);
- Holly (*Ilex aquifolium*);
- Crab apple (*Malus sylvestris*);
- Goat willow (*Salix caprea*);
- Elder (*Sambucus nigra*); and
- Wayfaring tree (*Viburnum lantana*).

4.15 The buffers could include backstop planting (a dense barrier of tree planting) along the inner edge of the woodland screen to intercept the flow of air containing pollutants into the SSSI/ancient woodland. Again, these will be species which are known to possess properties which help disperse emissions and reduce atmospheric nitrogen deposition but are also selected for their growth rate and height at maturity). Native tree species that could be planted, in order of preference include Aspen (*Populus tremula*), silver birch, downy birch, Scots pine, beech (*Fagus sylvatica*), and sessile oak.

4.16 The precise species composition will be selected through consultation with Natural England and local authorities and detailed within the Woodland Management Plan secured by Requirement 31.

NATIVE SPECIES RICH HEDGEROW WITH TREES

4.17 Proposed native hedgerow referenced in this document is detailed on the Illustrative Landscape Strategy Figure 11.20, document reference 6.3.11.20. Planting to be carried out to the following outline specification:

- hedge plants to be planted as transplants/whips at 40-60cm in height using the 'notch' planting method, ensuring roots are evenly spread out and the plant well-heeled in.
- ground preparation is key to establishment. Soil testing, tilling and aeration will be required as part of a detailed specification to be prepared in accordance with Requirement 21.
- hedge plants to be planted in double staggered rows spaced at 20-30cm.
- tall tree species to be planted as 60-90cm whips, spaced at 15-30m intervals.
- percentage species mix and layout to be agreed at the detailed design stage in accordance with Requirement 21.
- planting to be carried out in the dormant season between mid-November and the end of February.
- hedgerows to be protected with deer/rabbit proof fencing/guards to be agreed at the detailed design stage.

4.18 The hedgerow mixes include species chosen for their benefits for wildlife and suitability to the local area. Proposed species are shown in Table 4.6. Percentage species mixes will be detailed as part of the discharge of Requirement 21.

Table 4.6: Species to be included in 'Native Hedgerow Mix'

Latin name	**Common name**
Acer campestre	Field Maple
Cornus sanguinea	Common Dogwood
Corylus avellana	Hazel
Crataegus monogyna	Hawthorn
Euonymus europaus	Spindle
Ilex aquifolium	Holly
Ligustrum Vulgare	Wild Privet
Prunus spinosa	Blackthorn
Ulmus glabra	Wych Elm

SPECIES RICH MEADOW GRASSLAND

4.19 Proposed areas for Species Rich Meadow Grassland planting are detailed on the Illustrative Landscape Strategy Figure 11.20, document reference 6.3.11.20.

Ground preparation

4.20 Ground preparation is to be carried out in accordance with the following:

- where topsoil has not been stripped or has been replaced, turn to expose the sub-soil;
- sow mustard seed or oil seed rape for a season or more to reduce nutrient level further, ensuring that the crop is removed before the seed is set. Test the soil for nutrient levels and pH to ensure the correct soil conditions have been achieved before sowing; and

- good preparation is essential to success. Control weeds and produce a good quality seed bed before sowing. Plough or dig to bury the surface vegetation, harrow or rake to produce a medium tilth, and roll, or tread, to produce a firm surface.

Sowing

4.21 Sowing is to be carried out in accordance with the following:

- sow in the autumn or spring (once the land has drained if it is wet);
- seed to be local provenance, ideally at least partly obtained from hay cuts at the adjacent Burbage Common to ensure a compatible grassland type;
- the seed must be surface sown and can be applied by machine or broadcast by hand. Sowing is to be undertaken at a rate of 4g/m^2;
- to get an even distribution and avoid running out, divide the seed into two or more parts and sow in overlapping sections; and
- do not incorporate or cover the seed, but firm in with a roll, or by treading, to give good soil/seed contact.

SPECIMEN TREES

4.22 Ground preparation is to be carried out as described above under General Measures.

4.23 Specimen tree species include wildlife-friendly species chosen for both their flowering and fruiting benefits as well as their suitability across a range of conditions. Willow species Alder and Black Poplar for example would be planted in the wetter streamside areas or at pond edges while more robust urban species such as Birch and Lime would be selected to create avenues on streets. New trees, once established, will provide increased opportunities for foraging and shelter for a range of fauna and provide new connections with the surrounding landscape. Proposed species are listed in Table 4.7. Species selection in each location will be detailed as part of the discharge of Requirement 21.

Table 4.7: Proposed 'Specimen Tree Planting'

Latin Name	**Common Name**
Acer campestre	Field Maple
Alnus glutinosa	Common Alder
Betula pendula	Silver Birch

Latin Name	**Common Name**
Castanea sativa	Sweet Chestnut
Juglans regia	Walnut
Populus nigra	Black Poplar
Prunus avium	Wild Cherry
Quercus ilex	Holm Oak
Quercus palustris	Pin Oak
Quercus robur	English Oak
Salix Alba	White Willow
Salix Fragilis	Crack Willow
Tilia cordata	Small-leaved Lime

WILDLIFE PONDS

4.24 A series of new lined wildlife ponds will be created as illustrated on the Illustrative Landscape Strategy Figure 11.20, document reference 6.3.11.20.), connected to the wider ecological landscape through wet species rich grassland, and wet woodland planting.

4.25 The ponds will be designed to provide aquatic breeding opportunities for amphibians including great crested newt in addition to rich feeding grounds for a diversity of invertebrate species. Key features to include in the construction include:

- irregularly shaped features;
- variable depth profile comprising a number of hollows and hummocks along the base as well as along the edges with depths achieved ranging from 0.5m to 3m;
- gently sloping margins to maximise habitat diversity when water levels retreat over

the spring and summer months, exposing wide, warm and wet muddy margins suitable for a range of plant and invertebrate species;

- shallow bank profiles with a gradient of no more than 30˚ where planting is proposed to allow soil to settle on top of the lining without sinking to the bottom;
- seeding of the banks with a suitable species rich wet grassland mix; and
- substantial cover of submerged and marginal vegetation with an absence of shading on the south side and some open areas to facilitate great crested newt courtship behaviour.
- a range of emergent, submergent and floating native macrophytes appropriate to the local context to be sparsely planted in the ponds as follows:
    - submerged plants – plant in areas of permanent water with the use of hessian sacks and weighted baskets as required;
    - emergent plants – plant into 'V' shaped trenches at the water's edge; and
    - floating plants – plant in areas of variable water depth, ensuring that at least part of the plant is above water level.
- natural colonisation by local species to be encouraged through a low-density planting regime of up to two plants/m^2.
- no topsoil to be used, Plant directly into subsoil to avoid nutrient enrichment, favouring competitive species capable of dominating ponds.
- plants will be carefully sourced to ensure that no non-native or unwanted invasive species are introduced into the pond and are not allowed to dry out during the transfer process.
- planting to take place in spring (March/April) to allow the plants to establish during optimal growing conditions.

ATTENUATION FEATURES AND SWALES

4.26 The primary function of the attenuation features and swales (refer to Figure 11.20, document reference 6.3.11.20 for location and extent), which will include some permanent water elements, is for drainage control and conveyance but these features will also offer considerable secondary benefits for wildlife, delivered via the following design principles:

- the permanent open water areas within attenuation features will be variable in depth and will be planted with suitable native submergent and floating aquatic plants;

- surrounding these will be wide 'draw-down' zones where water levels will rise and fall naturally, to be planted with wet grassland seed mixes and native wet habitat species which once established will provide habitat and foraging opportunities for birds and small mammals; and
- surrounding this the seasonally wet grassland will grade into wildflower grassland.
- swales generally have permanently damp bases and can be planted with appropriate wet habitat species.

STREAM AND DITCHES

4.27 The channel for the re-direction of the stream should be designed to include a number of features to benefit biodiversity as follows:

- variable bank profile to create a more naturalistic channel, suitable for a range of riparian species;
- the addition of riffles and lags to create a variety of niches suitable for a range of invertebrate and fish species; and
- seeding of the banks with a suitable species rich wet grassland mix.

4.28 Review of existing ditch profiles and consideration of bank re-profiling to increase species diversity if appropriate.

BIRD BOXES

4.29 To enhance bird nesting opportunities across the Site and compensate for the loss of nesting habitat as a result of hedgerow, scrub and tree loss, bird nest boxes will be installed on retained semi-mature/mature trees across the Main Order Limits, as illustrated on Figure 12.24 (document reference 6.3.12.24). A variety of new bird nest boxes are suggested to accommodate different bird species likely to use the habitats within the Site and include the number/specification as follows:

- 25 Vivara Pro Woodstone Seville Nest Box 28mm (or similar) for tree sparrows (*Passer montan*us), blue tits (*Cyanistes caeruleus*) , coal tits (*Periparus ater*) and great tits (*Passer major)* with 10 sited in groups of five to allow for colony nesting;
- 25 Vivara Pro Woodstone Seville Nest Box 32mm Oval (or similar) for house sparrows, redstarts (*Phoenicurus phoenicurus*), tree sparrows and great tits with 10 sited in groups of five to allow for colony nesting;
- 15 Vivara Pro Woodstone Starling Box 45mm Hole (or similar) sited in groups of five on the woodland edge;

- two Vivara Pro Kestrel Nest Boxes (or similar);
- two Vivara Pro External Barn Owl Nest Boxes (or similar); and
- a range of nesting features will be integrated into new buildings, creating new breeding opportunities for target species including swifts and house sparrows. The precise number, specification and location of these features will be confirmed at the detailed design stage.

4.30 The indicative location of bird boxes is illustrated on Figure 12.24 (document reference 6.3.12.24; precise locations will be chosen based on site practicalities and in consultation with a suitably experienced ecologist. The bird boxes will be erected according to the manufacturer's instructions. This will typically include the following:

- mount bird boxes adjacent to suitable foraging habitats such as retained trees, hedgerows and newly created wildflower meadow grasslands;
- mount bird boxes at c.3m from the ground on a tree of sufficient size to support the box;
- avoid directing bird boxes into the prevailing wind, rain and strong sunlight;
- avoid siting nest boxes of a similar style together (apart from boxes for sparrow or starling (*Sturnus vulgaris*), which are gregarious species), to reduce any potential aggressive behaviour between neighbours; and
- use galvanised or stainless-steel screws to mount the box to prevent rusting.

BAT BOXES

4.31 A number of new bat boxes are to be installed on new and retained trees across the Main Order Limits (indicative locations are illustrated on Figure 12.24 (document reference 6.3.12.24) to provide compensation for those potential roost features lost and to enhance the Main Order Limits' potential to support roosting bats. The bat boxes include a number of different styles to provide a niche for a variety of species, as follows:

- 30 Vivara Pro Harlech Woodstone Bat Boxes (or similar). General purpose crevice box;
- 30 Vivara Pro Beaumaris Woodstone Bat Boxes Maxi (or similar). General purpose crevice box for larger species;
- four Vivara Pro Large Multi Chamber Woodstone Bat Boxes (or similar). Colony box for maternity/hibernation;
- four Vivara Pro Miramare Large Woodstone Bat Boxes (or similar). Replicates natural tree hollows and can support groups of larger species and should be positioned near

existing woodland where possible; and

- a range of new roosting features will also be integrated into new buildings where practicable. The precise number, specification and location of these features will be confirmed at the detailed design stage.

4.32 Precise locations will be chosen based on site practicalities and in consultation with a suitably experienced ecologist. The bat boxes will be erected according to the manufacturer's instructions. These will typically suggest installing at a minimum height of 4m above-ground level on a part of the main trunk free from obstructing branches. All should be mounted in pairs (of the same type) on different aspects of the same tree to account for daily temperature differences.

REFUGIA AND INVERTEBRATE FEATURES

4.33 To provide new suitable hibernation and refuge habitats for a range of fauna (such as amphibians, reptiles, invertebrates, small mammals and European hedgehog), new features will be created including:

- creation of log piles, each comprising a pile of log wood no smaller than 2m (L) x 2m (W) x 1m (H) and to be sited in sunny locations; and
- a minimum of 8 hibernacula, created as follows:
  - reptile hibernacula will have a finished size no less than approximately 2m (L) x 2m (W) x 1m (H), and be partially buried in a pit up to 0.5-1m deep;
  - the body of the hibernaculum is to contain a range of materials including cut timber, brash, inert hardcore, bricks, rocks, grubbed up tree roots or building rubble;
  - materials that will decompose should not be placed beneath heavy components such as bricks or rocks, to avoid the risk of collapse;
  - wood chippings or loose topsoil should be incorporated into the construction, to pack some of the larger cavities;
  - hibernacula to be covered with topsoil and seeded using a wildflower grassland seed mix; and
  - access points for fauna should be created by ensuring that some timber, or rubble protrudes from the edge, creating crevices that allow access deep inside the hibernacula.

4.34 Invertebrate nesting and egg-laying features:

- sand banks/mounds in newly created meadow grassland areas; and

- insect hotels such as Vivara Pro Insect Hotel XXL (or similar).

4.35 The proposed location of these features is illustrated on Figure 12.24 (document reference 6.3.12.24).

Section 5 ◆ Management and Maintenance

5.1 This section outlines the management and maintenance measures required for the proposed habitats to establish and thrive. A timescale of 30 years is considered as this is the timescale over which the biodiversity net gain for the development must be maintained to meet the requirements of the biodiversity net gain agreement. To ensure the long-term biodiversity and maintenance of the land from a public and private amenity perspective, management prescriptions should be reviewed every five years and altered if expectations for plant growth and health, species diversity and public and private amenity are not being met.

MANAGEMENT AND MAINTENANCE, YEARS 1-5

General establishment measures

5.2 Watering will be undertaken as necessary to ensure the establishment of all planted areas including any subsequent plant replacements or re-seeding. If supply is restricted by emergency legislation, watering will not be carried out unless instructed to do so by the Developer.

5.3 In the event of drought conditions, the contractor shall notify the Developer of any restrictions on the use of water from the supply and propose alternative water sources and the costs of so doing, which following a formal instruction may be an extra cost to the contract. Failure to notify shall mean the landscape contractor will be responsible for any subsequent plant losses.

5.4 All areas where plants or trees have failed to thrive (through death, damage or disease) will be identified, and plants will be removed and replaced with equivalent species to match the size of adjacent nearby plants in the next appropriate planting season as frequently as necessary up to five years post completion of the development. The advice of the project landscape architect should be sought wherever possible. Any variation of this will only occur upon consent by the relevant LPA.

5.5 Deer/rabbit proof fencing/tree guards shall remain in place until such time that the plants have developed woody stems.

5.6 Weed control around the base of all new plants should be undertaken using organic methods.

5.7 Only as a last resort and if considered necessary to the ongoing health of the plants, spot weed control of all broad-leaved and injurious weed species listed in the *Weeds Act* 1959 will be undertaken using a suitable non-residual Soil Association approved herbicide. The specification and use of herbicides or pesticides, including their use in proximity to watercourses, must comply with all contemporary Regulations, British Standards and

Codes of Practice.

Retained hedgerows

5.8 Existing retained hedgerows will be managed through the following:

- the management of the hedgerows to achieve a minimum of 3m width and 4m height from the root base (where this is not currently already present) through the implementation of long cutting cycles, with hedgerow cutting to occur every three to five years. Cutting will be undertaken on a rotation cycle, to ensure a smaller proportion of cut versus un-cut hedgerows exist on-site at any one time, and restricted to the hedgerow sides only;

- the implementation of appropriate hedgerow management including coppicing and/or laying of the hedgerow in the traditional 'Midlands' style to encourage the formation of a dense and continuous hedgerow; and

- the future planting up of any emerging gaps over time using native species preferably of local provenance, including species that are considered to offer valuable food resources to birds in particular.

Retained trees and scrub

5.9 To ensure the long-term viability of all retained mature trees and hedgerows on-site, an annual inspection of all retained mature trees should be undertaken by a suitably qualified arboricultural consultant, with all recommendations implemented in full within three months of initial inspection. Dead/dying/damaged limbs would be removed only if they pose a hazard to public health and safety. In these instances, a bat licenced ecologist should inspect any limbs prior to their removal to check for the presence of roosting bats. Once removed, the limb, as well as any dead wood, should be left at the base of the tree to provide a refugia and food resource for invertebrates.

Retained ditches

5.10 Retained ditches to be enhanced through planting of marginal and bankside vegetation to increase species diversity and improve water quality. New planting to be undertaken in open areas where shading by bankside vegetation is unlikely to limit growth and colonisation. Planting to be appropriate to water levels and flow rates experienced.

5.11 Where there is some water flow it is important to carry out de-silting operations moving upstream. Thus, dislodged plant propagules and invertebrates will be able to float downstream onto the disturbed substrate with an opportunity to re-colonise.

5.12 Vegetation cutting to be carried out in short sections in different years. For bank vegetation, a late autumn cut every one or two years would simulate a rich grassland sward, without affecting the drainage function of the ditch.

5.13 Bankside cutting to be carried out in late summer (mid-July to mid-September), with vegetation cut to 10-15cm in height. Variable cutting will encourage diversity and increase

the ecological value of the ditch system.

New planting

Trees, shrubs and hedgerows

5.14 Immediately following planting, trees/shrubs to be watered thoroughly. Following this, and with regard to prevailing weather conditions, newly planted trees/shrubs should be watered regularly during periods of dry weather. If the tree/shrub pit has been specified with an irrigation pipe, this should be used as the primary method of watering. If no irrigation pipe is specified, the square metre of ground around the tree/shrub should be soaked to field capacity (refer to BS 8545:2014 for further detail) by surface watering. Watering frequency is more important than quantity to prevent the root ball of the newly planted tree from drying out.

5.15 All trees/shrubs to be fitted with protective guards to prevent animal damage. These should be checked regularly to ensure they remain in place and are providing adequate protection against the animals in the area. If damage to trees from browsing by animals still occurs, additional measures may be required.

5.16 A formal assessment of young tree health and development to be carried out annually by a qualified arboriculturist who will be able to advise on solutions should any problems be picked up. During this assessment, any stakes and ties should be checked to ensure they are providing support but not damaging the tree and that the tree is still firmly seated in the ground. If the tree has become loose in the ground, the soil around the base should be re-firmed and stakes and ties adjusted accordingly.

5.17 All areas where plants have failed to thrive (through death, damage or disease) to be identified by the Developer and plants should be removed and replaced with equivalent species to match the size of adjacent nearby plants in the next appropriate planting season as frequent as necessary. The advice of the project landscape architect should be sought wherever possible.

5.18 The mulched area around the base of the tree/shrub should be kept clear of competing vegetation and weeds at all times.

5.19 Tree/shrub stakes and ties to be removed once the tree/shrub has established a strong enough root system to support itself, likely to be 1-2 years after planting. Tree/shrub guards should only be removed if they are beginning to restrict tree/shrub growth or if it is felt the risk of damage has significantly reduced due to strong tree/shrub growth and development or changes in the surrounding environment.

5.20 Shrub shelters to mixed native hedgerows may be removed from year three, provided the plants are well established, and if retaining shelters for a longer period would make removal difficult due to bushy/spiny growth.

5.21 Formative pruning to be carried out in accordance with BS 3998 as required throughout the five-year establishment period. Pruning to be undertaken annually, or as appropriate

to each species, between September and February inclusive, to avoid the main bird breeding season. All arisings to be removed for composting.

5.22 In respect of the stream, newly-planted trees and scrub should not be allowed to grow significantly in extent beyond the current baseline, to prevent growth increasing levels of shading over the stream and adjacent marginal habitats, within a 5 to 10m width. The aim of ongoing management is to achieve no more than 'dappled shade' along the length of the water course. When managing adjacent habitats such as grassland, scrub, and trees, any trimmings and arisings entering the watercourse or falling onto or close by the banksides should be removed immediately, and either removed from site or where appropriate, used to maintain log piles and hibernacula - refer to Figure 12.24 (document reference 6.3.12.24).

5.23 The review and management of these habitats to prevent overshading of the water course and marginal habitats, such as by branch/scrub trimming and subsequent removal of cut branches/trimmings, should be undertaken on an annual basis.

Whips

5.24 Immediately following planting, the whip should be watered thoroughly. Following this, and with regard to prevailing weather conditions, newly planted whips should be watered regularly during periods of dry weather. When watering, the square metre of ground around the whip should be soaked to field capacity (refer to BS 8545:2014 for further detail) by surface watering. Watering frequency is more important than quantity to prevent the roots of the newly planted whip from drying out.

5.25 All whips to be fitted with protective guards to prevent animal damage. These should be checked regularly to ensure they remain in place and are providing adequate protection against the animals in the area. If damage to trees from browsing by animals still occurs, additional measures may be required.

5.26 A formal assessment of areas of whip planting to be carried out annually by a qualified arboriculturist who will be able to advise on solutions should any problems be picked up. During this assessment, any guards and canes/stakes should be checked to ensure they are providing protection but not damaging the developing whip and that its roots are still firmly seated in the ground. If the whip has become loose in the ground, the soil around the base should be re-firmed and guards adjusted accordingly.

5.27 The space above the mulch mat around the whip to be kept clear of competing vegetation and weeds at all times.

5.28 The shrub shelter/guard should be removed once the whip has established a strong enough root system to support itself and has begun to grow strongly, clear of the top of the shelter/guard, likely to be 1–2 years after planting. Biodegradable mulch mats can remain in place indefinitely.

5.29 Formative pruning to be carried out in accordance with BS 3998 as required during the first five years to ensure the desired form is achieved.

5.30 For further guidance on whip and tree maintenance during establishment refer to BS 8545:2014 Section 11.

Species rich meadow grassland

5.31 With respect to areas subject to species-rich and wet grassland seed mix, during the first year, annual weeds will be removed through cutting or hand-pulling, with flushes of weeds controlled by topping or mowing.

5.32 These grassland areas will be mown regularly throughout the first year of establishment to a height of 40-60mm to control annual weeds and help maintain balance between faster growing grasses and slower developing wildflowers. The cutting will be undertaken on a rotational basis so that in any one year there are uncut areas present.

5.33 In the second and subsequent years, areas of species-rich and wet grassland will be cut once per annum to a height of c.150mm in October on a rotational basis (as above). Cutting will be avoided during the months of May to August so that a long sward is maintained throughout the summer and the majority of species can flower and set seed.

5.34 All arisings to be removed from the grassland area and either composted on the site or removed from the site. It is important to remove all cuttings from the grassland to progressively reduce the soil fertility and thereby prevent weed dominance.

Wildlife ponds

5.35 Undertake regular formative pruning of bankside trees to maintain direct sunlight to the pond surface, completed in line with Management and Maintenance Operations outlined above with respect to existing trees.

5.36 Marginal and emergent vegetation is to be maintained around at least one half of the pond's edges. Where necessary, marginal plants shall be prevented from encroaching across the water's surface by hand removal. As a minimum 40% of the water's surface is to remain clear. To be effective in removing marginal and emergent vegetation, and to prevent rapid regrowth, plant removal must include removal of the roots.

5.37 At least 40% of the pond's water surface to be kept free from floating macrophytes through hand removal where necessary; no removal of vegetation is to occur within the newt breeding season (approximately March-July) to prevent risk of damage or harm to eggs, egg-laying sites and amphibians, including great crested newts. Any vegetation removed from the water body should be piled on the bankside for 24 hours prior to removal for composting.

Attenuation features and swales

5.38 Planting of the newly constructed attenuation features and swales is proposed to encourage emergent vegetation cover and encourage colonisation by invertebrates and other fauna.

5.39 Management of the attenuation features and swales throughout the establishment phase will involve annual inspections for the presence of invasive alien plant species, and aggressive native/naturalised plant species, which thrive particularly well amongst bare pond edges. The inspection should be undertaken by a suitably experienced ecologist, with remedial works as required, to control the spread of these species should they be present, implemented immediately. Control measures could involve cutting and removal, mechanical control through excavation if plants become well established, hand removal for shallow rooted plants, or (if all other methods have failed/are not suitable) treatment by non-residual Soil Association approved herbicides, suitable for use near water following guidance from the Environment Agency.

Bird and bat boxes

5.40 All bird and bat boxes should be checked two years following installation. Bat boxes should be inspected by a bat licensed ecologist, with damaged boxes repaired/replaced where necessary. The maintenance and repair of bat boxes installed across the site should remain the responsibility of the Developer, or any appointed Management Company. Five-year replacement checks should continue long-term, ideally during the autumn months.

Public rights of way, public access paths, well-being areas and signage

5.41 Public rights of way, permissive public access paths, well-being areas and signage to be well maintained and managed to ensure safe passage and use, and limit public access impacts on habitat establishment and biodiversity.

5.42 Seating and equipment within well-being areas to be checked weekly by a competent person for any damage or defects.

5.43 An independent inspection of well-being areas to be carried out by a qualified inspector annually and following any damage/repair/replacement of equipment or other changes to the well-being area.

MANAGEMENT AND MAINTENANCE, YEAR 6 ONWARDS

5.44 Given the dynamic nature of habitats and their ability to change over time, it is impractical to set out a fixed and prescriptive set of management tasks to be implemented 'regardless of progress'. A key element of the plan is flexibility. It is therefore considered that this plan should be reviewed after five years with any necessary changes to management documented within an updated LEMP, where deemed necessary. However, the recommendations for management discussed below should be broadly adopted during the management regime of beyond year 6 and included within an updated LEMP if required.

Trees, woodland, shrubs and hedgerows

Monitoring and management

5.45 The following monitoring and management tasks are to be carried out:

- all trees to be subject to an inspection every five years by an Arboricultural Association approved arboriculturist contractor or professional arboriculturist, to ensure that:
  - an up-to-date and comprehensive inventory of the tree stock is maintained over the long-term;
  - the tree stock is managed for its health and safety and its lifespan and coverage optimised; and
  - the biodiversity benefits of the scheme are to be monitored annually to ensure the species richness of habitats is maximised for the benefit of both local wildlife and the public.
- any tree/shrub/whip planting that is found to have failed will be replaced in full in the current, or next available planting season;
- any retained trees/scrub/shrubs, which are deemed to have grown such as to cause increased shading of the stream and adjacent marginal habitats (those within 5-10m of the water course), be subject to appropriate trimming; and
- public access paths and signage to be well maintained and managed to limit public access impacts on habitat establishment and biodiversity.

Maintenance

5.46 The following maintenance tasks are to be carried out:

- any maintenance pruning required, particularly in relation to trees/shrubs, to be undertaken in accordance with good horticultural and arboricultural practice with thinning, trimming and shaping of specimens undertaken as appropriate to species, location, season, and stage of growth;
- selective thinning of all newly planted native trees and shrubs will be regularly undertaken to ensure that overcrowding is reduced with increasing species maturity; that slower growing climax species are not outcompeted; and that diseased and dying plants are removed;
- all arisings from any vegetation clearance will be removed for composting; and
- maintenance pruning and thinning will be undertaken annually or as appropriate to each species in accordance with best practice between October and February inclusive, so as to avoid the main bird breeding season. Care should be taken to avoid disturbing any hibernating European hedgehog, which may be present within areas of denser vegetation at ground level.

Species rich meadow grassland

5.47 Grassland habitats will be monitored on an annual basis to ensure species composition is appropriate and management activities are being carried out to approved standards. Monitoring visits will be carried out during the summer months. Monitoring of grassland habitats will ensure the quality and future viability of any existing and created habitats and will be assessed against the habitat creation objectives of this document (recommended during June to enable species diversity assessment).

5.48 Areas of species rich meadow grassland within the Main Order Limits should continue to be managed as such in the long-term, with management based around a traditional summer hay cut in combination with autumn, and possibly spring, mowing. Cutting should be undertaken on a rotational basis so that in any one year, uncut areas remain. Care should be taken when cutting longer areas to ensure no fauna such as reptiles or European hedgehog in 'day nests' are present within longer, densely vegetated or tussocky areas. Management prescriptions, as discussed in relation to management during the establishment phase, should be followed during the long-term management of the species rich grasslands.

5.49 Within the species rich meadow grassland areas, where the aim is to encourage development of a tussocky grassland structure, once established this will require minimal maintenance. Control of unwanted weeds (such as docks, thistles (*Cirsium sp*.) and nettles (*Urtica sp*.), which out compete other slower growing species) by spot treatment with a herbicide may be needed occasionally (although use of herbicides should be considered only where strictly necessary). Tussocky areas may need cutting every 2-3 years on a rotational basis between October and February to control scrub and bramble (*Rubus fruiticosa* agg.) development, although any cutting of densely vegetated areas such as bramble scrub will need to be carefully done to avoid potential injury to species such as hibernating European hedgehogs.

Ponds and attenuation features

5.50 The ponds and attenuation features will continue to be visually monitored on an annual basis to ensure species composition is appropriate and management activities are being carried out to approved standards.

5.51 Shading vegetation is to be managed through hand clearance/strimming of vegetation, where necessary, to maintain direct sunlight to the attenuation feature area.

5.52 Where relevant, marginal vegetation is to be maintained around at least one half of the attenuation feature's edge; where necessary, marginal plants shall be prevented from encroaching across the water's surface by hand removal. As a minimum, 40% of the water's surface is to remain clear. To be effective in removing marginal and emergent vegetation, and to prevent rapid regrowth, plant removal must include removal of the roots. Hand digging with spades is advisable in small areas. The use of herbicides should be avoided and considered only where all other methods have failed/are not suitable, only non-residual, Soil Association approved herbicides suitable for use near water, and following up-to-date guidance from the Environment Agency, should be used.

Bird and bat boxes and insect hotels

5.53 Replacement/repair checks of new bird and bat boxes and insect hotels should continue over the long term at five-year intervals.

Refugia

5.54 Hibernacula, sand banks and log piles created as part of the Proposed Development will be inspected every five years with any damage to these features repaired/replaced where necessary. The maintenance and repair of ecology features installed across the site will remain the responsibility of the Developer, or an appointed Management Company.

Public rights of way, public access paths, well-being areas and signage

5.55 Public rights of way, permissive public access paths, well-being areas and signage to be well maintained and managed to ensure safe passage and use, and limit public access impacts on habitat establishment and biodiversity.

5.56 Seating and equipment within well-being areas to be checked weekly by a competent person for any damage or defects.

5.57 An independent inspection of well-being areas to be carried out by a qualified inspector annually and following any damage/repair/replacement of equipment or other changes to the well-being area.

Section 6 ◆ Monitoring and Management Summary

MONITORING

6.1 The aim of monitoring activities carried out post-development is to address any issues relating to biophysical changes to habitats as a result of recreational pressure and construction activities within the site. Monitoring will also evaluate the effectiveness of any specific mitigation measures (such as bird and bat boxes) as well as the management and function of retained and newly created habitats as identified above. The success of each feature will be assessed against the management prescriptions as detailed in this document.

6.2 TSH will have responsibility for implementation of the landscape proposals based on the attached plans and in accordance with the DCO. When the landscaping is completed as part of the construction of the Public Open Space, the management company will take over responsibility for the maintenance and management of the landscaping described here in the LEMP.

6.3 Periodic monitoring visits/site inspections will be vital to ensure that any remedial measures are identified to ensure that the objectives of the LEMP are being met.

6.4 Monitoring of retained, enhanced and created habitats will be undertaken by an experienced ecologist to determine habitat conditions in accordance with the Condition Assessments associated with the DEFRA 3.1 Metric.

6.5 It is anticipated that monitoring visits will be undertaken by suitably experienced operatives, with input from a suitably experienced/licenced/accredited ecologist and arboriculturist as required. Further additional monitoring requirements may be required as part of protected species licences (bats) and these will be undertaken as required.

6.6 The responsibility of the undertakings set out within this LEMP rests with the Developer/Principal Contractor's nominated Management Company.

6.7 Table 6.1 provides a summary of the actions and optimal timings within the Management Plan, as defined previously and, unless otherwise agreed with the LPAs, any substantial amendments of this LEMP will be approved in writing by the relevant LPA.

6.8 Detailed timings for the delivery of management prescriptions in the long-term (year 10 onwards) have not been provided. Instead, broad management recommendations have been provided, which will be informed by a review of the LEMP at 5-yearly intervals.

Table 6.1: Management and Monitoring Summary

Operation	Frequency	J	F	M	A	M	J	J	A	S	O	N	D
General													
Plant Replacement	First five years and if required	■	■								■	■	■
Watering	As required.				■	■	■	■	■	■			
Disposal of Arisings	Following cut.				■	■	■	■	■	■	■		
Existing Hedges													
Cutting	3- to 5-year rotation.	■	■										■
Gapping Up	First five years and if required	■	■								■	■	■
Watering after Gapping Up	As required.				■	■	■	■	■	■			
Coppicing	Every 15-30 years (dependent upon species).	■	■										■
Hedge Laying	Every 15-30 years (dependent upon species).	■	■										■

Operation	Frequency	J	F	M	A	M	J	J	A	S	O	N	D
Mature and Semi-mature Trees													
Pruning (establish pruning objectives)	Once annually.												
Newly Planted Trees, Shrubs and Woodland													
Establishment Period Weed Control	Monthly.												
Replacement of Dead/Dying Plants	As required.												
Re-firming	As required.												
Watering	As required.												
Formative Pruning	Once annually.												
Tree supports, Guards and Shelters	As required.												
Arboricultural Monitoring	Annually.												

Operation	Frequency	J	F	M	A	M	J	J	A	S	O	N	D
Biodiversity Condition Assessment Monitoring	Annually												
Pruning Excessive Overhang	Annually.												
Wildflower and Wet Grassland													
Establishment Period Weed Control	Monthly.												
First Year Cut	Regularly on rotation.												
Second and Subsequent Cuts	Once annually on rotation.												
Disposal of Arisings	Following cut.												
Biodiversity Condition Assessment Monitoring	Annually												
Attenuation Features and Wildlife Ponds													
Establishment Period Weed Control	Annually.												

Operation	Frequency	J	F	M	A	M	J	J	A	S	O	N	D
Control Measures	As required.												
Biodiversity Condition Assessment Monitoring	Annually												
Bird and Bat Boxes													
Condition Check and Replacement	Two years following installation, then every five years.												
Public Rights of Way, Public Access Paths, Gates and Signage													
Condition Check	Monthly or as Required												
Well-Being Areas													
Condition Check by Competent Person	Weekly												
Inspection by Qualified Inspector	Annually or following any changes to the Well-being Area such as equipment replacement.												

Operation	Frequency	J	F	M	A	M	J	J	A	S	O	N	D
Review of LEMP													
Review of Long-term Management Requirements	Every five years.												