M60/M62/M66 Simister Island Interchange

TR010064

6.5 FIRST ITERATION ENVIRONMENTAL MANAGEMENT PLAN

APPENDIX N: OUTLINE LANDSCAPE AND ECOLOGY MANAGEMENT PLAN

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FIRST ITERATION ENVIRONMENTAL MANAGEMENT PLAN

APPENDIX N: OUTLINE LANDSCAPE AND ECOLOGY MANAGEMENT PLAN

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CONTENTS

Outline Landscape and Ecology Management Plan

N.1 Introduction

Background to the plan

N.1.1 This Outline Landscape and Ecology Management Plan (Outline LEMP) has been produced to set out how the Landscape and Ecology Management Plan (LEMP) would be structured and what it would contain. This Outline LEMP will be updated to a Landscape and Ecology Management Plan (LEMP) 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 Requirement 4 in Schedule 2 of the draft Development Consent Order (DCO) (TR010064/APP/3.1) and the requirements of the First Iteration Environmental Management Plan (EMP).

N.1.2 This Outline 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 M60/M62/M66 Simister Island interchange (the “Scheme”), and the successful establishment of landscape and ecological mitigation including planting and seeding associated with the Scheme. This Outline LEMP has been developed to ensure that the Scheme reflects the existing landscape character and context of the M60 / M62 / M66 Simister Island Interchange, whilst accommodating principles established within the Environmental Statement (TR010064/APP/6.1).

N.1.3 An Environmental Masterplan, Figure 2.3: (Environmental Masterplan) of the Environmental Statement Figures (TR010064/APP/62) has been prepared to illustrate mitigation requirements for both ecology and landscape assets. Design principles are focus on replacement of vegetation lost during construction, integration of the 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.

N.1.4 The LEMP will provide a consistent approach to the control of construction activities for the 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 8.12 Biodiversity Net Gain Assessment (BNG Report of the Environmental Statement Appendices (TR010064/APP/6.3)).

N.1.5 Under the terms of the Development Consent Order (DCO) Requirement 5, 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.

N.1.6 A five-year aftercare period would be established for all soft environmental features of the Scheme, typically 1 to 3 years of which would be included as part of the construction contract requirements. Thereafter, the soft estate would be maintained by the Applicant. The Applicant 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 retained by the Applicant post the five-year aftercare period would be subject to landowner agreement and defined within the LEMP.

N.1.7 The Scheme must be undertaken in accordance with the LEMP.

Structure of this Outline LEMP

N.1.8 This Outline LEMP forms part of the strategy for successfully integrating the Scheme within the surrounding landscape and ensuring the mitigation of many of the related impacts identified within the Environmental Statement (refer to Chapter 7: Landscape and Visual and Chapter 8: Biodiversity of the Environmental Statement (TR010064/APP/6.1), for landscape and visual impacts and ecology impacts respectively.

N.1.9 This Outline 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 receptors.

N.1.10 This Outline LEMP is informed by the documents listed below:

- Appendix 8.14: Draft Badger Licence Application (Confidential), of the Environmental Statement Appendices (TR010064/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)
- Appendix 7.5 (Arboricultural Impact Assessment) of the Environmental Statement Appendices (TR010064/APP/6.3)
- Figure 2.3: (Environmental Masterplan) of the Environmental Statement Figures (TR010064/APP/6.2)
- Environmental Control Plan: General Ecology, Appendix D of this First Iteration EMP
- Environmental Control Plan: Invasive Species, Appendix E of this First Iteration EMP
- 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)

N.1.11 The Second Iteration EMP to be developed from this First Iteration EMP will set out how environmental management would be undertaken on the 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

N.1.12 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 this First Iteration EMP.

N.1.13 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.

N.1.14 Should any protected or notable species be found during any activities, works will stop immediately and the Principal Contractor's ECoW will be contacted to advise how the works should proceed and measures to be taken to minimise disturbance to protected or notable species.

N.1.15 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.

N.2 Landscape and ecology context

N.2.1 The Scheme is situated between several urban areas and settlements including Whitefield, Prestwich, Simister and Middleton within an urban fringe landscape, with urban settlements to the west, north and south of the Scheme and predominantly low-lying Grade 3/4 agricultural land to the east. Most of the Scheme location falls within Green Belt.

N.2.2 The topography within the study areas gently rises to the north and east. To the south and east of the M62, areas around Simister, Middleton West and Langley are at a slightly higher elevation than the M62 with areas to the South West of the study area, west of M60 and M60 J18, the landform is relatively flat.

N.2.3 Vegetation includes extensive highway plantation, such as along the M60, M62 and M66 embankments and cutting. With larger plantation woodland associated with golf courses at Heaton Park to the south, Pike Fold Golf Course to the north and Whitefield Golf Course to the west creating a pattern of woodland blocks and belts throughout the landscape. A network of gapped hedgerows along field boundaries, lanes and tracks are noticeable to the north, east and south of the scheme.

N.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.

N.2.5 There are a number of designations relevant to landscape with a large proportion of the study area located within the green belt as defined within the Bury Unitary Development Plan (UDP). The key landscape designations relevant to the LEMP are listed below. Further information on landscape character and landscape designations can be found in Chapter 7: Landscape and Visual of the Environmental Statement (TR010064 /APP/6.1).

- The Northern Loop, Simister Pike Fold Bridge, Pond 1 and Pond 2 would be located within the Special Landscape Area identified withing the Bury UDP. However, the Special Landscape Area is already heavily influenced by motorway infrastructure which is both visually and audibly prominent.
- Heaton Park, a Grade II listed Registered Park and Garden, is in the south of the study area adjacent to the M60 between J18 and J19. The southern extent of the Order Limits borders a short section of the park boundary which comprises broad areas of woodland within the parkland and along the parkland boundary.
- There are several statutory listed buildings and features located within the landscape study area including several within Heaton Park, the Grade II Listed Church of St George at Simister and the Grade II Listed Brick Farmhouse at Unsworth, all of which fall outside the Order Limits.
- A network of public rights of way (PRoWs) running throughout the landscape within the study area and area and crossing underneath the M60
- The nearest ancient woodland is located approximately 470m from the Order Limits and none would be affected by the Scheme.
- There are a number of TPOs within the study area however none would be directly affected by the Scheme. Refer to Appendix 7.5: Arboricultural impact assessment of the Environmental Statement Appendix (TR010064/APP/6.3) and Figure 7.3 Key Landscape Designations and Features of the Environmental Statement Figures (TR010064/APP/6.2).
- The Ancient Tree Inventory (Woodland Trust, 2021) was checked in March 2023 as well as an arboricultural assessment made of potential veteran (ancient and notable) trees undertaken both of which did not identify any Ancient or Veteran trees within the study area.

N.2.6 The statutory ecological designations relevant to the LEMP are listed below. Further information on ecological designations can be found in

Chapter 8: Biodiversity of the Environmental Statement (TR010064 /APP/6.1).

- Hazlitt Wood Site of Borough Importance (SBI), situated 3m south-east of the Order Limits

N.3 Scheme commitments

Overview

N.3.1 A number of commitments have been made as part of the 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), within this First Iteration EMP.

Vegetation retention and removal

N.3.2 Root protection areas (RPAs) for all existing trees have been identified in Appendix 7.5 of the Environmental Statement, the Arboricultural Impact Assessment (TR010064/APP/6.3).

N.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 Second Iteration 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 Appendix 7.5 (Arboricultural Impact Assessment) of the Environmental Statement (TR010064/APP/6.2).

N.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.

N.3.5 The Principal Contractor's ECoW (supported by an experienced Arboriculturalist and Landscape Architect) would be available during the phase of site clearance to assess and advise on retention of habitats. Where practicable, the 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.

N.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.

N.3.7 Any hedgerow trimming shall be undertaken outside of the bird breeding season where practicable. Any works required within the bird nesting seasons will need to be undertaken with the supervision of the ECoW.

Habitat and species protection

Pre-construction surveys

N.3.8 Pre-construction surveys for protected species are required by Requirement 7 of the draft DCO and are secured by Commitments B11 and B12 in the REAC contained within this First Iteration EMP. In summary these surveys will comprise the following:

- Bat surveys of all trees to be felled to enable construction of the Scheme, and all trees within a radius of potential disturbance effects depending on the type of construction activity but up to a maximum distance of 50m;
- Barn owl surveys of all trees that would be impacted by the Scheme to determine use by barn owls ahead of works;
- Badger surveys up to 50m from any construction activities; and
- Schedule 9 Invasive Species surveys up to 10m from any construction activities.

N.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. Surveys for nesting barn owl and badger are not constrained by season, and these will be completed within a suitable timeframe prior to the start of construction at any given location.

N.3.10 Pre-construction survey data will be reviewed to determine if any changes to the (draft) badger licence, as provided with the DCO application (Appendix 8.14 Draft Badger Licence Application (Confidential) of the Environmental Statement Appendices (TR010064/APP/6.3)), 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

N.3.11 Procedures for protected species safeguarding and mitigation during construction will be fully detailed within Appendix 8.14 of the Environmental Statement Appendices (TR010064/APP/6.3) and (with respect to badgers) within the Natural England Protected Species Licence for badgers and are not repeated here. The Environmental Statement (TR010064/APP/6.3) includes consideration of breeding birds (including barn owl), badger, bats, fish, reptiles, great crested newt (GCN), terrestrial invertebrates and other species of principal importance for the purpose of conserving biodiversity[1].

N.3.12 A badger licence will be produced for several setts that are located within the Scheme, or within 30m of these areas. This will include the permanent closure of an outlier sett, as well as measures to reduce disturbance to other outlier setts, a main and an annex sett.

N.3.13 For trees which are identified as having bat roost potential, preconstruction surveys would confirm if the status of the feature has changed since baseline surveys were undertaken (i.e. is there any new evidence to confirm bats are now using the trees to roost). Should any roosts be confirmed a licence would be submitted for approval to Natural England to agree appropriate mitigation including the timing of works, exclusion measures and suitable replacement roosts.

N.3.14 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). A phased clearance of vegetation would be required to displace reptiles into suitable retained habitat. A detailed methodology would be provided within the Second Iteration EMP.

N.3.15 Additional timing constraints include avoiding night working near sensitive features such as badger setts and watercourses.

[1] *As provided for in section 41 of the Natural Environment and Rural Communities Act 2006.*

N.3.16 In addition to the above, species protection measures in relation to vegetation removal are detailed in the REAC, within this First Iteration EMP.

N.3.17 The REAC refers to and recommends two-stage vegetation clearance methods to mitigate risks for amphibians and reptiles. GCN will be mitigated through the district level licencing process. 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.

N.3.18 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 E: Environmental Control Plan: Invasive Species, of this First Iteration EMP and are not repeated here.

N.3.19 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.

Species mitigation

N.3.20 The closure of badger setts will be detailed within the relevant Natural England Protected Species Licence. Once the licence has been granted, works will be conducted in accordance with the terms and conditions of the licence documents and those contained within the application documentation.

N.3.21 Bat boxes will be installed at a ratio of two to one for every tree, with suitability to support roosting bats that is being lost because of construction. The areas for replacement bat boxes are shown on the Figure 2.3: (Environmental Masterplan) of the Environmental Statement Figures (TR010064/APP/6.2)). Enhancement features such as log piles and hibernacula will be provided in newly created habitats as detailed in Chapter 8: Biodiversity of the Environmental Statement (TR010064/APP/6.1)) and as shown on Figure 2.3 Environmental Masterplan of the Environmental Statement Figures (TR010064/APP/6.2)).

N.3.22 The design of linear habitats such as hedgerows and lines of trees would aim to increase connectivity along the Scheme, linking with retained woodland and hedgerows where practicable.

N.4 Landscape and ecological enhancement

N.4.1 This section sets out the general principles for how enhancement of retained habitats would be undertaken in accordance with Appendix 8.12 Biodiversity Net Gain Report of the Environmental Statement Appendices (TR010064/APP/6.3).

Grassland

N.4.2 In accordance with the metric, areas of other neutral grassland would be managed to improve their condition from poor to moderate, or from moderate to good.

N.4.3 This would be achieved through altering the maintenance regimes to ensure a varied sward height throughout each parcel of habitat, with at least 20% of the sward height less than 7cm and at least 20% more than 7cm to create microclimates which provide opportunities for insects, birds, and small mammals to live and breed.

N.4.4 Bare ground would be created or sown with seed in order to maintain a cover of between 1% and 5% where practicable.

N.4.5 Scrub and bracken would be managed to maintain cover at less than 5% and 20% respectively.

N.4.6 Where the diversity of species is below 9 species per metre squared, native plugs or seed mixes would be over sown on existing grassland in order to increase the diversity.

N.4.7 Lastly, invasive species would be treated and eradicated where present.

Woodland

N.4.8 In accordance with the metric, areas of woodland would be managed to improve their condition from moderate to fairly good.

N.4.9 This would be achieved through selective thinning and understorey planting with younger trees and scrub to increase the diversity of age of woody species within the woodlands. Where the diversity in species is currently limited, new native species would be used to ensure a minimum of five native species within each woodland block.

N.4.10 In addition, standing deadwood would be artificially created, to achieve presence of deadwood within 50% of the survey plots within each woodland where practicable.

N.4.11 Lastly, invasive species would be treated and eradicated where present.

N.5 Landscape and ecological reinstatement

N.5.1 This section sets out the general principles for how reinstatement of vegetation and reinstatement of habitat would be undertaken.

N.5.2 The environmental design for the Scheme is shown on Figure 2.3: (Environmental Masterplan) of the Environmental Statement Figures (TR010064/APP/6.2). The environmental design aims to replace features lost by the Scheme, to integrate the 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.

N.5.3 The REAC, within this First Iteration EMP includes the key commitments that are relevant to reinstatement of vegetation which would be implemented in accordance with Figure 2.3: (Environmental Masterplan) of the Environmental Statement Figures (TR010064/APP/6.2).

N.5.4 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 and will target habitat types and condition values used in the Biodiversity Metric.

N.5.5 Reinstatement and new planting of woodland, trees, shrubs, and hedges would be undertaken in the first available planting season following completion of the 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.

N.5.6 Where there is opportunity to undertake advance planting within the first planting season of the construction period this will be identified within the contract documentation and the Second Iteration of this appendix. Planting that can be guaranteed undisturbed by other construction activities and maintained throughout the construction period and into aftercare should be identified (e.g. planting along Pole Lane).

N.5.7 The Second Iteration LEMP will include an implementation timetable of reinstatement planting and reinstatement of habitat.

N.5.8 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).

N.5.9 Non-native trees and shrubs would be used where required for reinstatement or reinforcement of non-native features, for example where identified to create a gateway into the urban edge of Manchester around the main interchange approaches.

N.5.10 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.

N.5.11 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

N.5.12 New woodland, tree, shrub, and hedge planting are part of the mitigation strategy for the Scheme, and planting locations are indicated on Figure 2.3: (Environmental Masterplan) of the Environmental Statement Figures (TR010064/APP/6.2) that would form the basis of the planting design to be developed during the detailed design stage.

N.5.13 The following planting categories will apply:

- Mixed woodland planting of trees and shrubs (general)
- Mixed woodland planting of trees and shrubs (broadleaf)
- Mixed woodland planting of trees and shrubs (conifer heavy)
- Wet woodland
- Individual trees
- Shrubs with intermittent trees
- Hedgerows
- Hedgerows with intermittent trees
- Marginal planting around attenuation ponds
- Woodland Edge

N.5.14 Tables N.1 to N.10 show indicative species mixes, reflecting existing species composition. These mixes will be further refined within the Series

3000 Landscape and Ecology Specification and accompanying appendices prepared during detailed design, to reflect the site-specific species composition suitable for each location based on existing soil and drainage conditions.

N.5.15 Non-native trees and shrubs would be used where required for reinstatement of non-native features at certain locations, for example to provide a gateway into the urban edge of Manchester on approach to the interchange using feature trees and shrubs for different year-round colour. Non-native trees and shrubs will be indicated in the Series 3000 Landscape and Ecology Series drawings, specification and accompanying appendices prepared during detailed design.

N.5.16 Most 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. Tree and shrub plant stock will predominantly be supplied as transplants with a percentage of feathered trees used in most planting mixes. Selected standard trees (10-12cm girth) would be considered for tall screen planting; standard trees (8-10cm girth) for individual tree planting; and feathered trees in intermittent trees planting.

Table N.1 Indicative LE2.1.1a Native Mixed Woodland mix

Scientific Name	Common Name
Alnus glutinosa	Alder
Betula pendula	Silver Birch
Corylus avellana	Hazel
Crataegus monogyna	Hawthorn
Ilex aquifolium	Holly
Pinus sylvestris	Scots pine
Prunus avium	Wild cherry
Prunus spinosa	Blackthorn
Quercus robur	English oak
Sorbus aucuparia	Rowan

Table N.2 Indicative LE2.1.1b Native Mixed Woodland - Broadleaf mix

Scientific Name	Common Name
Alnus glutinosa	Alder

Scientific Name	Common Name
Betula pendula	Silver Birch
Corylus avellana	Hazel
Crataegus monogyna	Hawthorn
Prunus avium	Wild cherry
Prunus spinosa	Blackthorn
Quercus robur	English oak
Sorbus aucuparia	Rowan

Table N.3 Indicative LE2.1.1c Native Mixed Woodland - Conifer mix

Scientific Name	Common Name
Alnus glutinosa	Alder
Betula pendula	Silver Birch
Corylus avellana	Hazel
Crataegus monogyna	Hawthorn
Ilex aquifolium	Holly
Pinus sylvestris	Scots pine
Prunus avium	Wild cherry
Prunus spinosa	Blackthorn
Quercus robur	English oak
Sorbus aucuparia	Rowan

Table N.4 Indicative LE2.1.2 Native Wet Woodland mix

Scientific Name	Common Name
Alnus glutinosa	Alder
Betula pendula	Silver Birch
Corylus avellana	Hazel
Crataegus monogyna	Hawthorn
Quercus robur	English oak
Salix caprea	Goat willow
Salix fragilis	Crack willow

Table N.5 Indicative LE2.2 Native Woodland Edge mix

Scientific Name	Common Name
Corylus avellana	Hazel
Crataegus monogyna	Hawthorn
Prunus spinosa	Blackthorn
Rosa canina	Dog rose
Viburnum opulus	Guelder rose

Table N.6 Indicative LE2.5 Native Shrubs with Intermittent Trees mix

Scientific Name	Common Name
Acer campestre	Field maple
Alnus glutinosa	Alder
Betula pendula	Silver Birch
Crataegus monogyna	Hawthorn
Prunus avium	Bird cherry
Rosa canina	Dog rose
Sambucus nigra	Elder
Sorbus aucuparia	Rowan

Table N.7 Indicative LE2.6 Native Shrubs mix

Scientific Name	Common Name
Acer campestre	Field Maple
Cornus sanguinea	Dogwood
Corylus avellana	Hazel
Crataegus monogyna	Hawthorn
Prunus spinosa	Blackthorn
Rosa canina	Dog rose
Viburnum opulus	Guelder rose

Table N.8 Indicative LE4.3 Native Hedgerow mix

Scientific Name	Common Name
Acer campestre	Field Maple

Scientific Name	Common Name
Cornus sanguinea	Dogwood
Corylus avelllana	Hazel
Crataegus monogyna	Hawthorn
Prunus spinosa	Blackthorn
Sambucus nigra	Elder

Table N.9 Indicative LE5.1 Native Individual Trees mix

Scientific Name	Common Name
Acer campestre	Field Maple
Alnus glutinosa	Alder
Betula pendula	Silver Birch
Carpinus betulus	Hornbeam
Prunus avium	Hawthorn
Quercus robur	English Oak
Salix caprea	Bird Cherry
Sorbus aucuparia	Rowan

Table N.10 Indicative LE6.1.2 Marginal plant species mix

Scientific Name	Common Name
Caltha palustris	Marsh marigold
Filipendula ulmaria	Meadowsweet
Iris pseudacorus	Yellow flag iris
Lythrum salicaria	Purple loosestrife
Mentha aquatica	Water mint
Myosotis scorpioides	Water forget-me-not
Veronica beccabunga	Brooklime

Environmental mitigation

N.5.17 Habitats established throughout the Scheme would mitigate the effects of habitat loss due to site clearance, when established and functional. The ecology design for the Scheme is shown on Figure 2.3: (Environmental

Masterplan) of the Environmental Statement Figures (TR010064/APP/6.2).

N.5.18 Impacts to protected species, including bats, GCN, badger, nesting birds and reptiles during construction and operation have been reduced/mitigated through embedded design measures and mitigation strategies as outlined in Chapter 8: Biodiversity of the Environmental Statement (TR010064/APP/6.1), and through Natural England Protected Species Licences for badgers and GCN. These include timing of works, provision of buffers, supervision by ECoW, and provision of bat and bird boxes.

N.5.19 Landscape mitigation and environmental compensation measures for the Scheme would be undertaken during the last phase of works.

N.5.20 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 environmental mitigation areas.

Grasslands

N.5.21 Areas of grassland to be seeded as part of the mitigation strategy for the Scheme are indicated on Figure 2.3: (Environmental Masterplan) of the Environmental Statement Figures (TR010064/APP/6.2).

N.5.22 Areas of grassland would include the following:

- Grassland suited to a low nutrient substrate along highway verges and at junctions.
- Wildflower meadows in environmental mitigation areas and around the wildlife and attenuation ponds
- Amenity grass in open greenspaces and for reinstatement of commercial, amenity and housing areas

N.5.23 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.

N.5.24 The LEMP will detail the land use type, grass seed mix for specific locations and maintenance regime for each type of grassland.

N.5.25 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.

N.5.26 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

N.5.27 The design of the attenuation ponds and pond 2 (a pond for water quality) 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.

N.5.28 Attenuation ponds would be designed to serve a dual purpose, providing habitat for wildlife, and mitigating flood risk and pollution. These ponds would incorporate marginal planting. Silt traps would be considered alongside the attenuation pond design to ensure the long-term health of the ponds.

N.5.29 Health and safety recommendations would be considered at the detailed design stage where practicable and in line with the design parameters for attenuation ponds.

N.5.30 Attenuation ponds and indicative locations of ecology ponds are shown on Figure 2.3: (Environmental Masterplan) of the Environmental Statement Figures (TR010064/APP/6.2). These would form the basis of the ecology design to be developed at detailed design stage.

N.6 Post-construction monitoring, maintenance and management plans

N.6.1 New rights will be acquired for the management of mitigation on third-party land within the Order Limits but outside the permanent land-take and maintained under suitable long term restrictive covenants.

N.6.2 For the reinstatement of land temporarily acquired for the Scheme which would be maintained under the establishment maintenance of the contracted works and then handed back to the landowner to maintain in the longer term.

N.6.3 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 the LEMP, along with management and maintenance plans beyond the first five years (to be

undertaken by the Applicant). 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.

N.6.4 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 8.12 of the Environmental Statement (TR010064/APP/6.3)).

N.6.5 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 3.1 Technical supplement and guidance. Monitoring surveys will allow progress to be recorded and adjustments made as necessary to achieve set biodiversity unit targets. Monitoring will be required to ensure ecological features are installed to specification and are effective. These features include hibernacula and log piles within the newly created habitats.

N.6.6 The maintenance and repair strategies for each habitat or landscape feature are shown in Tables N.11 and N1.2. These are evolving tables and will be updated as required based on any updates in the detailed design and on the outcome of monitoring.

N.6.7 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)

N.6.8 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 always maintained as weed-free 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.
- Replace or reattach all ancillaries such as stakes, trees and shrub shelters / spiral guards etc. and remove all damaged items from site.
- 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 maintenance and management (over five years)

N.6.9 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 Tables N.11 and N.12 below, unless monitoring determines establishment maintenance is still required.

N.6.10 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.

N.6.11 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.

N.6.12 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.

N.6.13 Tree felling and limb management would be undertaken in line with the guidance, Common Sense Risk Management of Trees (Forestry Commission, 2011).

Hedgerows

Short-term maintenance (0-5 years)

N.6.14 Hedgerows 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).

N.6.15 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 maintenance and management (over five years)

N.6.16 Management of hedgerows beyond the first five years would be in accordance with standard highway soft-estate management practices, as described in Table N.12 below, unless monitoring determines establishment maintenance is still required.

N.6.17 Measures would include the following:

- Removal of non-desirable woody species where this does not prejudice screening requirements.

- To fulfil the management objectives, each hedgerow would be managed as appropriate, for example by trimming, laying, coppicing, bulking up, etc.
- Annual hedgerow 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 hedgerow 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.
- Hedgerows 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.

N.6.18 Any natural flora that has colonised the hedgerow and are not causing problems with structural integrity, resulting in hedgerow plants failure, can be retained in situ to promote biodiversity gain.

Grasslands

Short-term maintenance (0-5 years)

N.6.19 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

N.6.20 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).

N.6.21 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.

N.6.22 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

N.6.23 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.

N.6.24 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.

N.6.25 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.

N.6.26 In the second and subsequent years, species-rich grassland sowings can be managed in several 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.

N.6.27 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.

N.6.28 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.

N.6.29 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.

N.6.30 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.

N.6.31 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.

N.6.32 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.

Long-term maintenance and management (over five years)

N.6.33 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

N.6.34 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)

N.6.35 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).

N.6.36 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.

N.6.37 To maintain the function of swales and 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)

N.6.38 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.

N.6.39 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.

N.6.40 Filter drains would be managed as described above for years 0-5.

N.6.41 It is expected that standard highway soft-estate management practices would be applicable, as described in Table N.12 below.

Protected species

N.6.42 Monitoring surveys for badgers would be detailed within the relevant Natural England Protected Species Licence. Once the licence has been granted, works will be conducted in adherence with the terms and conditions of the licence document and those contained within the application documentation.

N.6.43 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.

N.6.44 Monitoring for Schedule 9 invasive species will be covered under the specific habitat monitoring of created habitats and within the Maintenance and Repair Strategy of the Scheme which will be detailed within the Third Iteration EMP.

Table N.11 Landscape and ecology maintenance requirement – Initial five years aftercare

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.**
Outcomes: 1) Soft estate landscape condition would be managed and maintained to minimise risks to road users, road workers and adjacent affected parties. 2) Soft estate would be managed and maintained to protect designated sites, protected species and habitats. 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. 4) Soft estate would be managed to ensure the status of the improved / semi-improved / landscaped parts.

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.**
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. 6) Soft estate would be managed and maintained to maximise the affected property's integration with the wider landscape and habitats. 7) Affected property would be managed and maintained to benefit the species, habitats and sites of nature conservation importance. 8) Affected property would be managed and maintained to contribute to the establishment of coherent ecological networks and delivery of National Highways biodiversity plan.
Deliverables: 1) The Second and Third Iteration EMP would be developed and annually updated subject to contract handover programmes in accordance with DMRB LA 120 - Environmental Management Plans (Highways England, 2020e). 2) Maintenance and Requirements Plan (MRP) would be prepared and implemented to execute the requirements of the Third Iteration EMP with regards to soft estate maintenance requirements. 3) The soft estate would be maintained to ensure vegetation would be removed from the central reserve. 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. 5) Road users' visibility of road traffic signs and signals would be maintained. 6) Illumination from lighting would not be obscured. 7) Closed-circuit television (CCTV) camera operational visibility splays would be maintained. 8) Soft estate would be maintained to minimise risk of fire hazards. 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 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.

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.**
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 MRPs would define the execution of the Second and Third Iteration 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).

N.6.45 The maintenance plan in Table N.11 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 N.12, and would be updated within the Third Iteration EMP when conditions change and at least annually. Table N.12 identifies typical maintenance activities.

N.6.46 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 N.12 Maintenance activities for landscape and ecology – post initial five years aftercare (Third Iteration EMP)

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.**			
Sub-asset type	**Cyclic maintenance:** **Scheduled activities that the Applicant requires to be delivered to contribute to National Highways outcomes**		**Repair maintenance:** **Repair activity to be instructed by the Applicant**
	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**
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
Hedgerows	Inspect gaps and vitality of vegetation. Trim vegetation where necessary to encourage healthy, thriving, bushy growth and maintain attractive form. Trim hedgerows, 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

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.**			
Sub-asset type	**Cyclic maintenance:** **Scheduled activities that the Applicant requires to be delivered to contribute to National Highways outcomes**		**Repair maintenance:** **Repair activity to be instructed by the Applicant**
	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**
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

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.**			
Sub-asset type	**Cyclic maintenance:** **Scheduled activities that the Applicant requires to be delivered to contribute to National Highways outcomes**		**Repair maintenance:** **Repair activity to be instructed by the Applicant**
	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

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.**			
Sub-asset type	**Cyclic maintenance:** **Scheduled activities that the Applicant requires to be delivered to contribute to National Highways outcomes**		**Repair maintenance:** **Repair activity to be instructed by the Applicant**
	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**
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
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)	N/A	N/A	
Woodlands – highways management	Maintain in line with EMP.	Annually (September - February)	

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.**			
Sub-asset type	**Cyclic maintenance:** **Scheduled activities that the Applicant requires to be delivered to contribute to National Highways outcomes**		**Repair maintenance:** **Repair activity to be instructed by the Applicant**
	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**
Woodlands and trees, including veteran trees	Maintain habitat integrity, including removal of scrub encroachment.	Every five years (September - February)	Rectify defects as instructed
Hedges (habitat)	Maintain habitat integrity, including removal of undesirable species.	Every three years	
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.	Rectify defects as instructed
Wildlife structures	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	

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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.</td></tr>
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Occurrence of activity that relates directly to the asset need</td><td>Activity:
Specific repair maintenance activity to be undertaken</td></tr>
<tr><td colspan="4">Procedures:
1. Woodland thinning/coppicing would be carried out according to objectives of the specific plots as detailed in the National Highways' systems.
2. Instances of invasive animal species would be reported to the Applicant.
3. All cyclic activities would be undertaken commensurate with the particular species present and the appropriate seasonal requirements for each species.
4. Soft estate cyclic and repair maintenance delivery activity data would be provided in accordance with the requirements of the ADMM.
5. 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 the Applicant for consideration.
6. Recommendations would be made to the Applicant to optimise the delivery of the soft estate cyclic and repair maintenance activities to minimise non-value-adding elements.</td></tr>
</table>

N.7 Handover of monitoring, maintenance, and management obligations

N.7.1 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 initially be the responsibility of the Principal Contractor (typically 1 to 3 years after completion, with the remainder undertaken by the Applicant).

N.7.2 The details of anticipated management operations beyond the establishment period under the contract would be passed over to the Applicant in the form of the Third Iteration EMP, set out by the Principal Contractor and based on the LEMP.

N.7.3 Whilst the nature of the maintenance operations set out would typically be repeated year on year, the frequency of such operations should be flexible in order that response can be made to any change in circumstances necessary to achieve the target outcomes.

N.7.4 The Third Iteration EMP would then be subject to a process of ongoing review and amendment during the lifetime of the Scheme to ensure it remains relevant. Landscape management plans and the maintenance schedules should be updated annually and formally reviewed every five years to determine the exact requirements to suit the longer-term management objectives.

N.8 References

British Standards Institution (1989). BS 4428:1989 Code of practice for general landscape operations.

British Standards Institution (2010). BS 3998:2010 Tree work. Recommendations.

British Standards Institution (2014). BS 8545:2014 Trees: from nursery to independence in the landscape. Recommendations.

Highways England (2001a). Series 3000 Landscape and Ecology, Manual of Contract Documents for Highway Works Volume 1 Specification for Highway Works.

Highways England (2001b). Series 200 Site Clearance, Manual of Contract Documents for Highway Works Volume 1 Specification for Highway Works.

Highways England (2009a). Network Management Manual.

Highways England (2009b). Routine and Winter Service Code.

Highways England (2020a). Design Manual for Roads and Bridges GM 701 Asset Delivery Asset Maintenance Requirements.

Highways England (2020b). Design Manual for Roads and Bridges LD 117 Landscape Design.

Highways England (2020c) Design Manual for Roads and Bridges LA 108 Biodiversity

Highways England (2020e). Design Manual for Roads and Bridges LA 120 - Environmental management plans

Highways England (2020f). Design Manual for Roads and Bridges GG 184 - Specification for the use of Computer Aided Design

Highways England (2020g). Asset Data Management Manual

Langton, T.E.S., Beckett, C.L., and Foster, J.P. (2001). Great Crested Newt Conservation Handbook, Froglife, Halesworth.