

# **A12 Chelmsford to A120 widening scheme TR010060**

## **6.5 First Iteration Environmental Management Plan Appendix I: Landscape and Ecology Management Plan**

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**A12 Chelmsford to A120 widening scheme  
Development Consent Order 202[ ]**

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**6.5 First Iteration Environmental Management Plan  
Appendix I: Landscape and Ecology Management Plan**

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# Appendix I Landscape and Ecology Management Plan

## I.1 Introduction

### Background to the plan

- I.1.1 The proposed scheme comprises improvements to the A12 between junction 19 (Boreham interchange) and junction 25 (Marks Tey interchange), a distance of approximately 24km, or 15 miles. The proposed scheme involves widening the A12 to three lanes throughout (where it is not already three lanes) with a bypass between junctions 22 and 23 and a second bypass between junctions 24 and 25. It also includes safety improvements, including closing off existing private and local direct accesses onto the main carriageway, and providing alternative provision for walkers, cyclists and horse riders (WCH) to existing routes along the A12, which would be removed. A detailed description of the proposed scheme can be found in Chapter 2 of the Environmental Statement [TR010060/APP/6.1].
- I.1.2 This Landscape and Ecology Management Plan (LEMP), in outline, has been produced to set out how the LEMP would be structured and what it would contain. This LEMP will be updated by the Principal Contractor (PC) and included within the second iteration Environmental Management Plan (EMP), as appropriate and necessary, prior to commencement of works in accordance with the relevant Requirements in Schedule 2 of the draft Development Consent Order (DCO) [TR010060/APP/3.1] and the requirements of the first iteration EMP [TR010060/APP/6.5].
- I.1.3 This LEMP has been prepared to help ensure the protection and management of landscape and ecological features such as vegetation and habitats, during construction of the proposed scheme, and the successful establishment of landscape and ecological mitigation including planting and seeding associated with the proposed scheme. This LEMP has been developed to ensure that the proposed scheme reflects the existing landscape character and context of the A12 between Chelmsford and Colchester, whilst accommodating principles established within the Environmental Statement [TR010060/APP/6.1].
- I.1.4 An Environmental Masterplan (Figure 2.1 of the Environmental Statement [TR010060/APP/6.2]) has been prepared to illustrate mitigation requirements for both ecology and landscape assets. Design principles are presented in the Design Principles document [TR010060/APP/7.10] and focus on replacement of vegetation lost during construction, integration of the proposed scheme into the landscape, provision of screening vegetation, reinforcement of the landscape pattern and character, improvement or reinstatement of natural habitats and creation of new habitats to compensate for the impact on protected species.

- I.1.5 The LEMP will provide a consistent approach to the control of construction activities for the proposed scheme. It will cover protection of landscape and ecology during construction, reinstatement of vegetation and habitats post construction, and the implementation of ecological mitigation measures, together with the subsequent aftercare and, where applicable, monitoring arrangements. The LEMP will be in line with the habitat targets specified within the Biodiversity Net Gain Assessment (BNG) Report (Appendix 9.14 of the Environmental Statement [TR010060/APP/6.3]).
- I.1.6 Under the terms of the Development Consent Order (DCO) requirement, the relevant part of the authorised development must be operated and maintained in accordance with the third iteration EMP. Any tree or shrub planted as part of a landscaping scheme that, within a period of five years after planting, is removed, dies or becomes in the opinion of the relevant planning authority, seriously damaged or diseased, must be replaced in the first available planting season with a specimen of the same species and size as that originally planted, unless the Secretary of State, following consultation by the undertaker with the relevant planning authority, gives consent to a variation.
- I.1.7 A five-year aftercare period would be established for all soft environmental features of the proposed scheme, and would be included as part of the construction contract requirements. Thereafter, the soft estate would be maintained by National Highways through its managing agents. National Highways would be responsible for managing land within the Order Limits subject to compulsory purchase in perpetuity for operational and safety reasons. Typical maintenance activities for land not acquired by National Highways post the five-year aftercare period would be subject to landowner agreement and defined within the LEMP.
- I.1.8 The proposed scheme must be undertaken in accordance with the LEMP.

### **Structure of this LEMP**

- I.1.9 This LEMP forms part of the strategy for successfully integrating the proposed scheme within the surrounding landscape and ensuring the mitigation of many of the related impacts identified within the Environmental Statement (refer to Environmental Statement Chapter 8: Landscape and visual, for landscape and visual impacts and to Chapter 9: Biodiversity, for ecology impacts [TR010060/APP/6.1]).
- I.1.10 This LEMP sets out the following:
- How landscape and ecological features such as vegetation and habitats would be protected during construction
  - How land would be restored post construction
  - Aftercare and monitoring required for new planting and ecology

I.1.11 This LEMP is informed by the documents listed below:

- Appendix 9.16: Draft Bat Licence, and Appendix 9.17: Draft Badger Licence, of the Environmental Statement [TR010060/APP/6.3]
- Design Manual for Roads and Bridges (DMRB) GM 701 Asset Delivery Asset Maintenance Requirements (Highways England, 2020a)
- DMRB LD 117 Landscape Design (Highways England, 2020b)
- DMRB LA 108 Biodiversity (Highways England, 2020c)
- Environmental Scoping Report – Appendix H Arboricultural survey strategy (Highways England, 2020d)
- Environmental Statement – Appendix 8.4 Arboricultural Impact Assessment [TR010060/APP/6.3]
- Environmental Statement – Figure 2.1 Environmental Masterplan [TR010060/APP/6.2]
- Essex Tree Palette – A guide to choosing the most appropriate tree species for Essex sites according to landscape character and soil type (Essex County Council, 2018)
- Invasive Species Management Plan, Appendix H of the first iteration EMP [TR010060/APP/6.5]
- Network Management Manual (Highways England, 2009a)
- Routine and Winter Service Code (Highways England, 2009b)
- Series 3000 Landscape and Ecology - Appendices 30/1 to 30/12 of the Manual of Contract Documents for Highway Works (MCHW) Volume 1 Specification for Highway Works (Highways England, 2001a)
- MCHW Volume 1 Series 200 Site Clearance (Highways England, 2001b)

I.1.12 The second iteration EMP will set out how environmental management would be undertaken on the proposed scheme during construction. It will also outline the roles and responsibilities for implementing actions on site, including the roles of the Principal Contractor's Landscape Architect and Ecological Clerk of Works (ECoW).

### **Roles and responsibilities**

I.1.13 The effective implementation of the LEMP requires that roles and responsibilities are clearly defined and understood. The key environmental management roles involved in the delivery of the LEMP are identified in Table 2.1 (environmental roles and responsibilities) of the first iteration EMP [TR010060/APP/6.5].

- I.1.14 At the start of a work shift or commencement of a new activity, contractors will be given a toolbox talk, for example by the Principal Contractor's Landscape Architect or ECoW, to inform them of the environmental and ecological constraints and restrictions of the site, as described in Section 7.4 of the first iteration EMP [TR010060/APP/6.5].
- I.1.15 Should any protected or notable species be found during any activities, works will stop immediately and the Principal Contractor's Environmental Specialist (ecologist)/ ECoW will be contacted. The ecologist will advise how the works should proceed and measures to be taken to minimise disturbance to protected or notable species.
- I.1.16 If any works are likely to impact on ancient, veteran and notable trees, trees subject to a Tree Preservation Order (TPO), specimen trees, category A and B trees, important hedgerows and ancient woodlands, works will stop immediately, and the Principal Contractor's Environmental Specialist (arboriculturalist)/ Landscape Architect will be contacted. The arboriculturalist will advise how the works should proceed and measures to be taken to minimise disturbance to protected or notable vegetation.

## **I.2 Landscape and ecology context**

- I.2.1 The proposed scheme is located adjacent to the settlements of Boreham, Hatfield Peverel, Witham, Rivenhall End, Kelvedon, Feering and Marks Tey.
- I.2.2 Outside built-up areas, the proposed scheme is located within a low-lying landscape of intensively cultivated agricultural land and pasture, interspersed by a complex and extensive network of hedgerows, ditches, streams, rivers and waterbodies. Areas of semi-natural habitats are rare, largely restricted to areas along rivers, including at Whetmead Local Nature Reserve (LNR) and River Brain, along the River Blackwater, River Ter, Domsey Brook and Roman River.
- I.2.3 Vegetation includes extensive highway plantation, such as at Boreham, at Hatfield Peverel, south and east of Witham, south-east of Kelvedon and north of Copford, a pattern of small woodland blocks and copses scattered throughout the landscape, an extensive network of hedgerows along field boundaries, lanes and tracks and locally distinctive willow plantations along the River Blackwater.
- I.2.4 Grassland habitats identified are either improved grassland or cultivated/disturbed land. Species-poor neutral grassland is associated with field edges and road verges. Small and isolated areas of species-rich neutral grassland, unimproved neutral grassland and marshy grassland are associated with watercourses.
- I.2.5 There are a number of designations relevant to landscape within or adjacent to the Order Limits, including a 'Green Wedge' to the east of Chelmsford and west



of the A12. The key landscape designations relevant to the LEMP are listed below. Further information on landscape character and landscape designations can be found in Environmental Statement Chapter 8: Landscape and visual [TR010060 /APP/6.1].

- Open greenspace, including Benton Hall Golf & Country Club south of Witham and the All Saints' Church grounds east of the B1023 (Inworth Road) at Inworth
- A green buffer between Witham, Rivenhall and Rivenhall End
- Boreham House Registered Park and Garden (grade II) south of Main Road west of junction 19
- Conservation areas, including the Chelmer and Blackwater Navigation, Boreham – Roman Road and Plantation Road, and Kelvedon
- Many listed buildings, notably including Boreham House (grade I listed) west of Boreham; All Saints Church (grade I listed) Inworth; Prested Hall (grade II); Doggets Hammer Farm (grade II listed) west of the proposed offline section south-east of Marks Tey; and Marks Tey Hall (grade II listed) south of junction 25
- The Blackwater Rail Trail Country Park south of Witham
- A network of public rights of way (PRoWs) running throughout the landscape within the study area and crossing the A12
- Trees with TPO status including within the grounds of Boreham House, and within Hatfield Peverel, Witham and Kelvedon

I.2.6 The following are other important tree classifications relevant to the LEMP:

- Scattered specimens within rural areas
- Veteran trees including three veteran elms as defined by the Woodland Trust

I.2.7 These are identified in the Arboricultural Impact Assessment (Appendix 8.4 of the Environmental Statement [TR010060/APP/6.3]) which also identifies potential veteran and potential ancient trees that have not been defined by the Woodland Trust.

I.2.8 The statutory ecological designations relevant to the LEMP are listed below. Further information on ecological designations can be found in Environmental Statement Chapter 9: Biodiversity [TR010060 /APP/6.1].

- Whetmead LNR, previous landfill site, now comprising unimproved grassland and lagoons. Supports a range of butterflies and dragonflies, and seed-eating birds. Located partially within the Order Limits, between junction 21 and junction 22.



- Brockwell Meadows LNR, associated with the River Blackwater, comprising a water meadow, woodland, a pond and hedgerows. Located 55m west of the Order Limits, south of Kelvedon between junction 23 and junction 24.
- Hilly Fields LNR, comprising a range of grassland, hedges, scrub and woodland vegetation in both wet and dry areas, including acid grassland, marsh, tall ruderal and sown agricultural meadows.
- Spring Lane Meadows LNR, comprising wildflower meadow and riverside habitats supporting a variety of wildlife including otters, kingfisher and snipe.
- Galleywood Common LNR, comprising areas of scrub, heathers, grasses, bare ground and wetlands.

## I.3 Project commitments

### Overview

- I.3.1 A number of commitments have been made as part of the proposed scheme, incorporating good practice measures which would reduce impacts on the landscape and to habitat and ecology. These commitments are provided in the Register of Environmental Actions and Commitments (REAC), appended to the first iteration of the EMP [TR010060/APP/6.5].

### Vegetation retention and removal

- I.3.2 The REAC includes commitments that are relevant to retention of existing vegetation which would be implemented in accordance with the Retained and Removed Vegetation Plans [TR10060/APP/2.14]. Root protection areas (RPAs) for all existing trees have been identified in Appendix 8.4 of the Environmental Statement, the Arboricultural Impact Assessment [TR010060/APP/6.3].
- I.3.3 Details on how individual trees would be protected and retained, and which site-specific construction methods would be used to safeguard trees and their roots, will be provided in an Arboricultural Method Statement and Tree Protection Plan, which would be prepared during the detailed design phase, refined following final design agreement and in place prior to works affecting trees commencing and appended to the EMP. The Arboricultural Method Statement and Tree Protection Plan would include areas of special measures to protect and retain features that would be subject to encroachment and localised removal. This would be based on the special measure areas, construction exclusion zones and outline tree protection measures presented within the Arboricultural Impact Assessment (Appendix 8.4 of the Environmental Statement [TR010060/APP/6.3]).

- I.3.4 Appropriate fencing would be installed to protect existing trees and ensure no construction activities affect the RPAs. All temporary fences would be regularly checked to ensure they have not been moved during construction.
- I.3.5 The Principal Contractor's ECoW (supported by an experienced arboriculturalist and ecologist) would be available during the phase of site clearance to assess and advise on retention of habitats. Where practicable, the proposed scheme would aim to avoid loss of habitats with importance for wildlife, such as hedgerows, woodland, scrub and water bodies. The ECoW would assess each area prior to clearance commencing and would advise whether full ECoW supervision is required for the work, or where it is not required would 'sign off' on the clearance of that particular area.
- I.3.6 All tree works would be carried out by a specialist contractor in accordance with the detailed requirements set out in the MCHW Volume 1 Series 200 Site Clearance (Highways England 2001b), that will be produced at detailed design stage.
- I.3.7 Any hedgerow trimming shall be undertaken outside of the bird breeding season.

## **Habitat and species protection**

### **Pre-construction surveys**

- I.3.8 Pre-construction surveys for protected species are required by the DCO. In summary these surveys will comprise the following:
- Bat surveys of buildings, bridges and trees up to 50m from any construction activities to determine if roosts are present
  - Otter and water vole surveys on waterbodies and associated habitat within the construction area and up to 100m (50m either side of the proposed scheme) to determine any breeding or resting sites
  - Barn owl surveys of all trees and buildings that would be impacted by the proposed scheme to determine use by barn owls ahead of works
  - Reptile surveys would be undertaken to establish the presence and extent of reptile populations prior to the start of works
  - Badger surveys up to 50m from any construction activities
  - Schedule 9 Invasive Species surveys up to 10m from any construction activities
- I.3.9 These surveys will follow best practice survey guidance and be conducted at suitable times of the year. For bats and invasive plant species that will be within the current or most recent optimal season, i.e. May to September prior to the start of construction. For reptiles, optimum period for surveying is April, May

and September. Surveys for nesting barn owl, badger, water vole and otter are not constrained by season, and these will be completed within three months of the start of construction at any given location.

- I.3.10 Dormice have been determined as not a constraint for the main section of the works following dormouse surveys to the main site. However, surveys are to be carried out for the gas main diversion to the east of the River Blackwater. Commitment BI33 of the REAC, within the first iteration EMP [TR010060/APP/6.5], outlines the mitigation required should the surveys conclude that dormice are present.
- I.3.11 The results of ongoing pre-construction surveys will update ecological constraints information for the proposed scheme during the construction phases. Data will be continuously reviewed to determine if any changes to the (draft) European Protected Species Mitigation (EPSM)/badger licences, as provided with the DCO application, are required and/or if licences for additional species or additional mitigation are needed. All up-to-date survey data should also be distributed to site operatives as soon as it is available, to ensure they are made aware of any new ecological constraints.

### **Species protection**

- I.3.12 Procedures for protected species safeguarding and mitigation during construction will be fully detailed within the Natural England EPSM and Protected Species Licences for bats and badger and within Appendix 9.16 and 9.17 of the Environmental Statement [TR010060/APP/6.3] respectively and are not repeated here. This document includes consideration of breeding birds (including barn owl), badger, otter, water vole, bats, fish, reptiles, great crested newt (GCN), terrestrial invertebrates and other species of principal importance for the purpose of conserving biodiversity<sup>1</sup>.
- I.3.13 In the event the remaining surveys within the habitats to the east of the River Blackwater identify dormouse presence, this species will also be included within the LEMP.
- I.3.14 A badger licence is proposed for several setts that are located within the proposed scheme, or within 30m of these areas. This will include the permanent closure of main, subsidiary, outlier and annexe setts, as well as the temporary closure of outlier setts.
- I.3.15 For trees, buildings and bridges in which bat roosts have been identified, or which are identified as having bat roost potential, the measures set out in the Natural England Bat Mitigation Licence will be followed. This applies to the entirety of the proposed scheme.

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<sup>1</sup> As provided for in section 41 of the Natural Environment and Rural Communities Act 2006.

- I.3.16 Seasonal ecological constraints will apply to certain construction activities. In respect of general vegetation clearance, nesting bird constraints will need to be considered between March and August (inclusive), and outside these times where weather conditions are suitable for nesting birds. Vegetation and hedgerows with the potential to support reptiles will need to be removed between March and October (weather dependent) unless the Principal Contractor's ECoW has assessed otherwise (in accordance with a hedgerow risk assessment). Further considerations include timing works to avoid impacts to bat roosts during sensitive periods (i.e. March to May and September to November) and avoiding in-channel works for main rivers during freshwater fish spawning and migration periods (October to May).
- I.3.17 Dormice have been determined as not a constraint for the main section of the works following dormouse surveys to the main site. In the event that dormice are confirmed to be present following surveys within the site section to the east of the River Blackwater, timing of work will need to be considered, for example removal of the roots and stumps of trees within hedgerows would not be undertaken during the hibernation season. Mitigation would be agreed with Natural England via an EPSM dormouse licence and details within the REAC [TR010060/APP/6.5] would be followed.
- I.3.18 Additional timing constraints include avoiding night working near sensitive features such as badger setts, bat roosts and watercourses.
- I.3.19 In addition to the above, species protection measures in relation to vegetation removal are detailed in the REAC, within the first iteration EMP [TR010060/APP/6.5].
- I.3.20 The REAC makes reference to and recommendations for two-stage vegetation clearance methods to mitigate risks for amphibians and reptiles. While GCN will not be actively trapped, any incidental individuals discovered during the works will be relocated into suitable alternative habitat. Habitat manipulation and natural dispersal methods for reptiles will be used first in preference to trapping and translocation, to be agreed within the Statement of Common Ground with Natural England.
- I.3.21 The REAC also outlines measures to avoid harm to otter and water vole and includes details on fish relocation for the proposed scheme, which will be undertaken under authorisation from the Environment Agency.
- I.3.22 Requirements and management of invasive species to prevent the spread of species listed on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended), are provided within Appendix H: Invasive Species Management Plan, of the first iteration EMP [TR010060/APP/6.5] and are not repeated here.
- I.3.23 Geographic information systems (GIS) will be used to display ecologically sensitive receptors and their locations. Prior to works commencing, the GIS will

be checked for potential impacts to ecological receptors. Should ecological receptors be present, the environmental team will be contacted for advice and guidance. Checking the GIS will be mandatory and ensured through use of risk assessment and method statement documentation.

### **Wildlife structures**

- I.3.24 The closure of badger setts and demolition/felling of bat roosts, and the associated creation of appropriate artificial replacements within the proposed scheme will be detailed within the relevant Natural England Protected Species Licences. Once licences have been granted, works will be conducted in accordance with the terms and conditions of the licence documents and those contained within the application documentation. Bat boxes will be installed at locations outlined in the Natural England Protected Species Licence, at a ratio of at least three bat boxes erected per roost removed, to be suitable for the species of bat roosting in the existing feature, and at a ratio of two to one for every tree, building or structure with suitability to support roosting bats that is being lost as a result of construction. Artificial replacement badger setts will be provided for the loss of two main setts in construction. The artificial setts will be constructed, in accordance with Natural England guidelines, at least six months prior to the exclusion phase (governed by the licence). The locations of the artificial setts have been discussed and agreed with Natural England. The precise location and design of these setts will be provided in the badger licence method statement. The areas for replacement roosts and bat boxes are shown on the Environmental Masterplan (Figure 2.1 of the Environmental Statement [TR010060/APP/6.2]). Reptile enhancement features such as log piles and hibernacula will be provided in mitigation areas built in advance of main construction as detailed in Environmental Statement Chapter 9: Biodiversity [TR010060/APP/6.1]) and as shown on the Environmental Masterplan (Figure 2.1 of the Environmental Statement [TR010060/APP/6.2]).
- I.3.25 Mammal tunnels/culverts have been incorporated into the proposed scheme, as near as practicable to known badger paths, bat and otter crossing points. The design of linear habitats such as hedgerows and lines of trees would aim to increase connectivity along the proposed scheme, linking with retained woodland and hedgerows where practicable.

## **I.4 Landscape and ecological reinstatement**

- I.4.1 This section sets out the general principles for how reinstatement of vegetation and reinstatement of habitat would be undertaken.
- I.4.2 The environmental design for the proposed scheme is shown on Figure 2.1 Environmental Masterplan [TR010060/APP/6.2]. The environmental design aims to replace features lost by the proposed scheme, to integrate the proposed scheme into the landscape, screen views of traffic and structures,

improve the existing green infrastructure and biodiversity by complementing and reinforcing the characteristics of the local landscape, and to provide a positive road user experience through varying type and degree of cover or openness.

- I.4.3 The REAC, within the first iteration EMP [TR010060/APP/6.5] includes the key commitments that are relevant to reinstatement of vegetation which would be implemented in accordance with Figure 2.1 Environmental Masterplan [TR010060/APP/6.2].
- I.4.4 The reinstatement of the temporary works area and the creation of habitats under the landscape scheme will be in line with the accompanying Biodiversity Net Gain report. The report will provide target habitat types and condition values which will be detailed within the LEMP.
- I.4.5 Reinstatement and new planting of woodland, trees, shrubs and hedges would be undertaken in the first available planting season following completion of the proposed scheme, typically between November and the end of March, avoiding periods of frost, extreme cold and waterlogged conditions. However, on newly formed cuts or embankments, planting would be undertaken at the earliest opportunity to prevent loose material from washing down slopes and entering watercourses or drainage.
- I.4.6 The LEMP will include an implementation timetable of reinstatement planting and reinstatement of habitat.
- I.4.7 Trees and shrubs would be of local provenance where practicable and shall be supplied in accordance with BS 8545:2014 Trees: from nursery to independence in the landscape - Recommendations (British Standards Institution (BSI), 2014).
- I.4.8 Non-native trees and shrubs would be used where required for reinstatement or reinforcement of non-native features, for example cricket-bat willow plantation, amenity planting, parkland and avenue trees.
- I.4.9 Areas of grassland and verges disturbed by construction works would be reinstated by seeding of an appropriate mix suitable to the existing soil conditions and land use.
- I.4.10 All landscape works shall be undertaken by an appropriate experienced landscape contractor in accordance with BS 4428:1989 Code of practice for general landscape operations (BSI, 1989) and in accordance with the detailed requirements set out in MCHW Volume 1 Series 3000 Landscape and Ecology (Highways England, 2001a) and accompanying appendices, that will be produced at detailed design stage.



**Woodland, trees, shrubs and hedges**

- I.4.11 New woodland, tree, shrub and hedge planting are proposed as part of the mitigation strategy for the proposed scheme, and planting locations are indicated on Figure 2.1 Environmental Masterplan [TR010060/APP/6.2] that would form the basis of the planting design to be developed during the detailed design stage.
- I.4.12 The following planting categories are proposed:
- Woodland planting of trees and shrubs
  - Wet woodland
  - Tall screen planting
  - Individual trees
  - Intermittent trees and shrubs
  - Hedges
  - Hedges with intermittent trees
- I.4.13 Tables Table I.1 to Table I.7 show indicative proposed species mixes, reflecting existing species composition. These mixes will be further refined within the Series 3000 Landscape and Ecology Series and accompanying appendices prepared during detailed design, in order to reflect the site-specific species composition suitable for each location based on existing soil and drainage conditions.
- I.4.14 Non-native trees and shrubs would be used where required for reinstatement of non-native features at certain locations, for example cricket-bat willow on floodplains to reinstate existing plantation, horse chestnut at Boreham House to offset loss of a TPO tree, parkland and avenue trees at Prested Hall, and amenity trees at Market Lane and Marks Tey. Non-native trees and shrubs where reinstatement is required will be indicated in the Series 3000 Landscape and Ecology Series and accompanying appendices prepared during detailed design.
- I.4.15 The majority of native trees and shrubs to be planted would be bare root (supplied with no soil around their roots) where practicable and appropriate to the species. Transplant trees and shrubs with a percentage of feathered trees would be used in most planting mixes. Selected standard trees (10-12cm girth) would be considered for tall screen planting; light standard trees (6-8cm girth) for individual tree planting; and feathered trees in intermittent tree planting.
- I.4.16 Linear planting on the embankments of Braxted Road Overbridge, Highfield Road Overbridge, Easthorpe Road Overbridge and Wishingwell Overbridge would include larger stock and faster-growing native trees at strategic locations



to act as hop-overs to guide bats over the new road. Where possible, linear planting would tie in with culverts to guide bats through these as opposed to over nearby sideroads.

**Table I.1 Indicative woodland planting of trees and shrubs mix**

Scientific name	Common name
<i>Acer campestre</i>	Field maple
<i>Crataegus monogyna</i>	Hawthorn
<i>Ilex aquifolium</i>	Holly
<i>Prunus avium</i>	Wild cherry
<i>Prunus spinosa</i>	Blackthorn
<i>Quercus robur</i>	English oak
<i>Corylus avellana</i>	Hazel
<i>Lonicera periclymenum</i>	Honeysuckle
<i>Malus sylvestris</i>	Crab apple

**Table I.2 Indicative wet woodland mix**

Scientific name	Common name
<i>Alnus glutinosa</i>	Alder
<i>Corylus avellana</i>	Hazel
<i>Populus nigra</i>	Black poplar
<i>Salix alba</i>	White willow
<i>Salix fragilis</i>	Crack willow

**Table I.3 Indicative tall screen planting species**

Scientific name	Common name
<i>Corylus avellana</i>	Hazel
<i>Crataegus monogyna</i>	Hawthorn
<i>Hedera helix</i>	Ivy
<i>Ilex aquifolium</i>	Holly
<i>Lonicera periclymenum</i>	Honeysuckle
<i>Malus sylvestris</i>	Crab apple
<i>Prunus avium</i>	Wild cherry

<i>Pyrus communis</i>	Common pear
<i>Quercus robur</i>	English oak
<i>Taxus baccata</i>	Yew

**Table I.4 Indicative individual tree species**

Scientific name	Common name
<i>Acer campestre</i>	Field maple
<i>Alnus glutinosa</i>	Alder
<i>Carpinus betulus</i>	Hornbeam
<i>Prunus avium</i>	Wild cherry
<i>Quercus robur</i>	English oak

**Table I.5 Indicative intermittent trees and shrubs mix**

Scientific name	Common name
<i>Acer campestre</i>	Field maple
<i>Alnus glutinosa</i>	Alder
<i>Corylus avellana</i>	Hazel
<i>Crataegus monogyna</i>	Hawthorn
<i>Prunus avium</i>	Wild cherry
<i>Prunus spinosa</i>	Blackthorn
<i>Quercus robur</i>	English oak
<i>Salix alba</i>	White willow
<i>Salix fragilis</i>	Crack willow

**Table I.6 Indicative hedge with intermittent trees mix**

Scientific name	Common name
<i>Acer campestre</i>	Field maple
<i>Corylus avellana</i>	Hazel
<i>Crataegus monogyna</i>	Hawthorn
<i>Ilex aquifolium</i>	Holly
<i>Prunus spinosa</i>	Blackthorn
<i>Quercus robur</i>	English oak

<i>Ulmus procera</i>	Elm
<i>Lonicera periclymenum</i>	Honeysuckle
<i>Malus sylvestris</i>	Crab apple

**Table I.7 Indicative hedge mix**

Scientific name	Common name
<i>Corylus avellana</i>	Hazel
<i>Crataegus monogyna</i>	Hawthorn
<i>Ilex aquifolium</i>	Holly
<i>Lonicera periclymenum</i>	Honeysuckle
<i>Prunus spinosa</i>	Blackthorn
<i>Cornus sanguinea</i>	Dogwood
<i>Rosa canina</i>	Dog-rose
<i>Euonymus europaeus</i>	Spindle

**Ecology mitigation**

- 1.4.17 Habitats established throughout the proposed scheme will provide a moderate to slight beneficial effect when established and functional. The ecology design for the proposed scheme is shown on Figure 2.1 Environmental Masterplan [TR010060/APP/6.2].
- 1.4.18 Impacts to protected species, including bats, GCN, otter, water vole, badger, nesting birds and reptiles during construction and operation have been reduced/mitigated through embedded design measures and mitigation strategies as outlined in Section 9.10 of Environmental Statement Chapter 9: Biodiversity [TR010060/APP/6.1], and through Natural England Protected Species Licences for bats, badgers and GCN. These include multi-species crossings, in the form of underbridges, overbridges, tunnels, culverts, and wildlife fencing designed to funnel mammals through the crossings.
- 1.4.19 Advanced ecological works and the protection of retained vegetation are to commence at least 12 months prior to construction starting, prioritising the creation of reptile receptor sites.
- 1.4.20 Landscape and ecology mitigation for the proposed scheme would be undertaken during the last phase of works.
- 1.4.21 Mitigation measures will also include the retention of felled vegetation and dead timber (including felled potential veteran trees) to use as habitat piles within retained habitat and advanced ecology mitigation areas. Any notable plants that would be directly lost as a result of clearance of verge-side vegetation during

construction of the proposed scheme would be translocated into the ecological mitigation areas where practicable. This includes wall bedstraw *Galium parisiense* at junction 22.

### Grasslands

- I.4.22 Areas of grassland proposed to be seeded as part of the mitigation strategy for the proposed scheme are indicated on Figure 2.1 Environmental Masterplan [TR010060/APP/6.2].
- I.4.23 Areas of grassland would include the following:
- Grassland suited to a low nutrient substrate along highway verges and at junctions
  - Wildflower meadows in ecology mitigation areas and around the wildlife and attenuation ponds
  - Amenity grass in open greenspaces and for reinstatement of commercial, amenity and housing areas
- I.4.24 Grass seed mixes shall be suitable to the specific ground conditions, such as loamy, clayey, silty, loamy over gravel and seasonally wet clay soils, that are present within the Order Limits.
- I.4.25 The LEMP will detail the land use type, grass seed mix for specific locations and maintenance regime for each type of grassland.
- I.4.26 No topsoil would be applied within grassland areas on new verges immediately adjacent to the carriageway and areas that are likely to require a higher-frequency cutting regime (for example visibility splays) to create grassland suited to a low nutrient substrate. This would reduce vegetation height and plant growth, improving safety, and reduce maintenance requirements while also contributing to biodiversity and providing the road user a more visually attractive roadside environment.
- I.4.27 Grass seed mixes should be of local provenance where possible and shall be sown in the autumn or spring but can be sown at the other times of the year if ground and climatic conditions are favourable.

### Ponds

- I.4.28 The design of the ponds would incorporate native wetland plant species and macrophytes and be surrounded by wildflower and grassland areas seeded from an appropriate species-rich seed mix. The ponds would provide habitat for numerous species including invertebrates, grass snakes, amphibians and foraging bats.
- I.4.29 Attenuation ponds would be designed to serve a dual purpose, providing habitat for wildlife and mitigating flood risk and pollution. These ponds would incorporate reedbeds to filter the water. Silt traps would be considered

alongside the attenuation pond design to ensure the long-term health of the ponds.

- I.4.30 Essex County Council recommends a maximum depth of 1.2m for sustainable drainage systems which are accessible to the public (Essex County Council, 2020). Health and safety recommendations would be considered at the detailed design stage where practicable and in line with the design parameters for attenuation ponds as presented in Appendix 14.6: Surface Water Drainage Strategy Report, of the Environmental Statement [TR0/10060/APP/6.3].
- I.4.31 Attenuation ponds and indicative locations of ecology ponds are shown on Figure 2.1 Environmental Masterplan [TR010060/APP/6.2]. These would form the basis of the ecology design to be developed at detailed design stage.

## **I.5 Post-construction monitoring and maintenance plans**

- I.5.1 REAC commitment LV18 states '*A five-year aftercare period as outlined within the LEMP, which is appended to the first iteration EMP [TR010060/APP/6.5], would be established for all soft environmental features of the proposed scheme*' (commitment LV18, REAC, within the first iteration EMP [TR010060/APP/6.5]). Alternative agreements would be sought for the management of third-party land within the Order Limits but outside the permanent land take, for example for the reinstatement of land temporarily acquired for the scheme.
- I.5.2 Detailed maintenance plans for the first five years will be provided in the LEMP included in the third iteration EMP for handover. A summary of operations in the first five years is provided in this LEMP, along with management and maintenance plans beyond the first five years (to be undertaken by National Highways). Operations beyond the first five years will form part of the third iteration EMP that will include maintenance schedules. The maintenance schedules will be developed during the first five years of the establishment maintenance period, informed by knowledge of the site and effectiveness of maintenance operations.
- I.5.3 Monitoring of the new habitats and planting would be required annually for the first five years post creation to identify any further work or remedial measures needed to deliver the landscape and habitat types committed to, and the appropriate level of mitigation. The management and maintenance plan for each habitat or landscape feature may require annual changes to help establishment. When the habitat is considered established, then standard highway soft estate management and maintenance practices can commence (usually after year 5). Monitoring may be required beyond this five-year period if habitats have not established sufficiently, less frequent over time, until target habitats are considered to be successful. Target habitats and condition value are stated within the BNG report (Appendix 9.14 of the Environmental

Statement [TR010060/APP/6.3]). These targets will be addressed in more detail within the LEMP.

- I.5.4 Monitoring will include UK Habitat surveys which will assess the habitat type and condition value of the site in line with the Defra Biodiversity Metric 3.0 Technical supplement and guidance. Monitoring surveys will allow progress to be recorded and adjustments made as necessary in order to achieve set biodiversity unit targets. Monitoring will be required to ensure ecological features are installed to specification and are effective. These features include plant translocations, hibernacula, log piles, relocation of felled potential veteran trees within the advanced mitigation areas, as well as monitoring of sandy banks and earth 'cliffs' created as part of the Coleman Farm Quarry restoration plan (as per the restoration plans approved by the local authority at the time of DCO submission).
- I.5.5 The maintenance and repair strategies for each habitat or landscape feature are shown in Table I.9. This is an evolving table and will be updated as required based on any updates in the detailed design and on the outcome of monitoring.
- I.5.6 Common remedial measures for planting, grassland and habitats have been described in the paragraphs below, but exact measures would need to respond to current site conditions. All remedial measures would be recorded and included in the third iteration EMP after each monitoring period. It is recommended that landscape management plans are updated annually and formally reviewed every five years.

### **Woodland, trees and shrubs**

#### **Short-term maintenance (0-5 years)**

- I.5.7 During the first five years, annual monitoring would determine the frequency of maintenance visits and the aftercare measures required for woodland, trees and shrubs following planting. Below is a summary of the operations that would be undertaken with additional information provided in the LEMP for the first five years of maintenance.
- The trees and shrubs would be checked on a quarterly basis and maintained as weed-free at all times around their bases to a diameter of 1,000mm. Bramble and other scrub growth would be cut to ground level where required so as not to suppress newly planted material. Herbicide might be needed to suppress weed growth in the first five years.
  - Any dead, dying or damaged tree/shrub would be replaced with matching species of the same size (unless agreed otherwise) during the next planting season after failure for a period of five years after planting. Trees found to be diseased or suffering pest damage would be assessed to see if they are likely to respond to treatment or whether they need replacement.

- Soil around roots would be re-firmed as necessary to ensure plants are supported and upright especially following periods of extreme winds.
- Trees and shrubs would be protected from strimming and animals following planting.
- Pruning would be undertaken to ensure damaged and diseased branches are removed and to promote the natural appearance of individual species.
- Watering would be undertaken as necessary to ensure the continued survival of plants.

### **Long-term management (over five years)**

- I.5.8 Management of woodlands, trees and shrubs beyond the first five years would be in accordance with standard highway soft-estate management practices, as described in Table I.8 and Table I.9 below, unless monitoring determines establishment maintenance is still required.
- I.5.9 Between five and ten years after planting, woodland areas would be reviewed and thinned out/coppiced as necessary, removing poor or weak specimens to allow the best specimens to flourish and give space for trees to establish. Up to 30% of the brash and timber arisings can be kept on site in the form of brash and wood piles for reptiles and invertebrates. Wood would be stacked neatly in piles not exceeding 1m high. Organic material such as wood chippings can be heaped to 1m by 1m by 1m to provide suitable egg-laying sites for grass snakes. Litter and vegetation hindering the growth of vegetation would be removed prior to thinning works with consideration for protected species.
- I.5.10 Trees adjacent to public rights of way, and within falling distance of the carriageway would require ongoing monitoring and management for health and safety reasons and to maintain access. Trees, shrubs and woodland would so far as reasonably practicable be kept in a good and safe condition, commensurate with their naturalistic context and amenity value to neighbouring residents and public. Any plant which presents a risk to neighbouring properties or to the health and safety of people would be dealt with appropriately.
- I.5.11 Where appropriate, any tree work would be carried out by an approved arboriculturalist and would be undertaken in accordance with BS 3998 Tree Work – Recommendations (BSI, 2010) and the Health and Safety Executive’s Forestry and arboriculture safety leaflets.
- I.5.12 Tree felling and limb management would be undertaken in line with the guidance, Common Sense Risk Management of Trees (Forestry Commission, 2011).



## Hedges

### **Short-term maintenance (0-5 years)**

- I.5.13 Hedges would be maintained as stated above for woodland, trees and shrubs, and invasive non-native species removed in line with guidance How to Stop Invasive Non-Native Plants from Spreading (Defra, 2022).
- I.5.14 In addition, a 300mm-wide corridor on each side of the hedge would be maintained to be weed-free during the establishment of plants.

### **Long-term management (over five years)**

- I.5.15 Management of hedges beyond the first five years would be in accordance with standard highway soft-estate management practices, as described in Table I.9 below, unless monitoring determines establishment maintenance is still required.
- I.5.16 Measures would include the following:
- Removal of non-desirable woody species where this does not prejudice screening requirements.
  - In order to fulfil the management objectives, each hedge would be managed as appropriate, for example by trimming, laying, coppicing, bulking up, etc.
  - Annual hedge cutting would be undertaken in January or February from around year six or as necessary for the hedges to become fully established. A maximum of one-third of the total hedge length would be cut, in interspersed sections and on a three-year rotational basis, with adjacent lengths being cut in different years to ensure year-round habitat for hedgerow species and to help develop the desired tall bushy structure. Consideration should also be given to cutting only one side of the hedge at each visit rather than both sides at the same time.
  - Hedge laying, where appropriate, would be undertaken on a rotational basis. This is a traditional management technique and seeks to retain the structural integrity of the hedge and maintain connections with other habitats. Cutting would be carried out at the end of the winter, thereby retaining berries through the winter months for wildlife, and avoiding the bird breeding season.
  - Undergrowth, overgrowing or overhanging shrubs and minor tree branches would be cut back from any pathways to maintain an unobstructed width of at least 2m, or the existing width of the pathway, whichever is the greater.
  - Hedges would be maintained to merge with the surrounding field margins to promote their value as intact boundary features, visual screening and for associated fauna.

- The existence and location of any hedgerow trees or parts of trees which are suffering from visible defects likely to cause danger, potential danger, obstruction or nuisance to users of adjoining properties, pathways and roads, would be reported.
- Dead, over-mature or dying hedgerow trees would be retained wherever possible, but those which are considered dangerous for health and safety reasons, for example adjacent to public rights of way or residences, would be felled or lopped as appropriate to maintain safety, and in accordance with protected species constraints.

I.5.17 Any natural flora that have colonised the hedge and are not causing problems with structural integrity, resulting in hedge plants failure, can be retained in situ to promote biodiversity gain.

### **Grasslands**

#### **Short-term maintenance (0-5 years)**

I.5.18 Management of the grassland varies depending on the type of grass. Management regimes will be defined in the LEMP, depending on the site-specific objective and grassland mixture selected for specific locations, as different species flower at different times in the growing season.

#### ***Low nutrient grassland***

I.5.19 Once the low nutrient grassland has established, resulting grassland shall be cut once a year between August and September, or twice a year, once in February/March and once in September/October (depending on desired plant species).

I.5.20 Any arisings from the cuttings should be collected and disposed of away from the grassland areas, to maintain low nutrient levels and promote future wildflower germination.

I.5.21 In some instances, annual mowing of the low nutrient verges would not be required due to the limited growth. Monitoring would identify if mowing is required.

#### ***Wildflower meadow***

I.5.22 Managing a species-rich grassland appropriately would, over time, help to increase the range and number of flowers that it supports, increasing the quantity and quality of foraging habitat for insects, including pollinators.

I.5.23 Species-rich grassland, particularly meadow mixtures, are composed mainly of perennial species which take at least a full year to establish. In addition, the early years of a sown species-rich grassland (years 2/3 from sowing) are characterised by the more quickly establishing pioneer perennials such as oxeye daisy *Leucanthemum vulgare* and sorrel *Rumex acetosa*, and the growth is vigorous. In following years, the species-rich grassland would become more

diverse as slower-establishing species like cowslip *Primula veris* appear and growth is less vigorous as nutrients become fixed in root systems and herbage.

- I.5.24 For new sowings on bare soil, the first summer would be dominated by a flush of annual weeds arising from the soil seed bank and by grass growth. This annual growth would be controlled by mowing throughout the first year to minimise competition and weed seed production. Cutting would be frequent enough to disperse the cuttings, or if less frequent removal of the cuttings is required. Any yellow rattle *Rhinanthus minor* in the mix would need to be re-seeded in the autumn of the first year, as this is an annual plant.
- I.5.25 In the second and subsequent years, species-rich grassland sowings can be managed in a number of ways which, in association with soil fertility, would determine the character of the grassland. The best results are usually obtained by traditional meadow management based around a main summer or autumn hay cut. The grassland monitoring would determine the appropriate management and maintenance strategies over this period.
- I.5.26 After flowering in summer, species-rich grassland areas would be mown with a strimmer or tractor mower to around 50mm. Arisings would be collected and removed off-site after strimming or mowing.
- I.5.27 Features of the grasslands would be recorded annually by a suitably qualified ecologist, during the flowering period from May to July. Features including the extent, sward composition (grass/herb ratio), positive and negative indicator species, local distinctiveness and sward structure would be recorded against the agreed broad target communities to determine the success of the species-rich grassland creation.
- I.5.28 Monitoring of the grassland would allow for the consideration of appropriate remedial actions to be sought based on the developing sward compared to the seed mixes sown. Such events are difficult to predict and consequently, the precise remedial action would need to be considered at the time of the event. However, remedial actions would include re-seeding areas in which the grassland has not established and removal of undesirable species.
- I.5.29 A common problem with newly sown species-rich grasslands is that rank grassland species, such as cock's-foot *Dactylis glomerata* and Yorkshire fog *Holcus lanatus*, or ruderals, such as creeping thistle *Cirsium arvense* and common nettle *Urtica dioica*, dominate the grassland sward. Dominance of rank species usually occurs due to residual nutrients in the soils, which favour the growth of competitive rank grassland species, persistent seed bank or from not correctly managing the grassland, allowing rank species to dominate or allowing nutrients to build up in the soil by not removing the arisings. In this event, additional cuts, strimming and removal of arisings would be required to reduce the growth of these rank species.

- I.5.30 Often due to changes in the soil nutrient levels or pH through natural events such as flooding, some species such as red clover can flourish and dominate the grassland swards. Such events and outcomes could be a one-off event and the grassland may re-cover and re-establish the desired diversity and sward. Nonetheless, if such an event becomes a recurring event, remedial actions such as reintroducing early cutting to remove arisings in spring and autumn with the aim of reducing the nutrient content, may be appropriate.
- I.5.31 If areas of bare ground appear during the establishment of the grasslands, re-seeding of these areas either in the autumn or spring would be considered if appropriate, depending on the extent of the bare ground and its ecological value. Reseeded areas would be managed under the first year cutting regime.

### ***Amenity grassland***

- I.5.32 The number and timing of cuts that amenity grassland requires each year depend on soil fertility and site-specific objectives. More cuts may be needed on sites with fertile soil and for a tidy managed appearance. Low-profile sites on poor soils need less mowing.
- I.5.33 Growth and establishment of grasses may be slow initially, especially at low sowing rates. There might often be a flush of annual weeds from the soil in the first growing season. The weed growth is easily controlled by topping or mowing.
- I.5.34 All plant growth would be mowed regularly to 40-60mm throughout the first growing season to prevent weeds smothering the slower-growing grasses. Cuttings would be removed, more frequent and regular topping would minimise the amount of toppings produced each time so they can be left to disperse.
- I.5.35 In the second and subsequent years amenity grassland can be managed in a number of ways which, in association with soil fertility, would determine the character of the grassland.
- I.5.36 Regular mowing would produce a short turf or lawn.
- I.5.37 Where appropriate, the grassland would be managed as a meadow allowing the grasses to grow tall, flower and seed from May through to July/August. The meadow would be cut back and mowing resumed in late summer.
- I.5.38 The LEMP will identify site specific maintenance regime for amenity grassland.

### **Long-term management (over five years)**

- I.5.39 Management of grassland beyond the first five years, would be in accordance with maintenance in the first five years after establishment. Monitoring during the first five years would help to determine the cutting regime.

## **Ponds**

- I.5.40 An indication of likely maintenance and management operations for ponds is provided below and will be updated in the LEMP as necessary to reflect the detailed design.

### **Short-term maintenance (0-5 years)**

- I.5.41 Marginal planting areas would be hand weeded three times a year to remove weed growth, and excess vegetation would be removed twice a year. Planting would be cut back up to 30% in years 3 and 5. Any non-native species identified during monitoring would be removed as soon as practicable. The removal of marginal vegetation should be carried out between September and November, during times of minimum GCN activity (Langton, *et al.*, 2001).
- I.5.42 The silt depth of ponds would be inspected once per year in October and silt removal undertaken where required. Inlets and outlets would be inspected twice a year and any blockages removed.
- I.5.43 To maintain the function of filter drains, the proprietary treatment medium would require periodic removal and replacement. Grass-lined filter drains would be subject to strimming several times a year and/or replacement with new seeding or new turf following removal of the treatment medium.

### **Long-term management (over five years)**

- I.5.44 Planting to the edges and/or bases of ponds would be cut back every three years and arisings removed off-site. Litter would be collected from ponds at each visit and removed off-site. Any non-native species identified during monitoring would be removed as soon as practicable.
- I.5.45 Silt levels would be checked annually to ensure pond depths are adequate and if silt removal is required. Inlets and outlets would be checked to confirm that they are not blocked by debris or vegetation. All arisings would be removed off-site.
- I.5.46 Filter drains would be managed as described above for years 0-5.
- I.5.47 It is expected that standard highway soft-estate management practices would be applicable, as described in Table I.9 below.

## **Protected species**

- I.5.48 Monitoring surveys proposed for bats and badgers are detailed within the relevant Natural England Protected Species Licences. Once licences have been granted, works will be conducted in adherence with the terms and conditions of the licence document and those contained within the application documentation.

- I.5.49 Monitoring of any mitigation measures for other protected species will be agreed with stakeholders at detailed design and included within subsequent iterations of the LEMP.
- I.5.50 Monitoring for Schedule 9 invasive species and invasive plants regarded as a threat in Essex, will be covered under the specific habitat monitoring of created habitats and within the Maintenance and Repair Strategy of the proposed scheme which will be detailed within the third iteration EMP.
- I.5.51 Receptor sites for translocated reptiles will require monitoring to determine success of the translocations. This is secured through the REAC, which is included in the first iteration EMP [TR010060/APP/6.5].
- I.5.52 Notable plants may require translocation away from the construction footprint, where practicable (as secured in the REAC, within the first iteration EMP [TR010060/APP/6.5]). If such translocation is required, a suitably competent person would conduct ecological monitoring on the translocated sites in subsequent growing seasons to measure survivability of the translocated plants. Specific monitoring goals and targets would be defined in the second iteration EMP prior to construction.

#### **Wildlife structures**

- I.5.53 Mammal tunnels will require little maintenance other than an annual check to confirm that the entrances are draining appropriately and are not becoming impassably overgrown or being deliberately blocked. If they are, the vegetation will need to be cut back and any blockages impeding drainage or access removed.
- I.5.54 Monitoring of the mammal tunnels will be carried out annually throughout a five year after-care period. Monitoring will comprise a combination of the use of sand traps (for underpasses and culverts), trail cameras and searching for field signs. Monitoring will occur four times a year in January, April, July and October. Annual reports on evidence of use for the first five years post-creation will feed into the third iteration EMP.
- I.5.55 The asset maintenance requirements in Table I.8 details asset delivery specific requirements in relation to carrying out of cyclic and repair maintenance activities for landscape and ecology after the initial five years aftercare, based on DMRB GM 701 Asset Delivery Asset Maintenance Requirements (Highways England, 2020a).



**Table I.8 Landscape and ecology maintenance requirement – post initial five years aftercare**

<p><b>Scope:</b></p> <p><b>The semi-natural, improved/semi-improved and landscaped parts within the affected property, including biodiversity, cultural heritage assets and hard landscaping areas. This includes existing landscape, amenity, screening functions and/or other commitments, protected habitats/species, designated sites or cultural heritage assets.</b></p>
<p><b>Outcomes:</b></p> <ol style="list-style-type: none"> <li>1) Soft estate landscape condition would be managed and maintained to minimise risks to road users, road workers and adjacent affected parties.</li> <li>2) Soft estate would be managed and maintained to protect designated sites, protected species and habitats.</li> <li>3) Soft estate would be managed and maintained to ensure that all designated sites and their constituent habitats and species meet the requirements and objectives for which they were designated.</li> <li>4) Soft estate would be managed to ensure the status of the improved / semi-improved / landscaped parts.</li> <li>5) Soft estate would be managed and maintained to meet legislative requirements and existing commitments to third parties, protection of designated sites, or protected habitats and species, and not at the detriment of its aesthetic value.</li> <li>6) Soft estate would be managed and maintained to maximise the affected property's integration with the wider landscape and habitats.</li> <li>7) Affected property would be managed and maintained in order to benefit the species, habitats and sites of nature conservation importance.</li> <li>8) Affected property would be managed and maintained in order to contribute to the establishment of coherent ecological networks and delivery of National Highways biodiversity plan.</li> </ol>
<p><b>Deliverables:</b></p> <ol style="list-style-type: none"> <li>1) EMP would be developed and annually updated in accordance with DMRB LA 120 - Environmental management plans (Highways England, 2020e).</li> <li>2) Maintenance and requirements plan (MRP) would be prepared and implemented to execute the requirements of the EMP with regards to soft estate maintenance requirements.</li> <li>3) The soft estate would be maintained to ensure vegetation would be removed from the central reserve.</li> <li>4) Road users' sight lines and stopping distance would be maintained. This would include but is not limited to junctions, access points, curves, bends and central reserve.</li> <li>5) Road users' visibility of road traffic signs and signals would be maintained.</li> <li>6) Illumination from lighting would not be obscured.</li> <li>7) Closed-circuit television (CCTV) camera operational visibility splays would be maintained.</li> <li>8) Soft estate would be maintained to minimise risk of fire hazards.</li> <li>9) The soft estate would be managed by removing any obstructions that prevent safe access, inspection and maintenance of technology equipment. This includes, but is not limited to, the</li> </ol>



**Scope:**

**The semi-natural, improved/semi-improved and landscaped parts within the affected property, including biodiversity, cultural heritage assets and hard landscaping areas. This includes existing landscape, amenity, screening functions and/or other commitments, protected habitats/species, designated sites or cultural heritage assets.**

roadside equipment cabinets and cable joint chambers, cable troughs, CCTV camera sites, message sign sites and meteorological equipment.

10) The soft estate would be managed by removing obstructions that prevent the use of customer facilities. This would include, but is not limited to, emergency roadside telephones and emergency refuge areas.

11) The soft estate would be managed by removing any obstructions that prevent safe access to and use of footways, footpaths, cycle tracks, bridleways and paved pedestrian areas. This would include, but is not limited to, the removal of vegetation and weeds.

12) The risk of trees or vegetation falling that could represent any safety risk, obstruction or nuisance would be minimised. This would include but is not limited to trafficked or pedestrian areas and adjacent property.

13) The soft estate would be managed by controlling the spread or increase of injurious, invasive non-native species.

14) The soft estate would be managed by minimising the risk of adversely affecting the stability, integrity or operation of other highway assets.

15) The soft estate would be managed by meeting existing landscape, amenity, screening functions and/or other commitments where these have been raised by existing public enquiries, planning consents, protected habitats, species or designated sites (international or national).

16) Knowledge and records of semi-natural assets, improved/semi-improved, landscaped, protected habitats and species present or likely to be present within the soft estate would be maintained and updated in accordance with DMRB GG 184 - Specification for the use of Computer Aided Design (Highways England, 2020f).

17) The soft estate would be managed to ensure that a strip from each edge of the carriageway remains unobstructed by vegetation throughout the year.

18) The soft estate would be managed to maintain the integrity of amenity areas and ensure that they remain unobstructed by vegetation throughout the year.

19) Habitats and species within the soft estate would be maintained in accordance with the EMP.

20) Designated wildlife and landscape areas would be maintained in accordance with the EMP.

**Processes:**

1) Work would be in accordance with the quality management system.

2) The MRP would define the execution of EMP to deliver the outputs.

**Procedures:**

1) Record asset data as defined in the Asset Data Management Manual (ADMM) (Highways England, 2020g).

2) The EMP is developed in accordance with DMRB LA 120 (Highways England, 2020e), DMRB LD 117 (Highways England, 2020b), Environment Strategy (Highways England, 2017d), and Managing Our Approach to Environmental Performance (Highways Agency, 2011).

- I.5.56 The maintenance plan in Table I.9 details the cyclic and repair activities that contribute to the delivery of the outcomes as set out in the requirements of GM 701 (Highways England, 2020a) and in Table I.8, and would be updated when conditions change and at least annually. Table I.9 identifies typical maintenance activities.
- I.5.57 To achieve the objectives of the LEMP, the second iteration EMP shall incorporate, where appropriate, the detailed requirements set out in Highway Highways England's MCHW Volume 1 Series 3000 Landscape and Ecology Series and accompanying appendices (Highways England, 2001a):
- Appendix 30/2 Weed Control
  - Appendix 30/3 Control of Rabbits and Deer
  - Appendix 30/4 Ground Preparation
  - Appendix 30/5 Grass Seeding, Wildflower Seeding and Turfing
  - Appendix 30/6 Planting
  - Appendix 30/7 Grass, Bulbs and Wildflower Maintenance
  - Appendix 30/8 Watering
  - Appendix 30/9 Establishment Maintenance for Planting
  - Appendix 30/10 Maintenance of Established Trees and Shrubs
  - Appendix 30/11 Management of Waterbodies
  - Appendix 30/12 Special Ecological Measures

**Table I.9 Maintenance activities for landscape and ecology – post initial five years aftercare**

<b>Scope:</b> <b>The semi-natural, improved/semi-improved and landscaped parts within the affected property, including biodiversity, cultural heritage assets and hard landscaping areas. This includes existing landscape, amenity, screening functions and/or other commitments, protected habitats/species, designated sites or cultural heritage assets.</b>			
Sub-asset type	<b>Cyclic maintenance:</b> <b>Scheduled activities that National Highways requires to be delivered to contribute to National Highways outcomes</b>	<b>Repair maintenance:</b> <b>Repair activity to be instructed by National Highways</b>	
	<b>Activity:</b> <b>Specific maintenance activity to be undertaken</b>	<b>Baseline frequency:</b> <b>Occurrence of activity that relates directly to the asset need</b>	<b>Activity:</b> <b>Specific repair maintenance activity to be undertaken</b>
Shrubs/trees	Inspect and where necessary carry out trimming, crown thinning or formative pruning to encourage healthy thriving growth, improve asset safety and maintain attractive form/habit.  Maintain habitat integrity, including removal of scrub encroachment.	As required based on monitoring (September to February)	Rectify defects as instructed
Hedges	Inspect gaps and vitality of vegetation. Trim vegetation where necessary to encourage healthy, thriving, bushy growth and maintain attractive form.  Trim hedges, maintain and preserve clear carriageway and footpath widths, sight lines and stopping distance, including junctions, access points, curves and bends.	Annually (September to February) for hedges along carriageway  Every two years for other edges	Rectify defects as instructed
Woodland	Thin/coppice as necessary to ensure healthy thriving growth and a closed canopy. Use arisings to create habitat piles of deadwood within woodland. Maintain habitat integrity, including removal of scrub encroachment.	Every seven years (September to February)	Rectify defects as instructed

<b>Scope:</b>			
<b>The semi-natural, improved/semi-improved and landscaped parts within the affected property, including biodiversity, cultural heritage assets and hard landscaping areas. This includes existing landscape, amenity, screening functions and/or other commitments, protected habitats/species, designated sites or cultural heritage assets.</b>			
<b>Sub-asset type</b>	<b>Cyclic maintenance:</b> <b>Scheduled activities that National Highways requires to be delivered to contribute to National Highways outcomes</b>	<b>Repair maintenance:</b> <b>Repair activity to be instructed by National Highways</b>	
	<b>Activity:</b> <b>Specific maintenance activity to be undertaken</b>	<b>Baseline frequency:</b> <b>Occurrence of activity that relates directly to the asset need</b>	<b>Activity:</b> <b>Specific repair maintenance activity to be undertaken</b>
Grass and vegetation	Maintain and preserve sight lines and stopping distance, including junctions, access points, curves, bends and central reserve.	Three times per year (April to September)	
	Maintain and preserve CCTV camera operational visibility splays.	Annually (April to September)	Rectify defects as instructed
	Maintain and preserve road users' visibility of road traffic signs and signals.	Annually (April to September)	
Grass and vegetation	Ensure illumination from lighting is not obscured.	Annually (April to September)	Rectify defects as instructed
	Remove obstructions and/ or maintain vegetation to facilitate safe access for inspection and maintenance of feeder pillars and technology equipment.	Annually (April to September)	
	Remove obstructions and maintain vegetation to provide safe access to and use of footways, cycle tracks, bridleways, footpaths and paved pedestrian areas.	Annually (April to September)	Rectify defects as instructed
Grass and vegetation	Undertake amenity cut of amenity grass areas, including gateway features, village verges and special landscape features.	As required based on the site-specific objective	Rectify defects as instructed

<b>Scope:</b> The semi-natural, improved/semi-improved and landscaped parts within the affected property, including biodiversity, cultural heritage assets and hard landscaping areas. This includes existing landscape, amenity, screening functions and/or other commitments, protected habitats/species, designated sites or cultural heritage assets.			
Sub-asset type	Cyclic maintenance: Scheduled activities that National Highways requires to be delivered to contribute to National Highways outcomes	Repair maintenance: Repair activity to be instructed by National Highways	
	Activity: Specific maintenance activity to be undertaken	Baseline frequency: Occurrence of activity that relates directly to the asset need	Activity: Specific repair maintenance activity to be undertaken
	Undertake 2m wide swathe cut of all highway verges to ensure strip remains unobstructed by vegetation throughout the year (in addition to visibility splay maintenance).	Annually (April to September)	
	Grass - mow the central reserve.	Annually (April to September)	
Grass and vegetation	Remove obstructions and/or maintain vegetation to facilitate safe use of customer facilities. This includes but is not limited to emergency roadside telephones and emergency refuge areas.	As required based on monitoring	Rectify defects as instructed
	Remove vegetation affecting the stability, integrity or operation of structures or other affected property assets.	As required based on monitoring	
Injurious weeds	Maintain affected property to control the spread or increase of identified instances of injurious weeds.	Annually (May-September)	Control spread of previously unidentified populations of injurious weeds
Invasive plant species	Maintain affected property to control the spread or increase of identified instances of invasive plant species.	Annually (May-September)	Control spread of previously unidentified populations of invasive plant species

<b>Scope:</b>			
<b>The semi-natural, improved/semi-improved and landscaped parts within the affected property, including biodiversity, cultural heritage assets and hard landscaping areas. This includes existing landscape, amenity, screening functions and/or other commitments, protected habitats/species, designated sites or cultural heritage assets.</b>			
<b>Sub-asset type</b>	<b>Cyclic maintenance:</b> <b>Scheduled activities that National Highways requires to be delivered to contribute to National Highways outcomes</b>	<b>Repair maintenance:</b> <b>Repair activity to be instructed by National Highways</b>	
	<b>Activity:</b> <b>Specific maintenance activity to be undertaken</b>	<b>Baseline frequency:</b> <b>Occurrence of activity that relates directly to the asset need</b>	<b>Activity:</b> <b>Specific repair maintenance activity to be undertaken</b>
Grassland (open grassland)	Maintain habitat integrity, including removal of scrub encroachment.	Every five years	Rectify defects as instructed
Heath and moorland	N/A	N/A	
Conservation grassland / wildflower grassland	Maintain habitat integrity including removal of scrub encroachment and undesirable weed species.	Annually (September, October)	Rectify defects as instructed
Rock scree	N/A	N/A	Rectify defect as instructed to meet existing commitments
Shrubs (general)	Maintain habitat integrity, including removal of scrub encroachment.	Every three years (September - February)	Rectify defects as instructed
Shrubs (ornamental)	Maintain design requirements / amenity function.	Annually (September - February)	
Woodlands – highways management	Maintain in line with EMP.	Annually (September - February)	
Woodlands and trees, including veteran trees	Maintain habitat integrity, including removal of scrub encroachment.	Every five years (September - February)	Rectify defects as instructed

<b>Scope:</b> The semi-natural, improved/semi-improved and landscaped parts within the affected property, including biodiversity, cultural heritage assets and hard landscaping areas. This includes existing landscape, amenity, screening functions and/or other commitments, protected habitats/species, designated sites or cultural heritage assets.			
<b>Sub-asset type</b>	<b>Cyclic maintenance:</b> Scheduled activities that National Highways requires to be delivered to contribute to National Highways outcomes	<b>Repair maintenance:</b> Repair activity to be instructed by National Highways	
	<b>Activity:</b> Specific maintenance activity to be undertaken	<b>Baseline frequency:</b> Occurrence of activity that relates directly to the asset need	<b>Activity:</b> Specific repair maintenance activity to be undertaken
Hedges (habitat)	Maintain habitat integrity, including removal of undesirable species.	Every three years	Rectify defects as instructed
Waterbodies - attenuation /highways management	Maintain in line with current guidance, seek guidance of an ecologist.	Annually (September - February)	
Waterbodies and wetlands – ecology ponds	Maintain habitat integrity, vegetation clearance to the maximum level of water storage, seek guidance of an ecologist.	Clear vegetation by one third every three years.	
Wildlife structures and tunnels	Remove all material that could impair operation.	Annually	
Protected habitats or designated sites	Maintain in line with current statutory body requirements.	Annually	
Protected species	Maintain in line with current species-specific legislation and current mitigation guidance.	Annually	
Nature improvement areas	N/A	N/A	



<b>Scope:</b> <b>The semi-natural, improved/semi-improved and landscaped parts within the affected property, including biodiversity, cultural heritage assets and hard landscaping areas. This includes existing landscape, amenity, screening functions and/or other commitments, protected habitats/species, designated sites or cultural heritage assets.</b>			
<b>Sub-asset type</b>	<b>Cyclic maintenance:</b> <b>Scheduled activities that National Highways requires to be delivered to contribute to National Highways outcomes</b>		<b>Repair maintenance:</b> <b>Repair activity to be instructed by National Highways</b>
	<b>Activity:</b> <b>Specific maintenance activity to be undertaken</b>	<b>Baseline frequency:</b> <b>Occurrence of activity that relates directly to the asset need</b>	<b>Activity:</b> <b>Specific repair maintenance activity to be undertaken</b>
<b>Procedures:</b> <ol style="list-style-type: none"> <li>Woodland thinning/coppicing would be carried out according to objectives of the specific plots as detailed in the National Highways' systems.</li> <li>Instances of invasive animal species would be reported to National Highways.</li> <li>All cyclic activities would be undertaken commensurate with the particular species present and the appropriate seasonal requirements for each species.</li> <li>Soft estate cyclic and repair maintenance delivery activity data would be provided in accordance with the requirements of the ADMM.</li> <li>In delivering soft estate cyclic or repair maintenance activities, problems or potential problems of the asset type and of other asset types would be reported to National Highways for consideration.</li> <li>Recommendations would be made to National Highways to optimise the delivery of the soft estate cyclic and repair maintenance activities in order to minimise non-value-adding elements.</li> </ol>			

## 1.6 Handover of maintenance obligations

- 1.6.1 Landscape and habitat maintenance for establishment to be undertaken within the first five years post construction will be set out in the LEMP and would be the responsibility of the Principal Contractor unless a shorter period is instructed by National Highways.
- 1.6.2 The management beyond the establishment period would be passed over to National Highways in the form of the third iteration EMP, set out by the Principal Contractor and based on the LEMP.
- 1.6.3 Whilst the nature of the maintenance operations set out would typically be repeated year on year, the frequency of such operations should be considered to be flexible in order that response can be made to any change in circumstances necessary to achieve the target outcomes.

- I.6.4 The third iteration EMP would then be subject to a process of ongoing review and amendment during the lifetime of the proposed scheme to ensure it remains relevant. Landscape management plans and the maintenance schedule will be updated annually and formally reviewed every five years to determine the exact requirements to suit the longer-term management objectives.

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