M25 junction 10/A3 Wisley interchange TR010030
6.5 Environmental Statement: Appendix 7.20 Landscape and ecology management and monitoring plan

Regulation 5(2)(a)
Planning Act 2008
Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009

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The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 (as amended)

M25 junction 10/A3 Wisley interchange

The M25 junction 10/A3 Wisley interchange Development Consent Order 202[x]

6.5 ENVIRONMENTAL STATEMENT:

APPENDIX 7.20 LANDSCAPE AND ECOLOGY

MANAGEMENT AND MONITORING PLAN

Regulation Number:	Regulation 5(2)(a)
Planning Inspectorate Scheme Reference	TR010030
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Author:	M25 junction 10/A3 Wisley interchange project team, Highways England

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Rev 1	11 February 2020	Request for change
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Appendix 7.20 Landscape and Ecology Management and Monitoring Plan

7.1 Introduction

7.1.1 Scope of document

7.1.1.1 This outline Landscape and Ecological Management and Monitoring Plan (LEMP) outlines the proposed management of the landscape and ecological elements of the M25 junction 10/A3 Wisley interchange scheme (the Scheme), for land outside of the boundary of the Thames Basin Heaths SPA and the associated SPA compensation land, and Ockham and Wisley Commons SSSI. The Scheme consists of two Nationally Significant Infrastructure Projects (NSIPs). This means that a Development Consent Order (DCO) application will be made to the Secretary of State under Section 37 of the Planning Act 2008 to seek authorisation to build the Scheme.

7.1.1.2 The outline LEMP should be read in conjunction with the outline SPA Management and Monitoring Plan, which is provided in Appendix 7.19 of the Environmental Statement (application reference TR010030/APP/6.3).

7.1.1.3 This is a live document and the current outline version provides a snapshot of the work that has been undertaken to date. It does not constitute the final version for implementation at this stage of drafting. It will continue to be updated and added to as ongoing discussions are held with Natural England, Environment Agency (EA), Surrey County Council (SCC), Surrey Wildlife Trust (SWT) and other relevant stakeholders.

7.1.1.4 This outline LEMP sets out the long-term goals and landscape and ecology management practices for the Scheme. The key objectives of the LEMP are to provide details of the habitat creation, ecological enhancement and soft landscaping within the Scheme boundary (for land outside of the SPA/SSSI boundary). During the detailed design phase the objectives will be developed further by the parties involved to set clear 'SMART' (specific, measurable, achievable, realistic and, timely) targets to monitor achievement against. The outline LEMP has been created to help ensure that the Scheme is in keeping with the following broad objectives:

- Enhancement and integration into the existing landscape – to maintain and develop the Scheme so that it becomes integrated with the surrounding landscape. This includes the retention of existing landscape features, where practicable;
- Nature conservation and biodiversity – to create, integrate and maintain habitat types, where possible, and to encourage greater biodiversity which is sustainable within the limits of the Scheme;
- Recreation and education – to enhance local use of the site for informal recreation, such as walking along the local public footpath network and for the appreciation of the natural environment; and

- Visual amenity – to provide an attractive scheme that is visually pleasing and safe for users of the road, cyclists, users of common land and public rights of way users.

7.1.1.5 This document forms Appendix 7.20 of the Environmental Statement (application reference TR10030/APP/6.3).

7.1.1.6 Detailed landscape and ecology designs, schedules and specifications will be produced for all works during the detailed design stage.

7.1.1.7 A Construction Environmental Management Plan (CEMP) will be produced to mitigate any impacts during the construction phase of the Scheme. This will broadly follow the Outline CEMP in 7.2 of the Environmental Statement (application reference TR10030/APP/6.3).

7.1.1.8 The Scheme covers works around the M25 junction 10/A3 Wisley interchange and its extents, including the SPA compensation land and SPA enhancement areas as illustrated in Appendix A.

7.1.2 Structure of Document

7.1.2.1 This document is structured as follows:

- Overview of how the LEMP will be implemented, including roles and responsibilities of individual parties;
- Draft objectives for each land parcel (separated into habitat creation type and/or activity, temporary land take areas and permanent structures).
- Outline prescriptions for habitat creation and/or management actions including draft timetables for habitat management and monitoring.
- Species monitoring approach.

7.1.2.2 All details are subject to further work and stakeholder engagement. The final version of the LEMP will be implemented in conjunction with the final SPA Management and Monitoring Plan (outline SPA Management and Monitoring Plan is Appendix 7.19 of the Environmental Statement, application reference TR010030/APP/6.3) and with additional measures covered by protected species licences and the CEMP.

7.2 Implementation of the Landscape and Ecology Management and Monitoring Plan (LEMP)

7.2.1 Roles and responsibilities

Highways England

7.2.1.1 Highways England has committed to make resources available for the works described within this outline LEMP for the durations outlined in Table 7.2.1. These durations are dependent on habitat type and/or management activities.

7.2.1.2 Highways England will continue to be responsible for carrying out routine maintenance of any highways assets such as road verges and drainage systems as part of their routine asset management programme.

Principal Contractor

7.2.1.3 The appointed principal contractor will be responsible for carrying out all works detailed in the DCO; they will have the overall control of delivering the Scheme.

7.2.1.4 The principal contractor will be responsible for restoration and reinstatement of existing habitats or creating the intended habitats in any temporary land take areas and constructing any new structures (such as bat mitigation structures and attenuation ponds). They will also be responsible for carrying out works required within the replacement land to facilitate, and (as a minimum) the initial enhancement work to Stratford Brook. Refer to the LEMP map in Appendix A for an overview of the areas/structures.

7.2.1.5 The principal contractor will appoint an appropriately experienced and qualified contractor. The contractor undertaking the management and maintenance works should hold a BASIS amenity horticultural products certificate – to ensure that they can provide appropriate advice on the selection and application of herbicides. The contractor is to be competent at identifying plant species, including those proposed as part of seeded and planted mixes, as well as any undesirable species, and experienced in the various habitat creation and enhancement works required on this Scheme. Specialist work (such as backwater creation and ancient woodland soil translocation) may be carried out by specialist sub-contractors appointed by the principal contractor where particular specific skills, equipment and/or experience are required.

Surrey County Council (SCC) / Surrey Wildlife Trust (SWT)

7.2.1.6 SWT manage SCC's countryside estate; this arrangement was put in place in 2002 for a 50 year period (i.e. it will be due for renewal around 2052). Highways England is not aware of any reason why this arrangement would change significantly during this time period.

7.2.1.7 It is expected that the long-term management of the replacement land will be undertaken by SWT on behalf of SCC.

Other landowners

7.2.1.8 There are two areas of privately-owned land where long-term management of landscape and ecological elements is proposed. One is land containing Stratford Brook and its associated riparian habitats, which at the time of drafting this document is owned by Wisley Property Investments Limited. The other is the proposed location of the bat mitigation structure (and associated landscape works) on the former San Domenico restaurant site, which at the time of drafting this document is owned by Eurogarages.

7.2.1.9 The mechanisms for funding the works in these land parcels and ensuring they will be carried out according to the prescriptions outlined in the LEMP are still under discussion; however, they are likely to be delivered through a legal agreement.

Monitoring party

7.2.1.10 Monitoring the measures of success are critical. Highways England will appoint a monitoring party to work collaboratively with the steering group and monitor the outcomes of the works carried out at set intervals during the agreed management/monitoring period. The monitoring party will include suitably qualified and experienced ecologists and landscape architects.

7.2.1.11 It is envisaged that an annual monitoring report will be prepared highlighting major works carried out and/or achievements met.

Steering group

7.2.1.12 A steering group will be set up to help inform decision making throughout the duration of this LEMP (or such time as the steering group agrees it is no longer required, if sooner). It will include a representative from Highways England, SCC / SWT, Environment Agency, Natural England and, during the period of their project involvement, Highways England's principal contractor and detailed design ecological consultant.

7.2.1.13 The remit of this steering group will be to discuss when major changes to the LEMP (and/or its prescribed management activities) are required, or when successful achievements of targets have been met.

7.2.1.14 Terms of reference for the steering group will be set during the development of this outline LEMP and will include details such as the frequency of meetings, how meetings will be administered and how any conflicts will be resolved.

7.2.2 Habitat management / monitoring duration

7.2.2.1 The duration of management / monitoring for each landscape/ecology element created or enhanced is provided in Table 7.2.1 below.

Table 7.2.1: Duration of habitat management / monitoring of habitats created / enhanced

Habitat type	Duration of management / monitoring
Woodland creation using translocated ancient woodland soils	25 years
Wood pasture (created)	20 years
Woodland (created)	20 years
Woodland enhancements	15 years
Grassland management	20 years
Pond enhancement (Chatley wood pond)	5 years
Stratford Brook habitat enhancement	15 years
Marginal/emergent planting	5 years
(Open) grassland (road verge)	5 years
Tree and shrub planting	5 years
Reinstatement of temporary land take areas	5 years
Permanent structures (bat house, bat and bird boxes)	5 years

7.2.2.2 Monitoring will be carried out to determine:

- Whether measures have been implemented as agreed;
- The relative success/effectiveness of the measures;
- How to remedy the situation if any of the measures fail; and
- If further consultation / approvals are required in the instance that the proposed measures are not proving effective.

7.2.3 Delivery Mechanisms

7.2.3.1 The mechanisms used to deliver the works described in this outline LEMP are complex, and different mechanisms will apply in different areas and at different stages of the work. This section outlines those mechanisms to give confidence to the Planning Inspectorate that the works can be delivered and managed in the long-term.

Draft DCO Requirements

7.2.3.2 Schedule 2 of the draft DCO contains the following requirements:

- Requirement 6: requires all details of hard and soft landscaping works to be submitted to and approved in writing by the Secretary of State, following consultation with SCC;
- Requirement 7: requires details of the layout and design of the replacement lands, following consultation with SCC, to be submitted to and approved in writing by the Secretary of State:
- Requirement 12: stipulates that details of the environmental mitigation works on land adjoining Stratford Brook should be submitted to and approved in writing by the Secretary of State, following consultation with Environment Agency and SCC;
- Requirement 16: details the information required for the restoration and/or landscaping of land used temporarily for construction, which is also required to be submitted and approved in writing by the Secretary of State, following consultation with SCC.

7.2.3.3 This document sets out part of the information that will be required to discharge these requirements and it will form the basis for consultation with SCC/Natural England/Environment Agency. It is envisaged that this document will be supported by detailed landscaping and ecology designs, schedules and specifications prior to submittal to the Secretary of State for approval.

7.2.3.4 The requirements above will ensure that the commitments made within this document are delivered by the Scheme and the principal contractor.

Adoption of Replacement Land

7.2.3.5 The proposed replacement land parcels include land at Park Barn Farm (PBF1, PBF2 and PBF3), land formerly part of Chatley Farm (CF1, CF2, CF3 and CF4) and land near Hatchford End (HE1 and HE2), see Landscape and Ecology Management Plan map in Appendix A for areas. Appendix C of the Statement of Reasons (application reference TR010030/APP/4.1) provides detail on the need for replacement land and the proposed locations.

7.2.3.6 The replacement land will be vested in SCC through Article 37 of the draft DCO. The principal contractor will be responsible for initial maintenance of the land under the construction contract, which would usually be for three to five years. It is Highways England's intention to enter into an agreement with SCC and SWT so that SWT will be responsible for carrying out the long-term management works in the replacement land parcels.

7.3 Woodland Creation

7.3.1 Overarching aims and objectives

7.3.1.1 Compensation woodland creation consisting of native trees and shrubs will be provided to compensate for the loss of vegetation associated with the Scheme. The proposed vegetation will mature to offer screening benefits and integration into the surrounding landscape, whilst also serving to ameliorate some of the negative effects of the Scheme.

7.3.2 Description of land parcels (where habitat creation is proposed)

Breach Hill Wood Replacement Land (part of CF2)

7.3.2.1 The wood south of Pointers Road, west of Chatley Cottage, (referred to as 'CF2'), is comprised of 3.0 ha woodland plantation, a remnant of Breach Hill Wood. The woodland is comprised of largely mature Scots pine. The western part of this area will be cleared during construction for use as a site compound, with the soil layers reinstated to be suitable for use as replacement land, which will be reinstated with native woodland planting.

Park Barn Farm Replacement Land

7.3.2.2 Parts of the 5.1 ha of low-lying pasture located within the grounds of Park Barn Farm, (referred to as 'PBF1, 'PBF2' and PBF3'), will be used for woodland planting, including planting to compensate for the loss of Ancient Woodland alongside the A3. A strip of native woodland planting along the northern edge of PBF2 and part of PBF3 is proposed (which will include the ancient woodland soil translocation area). Furthermore, there is an additional area of field to the southeast of Park Barn Farm (PBF1) which will also be used for new woodland planting.

7.3.2.3 The planting proposed will enhance habitat connectivity between Buxton Wood and Clearmount and the line of Ancient Woodland running along the slopes north of Foxwarren Park.

Hatchford End

7.3.2.4 In the south eastern quadrant of the Scheme, there are two fields, an enclosed 1.2ha field beside Old Lane (HE1), opposite Hatchford End, and the 0.5ha open field beside Old Lane (HE2), which are currently used for pasture. Both fields are suitable areas for woodland planting and will include woodland planting areas to enhance connectivity to existing areas of woodland in this area.

7.3.3 Background

7.3.3.1 The specific methodology for woodland creation will be developed during detailed design. However, woodland planting will be subject to the typical maintenance period of 5 years (e.g. weeding / watering / replacing of failures etc.). After approximately 10 years, the woodland planting will be thinned and any failures will have been removed. Robust fencing will be used to protect the new planting at Park Barn Farm from livestock grazing, which will be encouraged within the surrounding grassland.

7.3.3.2 The Wisley Common and Ockham and Chatley Heath Woodland Management Plan[1] states that the dominant woodland species are oak and birch, with less common species including sweet chestnut, sycamore and turkey oak. There is also localised wet woodland which occurs where the water table is high, supporting willow and alder. The dominant conifer species is Scots pine, with a few small areas of minor species such as Western Hemlock and Lodgepole pine.

7.3.3.3 One of SCC and SWTs aspirations for the commons 'is to gradually reduce the conifer component in their woodlands to allow the further development of native woodland (W10 & W16) and heathland habitats'[1]. Proposed woodland planting will follow species compositions listed for National Vegetation Classification (NVC) woodland types W10 and W16 (some woodland planting areas will be more suited to W10 species and some may be more suited to W16 species, this will be considered further during detailed design). See typical species list below:

Table 7.3.1: Woodland species (to be decided during detailed design)

NVC group/Species
W10 – lowland mixed broadleaved woodland with bluebell:
Major species – silver birch, common oak, common hawthorn, hazel
Minor species – crab apple, holly, rowan, elder, common gorse, guelder rose
Locally occurring – [additional relevant native and / or locally appropriate species to be added if desired by SCC / SWT]
W16 – lowland oak-birch woodland with bilberry:
Major species – silver birch, common oak
Minor species – holly, rowan, common gorse
Locally occurring – [additional relevant native and / or locally appropriate species to be added if desired by SCC / SWT]

7.3.3.4 Where woodland creation is undertaken adjacent to ancient woodland, species planted will be limited to native species recorded within the adjacent woodland and trees will be locally sourced. In detailed design, consideration will also be given to whether some areas adjacent to existing native-dominated woods would be suitable for woodland / woodland edge creation by natural regeneration. In

[1] Woodland Management Plan: Wisley Common and Ockham and Chatley Heath. Forestry Commission.

detailed design, consideration will also be given to introducing woodland ground flora planting in some areas.

7.3.4 Objectives

7.3.4.1 The following objectives are applicable to the replacement land parcels:

- Objective 1: To ensure successful establishment (80% of original number of plants having been growing well for at least 3 years at the end of the 5 year aftercare period) and maintenance of the proposed vegetation;
- Objective 2: To provide effective screening measures through woodland creation and to ensure integration of the Scheme into the surrounding landscape; and
- Objective 3: To keep a balance of species, form and alignment that was set out in the original planting design and which reflects the adjoining woodland and other features.

7.3.4.2 These will be agreed by Highways England, Natural England and SCC/SWT as part of the final LEMP which will be developed in the detailed design phase of the project.

7.3.5 Prescriptions

7.3.5.1 The exact details of work activities will be developed between all parties during the development of the LEMP and work-specific method statements.

Table 7.3.2: Approach to woodland creation

Task	Timing	Restrictions/key specifications
Design a final planting plan and specifications in consultation with the steering group.	During detailed design.	
Source tree stock from certified providers.	As soon as the final planting plan is agreed.	Locally sourced (Forestry Commission ROP 405) native stock for all planting
Mark out tree blocks on the ground	Winter 2020.	
Prepare the ground for woodland planting.	Winter 2020.	
Woodland planting is to be protected from livestock at Park Barn Farm (e.g. stock fencing around the tree block) and wild animals (rabbit/deer guards) in all areas.	Winter 2020 (from November) to Spring 2021 (up to late March).	Do not plant in frosty weather. Plant during the ideal time for that species (considering soil conditions).

7.3.6 Management and Monitoring

Programme of Works

7.3.6.1 Table 7.3.3 and 7.3.4 below detail the programme of works for woodland establishment and initial maintenance (first five years), and then for long-term management (20 years in total, including the first five years). The areas have been combined, as general measures will be identical in all woodland creation areas. The specification for the works shall be in accordance with Highways England's Manual of Contract Documents for Highways Works, Series 3000 unless otherwise agreed with Highways England.

Table 7.3.3: Programme of works for years 0 – 5

Years 0 - 5							
Task	Responsibility	Season	1	2	3	4	5
Attendance of quarterly site inspections with the Project Landscape Architect.	Landscape contractor (LC) appointed by principal contractor (PC).	Quarterly.	Y	Y	Y	Y	Y
Provide irrigation to maintain healthy growth, during the establishment period (year 1)	LC appointed by PC.	As required.	Y				
Any dead or damaged trees should be replaced annually with matching species of the same size during the next planting season after failure.	LC appointed by PC.	Once yearly (during November - February).	Y	Y	Y	Y	Y
Pruning to be undertaken to broken and damaged branches.	LC appointed by PC.	As required.	Y	Y	Y	Y	Y
No trimming or clearance shall be undertaken during the bird nesting season.	LC appointed by PC.	As required.	Y	Y	Y	Y	Y
All tree / timber stakes / guards should be checked and adjusted, repaired or replaced as necessary.	LC appointed by PC.	Once yearly (in winter).	Y	Y	Y	Y	Y
Soil around the roots of tree species is to be re-firmed as necessary, to ensure that plants are supported and upright, especially following periods of extreme winds.	LC appointed by PC.	As required.	Y	Y	Y	Y	Y
All litter / foreign debris should be removed from planted areas and taken off site. All fallen leaves and branches etc. are to remain	LC appointed by PC.	As required.	Y	Y	Y	Y	Y

Years 0 - 5							
in-situ unless removal is otherwise instructed.							
Weed control (non-residual herbicide to planting stations) – 1000mm diameter around each planted shelter / tree.	LC appointed by PC.	Three times per year (spring, summer and winter).	Y	Y	Y	Y	Y
Selective spot treatment of herbicide should be applied targeting all undesirable species, including: broad-leaved dock, curled dock, common ragwort, creeping thistle, spear thistle and bracken.	LC appointed by PC.	Twice a year (May and September).	Y	Y	Y	Y	Y
Grassland cut between planting (arisings to be spread evenly across the plot).	LC appointed by PC.	Twice yearly (Early Spring and Late Summer).	Y	Y	Y	Y	Y
Hand weeding as required in shelters.	LC appointed by PC.	Twice yearly (Spring and Winter).	Y	Y	Y	Y	Y
Tree stakes should be removed by year 5 or as instructed by Project Landscape Architect.	LC appointed by PC.	As instructed by LA or by year 5.	Y	Y	Y	Y	Y

Table 7.3.4: Programme of works for years 6 – 20

Action			Years 6 – 20													
Task	Responsibility	Season	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Selected removal of planted trees to retain the best specimens and contribute to development of woodland canopy structure.	To be agreed in final LEMP – Possibly SWT.	Year 10.					Y										

Action			Years 6 – 20														
Task	Responsibility	Season	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Removal of deadwood / individual trees undertaken as necessary to maintain health and safety.	To be agreed in final LEMP – Possibly SWT.	Every 5 years plus as necessary for safety reasons.					Y					Y					Y
Arisings which are generated as a result of thinning and other woodland management operations shall be specified to be retained either as chipped material or windrow.	To be agreed in final LEMP – Possibly SWT.	As required.					Y					Y					Y
Thinning to maintain and promote a healthy woodland structure, including high canopy trees, understorey scrub vegetation and ground flora as commensurate with their function.	To be agreed in final LEMP – Possibly SWT.	As required.					Y					Y					Y
Regulative pruning to encourage even and healthy growth. Including removal of basal suckers and epicormic growth.	To be agreed in final LEMP – Possibly SWT.	As required.	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

Action			Years 6 – 20														
Task	Responsibility	Season	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Remove tree shelters, stakes and ties and dispose of off-site	To be agreed in final LEMP – Possibly SWT	As required					Y										
Removal of any stock-proof fencing	To be agreed in final LEMP – Possibly SWT	Year 15 or as required										Y					

Measures of Success

7.3.6.2 To ensure that the management objectives outlined previously are achieved, the following monitoring targets have been devised to measure the success of the management objectives:

- All plant failures to be removed and replanted, with a 95% success rate target of new planting by Year 5; and
- The new woodland areas shall be maintained as outlined above and will achieve the following performance by Year 20:
  - The vegetation shall form or shall be clearly capable of forming groups of similar species, form and height to those in the vicinity, reflecting local vegetation patterns, structure and nature conservation value; and
  - Native ground flora shall have been allowed to develop.

Monitoring frequency and methods

7.3.6.3 The aim of the suggested monitoring programme is to ascertain whether the measures of success listed above have been achieved.

7.3.6.4 Highways England's appointed monitoring party will carry out the monitoring visits and feed back to the steering group as part of annual monitoring reporting.

7.3.6.5 Frequency of initial monitoring visits (years 0 to 5) will be determined by the success of establishment of planting and the frequency of monitoring outlined in Table 7.3.5 will be adjusted accordingly to ensure relevant follow up operations are undertaken.

Table 7.3.5: Frequency of Monitoring

Action			Years 0 – 5			
Task	Responsibility	Season	1	2	3	5

Action			Years 0 – 5			
Periodic checks of new planting plots and ancillary items / fencing, tree stakes etc.	Highways England's appointed monitoring party	Summer	Y	Y	Y	Y

7.3.6.6 Long term monitoring will be carried out using fixed point photography and inspections providing detailed field notes to document the changes within the woodland creation parcels. Fixed point photography involves the surveyor taking photos from set points each time the site is monitored, and locations, camera settings and other details of method will be recorded on the first visit to ensure comparability. The aim of the long term monitoring programme is to detect major changes, therefore surveying at five yearly intervals will be carried out.

Table 7.3.6: Frequency of Monitoring

Action			Years 5-20			
Task	Responsibility	Season	5	10	15	20
Fixed point photography supported with aerial photography and inspections carried out on foot by suitably experienced staff.	Monitoring Party	Late summer	Y	Y	Y	Y

7.4 Ancient woodland soil translocation

7.4.1 Overarching aims and objectives

7.4.1.1 To utilise as much as possible of the soil resource, including seed bank, from existing ancient woodland areas to enhance an area[2] of woodland creation proposed at Park Barn Farm replacement land.

7.4.2 Description of land parcels (where habitat creation is proposed)

Park Barn Farm Replacement Land

7.4.2.1 Park Barn Farm replacement land is north west of junction 10 of the M25, immediately to the west of the western SSSI boundary within Wisley Common. There are three parcels of replacement land referred to in this area: PBF1, PBF2 and PBF3. There is an existing area of ancient woodland in PBF3 which is adjacent to PBF2. The translocated ancient woodland soil will be placed in an area[2] of PBF2 where woodland creation is planned (this is likely to be along the northern boundary) and this should link up to the area of existing ancient woodland (where woodland enhancements are proposed, see section 7.5).

7.4.2.2 The proposed ancient woodland donor sites are Elm Corner Woods and Heyswood girl guides camp. The soil will be translocated from areas of these woodlands which will be lost as a result of the Scheme.

7.4.3 Background

7.4.3.1 A desk study assessment[3] of the broad soil types at these soil donor sites and at the receptor site in PBF2 has identified similar soil types with acid, free-draining profiles. Therefore, PBF2 should be an appropriate receptor site for the ancient woodland soil. Further soil sampling and analysis will be undertaken to confirm this and highlight any need for further investigations and/or refinement of the proposed methodology.

7.4.3.2 Development of the methodology for the ancient woodland soil translocation will be carried out during detailed design. A high level description of the basic steps involved has been provided in Table 7.4.1 but the methodology will be developed in detail and contained within the final CEMP.

[2] The exact area to be enhanced with translocated ancient woodland soils is yet to be determined. Detailed soil and botanical surveys will be carried out during detailed design to define the approach.
[3] References used include:
British Geological Survey: Geology of Britain viewer http://mapapps.bgs.ac.uk/geologyofbritain/home.html
Fordham, S.J. (1986). Soils in Surrey I: Sheet TQ05 (Woking). Soil Survey Record 90. SSEW, Harpenden.
Soil Survey of England and Wales (1983). The Soils of England and Wales, Sheet 6, South East England. SSEW, Harpenden. Digital version: (National Soil Map) http://www.landis.org.uk/data/natmap.cfm, Cranfield university.
Soil Survey of England and Wales (1984). Soils and their use in South East England. Bulletin No.15. SSEW, Harpenden.

7.4.3.3 With regard to management/monitoring, the activities described in Section 7.3.6 will apply to this area also (in terms of ensuring tree planting establishes and the target woodland is created). However, best practice[4] warns that vegetation changes can persist for more than 10 years for soil transfer schemes, or longer if management is incorrect and the guide recommends a monitoring period of 20-30 years for 'woody habitats' to reflect the time taken to reach a full canopy. The management/monitoring period of 25 years for the ancient woodland soil translocation area reflects this.

7.4.4 Objectives

7.4.4.1 The following objectives are applicable to the ancient woodland soil translocation area are:

- Objective 1: Create native woodland with a variable light environment to benefit ground flora species.
- Objective 2: Transfer at least 50% of the ancient woodland indicator species from the donor areas[5] to the receptor site.

7.4.4.2 These will be agreed by Highways England, Natural England and SCC/SWT as part of the final LEMP.

7.4.5 Prescriptions

7.4.5.1 The exact details of work activities will be developed between all parties during the development of the outline LEMP and subsequent work-specific method statements. It is imperative that the contractor undertaking the ancient woodland soil translocation is competent and experienced in carrying out this type of work.

7.4.5.2 This is a high level description of the basic steps involved, and not a detailed methodology which will be developed during detailed design using best practice guidance[6].

Table 7.4.1: Approach to ancient woodland soil translocation

Task	Timing	Restrictions/key specifications
Carry out pre-construction botanical surveys to produce a baseline for the donor areas and receptor site.	During detailed design.	
Carry out soil sampling tests and analysis the data for the detailed areas within receptor area to ensure best point to point matching with the donor sites.	During detailed design.	
Produce a detailed specification for ancient woodland soil translocation in consultation with the steering group – to include stringent soil protection measures and new tree	During detailed design.	

[4] Anderson, P. (2003) Habitat translocation, a best practice guide. CIRIA.
[5] 'Donor areas' refer to the areas of ancient woodland soil being moved (translocated).
[6] Anderson, P. (2003) Habitat translocation, a best practice guide. CIRIA.

Task	Timing	Restrictions/key specifications
planting plans. The specification and detailed method statements will be submitted to the steering group for comment prior to being finalised for use.		
Prepare donor areas (Elm Corner Woods and Heyswood girl guides camp) for soil removal (e.g. tree coppicing/felling/stump removal, debris removal) ensuring soil conditions are kept as favourable as possible (i.e. limiting disturbance and compaction from plant).	To be agreed in final LEMP – year will be dependent on the final construction programme.	All trafficking over soils should be kept to an absolute minimum and confined to designated routes.
Prepare receptor area: install tree protection around any existing trees, remove any debris, strip existing topsoil and remove off site and limit compaction of exposed subsoil.	To be agreed in final LEMP – year will be dependent on the final construction programme.	All trafficking over soils should be kept to an absolute minimum and confined to designated routes.
Translocate soil from donor areas to the receptor site (wherever possible native coppice stools will also be translocated).	To be agreed in final LEMP – year will be dependent on the final construction programme, but season of works will be set by good practice.	Translocation will be undertaken in autumn only[7]. Excavated soils should be moved in a single operation and replaced on the same day with no overnight storage. All trafficking over soils should be kept to an absolute minimum and confined to designated routes.
Tree planting within receptor area (PBF2). Trees planted will be native species recorded in the donor areas and locally sourced.	To be agreed in final LEMP. See section 7.3 for further details.	

7.4.6 Management and Monitoring

Programme of works

7.4.6.1 The programme of works for landscape establishment and initial maintenance (for the first five years) is largely identical to that described in Table 7.3.5 and 7.3.6 (woodland creation section) and has not been reproduced here. Variations to deal with management of desirable species and removal of undesirable species will be included in the final LEMMP.

7.4.6.2 The programme for the additional measures required in the ancient woodland soil translocation area is detailed in Table 7.4.2 below.

Table 7.4.2: Programme or works for years 6 – 25

Action			Years 6 - 25			
Task	Responsibility	Season	10	15	20	25

[7] Craig, M., Buckley, P. & Howell, R. (2015) Responses of an ancient woodland field layer to soil translocation: methods and timing. Applied Vegetation Science.

Action			Years 6 - 25			
Assess whether supplementary seeding of ground flora species is required (and carry out seeding if agreed)	To be agreed in final LEMP: possibly the Monitoring Party with SWT	n/a	Y			
Remove any tree guards remaining (these should be removed when instructed by the monitoring party).	To be agreed in final LEMP: possibly SWT	anytime	Y	Y	Y	Y
Carry out thinning/coppicing to promote variable light conditions	To be agreed in final LEMP: possibly SWT	Winter	Y		Y	
Consider additional tree planting to diversify the age range of trees within the created woodland.	To be agreed in final LEMP: possible the Monitoring Party with SWT	Winter	Y		Y	
Consider removal of fencing around the woodland creation area (i.e. to allow access)	To be agreed in final LEMP: possible the Monitoring Party with SWT	n/a		Y	Y (if not done previously)	Y (if not done previously)

Measures of Success

7.4.6.3 Monitoring targets have been devised to measure the success of the objectives listed above. These are longer term targets in comparison to some of the other habitat creation sections which reflects the length of time required for woodland conditions to establish for ancient woodland indicator species.

Table 7.4.3: Monitoring targets / measures of success

Objective	Targets Years 0-15	Targets Years 15 - 25
Objective 1: Create woodland with a variable light environment to benefit ground flora species.	Limited tree failures and progress towards a closed canopy but with variation in structure across the woodland.	Achieve a closed canopy but with variable levels of shading to benefit ground flora species.
Objective 2: Transfer at least 50% of the ancient woodland indicator species from the donor areas to the receptor site.	Some ancient woodland indicator species present. Non-target species coverage <10%	50% of ancient woodland indicator species from the donor sites present within the receptor areas. Non-target species coverage <5%

Monitoring frequency and methods

7.4.6.4 The aim of the suggested monitoring programme is to ascertain whether the measures of success listed above have been achieved.

7.4.6.5 Highways England's appointed monitoring party will carry out the monitoring visits and feed back to the steering group as part of annual monitoring reporting.

7.4.6.6 Frequency of initial monitoring visits will be as per the woodland creation section (section 7.3.6) and will be focused on monitoring the establishment of the tree planting.

7.4.6.7 The aim of the detailed botanical monitoring is to detect major changes in the ground flora which can be done by surveying at five yearly intervals. It is not proposed to commence this monitoring until Year 10 when some degree of canopy closure will have been achieved.

7.4.6.8 The suggested method is NVC surveys with fixed quadrats supplemented with fixed point photography supported with aerial photography.

Table 7.4.4: Frequency of Detailed Botanical Monitoring

Action			Years 6 – 25			
Task	Responsibility	Season	10	15	20	25
Post-planting/ancient woodland soil translocation NVC fixed quadrat surveys.	Highways England's appointed monitoring party	Spring & Summer	Y	Y	Y	Y
Fixed point photography supported with aerial photography.	Highways England's appointed monitoring party	Summer	Y	Y	Y	Y

7.5 Woodland Enhancement

7.5.1 Overarching aims and objectives

7.5.1.1 Enhance existing woodlands to improve their biodiversity potential, through harvesting of Scots pine and non-native trees, the removal of invasive non-native species, creation or rides and glades and rotational woodland management.

7.5.2 Description of land parcels (where woodland enhancements are proposed)

Park Barn Farm Replacement Land

7.5.2.1 Park Barn Farm replacement land is north west of junction 10 of the M25, immediately to the west of the western SSSI boundary within Wisley Common. There are three parcels of replacement land referred to in this area: PBF1, PBF2 and PBF3. There is an existing area of ancient woodland in PBF3 where woodland enhancements are proposed, this area opens up into PBF2 where woodland creation is proposed (see section 7.3) and ancient woodland soil translocation (section 7.4). Proposed measures include thinning dense stands of birch to create new rides and glades.

Chatley Wood Replacement Land

7.5.2.2 This area (CF1) is an area of plantation woodland comprised primarily of mature Scots pine trees, with areas of birch woodland to the east and mature oaks along some of the boundaries. This woodland will require active management in order to increase its biodiversity potential and bring it into a more appropriate condition for public access. Such measures will include the harvesting of some of the mature Scots pine, the removal of invasive rhododendron species, and potentially introducing additional native planting to diversify the tree species present.

Breach Hill Wood Replacement Land

7.5.2.3 This area (CF2) comprises woodland remnant of Breach Hill Wood, which is largely comprised of mature Scots pine. This woodland will require management, so as to bring it into a more appropriate condition for public access, and so as to increase the biodiversity potential, through removal of some or all of the mature Scots pine, the removal of invasive rhododendron species, and potentially introducing additional native planting to diversify the tree species present. Part of CF2 will be used a construction compound and reinstated after construction with woodland planting that will complement the enhancement works proposed.

Pointers Road South Replacement Land

7.5.2.4 This area (CF3) comprises plantation woodland adjacent to the M25. It is mostly mature Scots pine. This woodland will require active management in order to increase its biodiversity potential and bring it into a more appropriate condition for public access. Such measures will include the harvesting of some of the mature Scots pine, the removal of invasive rhododendron species, and potentially introducing additional native planting to diversify the tree species present.

Pointers Road North Replacement Land

7.5.2.5 This area of mixed woodland (CF4) is located to the north of Pointers Road and is known as 'The Bogs'. It is mostly designated as ancient woodland and includes sweet chestnut and extensive areas of dense rhododendron understorey. This replacement land will be managed/enhanced so as to achieve the necessary conditions for public access, and to increase the biodiversity potential and health of the ancient woodland, including reducing the predominance of the Scots pine and other non-native tree species, and the removal of invasive non-native rhododendron species. Introducing additional native tree planting to diversify the woodland will also be considered.

Elm Corner Woods Ancient Woodland

7.5.2.6 This is an area of Ancient Woodland, also designated as a Site of Nature Conservation Importance (SNCI). It falls outside the DCO boundary. However, woodland enhancement works, by agreement with the Surrey Wildlife Trust, are proposed in order to create a more diverse woodland with open rides and a diverse woodland edge.

7.5.3 Background

Thinning

7.5.3.1 Selective felling will be carried out in all the woodland areas, predominantly targeting Scots pine but also thinning dense stands of birch where they occur (retaining all veteran trees or trees with veteran features, and trees with bat roost potential). This should open the canopy and allow the remaining trees to fill in the space, allowing the retained trees to flourish, encouraging a more diverse species assemblage to return.

7.5.3.2 Introducing new planting in the woodland areas is an option which will be considered in the long-term to increase tree diversity (approximately Year 5 onwards) once the result of initial thinning works is evident.

7.5.3.3 There is also a trade-off to be made with allowing natural regeneration of 'open areas/glades' by seedlings which are naturally better adapted to the conditions

(and will therefore require less maintenance/management) and trying to introduce new species, which can increase tree diversity but may require more intensive management.

Creation of Rides

7.5.3.4 If rides are created, they will have a structurally diverse, graduated woodland edge. For the reasons given above, the need to introduce new planting to diversify the rides will be assessed at approximately Year 5.

7.5.3.5 It is not currently proposed to fence off newly created rides (to optimise the natural regeneration of successional habitats by eliminating grazing pressure). However, if the desired results were not being achieved, this could be considered in the longer term (to be assessed at Year 5).

7.5.3.6 Rides will be managed rotationally with 'central zones' and 'outer edges' managed at a different frequency to promote a transitional woodland edge to develop.

Rhododendron Control

7.5.3.7 Rhododendron reduction will be part of the enhancements and this can take several years to achieve, depending on the size of the seed bank and how extensive the root system is.

7.5.3.8 The approach will be to cut stems and then apply a herbicide treatment on new growth. However, new approaches (i.e. stem injection) will be considered if they have proven successful elsewhere. Further discussions on the removal and disposal of material is also required as part of agreeing the final LEMP with the stakeholders listed below.

7.5.4 Objectives

7.5.4.1 The following objectives are applicable to the woodland enhancement areas are:

Park Barn Farm Replacement Land (PBF3)

- Objective 1 – Facilitate public access.
- Objective 2 – Selective thinning and creation of rides and glades.

Chatley Wood Replacement Land (CF1)

- Objective 1 – Improve public access.
- Objective 2 – Harvesting of some of the mature Scots pine.
- Objective 3 – Removal of rhododendron coverage.

Breach Hill Wood Replacement Land (CF2)

- Objective 1 – Improve public access.
- Objective 2 – Harvesting of some or all of the Scots pine.
- Objective 3 – Removal of rhododendron coverage.

Pointers Road South Replacement Land (CF3)

- Objective 1 – Improve public access.
- Objective 2 – Harvesting of some or all of the Scots pine and other non-native tree species.
- Objective 3 – Removal of rhododendron coverage.

Pointers Road North Replacement Land (CF4)

- Objective 1 – Improve public access.
- Objective 2 – Harvesting of some or all of the Scots pine and other non-native tree species.
- Objective 3 – Removal of rhododendron coverage.

Elm Corner Wood Ancient Woodland

- Objective 1 – selective thinning to create a more diverse woodland with open rides and a diverse woodland edge.

7.5.4.2 These will be agreed by Highways England, Natural England and SCC/SWT as part of the final LEMP.

7.5.5 Prescriptions and resources

7.5.5.1 The exact details of work activities will be developed between all parties during the development of the LEMP and subsequent work-specific method statements.

Table 7.5.1: Approach to woodland enhancement works

Task	Timing
Selective thinning:	
Survey woodlands in woodland enhancement areas and identify trees with bat roost potential, veteran features, or significant value for saprophytic invertebrates (e.g. standing dead wood) and mark trees for retention.	Before tree felling.
Design a 'removals plan' in consultation with the steering group.	Before tree felling.
Fell Scots pine and other selected trees, collect all cut material and remove.	Winter (To be agreed in final LEMP).
Creation of rides and glades:	
Design a 'removals plan' which shows the existing rides (to be widened) or proposed glades and rides including any box junctions, in consultation with steering group.	Before tree felling.
Fell trees, collect all cut material and remove.	Winter (To be agreed in final LEMP).

Task	Timing
Rhododendron removal:	
Cut rhododendron.	Winter / early spring (To be agreed in final LEMP).
Apply herbicide	On new growth.

7.5.6 Management and Monitoring

Programme of Works

7.5.6.1 Table 7.5.1 and Table 7.5.3 below detail the programme of works for woodland enhancement initial maintenance (years 0 to 5), and then for the long-term management of the woodland enhancements (years 5 to 15).

Table 7.5.2: Programme of works for years 0 – 5

Action			Years 0 - 5				
Task	Responsibility	Season	1	2	3	4	5
Assess the need for supplementary planting (in all woodland enhancement areas).	Highways England's appointed Monitoring Party	Late summer					Y
Management of rides and glades – central zones (mowing).	To be agreed in final LEMP – possibly SWT	Early autumn	Y	Y	Y	Y	Y

Table 7.5.3: Programme of works for years 6 - 15

Action			Years 6 – 15									
Task	Responsibility	Season	6	7	8	9	10	11	12	13	14	15
Rotational tree thinning	To be agreed in final LEMP – possibly SWT	Autumn/ Winter	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Management of glades and edges– central zones (mowing)	To be agreed in final LEMP – possibly SWT	Early autumn	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Management of glades and edges – outer edges	To be agreed in final LEMP – possibly SWT	Early autumn		Y			Y			Y		

Measures of Success

7.5.6.2 The measures of success focus mainly on vegetation structure rather than composition, as for many species associated with woodland rides/edges this is more important in determining habitat quality.

7.5.6.3 To ensure that the objectives outlined previously are achieved, the following monitoring targets have been devised to measure the success of the management objectives:

Table 7.5.4: Monitoring targets / measures of success

Objective	Targets Years 0-5	Targets Years 5-10	Targets Years 10 – 15
CF1, CF2, CF3 and CF4 – Objective 2 - Harvesting of some or all of the Scots pine and other non-native tree species.	A diversity of woodland (tree) species are establishing.	A diversity of woodland (tree) species are being maintained.	A diversity of woodland (tree) species are being maintained.
CF1, CF2, CF3, CF4 – Objective 3 - Removal of rhododendron coverage.	Initial rhododendron has been successful at reducing the dominance of this species.	Re-growth of rhododendron is being successfully controlled.	Re-growth of rhododendron is being successfully controlled.
CF1, CF2, CF3, CF4 – Objective 1 – public access maintained.	Public are using the areas. All facilities (i.e. fencing / gates) are being maintained.	Public are using the areas. All facilities (i.e. fencing / gates) are being maintained.	Public are using the areas. All facilities (i.e. fencing / gates) are being maintained.
Park Barn Farm (PBF3) and Elm Corner Wood			
Objective 1 Selective thinning and creation of rides and glades.	Woodland developing with diverse vegetation composition. Rides are developing ‘edge habitats’ and linking areas of connected habitats	Woodland developing with diverse vegetation composition. Rides are being managed to provide a range of microhabitats including ‘edge habitats’ and connectivity to other habitats is being maintained.	Woodland developing with diverse vegetation composition. Rides are being managed to provide a range of microhabitats including ‘edge habitats’ and connectivity to other habitats is being maintained.

Monitoring frequency and methods

7.5.6.4 The aim of the suggested monitoring programme is to ascertain whether the measures of success listed above have been achieved.

7.5.6.5 Highways England’s appointed monitoring party will carry out the monitoring visits and feedback to the steering group as part of annual monitoring reporting.

7.5.6.6 Fixed point photography will be used, supplemented with detailed field notes to document the changes within the woodland enhancement parcels. The aim of the monitoring programme is to detect major changes, however, during the initial establishment phase (i.e. the first 5 years) monitoring will be carried out annually, at Year 5 this will revert to surveying at five yearly intervals.

Table 7.5.5: Frequency of Monitoring

Action			Years 0 – 5			
Task	Responsibility	Season	0	5	10	15
Fixed point photography supported with aerial photography.	Monitoring Party	Late summer	Y (annually)	Y	Y	Y

7.6 Grassland management

7.6.1 Overarching aims and objectives

7.6.1.1 To manage the open grassland through grazing to promote increased plant species diversity.

7.6.2 Description of land parcels (where long-term management is proposed)

Park Barn Farm

7.6.2.1 The central part of the Park Barn Farm replacement land is a semi-improved grassland field. It covers most of the area referred to as 'PBF2' and it extends into the west of the area referred to as 'PBF3'. The field appears to have been mown rather than farmed (i.e. plough/fertilised) in recent years.

7.6.3 Background

7.6.3.1 The proposals are to manage the grassland in the long term through grazing (20 years, as per the majority of habitat creation proposed at Park Barn Farm replacement land) with the aim to reduce the nutrient levels in the soil and encourage species-rich grassland to develop.

7.6.3.2 Grazing the field with cattle (SWT's grazing cattle) should achieve this in two ways. Firstly, rotational grazing results in more vigorous plant growth, which results in more nutrient uptake (as the new growth is continuously 'cropped' by cattle during the growing season). Secondly, grazing acts by supressing the dominant species in the grassland, whilst creating disturbances that provide bare areas for seed germination and establishment[8], both of which promotes the growth of a diverse plant community.

7.6.3.3 Diversifying species-poor grassland is complex and can be affected by different biotic and abiotic factors such as site conditions, soil chemistry and the availability of source species. The approach proposed is reliant on the assumption that there is a sufficient seed bank which has persisted in the soil of this field and is ready to propagate once the necessary conditions have been created (through grazing). However, alternative approaches can be pursued if the seed bank is insufficient. Therefore, supplementary seeding will be considered in the longer term if the objective of increasing species diversity is not being met through grazing alone.

7.6.3.4 Furthermore, grazing impacts can vary according to stocking densities and the timings of grazing (coupled with weather conditions). It may be necessary to

[8] Blakesley. D, Buckley. P (2016) Grassland Restoration and Management. Pelagic Publishing, Exeter, UK.

adapt grazing practices, and in extreme circumstances (e.g. foot and mouth outbreaks, unseasonal wet weather creating unacceptable risks of erosion) temporarily cease grazing, if the objective of increasing species diversity is not being met. Part of the steering groups remit will be to discuss and agree any changes required such as when habitat development needs to be balanced against the need to graze cattle.

7.6.4 Objectives

7.6.4.1 The following objectives are applicable:

- Objective 1: Establish and maintain species-rich grassland suitable to site soil conditions.

7.6.5 Prescriptions

7.6.5.1 The exact details of work activities will be developed between all parties during the development of the LEMP and subsequent work-specific method statements.

Table 7.6.1: Approach to Park Barn Farm grassland management

Task	Timing	Restrictions/key specifications
Design a fencing plan in consultation with the steering group which will; facilitate grazing i.e. access gates/routes etc, protect areas of new woodland planting during establishment, and provide the required public access routes.	During detailed design.	Water provisions for cattle will need to be considered as well as signage.
Pre-construction NVC monitoring – set up fixed quadrats and collect baseline data to compare subsequent surveys to.	During detailed design.	Survey to be carried out in summer (July/August).
Grazing to commence on 'Day 1'	During appropriate periods within June to November 2020 and each year thereafter	Grazing shouldn't commence (after planting) until the stock fencing surrounding the new woodland planting is complete.

7.6.6 Management and Monitoring

Programme of Works

7.6.6.1 Table 7.6.2 and 7.6.3 below details the programme of works for habitat establishment and initial maintenance (first five years), and then for long term management (20 years in total, including first five years).

Table 7.6.2: Programme of works for years 0 – 5

Years 0 - 5							
Task	Responsibility	Season	1	2	3	4	5
Grazing surrounding grassland	SWT	Appropriate periods within June to November (based on SWTs grazing strategy)	Y	Y	Y	Y	Y

Table 7.6.3: Programme of works for years 6 – 20

Action			Years 6 – 20														
Task	Responsibility	Season	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Grazing surrounding grass-land.	SWT	June to November	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Consider supple-mentary seeding	Highways England's appointed Monitoring Party with SWT	Late summer	Y									Y					

Measures of Success

7.6.6.2 Setting monitoring targets for this type of habitat creation/management is complex as there may be different outcomes depending on the soil characteristics and the response of the vegetation to the grazing regime. As species-richness will depend on the habitat type that develops (for example, acid grassland is of nature conservation value but can be relatively species-poor) targets will be developed during the initial years of management.

7.6.6.3 Therefore, the monitoring targets proposed attempt to give broad measures of success rather than targeting the creation of a 'habitat type'. These need to be confirmed with Natural England and SCC / SWT and developed during detailed design.

Table 7.6.4: Monitoring targets / measures of success

Objective	Targets Years 0-5	Targets Years 5-10	Targets Years 10 - 20
Objective 1: Establish and maintain species-rich grassland.	Species-richness and / or conformity to semi-natural grassland suitable to soil conditions increased from baseline. Non-target species coverage <20% No more than 10% scrub cover	Species-rich grassland[9] developing. Non-target species coverage <10% No more than 10% scrub cover	Species-rich grassland suitable to soil conditions in a stable condition. Non-target species coverage <5% No more than 10% scrub cover

Monitoring frequency and methods

7.6.6.4 The aim of the detailed botanical monitoring is to detect major changes which can be done by surveying at five yearly intervals.

7.6.6.5 The suggested method is NVC surveys with fixed quadrats.

7.6.6.6 Highway England's appointed monitoring party will carry out the monitoring visits and feed back to the steering group as part of annual monitoring reporting.

Table 7.6.5: Frequency of Detailed Botanical Monitoring

Action			Years 5 – 20			
Task	Responsibility	Season	5	10	15	20
Post- grazing NVC fixed quadrat surveys.	Highways England's appointed monitoring party	Spring & Summer	Y	Y	Y	Y

[9] The definition of 'species-rich' for the Park Barn Farm replacement land grassland will be developed in consultation with the steering group and based on information gathered on soil chemistry, baseline vegetation composition, and the initial (0-5 years) vegetation responses to grazing.

7.7 Pond enhancement

7.7.1 Overarching aims and objectives

7.7.1.1 To improve the biodiversity value of Chatley wood pond to benefit species identified within the citation of the wetland elements of Ockham and Wisley Commons SSSI, and in particular the Odonata (dragonflies and damselflies) assemblages.

7.7.2 Background/description of land parcels (where habitat enhancement is proposed)

Chatley wood pond

7.7.2.1 Chatley wood pond is located north east of junction 10 of the M25, within the former Chatley Farm area it is referred to as 'CF1'. It is almost entirely silted up. However, there is a distinct ditch running through the pond which is dense with water pepper (*Persicaria hydropiper*) becoming less distinct as it flows west through a group of willow trees. Much of the pond is unshaded and there is a continuous covering of marsh pennywort (*Hydrocotyle vulgaris*) with areas of rushes and sedges. An embankment/high ground runs along the northern and eastern perimeters. The pond sits within an area of mature woodland which is predominantly Scots pine.

7.7.2.2 Proposals are to modify the pond so that it becomes a more persistent wetland feature by excavating the pond to its original dimensions (c. 0.25 ha). The pond will be excavated deep enough to create continuity between shallow groundwater / soil water level during at least part of the year. Also, shallow margins will be created to encourage development of a gradual transition between open water and terrestrial habitat. A nature-based control will be installed on the outflow of the pond (for instance a throttle to flow created from felled trees), to encourage retention of water in the pond during higher flows. Although it is accepted that the pond is still likely to be ephemeral, the works proposed should generate open water habitat which will persist for a longer period of time during wet conditions (than is currently provided).

7.7.2.3 Trees surrounding the pond margin will either coppiced or felled to allow more sun onto the pond edges and encourage marginal vegetation to grow.

7.7.2.4 Rhododendron control will be carried out within a 20 m radius of the pond, see section 7.5 for further details.

7.7.3 Objectives

7.7.3.1 The following objective is applicable to Chatley wood pond:

- Objective 1: Create and maintain open water habitat which persists for part of the year and supports marginal vegetation transitioning into terrestrial habitat.

7.7.3.2 This will be agreed by Highways England, Natural England and SCC/SWT as part of the final LEMP.

7.7.4 Prescriptions

7.7.4.1 The exact details of work activities will be developed between all parties during the development of the LEMP and subsequent work-specific method statements.

Table 7.7.1: Approach to Chatley wood pond enhancement

Task	Timing	Restrictions/key specifications
Excavation of original pond extent:		
Excavation of the pond to its original dimensions, including creating shallow margins.	To be agreed in final LEMP	Approximate pond dimensions of c. 0.25 ha, with gradual transition of the margins between open water and terrestrial habitat. A proportion of the existing macrophytes should be retained as a seed/propagating source where practicable. Excavated material to be placed so as not to adversely affect biodiversity. Disposal off-site to be used if necessary. If additional planting is required, plants will be locally sourced native species selected to contribute to suitable habitat for Odonata.
Control of outflow from pond:		
Design a nature-based water control mechanism to encourage retention of water during wet periods, in consultation with the steering group.	During detailed design	
Install water control mechanism.	To be agreed in final LEMP	
Enhancement of pond margin:		
Survey trees surrounding pond margin and identify trees with bat roost potential, veteran features, or significant value for saprophytic invertebrates (e.g. standing dead wood) and mark trees for retention.	During detailed design.	
Design a ‘removals plan’ which shows the existing trees to be felled/coppiced.	During detailed design.	

Task	Timing	Restrictions/key specifications
Coppice willows and remove Scots pine. to increase light to enter the pond margins. Remove Scots pine.	To be agreed in final LEMP	Removal of Scots pine from the southern margin of the pond (10-20m clearance zone)
Removal of rhododendrons	To be agreed in final LEMP	Removal of rhododendron from the margins of the pond (20m clearance zone)

7.7.5 Management and Monitoring

Programme of works

7.7.5.1 The pond enhancements at Chatley wood pond will be managed and monitoring for five years directly. In addition, the pond is situated with the Chatley wood replacement land (CF1) where woodland enhancement work will be carried out over a 15-year period therefore 'by association' the pond edge will be managed/monitored for the same length of time, see section 7.5 for further details. Table 7.7.2 below details the programme of works for Years 0 through to 5.

Table 7.7.2: Programme of works for years 0 – 5

Action			**Years 0 - 5**				
Task	Responsibility	Season	1	2	3	4	5
Assess establishment of marginal vegetation and consider whether native supplementary planting is required.	To be agreed in final LEMP: Possibly Highways England's appointed monitoring party with SWT	Late summer		Y		Y	
Consider management of marginal vegetation (raking out small proportion of dominant species to encourage a variety of vegetation types)	To be agreed in final LEMP: Possibly Highways England's appointed monitoring party with SWT	Late summer		Y		Y	
Surveillance for and removal of non-native invasive species.	To be agreed in final LEMP: Possibly Highways England's appointed monitoring party with SWT	Late summer		Y		Y	

Measures of Success

7.7.5.2 Monitoring targets have been devised to measure the success of the objectives described above.

Table 7.7.3: Monitoring targets / measures of success

Objective	Targets Years 0-2	Targets Years 2-5
Objective 1: Create and maintain open water habitat which persists for part of the year and supports marginal vegetation transitioning into terrestrial habitat.	Increase in area of open water habitat (seasonally wet) Development of a transitional zone between open water and terrestrial habitat.	Increase in area of open water habitat (seasonally wet) A varied pond margin established, with marginal aquatic vegetation transitioning into terrestrial habitat.

Monitoring frequency and methods

7.7.5.3 The aim of the suggested monitoring programme is to ascertain whether the measures of success listed above have been achieved.

7.7.5.4 Highways England's appointed monitoring party will carry out the monitoring visits and feed back to the steering group as part of annual monitoring reporting.

7.7.5.5 Fixed point photography, supplemented with detailed field notes will be used to document the changes within the pond and the pond margins. The aim of the monitoring programme is to detect changes during the initial establishment phase (i.e. first 5 years) therefore monitoring will be carried out annually and will start in Year 2 after the initial changes in the vegetation is likely to have occurred as a result of the nutrients are released because of the excavations (to re-create the original dimensions of the pond).

Table 7.7.4: Frequency of Monitoring

Action			Years 0 – 5			
Task	Responsibility	Season	2	3	4	5
Fixed point photography supported with aerial photography.	Highways England's appointed monitoring party.	Late summer	Y (annually)	Y	Y	Y

7.8 Stratford Brook enhancements

7.8.1 Overarching aims and objectives

7.8.1.1 To improve terrestrial and aquatic habitats along a section of the Stratford Brook upstream of the A3 and to mitigate for local effects from the Scheme.

7.8.2 Description of land parcels (where habitat creation/enhancement is proposed)

7.8.2.1 Stratford Brook is a narrow watercourse (approximately 1.5 m wide), which flows underneath the current A3 and A3 slip roads approximately east to west. Habitat creation/reinstatement works are associated with a 200m section of the watercourse which is situated upstream of the existing A3.

7.8.2.2 Riparian tree/shrub removal is required for the construction of a new wide-span bridge, approximately 70m south of the A3, and possibly the modification of the existing Stratford Brook culvert south crossing

7.8.3 Background

7.8.3.1 Shading by riparian trees is a constraining factor which can limit the distribution of aquatic macrophytes within the Stratford Brook and by association in-channel and riparian habitat complexity. Selective tree/shrub works that will include clearance (including root mass) and felling and/or coppicing (depending on species) will be undertaken to improve the watercourse habitat and generate a more varied age structure along the riparian zone. Six daylighting areas along the watercourse will be created, along both the right and left bank. It is envisaged that works will be motor-manual (i.e. no need for access by plant) with tree arising being processed in situ and stored/secured locally to provide valuable dead wood habitat[11] adjacent to the watercourse. An ecological assessment of trees/shrubs (e.g. bat roost potential/intrinsic ecological value) within each daylighting area will be undertaken prior to the works with trees marked for retention as required. Where individual tree species lend themselves to coppicing e.g. alder, this will be the preferred method of daylighting. All tree / shrub works will be undertaken outside of the bird nesting period.

7.8.3.2 Six large wood features using logs and branches will be installed in the watercourse to add habitat complexity and improve local hydromorphological condition in keeping with the character of the watercourse. Appropriately sized large wood will come from the tree felling that comprises the local daylighting works along the brook and will be secured within the channel to prevent them being washed away during high flows. Due to the small size of the watercourse and the lengths of wood involved this operation will be done by hand without the use of heavy machinery.

7.8.4 Objectives

7.8.4.1 The following objectives are applicable to the section of Stratford Brook impacted by the Scheme are:

- To reinstate riparian habitat (trees and shrubs) removed to facilitate construction[10].
- To improve in-channel and riparian habitat complexity through:
  - Creating three backwaters;
  - Creating six 'daylighting areas'; and
  - Creating six 'large wood features'.

7.8.4.2 These will be agreed by Highways England and the Environment Agency as part of the final LEMP.

7.8.5 Prescriptions and resources

7.8.5.1 The exact details of work activities will be developed between all parties during the development of this LEMP and subsequent work-specific method statements.

Table 7.8.1: Approach to Stratford Brook Enhancements

Task	Timing
Reinstate riparian trees and shrubs	
Reinstatement of trees will be undertaken at a minimum of a 1 to 1 replacement ratio (for whole tree loses only i.e. it is assumed that coppiced trees will not need to be replaced) and involve the planting of semi-mature native wetland tree species such as alder and willow at an appropriate time of year (nominally mid-November to March, depending on weather and ground conditions). Trees will be appropriately staked and protected with rabbit/deer guards as required.	To be agreed in final LEMP
Backwater Creation	
Survey riparian corridor and identify trees with bat roost potential, veteran features, or significant value for saprophytic invertebrates (e.g. standing dead wood) and mark trees for retention.	To be agreed in final LEMP
Mechanical excavation of the banks to provide additional wetted channel habitat connected to the main watercourse. The backwaters will be nominally 5m in length and 2m wide at the base.	To be agreed in final LEMP
Create 'daylighting areas'	
Survey riparian corridor and identify trees with bat roost potential, veteran features, or significant value for saprophytic invertebrates (e.g. standing dead wood) and mark trees for retention.	To be agreed in final LEMP
Design a 'removals plan' which details where tree/scrub clearance / coppicing is required in consultation with the steering group.	To be agreed in final LEMP

[10] Reinstatement of trees will be undertaken at a minimum of a 1 to 1 replacement ratio (for whole tree loses only i.e. it is assumed that coppiced trees will not need to be replaced) and involve the planting of semi-mature native wetland tree species such as alder and willow.

Task	Timing
Selective tree/shrub works that will include clearance (including root mass) and felling and/or coppicing (depending on species) will be undertaken. Six daylighting areas along the watercourse will be created, each nominally 100m^2 in area. At each daylighting area, nominally 10m of bank length, extending 5m into the riparian zone, will be daylighted along both the right and left bank.	To be agreed in final LEMP
Introduce 'large wood features'	
Six large wood features will be installed in the watercourse in keeping with the character of the watercourse (wooded headwater). Appropriately sized large wood (typically 200mm to 300mm in diameter, 2m to 3m long) will be yielded from the local daylighting works and secured within the channel to prevent mobilisation during high flows.	To be agreed in final LEMP

7.8.6 Management and Monitoring

Programme of works

7.8.6.1 The programme of works for landscape establishment and initial maintenance (for the first five years) is identical to that described in Table 7.3.5 and Table 7.3.6 (woodland creation section) and has not been reproduced here.

7.8.6.2 Table 7.8.2 below details the programme of works for the long term management of these enhancements (15 years in total).

Table 7.8.2: Programme of works for years 6 - 15

Action			Years 6 – 15									
Task	Responsibility	Season	6	7	8	9	10	11	12	13	14	15
Carry out selective tree removals/coppicing in daylighting areas.	To be agreed in final LEMP	Winter					Y					Y

Measures of Success

7.8.6.3 Monitoring targets have been devised to measure the success of the objectives listed above.

Table 7.8.3: Monitoring targets / measures of success

Objective	Targets Years 0-5	Targets Years 5-15
Objective 1: To reinstate riparian habitat (trees and shrubs) removed to facilitate construction.	Limited tree failures and establishment of a riparian corridor similar to that lost.	Limited tree failures and establishment of a riparian corridor similar to that lost.

Objective	Targets Years 0-5	Targets Years 5-15
Objective 2: To improve in-channel and riparian habitat complexity.	Increase in areas where light penetration is encouraging macrophyte establishment. Complex riparian corridor with backwaters establishing. Large woody debris persisting in channel and signs of associated geomorphological processes observed.	Good macrophyte assemblages. Complex riparian corridor with backwaters persisting. Large woody debris resulting in a more complex in-stream habitat structure.

Monitoring frequency and methods

7.8.6.4 The aim of the suggested monitoring programme is to ascertain whether the measures of success listed above have been achieved.

7.8.6.5 Highways England's appointed monitoring party will carry out the monitoring visits and feed back to the steering group as part of annual monitoring reporting.

7.8.6.6 Fixed point photography, supplemented with detailed field notes will be used to document the changes within the river and the riparian habitats. River Corridor Surveys will enable improvements in habitat complexity to be assessed.

7.8.6.7 The aim of the monitoring programme is to detect long term changes therefore monitoring will be carried out annually between years 0 and 5 and then every five years afterwards.

Table 7.8.4: Frequency of Monitoring

Action			Years 0 – 15		
Task	Responsibility	Season	0 to 5	10	15
Fixed point photography supported with aerial photography.	Highways England's appointed monitoring party.	Late summer	Y (annually)	Y	Y
River corridor surveys	Highways England's appointed monitoring party.	Late summer	Y (annually)	Y	Y

7.9 Veteran Trees and Dead Wood Habitat

7.9.1 Overarching aims and objectives

7.9.1.1 To translocate veteran trees as standing and/or fallen dead wood to provide a long term habitat resource for saprophytic invertebrates.

7.9.1.2 To retain standing dead wood and incorporate it into habitat creation areas wherever possible and to utilise high quality dead wood resources created during construction for habitat enhancements.

7.9.2 Background / description of land parcels

Veteran trees

7.9.2.1 There are up to eleven veteran trees which could potentially impacted during construction of the Scheme. Attempts to avoid or reduce these impacts will continue during the detailed design stage. Current proposals are detailed within the Appendix 7.3 of the Environmental Statement (application reference TR010030/APP/6.3). However, provisions have been made for retention in situ if possible, and management of these trees as either standing or fallen dead wood features.

7.9.2.2 Tree translocation is a relatively new process but it is being attempted in many parts of the UK. The method and potential for success of translocating veteran trees is highly dependent on the size and health of the tree and the surrounding constraints associated with moving it. Therefore, at this stage insufficient details are known to determine if, or how, the trees would be translocated.

7.9.2.3 However, if veteran tree translocation was required, and deemed feasible, then it is Highway England's intention to move veteran trees that cannot be retained into adjacent lands (where acceptable to any third parties) and/or the SPA compensation lands (C1 and C2) where wood pasture habitat creation is proposed.

Standing dead wood/future dead wood

7.9.2.4 There is also a large amount of standing dead wood (trees which have died/or are dying but are still remaining upright during the decay process) within the proposed Scheme footprint. There will also be a number of mature trees which will require felling for the proposed Scheme (creating future dead wood). Often this valuable resource is overlooked or modified to an extent that it’s value for dead wood invertebrates is decreased (i.e. cutting large tree trunks into sections speeds up desiccation which reduces its value for some saprophytic

invertebrates). Wherever possible these dead wood resources[11] will be retained and moved into adjacent lands (where acceptable to any third parties) and/or the SPA compensation lands (C1 and C2) where wood pasture habitat creation is proposed.

7.9.3 Objectives

7.9.3.1 It is not possible to define objectives within this outline LEMP at this stage. However, during the development of the LEMP objectives will be set in consultation with Natural England, SCC and SWT with regard to veteran trees and retention of dead wood resources.

7.9.4 Prescriptions and resources

7.9.4.1 The exact details of work activities will be developed between all parties during detailed design and the development of the LEMP and subsequent work-specific method statements.

7.9.4.2 In order of preference the options considered for the individual veteran trees are:

- Detailed design will keep works around the locations of veteran trees under review. If detailed design allows the tree to be retained in situ with reduced crown or with a reduced root spread rather than being lost then this approach will be taken.
- If retention is not practicable then, if practicable, the tree will be translocated using a tree spade (or an appropriate alternative method). Some crown reduction may be undertaken to increase chances of potential survival.
- If translocation of the live tree is not practicable the tree will be reduced to maintain the main trunk and any associated veteran features and translocated using a tree spade (or an appropriate alternative method) but re-erected on the receptor site with additional support to maintain the tree as standing dead wood.
- If none of the above options is practicable, the tree will be cut down to a stump and this will be translocated, allowing for either potential regrowth to occur or, at least, the decaying stump to provide deadwood habitat.

7.9.4.3 In addition, consideration may also be given to ‘veteranizing’ features on some standing mature trees through measures such as ring barking branches, in safe locations away from public access and active highways.

[11] dead wood resources’ could include fallen branches, fallen and standing trunks, dead branches in the crowns of trees, rotten heartwood in standard trees and fallen twigs and fine branches – taken from Kirby, P. (2001) Habitat Management for Invertebrates. Joint Nature Conservation Committee, Natural Power and Royal Society for the Protection of Birds.

7.9.5 Monitoring and Management

7.9.5.1 A monitoring and management programme for dead wood habitats will be developed in consultation with Natural England, SCC and SWT during the detailed design stage.

7.10 Marginal/emergent planting areas

7.10.1 Overarching aims and objectives

7.10.1.1 To integrate the highway (specifically waterbodies and attenuation ponds) with the character of the surrounding landscape, assisting in maintaining local vegetation patterns and softening the appearance of highways infrastructure.

7.10.2 Description of areas (where landscape elements are proposed)

Balancing Ponds

7.10.2.1 There are six proposed attenuation ponds for the Scheme situated outside of the SPA / SSSI boundary (ten are proposed within the SPA / SSSI boundary and are therefore discussed within the draft SPA Management and Monitoring Plan in Appendix 7.19 of the Environmental Statement (application reference TR10030/APP/6.3). These will be planted with marginal and emergent planting.

7.10.2.2 The requirement for these will be confirmed during detailed design, and the design of the attenuation ponds will be developed during this time. These features have a primary function relating to drainage and pollution control, which will be paramount in design and maintenance with any ecological value considered as additional benefits.

7.10.3 Background

7.10.3.1 Marginal and emergent planting is an essential component of the Scheme, ensuring that proposed attenuation ponds and existing waterbodies are multifunctional and provide biodiversity and landscape amenity value. The specific methodology for marginal and emergent planting will be developed during detailed design. It is likely that the planting will comprise of a pond edge meadow mix and marginal and emergent plug plants. This planting will be subject to typical landscape maintenance requirements (e.g. weeding / cutting and removal of arisings etc.) for a period of 5 years.

7.10.3.2 Marginal and emergent species are to be appropriate to the location or as exist already on site, with a species composition and diversity capable of being maintained by an average of one cut per year or less. An indicative list of marginal and emergent planting species are shown in the table below, however,

this planting mix is for illustrative purposes only and will be adapted/improved at the detailed design stage.

Table 7.10.1: Illustrative list of marginal and emergent planting species (to be decided during detailed design):

Illustrative Marginal and Emergent Planting Species:
Pond Edge Mixture:
Achillea ptarmica – Sneezewort
Angelica sylvestris – Wild angelica
Caltha palustris – Marsh marigold
Eupatorium cannabinum – Hemp agrimony
Filipendula ulmaria – Meadowsweet
Geum rivale – Water avens
Hypericum tetrapterum – Square-stalked St John's wort
Iris pseudacorus – Yellow iris
Lotus pedunculatus – Greater birdsfoot trefoil
Lycopus europaeus – Gypsywort
Lythrum salicaria – Purple loosestrife
Mentha aquatica – Water mint
Pulicaria dysenterica – Common fleabane
Ranunculus acris – Meadow buttercup
Scrophularia auriculata – Water figwort
Silene flos-cuculi – Ragged robin
Succisa pratensis – Devil's bit scabious
Vicia cracca – Tufted vetch
Agrostis capillaris – Common bent
Alopecurus pratensis – Meadow foxtail
Anthoxanthum odoratum – Sweet vernal-grass
Cynosurus cristatus – Crested dog's-tail
Deschampsia cespitosa – Tufted hair-grass
Festuca rubra – Slender-creeping red fescue
Hordeum secalinum – Meadow barley
Schedonorus pratensis – Meadow fescue
Plug plants (Marginal):
Angelica sylvestris – Wild angelica
Caltha palustris – Marsh marigold
Carex acuta – Slender tufted sedge
Carex acutiformis – Lesser pond sedge

Illustrative Marginal and Emergent Planting Species:
Carex pendula – Pendulous sedge
Geum rivale – Water avens
Hydrocotyle vulgaris – Marsh pennywort
Iris pseudacorus – Flag iris
Juncus effusus – Soft rush
Lychnis flos-cuculi – Ragged robin
Lysimachia vulgaris – Yellow loosestrife
Myosotis scorpioides – Water forget-me-not
Plug plants (Emergent):
Acorus calamus – Sweet flag
Alisma plantago-aquatica – Water plantain
Apium nodiflorum – Fools watercress
Berula erecta – Lesser water parsnip
Butomus umbellatus – Flowering rush
Glyceria maxia – Reed sweet-grass
Hippuris vulgaris – Marestail
Persicaria amphibia – Amphibious bistort
Ranunculus flammula – Lesser spearwort

7.10.4 Objectives

7.10.4.1 The following objective is are for all areas of marginal / emergent planting:

- Objective 1 – Establish and maintain proposed marginal / emergent planting areas.

7.10.4.2 This will be agreed by Highways England, Natural England and SCC/SWT.

7.10.5 Prescriptions

7.10.5.1 The exact details of the work activities will be developed between all parties during the development of the LEMP and subsequent work-specific method statements.

Table 7.10.2: Approach to marginal/emergent planting areas

Task	Timing	Restrictions/key specifications
Design a final planting plan and specifications and in consultation with the steering group.	During detailed design.	

Task	Timing	Restrictions/key specifications
Source seed mixes and plug plants from certified providers.	As soon as the final planting plan is agreed.	
Mark out areas for planting and ensure that the ground is prepared such that it is not highly fertile and so that all perennial weeds have been removed – a good quality seed bed is to be prepared prior to sowing using repeated cultivation or herbicide.	Spring or autumn To be agreed in final LEMP.	Herbicides should only be applied in or near water after permission has been obtained from the Environment Agency.
Sow seeds evenly by machine or broadcast by hand.	Late summer or spring (dependent upon the grounds proneness to winter flooding).	Do not incorporate or cover the seed.
Plug plants (if required) to be planted as per the agreed planting plan and to the locations as shown on the Detailed Areas drawings.	Winter or early spring.	

7.10.6 Management and Monitoring

Programme of Works

7.10.6.1 Table 7.10.3 below details the programme of works for landscape establishment and initial maintenance (for the first five years).

Table 7.10.3: Programme of works for years 0 – 5

Action			Years 0 - 5				
Task	Responsibility	Season	1	2	3	4	5
Attendance of quarterly site inspections with the Project Landscape Architect	Landscape contractor (LC) appointed by principal contractor (PC)	Quarterly.	Y	Y	Y	Y	Y
In the first year, annual weed growth is to be cut back to encourage the development of a good perennial cover.	LC appointed by PC	Monthly during the growing season.	Y	N	N	N	N
To enhance the habitat value – variation in structure can be achieved by cutting back and removing short sections every 2-3 years in rotation.	LC appointed by PC	Every 2-3 years in rotation.	N	Y	N	Y	N
Thin dense stands of single species.	LC appointed by PC	As required and during September and November to cause the least disruption to wildlife.	Y	Y	Y	Y	Y

Action			Years 0 - 5				
Injurious weeds and undesirable waterbody species are to be eradicated, removed and disposed of off-site, as per the latest DEFRA / Natural England guidance on these matters. All weeding to be carried out by hand,	LC appointed by PC	Between September and January.	Y	Y	Y	Y	Y
All litter / foreign debris should be removed from planted areas and taken off site.	LC appointed by PC	As required.	Y	Y	Y	Y	Y
Pond edge planting to receive one-two cuts at the end of the season.	LC appointed by PC	Twice per year (hay cut after flowering in July / August and mow or graze the re-growth through to late Autumn to c 50mm).	N	Y	Y	Y	Y
Arisings are to be collected and removed from the site within 72 hours.	LC appointed by PC	Twice per year (as above or during one as per each regular mowing/cutting session).	Y	Y	Y	Y	Y
Regular inspection of hard features, including weirs, silt in chambers, petrol interceptors etc.	PC	Regular inspection as necessary to ensure the continued functioning of the attenuation ponds.	Y	Y	Y	Y	Y

Measures of Success

7.10.6.2 To ensure that the management objectives outlined previously are achieved, the following monitoring targets have been devised to measure the success of the management objectives:

Table 7.10.4: Monitoring targets / measures of success

Objective	Targets Years 0-2	Targets Years 2-3	Targets Years 3-5
Establish and maintain marginal / emergent planting areas	Good cover achieved. No single species dominant.	No single species dominant. Injurious weeds totally no more than 20% of the area coverage.	A diversity of species occurring with injurious weeds totally no more than 10% of the area coverage.

Monitoring frequency and methods

7.10.6.3 The aim of the suggested monitoring programme is to ascertain whether the measures of success listed above have been achieved.

7.10.6.4 Monitoring of marginal and emergent planting areas will be carried out in years 1, 3 and 5 by Highways England's appointed monitoring party and fed back to the steering group as part of annual monitoring reporting.

7.10.6.5 Frequency of monitoring visits will be determined by the success of establishment of planting, and the frequency of monitoring outlined in Table 7.10.5, which will be adjusted accordingly to ensure relevant follow-up operations are undertaken.

Table 7.10.5: Frequency of Monitoring

Action			**Years 0 – 5**			
Task	Responsibility	Season	1	2	3	5
Periodic checks of new planting plots	Highways England's appointed Monitoring Party.	Summer	Y		Y	Y

7.11 (Open) Grassland areas

7.11.1 Overarching aims and objectives

7.11.1.1 To provide a robust and easily managed ground cover for the road verges and to integrate the highway with the character of the surrounding landscape, assisting in maintaining local vegetation patterns and softening views of the highway, its infrastructure and traffic.

7.11.2 Description of land parcels (where landscape elements are proposed)

Ockham Park to M25 junction 10

7.11.2.1 Along the earthworks for the replacement Cockcrow Overbridge and in adjacent areas, the soils will be sown with species-rich native grass seed and heather brash to re-establish heathland on the approaches to the bridge (further details are provided in the outline SPA Management and Monitoring Plan in Appendix 7.19 of the Environmental Statement (application reference TR10030/APP/6.3)). Open grassland will be applied to the verges within and around this section of the Scheme.

M25 junction 10

7.11.2.2 It is anticipated that the majority of the existing vegetation within the existing Wisley interchange and all of the planting surrounding it would be lost as a result of the Scheme. Open grassland planting is proposed to the verges within and around the junction.

M25 junction 10 to Painshill

7.11.2.3 Open grassland is proposed along the verges and at points within adjoining areas between M25 junction 10 and Painshill.

M25 West of junction 10

7.11.2.4 Open grassland is proposed along the verges (where space permits / dictates) and at points within adjoining areas west of junction 10.

M25 East of junction 10

7.11.2.5 Open grassland is proposed along the verges (where space permits / dictates) and at points within adjoining areas of land east of junction 10.

7.11.3 Background

7.11.3.1 Open grassland is proposed as an essential component of the landscape mitigation design. The specific methodology for open grassland planting will be

developed during detailed design. However, the principal contractor will sow open grassland mixes, which will be subject to typical landscape maintenance requirements (e.g. weeding / cutting and removal of arisings etc.) for a period of 5 years.

7.11.3.2 Open grassland species are to be appropriate to the location or as exist already on site, with a species composition and diversity capable of being maintained by an average of two cuts per year, so that in time, biodiversity interest is developed. A list of open grassland species are shown in the table below, however, this planting mix is for illustrative purposes only and will be adapted/improved at the detailed design stage.

Table 7.11.1: Illustrative list of open grassland species (to be decided during detailed design):

Illustrative Open Grassland Meadow Mix:
Agrostis capillaris – Common bent
Agrostis vinealis – Brown bent
Anthoxanthum odoratum – Sweet vernal-grass
Cynosurus cristatus – Crested dogstail
Deschampsia flexuosa – Wavy hair-grass
Festuca ovina – Sheep's fescue
Festuca rubra – Slender-creeping red fescue
Koeleria macrantha – Crested hair-grass
Phleum bertolonii – Smaller cat's-tail

7.11.4 Objectives

7.11.4.1 The following objectives are applicable:

- To integrate the highway with the character of the surrounding landscape by maintaining the matrix of local vegetation patterns, blending with local landform and softening views of the highway, its infrastructure and its traffic;
- To ensure successful establishment of the proposed vegetation;
- To protect, manage and enhance the nature conservation value of the highway estate and integrate with and protect adjacent habitats and locations containing protected species, or other locally-important species or habitats; and
- Open grassland planting mixes to roadside verges are to be developed at the detailed design stage to ensure that the mix contains species that will be tolerant of the roadside verge environment.

7.11.5 Prescriptions

7.11.5.1 The exact details of work activities will be developed between all parties during the development of the LEMP and subsequent work-specific method statements. This will be based on the Highways England's Manual of Contract Documents for Highways Works, Series 3000 unless otherwise agreed with Highways England.

Table 7.11.2: Approach to Open Grassland Creation

Task	Timing	Restrictions/key specifications
Design a final planting plan and specifications and agree with the steering group.	During detailed design.	
Source seed mixes from certified providers.	As soon as the final planting plan is agreed.	
Mark out areas for planting and ensure that ground is prepared such that it is not highly fertile and so that all perennial weeds have been removed – a good quality seed bed is to be prepared prior to sowing.	Spring or Autumn.	Soil cultivation around established trees and hedges can be very damaging to tree and shrub roots – only surface treatments are safe here.
Sow seeds evenly by machine or hand – seed to be firmed in with a roll or by treading.	Spring or Autumn.	Do not incorporate the seed by drilling, or rake and harrow after sowing to cover the seed, as most seeds are very fine and cannot germinate if buried.

7.11.6 Management and Monitoring

Programme of Works

7.11.6.1 Table 7.11.3 below details the programme of works for landscape establishment and initial maintenance (for the first five years).

Table 7.11.3: Programme of works for years 0 – 5

Action			Years 0 - 5				
Task	Responsibility	Season	1	2	3	4	5
Attendance of quarterly site inspections with the Project Landscape Architect	Landscape contractor (LC) appointed by principal contractor (PC)	Quarterly.	Y	Y	Y	Y	Y
It is anticipated that a flush of annual weeds will be present in the soil within the first-growing season, weed growth is to be	LC appointed by PC	Monthly during the growing season.	Y	N	N	N	N

Action			Years 0 - 5				
controlled by topping or mowing. All plant growth (sown grasses and weeds) is to be mown regularly to 40-60mm throughout the first growing season to prevent weeds smothering the slower-growing grasses. Removing cuttings if dense.							
Planting to be managed according to the location – along verges planting will require regular mowing to maintain the required visibility splay. Cuttings are to be raked off and removed.	LC appointed by PC	As required.	Y	Y	Y	Y	Y
Planting to be managed according to the location – where visibility splay requirements are not required, planting is to be managed as a meadow, allowing the grasses to grow tall, flower and seed from May through to July/August. The grass meadow should be cut back and mowing resumed in late summer. Cuttings are to be raked off and removed.	LC appointed by PC	Twice yearly (Early Spring and Late Summer).	N	Y	Y	Y	Y
Injurious weeds are to be eradicated, removed and disposed of off-site, as per the latest DEFRA / Natural England guidance on these matters. Grass swards that do not contain wildflowers can be selectively sprayed. Hand weeding will be required in areas of wildflower.	LC appointed by PC	As required.	Y	Y	Y	Y	Y
All litter / foreign debris should be removed from planted areas and taken off site.	LC appointed by PC	As required.	Y	Y	Y	Y	Y

Measures of Success

7.11.6.2 To ensure that the management objectives outlined previously are achieved, the following monitoring targets have been devised to measure the success of the management objectives:

- The sward shall cover at least 80% of the area and be managed where necessary to ensure that this landscape element fulfils its environmental functions; and
- The area shall contain no more than 10% scrub cover (greater than this would signal a change of planting type).

Monitoring frequency and methods

7.11.6.3 The aim of the suggested monitoring programme is to ascertain whether the measures of success listed above have been achieved.

7.11.6.4 Monitoring will be carried out in years 1, 3 and 5 by Highways England's appointed monitoring party and fed back to the steering group as part of annual monitoring reporting.

7.11.6.5 Frequency of initial monitoring visits will to a certain extent be determined by the success of establishment of planting, and the frequency of monitoring outlined in Table 7.11.4, which will be adjusted accordingly to ensure relevant follow-up operations are undertaken.

Table 7.11.4: Frequency of Monitoring

Action			**Years 0 – 5**			
Task	Responsibility	Season	1	2	3	5
Periodic checks of new planting plots	Monitoring Party.	Summer	Y		Y	Y

7.12 Tree and shrub planting

7.12.1 Overarching aims and objectives

7.12.1.1 To replace vegetation lost as a result of the Scheme, and overtime offer effective screening, reintegrating the road back into the landscape.

7.12.2 Description of land parcels (where landscape elements are proposed)

Ockham Park to M25 junction 10

7.12.2.1 Along this section of the route, the A3 is close to grade, with limited earthworks required to accommodate the widening. However, new areas of tree and shrub planting are proposed to the following areas: adjacent to the ancient woodland (native and locally sourced species only), to the south of the new Wisley Lane overbridge, along the RHS Wisley boundary, by the proposed attenuation pond opposite Bolder Mere, near to the Bell Barrow Scheduled Monument by M25 junction 10, and along the Wisley Lane diversion and realignment sections.

M25 junction 10

7.12.2.2 Tree and shrub planting will take place along the earthwork slopes within and around the junction. Furthermore, tree and shrub planting is proposed adjacent to the new restricted byway and attenuation pond earthworks to the east of M25 junction 10.

M25 junction 10 to Painshill

7.12.2.3 Tree and shrub planting is proposed to the north of M25 junction 10 and would take place along the available earthwork slopes of the A3, as well as along the earthworks for the attenuation pond by New Farm, the new Heyswood private access and alongside Feltonfleet School grounds. On ~~either~~ the westbound side of the A245, vegetation lost to the widening of the Scheme would be replaced with new tree and shrub planting.

M25 West of junction 10

7.12.2.4 Tree and shrub planting is proposed along the new earthwork slopes, replacing the planting lost through the new slip roads and replacement Clearmount Overbridge. Beyond the Clearmount Overbridge the land temporarily taken for topsoil storage will be planted with trees and shrubs to restore a vegetation screen to the M25.

M25 East of junction 10

7.12.2.5 Tree and shrub planting is proposed along the mainline earthwork slopes so as to replace the existing planting lost to the widening associated with the Scheme and the new slip roads.

7.12.3 Background

7.12.3.1 New tree and shrub planting is proposed as an integral component of the landscape mitigation design. The specific methodology for tree and shrub planting will be developed during detailed design.

7.12.3.2 Tree and shrub species are to be appropriate to the location or as exist already on site. A list of potential tree and shrub species are shown in the table below, however, this planting mix is for illustrative purposes only, and will be adapted/improved at the detailed design stage. The tree and shrub planting will comprise of plants adapted from the NVC Woodland types: W10 and W16, with other native and / or locally appropriate species. An illustrative species list is shown in the table below.

Table 7.12.1: Illustrative list of tree and shrub species (to be confirmed during detailed design):

Illustrative Tree and Shrub Planting Mix:
Quercus robur – Common oak
Betula pendula – Silver birch
Crataegus monogyna – Common hawthorn
Ilex aquifolium – Common holly
Sorbus aucuparia - Rowan
Malus sylvestris – Crab apple
Sambucus nigra – Elder
Viburnum opulus – Guelder rose
Acer campestre – Field maple
Carpinus betulus - Hornbeam
Fagus sylvatica – Beech
Pinus sylvestris – Scots pine

7.12.4 Objectives

7.12.4.1 The following objectives are applicable to the areas of tree and shrub planting are:

- To integrate the highway with the character of the surrounding landscape by maintaining the matrix of local vegetation patterns, blending with local landform and softening views of the highway, its infrastructure and its traffic;
- To ensure successful establishment of the proposed vegetation;
- To maintain interest, variety and an acceptable visual appearance for both road users and adjacent public viewers by creating/maintaining views to the wider landscape, providing seasonal variation and creating a 'sense of place';
- To retain a dense belt of planting with some native evergreen species in the mix where planting has a screening function;
- Maintain shrub layer for low-level screening;
- Keep a balance of species, form and alignment to reflect adjoining linear features;
- Retain as continuous features to provide wildlife corridors to other woody plots or linear features (on or off site); and
- Provide seasonal colour and a variety of plant form.

7.12.4.2 These will be agreed by Highways England and SCC/SWT as part of the final LEMP.

7.12.5 Prescriptions

7.12.5.1 The exact details of work activities will be developed between all parties during the development of the LEMP and subsequent work-specific method statements. This will be based on the Highways England's Manual of Contract Documents for Highways Works, Series 3000 unless otherwise agreed with Highways England.

Table 7.12.2: Approach to Tree and Shrub Planting Creation

Task	Timing	Restrictions/key specifications
Design a final planting plan and specifications in consultation with the steering group.	During detailed design.	
Source tree and shrub stock from certified providers.	As soon as the final planting plan is agreed.	
Mark out tree blocks on the ground.	To be agreed in final LEMP, subject to construction programme	
Prepare the ground for tree and shrub planting.	To be agreed in final LEMP, subject to construction programme	

Task	Timing	Restrictions/key specifications
Tree and shrub planting to be protected from livestock where necessary (e.g. stock fencing around the planting block) and wild animals (rabbit/deer guards).	Winter (from November) to spring (up to late March). Timing to be agreed in final LEMP, subject to construction programme	Setting out of trees and shrubs to be decided at the detailed design stage. Do not plant in frosty weather. Plant during the ideal time for that species (considering soil conditions).

7.12.6 Management and Monitoring

Programme of Works

7.12.6.1 Table 7.12.3 below details the programme of works for landscape establishment and initial maintenance (for the first five years).

Table 7.12.3: Programme of works for years 0 – 5

Years 0 - 5							
Task	Responsibility	Season	1	2	3	4	5
Attendance of quarterly site inspections with the Project Landscape Architect.	LC appointed by PC.	Quarterly.	Y	Y	Y	Y	Y
Provideirrigation during the establishment period (year 1) and growing season (April-September) as required.	LC appointed by PC.	As required.	Y	Y	Y	Y	Y
Any dead or damaged trees should be replaced annually with matching species of the same size during the next planting season after failure. Replacement planting only to be undertaken once cause of death has established.	LC appointed by PC.	Once yearly (during November - February).	Y	Y	Y	Y	Y
Pruning to be undertaken to broken and damaged branches.	LC appointed by PC.	As required.	Y	Y	Y	Y	Y
No trimming or clearance shall be undertaken during the bird nesting season.	LC appointed by PC.	As required.	Y	Y	Y	Y	Y
All tree / timber stakes / guards should be checked and adjusted, repaired or replaced as necessary.	LC appointed by PC.	Once yearly (in winter).	Y	Y	Y	Y	Y

Years 0 - 5							
Soil around the roots of tree and shrub species is to be re-firmed as necessary, to ensure that plants are supported and upright, especially following periods of extreme winds.	LC appointed by PC.	As required.	Y	Y	Y	Y	Y
All litter / foreign debris should be removed from planted areas and taken off site. All fallen leaves and branches etc. are to remain in-situ unless removal is otherwise instructed.	LC appointed by PC.	As required.	Y	Y	Y	Y	Y
Weed control (non-residual herbicide to planting stations) – 1000mm diameter around each planted shelter / tree.	LC appointed by PC.	Three times (spring, summer and winter).	Y	Y	Y	Y	Y
Selective spot treatment of herbicide should be applied targeting all undesirable species, including: broad-leaved dock, curled dock, common ragwort, creeping thistle, spear thistle and bracken.	LC appointed by PC.	Twice a year (May and September).	Y	Y	Y	Y	Y
Grassland cut between planting (arisings to be spread evenly across the plot).	LC appointed by PC.	Twice yearly (Early spring and Late summer).	Y	Y	Y	Y	Y
Hand weeding required in shelters.	LC appointed by PC.	Twice yearly (spring and winter).	Y	Y	Y	Y	Y
Tree stakes should be removed by year 5 or as instructed by Landscape Architect (LA).	LC appointed by PC.	As instructed by LA or by year 5.	Y	Y	Y	Y	Y

Measures of Success

7.12.6.2 To ensure that the management objectives outlined previously are achieved, the following monitoring targets have been devised to measure the success of the management objectives:

- All plant failures to be removed and replanted, with a 95% success rate target of new planting by Year 5.

Monitoring frequency and methods

7.12.6.3 The aim of the suggested monitoring programme is to ascertain whether the measures of success listed above have been achieved.

7.12.6.4 Highways England's appointed monitoring party will carry out the monitoring visits and feed back to the steering group as part of annual monitoring reporting.

7.12.6.5 Frequency of initial monitoring visits will be determined by the success of establishment of planting and the frequency of monitoring outlined in Table 7.12.4 will be adjusted accordingly to ensure relevant follow up operations are undertaken.

Table 7.12.4: Frequency of Monitoring

Action			Years 0 – 5			
Task	Responsibility	Season	1	2	3	5
Periodic checks of new planting plots and ancillary items / fencing, tree stakes etc.	Highways England's appointed monitoring party.	Summer	Y	Y	Y	Y

7.13 Reinstatement of temporary land take areas

7.13.1 Overarching aims and objectives

7.13.1.1 To reinstate land used temporarily for construction of the Scheme back to (as a minimum) the same condition as it was before works commenced.

7.13.1.2 For the soil storage area adjacent to Buxton Wood the aim (once construction is complete) is to create wood pasture, providing connectivity to other woodland parcels in this area, and enhancing its value for biodiversity.

7.13.2 Background/description of land parcels (where reinstatement of land is required)

Restoration of construction compounds and soil storage areas

7.13.2.1 The main compound for the works will be located at the Nutberry Farm, adjacent to the Ockham Park junction at the southern end of the scheme and will operate for the duration of the works. This will occupy an area of 5.5 ha of agricultural land that is currently used as a fruit farm and occasional car boot sale site.

7.13.2.2 A second compound will be required at the northern end of the scheme and will be located on the site of the former San Domenico restaurant off the A3 northbound carriageway near the Painshill junction.

7.13.2.3 There will be another compound between Pointers Road and the M25 eastbound carriageway east of junction 10. However, at the end of the works, the Pointers Road compound will be used as part of the replacement land package rather than being returned to its original owners.

7.13.2.4 Similar compounds will be required adjacent to the M25 eastbound carriageway at Buxton Wood, and on the former Wisley Airfield near Elm Lane. Both of these compounds would also be used for storage of soils removed from the site of the works, to enable it to be reused over the earthworks to support new planting and grass seeding. Other areas will be taken for soil storage on land within the Hilton Hotel site, on the land at New Farm (both at the northern end of the scheme)

7.13.2.5 Compounds required within the SPA/SSSI boundary are included within the draft SPA Management and Monitoring Plan in Appendix 7.19.

Buxton Wood soil storage area

7.13.2.6 The soil storage area at Buxton Wood will be converted to wood pasture following completion of the Scheme. It is currently a semi-improved grassland field.

7.13.2.7 The specific methodology for wood pasture creation will be developed during detailed design. However, the principle will be to plant small groupings of 5-7 feathered trees[12], which will be subject to the typical maintenance (e.g. weeding/watering/replacing failures) period of 5 years. Eventually (after approximately 10 years, unless extensive failures occurred) the best specimens will be selected and the remaining trees will be removed. Robust fencing will be used to protect the new planting from grazing, which will be encouraged within the surrounding grassland.

7.13.2.8 The Wisley Common and Ockham and Chatley Heath Woodland Management Plan [13] states that the dominant woodland species are oak and birch, with less common species including sweet chestnut, sycamore and turkey oak. There is also localised wet woodland which occurs where the water table is high, supporting willow and alder carr. The dominant conifer species is Scots pine, with a few small areas of minor species such as Western Hemlock and Lodgepole pine.

7.13.2.9 One of SCC and SWTs aspirations for the commons 'is to gradually reduce the conifer component in their woodlands to allow the further development of native woodland (W10 & W16) and heathland habitats'. Proposed wood pasture planting will follow species compositions listed for NVC woodland types W10 and W16. See typical species list below:

Table 7.13.1: Wood pasture species (to be decided during detailed design)

NVC group/Species
W10 – lowland mixed broadleaved woodland with bluebell:
Major species – silver birch, common oak, common hawthorn, hazel
Minor species – crab apple, holly, rowan, elder, common gorse, guelder rose
Locally occurring – [additional relevant native species to be added if desired by SCC / SWT]
W16 – lowland oak-birch woodland with bilberry
Major species – silver birch, common oak
Minor species – holly, rowan, common gorse
Locally occurring – [additional relevant native species to be added if desired by SCC / SWT]

7.13.2.10 The increased plant species diversity within the grassland understory will be achieved through grazing, using SWTs existing grazing herd. It is not envisaged that any supplementary seeding or further management interventions for the grassland areas themselves (i.e. mowing / weeding) will be required.

[12] All planting would need to be locally sourced and native to the UK.
[13] Woodland Management Plan: Wisley Common and Ockham and Chatley Heath. Forestry Commission.

7.13.2.11 Introducing additional dead wood habitat is proposed which should diversify the habitats available for invertebrates within these fields and make use of felled trees from the works area. In the long term the new tree stock planted will be allowed to develop dead wood features, where appropriate.

7.13.3 Objectives

7.13.3.1 The following objectives are applicable to construction compounds and soil storage areas (outside of the SPA/SSSI boundary):

All Compounds/soil storage areas

- Objective 1: Restore compounds/soils storage areas to the same condition, or better.

Buxton Wood soil storage area

- Objective 1: Establish and maintain standard trees.
- Objective 2: Establish and maintain species-rich grasslands (surrounding trees).
- Objective 3: Introduce dead wood habitats and encourage dead wood habitats to develop.

7.13.3.2 These will be agreed by Highways England and SCC/SWT as part of the final LEMP.

7.13.4 Prescriptions and resources

7.13.4.1 The exact details of work activities will be developed between all parties during the development of the LEMP and work specific method statements.

Table 7.13.2: Approach to temporary land take reinstatement

Task	Timing	Restrictions/key specifications
Compounds and soil storage areas		
Design a final planting plant and specifications for compound areas in consultation with the steering group.	During detailed design.	
Prepare the ground for tree / shrub / scrub planting and/or re-seeding where appropriate	Once construction is complete.	
Wood pasture creation (Buxton Wood soil storage area):		
Design a final planting plant and specifications in consultation with the steering group.	During detailed design.	

Task	Timing	Restrictions/key specifications
Source tree stock from certified providers.	As soon as the final planting plan is agreed.	Native species, locally sourced only.
Prepare the ground for tree planting	Once construction is complete.	
Mark out tree blocks on the ground based on the typical crown spread of species selected (to ensure tree blocks are spaced wide enough to create an open crown where appropriate).	Once construction is complete.	
Plant small groupings of 5-7 feathered trees in each tree block and install protection from damage from livestock (e.g. stock fencing around the tree block) and wild animals (rabbit/deer guards).	Winter (from November) to spring (up to late March).	Do not plant trees in regular blocks/rows. Do not plant in frosty weather. Plant during the ideal time for that species (considering soil conditions).
Translocate an agreed amount of dead wood from works area (either standing or fallen).	Once construction is complete.	Felled tree stems should be retained in large sections (to allow dead wood to form slowly without excess desiccation) these could be introduced as either standing or fallen stems.
Grazing to commence when conditions are appropriate.	June to November (year to be agreed in final LEMP) and each year thereafter	Grazing shouldn't commence (after planting) until the stock fencing surrounding the new planting is complete.

7.13.5 Management and Monitoring

Programme of Works

7.13.5.1 The temporary land take areas will be maintained (managed and monitored) during the initial establishment phase (5 years). The wood pasture area at Buxton Wood will require longer term management (20 years in total) in order to achieve the target wood pasture habitat.

7.13.5.2 Table 7.13.3 below details the programme of works for habitat establishment and initial maintenance. Different sections of temporary land take will become available for restoration at different times depending on the construction programme. Year 0 will be taken as the year in which planting was initially installed (or replaced in the case of failures).

Table 7.13.3: Programme of works for years 0 – 5

Action			Years 0 – 5				
Task	Responsibility	Season	1	2	3	4	5
Weed control (non-residual herbicide to planting stations) – 1000mm diameter around each planted shelter / tree.	LC appointed by PC.	Once or twice a year.	Y	Y	Y	Y	Y
Watering.	LC appointed by PC.	As required	Y	Y	Y	Y	Y
Attendance of quarterly site inspections with the Project Landscape Architect	LC appointed by PC.	Quarterly.	Y	Y	Y	Y	Y
Provide artificial irrigation through the use of a Bowser via a combination of surface watering and irrigation tubes sufficient to maintain healthy growth, during the establishment period (year 1) and growing season (April-September) as required.	LC appointed by PC.	As required.	Y	Y	Y	Y	Y
Any dead or damaged trees should be replaced annually with matching species of the same size during the next planting season after failure. Replacement planting only to be undertaken once cause of death has been established.	LC appointed by PC.	Once yearly (in winter).	Y	Y	Y	Y	Y
All tree / timber stakes / guards should be checked and adjusted, repaired or replaced as necessary. These should be removed when instructed by Monitoring Party.	LC appointed by PC.	Once yearly (in winter).	Y	Y	Y	Y	Y
Soil around the roots of tree species is to be re-firmed as necessary, to ensure that plants are supported and upright, especially following periods of extreme winds.	LC appointed by PC.	As required.					
All litter / foreign debris should be removed from planted areas and taken off site. All fallen leaves and branches etc. are to remain in-situ unless removal is otherwise instructed.	LC appointed by PC.	As required.					

Action			Years 0 – 5				
Buxton Wood soils storage area only:							
Grazing surrounding grassland (once fencing around the new planting has been installed).	SWT	June to November (based on SWT's grazing strategy).	Y	Y	Y	Y	Y

Table 7.7.5: Programme of works for years 6 – 20 for wood pasture at Buxton Wood soil storage area

Action			Years 6 – 20													
Task	Responsibility	Season	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Grazing surrounding grassland.	SWT	June to November	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Selected removal of planted trees to retain the best specimens.	To be agreed in final LEMP – Possibly SWT	Year 10					Y										
Any remaining tree guards monitored/replaced/loosened/removed	To be agreed in final LEMP – Possibly SWT	Once yearly (in winter)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Removal of fencing	To be agreed in final LEMP – Possibly SWT	Year 15										Y					

Measures of Success

7.13.5.3 Monitoring targets have been devised to measure the success of the objectives described above.

7.13.5.4 For the restoration of compounds and soils storage areas (other than those areas where wood pasture creation or woodland creation is proposed) the following targets have been set:

- All plant failures to be removed and replanted, with a 95% success rate target of new planting by Year 5.

7.13.5.5 The measures of success relating to Buxton Wood soil storage area (wood pasture creation) are outlined below.

Table 7.13.6: Monitoring targets / measures of success for Buxton Wood soil storage area

Objective	Targets Years 0-5	Targets Years 5-10	Targets Years 10 - 20
Objective 1: Establish and maintain standard trees.	All failures removed and replanted. 95% success rate of new planting by Year 5.	Limited failures and at least 20% of 'best specimens' to select for retention at Year 10.	Retained 'best specimens' developing open canopies
Objective 2: Establish and maintain species-rich grasslands (surrounding trees) [14].	Semi-improved neutral grassland with an average of 12 target species. Non-target species coverage <20%	Semi-improved neutral grassland with an average of 15 target species. Non-target species coverage <10%	Semi-improved neutral grassland with an average of >15 target species. Non-target species coverage <5%
Objective 3: Introduce/encourage dead wood habitats[15] to develop	2/3 dead wood features per hectare (either on the ground or on trees)	4/5 dead wood features per hectare (either on the ground or on trees)	5-10 dead wood features per hectare (either on the ground or on trees)

Monitoring frequency and methods

7.13.5.6 The aim of the suggested monitoring programme is to ascertain whether the measures of success listed above have been achieved.

7.13.5.7 Highways England's appointed monitoring party will carry out the monitoring visits and feed back to the steering group as part of annual monitoring reporting.

7.13.5.8 Frequency of monitoring visits will be determined by the success of establishment of planting and the frequency of monitoring outlined in Table 7.13.7 will be adjusted accordingly to ensure relevant follow up operations are undertaken.

[14] Targets taken from…Natural England. (2010) Higher Level Stewardship: Farm Environment Plan (FEP) Manual, 3rd Edition.
[15] 'dead wood habitats' could include fallen branches, fallen and standing trunks, dead branches in the crowns of trees, rotten heartwood in standard trees and fallen twigs and fine branches – taken from Kirby, P. (2001) Habitat Management for Invertebrates. Joint Nature Conservation Committee, Natural Power and Royal Society for the Protection of Birds.

Table 7.13.7: Frequency of Monitoring

Action			Years 0 – 5			
Task	Responsibility	Season	1	2	3	5
Periodic checks of planting / fencing	Highways England's appointed Monitoring Party.	Summer	Y	Y	Y	Y

7.13.5.9 The aim of the detailed botanical monitoring (for wood pasture creation area only) is to detect major changes which can be done by surveying at five yearly intervals.

7.13.5.10 The suggested method is NVC surveys with fixed quadrats supplemented with fixed point photography supported with aerial photography.

Table 7.137.8: Frequency of Detailed Botanical Monitoring

Action			Years 5 – 20			
Task	Responsibility	Season	5	10	15	20
Pre-construction NVC monitoring – setting up fixed quadrats and collecting baseline data to compare subsequent surveys to.	Highways England's appointed monitoring party	Spring & Summer	Y			
Post-planting/grazing NVC fixed quadrat surveys.	Highways England's appointed monitoring party	Spring & Summer		Y	Y	Y
Fixed point photography supported with aerial photography.	Highways England's appointed monitoring party	Summer		Y	Y	Y

7.14 Permanent structures

7.14.1 Overarching aims and objectives

7.14.1.1 Ensure that any new structures built within the Scheme boundary (that have a biodiversity purpose) are managed appropriately and any issues are identified and rectified.

7.14.2 Background/ description of land parcels

Bat mitigation structure and bat/bird boxes

7.14.2.1 The design of the bat mitigation structure (providing compensatory roosting opportunity for loss of building supporting roost) will be confirmed during detailed design. However, it is envisaged that the structure will require screening using fencing (possibly in the short term only whilst vegetation establishes) and tall trees/hedgerow planting. This planting, the fencing and the structure itself will require maintenance / management. The proposed location of the structure is shown on the LEMP map in Appendix A.

7.14.2.2 A five-year maintenance period is proposed during which time the bat mitigation structure will be checked and structurally amended as instructed by a bat licensed ecologist (should it be required), based on the results of the monitoring surveys in order to ensure its continued functionality. Bat boxes will also be checked during this period and any damaged or lost bat boxes will be mended or replaced.

7.14.2.3 Specific locations and designs of bat boxes will determined during detailed design.

Bird Boxes

7.14.2.4 A five-year maintenance period is proposed during which time the proposed bird boxes will be checked (once a year is proposed) and any damaged or lost bird boxes will be mended or replaced.

7.14.2.5 Specific locations and designs of bird boxes will determined during detailed design.

7.14.3 Objectives

7.14.3.1 The following objectives are applicable to the new structures are:

- Objective 1: Design and build a bat mitigation structure.
- Objective 2: Provide sufficient screening for the bat mitigation structure to reduce the risk of future disturbance of any bats using it.

- Objective 3: Establish and maintain an appropriate number of bat/bird boxes (locations to be agreed).

7.14.3.2 These will be agreed by Highways England, Natural England and SCC/SWT as part of the final LEMP.

7.14.4 Prescriptions and resources

7.14.4.1 The exact details of work activities will be developed between all parties during the development of the LEMP and subsequent work-specific method statements.

Table 7.14.1: Approach for establishing new structures

Task	Timing	Restrictions/key specifications
Design the bat mitigation structure and planting/fencing plan	During detailed design.	Ensure 'gaps' are left in the screening planting /fencing to allow bats to access the structure.
Agree locations and types of bat / bird boxes and how they will be affixed with the steering group.	During detailed design.	
Construct bat mitigation structure and erect fencing	To be agreed in final LEMP	By 1st March 2021 (based on current indicative programme)
Source tree/shrub stock from certified providers.	As soon as the final planting plan is agreed.	
Prepare the ground for tree/shrub planting.	Once construction of the bat mitigation structure is complete.	
Plant trees/shrub species (for screening of the bat mitigation structure) and install protection from damage from wild animals (rabbit/deer guards).	Winter (from November) to Spring (up to late March)	Do not plant in frosty weather. Plant during the ideal time for that species (considering soil conditions).
Erect bat boxes (associated with licensed works).	To be agreed in final LEMP	Boxes should be in place prior to destruction of known bat roosts and according to the requirements stated in the European Protected Species (EPS) licence.
Erect bat and bird boxes	To be agreed in final LEMP	No timing restrictions for bat boxes which are not part of the EPS licence.

7.14.5 Management and monitoring

Programme of Works

7.14.5.1 The programme of works for landscape establishment and initial maintenance for the tree and shrub (screening) planting (for the first five years) is identical to that described in Table 7.12.3 (tree and shrub planting section) and has not been reproduced here.

7.14.5.2 Management/maintenance activities for the bat mitigation structure and screening planting, and bat and bird boxes have been proposed below. However, the measures of success for these new structures still need to be developed (and agreed with Natural England) once detailed design has been carried out.

7.14.5.3 Table 7.14.2 below details the programme of works. Monitoring for the planting is described in section 7.12.6 and the associated species monitoring is described in section 7.15.

Table 7.14.2: Programme of works for years 0 – 5

Action			Years 0-5				
Task	Responsibility	Season	1	2	3	4	5
Check bat mitigation structure	Highways England's appointed monitoring party	Once a year	Y	Y	Y	Y	Y
Check fencing/ planting is proving sufficient screening for the bat mitigation structure	Highways England's appointed monitoring party	Once a year	Y	Y	Y	Y	Y
Check bat / bird boxes and replace any that are damaged/lost	Highways England's appointed monitoring party /PC	Once yearly (in winter)	Y	Y	Y	Y	Y

7.15 Species monitoring approach

7.15.1.1 Monitoring of habitat creation / enhancement (outside of the SPA/SSSI) is dealt with in the preceding sections. This is to ensure that the measures of success are achieved and any issues with creation, enhancement or reinstatement works are rectified. Species monitoring for areas within the SPA/SSSI are dealt with within Appendix 7.19 – SPA Management and Monitoring Plan.

7.15.1.2 Requirements for protected species monitoring for the M25 junction 10/A3 Wisley interchange Scheme (associated with the European Protected Species Mitigation licences) are still under discussion with Natural England and therefore the information provided in this section is indicative and subject to change.

7.15.1.3 Species monitoring will be carried out by the Monitoring Party. The results of species monitoring will be documented in annual species monitoring reports (in years where surveys have been carried out).

7.15.1.4 Reports will document the methods used and results of monitoring, they will also analyse the results with reference to 'measures of success' described in this document and include specific habitat management recommendations (where required). A key requirement of the species monitoring is to trigger appropriate management interventions.

7.15.1.5 Each year, the annual monitoring report will be submitted to the steering group.

7.15.1.6 On completion of the monitoring programme for a particular species, the annual monitoring report that year, will summarise all monitoring results to date for that species and state clearly whether the habitat works have had an impact on the species.

Bats

7.15.1.7 Monitoring for bats will be included in the final LEMP. It will include all monitoring required under the Natural England EPS licence.

Other species

7.15.1.8 There is no further species monitoring proposed at this stage for the Scheme (other than that described within Appendix 7.19 SPA Management and Monitoring Plan). However, this will be kept in review during detailed design and if additional monitoring is beneficial to inform adaptive management it will be added into the LEMP.

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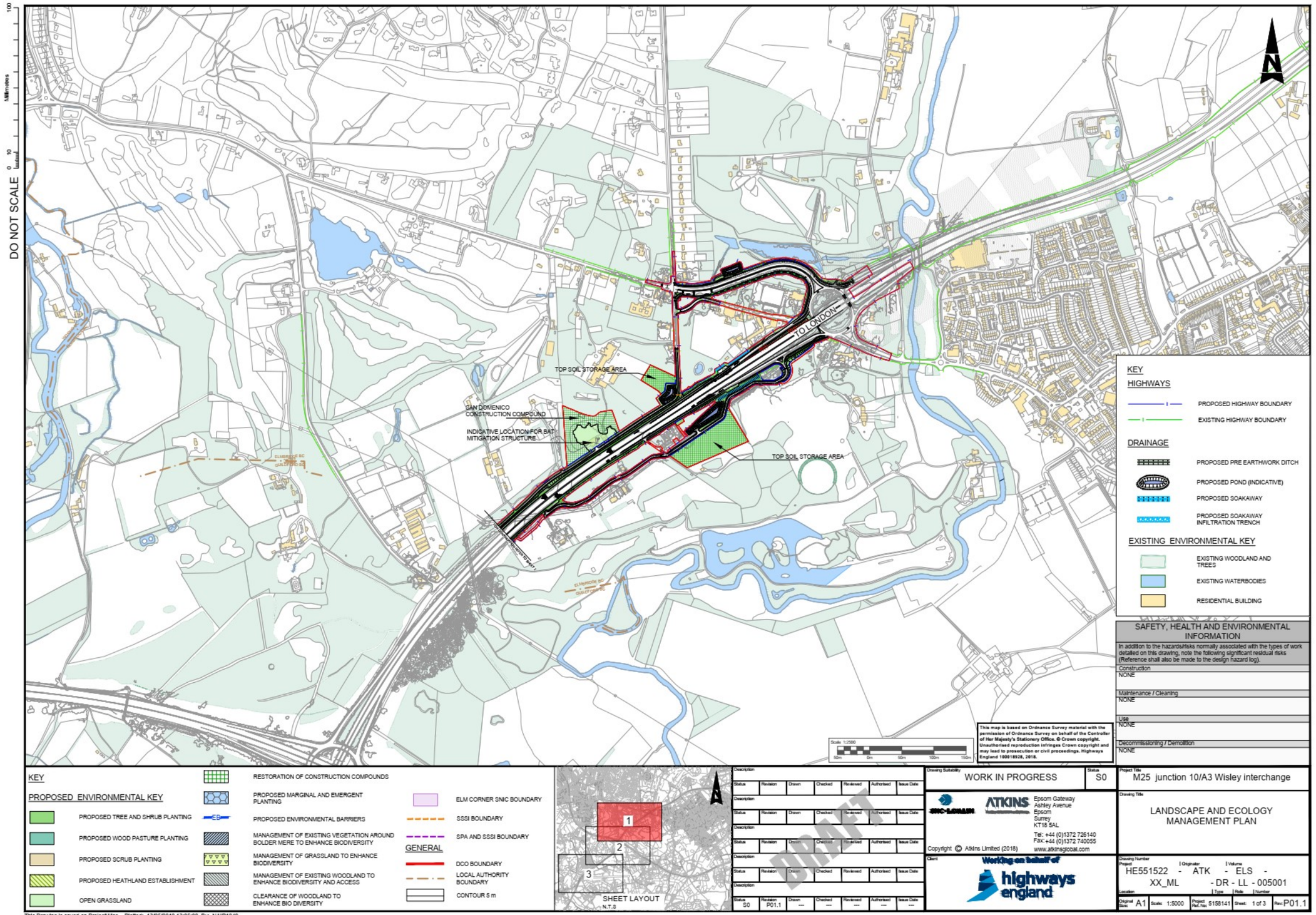
7.16.1.16 Soil Survey of England and Wales (1984). Soils and their use in South East England. Bulletin No.15. SSEW, Harpenden

7.16.1.17 Williams, P. et al (2010) The Pond Book: A guide to management and creation of ponds. 2nd Edition, Pond Conservation, Oxford.

Appendix A. Landscape and Ecology Management Plan Drawings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Millimetres
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N
TO LONDON
TOP SOIL STORAGE AREA
CAN DOMENICO CONSTRUCTION COMPOUND
INDICATIVE LOCATION FOR BAT MITIGATION STRUCTURE
TOP SOIL STORAGE AREA
KEY
HIGHWAYS
PROPOSED HIGHWAY BOUNDARY
EXISTING HIGHWAY BOUNDARY
DRAINAGE
PROPOSED PRE EARTHWORK DITCH
PROPOSED POND (INDICATIVE)
PROPOSED SOAKAWAY
PROPOSED SOAKAWAY INFILTRATION TRENCH
EXISTING ENVIRONMENTAL KEY
EXISTING WOODLAND AND TREES
EXISTING WATERBODIES
RESIDENTIAL BUILDING
SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION
In addition to the hazards/risks normally associated with the types of work detailed on this drawing, note the following significant residual risks (Reference shall also be made to the design hazard log).
Construction
NONE
Maintenance / Cleaning
NONE
Use
NONE
Decommissioning / Demolition
NONE
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Scale 1:2500
50m 0m 50m 100m 150m
KEY
PROPOSED ENVIRONMENTAL KEY
PROPOSED TREE AND SHRUB PLANTING
PROPOSED WOOD PASTURE PLANTING
PROPOSED SCRUB PLANTING
PROPOSED HEATHLAND ESTABLISHMENT
OPEN GRASSLAND
RESTORATION OF CONSTRUCTION COMPOUNDS
PROPOSED MARGINAL AND EMERGENT PLANTING
PROPOSED ENVIRONMENTAL BARRIERS
MANAGEMENT OF EXISTING VEGETATION AROUND BOLDER MERE TO ENHANCE BIODIVERSITY
MANAGEMENT OF GRASSLAND TO ENHANCE BIODIVERSITY
MANAGEMENT OF EXISTING WOODLAND TO ENHANCE BIODIVERSITY AND ACCESS
CLEARANCE OF WOODLAND TO ENHANCE BIO DIVERSITY
ELM CORNER SNIC BOUNDARY
SSSI BOUNDARY
SPA AND SSSI BOUNDARY
GENERAL
DCO BOUNDARY
LOCAL AUTHORITY BOUNDARY
CONTOUR 5 m
1
2
3
SHEET LAYOUT
N.T.S
DRAFT
Drawing Suitability
WORK IN PROGRESS
Status
S0
Project Title
M25 junction 10/A3 Wisley interchange
Drawing Title
LANDSCAPE AND ECOLOGY MANAGEMENT PLAN
ATKINS
Epsom Gateway
Ashley Avenue
Epsom
Surrey
KT18 5AL
Tel: +44 (0)1372 726140
Fax: +44 (0)1372 740055
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Client
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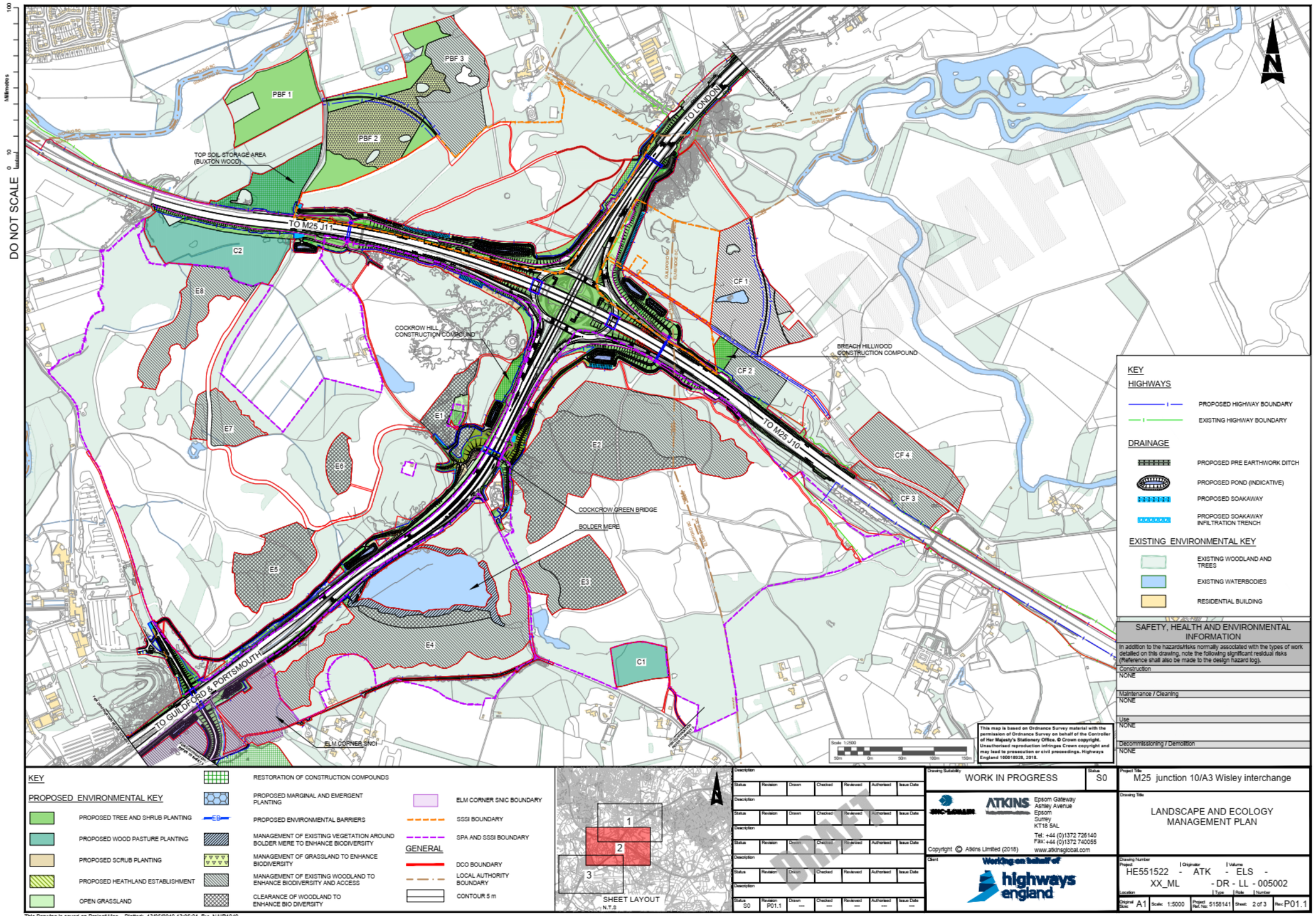
Drawing Number
Project HE551522 - Originator ATK - Volume ELS - XX_ML - Type DR - Role LL - Number 005001
Location
Original Size A1
Scale 1:5000
Project Ref. No. 5158141
Sheet 1 of 3
Rev P01.1
Status S0 Revision P01.1
This Drawing is saved on ProjectWise. Plotted: 13/06/2019 13:06:09 By: NAIR1949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Millimetres 100 0 10
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PBF 1
PBF 2
PBF 3
TOP SOIL STORAGE AREA (BUXTON WOOD)
TO LONDON
TO M25 J11
C2
E8
E7
E6
E1
E2
E3
E4
E5
C1
CF 1
CF 2
CF 3
CF 4
COCKROW HILL CONSTRUCTION COMPOUND
BREACH HILLWOOD CONSTRUCTION COMPOUND
COCKROW GREEN BRIDGE
BOLDER MERE
TO M25 J10
TO GUILDFORD & PORTSMOUTH
ELM CORNER SNCI
KEY
HIGHWAYS
PROPOSED HIGHWAY BOUNDARY
EXISTING HIGHWAY BOUNDARY
DRAINAGE
PROPOSED PRE EARTHWORK DITCH
PROPOSED POND (INDICATIVE)
PROPOSED SOAKAWAY
PROPOSED SOAKAWAY INFILTRATION TRENCH
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RESIDENTIAL BUILDING
SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION
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Decommissioning / Demolition
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KEY
PROPOSED ENVIRONMENTAL KEY
PROPOSED TREE AND SHRUB PLANTING
PROPOSED WOOD PASTURE PLANTING
PROPOSED SCRUB PLANTING
PROPOSED HEATHLAND ESTABLISHMENT
OPEN GRASSLAND
RESTORATION OF CONSTRUCTION COMPOUNDS
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PROPOSED ENVIRONMENTAL BARRIERS
MANAGEMENT OF EXISTING VEGETATION AROUND BOLDER MERE TO ENHANCE BIODIVERSITY
MANAGEMENT OF GRASSLAND TO ENHANCE BIODIVERSITY
MANAGEMENT OF EXISTING WOODLAND TO ENHANCE BIODIVERSITY AND ACCESS
CLEARANCE OF WOODLAND TO ENHANCE BIO DIVERSITY
ELM CORNER SNCI BOUNDARY
SSSI BOUNDARY
SPA AND SSSI BOUNDARY
GENERAL
DCO BOUNDARY
LOCAL AUTHORITY BOUNDARY
CONTOUR 5 m
SHEET LAYOUT
N.T.S.
DRAFT
WORK IN PROGRESS
S0
M25 junction 10/A3 Wisley interchange
LANDSCAPE AND ECOLOGY MANAGEMENT PLAN
ATKINS
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Epsom
Surrey
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HE551522 - ATK - ELS - XX_ML - DR - LL - 005002
A1
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5158141
2 of 3
P01.1
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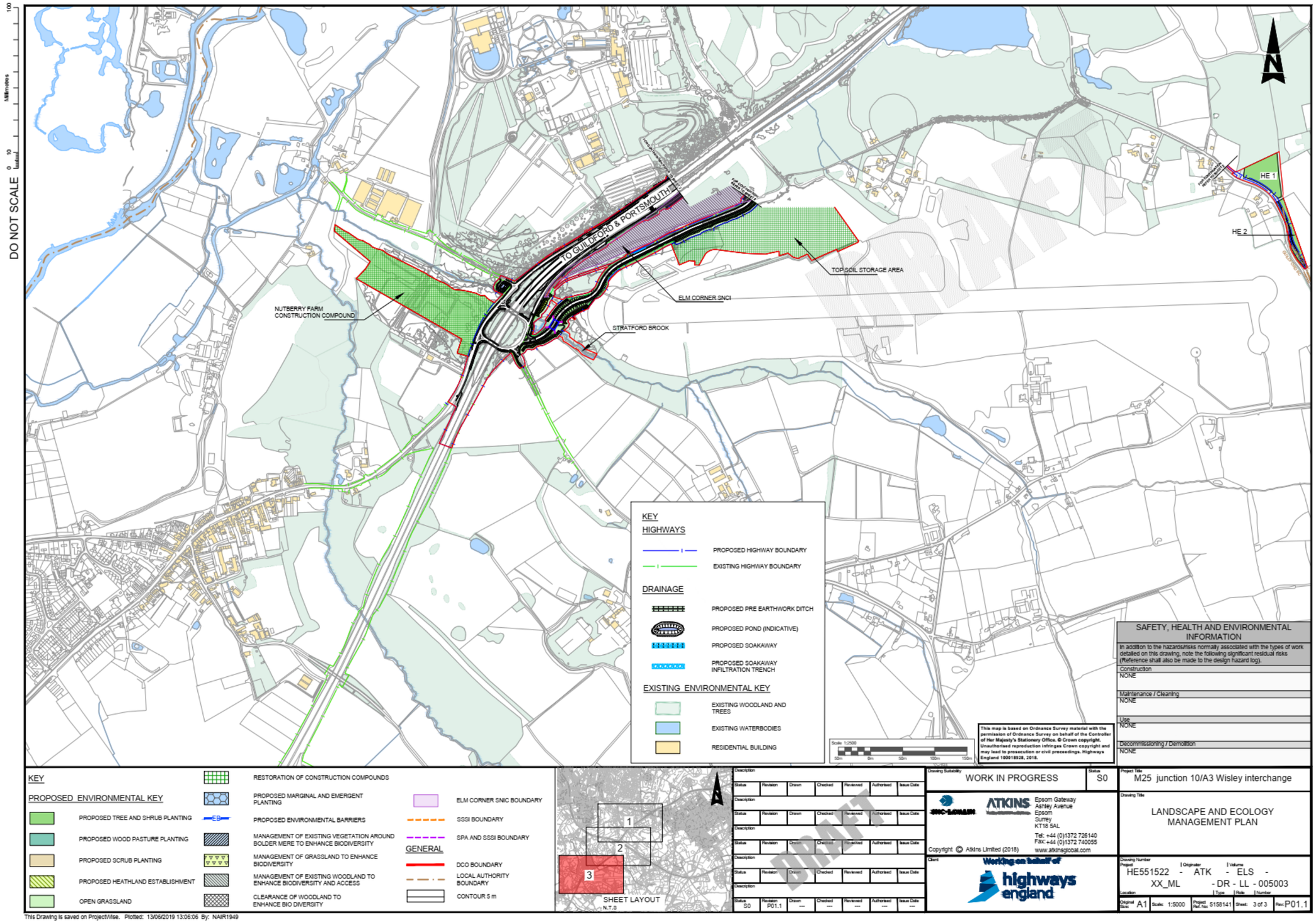
DO NOT SCALE
Millimetres
0 10 100
TO GUILDFORD & PORTSMOUTH
NUTBERRY FARM CONSTRUCTION COMPOUND
STRATFORD BROOK
ELM CORNER SNCI
TOPSOIL STORAGE AREA
HE 1
HE 2
N
KEY
HIGHWAYS
PROPOSED HIGHWAY BOUNDARY
EXISTING HIGHWAY BOUNDARY
DRAINAGE
PROPOSED PRE EARTHWORK DITCH
PROPOSED POND (INDICATIVE)
PROPOSED SOAKAWAY
PROPOSED SOAKAWAY INFILTRATION TRENCH
EXISTING ENVIRONMENTAL KEY
EXISTING WOODLAND AND TREES
EXISTING WATERBODIES
RESIDENTIAL BUILDING
KEY
PROPOSED ENVIRONMENTAL KEY
PROPOSED TREE AND SHRUB PLANTING
PROPOSED WOOD PASTURE PLANTING
PROPOSED SCRUB PLANTING
PROPOSED HEATHLAND ESTABLISHMENT
OPEN GRASSLAND
RESTORATION OF CONSTRUCTION COMPOUNDS
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MANAGEMENT OF EXISTING WOODLAND TO ENHANCE BIODIVERSITY AND ACCESS
CLEARANCE OF WOODLAND TO ENHANCE BIO DIVERSITY
ELM CORNER SNIC BOUNDARY
SSSI BOUNDARY
SPA AND SSSI BOUNDARY
GENERAL
DCO BOUNDARY
LOCAL AUTHORITY BOUNDARY
CONTOUR 5 m
SHEET LAYOUT
N.T.S
1
2
3
SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION
In addition to the hazards/risks normally associated with the types of work detailed on this drawing, note the following significant residual risks (Reference shall also be made to the design hazard log).
Construction
NONE
Maintenance / Cleaning
NONE
Use
NONE
Decommissioning / Demolition
NONE
DRAFT
WORK IN PROGRESS
S0
M25 junction 10/A3 Wisley interchange
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A1
1:5000
P01.1
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