

Southampton to London Pipeline Project

Landscape and Ecological Management Plan
(LEMP)

Revision No. 2.0

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East Hampshire District Council





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**Southampton to London Pipeline Project
East Hampshire District Council Landscape
and Ecological Management Plan**



Appendix B: Landscape and Ecological Reinstatement Plans

Appendix C: Approach to Ancient Woodland and Veteran Trees

Appendix D: Methodology for Working Near Trees



Acronyms and Abbreviations

Acronym	Definition
CEMP	Construction Environmental Management Plan
CEZ	Construction Exclusion Zone
CoCP	Code of Construction Practice
DCO	Development Consent Order
ECoW	Environmental Clerk of Works
EPS	European Protected Species
INNS	Invasive Non-Native Species
LEMP	Landscape and Ecological Management Plan
RPA	Root Protection Area
SINC	Site of Importance for Nature Conservation
SSSI	Site of Special Scientific Interest
TPO	Tree Preservation Order



1 Introduction

1.1 Overview

- 1.1.1 Esso Petroleum Company, Limited (Esso) has been granted a Development Consent Order (DCO) by the Secretary of State to replace 90km (56 miles) of an existing pipeline with 97km of new pipeline to transport aviation fuel between Boorley Green in Hampshire and the Esso West London Terminal storage facility in Hounslow. The replacement pipeline is 97km long, taking into account that it cannot follow the line of the existing pipeline along its whole length due to new developments and environmental constraints.
- 1.1.2 Esso has already replaced 10km of pipeline between Hamble and Boorley Green in Hampshire. The replacement pipeline starts near Boorley Green at the end point of the previously replaced pipeline. The route runs generally in a northeast direction via Esso's Pumping Station in Alton. It terminates at the Esso West London Terminal storage facility. The areas of land to be permanently or temporarily used for the project are known as the Order Limits.
- 1.1.3 The project within this local authority area is broken down into six stages. These are based on geographical areas. East Hampshire District Council is host to 17.73km of the 97km pipeline route. This Landscape and Ecological Management Plan (LEMP) specifically applies to the section of works between (465 956E, 130 454N) and (468 528E, 134 052N), and between (472 166E, 137 621N) and (478 779E, 146 499N) in East Hampshire District. This is shown on Sheets 4, 5, 6 and 7 in the Stages of the Authorised Development.
- 1.1.4 It is anticipated that works to install the pipeline will start in 2021 and be completed in 2023. The installation of the pipeline is planned to be completed within a two-year construction period. On completion of the installation works the contractor will hydrotest the pipeline and any post-construction monitoring required will be carried out.
- 1.1.5 The development authorised by the DCO must be undertaken in accordance with the LEMP pursuant to Requirement 12 of the DCO.

1.2 Purpose of the LEMP

- 1.2.1 An Environmental Impact Assessment was carried out to assess the effects that the project, as presented within the application for development consent, would have on the environment. As part of this process, which included extensive stakeholder engagement, a number of commitments were made to good practice measures to be actioned during design and construction. These were assumed as part of the assessment process. In addition, mitigation measures were proposed and committed to, to offset any significant effects identified as part of the assessment.
- 1.2.2 The purpose of the LEMP is to set out how landscape and ecological features such as vegetation and habitats would be protected and managed during construction,



and reinstated following construction. The LEMP enables the proposed landscape and ecological good practice measures to be actioned within the project.

- 1.2.3 The LEMP provides a consistent approach to the control of construction activities for the project. The LEMP covers protection of landscape and ecology during construction, reinstatement of vegetation and habitats post construction and the implementation of other ecological mitigation measures, together with the subsequent aftercare and, where applicable, monitoring arrangements.
- 1.2.4 Under the terms of the DCO Requirement 12, no stage (as outlined in Section 1.1) of the authorised development must commence until a LEMP relating to that stage has been submitted to and approved by the relevant planning authority. Under Requirement 12 of the DCO, the final LEMP must be in accordance with the Outline LEMP. The LEMP must also include an implementation timetable and must be carried out as approved. To avoid duplication, the LEMP refers to the Staging Plan, which sets out the implementation timetable.
- 1.2.5 The LEMP is being issued to East Hampshire District Council as part of discharging Requirement 12. It is anticipated that East Hampshire District Council will, at their discretion, consult relevant statutory bodies, including Natural England and other relevant consultees, such as the local wildlife trusts. Once the planting proposals have been agreed with East Hampshire District Council, Esso will discuss the proposals with the relevant landowners, prior to construction.
- 1.2.6 Esso will put in place robust procedures to inform and supervise all those working on the project, including its supply chain of contractors, to make sure the control measures set out in the LEMP are adopted when undertaking the construction of the pipeline and ancillary works.

1.3 Change Process

- 1.3.1 This section sets out how change would be managed if this was necessary in order to implement the project. It creates a category of “Technical Variation” for the approval of minor variations by the relevant authority that Esso considers does not require formal evaluation under paragraph 20 of Schedule 2 of the DCO (Amendments to approved details).
- 1.3.2 For those more significant changes that need to be considered under paragraph 20 it sets out a process for distinguishing which changes may need to be considered under paragraph 20(2). Changes that may result in likely significant effects on the environment, and that are not assessed in the Environmental Statement, may require further assessment by the relevant authority. A change which Esso considers does not require further assessment is termed a “Non-material Change” below. A change that Esso considers does require further assessment and therefore a discussion to determine what assessment is required, is termed a “Material Change” below.
- 1.3.3 In each case under this section it is open for the relevant authority to require more stringent evaluation if it considers this necessary.



Technical Variation (not covered by Paragraph 20 (Amendments to approved details))

- 1.3.4 By agreement with landowners and relevant regulatory bodies it may be necessary to amend the details contained in the supporting appendices and plans attached to this LEMP as a result of the iterative discussion and engagement that will continue after the LEMP has been approved. The resulting technical variation would not alter any of the underlying commitments, mitigations and methodologies set out in the LEMP. An example may be a proposed change to the planting locations or species as a result of a landowner request to those shown in the Landscape and Ecological Reinstatement Plans in Appendix B.
- 1.3.5 Where there is a proposed technical variation, Esso will provide details to the Relevant Planning Authority together with evidence of relevant stakeholder approval. The Relevant Planning Authority will, acting reasonably, endeavour to respond within 10 business days to either confirm its consent to the technical variation or provide its reasons why the change is not accepted, including where it considers the requested variation to be a Non-material or a Material Change (as described below). If declined, Esso may then withdraw the request, or treat the request as a Non-material or a Material Change.

Other Changes (covered by Paragraph 20 (Amendments to approved details))

- 1.3.6 During the implementation of the project it may be necessary or prudent to seek an alternative approach to the commitments, mitigations and methodologies set out in this approved LEMP. Pursuant to Paragraph 20 of Schedule 2 of the DCO, Esso and East Hampshire District Council will adopt the following procedure in respect of a requested change to the requirements of the LEMP.

Non-Material Change

- 1.3.7 Where Esso and its expert advisers reasonably consider that the proposed change is not likely to give rise to any materially new or materially different environmental effects to those assessed in the Environmental Statement, this would be presented as a Non-material Change.
- 1.3.8 Esso will submit the proposed change to East Hampshire District Council with details of the requested change (including any amendments to the relevant mitigation measures) together with a summary of why Esso considers the change to be a Non-material. Upon receipt of the request East Hampshire District Council will, acting reasonably, endeavour to respond within 15 business days to either confirm its consent to the Non-material Change or provide its reasons why the change is not accepted. It should be noted that consent is deemed to be approved if no formal decision is made by the relevant authority within 42 days of the initial application. If declined, Esso may then withdraw the request, treat the request as a Material Change or appeal the decision in accordance with Schedule 2 of the DCO.



Material Change

- 1.3.9 Where Esso and its expert advisers reasonably consider that the proposed change is likely to give rise to any materially new or materially different environmental effects to those assessed in the Environmental Statement, this would be presented as a Material Change.
- 1.3.10 Esso will discuss the proposed change with East Hampshire District Council together with its proposals for appropriately assessing the Material Change. Upon receipt of the assessment proposals, East Hampshire District Council will, acting reasonably, endeavour to respond within 10 business days to comment on the assessment proposals.
- 1.3.11 Following subsequent assessment of the proposed change in accordance with any comments received Esso will submit the proposed change to East Hampshire District Council with details of the requested change (including details of any amendments to the relevant mitigation measures) together with the findings of the assessment and the reasons why Esso considers the change is unlikely to give rise to any materially new or materially different environmental effects in comparison with the authorised development as approved (as identified in the environmental statement). Upon receipt of the request East Hampshire District Council will, acting reasonably, endeavour to respond within 15 business days to either confirm its consent to the Material Change or provide its reasons why the change is not accepted. It should be noted that consent is deemed to be approved if no formal decision is made by the relevant authority within 42 days of the initial application. If declined, Esso may then withdraw the request or appeal the decision in accordance with Schedule 2 of the DCO.

1.4 Structure of the LEMP

- 1.4.1 The LEMP sets out:
- how existing sensitive features would be retained during construction;
 - how land would be restored post construction;
 - a programme of post construction aftercare; and
 - a programme of monitoring.
- 1.4.2 Section 3 of the LEMP provides an overview of the main landscape and ecological designations which provide the planning policy context for the LEMP. Commitments relevant to vegetation retention and removal are set out in Section 4. Commitments relevant to landscape and ecological reinstatement are set out in Section 5. Aftercare arrangements and monitoring are outlined in Sections 6 and 7 respectively. The LEMP contains the following appendices:
- *Appendix A – SSSI Working Plans – Not applicable to East Hampshire District Council.*
 - Appendix B – Landscape and Ecological Reinstatement Plans – these show the proposed reinstatement of the working area following the installation of the pipeline. The plans also show the proposed reinstatement planting. Appendix B



also contains the planting schedules including seed mixes, tree types and sizes which have coded references on the plans to show which applies in each location.

- Appendix C – Approach to Ancient Woodland and Veteran Trees.
- Appendix D – Methodology for working near trees.

1.4.3 Commitment G87 states '*Vegetation clearance, retention, protection and replanting/reinstatement drawings would be produced prior to the construction phase*'. This is implemented through Requirement 8 of the DCO as follows.

- East Hampshire District Council will be notified of the Vegetation Retention and Removal Plans in accordance with Requirement 8(1)(a) of the DCO. These plans are based on the intended pipeline alignment which has taken into account the construction and environmental good practice measures, local features and engineering constraints. These plans will reflect the requirements of Section 4 of the LEMP. Where a Site Specific Plan is applicable, the vegetation removal and retention must be in accordance with the Vegetation Retention and Removal Plans set out in the relevant Site Specific Plan, save with such variations as may be agreed by the relevant planning authorities.
- Appendix B contains the Landscape and Ecological Reinstatement Plans in accordance with Requirement 8(1)(b) of the DCO. These reflect the requirements of Section 5 of the LEMP.

1.4.4 In addition, the 'Approach to Ancient Woodland and Veteran Trees' is included as Appendix C for information.

1.4.5 The LEMP should be read in conjunction with the Code of Construction Practice (Document Reference REP7-028), the Site Specific Plans and the CEMP and associated appendices. The DCO specified that the final plans would be in accordance with the Outline plans that were certified as part of the DCO and that they be approved by the relevant authorities prior to the commencement of construction.

- Code of Construction Practice (CoCP): The CoCP provides a consistent approach to the control of construction activities along the entire pipeline and mitigates potential impacts on people and the environment. It sets out the embedded design measures that have been committed to on the project, including locations and requirements for narrow working. In addition, the CoCP contains construction methodologies about how the works would be undertaken in general. These comprise:
 - open cut;
 - trenchless: auger bore;
 - trenchless: Horizontal Directional Drilling;
 - streets;
 - watercourses;
 - woodland;
 - working near trees;



- hedgerows;
 - schools; and
 - sports pitches and golf courses.
- **Construction Environmental Management Plan (CEMP):** This sets out generally how environmental management will be undertaken on the project during construction. It also outlines the roles and responsibilities for implementing actions on site, including the role of the Environmental Clerk of Works (ECoW). The CEMP also includes relevant appendices, as described below.
 - **Appendix A: Emergency Action Plan** – sets out the emergency procedures to be put in place for potential environmental incidents.
 - **Appendix B: Water Management Plan** – sets out a framework for use and control of water on the project. It outlines the environmental risks and considers appropriate methods to mitigate against these risks. It considers surface water and groundwater pollution and surface water runoff contributing to flood risk.
 - **Appendix C: Site Waste Management Plan** – identifies the main sources of waste produced during construction of the project and how it should be disposed of.
 - **Appendix D: Dust Management Plan** – sets out how the project would avoid or reduce emissions to air and human exposure to emissions. It also promotes close working with relevant authorities to maintain air quality, and provides for mitigation where dust soiling cannot be prevented.
 - **Appendix E: Noise and Vibration Management Plan** – sets out measures to reduce noise and vibration impacts at local receptors during the construction of the pipeline. It also promotes positive working relationships with local communities and the relevant planning authorities.
 - **Appendix F: Soil Management Plan** – sets out the generic commitments that the project has made and details about how soils would be protected, stored and reinstated as part of the works. It also outlines the monitoring and reporting that would be undertaken in respect of soils.
 - **Appendix G: Lighting Management Plan** – sets out the project’s strategy for lighting, including identification of light-sensitive locations and measures to reduce impacts, for example at bat roosts.
 - **Community Engagement Plan:** This sets out how the project will communicate with the local community. It sets out the roles and responsibilities for engagement on the project.

1.5 Links to European Protected Species Licences

- 1.5.1 The application for Development Consent included the draft European Protected Species (EPS) licences and also the Letters of No Impediment from Natural England. The final licences will be produced and submitted to Natural England in 2021. The final licences will contain the mitigation measures required to comply with legislation. The measures set out within the draft licences have been taken into



account when developing the Vegetation Retention and Removal Plans and the Landscape and Ecological Reinstatement Plans.

- 1.5.2 Project Commitment G174 states that *'buildings, structures and trees within the Order Limits, confirmed to have high or moderate potential to support bats, that do not require removal, would be retained and protected with an appropriate buffer zone. Those that require removal and have high or moderate potential for bat roosts would be surveyed prior to their removal and either removed or removed under licence from Natural England if roosts are confirmed to be present.'* There are ongoing bat surveys to confirm which trees containing bat roosts would require felling on the project. If any trees are identified that contain roosts and would require felling, a bat licence would be submitted to Natural England for approval.



2 Project Commitments

2.1.1 During application, Esso made a number of good practice measures which would reduce impacts on the landscape and to habitats and ecology. These are indicated by a reference number, for example '(G21)'. The overarching good practice measures that would reduce landscape and ecological impacts are listed in Table 2.1. There are a number of more detailed commitments relating to specific aspects of the LEMP, which are included at the start of the relevant section.

Table 2.1: Good Practice Measures Relevant to the LEMP

Commitment number	Commitment
O1	Commitment to only utilise a 10m width when crossing through boundaries between fields where these include hedgerows, trees or watercourses.
G40	Where sensitive features are to be retained within or immediately adjacent to the Order Limits, an appropriate buffer zone would be created where this extends within the Order Limits. The buffers would be established using appropriate fencing and signage. Suitable methodologies would be produced to ensure that construction works are undertaken in a manner that reduces the risk of damage or disturbance to the sensitive feature.
G61	Construction within Bourley and Long Valley SSSI, Colony Bog and Bagshot Heath SSSI and Chobham Common SSSI would be in accordance with Appendix B of the Habitat Regulations Assessment (application document 6.5). Where necessary, detailed methodologies would be agreed with Natural England prior to commencement. All construction works would be in accordance with the detailed methodologies.
G65	Working widths would be reduced in specific locations where trees or hedges are present. Where notable ¹ , TPO, Ancient Woodland and veteran trees would be retained within or immediately adjacent to the Order Limits, the trees and their root protection areas would be protected where they extend within the Order Limits and are at risk. This would be by means of fencing or other measures.
G88	Where possible, reinstatement of vegetation would generally be using the same or similar species to that removed (subject to restrictions for planting over and around pipeline easements).
G91	The contractor(s) would retain vegetation where practicable and in accordance with, as a minimum, the vegetation retention drawings.
G92	A five-year aftercare period would be established for all mitigation planting and reinstatement.
G94	Land used temporarily would be reinstated to an appropriate condition relevant to its previous use.
G95	The contractor(s) would apply the relevant protective principles set out in the British Standard 5837:2012: Trees in relation to design, demolition and construction. This would be applied to trees within the Order Limits which would be preserved through the construction phase, and to trees outside of the Order Limits where such measures do not hinder or prevent the use of the relevant working width for construction.
G97	Where woodland vegetation is lost and trees cannot be replaced due to the restrictions of pipeline easements, native shrub planting approved by Esso would be used as a replacement, in accordance with the vegetation reinstatement plans to be approved by the relevant planning authorities as part of the LEMP. The approved vegetation reinstatement plan will also include replacement tree planting where appropriate.
G200	Trees that are removed as a result of the construction of the project will be replaced on a one for one basis in accordance with the vegetation reinstatement plans approved

¹ Notable trees are defined as 'prominent trees within the landscape and by nature will generally be the larger more mature specimens'.



Commitment number	Commitment
	under the LEMP. Where possible, replacement tree planting will be located in close proximity to the original tree. It should be noted that such tree reinstatement would not apply to areas where tree removal is for habitat improvement reasons, such as at Chobham Common and this has been agreed with Natural England and the relevant landowners.
HRA1	Heathland within statutory or non-statutory designated wildlife sites would be reinstated using natural regeneration, unless otherwise agreed with Natural England.

- 2.1.2 In certain areas, a commitment has been made to a narrower working width within the Order Limits to reduce impacts at these specific locations. This approach involves using a narrower working width than the typical 30m due to localised constraints, such as working in roads or ecologically sensitive areas. Vegetation outside the narrow working limit would be retained as shown in the Vegetation Retention and Removal Plans. The full list of narrow working locations is listed in Annex A of the CoCP.
- 2.1.3 There are also areas where the project has made commitments to avoid features within the Order Limits (embedded design measures) set out in Table 3.1 of the CoCP. These have been taken into account when developing the Vegetation Retention and Removal Plans.



3 Landscape and Ecological Features

3.1 Landscape and Ecological Designations

3.1.1 The landscape and ecological designations relevant to the LEMP are summarised below. Further details relating to landscape designations can be found in ES Chapter 10 (**Application Document [APP-050](#)**), and further information relating to ecological designations can be found in ES Chapter 7 (**Application Document [APP-047](#)**).

Statutory and Non-statutory Designations

3.1.2 The sections of the Order Limits within South Downs National Park are covered within the LEMP that is to be discharged by the South Downs National Park Authority. This section of the East Hampshire District LEMP only includes a description of the sites and features that lie outside of the South Downs National Park.

3.1.3 The Order Limits cross one non-statutory designated site, Water Lane Site of Importance for Nature Conservation (SINC). The Order Limits also lie adjacent to a further three SINCs:

- Little Down Wood SINC;
- Monk Wood SINC; and
- Neatham Farm Manor Copse SINC.

3.1.4 St Swithun's Way lies to the west of the Order Limits at Hawthorn and Upper Froyle but does not cross them. Hangers Way crosses the Order Limits at Neatham Down. There are many other Public Rights of Way within East Hampshire District, some of which cross the Order Limits, for example a number of paths near Kitwood Lane, along Water Lane and near Lower Froyle. There is no open access land within the Order Limits.

Ancient Woodland, Veteran Trees and Tree Preservation Orders

3.1.5 There is designated Ancient Woodland to the south of Neatham Manor (1490082). There is also an area of potential ancient woodland (less than 2ha) identified at Neatham Down, west of Monk Wood (AW12). There are no TPOs within the Order Limits.

3.1.6 There are potential veteran trees at the following locations:

- south of Petersfield Road, Ropley (T105);
- within potential ancient woodland (AW12) at Neatham Down, west of Monk Wood (S1100-T11); and
- within woodland south of West End (S1200-T4).



3.2 Summary of Main Land Uses Crossed by the Pipeline Route

3.2.1 The land uses that the Order Limits would pass through are presented in ES Chapter 12 (**Application Document [APP-052](#)**). Soils and geology are described within ES Chapter 11 (**Application Document [APP-051](#)**). For the purpose of identifying landscape mitigation and management, the main land uses that the Order Limits would pass through are summarised below. Soils have been broadly categorised by reference to LandIS (Cranfield University, 2019).

Agricultural Land (Including Pasture)

3.2.2 The Order Limits comprise mainly agricultural land including arable and pasture. The soils are typically well drained calcareous soils consisting of silts and clays.

Priority Habitats and Ecological Features

3.2.3 Priority habitats are outlined within the Phase 1 Habitat Survey (**Application Documents [APP-080](#) and [APP-081](#)**). There is Coastal and Floodplain Grazing Marsh centred on SU 72579 37804 following the Caker Stream; and also centred on SU 74847 41383 following the River Wey.

3.2.4 There are potential bat roosts in the trees within the Order Limits and dormouse (*Muscardinus avellanarius*) have been confirmed within the hedgerows. There are great crested newt (*Triturus cristatus*) at Upper Froyle (ponds 50, 55, 56, 57 and 57a), Worldham Golf Club (pond 41) and south of Water Lane (Pond 39). There is also common reptile habitat to the south of Smugglers Lane (SU 66198 30803); south of Kitwood Lane (SU 67200 32981); west of Water Lane (SU 73361 37571); north of Water Lane (SU 73627 37876); south of Binsted Road (SU7494141098); and at three locations around Alton (SU 75273 42132; SU 74997 41999; and SU 74680 41576).

Golf Courses

3.2.5 There are golf courses at Four Marks and Worldham Park.

3.3 Invasive Non-Native Species

3.3.1 The following Invasive Non-Native Species (INNS) has been identified to date within the Order Limits in East Hampshire District:

- Butterfly bush (*Buddleia davidii*) (SU 74629 41584).

4 Vegetation Retention and Removal

4.1 Planning and Programming of Vegetation Removal

4.1.1 The LEMP should be read alongside the Staging Plan, which sets out the implementation timetable for the work within East Hampshire District. This has taken account of restrictions such as constraints on timing due to seasonal and/or ecological constraints including the good practice measures set out in Table 4.1.

Table 4.1: Good Practice Measures for Planning and Programming

Commitment number	Commitment
G34	Where restrictions to working are required due to ecological seasonality, e.g. for hibernation or breeding of protected species, standard timings have been indicated. However, due to alterations in weather patterns and temperatures from year to year, the restricted season may alter. It would be at the discretion of the ECoW in consultation with Natural England, where applicable, to decide the actual dates for restriction of works.
G35	Bird Breeding Season: The assumption would be that vegetation with the potential to support bird nests would not be removed during the breeding bird season (March to August inclusive). If any works become necessary during the breeding bird season, works would be supervised by an ECoW. Appropriate protection measures would be put in place should active nests be found. These would include exclusion zones around active nests until chicks fledge or nests become inactive as determined by monitoring by the ECoW.
G42	A suitable methodology would be produced to set out how identifiable areas with the potential presence of Schedule 9 plant species or other invasive species would be demarcated, and how any affected soils would be appropriately managed throughout the works.
G52	Adder and sand lizard hibernacula would be retained and protected during construction where practicable. If unavoidable, the removal of vegetation and groundworks at hibernacula would be timed to avoid the hibernation season.
G59	Potential disturbance to ponds would preferably be timed to avoid the amphibian breeding season or would be supervised by an ECoW. Any amphibians captured during supervision would be translocated to the nearest undisturbed pond.
G61	Construction within Bourley and Long Valley SSSI, Colony Bog and Bagshot Heath SSSI and Chobham Common SSSI would be in accordance with Appendix B of the Habitat Regulations Assessment (application document 6.5). Where necessary, detailed methodologies would be agreed with Natural England prior to commencement. All construction works would be in accordance with the detailed methodologies.
G196	All habitats suitable for common reptiles would be subject to two-stage habitat manipulation between mid-March and mid-October. Firstly, vegetation would be cut to approximately 150mm (with the arisings removed) under the supervision of an ECoW and the site left for a minimum of two days to allow reptiles to move away from the area. Secondly, vegetation would be cleared down to ground level under the supervision of an ECoW. Vegetation clearance would be achieved using appropriate equipment based on the type of vegetation to be removed, the area affected, and the risk of killing or injuring reptiles. Construction works could commence immediately after completion of the second stage.

4.2 General Principles of Vegetation Retention and Removal

4.2.1 The overarching aim would be to *'retain vegetation where practicable and in accordance with, as a minimum, the vegetation retention drawings'* (Commitment G91). In accordance with G95, the contractor(s) would apply the relevant protective

principles set out in the British Standard (BS) 5837:2012 Trees in relation to design, demolition and construction. This would be applied to trees within the Order Limits which would be preserved through the construction phase, and to trees outside of the Order Limits where such measures do not hinder or prevent the use of the relevant working width for construction.

4.2.2 The Vegetation Retention and Removal Plans that have been submitted in accordance with Requirement 8(1)(a) of the DCO (the Vegetation Retention and Removal Plans), have been developed following the identification of the intended pipeline alignment and provided to the relevant planning authorities for information in accordance with Requirement 8. Vegetation retention and removal at the areas covered by the Site Specific Plans will be as per the Site Specific Plan unless otherwise approved by the relevant planning authority.

4.2.3 The Vegetation Retention and Removal Plans will follow the requirements of DCO Article 42 – Felling or lopping, namely:

‘(1) The undertaker may fell, lop, prune, coppice, pollard or reduce in height or width, any tree or shrub within or overhanging land within the Order limits, or may cut back the roots of a tree or shrub which extend into the Order limits if it reasonably believes it to be necessary to do so to prevent the tree, shrub or roots from—

(a) obstructing or interfering with the construction, maintenance or operation of the authorised development or any apparatus used in connection with the authorised development; or

(b) constituting a danger to persons using the authorised development.

(2) In carrying out any activity authorised by paragraph (1) or (3), the undertaker must not cause unnecessary damage to any tree, shrub or hedgerow and must pay compensation to any person who sustains any loss or damage arising from such activity for that loss or damage.

(3) The undertaker may, for the purpose of the authorised development—

(a) subject to paragraph (2), remove any hedgerows within the Order limits that may be required for the purposes of carrying out the authorised development; and

(b) only remove important hedgerows identified in Schedule 10 (Removal of important hedgerows) to the extent shown on the plans identified in Schedule 10 [of the DCO]’

4.2.4 The Vegetation Retention and Removal Plans show:

- working areas (taking into account narrow working and trenchless crossings where applicable) and the intended pipeline alignment;
- vegetation to be retained and removed;

- Root Protection Areas (RPAs) and proposed mitigation hierarchy (see LEMP Appendix D for details) applied to Ancient Woodland, potential ancient woodland, Veteran Trees and potential veteran trees;
- RPAs for surveyed trees, including notable trees;
- known sensitive landscape and ecological features to be retained such as hedgerows and ponds; and
- locations where measures to protect vegetation would be required, such as protective matting or fencing.

4.2.5 In general, waste generated from vegetation clearance would be removed from site in accordance with Appendix C (Site Waste Management Plan) of the CEMP. Subject to landowner agreement, some logs and vegetation may be used to create replacement hibernacula and refugia to mitigate habitat loss to reptiles and amphibians, in accordance with Commitment G53 and as set out within the EPS licences. Some vegetation may also be chipped and left on site, subject to landowner agreement.

4.3 Vegetation and Tree Retention

4.3.1 The overarching aim would be to *'retain vegetation where practicable and in accordance with, as a minimum, the vegetation retention drawings'* (Commitment G91). Table 4.2 includes the key project commitments that are relevant to retention of existing vegetation which would be implemented when developing the Vegetation Retention and Removal Plans.

4.3.2 In accordance with Commitment G85, the working area would be appropriately fenced. The fencing may serve more than one function, for example delineating the working area and protection of trees. The choice of fencing would be decided relevant to the work location in accordance with BS 5837:2012. Provision of additional fencing on a site by site basis may be used to reduce the potential for impacts on wildlife and trees. Fencing would be regularly inspected and maintained and removed as part of the demobilisation unless otherwise specified. The ECoW and arboriculturalist will contribute to discussions on appropriate signage and/or fencing to protect environmentally sensitive features, including RPAs.

4.3.3 Tree Protection Fencing types would include:

- Level 1 Protection: This will be used to protect important trees within areas of high construction activity. It could include braced Heras-type panels with signage. It may include solid hoarding in areas where it provides a combined function of protecting trees and providing security and screening;
- Level 2 Protection: This will be used to reduce the risk of construction encroachment such as at the edge of the working area. This may include rigid pedestrian barriers; and
- Level 3 Protection: This will be used in areas with a low risk to trees such as marking the RPA of trees lying outside of the working area. This may include

orange netting on steel pins to mark out the extent of the RPA for trees beyond the working area.

- 4.3.4 Physical barriers will not be provided where retained vegetation is in a location where there is a very low risk of accidental damage being caused, for example at the top of a steep cutting where the cutting itself provides protection. Where other temporary fencing is provided, for example great crested newt fencing, this may provide suitable protection, although further signage will be added.
- 4.3.5 As well as delineating the site, the working area fencing would serve to protect the trees that lie outside of the working area.

Table 4.2: Good Practice Measures in Relation to Retention of Vegetation

Commitment number	Commitment
O1	Commitment to only utilise a 10m width when crossing through boundaries between fields where these include hedgerows, trees or watercourses.
G40	Where sensitive features are to be retained within or immediately adjacent to the Order Limits, an appropriate buffer zone would be created where this extends within the Order Limits. The buffers would be established using appropriate fencing and signage. Suitable methodologies would be produced to ensure that construction works are undertaken in a manner that reduces the risk of damage or disturbance to the sensitive feature.
G51	Where works in wet heath would be unavoidable, effects on soils and surface vegetation would be reduced through the use of ground protection matting and use of appropriate machinery.
G52	Adder and sand lizard hibernacula would be retained and protected during construction where practicable. If unavoidable, the removal of vegetation and groundworks at hibernacula would be timed to avoid the hibernation season.
G57	Earth banks within SSSIs which are likely to be of importance for common reptiles and invertebrates would be avoided and protected, where practicable. If their removal is unavoidable during construction, the banks should be reinstated.
G65	Working widths would be reduced in specific locations where trees or hedges are present. Where notable, TPO, Ancient Woodland and veteran trees would be retained within or immediately adjacent to the Order Limits, the trees and their root protection areas would be protected where they extend within the Order Limits and are at risk. This would be by means of fencing or other measures.
G86	Works to notable, TPO and veteran trees, where at risk of damage, would be supervised by the ECoW and supported by an experienced arboriculturalist.
G91	The contractor(s) would retain vegetation where practicable and in accordance with, as a minimum, the vegetation retention drawings.
G95	The contractor(s) would apply the relevant protective principles set out in the British Standard 5837:2012 Trees in relation to design, demolition and construction. This would be applied to trees within the Order Limits which would be preserved through the construction phase, and to trees outside of the Order Limits where such measures do not hinder or prevent the use of the relevant working width for construction.
G131	River bank and in-channel vegetation would be retained where not directly affected by installation works.
G174	Buildings, structures and trees within the Order Limits, confirmed to have high or moderate potential to support bats, that do not require removal, would be retained and protected with an appropriate buffer zone. Those that require removal and have high or moderate potential for bat roosts would be surveyed prior to their removal and either removed or removed under licence from Natural England if roosts are confirmed to be present.



Commitment number	Commitment
G175	For trenchless crossings TC001 to TC015, TC019, TC021 to TC028, TC030 to TC040, vegetation would be retained except where emergency access is required to trenchless equipment or ecological works have been proposed. At TC029 vegetation would be retained to the east of Hardwick Lane but not to the west side due to the requirement for access. At TC016, TC017 and TC018, there would be limited removal of vegetation along the alignment of the existing pathway to allow for pipe stringing.

Retention and Protection of Woodland and Trees

Extract taken from the CoCP (Section 2.11)

Site preparation:

- All tree surgery works necessary for the project will be carried out prior to the commencement of site operations unless otherwise agreed. All works will be carried out in accordance with BS3998: 2010, Tree Work – Recommendations.
- Prior to the commencement of any works the appointed arboriculturist will set out the Construction Exclusion Zone (CEZ). The CEZ is defined as the area of the root protection area that all works, and access are not permitted within. The CEZ will be delineated with the use of exclusion fencing
- Where the entire RPA cannot be protected due to restricted space or agreed works within the area then suitable ground protection will also be necessary. Section 6.2.3.3 of BS5837: 2012 sets out the requirements for ground protection and states that the level of protection should be capable of supporting any traffic entering the area. This may be scaffold boards for pedestrian movements, or a proprietary system capable of supporting loads of several tons.
- Once all protection measures are in place a photographic record will be taken and these measures will remain in place until works in the area are completed.
- Where works are beyond RPAs and a considerable distance from trees the RPA will be marked out using orange pedestrian fencing to highlight the prohibited area.

No alterations in soil levels other than those already agreed, will occur within the CEZ without prior agreement from the appointed arboricultural consultant.

No materials, vehicles, plant or personnel will be permitted into the CEZ at any time without prior consent from the arboricultural consultant. Where pipeline installation is required within RPAs, manual excavation will be used as described in section 7.2 of BS5837:2012.

4.3.6 When crossing woodland, the working area would typically be reduced to 15m wide. Trees not being retained would be removed from the working area. As with typical woodland management, the trees would generally be coppiced to ground level with the tree stumps left *in situ* to allow for rapid regrowth, to reduce the ground disruption and for ecological value (for invertebrates during decomposition), providing this does not impede the use of the working area. Additional scrub and ground cover may also need to be cleared beneath the canopy of trees in woodland areas and retained woodland, to allow access for the pipeline installation.

4.3.7 The Order Limits have been defined to avoid Ancient Woodland and Veteran Trees, where practicable. Where works are located near to Ancient Woodland (including potential ancient woodland) and Veteran Trees (including potential veteran trees), these will follow the mitigation principles set out in Appendix C and this has been reflected in the Vegetation Retention and Removal Plans. Appendix C has been developed having regard to the joint standing advice from Natural England and the

Forestry Commission (2018) 'Ancient woodland, ancient trees and veteran trees: protecting them from development'.

- 4.3.8 Appendix C sets out the agreed mitigation hierarchy for the protection of Ancient (and potential ancient) Woodland and Veteran (and potential veteran) Trees. Appendix C also identifies which trees fall within each tier of the mitigation hierarchy, as also indicated on the Vegetation Retention and Removal Plans.
- 4.3.9 In most cases, there is sufficient space to locate the pipeline trench outside of the 15m buffer around the designated trees. In a small number of cases, this is not practicable due to engineering or other environmental constraints and construction working and/or the pipeline trench would need to be located within the RPA. Where avoidance of the RPA is not practicable, specialist construction measures would be adopted, as set out in Appendix D. If any additional Veteran Trees are added to the Woodland Trust Inventory ahead of site works, the mitigation hierarchy would be applied in the same way. The Vegetation Retention and Removal Plans show the buffer applied to each area of known Ancient Woodland, potential ancient woodland, Veteran Tree and potential veteran tree.
- 4.3.10 Commitment G65 states that *'working widths would be reduced in specific locations where trees or hedges are present. Where notable, TPO, Ancient Woodland and veteran trees would be retained within or immediately adjacent to the Order Limits, the trees and their root protection areas would be protected where they extend within the Order Limits and are at risk. This would be by means of fencing or other measures'*. In addition, *'works to notable, TPO and veteran trees, where at risk of damage, would be supervised by an Environmental Clerk of Works (ECoW) and supported by an experienced arboriculturalist'* (Commitment G86).
- 4.3.11 For all other trees, *'the contractor(s) would apply the relevant protective principles set out in the British Standard 5837:2012 Trees in relation to design, demolition and construction. This would be applied to trees within the Order Limits which would be preserved through the construction phase, and to trees outside of the Order Limits where such measures do not hinder or prevent the use of the relevant working width for construction'* (Commitment G95).
- 4.3.12 There are ongoing site surveys being undertaken to map trees within the working area and to identify the RPAs. All trees to be retained (as indicated on the Vegetation Retention and Removal Plans) will be protected during construction to reduce the risk of accidental damage and compaction of roots.
- 4.3.13 The Vegetation Retention and Removal Plans show the RPAs for surveyed trees, including notable trees. The RPAs would be delineated with fencing during construction. The RPA may be identified using tree groupings rather than individual trees. In this case, an arboriculturalist will calculate the RPA based on the largest stem diameter. The RPA for all retained trees within the working area (or where roots are likely to extend into the working area) will be delineated on site prior to works commencing. This will be undertaken in discussion with an arboriculturalist, with site checks undertaken by the ECoW.



- 4.3.14 Where trees are to be retained, works would be undertaken outside of the RPA where practicable. Where some encroachment into the RPAs of retained trees is unavoidable, an arboriculturalist will assess and specify temporary ground protection if deemed necessary to avoid compaction. This will be based upon the extent of encroachment into the RPA (area or linear length), the duration of the works and the type of work to be carried out. The specified ground protection will be suitable for the level of encroachment and type of traffic in accordance with section 6.2.3 of BS 5837:2012 and the area will be made good once the ground protection is removed. This area would be indicated on the Vegetation Retention and Removal Plans. Appendix D contains a methodology outlining how the works would be undertaken within RPAs where required. The location of protection measures, such as ground matting, is indicated on the Vegetation Retention and Removal Plans.
- 4.3.15 Crown lifting or pruning may be required to some trees and overhanging vegetation, to reduce the risk of further damage. This would be undertaken by a qualified contractor and advised by an arboriculturalist.
- 4.3.16 The working method near trees will take into account installation requirements, such as working space, soil type and construction activities, and site constraints, such as proximity to services, watercourses or archaeology.

Protection of Watercourses

Extract taken from the CoCP (Section 2.9)

Fencing along the outside of the working area will be narrowed at this point to ensure no encroachment onto the watercourse banks beyond the 10m width. The fencing would not be placed down the bank or within the watercourse.

In-stream vegetation within the crossing area would be temporarily translocated within the watercourse slightly upstream or downstream of the works and will be returned to its original position as part of the reinstatement. The bed material will also be stored separately and used for reinstatement.

Only the bank vegetation within the working width will be removed to reduce biodiversity impacts and fragmentation. The species mix will be recorded by the Environmental Clerk of Works so that it can be reflected in the reinstatement, as appropriate.

[Upon completion], the instream vegetation will be removed from its temporary location and returned to this section of the watercourse. The banks of the watercourse will be replanted and reseeded as part of the reinstatement plans contained within the LEMP. The area of bank reinstatement will be covered with hessian which will encourage plant establishment and reduce the risk of soil erosion. The hessian will naturally degrade in situ as the vegetation grows back.

- 4.3.17 The crossing of major rivers by the project would be undertaken using trenchless methods in accordance with overarching Commitment O5: '*Trenchless crossing technology to be used for crossings of waterways over 30m wide*'. A construction methodology has been set out in the CoCP to describe how the remaining watercourses would be crossed using open cut methods. This includes Commitment O1, '*to only utilise a 10m width when crossing through boundaries between fields where these include watercourses*'. River bank and in-channel vegetation would be

retained where not directly affected by installation works (G131). Such works will also be in accordance with approvals from the Environment Agency or Lead Local Flood Authorities as per the protective provisions in Schedule 9 of the DCO.

- 4.3.18 In addition, appropriate buffer zones would be established within Order Limits adjacent to identified watercourses (G39). These are indicated on the Vegetation Retention and Removal Plans by showing the 10m working area as per Commitment O1. The buffer zone would be set out following the method set out within the CEMP, Appendix B Water Management Plan.

Retention and Protection of Ecological Features

- 4.3.19 Measures to retain and protect features specific to protected species are set out in the Protected and Controlled Species Legislation Compliance Report (Appendix 7.17 of the ES (**Application Document APP-101**)) and would be confirmed in the EPS licences. These measures are not shown on the Vegetation Retention and Removal Plans but where known, have been taken into account during the development of these plans. Further details would be set out within the relevant EPS licence and the protection of such features would be determined on site under supervision of the ECoW and an ecologist.
- 4.3.20 Known ecologically sensitive features, such as priority habitats and rare species are indicated on the Vegetation Retention and Removal Plans, which show locations where topsoil stripping would be reduced or where matting is required. In addition, further checks prior to construction may identify additional site-specific ecological features that would be retained and protected during construction, where practicable. This will include the identification of reptile hibernacula in accordance with the following commitment:
- Commitment G52: *'Adder and sand lizard hibernacula would be retained and protected during construction where practicable. If unavoidable, the removal of vegetation and groundworks at hibernacula would be timed to avoid the hibernation season.'*

Retention and Protection of Hard Landscape Features

- 4.3.21 Where existing hard landscape features lie within the Order Limits, such as walls, paths or street furniture, such features will be protected during construction where practicable. Where it is not practicable to retain such features, these will be removed from the working area and, where appropriate, stored to allow reinstatement following the works, or replaced with new. Details will be recorded about the location of the feature(s) to aid reinstatement following construction. Details of key features, such as those in publicly accessible areas, are shown on the Vegetation Retention and Removal Plans and the Landscape and Ecological Reinstatement Plans.

Retention and Protection of Specific Features

- 4.3.22 Archaeological trial-trenching is being undertaken in advance of the main works to assist in identifying the extent of archaeology. This may result in archaeological mitigation in accordance with Requirement 11 of the DCO which would comprise

either a full or sample excavation; strip, mapping and sample prior to construction, or an archaeological watching brief during construction (G68).

- 4.3.23 Where appropriate, topsoil stripping will be monitored by an archaeologist in order that any archaeological features uncovered during topsoil removal can be investigated in accordance with the Archaeological Written Scheme of Investigation.

4.4 Vegetation and Tree Removal

General Approach to Removal of Vegetation

- 4.4.1 The Vegetation Retention and Removal Plans show the locations where vegetation will be removed. A record would be made of the species types, approximate age and size to inform the reinstatement in line with the specification tables in Appendix B.
- 4.4.2 The vegetation clearance will be supervised by the ECoW and supported by an experienced arboriculturalist at locations where tree works are required to notable, TPO and Veteran Trees (in accordance with Commitment G86).

Woodland and Tree Removal

Extract taken from the CoCP (Section 2.10)

When crossing woodland, the detailed design process would seek to reduce the working area to 15m wide although this could be narrowed to as little as 10m.

Trees not being retained will be removed from the working area. These will be cut down to ground level by a specialist contractor. As with typical woodland management, tree stumps will be left in situ, to reduce the ground disruption and for ecological value (for invertebrates during decomposition), providing this does not impede the use of the working area.

Stumps and topsoil will be removed from the area required for the trench.

Landowners retain rights over felled timber and the method of disposal will require agreement of the landowner. Typically, timber can be used within the woodland for habitat creation, nearby ecological or community projects, or it is recycled.

The Environmental Clerk of Works and arboriculturalist will provide advice when any works to trees such as branch removal are required.

- 4.4.3 All tree works will be carried out by a specialist contractor. Where trees and shrubs are removed to facilitate construction access but do not lie within the direct route of excavation, these may be coppiced to allow rapid regeneration. Where trees are removed within the direct route of excavation, stumps shall be ground out or excavated using a tracked excavator. Details of the location of trees to be removed are shown on the Vegetation Retention and Removal Plans.
- 4.4.4 Where working beneath trees is unavoidable the introduction of height barriers may be necessary if pruning cannot provide sufficient height clearance. This will prevent damage to overhead branches within wooded areas.

Hedgerows

Extract based on Section 2.12 of the CoCP

The working area would be reduced to a maximum of 10m in width (O1).

Within the typical 36m Order Limits, and taking account of other local considerations, the detailed design will select the least impactful 10m width to use within the Order Limits, to take advantage of gaps within an existing hedge, or reduce the number of trees removed where possible. For example, if there is a tree within the hedgerow, installation will seek to retain the tree by positioning the working area to the side. Similarly, utilising existing gaps or entrances already within the hedgerow will reduce the amount of vegetation to be removed.

Tree felling and removal will be undertaken by a specialist contractor. Fencing of the working area will be continuous when crossing a hedgerow, creating a barrier between the retained hedge and the working area and taking account of the Root Protection Area (RPA) where practicable.

Topsoil will be stripped from the working area. If the haul road crosses the RPA of the retained hedge, appropriate ground protection such as matting will be used.

On completion of the works, dead hedging will be installed for all hedges to restore ecological connectivity until permanent reinstatement can be undertaken.

- 4.4.5 The Vegetation Retention and Removal Plans show the extent of hedge to be removed consistent with Commitment O1, 'to only utilise a 10m width when crossing through boundaries between fields where these include hedgerows, trees or watercourses'. Where practicable the selection of the location has been based on the least impactful 10m width, taking into account other local considerations. For example, taking advantage of existing gaps within a hedge.
- 4.4.6 Where hedgerows lie within the Order Limits but are not crossed by the pipeline alignment, these would be protected, with the RPA being delineated and works occurring outside of the RPA where practicable.

4.5 Ecological Considerations

- 4.5.1 Specific measures relating to protected species will be set out within the final licences which will be approved by Natural England.
- 4.5.2 All habitats suitable for common reptiles would be subject to two-stage habitat manipulation between mid-March and mid-October. Firstly, vegetation would be cut to approximately 150mm (with the arisings removed) under the supervision of an ECoW and the site left for a minimum of two days to allow reptiles to move away from the area. Secondly, vegetation would be cleared down to ground level under the supervision of an ECoW. Vegetation clearance would be achieved using appropriate equipment based on the type of vegetation to be removed, the area affected and the risk of killing or injuring reptiles. Construction works could commence immediately after completion of the second stage (Commitment G196).

4.6 Turf Stripping

4.6.1 Turf stripping is proposed at golf courses and sports pitches (see Section 2.14 of the CoCP) and also at species-diverse priority habitats where natural regeneration would not be suitable. Turf stripping allows a quicker time for reinstatement and will be undertaken at the following locations within East Hampshire District (as shown on the Vegetation Retention and Removal Plans and also on the Landscape and Ecological Reinstatement Plans):

- Sports pitches and golf courses: Typically, the only area that would require topsoil to be removed would be the area directly above the trench to reduce the impact and reinstatement time. In such areas, the turf would be removed and stored before being re-laid following pipeline installation. Further details can be found in the construction methodology for Sports Pitches and Golf Courses in Section 2.14 of the CoCP.

4.6.2 In locations where turf stripping is proposed, topsoil would only be removed from the area directly above the pipeline trench. Ground protection would be used to evenly distribute the load from vehicles and machinery for the rest of the working area. The type of ground protection would be selected, either matting, timber, metal, rubberised or similar, dependent on the ground conditions and the machinery/plant being used.

4.6.3 Turf would be removed from the trench and the topsoil and subsoil would be stored (separately) away from the trench in a suitable location. Once the pipe has been installed, the subsoil and topsoil would be replaced. Backfilling may be undertaken in several layers, around 150mm at a time. This is to provide a level and even compression of the soils, and thus a flat reinstated surface.

4.6.4 In sports pitches and golf courses the existing turf may be re-laid or alternatively, reinstatement could be achieved through seeding or turfing with new turf, with like-for-like species of grass, in accordance with Sport England's guidance 'Natural Turf for Sport' 2011, or to the specification given by the landowner, using a specialist sports turf contractor. The locations of turf storage would also be agreed on site. For all turf stripping locations, the reinstatement method would be agreed with the landowner or tenant and this would involve the use of specialist contractors where required.

4.7 Transplantation

4.7.1 In accordance with Commitment G89, '*appropriate techniques would be used for the removal, storage and transplantation of any vegetation which is to be reused, relocated or transplanted*'.

4.7.2 The Phase 1 Habitat Survey (**Application Documents [APP-080](#) and [APP-081](#)**) identified locations of particularly species-diverse priority habitat where natural regeneration would not be suitable. In these locations, translocation (and turf stripping as outlined in Section 4.6) is proposed to retain the diverse seedbank and allow quicker establishment of land use following construction.



4.7.3 Where practicable, in-stream vegetation at watercourse crossings would be temporarily translocated within the watercourse slightly up or downstream of the works and will be returned to its original position as part of the reinstatement. The bed material will also be stored separately and used for reinstatement. Specific plants would be identified during the pre-construction checks and the temporary locations agreed on site with the ECoW. Further details can be found in the construction methodology for watercourses in the CoCP.

4.7.4 **Invasive Non-Native Species**

4.7.5 Existing survey work has identified the presence of INNS at the locations listed within Section 3.3. In areas where Schedule 9 plant species or other INNS are identified, the proposed working method would be discussed with the ECoW and supported by an ecologist. Where required, vegetation would be removed from the site in accordance with the CEMP, Appendix C Site Waste Management Plan.

5 Landscape and Ecological Reinstatement

5.1 Introduction

- 5.1.1 This section sets out the general principles for how reinstatement would be undertaken on the project. It includes the reinstatement of hard landscaping features such as walls and fences. It also covers soft landscaping, including the reinstatement of vegetation that has been removed and reinstatement of habitat areas.
- 5.1.2 Requirement 8 of the DCO states that '*the reinstatement of all vegetation must be undertaken in accordance with a written plan of reinstatement to be prepared by the undertaker in accordance with paragraph (2). The written plan of reinstatement referred to in sub-paragraph (1)(b) must form part of the LEMP approved in accordance with Requirement 12 (landscape and ecological management plan)*'.
- 5.1.3 Appendix B contains the Landscape and Ecological Reinstatement Plans, which are based on the intended pipeline alignment and show locations where specific measures would be applied. These are based on the examples of the Landscape and Ecological Reinstatement Plans provided during Examination.
- 5.1.4 The final Landscape and Ecological Reinstatement Plans show:
- existing features retained;
 - location of key hard landscaping features to be reinstated, such as walls and fences and surfacing of paths within public parks;
 - vegetation, including hedges and trees, to be replanted with reference to types and sizes; and
 - landscape and ecological mitigation measures, for example provision of hedge infilling for dormice.

5.2 General Reinstatement Proposals

- 5.2.1 The LEMP includes reference to the Staging Plan, which sets out the implementation timetable of reinstatement for the work within East Hampshire District. Reinstatement would be undertaken in the first available planting season following completion of installation of the pipeline.
- 5.2.2 The general principle of reinstatement on the project is that '*Land used temporarily would be reinstated to an appropriate condition relevant to its previous use*' (Commitment G94). Reinstatement would be on a like-for-like basis, unless specified otherwise in the Landscape and Ecological Reinstatement Plans in Appendix B.
- 5.2.3 Reinstatement tree planting would be undertaken in accordance with G200. Where practicable, this will be in the same location or in close proximity to the tree that has been removed. In some locations existing constraints or the location of the pipeline easement may preclude planting in close proximity, in which case the planting would be undertaken as close as possible to the original location (and still within the Order

Limits). Reinstatement planting is shown on the Landscape and Ecological Reinstatement Plans in Appendix B. Further commitments in relation to reinstatement are included in Table 5.1.

Table 5.1: Good Practice Measures for Reinstatement

Commitment number	Commitment
G53	Replacement hibernacula and refugia would be provided within the Order Limits to mitigate habitat loss to reptiles and amphibians.
G55	Individual plants of creeping willow (<i>Salix repens</i>) and common wintergreen (<i>Pyrola minor</i>) at Bourley and Long Valley SSSI and Chobham Common SSSI, where likely to be affected by construction, would be translocated into suitable receptor locations within the Order Limits where practicable. The location of the receptor site would be determined by the ECoW and protected by an appropriate buffer during the pipeline construction period.
G56	Alternative roost structures (bat boxes) would be provided (with landowner consent) on retained trees within the Order Limits. Three boxes would be provided for all trees with moderate bat roost potential to be felled. Five boxes would be provided for all trees with high bat roost potential to be felled.
G58	Barn owl boxes would be provided for barn owls as necessary. Two boxes per roost would be positioned a minimum of 40m away from the likely construction zone of disturbance.
G62	Vegetation arisings would be disposed of responsibly. Small quantities may be reused on site to create ecological habitat.
G88	Where possible, reinstatement of vegetation would generally be using the same or similar species to that removed (subject to restrictions for planting over and around pipeline easements).
G93	Hedgerows, fences and walls (including associated earthworks and boundary features) would be reinstated to a similar style and quality to those that were removed, with landowner agreement.
G94	Land used temporarily would be reinstated to an appropriate condition relevant to its previous use.
G97	Where woodland vegetation is lost and trees cannot be replaced due to the restrictions of pipeline easements, native shrub planting approved by Esso would be used as a replacement, in accordance with the vegetation reinstatement plans to be approved by the relevant planning authorities as part of the LEMP. The approved vegetation reinstatement plan will also include replacement tree planting where appropriate.
G200	Trees that are removed as a result of the construction of the project will be replaced on a one for one basis in accordance with the vegetation reinstatement plans approved under the LEMP. Where possible, replacement tree planting will be located in close proximity to the original tree. It should be noted that such tree reinstatement would not apply to areas where tree removal is for habitat improvement reasons, such as at Chobham Common and this has been agreed with Natural England and the relevant landowners.
HRA1	Heathland within statutory or non-statutory designated wildlife sites would be reinstated using natural regeneration, unless otherwise agreed with Natural England.
HRA2	At heathland SSSIs, targeted scrub and secondary woodland within the Order Limits would be removed. Subject to landowner consent, these areas would be reinstated as heathland or acid grassland through natural regeneration.

5.2.4 The Landscape and Ecological Reinstatement Plans will be discussed with the relevant landowner (and, where appropriate, tenant). This will be to confirm the suitability of proposed planting, the specification of hard landscape features such as fences and walls (based on like-for-like reinstatement) and will also include discussions about the acceptability with the landowner of the planting once the five-

year aftercare period has been completed. Where there is reinstatement on a private property, the final placement would be agreed with the landowner.

5.2.5 The proposed reinstatement is shown on the Landscape and Ecological Reinstatement Plans in Appendix B. The planting proposals have followed the following principles:

- Trees and shrubs will be of local provenance and shall be supplied in accordance with BS 8545:2014 Trees: from nursery to independence in the landscape (British Standards Institution, 2014). Exceptions may include urban or park environments, where ornamental species may be more appropriate. The proposed species and sizes are shown in Appendix B.
- Reinstatement planting, including any subsequent replacement of failed planting, shall be carried out in the first available planting season. For example, tree and scrub planting would typically be undertaken between November and the end of March, avoiding periods of frosts, extreme cold and waterlogged conditions.
- Planting shall be undertaken by an appropriately experienced landscape contractor, in accordance with good horticultural practice and the following current British Standards:
 - BS 4428:1989 Code of practice for general landscape operations (British Standards Institution, 1989); and
 - BS 8545:2014 Trees: from nursery to independence in the landscape (British Standards Institution, 2014).
- Tree and shrub planting areas will initially be protected to shield young trees from browsing rabbits and deer during establishment, for example using tree/shrub shelters or fencing.

5.2.6 The proposed species mixes and typical stock sizes for the main planting reinstatement types are set out in the table in Appendix B and are cross-referenced on the relevant reinstatement plan. These generally reflect existing species compositions and habitat types (see ES Appendix 7.1 (**Application Documents APP-080 and APP-081**)) and ES Figure 7.4 (**Application Document APP-061**) for further details) where these were considered appropriate. Alternative mixes have been set out in some locations, as shown on the plans, where alternative species are considered more appropriate. Alternative species mixes have been proposed in areas where the current site conditions (including habitats and drainage) may have changed in recent years; where the existing planting includes INNS that would be inappropriate to reinstate; or where there are existing species at risk of pests and diseases (such as ash dieback).

5.2.7 It may be difficult to purchase proposed species mixes and stock sizes set out within the LEMP. If during implementation, there are difficulties with sourcing the planting species and sizes specified, a discussion would be held with the East Hampshire District Council regarding alternative species or sizes.



5.3 Reinstatement of Woodland and Trees

- 5.3.1 Following construction, areas of woodland that were removed would be reinstated using the same or similar species to those removed. Where tree species cannot be used due to the restrictions of the 6.3m wide pipeline easement, native shrub understorey/edge planting would be used. Reinstatement woodland and tree planting would typically be undertaken between November and the end of March, avoiding periods of frosts, extreme cold and waterlogged conditions.

Reinstatement of Hedgerow and Woodland Field Boundaries

- 5.3.2 The construction methodology for hedgerows in the CoCP (and within Section 4.4 of the LEMP) sets out how construction would be undertaken in hedgerows and woodland field boundaries. Following construction, hedgerows and woodland field boundaries that were removed would be reinstated using the same or similar species to those removed. Where tree species cannot be used due to the restrictions of the 6.3m wide pipeline easement, native shrub would be used.
- 5.3.3 Hedgerows will typically be planted at 300mm centres in a double staggered row 450mm apart, with tree species randomly incorporated where appropriate. However, where the pipeline installation requires removal of 10m of hedge, trees will not be replaced over the 6.3m pipeline easement but will be located either side of this area (in the remaining 3.7m). The reinstated hedgerow will be boxed with stockproof post and rail to protect the plants until they established. In addition, dead hedging will be installed for hedgerows to restore ecological connectivity until permanent reinstatement can be undertaken.
- 5.3.4 A proportion of tree species within hedgerows would be planted as feathered stock to help establish hedgerow tree forms. The proportion of feathered tree species within reinstatement hedgerow planting is set out within the specification in Appendix B. A higher proportion of feathered tree species has been used for reinstatement of woodland field boundaries compared to a hedgerow, to establish a replacement tree line/woodland belt.

Reinstatement of Individual Trees

- 5.3.5 Where individual mature trees may need to be removed they will be replaced with a mix of feathered and extra heavy trees using the species listed in Appendix B, which has drawn on the baseline information from the arboricultural surveys.
- 5.3.6 The depth and size of topsoil pit for tree planting shall be appropriate to the stock size of tree to be planted and in accordance with BS 8545:2014 Trees: from nursery to independence in the landscape (British Standards Institution, 2014).

5.4 Reinstatement of Grassland

- 5.4.1 Areas of grassland and verges disturbed by construction activities outside of the areas identified for natural regeneration, will be reinstated by seeding of an appropriate grass mix suited to the existing soil conditions and site use. Seed is best sown in the autumn or spring, but can be sown at the other times of the year if there

is sufficient warmth and moisture. The Landscape and Ecological Reinstatement Plans in Appendix B show the land use type and proposed species mix composition within the accompanying specification.

5.5 Reinstatement of Hard Landscaping

5.5.1 Commitment G94 states that '*Land used temporarily would be reinstated to an appropriate condition relevant to its previous use*'. This assumes that in general, hard landscaping features, such as footpaths, walls or bank features would be reinstated or replaced on a like-for-like basis. This includes earth banks and hibernacula that were temporarily dismantled during construction. Like-for-like reinstatement has been assumed when developing the Landscape and Ecological Reinstatement Plans in Appendix B, and therefore only key features or those where reinstatement may be different than existing, are indicated on the plans.

5.6 Ecological Habitat Creation and Improvements

5.6.1 A number of Environmental Mitigation Areas (EMA) have been identified and are shown in the General Arrangement Plans to the DCO. The EMAs have been secured within the Order Limits to provide sufficient area for undertaking the good practice measures and mitigation identified within the ES, HRA Report (**Application Documents [APP-130](#) and [APP-131](#)**) and the draft European Protected Species (EPS) Licences.

5.6.2 The EMAs are areas where environmental mitigation work could be undertaken. As such, topsoil and subsoils will not be stripped from these areas, construction materials will not be stored in these areas and only light vehicles would be used for the mitigation work.

5.6.3 Some of the EMAs were included on a precautionary basis in case mitigation could not be accommodated within the working area and are not anticipated to be required. The specific measures required for provision of bat boxes (three boxes provided for all trees with moderate bat roost potential to be felled and five boxes for all trees with high bat roost potential to be felled) and great crested newt receptor ponds, will be set out in the EPS licences and are not duplicated in the LEMP.

5.6.4 The dormouse licence requires additional hedgerow planting and gapping up within the Order Limits (i.e. excluding the like-for-like habitat replacement where hedgerow removal is required) which will mitigate the effects of temporary habitat loss associated with the project. Locations for hedge infilling are shown on the Landscape and Ecological Reinstatement Plans in Appendix B to show the species types proposed.

5.6.5 Any activities identified within Esso's Environmental Investment Programme would be managed separately.

6 Aftercare

6.1 General Aftercare Commitments

- 6.1.1 As a general principle, at the end of installation, '*land used temporarily would be reinstated to an appropriate condition relevant to its previous use*' (Commitment G94). In many locations, the land would be handed back to the relevant landowner at the end of reinstatement. Where vegetation including woodland, hedgerows and trees have been planted as part of the reinstatement, these would have a five-year aftercare period in accordance with Commitment G92 and Requirement 8 of the DCO.
- 6.1.2 Requirement 8 states, '*any vegetation planting which is part of an approved reinstatement plan that, within a period of five years beginning with the date of planting, is removed, uprooted, destroyed, dies or (in the reasonable opinion of the relevant planning authority) becomes seriously damaged or defective, must be replaced with planting material of the same specification as that originally planted unless otherwise approved by the relevant planning authority and the landowner concerned*'.
- 6.1.3 Periodic checks would be undertaken by a suitably experienced professional to check reinstatement and to replace species that have not taken. The landscape contractor would prepare inspection reports as part of these visits.
- 6.1.4 Prior to the end of the five-year aftercare period, an interim final inspection shall be undertaken jointly with Esso and the landowner at which any final replacement planting required shall be agreed. Following the completion of any agreed replacement planting, a final inspection shall then be held as part of the completion of the aftercare, whereupon Esso shall cease to have any further maintenance obligation.
- 6.1.5 The following sub-sections set out the proposed aftercare arrangements based on planting/habitat type.

6.2 Woodland, Trees and Hedgerows

- 6.2.1 The five-year aftercare includes inspections by a suitably experienced professional for all reinstated woodland, hedgerows, woodland field boundaries and individual trees, to:
- check and record failing, dead or defective plants and replace any failed planting each year, between November and end of March;
 - re-firm plants and inspect, adjust or remove stakes, guards and ties as required;
 - apply herbicide to maintain weed-free plant circles around base of transplants and spot-treat undesirable species, having regard to any restrictions on use of herbicides in certain locations, for example, in proximity to watercourses or other sensitive habitats, or through agreement with the landowner; and
 - water individual larger specimen trees that have been planted, as required, during the five-year aftercare.



6.3 Pests and Diseases

- 6.3.1 The periodic checks of reinstatement planting would include a check for any obvious signs of pests or diseases, including ash dieback or reoccurrence of INNS. Any instances would be recorded on the quarterly inspection reports and appropriate action taken.



7 Ecological Monitoring

7.1 Monitoring in Relation to Protected Species

- 7.1.1 In addition, further measures may be required by the conditions of species licensing, as required by the licensing authority, Natural England. These would last for a minimum of one year but may extend to the full five years of aftercare.
- 7.1.2 The scope of the protected species monitoring would be set out in the final EPS licence applications and would be agreed with Natural England. This may include site checks to monitor the presence/absence of a species, or population-monitoring of a species. This would be used to determine the success of the mitigation undertaken. This would include nest-box checks for bats and dormouse and habitat creation checks of hibernacula and egg-laying substrate for amphibians, reptiles and invertebrate assemblages.
- 7.1.3 The monitoring requirements, including locations and frequency of inspections, would be set out within the finalised EPS licence applications and would be agreed with Natural England. Any corrective actions that may be required would be agreed with Natural England and implemented as required.



References

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

British Standards Institution (2012). BS 5837:2012 Trees in relation, demolition and construction. British Standards Institution, London.

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

Cranfield University (2019). LandIS. Accessed December 2019.
<http://www.landis.org.uk/soilscapes/index.cfm>

Forestry Commission and Natural England (2018). Ancient woodland, ancient trees and veteran trees: protecting them from development. Accessed 25 July 2019.
<https://www.gov.uk/guidance/ancient-woodland-and-veteran-treesprotection-surveys-licences>

Sport England (2011) Natural Turf for Sport Updated Guidance.



Appendices

- A. SSSI Working Plans – Not applicable to East Hampshire District Council
- B. Landscape and Ecological Reinstatement Plans
- C. Approach to Ancient Woodland and Veteran Trees
- D. Methodology for Working Near Trees



Appendix B: Landscape and Ecological Reinstatement Plans

NOTES

1. Intended pipeline alignment is indicative only.
2. These Landscape and Ecological Reinstatement Plans should be read in conjunction with the Landscape and Ecological Management Plan (LEMP) Report.

REINSTATEMENT SPECIES MIXES*

- T2** Individual tree planting for well drained clayey and silty soil.
- H2** Hedgerow mix for well drained clayey and silty soil.
- H3** Hedgerow mix for chalky soil.
- G1** Seed mix for improved grassland on well drained clayey and silty soil.
- G4** Seed mix for semi-improved grassland on chalky soil.

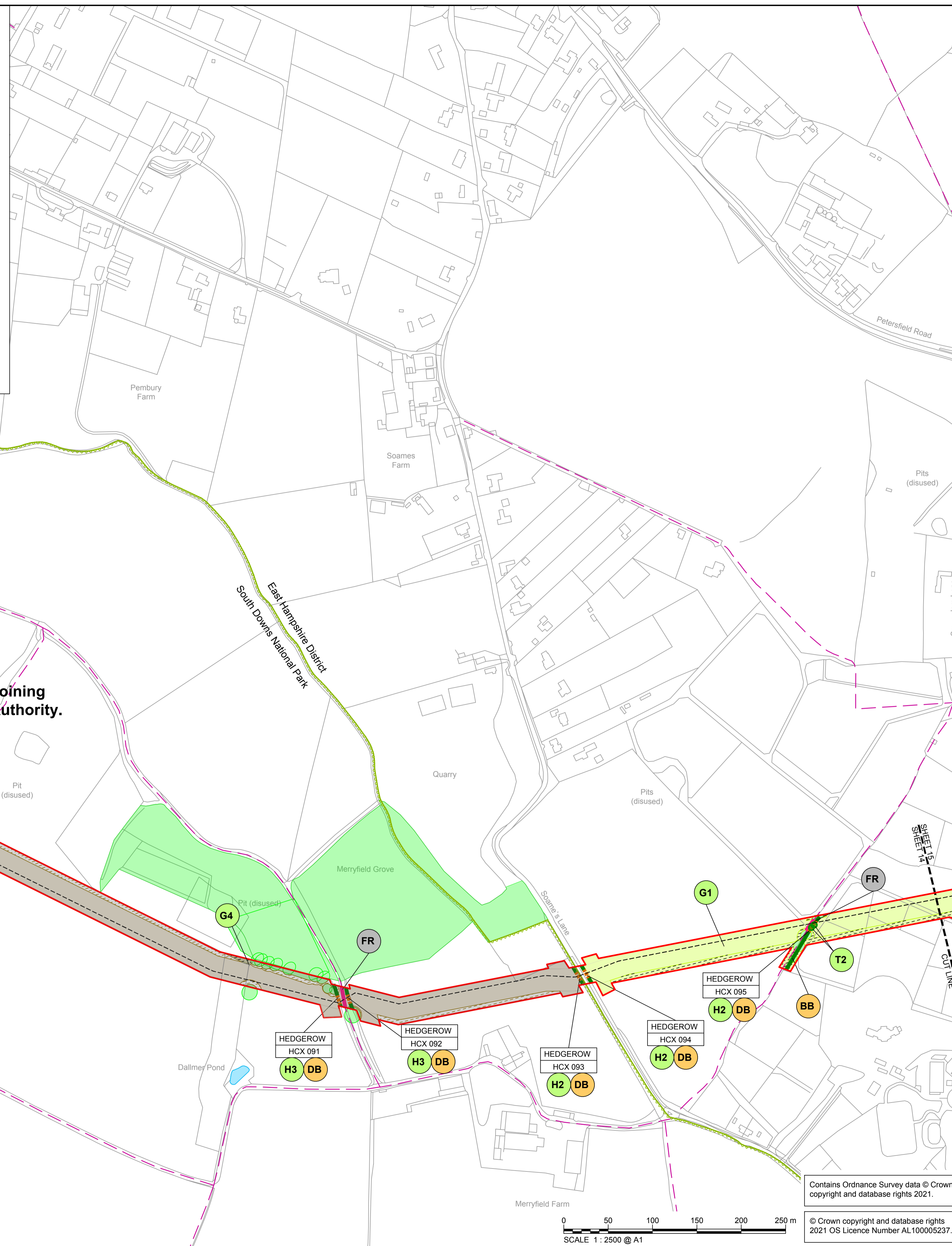
*Refer to the LEMP for reinstatement planting mixes.

OTHER REINSTATEMENT

- FR** Footpath to be reinstated to match existing.

ADDITIONAL ECOLOGY MITIGATION

- DB** Dormouse nest boxes to be placed at either end of retained hedgerow / within woodland within the Order Limits.
- BB** Bat boxes to be placed within Woodland.



For Approval by Adjoining Relevant Planning Authority.



LOCATION PLAN
SCALE 1:500,000

LEGEND

- ORDER LIMITS
- - - INTENDED PIPELINE ALIGNMENT
- SOUTH DOWNS NATIONAL PARK
- TREE PROTECTION ORDER (TPO)
- PUBLIC RIGHTS OF WAY
- PONDS
- EXISTING FEATURES TO BE RETAINED**
- POTENTIAL VETERAN TREES TO BE RETAINED (WITHIN 15M OF THE ORDER LIMITS)
- TREES AND WOODLAND TO BE RETAINED
- HEDGEROWS TO BE RETAINED
- IMPROVED GRASSLAND PASTURE TO BE RETAINED
- POOR SEMI-IMPROVED GRASSLAND TO BE RETAINED
- ARABLE LAND TO BE RETAINED
- FEATURES TO BE REINSTATED**
- TREES AND WOODLAND REINSTATEMENT PLANTING
- HEDGEROW REINSTATEMENT PLANTING
- REINSTATEMENT OF IMPROVED GRASSLAND PASTURE
- REINSTATEMENT OF SEMI-IMPROVED GRASSLAND
- ARABLE LAND TO BE MADE GOOD
- FOOTPATH TO BE REINSTATED TO MATCH EXISTING

Rev	Rev. Date	Purpose of revision	Drawn	Checked	Rev'd	Apprv'd
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LANDSCAPE AND ECOLOGICAL REINSTATEMENT PLANS SHEET 14B

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SHEET 13
SHEET 14

SHEET 15
CUTLINE

NOTES

1. Intended pipeline alignment is indicative only.
2. These Landscape and Ecological Reinstatement Plans should be read in conjunction with the Landscape and Ecological Management Plan (LEMP) Report.

REINSTATEMENT SPECIES MIXES*

- W2** Broadleaved woodland and woodland field boundary mix for well drained clayey and silty soil.
- H2** Hedgerow mix for well drained clayey and silty soil.
- G1** Seed mix for improved grassland on well drained clayey and silty soil.

*Refer to the LEMP for reinstatement planting mixes.

OTHER REINSTATEMENT

- FR** Footpath to be reinstated to match existing.

ADDITIONAL ECOLOGY MITIGATION

- DB** Dormouse nest boxes to be placed at either end of retained hedgerow / within woodland within the Order Limits.



LEGEND

- ORDER LIMITS
- INTENDED PIPELINE ALIGNMENT
- ANCIENT WOODLAND
- PUBLIC RIGHTS OF WAY
- PONDS
- EXISTING FEATURES TO BE RETAINED**
- POTENTIAL VETERAN TREES TO BE RETAINED (WITHIN 15M OF THE ORDER LIMITS)
- TREES AND WOODLAND TO BE RETAINED
- HEDGEROWS TO BE RETAINED
- IMPROVED GRASSLAND PASTURE TO BE RETAINED
- ARABLE LAND TO BE RETAINED
- FEATURES TO BE REINSTATE**
- TREES AND WOODLAND REINSTATEMENT PLANTING
- HEDGEROW REINSTATEMENT PLANTING
- REINSTATEMENT OF IMPROVED GRASSLAND PASTURE
- ARABLE LAND TO BE MADE GOOD
- FOOTPATH TO BE REINSTATE TO MATCH EXISTING

2.0	01/02/21	Final for issue	JS/RL	DR/LD	SK	SN
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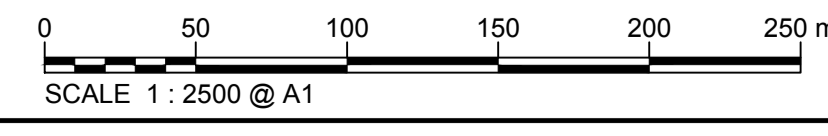
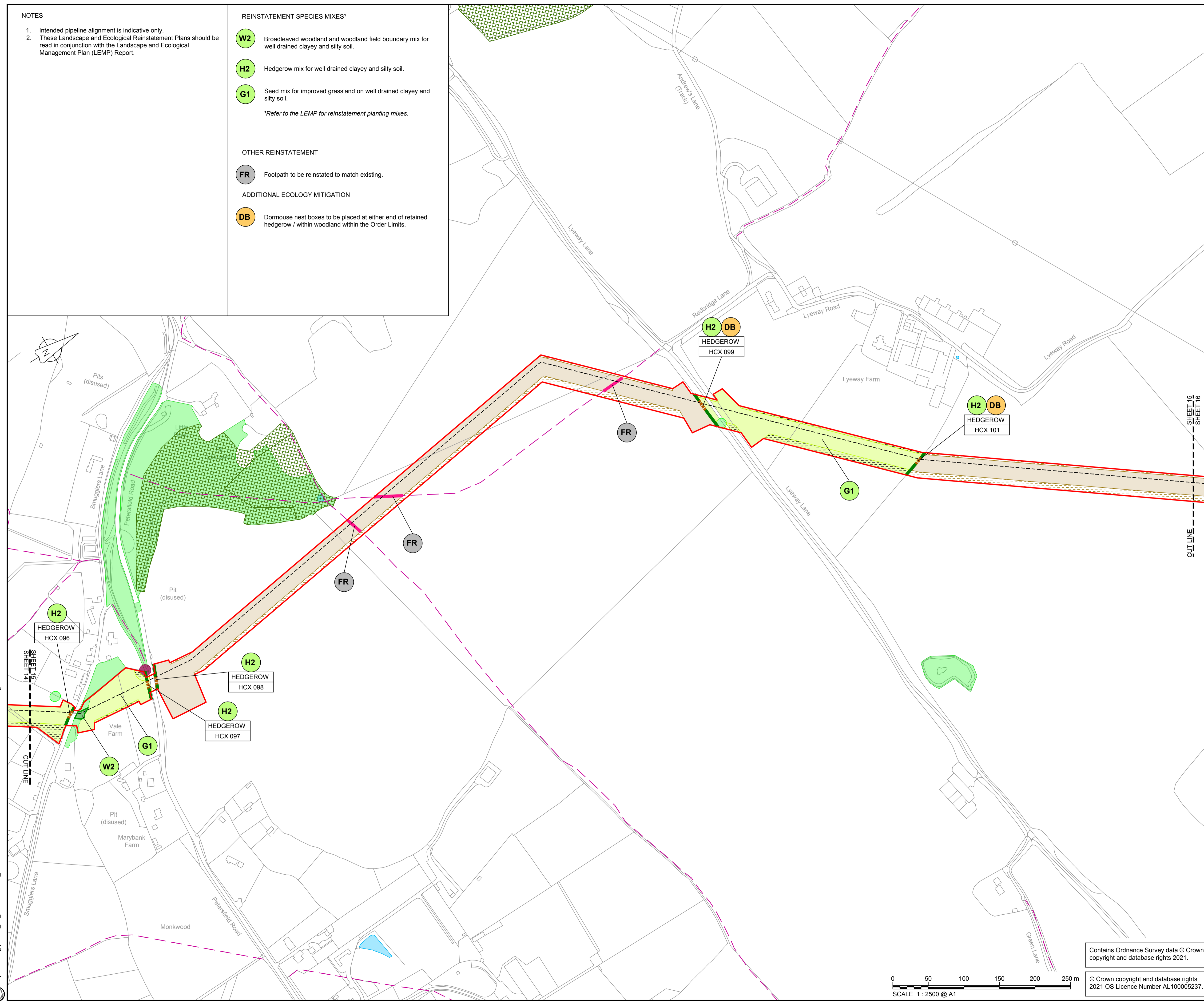
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LANDSCAPE AND ECOLOGICAL REINSTATEMENT PLANS SHEET 15

Drawing status: **Fit for Information**

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NOTES

- Intended pipeline alignment is indicative only.
- These Landscape and Ecological Reinstatement Plans should be read in conjunction with the Landscape and Ecological Management Plan (LEMP) Report.

REINSTATEMENT SPECIES MIXES*

- T2** Individual tree planting for well drained clayey and silty soil.
- H2** Hedgerow mix for well drained clayey and silty soil.
- G1** Seed mix for improved grassland on well drained clayey and silty soil.
- G5** Seed mix for semi-improved grassland on well drained clayey and silty soil.

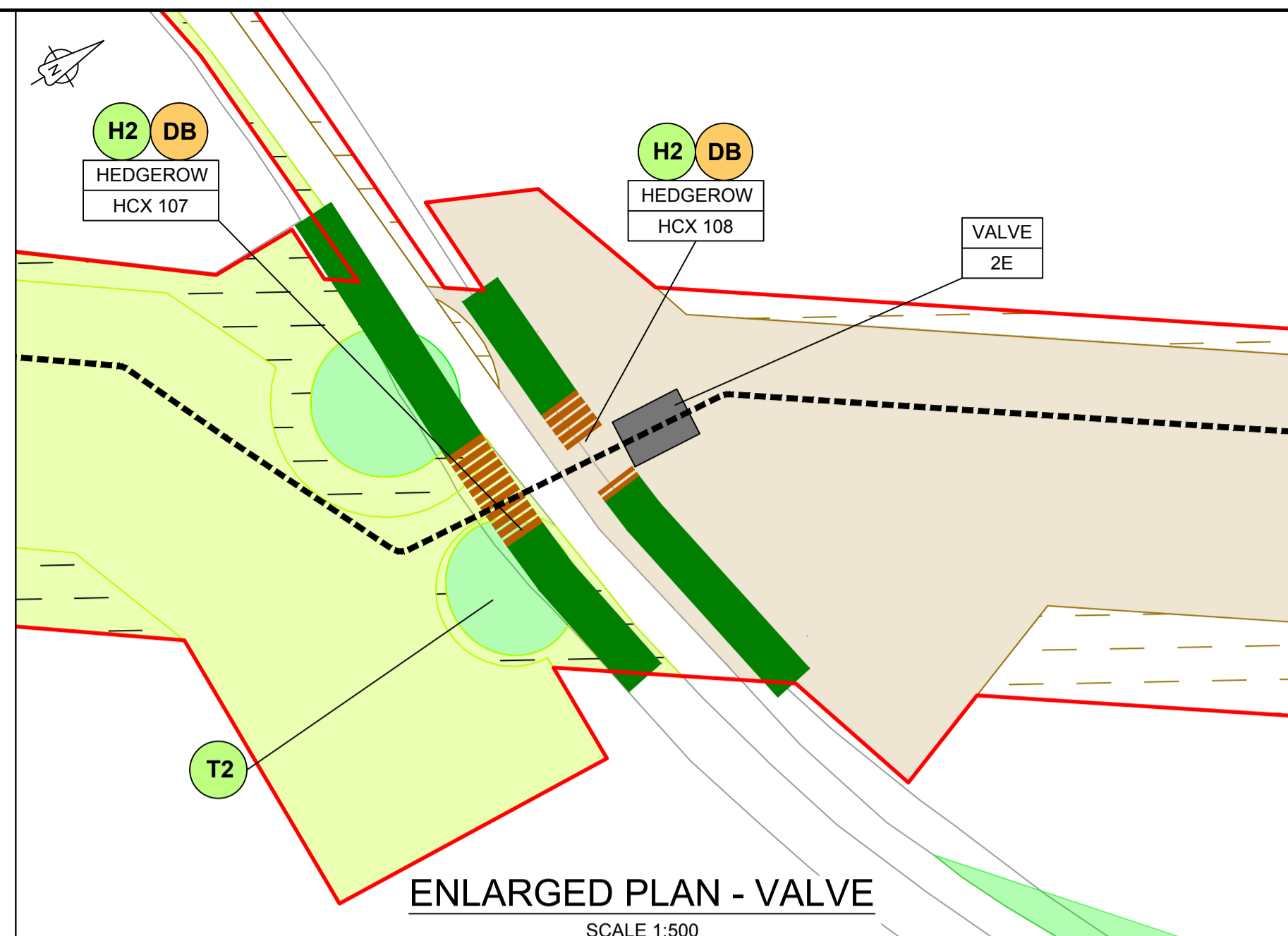
*Refer to the LEMP for reinstatement planting mixes.

OTHER REINSTATEMENT

- FR** Footpath to be reinstated to match existing.

ADDITIONAL ECOLOGY MITIGATION

- DB** Dormouse nest boxes to be placed at either end of retained hedgerow / within woodland within the Order Limits.
- BB** Bat boxes to be placed within woodland.



LOCATION PLAN
SCALE 1:500,000

LEGEND

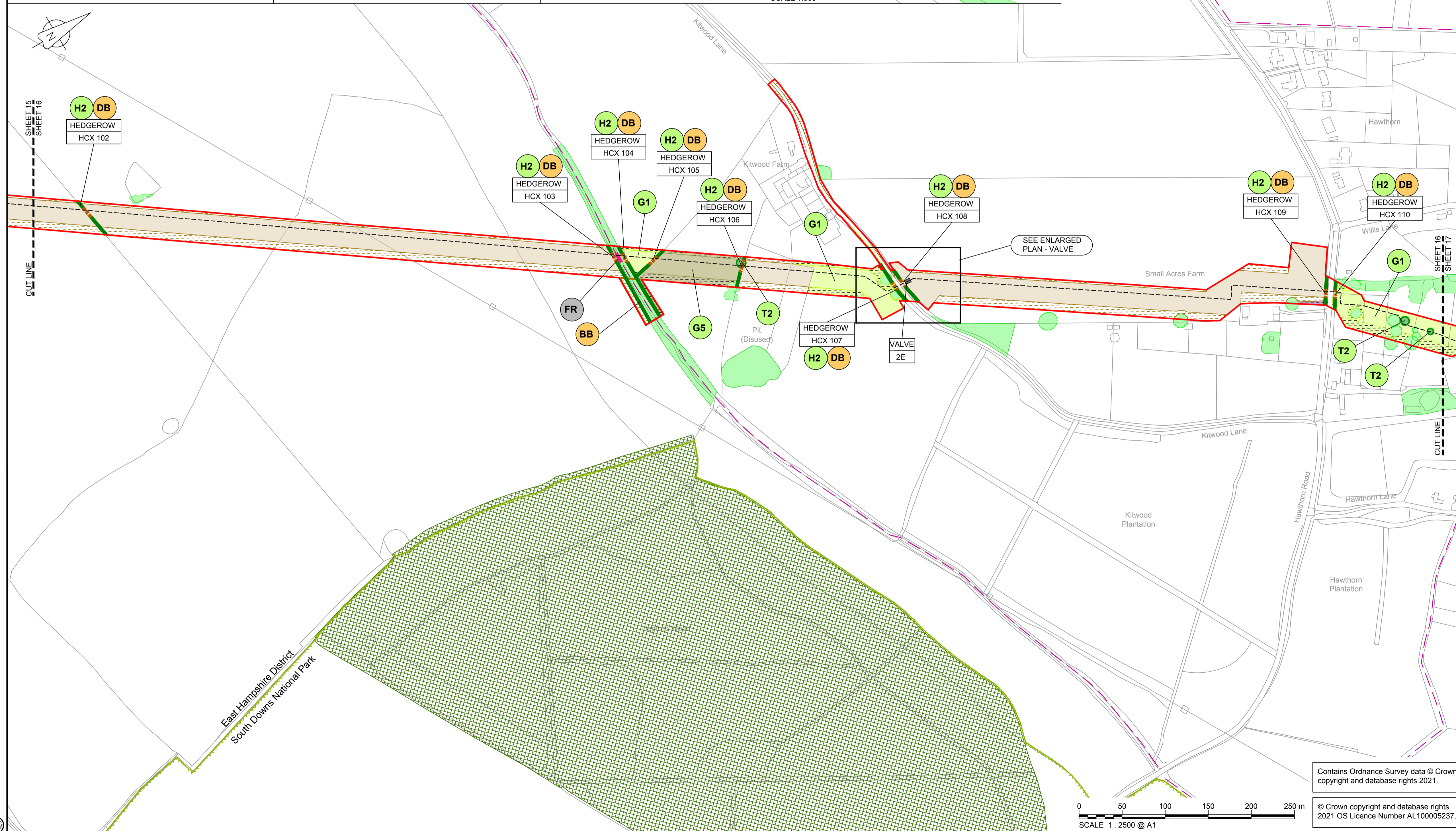
- ORDER LIMITS
- INTENDED PIPELINE ALIGNMENT
- ABOVE GROUND INSTALLATION (VALVE OR PRESSURE TRANSDUCER)

EXISTING CONTEXT

- SOUTH DOWNS NATIONAL PARK
- ANCIENT WOODLAND
- PUBLIC RIGHTS OF WAY
- PONDS
- EXISTING FEATURES TO BE RETAINED
- TREES AND WOODLAND TO BE RETAINED
- HEDGEROWS TO BE RETAINED
- IMPROVED GRASSLAND PASTURE TO BE RETAINED
- POOR SEMI-IMPROVED GRASSLAND TO BE RETAINED
- AMENITY GRASSLAND TO BE RETAINED
- ARABLE LAND TO BE RETAINED

FEATURES TO BE REINSTATED

- TREES AND WOODLAND REINSTATEMENT PLANTING
- HEDGEROW REINSTATEMENT PLANTING
- REINSTATEMENT OF IMPROVED GRASSLAND PASTURE
- REINSTATEMENT OF SEMI-IMPROVED GRASSLAND
- ARABLE LAND TO BE MADE GOOD
- FOOTPATH TO BE REINSTATEMENT TO MATCH EXISTING



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NOTES

- Intended pipeline alignment is indicative only.
- These Landscape and Ecological Reinstatement Plans should be read in conjunction with the Landscape and Ecological Management Plan (LEMP) Report.

- REINSTATEMENT SPECIES MIXES***
- T2** Individual tree planting for well drained clayey and silty soil.
 - H2** Hedgerow mix for well drained clayey and silty soil.
 - G1** Seed mix for improved grassland on well drained clayey and silty soil.

*Refer to the LEMP for reinstatement planting mixes.

OTHER REINSTATEMENT

- FR** Footpath to be reinstated to match existing.
- TR** Turf to be re-laid above pipeline trench.

ADDITIONAL ECOLOGY MITIGATION

- DB** Dormouse nest boxes to be placed at either end of retained hedgerow / within woodland within the Order Limits.
- BB** Bat boxes to be placed within woodland.



LOCATION PLAN
SCALE 1:500,000

- LEGEND**
- ORDER LIMITS
 - INTENDED PIPELINE ALIGNMENT
 - ABOVE GROUND INSTALLATION (VALVE OR PRESSURE TRANSDUCER)
- EXISTING CONTEXT**
- SOUTH DOWNS NATIONAL PARK
 - ANCIENT WOODLAND
 - PUBLIC RIGHTS OF WAY
 - PONDS
- EXISTING FEATURES TO BE RETAINED**
- TREES AND WOODLAND TO BE RETAINED
 - HEDGEROWS TO BE RETAINED
 - IMPROVED GRASSLAND PASTURE TO BE RETAINED
 - AMENITY GRASSLAND TO BE RETAINED
 - ARABLE LAND TO BE RETAINED
- FEATURES TO BE REINSTATED**
- TREES AND WOODLAND REINSTATEMENT PLANTING
 - HEDGEROW REINSTATEMENT PLANTING
 - REINSTATEMENT OF IMPROVED GRASSLAND PASTURE
 - REINSTATEMENT OF AMENITY GRASSLAND
 - ARABLE LAND TO BE MADE GOOD
 - FOOTPATH TO BE REINSTATED TO MATCH EXISTING
- ADDITIONAL LANDSCAPE AND ECOLOGY MITIGATION**
- HEDGEROW INFILLING

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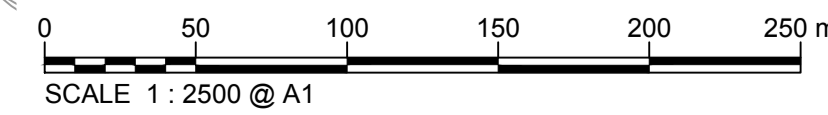
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NOTES

- Intended pipeline alignment is indicative only.
- These Landscape and Ecological Reinstatement Plans should be read in conjunction with the Landscape and Ecological Management Plan (LEMP) Report.

- REINSTATEMENT SPECIES MIXES***
- W1** Woodland and woodland field boundary mix for chalky soil.
 - H3** Hedgerow mix for chalky soil.
 - G2** Seed mix for improved grassland on chalky soil.
 - G4** Seed mix for semi-improved grassland on chalky soil.
 - S7** Scrub mix for chalky soil.
- *Refer to the LEMP for reinstatement planting mixes.

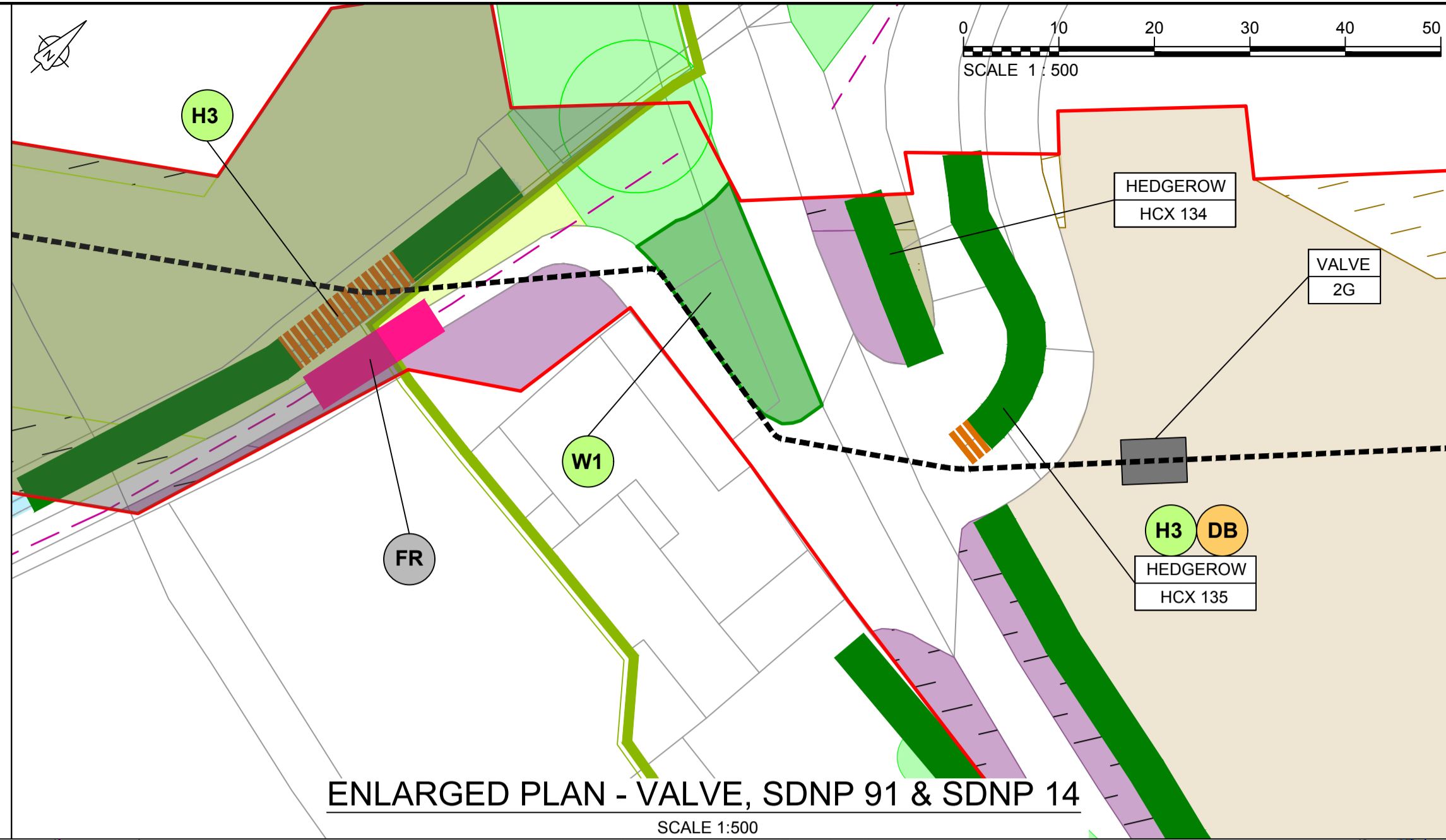
For open cut watercourse crossings and installation of vehicle crossing points, mitigation measures would include to... re-instate the riparian vegetation and natural bed of the watercourse using the material removed when appropriate on completion of the works and compact as necessary. If additional material is required, appropriately sized material of similar composition would be used.

OTHER REINSTATEMENT

- FR** Footpath to be reinstated to match existing.

ADDITIONAL ECOLOGY MITIGATION

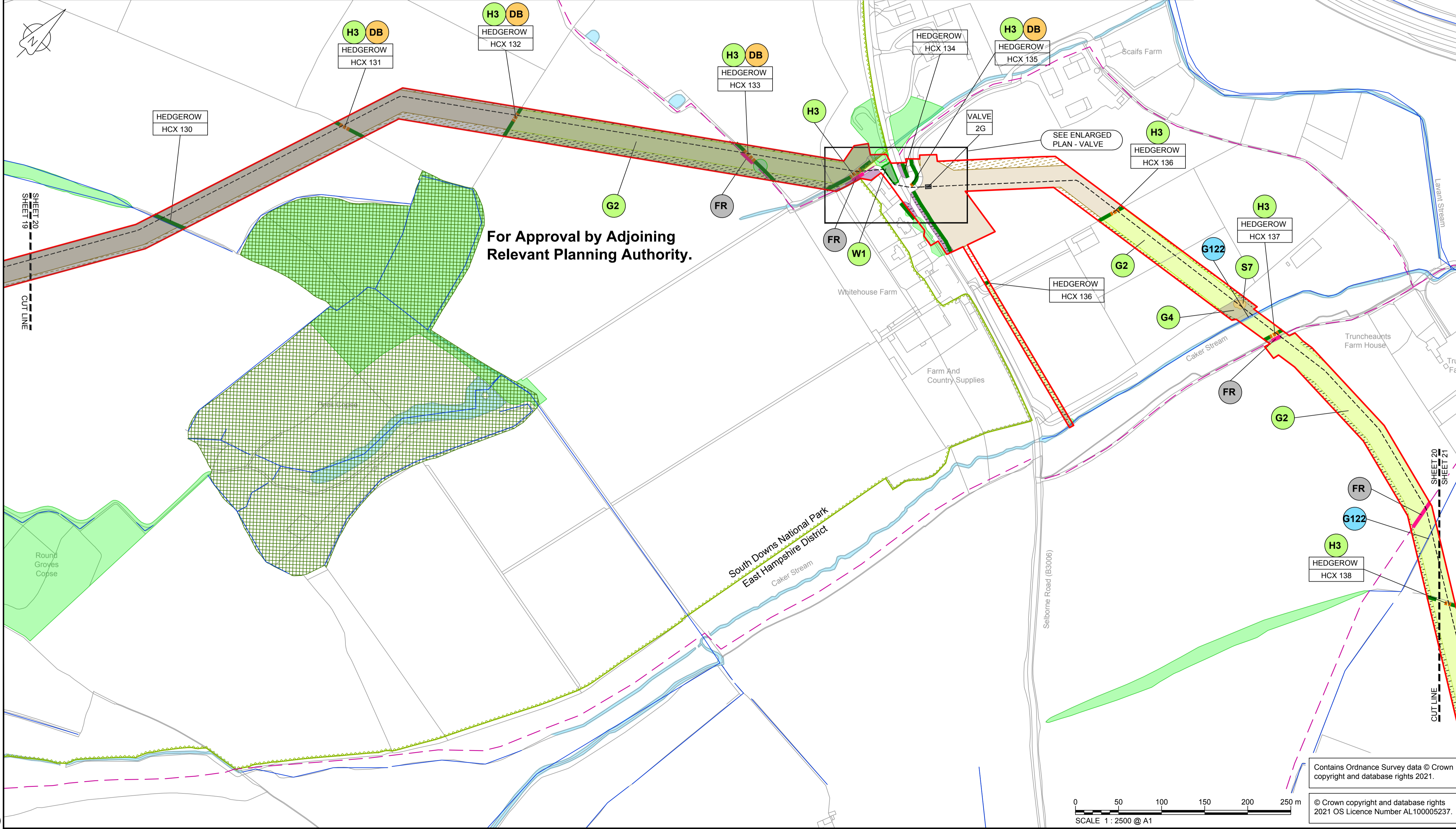
- DB** Dormouse nest boxes to be placed at either end of retained hedgerow / within woodland within the Order Limits.



LOCATION PLAN
SCALE 1:500,000

- LEGEND**
- ORDER LIMITS
 - INTENDED PIPELINE ALIGNMENT
 - ABOVE GROUND INSTALLATION (VALVE OR PRESSURE TRANSDUCER)
- EXISTING CONTEXT**
- SOUTH DOWNS NATIONAL PARK
 - ANCIENT WOODLAND
 - PUBLIC RIGHTS OF WAY
 - WATERCOURSE
 - PONDS / WATERBODIES
- EXISTING FEATURES TO BE RETAINED**
- TREES AND WOODLAND TO BE RETAINED
 - HEDGEROWS TO BE RETAINED
 - IMPROVED GRASSLAND PASTURE TO BE RETAINED
 - AMENITY GRASSLAND TO BE RETAINED
 - POOR SEMI-IMPROVED GRASSLAND TO BE RETAINED
 - ARABLE LAND TO BE RETAINED
- FEATURES TO BE REINSTATED**
- TREES AND WOODLAND REINSTATEMENT PLANTING
 - HEDGEROW REINSTATEMENT PLANTING
 - REINSTATEMENT OF IMPROVED GRASSLAND PASTURE
 - REINSTATEMENT OF AMENITY GRASSLAND
 - REINSTATEMENT OF SEMI-IMPROVED GRASSLAND
 - ARABLE LAND TO BE MADE GOOD
 - REINSTATEMENT OF SCRUB
 - FOOTPATH TO BE REINSTATED TO MATCH EXISTING

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NOTES

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REINSTATEMENT SPECIES MIXES*

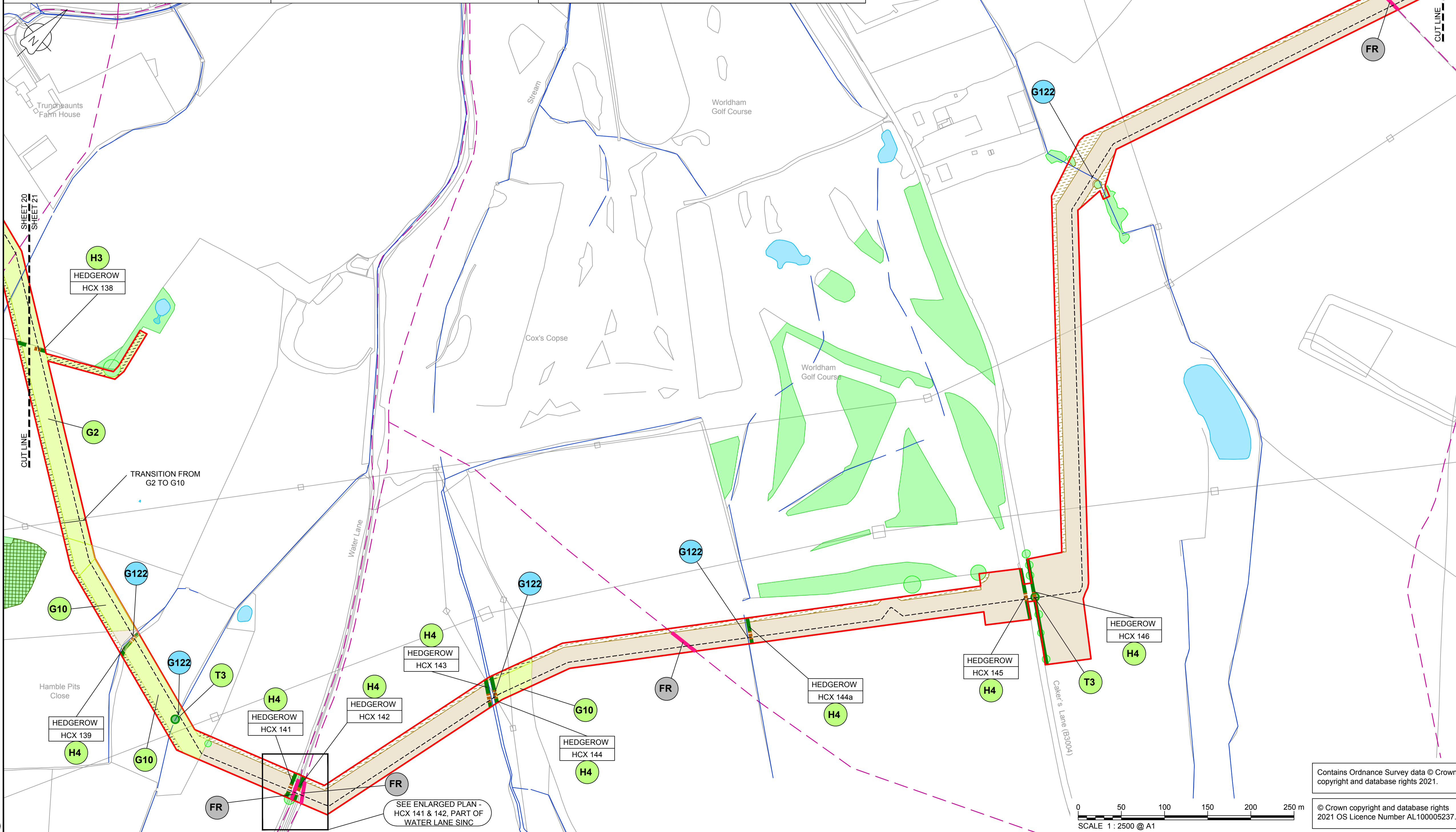
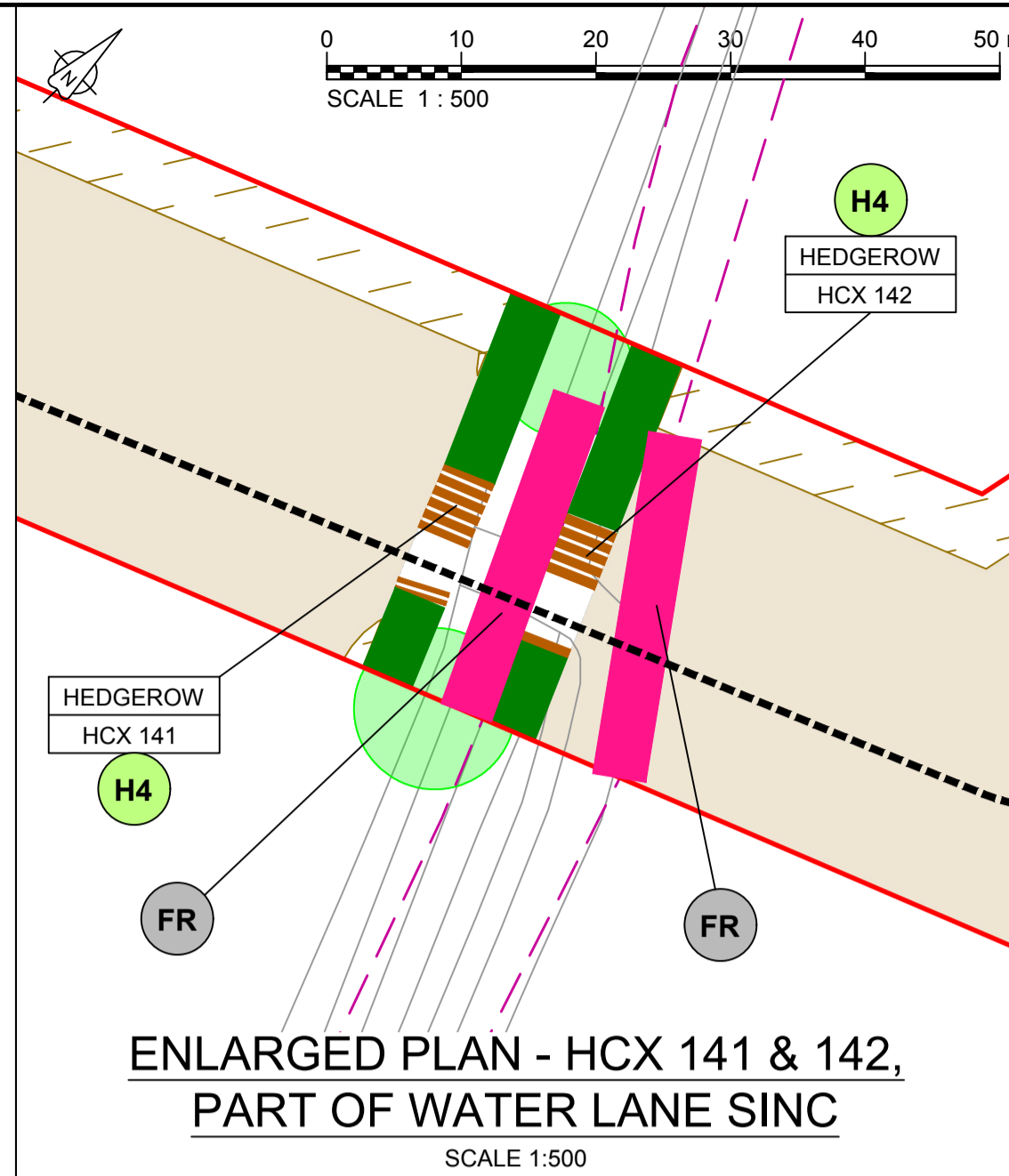
- T3** Individual tree planting for seasonally wet sandy and loamy soil.
- H3** Hedgerow mix for chalky soil.
- H4** Hedgerow mix for seasonally wet sandy and loamy soil.
- G2** Seed mix for improved grassland on chalky soil.
- G10** Seed mix for improved grassland on seasonally wet sandy and loamy soil.

*Refer to the LEMP for reinstatement planting mixes.

For open cut watercourse crossings and installation of vehicle crossing points, mitigation measures would include to... re-instate the riparian vegetation and natural bed of the watercourse using the material removed when appropriate on completion of the works and compact as necessary. If additional material is required, appropriately sized material of similar composition would be used.

OTHER REINSTATEMENT

- FR** Footpath to be reinstated to match existing.



LEGEND

- ORDER LIMITS
- INTENDED PIPELINE ALIGNMENT

EXISTING CONTEXT

- ANCIENT WOODLAND
- PUBLIC RIGHTS OF WAY
- WATERCOURSE
- PONDS

EXISTING FEATURES TO BE RETAINED

- TREES AND WOODLAND TO BE RETAINED
- HEDGEROWS TO BE RETAINED
- IMPROVED GRASSLAND PASTURE TO BE RETAINED
- ARABLE LAND TO BE RETAINED

FEATURES TO BE REINSTATED

- HEDGEROW REINSTATEMENT PLANTING
- REINSTATEMENT OF IMPROVED GRASSLAND PASTURE
- ARABLE LAND TO BE MADE GOOD
- FOOTPATH TO BE REINSTATED TO MATCH EXISTING

2.0	01/02/21	Final for issue	JS/RL	DR/LD	SK	SN
Rev	Rev. Date	Purpose of revision	Drawn	Checked	Rev'd	Apprv'd

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 KT22 8UX

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LANDSCAPE AND ECOLOGICAL REINSTATEMENT PLANS SHEET 21

Drawing status: **Fit for Information**

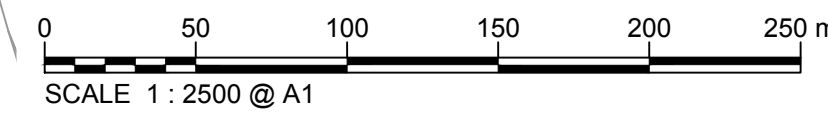
Scale	1:2500	DO NOT SCALE
Jacobs No.	B2325301	Rev
Client no.		2.0
Drawing number	B2325301-JAC-000-ENV-DRG-000124	

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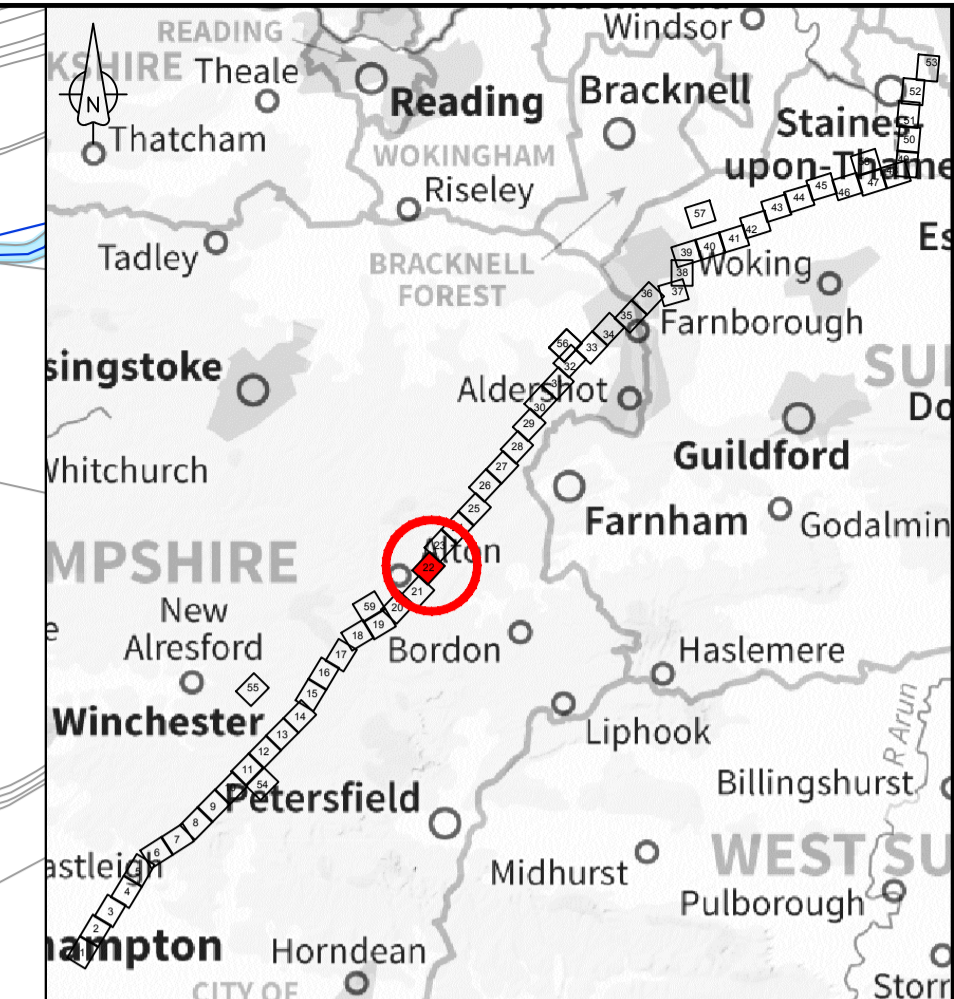
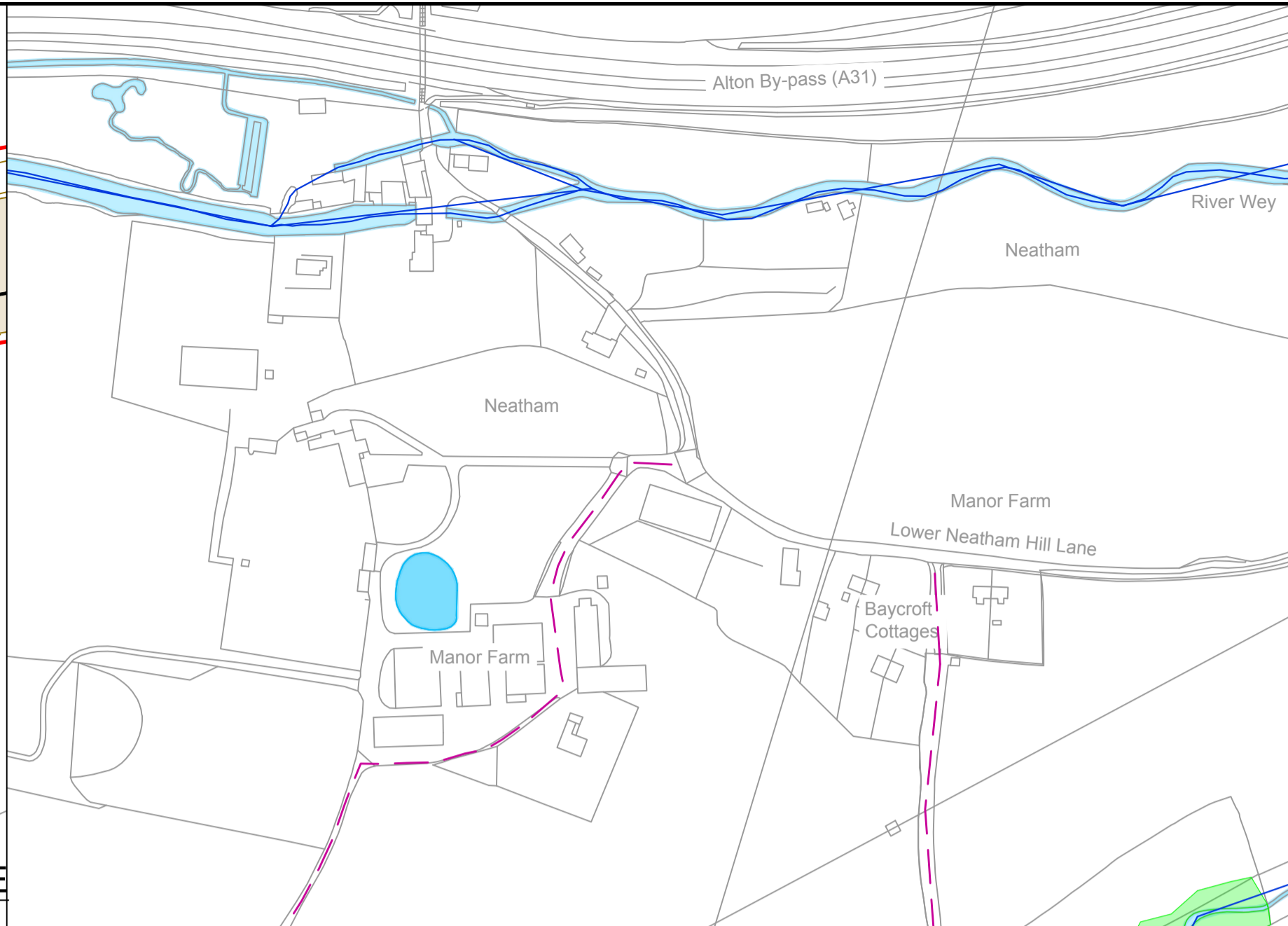
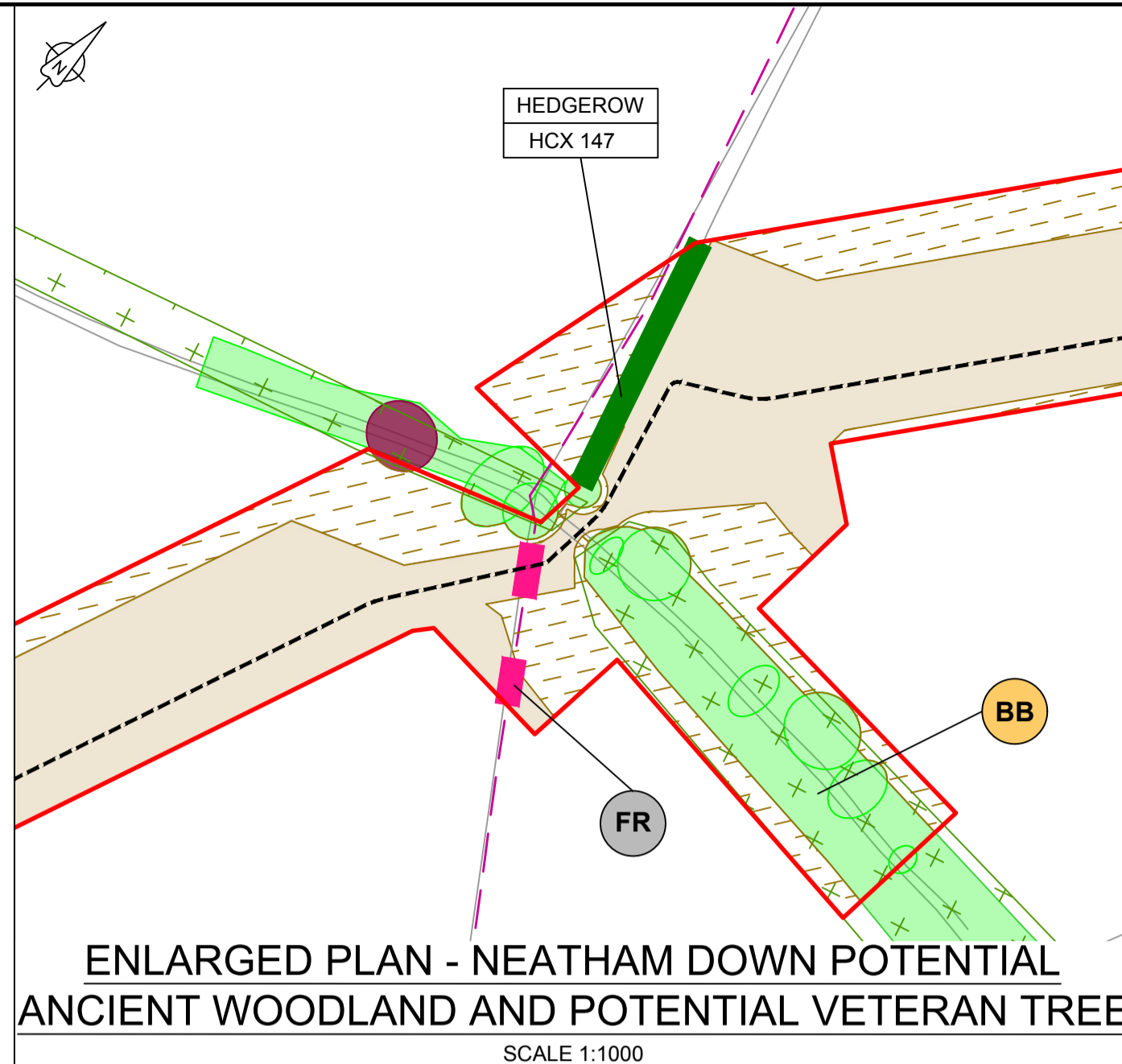


NOTES

- Intended pipeline alignment is indicative only.
- These Landscape and Ecological Reinstatement Plans should be read in conjunction with the Landscape and Ecological Management Plan (LEMP) Report.

REINSTATEMENT SPECIES MIXES*

- H3** Hedgerow mix for chalky soil.
**Refer to the LEMP for reinstatement planting mixes.*
- G122** For open cut watercourse crossings and installation of vehicle crossing points, mitigation measures would include to... re-instate the riparian vegetation and natural bed of the watercourse using the material removed when appropriate on completion of the works and compact as necessary. If additional material is required, appropriately sized material of similar composition would be used.
- OTHER REINSTATEMENT**
- FR** Footpath to be reinstated to match existing.
- ADDITIONAL ECOLOGY MITIGATION**
- BB** Bat boxes to be placed within woodland.



LOCATION PLAN
SCALE 1:500,000

- LEGEND**
- ORDER LIMITS
 - INTENDED PIPELINE ALIGNMENT
- EXISTING CONTEXT**
- ANCIENT WOODLAND
 - PUBLIC RIGHTS OF WAY
 - WATERCOURSE
 - PONDS / WATERBODIES
- EXISTING FEATURES TO BE RETAINED**
- POTENTIAL ANCIENT WOODLAND TO BE RETAINED (15M OF THE ORDER LIMITS)
 - POTENTIAL VETERAN TREES TO BE RETAINED (WITHIN 15M OF THE ORDER LIMITS)
 - TREES AND WOODLAND TO BE RETAINED
 - HEDGEROWS TO BE RETAINED
 - ARABLE LAND TO BE RETAINED
- FEATURES TO BE REINSTATED**
- HEDGEROW REINSTATEMENT PLANTING
 - ARABLE LAND TO BE MADE GOOD
 - FOOTPATH TO BE REINSTATED TO MATCH EXISTING
- ADDITIONAL LANDSCAPE AND ECOLOGY MITIGATION**
- HEDGEROW INFILLING

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Project: **Esso** Southampton to London Pipeline Project

Drawing title:
LANDSCAPE AND ECOLOGICAL REINSTATEMENT PLANS SHEET 22

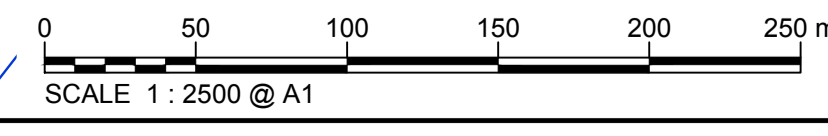
Drawing status: **Fit for Information**

Scale	1:2500	DO NOT SCALE
Jacobs No.	B2325301	Rev
Client no.		2.0

Drawing number:
B2325301-JAC-000-ENV-DRG-000125

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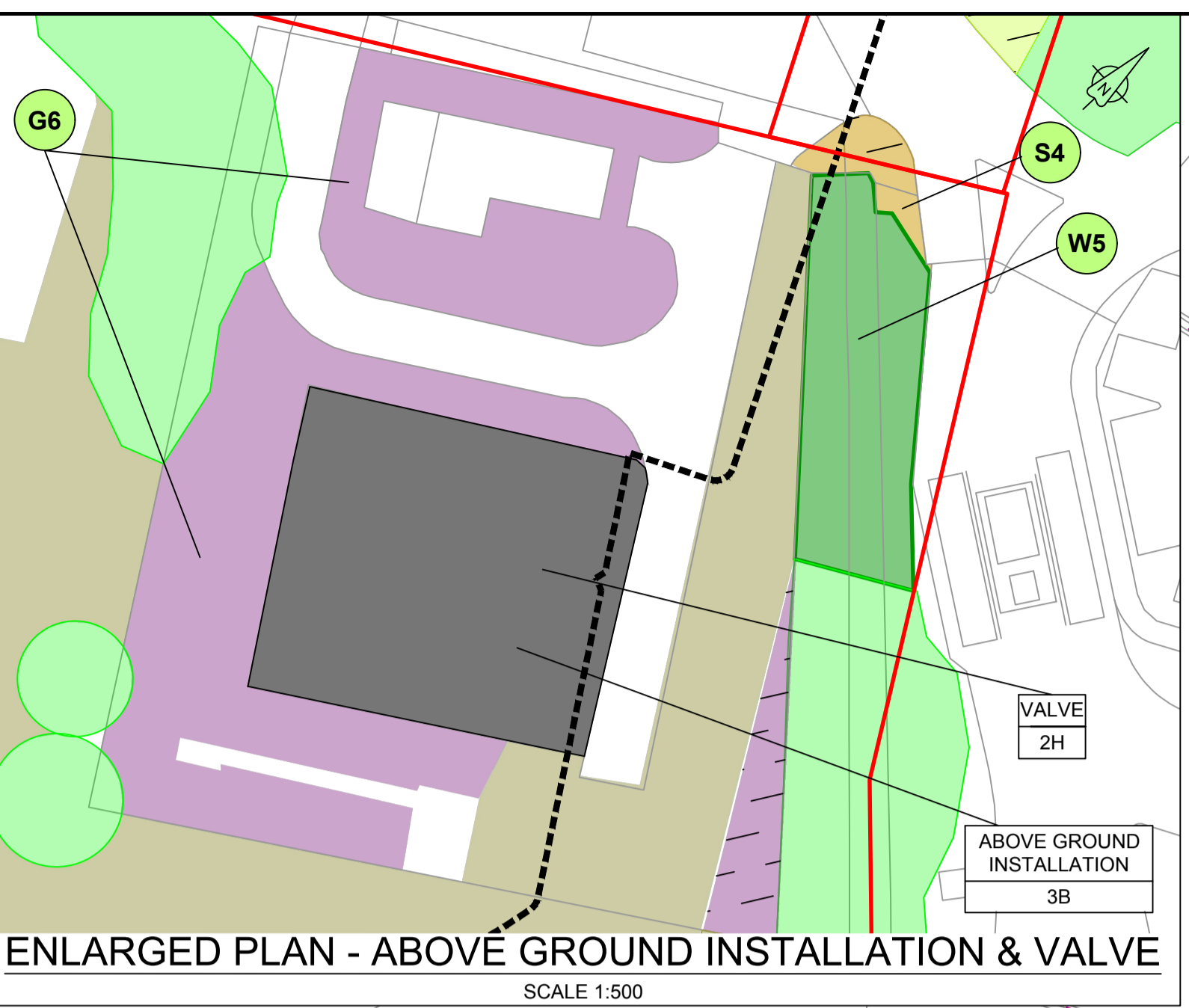
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NOTES

- Intended pipeline alignment is indicative only.
- These Landscape and Ecological Reinstatement Plans should be read in conjunction with the Landscape and Ecological Management Plan (LEMP) Report.

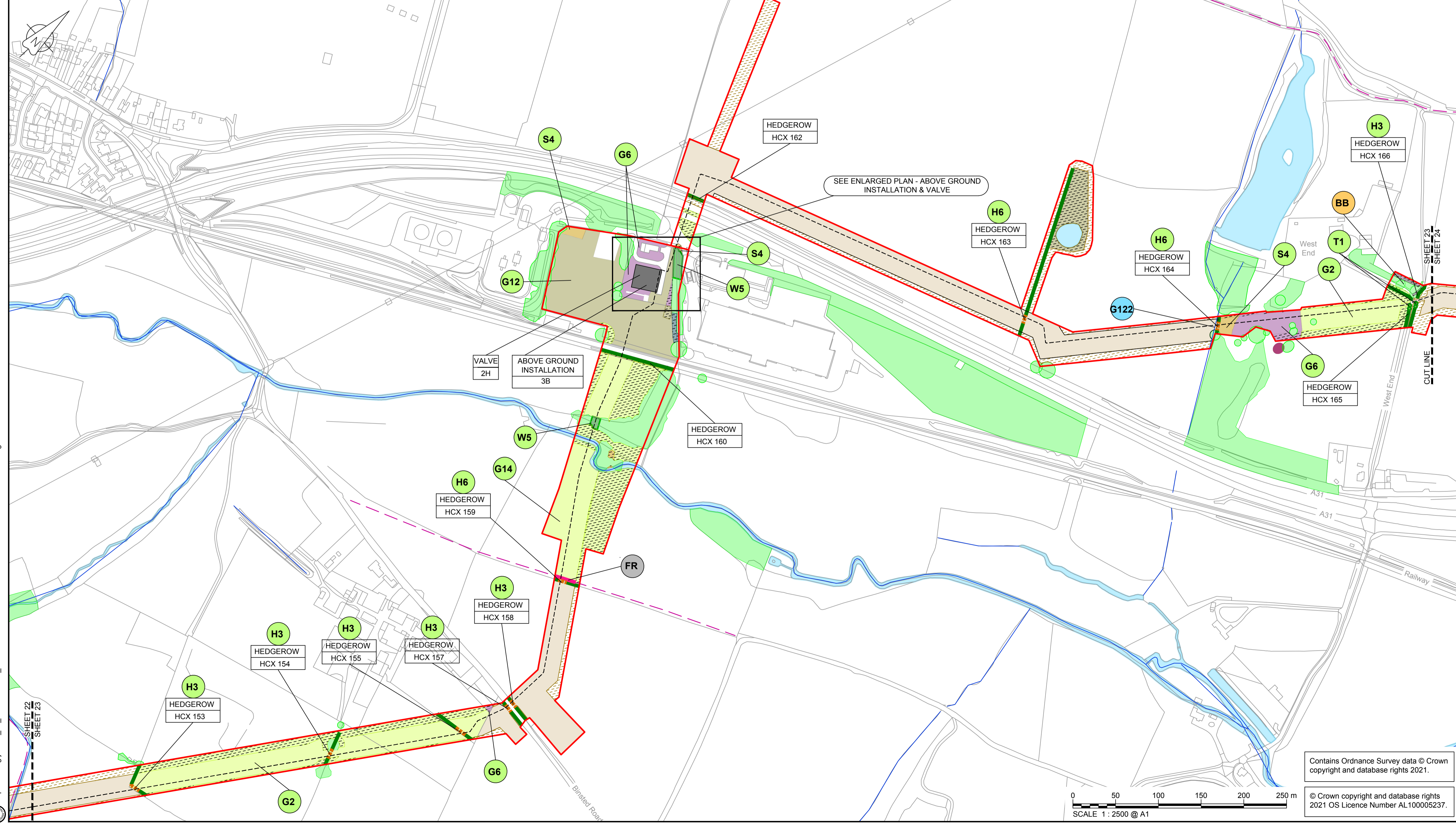
- REINSTATEMENT SPECIES MIXES***
- W5** Woodland and woodland field boundary mix for well drained loamy and sandy soil over gravel.
 - T1** Individual tree planting for chalky soil.
 - H3** Hedgerow mix for chalky soil.
 - H6** Hedgerow mix for well drained loamy and sandy soil over gravel.
 - S4** Scrub mix for well drained loamy and sandy soil over gravel.
 - G2** Seed mix for improved grassland on chalky soil.
 - G6** Seed mix for amenity grassland (general purpose).
 - G12** Seed mix for semi-improved grassland on well drained loamy and sandy soil over gravel.
 - G14** Seed mix for improved grassland on well drained loamy and sandy soil over gravel.
- *Refer to the LEMP for reinstatement planting mixes.*
- For open cut watercourse crossings and installation of vehicle crossing points, mitigation measures would include to... re-instate the riparian vegetation and natural bed of the watercourse using the material removed when appropriate on completion of the works and compact as necessary. If additional material is required, appropriately sized material of similar composition would be used.

- OTHER REINSTATEMENT**
- FR** Footpath to be reinstated to match existing.
- ADDITIONAL ECOLOGY MITIGATION**
- BB** Bat boxes to be placed within woodland.



LOCATION PLAN
SCALE 1:500,000

- LEGEND**
- ORDER LIMITS
 - INTENDED PIPELINE ALIGNMENT
 - ABOVE GROUND INSTALLATION (VALVE OR PRESSURE TRANSDUCER)
- EXISTING CONTEXT**
- PUBLIC RIGHTS OF WAY
 - WATERCOURSE
 - PONDS
- EXISTING FEATURES TO BE RETAINED**
- POTENTIAL VETERAN TREES TO BE RETAINED (WITHIN 15M OF THE ORDER LIMITS)
 - TREES AND WOODLAND TO BE RETAINED
 - HEDGEROWS TO BE RETAINED
 - SCRUB TO BE RETAINED
 - IMPROVED GRASSLAND PASTURE TO BE RETAINED
 - AMENITY GRASSLAND TO BE RETAINED
 - TALL HERBS AND FERNS TO BE RETAINED
 - POOR SEMI-IMPROVED GRASSLAND TO BE RETAINED
 - ARABLE LAND TO BE RETAINED
- FEATURES TO BE REINSTATED**
- TREES AND WOODLAND REINSTATEMENT PLANTING
 - HEDGEROW REINSTATEMENT PLANTING
 - REINSTATEMENT OF SCRUB
 - REINSTATEMENT OF IMPROVED GRASSLAND PASTURE
 - REINSTATEMENT OF AMENITY GRASSLAND
 - REINSTATEMENT OF SEMI-IMPROVED GRASSLAND
 - ARABLE LAND TO BE MADE GOOD
 - FOOTPATH TO BE REINSTATED TO MATCH EXISTING



2.0	01/02/21	Final for issue	JS/RL	DR/LD	SK	SN
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Drawing title
LANDSCAPE AND ECOLOGICAL REINSTATEMENT PLANS
SHEET 23

Drawing status: **Fit for Information**

Scale: 1:2500 **DO NOT SCALE**

Jacobs No. B2325301 Rev. **2.0**

Client no. B2325301
Drawing number **B2325301-JAC-000-ENV-DRG-000126**

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NOTES

- Intended pipeline alignment is indicative only.
- These Landscape and Ecological Reinstatement Plans should be read in conjunction with the Landscape and Ecological Management Plan (LEMP) Report.

REINSTATEMENT SPECIES MIXES*

- H3** Hedgerow mix for chalky soil.
- H4** Hedgerow mix for seasonally wet sandy and loamy soil.
- G2** Seed mix for improved grassland on chalky soil.
- G7** Seed mix for semi-improved grassland on seasonally wet sandy and loamy soil.
- G10** Seed mix for improved grassland on seasonally wet sandy and loamy soil.

*Refer to the LEMP for reinstatement planting mixes.

G122

For open cut watercourse crossings and installation of vehicle crossing points, mitigation measures would include to... re-instate the riparian vegetation and natural bed of the watercourse using the material removed when appropriate on completion of the works and compact as necessary. If additional material is required, appropriately sized material of similar composition would be used.

OTHER REINSTATEMENT

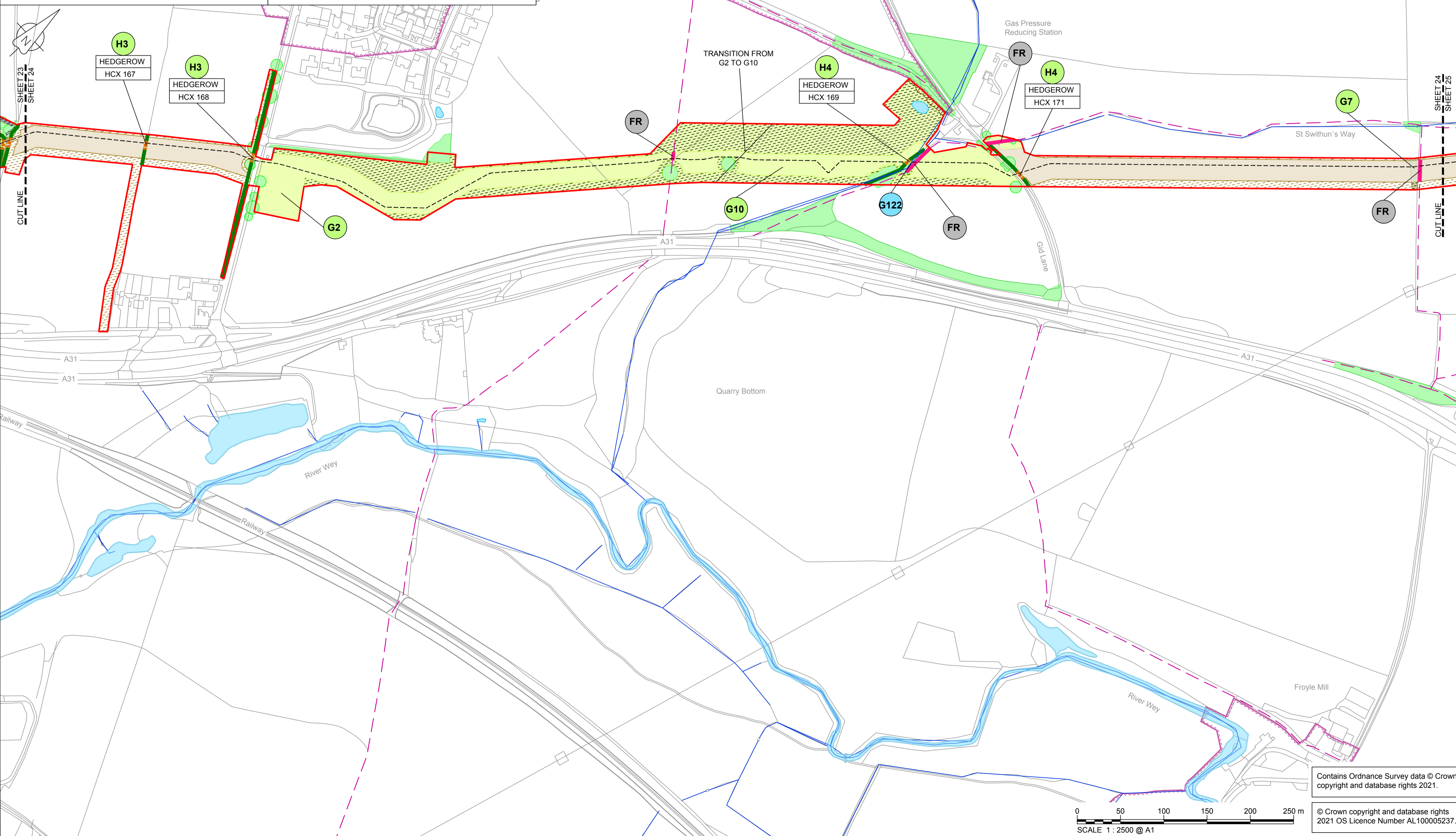
- FR** Footpath to be reinstated to match existing.



LOCATION PLAN
SCALE 1:500,000

LEGEND

- ORDER LIMITS
- INTENDED PIPELINE ALIGNMENT
- EXISTING CONTEXT
 - CONSERVATION AREA
 - PUBLIC RIGHTS OF WAY
 - WATERCOURSE
 - PONDS/WATERBODIES
- EXISTING FEATURES TO BE RETAINED
 - TREES AND WOODLAND TO BE RETAINED
 - HEDGEROWS TO BE RETAINED
 - IMPROVED GRASSLAND PASTURE TO BE RETAINED
 - POOR SEMI-IMPROVED GRASSLAND TO BE RETAINED
 - ARABLE LAND TO BE RETAINED
- FEATURES TO BE REINSTATEMENT
 - HEDGEROW REINSTATEMENT PLANTING
 - REINSTATEMENT OF IMPROVED GRASSLAND PASTURE
 - REINSTATEMENT OF SEMI-IMPROVED GRASSLAND
 - ARABLE LAND TO BE MADE GOOD
 - FOOTPATH TO BE REINSTATEMENT TO MATCH EXISTING



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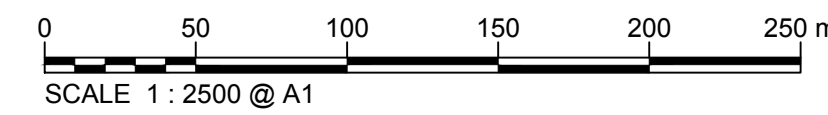
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LANDSCAPE AND ECOLOGICAL REINSTATEMENT PLANS SHEET 24

Drawing status	Fit for Information	
Scale	1:2500	DO NOT SCALE
Jacobs No.	B2325301	Rev 2.0
Client no.		
Drawing number	B2325301-JAC-000-ENV-DRG-000127	

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NOTES

1. Intended pipeline alignment is indicative only.
2. These Landscape and Ecological Reinstatement Plans should be read in conjunction with the Landscape and Ecological Management Plan (LEMP) Report.

REINSTATEMENT SPECIES MIXES*

- W3** Woodland and woodland field boundary mix for seasonally wet sandy and loamy soil.
- T3** Individual tree planting for seasonally wet sandy and loamy soil.
- H3** Hedgerow mix for chalky soil.
- H4** Hedgerow mix for seasonally wet sandy and loamy soil.

*Refer to the LEMP for reinstatement planting mixes.

- G122** For open cut watercourse crossings and installation of vehicle crossing points, mitigation measures would include to re-instate the riparian vegetation and natural bed of the watercourse using the material removed when appropriate on completion of the works and compact as necessary. If additional material is required, appropriately sized material of similar composition would be used.

OTHER REINSTATEMENT

- FR** Footpath to be reinstated to match existing.



LOCATION PLAN
SCALE 1:500,000

LEGEND

- ORDER LIMITS
- INTENDED PIPELINE ALIGNMENT
- EXISTING CONTEXT
 - CONSERVATION AREA
 - PUBLIC RIGHTS OF WAY
 - WATERCOURSE
 - PONDS
- EXISTING FEATURES TO BE RETAINED
 - TREES AND WOODLAND TO BE RETAINED
 - HEDGEROWS TO BE RETAINED
 - ARABLE LAND TO BE RETAINED
- FEATURES TO BE REINSTATED
 - TREES AND WOODLAND REINSTATEMENT PLANTING
 - HEDGEROW REINSTATEMENT PLANTING
 - ARABLE LAND TO BE MADE GOOD
 - FOOTPATH TO BE REINSTATED TO MATCH EXISTING

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Project: **Esso** Southampton to London Pipeline Project

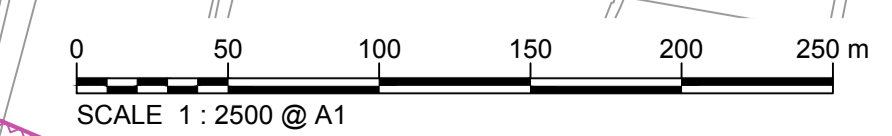
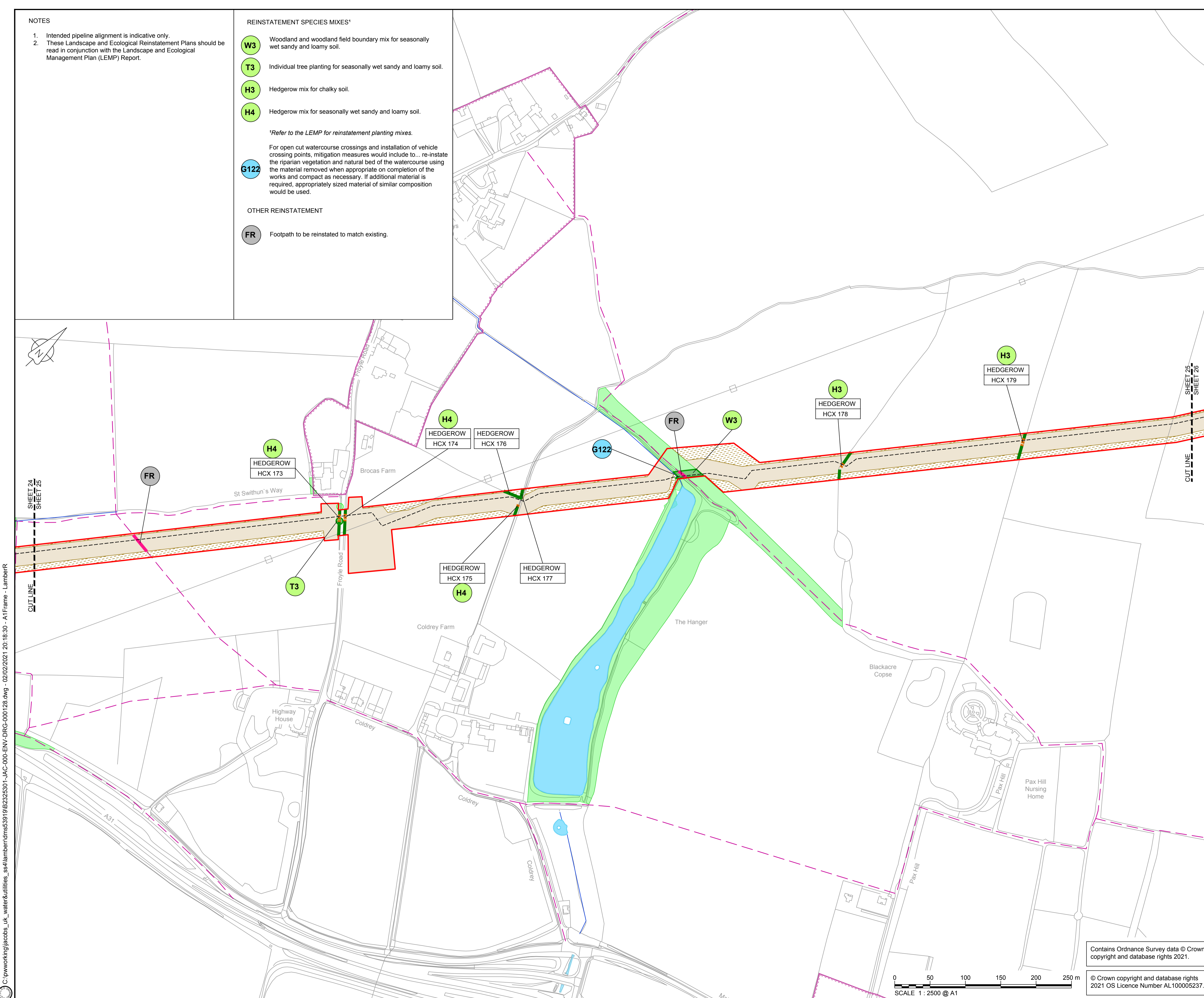
Drawing title
LANDSCAPE AND ECOLOGICAL REINSTATEMENT PLANS SHEET 25

Drawing status: **Fit for Information**

Scale	1:2500	DO NOT SCALE
Jacobs No.	B2325301	Rev
Client no.		2.0

Drawing number
B2325301-JAC-000-ENV-DRG-000128

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NOTES

- Intended pipeline alignment is indicative only.
- These Landscape and Ecological Reinstatement Plans should be read in conjunction with the Landscape and Ecological Management Plan (LEMP) Report.

REINSTATEMENT SPECIES MIXES*

- W1** Broadleaved native woodland and woodland field boundary mix for chalky soil.
- H2** Hedgerow mix for well drained clayey and silty soil.
- H3** Hedgerow mix for chalky soil.
- G1** Seed mix for improved grassland pasture on well drained clayey and silty soil.

*Refer to the LEMP for reinstatement planting mixes.

For open cut watercourse crossings and installation of vehicle crossing points, mitigation measures would include to... re-instate the riparian vegetation and natural bed of the watercourse using the material removed when appropriate on completion of the works and compact as necessary. If additional material is required, appropriately sized material of similar composition would be used.

OTHER REINSTATEMENT

- FR** Footpath to be reinstated to match existing.



LOCATION PLAN
SCALE 1:500,000

LEGEND

- ORDER LIMITS
- INTENDED PIPELINE ALIGNMENT
- LOCAL PLANNING AUTHORITY BOUNDARY

EXISTING CONTEXT

- ANCIENT WOODLAND
- PUBLIC RIGHTS OF WAY
- WATERCOURSE
- PONDS

EXISTING FEATURES TO BE RETAINED

- TREES AND WOODLAND TO BE RETAINED
- HEDGEROWS TO BE RETAINED
- IMPROVED GRASSLAND PASTURE TO BE RETAINED
- TALL HERBS AND FERNS TO BE RETAINED
- ARABLE LAND TO BE RETAINED

FEATURES TO BE REINSTATEMENT

- TREES AND WOODLAND REINSTATEMENT PLANTING
- HEDGEROW REINSTATEMENT PLANTING
- REINSTATEMENT OF IMPROVED GRASSLAND PASTURE
- ARABLE LAND TO BE MADE GOOD
- FOOTPATH TO BE REINSTATEMENT TO MATCH EXISTING

Rev	Rev. Date	Purpose of revision	Drawn	Checked	Rev'd	Appr'd
2.0	01/02/21	Final for issue	JS/RL	DR/LD	SK	SN



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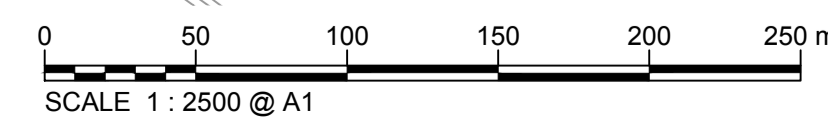
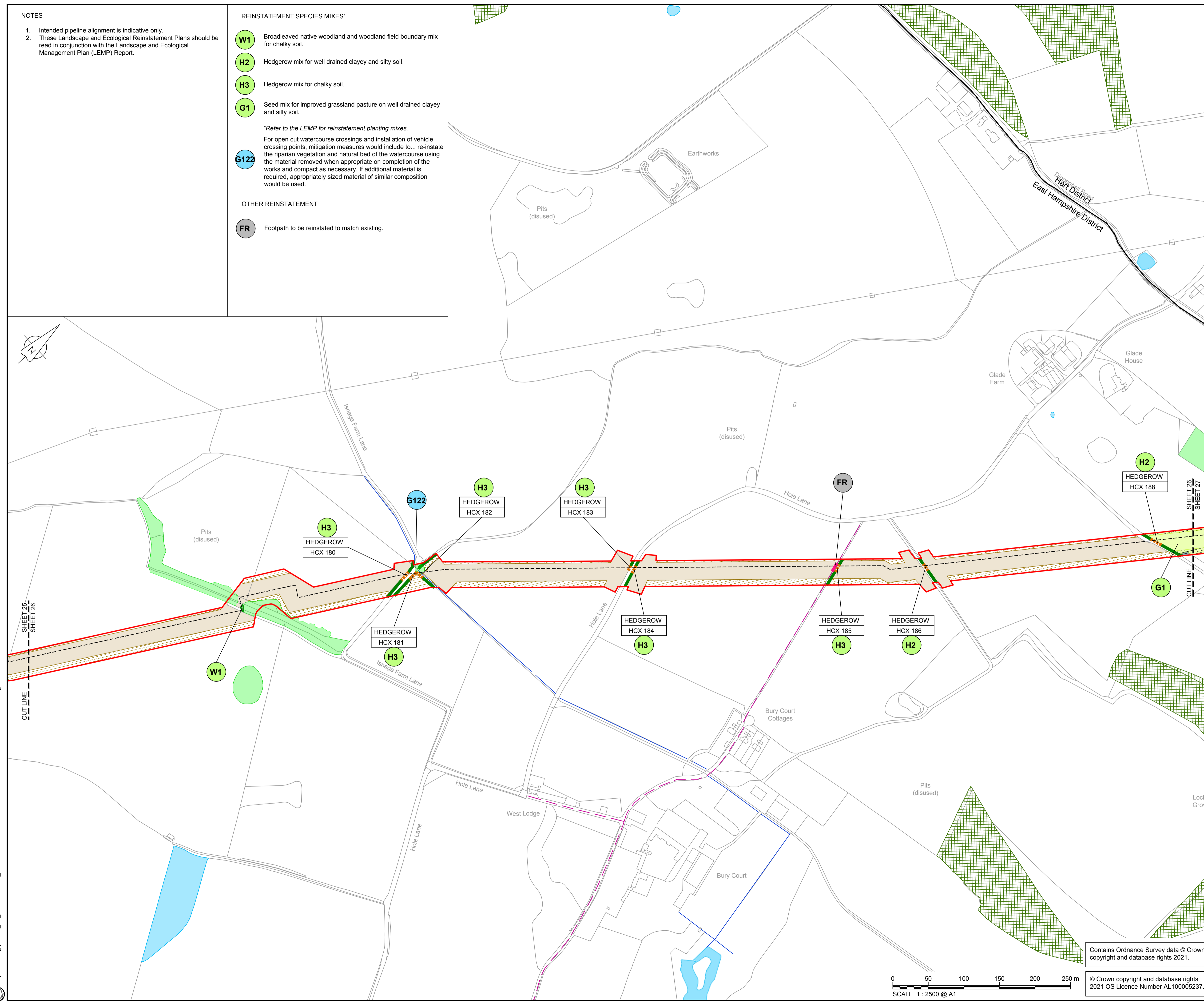
Drawing title: **LANDSCAPE AND ECOLOGICAL REINSTATEMENT PLANS SHEET 26**

Drawing status: **Fit for Information**

Scale	1:2500	DO NOT SCALE
Jacobs No.	B2325301	Rev
Client no.		2.0

Drawing number: **B2325301-JAC-000-ENV-DRG-000129**

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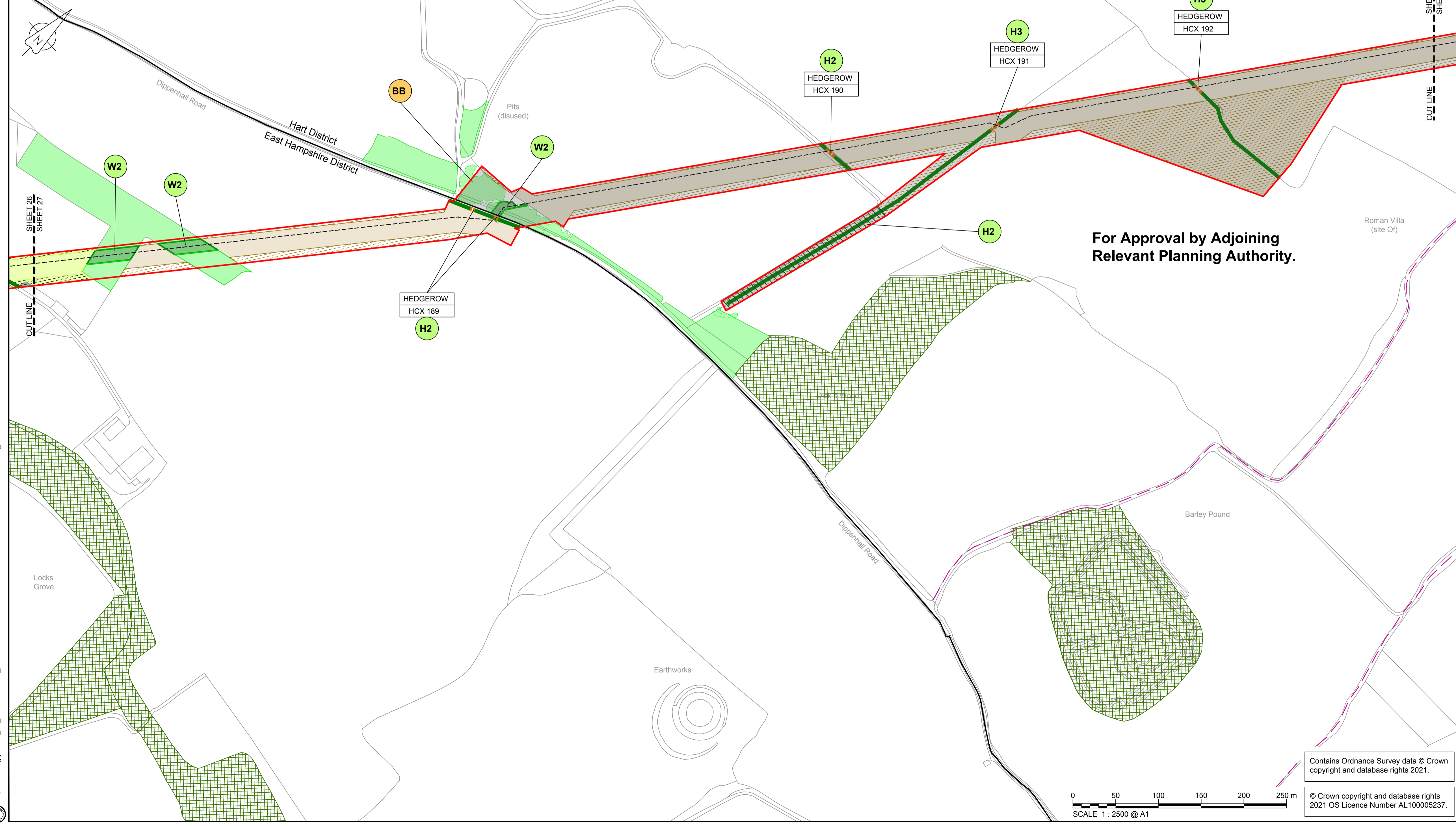
NOTES

- Intended pipeline alignment is indicative only.
- These Landscape and Ecological Reinstatement Plans should be read in conjunction with the Landscape and Ecological Management Plan (LEMP) Report.

- REINSTATEMENT SPECIES MIXES***
- W2** Woodland and woodland field boundary mix for well drained clayey and silty soil.
 - H2** Hedgerow mix for well drained clayey and silty soil.
 - H3** Hedgerow mix for chalky soil.
- *Refer to the LEMP for reinstatement planting mixes.*
- ADDITIONAL ECOLOGY MITIGATION**
- BB** Bat boxes to be placed within woodland.



- LEGEND**
- ORDER LIMITS
 - INTENDED PIPELINE ALIGNMENT
 - LOCAL PLANNING AUTHORITY BOUNDARY
- EXISTING CONTEXT**
- ANCIENT WOODLAND
 - PUBLIC RIGHTS OF WAY
- EXISTING FEATURES TO BE RETAINED**
- TREES AND WOODLAND TO BE RETAINED
 - HEDGEROWS TO BE RETAINED
 - IMPROVED GRASSLAND PASTURE TO BE RETAINED
 - ARABLE LAND TO BE RETAINED
- FEATURES TO BE REINSTATEMENT**
- TREES AND WOODLAND REINSTATEMENT PLANTING
 - HEDGEROW REINSTATEMENT PLANTING
 - REINSTATEMENT OF IMPROVED GRASSLAND PASTURE
 - ARABLE LAND TO BE MADE GOOD
- ADDITIONAL LANDSCAPE AND ECOLOGY MITIGATION**
- HEDGEROW INFILLING



For Approval by Adjoining Relevant Planning Authority.

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Rev	Rev. Date	Purpose of revision	Drawn	Checked	Rev'd	Apprv'd

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Project: **Esso** Southampton to London Pipeline Project

Drawing title: **LANDSCAPE AND ECOLOGICAL REINSTATEMENT PLANS SHEET 27A**

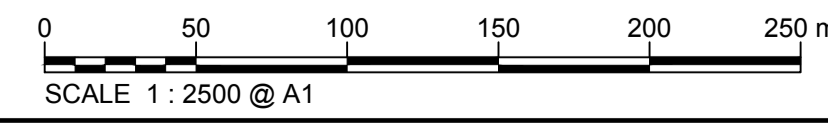
Drawing status: **Fit for Information**

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Client no.		2.0

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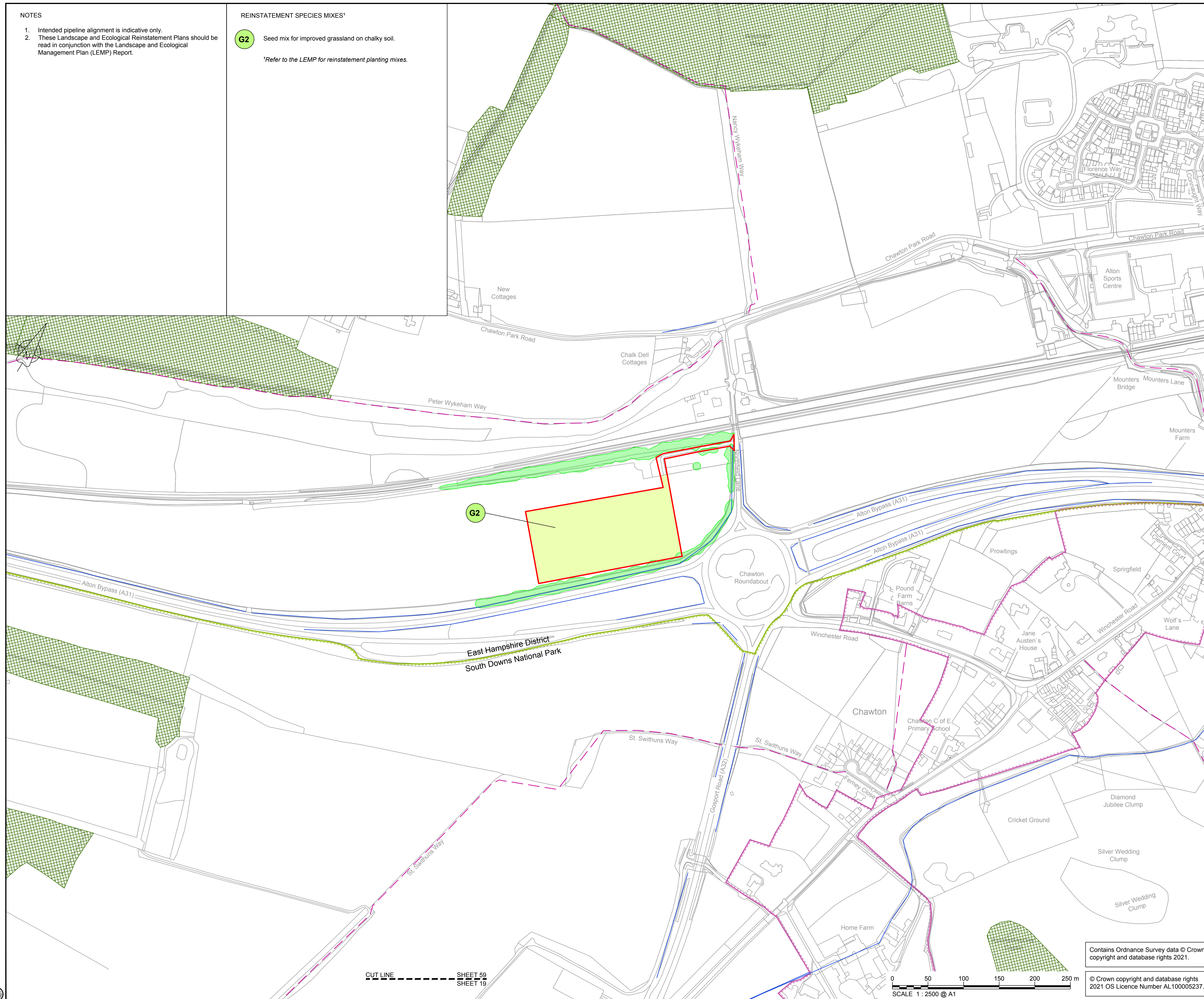
NOTES

1. Intended pipeline alignment is indicative only.
2. These Landscape and Ecological Reinstatement Plans should be read in conjunction with the Landscape and Ecological Management Plan (LEMP) Report.

REINSTATEMENT SPECIES MIXES*

G2 Seed mix for improved grassland on chalky soil.

*Refer to the LEMP for reinstatement planting mixes.



LOCATION PLAN
SCALE 1:500,000

LEGEND

- ORDER LIMITS
- SOUTH DOWNS NATIONAL PARK
- CONSERVATION AREA
- ANCIENT WOODLAND
- PUBLIC RIGHTS OF WAY
- WATERCOURSE
- TREES AND WOODLAND TO BE RETAINED
- REINSTATEMENT OF IMPROVED GRASSLAND PASTURE

EXISTING FEATURES TO BE RETAINED

FEATURES TO BE REINSTATED

2.0	01/02/21	Final for issue	JS/RL	DR/LD	SK	SN
Rev	Rev. Date	Purpose of revision	Drawn	Checked	Rev'd	Apprv'd



Client: Esso Petroleum Company, Limited
Emryn House,
Emryn Way,
Leatherhead,
Surrey,
KT22 8UX



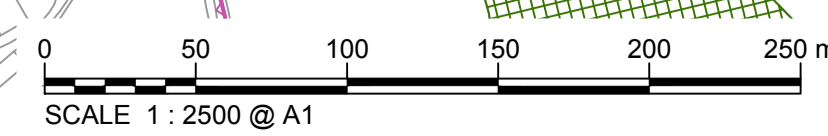
LANDSCAPE AND ECOLOGICAL REINSTATEMENT PLANS SHEET 59

Drawing status: **Fit for Information**

Scale	1:2500	DO NOT SCALE
Jacobs No.	B2325301	Rev
Client no.		2.0

Drawing number: **B2325301-JAC-000-ENV-DRG-000162**

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CUT LINE SHEET 59 SHEET 19

C:\working\jacobs_uk_water&utilities_sst\lamber\dms53919\B2325301-JAC-000-ENV-DRG-000162.dwg - 02/02/2021 20:26:53 - A1Frame - LamberR

East Hampshire Plant Schedules (excluding South Downs National Park).

Key:

B – Bare rooted and bagged

Breaks – Minimum number of breaks or shoots

L – Container size in litres

RB – Root-balled

1+1 – 2 year seedling transplanted after first year

0/2 – 2 year cutting not transplanted

2x – 2 times transplanted

Woodland Planting

W1. Broadleaved native woodland / woodland field boundary mix for chalky soil

Botanical Name	Common Name	Girth/ Stem Dia cm	Height cm	Root Zone	Form and age / method of growth	Percentage	Density
<i>Acer campestre</i>	Field Maple	N/A	60-80	B	1+1; Transplant - seed raised	20%	1.5m centres
<i>Cornus sanguinea</i>	Dogwood	N/A	40-60	B	1+1; Transplant - seed raised; branched; 2 breaks	10%	
<i>Corylus avellana</i>	Hazel	N/A	40-60	B	1+1; Transplant - seed raised; branched; 2 breaks	5%	
<i>Euonymus europaeus</i>	Spindle Tree	N/A	40-60	B	1+1; Transplant - seed raised; branched; 3 breaks	2.5%	

Botanical Name	Common Name	Girth/ Stem Dia cm	Height cm	Root Zone	Form and age / method of growth	Percentage	Density
<i>Fagus sylvatica</i>	Beech	N/A	60-80	B	1+2; Transplant - seed raised	37.5%	
<i>Sambucus nigra</i>	Elder	N/A	40-60	B	1+0; Seedling; branched; 2 breaks	10%	

W2. Broadleaved native woodland / woodland field boundary mix for well drained clayey and silty soil

Botanical Name	Common Name	Girth/ Stem Dia cm	Height cm	Root Zone	Form and age/ method of growth	Percentage	Density
<i>Betula pendula</i>	Silver Birch	N/A	60-80	B	1+1; Transplant - seed raised	20%	1.5m centres
<i>Crataegus monogyna</i>	Hawthorn	N/A	40-60	B	1+1; Transplant - seed raised	15%	
<i>Euonymus europaeus</i>	Spindle Tree	N/A	40-60	B	1+1; Transplant - seed raised; branched; 3 breaks	5%	
<i>Prunus avium</i>	Wild Cherry	N/A	60-80	B	1+1; Transplant - seed raised	5%	
<i>Prunus spinosa</i>	Blackthorn	N/A	40-60	B	1+1; Transplant - seed raised; branched; 2 breaks	2.5%	
<i>Quercus robur</i>	Oak	N/A	60-80	B	1+1; Transplant - seed raised	37.5%	
<i>Rosa arvensis</i>	Field Rose	N/A	40-60	3L	Branched; 5 breaks	10%	
<i>Sorbus aria</i>	Whitebeam	N/A	40-60	B	1+1; Transplant - seed raised	5%	

W3. Broadleaved native woodland and woodland field boundary mix for seasonally wet sandy and loamy soil

Botanical Name	Common Name	Girth/ Stem Dia cm	Height cm	Root Zone	Form and age / method of growth	Percentage	Density
<i>Alnus glutinosa</i>	Alder	N/A	60-80	B	1+1; Transplant - seed raised	10%	1.5m centres
<i>Betula pubescens</i>	Downy Birch	N/A	60-80	B	1+1; Transplant - seed raised	10%	
<i>Carpinus betulus</i>	Hornbeam	N/A	60-80	B	1+1; Transplant - seed raised	17.5%	

Botanical Name	Common Name	Girth/ Stem Dia cm	Height cm	Root Zone	Form and age / method of growth	Percentage	Density
<i>Corylus avellana</i>	Hazel		40-60	B	1+1; Transplant - seed raised; branched; 2 breaks	10%	
<i>Lonicera periclymenum</i>	Honeysuckle	N/A	60-80	2L	Caned; several shoots; 2 breaks	2.5%	
<i>Prunus avium</i>	Wild Cherry	N/A	60-80	B	1+1; Transplant - seed raised	5%	
<i>Quercus robur</i>	Oak	N/A	60-80	B	1+1; Transplant - seed raised	20%	
<i>Rosa canina</i>	Dog Rose	N/A	40-60	2L	Branched; 3 breaks	10%	
<i>Salix caprea</i>	Goat willow	N/A	40-60	2L	Cutting; branched; 3 breaks	10%	
<i>Sorbus aucuparia</i>	Rowan	N/A	60-80	B	1+1; Transplant - seed raised	5%	

W5. Broadleaved native woodland / woodland field boundary mix for well drained loamy and sandy soil over gravel

Botanical Name	Common Name	Girth/ Stem Dia cm	Height cm	Root Zone	Form and age/ method of growth	Percentage	Density
<i>Acer campestre</i>	Field Maple	N/A	60-80	B	1+1; Transplant - seed raised	5%	1.5m centres
<i>Betula pendula</i>	Silver Birch	N/A	60-80	B	1+1; Transplant - seed raised	20%	
<i>Crataegus monogyna</i>	Hawthorn	N/A	40-60	B	1+1; Transplant - seed raised	15%	
<i>Ligustrum vulgare</i>	Privet	N/A	40-60	B	0/1; Cutting; branched; 2 breaks	5%	
<i>Prunus spinosa</i>	Blackthorn	N/A	40-60	B	1+1; Transplant - seed raised; branched; 2 breaks	2.5%	
<i>Quercus robur</i>	Oak	N/A	60-80	B	1+1; Transplant - seed raised	37.5%	
<i>Rosa canina</i>	Dog Rose	N/A	40-60	2L	Branched; 3 breaks	10%	
<i>Sorbus aucuparia</i>	Rowan	N/A	60-80	B	1+1; Transplant - seed raised	5%	

Individual tree planting

T1. Individual tree planting for chalky soil

Botanical Name	Common Name	Girth/ Stem Dia cm	Height cm	Root Zone	Form and age / method of growth	Percentage
<i>Populus alba</i>	White Poplar	N/A	125-150	B	0/2; Cutting	100%

T2. Individual tree planting for well drained clayey and silty soil planting

Botanical Name	Common Name	Girth/ Stem Dia cm	Height cm	Root Zone	Form and age / method of growth	Percentage
<i>Quercus robur</i>	Oak	N/A	125-150	B	2x; Feathered; 2 breaks	100%

T3. Individual tree planting for seasonally wet sandy and loamy soil.

Botanical Name	Common Name	Girth/ Stem Dia cm	Height cm	Root Zone	Form and age / method of growth	Percentage
<i>Betula pubescens</i>	Downy Birch	N/A	125-150	B	2x; Feathered; 2 breaks	100%

Hedgerow Planting

H2. Hedgerow mix for well drained clayey and silty soil

Botanical Name	Common Name	Girth/ Stem Dia cm	Height cm	Root Zone	Specification	Percentage	Density
<i>Cornus sanguinea</i>	Dogwood	N/A	40-60	B	1+1; Transplant - seed raised; branched; 2 breaks	10%	2 staggered rows at 450mm linear centres
<i>Crataegus monogyna</i>	Hawthorn	N/A	40-60	B	1+1; Transplant - seed raised	45%	

Botanical Name	Common Name	Girth/ Stem Dia cm	Height cm	Root Zone	Specification	Percentage	Density
<i>Euonymus europaeus</i>	Spindle Tree	N/A	40-60	B	1+1; Transplant - seed raised; branched; 3 breaks	15%	
<i>Prunus spinosa</i>	Blackthorn	N/A	40-60	B	1+1; Transplant - seed raised; branched; 2 breaks	2.5%	
<i>Rosa canina</i>	Dog Rose	N/A	40-60	2L	Branched; 3 breaks	7.5%	
<i>Sambucus nigra</i>	Elder	N/A	40-60	B	1+0; Seedling; branched; 2 breaks	20%	

H3. Hedgerow mix for chalky soil

Botanical Name	Common Name	Girth/ Stem Dia cm	Height cm	Root Zone	Specification	Percentage	Density
<i>Fagus sylvatica</i>	Beech	N/A	40-60	B	1+1; Transplant - seed raised	20%	2 staggered rows at 450mm linear centres
<i>Corylus avellana</i>	Hazel	N/A	40-60	B	1+1; Transplant - seed raised; branched; 2 breaks	40%	
<i>Cornus sanguinea</i>	Dogwood	N/A	40-60	B	1+1; Transplant - seed raised; branched; 2 breaks	10%	
<i>Sambucus nigra</i>	Common Elder	N/A	40-60	B	1+0; Seedling; branched; 2 breaks	15%	
<i>Viburnum lantana</i>	Wayfaring-tree	N/A	40-60	B	1+1; Transplant - seed raised; branched; 2 breaks	15%	

H4. Hedgerow mix for seasonally wet sandy and loamy soil

Botanical Name	Common Name	Girth/ Stem Dia cm	Height cm	Root Zone	Form and age / method of growth	Percentage	Density
<i>Cornus sanguinea</i>	Dogwood	N/A	40-60	B	1+1; Transplant - seed raised; branched; 2 breaks	10%	2 staggered rows at 450mm linear centres
<i>Corylus avellana</i>	Hazel	N/A	40-60	B	1+1; Transplant - seed raised; branched; 2 breaks	15%	

Botanical Name	Common Name	Girth/ Stem Dia cm	Height cm	Root Zone	Form and age / method of growth	Percentage	Density
<i>Crataegus monogyna</i>	Hawthorn	N/A	40-60	B	1+1; Transplant - seed raised	50%	
<i>Ilex aquifolium</i>	Holly	N/A	40-60	2L	Leader with laterals	10%	
<i>Prunus spinosa</i>	Blackthorn	N/A	40-60	B	1+1; Transplant - seed raised; branched; 2 breaks	2.5%	
<i>Rosa canina</i>	Dog Rose	N/A	40-60	2L	Branched; 3 breaks	12.5%	

H6. Hedgerow mix for well drained loamy and sandy soil over gravel

Botanical Name	Common Name	Girth/ Stem Dia cm	Height cm	Root Zone	Specification	Percentage	Density
<i>Cornus sanguinea</i>	Dogwood	N/A	40-60	B	1+1; Transplant - seed raised; branched; 2 breaks	15%	2 staggered rows at 450mm linear centres
<i>Corylus avellana</i>	Hazel	N/A	40-60	B	1+1; Transplant - seed raised; branched; 2 breaks	30%	
<i>Crataegus monogyna</i>	Hawthorn	N/A	40-60	B	1+1; Transplant - seed raised	40%	
<i>Ligustrum vulgare</i>	Privet	N/A	40-60	B	0/1; Cutting; branched; 2 breaks	5%	
<i>Rosa canina</i>	Dog Rose	N/A	40-60	2L	Branched; 3 breaks	7.5%	
<i>Prunus spinosa</i>	Blackthorn	N/A	40-60	B	1+1; Transplant - seed raised; leader with laterals; 2 breaks	2.5%	

Scrub planting

S4. Scrub mix for well drained loamy and sandy soil over gravel

Botanical Name	Common Name	Girth/ Stem Dia cm	Height cm	Root Zone	Specification	Percentage	Density
<i>Crataegus monogyna</i>	Hawthorn	N/A	40-60	B	1+1; Transplant - seed raised	40%	

Botanical Name	Common Name	Girth/ Stem Dia cm	Height cm	Root Zone	Specification	Percentage	Density
<i>Cornus sanguinea</i>	Dogwood	N/A	40-60	B	1+1; Transplant - seed raised; branched; 2 breaks	10%	0.75m centres
<i>Corylus avellana</i>	Hazel	N/A	40-60	B	1+1; Transplant - seed raised; branched; 2 breaks	20%	
<i>Salix caprea</i>	Goat Willow	N/A	40-60	2L	Cutting; branched; 3 breaks	15%	
<i>Sambucus nigra</i>	Elder	N/A	40-60	B	1+0; Seedling; branched; 2 breaks	15%	

S7. Scrub mix for chalky soil

Botanical Name	Common Name	Girth/ Stem Dia cm	Height cm	Root Zone	Specification	Percentage	Density
<i>Cornus sanguinea</i>	Dogwood	N/A	40-60	B	1+1; Transplant - seed raised; branched; 2 breaks	2.5%	0.75m centres
<i>Corylus avellana</i>	Hazel	N/A	40-60	B	1+1; Transplant - seed raised; branched; 2 breaks	17.5%	
<i>Crataegus monogyna</i>	Hawthorn	N/A	40-60	B	1+1; Transplant - seed raised	50%	
<i>Euonymus europaeus</i>	Spindle Tree	N/A	40-60	B	1+1; Transplant - seed raised; branched; 3 breaks	5%	
<i>Sambucus nigra</i>	Elder	N/A	40-60	B	1+0; Seedling; branched; 2 breaks	25%	

Grass seeding

G1. Improved grassland pasture seed mix for well drained clayey and silty soil

Botanical Name	Common Name	Percentage	Density
Grasses		100%	4 g/m ²
<i>Agrostis capillaris</i>	Common Bent	12.5%	

Botanical Name	Common Name	Percentage	Density
<i>Alopecurus pratensis</i>	Meadow Foxtail	1.25%	
<i>Anthoxanthum odoratum</i>	Sweet Vernal-grass	3.75%	
<i>Briza media</i>	Quaking Grass	1.25%	
<i>Cynosurus cristatus</i>	Crested Dog's-tail	32.5%	
<i>Festuca rubra</i>	Slender-creeping Red-fescue	30%	
<i>Hordeum secalinum</i>	Meadow Barley	1.25%	
<i>Phleum bertolonii</i>	Smaller Cat's-tail	5%	
<i>Poa pratensis</i>	Smooth-stalked Meadow-grass	12.5%	

G2. Improved grassland pasture seed mix for chalky soil

Botanical Name	Common Name	Percentage	Density
Grasses		100%	4 g/m ²
<i>Briza media</i>	Quaking Grass	5%	
<i>Carex flacca</i>	Glaucous Sedge	0.25%	
<i>Cynosurus cristatus</i>	Crested Dog's-tail	25%	
<i>Festuca ovina</i>	Sheep's Fescue	30%	
<i>Festuca rubra</i>	Red-fescue	30%	
<i>Koeleria macrantha</i>	Crested Hair-grass	2.5%	
<i>Phleum bertolonii</i>	Smaller Cat's-tail	5.75%	
<i>Trisetum flavescens</i>	Yellow Oat-grass	1.5%	

G4. Semi-improved grassland seed mix for chalky soil

Botanical Name	Common Name	Percentage	Density
Wildflowers		20%	4 g/m ²
<i>Achillea millefolium</i>	Yarrow	0.5%	
<i>Agrimonia eupatoria</i>	Agrimony	0.3%	
<i>Anthyllis vulneraria</i>	Kidney Vetch	1.2%	
<i>Centaurea nigra</i>	Common Knapweed	1.5%	
<i>Centaurea scabiosa</i>	Greater Knapweed	1.5%	
<i>Cruciata laevipes</i>	Crosswort	0.3%	
<i>Daucus carota</i>	Wild carrot	1%	
<i>Filipendula vulgaris</i>	Dropwort	1%	
<i>Galium verum</i>	Lady's Bedstraw	2%	
<i>Knautia arvensis</i>	Field Scabious	1.2%	
<i>Leontodon hispidus</i>	Rough Hawkbit	0.8%	
<i>Leuchanthemum vulgare</i>	Oxeye Daisy	0.5%	
<i>Malva moscata</i>	Musk Mallow	0.8%	
<i>Ononis spinosa</i>	Spiny Restharrow	0.1%	
<i>Origanum vulgare</i>	Wild Marjoram	1%	
<i>Plantago media</i>	Hoary Plantain	1%	
<i>Poterium sanguisorba</i>	Salad Burnet	1.8%	
<i>Primula veris</i>	Cowslip	1.6%	
<i>Prunella vulgaris</i>	Selfheal	0.4%	
<i>Ranunculus bulbosus</i>	Bulbous Buttercup	1%	

Botanical Name	Common Name	Percentage	Density
<i>Scabiosa columbaria</i>	Small Scabious	0.5%	
Grasses		80%	
<i>Briza media</i>	Quaking Grass	4%	
<i>Carex flacca</i>	Glaucous Sedge	0.2%	
<i>Cynosurus cristatus</i>	Crested Dog's-tail	20%	
<i>Festuca ovina</i>	Sheep's Fescue	24%	
<i>Festuca rubra</i>	Red-fescue	24%	
<i>Koeleria macrantha</i>	Crested Hair-grass	2%	
<i>Phleum bertolonii</i>	Smaller Cat's-tail	4.6%	
<i>Trisetum flavescens</i>	Yellow Oat-grass	1.2%	

G5. Semi-improved grassland seed mix for well drained clayey and silty soil

Botanical Name	Common Name	Percentage	Density
Wildflowers		20%	4 g/m ²
<i>Achillea millefolium</i>	Yarrow	0.5%	
<i>Betonica officinalis</i>	Betony	0.5%	
<i>Centaurea nigra</i>	Common Knapweed	3%	
<i>Filipendula ulmaria</i>	Meadowsweet	0.5%	
<i>Galium album</i>	Hedge Bedstraw	0.5%	
<i>Galium verum</i>	Lady's Bedstraw	4%	
<i>Leontodon hispidus</i>	Rough Hawkbit	1%	
<i>Leuchanthemum vulgare</i>	Oxeye Daisy	2%	

Botanical Name	Common Name	Percentage	Density
<i>Plantago lanceolata</i>	Ribwort Plantain	1%	
<i>Primula veris</i>	Cowslip	1.5%	
<i>Prunella vulgaris</i>	Selfheal	0.4%	
<i>Ranunculus acris</i>	Meadow Buttercup	0.7%	
<i>Rhinanthus minor</i>	Yellow Rattle	1%	
<i>Rumex acetosa</i>	Common Sorrel	1.4%	
<i>Silaum silaus</i>	Pepper Saxifrage	0.7%	
<i>Silene flos-cuculi</i>	Ragged Robin	0.8%	
<i>Taraxacum officinale</i>	Dandelion	0.8%	
<i>Vicia cracca</i>	Tufted Vetch	0.1%	
Grasses		80%	
<i>Agrostis capillaris</i>	Common Bent	10%	
<i>Alopecurus pratensis</i>	Meadow Foxtail	1%	
<i>Anthoxanthum odoratum</i>	Sweet Vernal-grass	3%	
<i>Briza media</i>	Quaking Grass	1%	
<i>Cynosurus cristatus</i>	Crested Dog's-tail	26%	
<i>Festuca rubra</i>	Red-fescue	24%	
<i>Hordeum secalinum</i>	Meadow Barley	1%	
<i>Phleum bertolonii</i>	Smaller Cat's-tail	4%	
<i>Poa pratensis</i>	Smooth-stalked Meadow-grass	1%	

G6. Amenity grassland seed mix (general purpose)

Botanical Name	Common Name	Percentage	Density
Grasses		100%	40 g/m ²
<i>Agrostis capillaris</i>	Common Bent	10%	
<i>Festuca rubra litoralis</i>	Slender Creeping Red-fescue	20%	
<i>Festuca ovina</i>	Sheep's Fescue	45%	
<i>Lolium perenne</i>	Perennial Ryegrass	20%	
<i>Trifolium repens</i>	White Clover	5%	

G7. Semi-improved grassland seed mix for seasonally wet loamy (clayey or sandy) soil

Botanical Name	Common Name	Percentage	Density
Wildflowers		20%	4 g/m ²
<i>Achillea millefolium</i>	Yarrow	0.5%	
<i>Agrimonia eupatoria</i>	Agrimony	0.3%	
<i>Centaurea nigra</i>	Common Knapweed	3%	
<i>Daucus carota</i>	Wild Carrot	1%	
<i>Galium album – (Galium mollugo)</i>	Hedge Bedstraw	0.5%	
<i>Galium verum</i>	Lady's Bedstraw	2.5%	
<i>Geranium pratense</i>	Meadow Crane's-bill	0.4%	
<i>Knautia arvensis</i>	Field Scabious	1%	
<i>Leontodon hispidus</i>	Rough Hawkbit	1%	
<i>Leucanthemum vulgare</i>	Ox-eye Daisy	1.8%	
<i>Malva moschata</i>	Musk Mallow	1%	
<i>Plantago lanceolata</i>	Ribwort Plantain	0.8%	

Botanical Name	Common Name	Percentage	
<i>Primula veris</i>	Cowslip	1%	
<i>Prunella vulgaris</i>	Selfheal	0.4%	
<i>Ranunculus acris</i>	Meadow Buttercup	1.3%	
<i>Ranunculus bulbosus</i>	Bulbous Buttercup	0.7%	
<i>Rhinanthus minor</i>	Yellow Rattle	0.8%	
<i>Rumex acetosa</i>	Common Sorrel	1.4%	
<i>Silene vulgaris</i>	Bladder Campion	0.3%	
<i>Taraxacum officinale</i>	Dandelion	0.2%	
<i>Vicia sativa ssp. segetalis</i>	Common Vetch	0.1%	
Grasses		80%	
<i>Agrostis capillaris</i>	Common Bent	8%	
<i>Anthoxanthum odoratum</i>	Sweet Vernal Grass	3%	
<i>Briza media</i>	Quaking Grass	3%	
<i>Cynosurus cristatus</i>	Crested Dog's Tail	20%	
<i>Festuca ovina</i>	Sheep's Fescue	18%	
<i>Festuca rubra</i>	Red Fescue	24%	
<i>Phleum bertolonii</i>	Smaller Cat's-tail	3%	
<i>Trisetum flavescens</i>	Yellow Oat-grass	1%	

G10. Improved grassland seed mix for seasonally wet loamy (clayey or sandy) soil

Botanical Name	Common Name	Percentage	Density
Grasses		100%	5 g/m²

Botanical Name	Common Name	Percentage	Density
<i>Agrostis capillaris</i>	Common Bent	10%	
<i>Anthoxanthum odoratum</i>	Sweet Vernal-grass	3.75%	
<i>Briza media</i>	Quaking Grass	3.75%	
<i>Cynosurus cristatus</i>	Crested Dog's-tail	25%	
<i>Festuca ovina</i>	Sheep's Fescue	22.5%	
<i>Festuca rubra</i>	Red-fescue	30%	
<i>Phleum bertolonii</i>	Smaller Cat's-tail	3.75%	
<i>Trisetum flavescens</i>	Yellow Oat-grass	1.25%	

G12. Semi-improved grassland seed mix for well drained loamy and sandy soil over gravel

Botanical Name	Common Name	Percentage	Density
Wildflowers		20%	4 g/m ²
<i>Achillea millefolium</i>	Yarrow	0.5%	
<i>Agrimonia eupatoria</i>	Agrimony	0.3%	
<i>Anthyllis vulneraria</i>	Kidney Vetch	0.2%	
<i>Betonica officinalis</i>	Betony	0.5%	
<i>Calluna vulgaris</i>	Ling – Common Heather	0.4%	
<i>Centaurea nigra</i>	Common Knapweed	2%	
<i>Centaurea scabiosa</i>	Greater Knapweed	0.5%	
<i>Daucus carota</i>	Wild Carrot	1.5%	
<i>Galium verum</i>	Lady's Bedstraw	2.5%	
<i>Leontodon hispidus</i>	Rough Hawkbit	1%	

Botanical Name	Common Name	Percentage	Density
<i>Leucanthemum vulgare</i>	Ox-eye Daisy	1.5%	
<i>Malva moschata</i>	Musk Mallow	1.5%	
<i>Origanum vulgare</i>	Wild Marjoram	0.5%	
<i>Plantago media</i>	Hoary Plantain	0.8%	
<i>Primula veris</i>	Cowslip	1.4%	
<i>Prunella vulgaris</i>	Selfheal	0.4%	
<i>Ranunculus acris</i>	Meadow Buttercup	0.3%	
<i>Ranunculus bulbosus</i>	Bulbous Buttercup	0.8%	
<i>Rumex acetosa</i>	Common Sorrel	1.4%	
<i>Rumex acetosella</i>	Sheep's Sorrel	0.9%	
<i>Silene vulgaris</i>	Bladder Campion	0.8%	
<i>Teucrium scorodonia</i>	Wood Sage	0.2%	
<i>Verbascum nigrum</i>	Dark Mullein	0.1%	
Grasses		80%	
<i>Agrostis capillaris</i>	Common Bent	10%	
<i>Agrostis vinealis</i>	Brown Bent	4%	
<i>Anthoxanthum odoratum</i>	Sweet Vernal-grass	4%	
<i>Cynosurus cristatus</i>	Crested Dog's Tail	16%	
<i>Festuca ovina</i>	Sheep's Fescue	18%	
<i>Festuca rubra</i>	Red Fescue	20%	
<i>Koeleria macrantha</i>	Crested Hair-grass	3%	
<i>Phleum bertolonii</i>	Smaller Cat's-tail	5%	

G14. Improved grassland seed mix for well drained loamy and sandy soil over gravel

Botanical Name	Common Name	Percentage	Density
Grasses		100%	4 g/m ²
<i>Agrostis capillaris</i>	Common Bent	12.5%	
<i>Agrostis vinealis</i>	Brown Bent	5%	
<i>Festuca ovina</i>	Sheep's Fescue	22.5%	
<i>Festuca rubra</i>	Red-fescue	25%	
<i>Koeleria macrantha</i>	Crested Hair-grass	3.75%	
<i>Phleum bertolonii</i>	Smaller Cat's-tail	6.25%	



Appendix C: Approach to Ancient Woodland and Veteran Trees



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1 Introduction

- 1.1.1 Esso Petroleum Company, Limited (Esso) has made an application for development consent to replace 90km (56 miles) of its existing 105km (65 miles) aviation fuel pipeline that runs from the Fawley Refinery near Southampton, to the Esso West London Terminal storage facility in Hounslow. The replacement pipeline is referred to as the project within this report.
- 1.1.2 The application for Development Consent is based on the project Order Limits, which are generally up to 36m wide. Within the Order Limits, there are the Limits of Deviation, which is the area within which the trench for the 300mm pipeline would be excavated. It is not possible to undertake a detailed Arboricultural Impact Assessment on individual trees within the Order Limits, as the pipeline routing would not be determined until the detailed design stage.
- 1.1.3 The Environmental Statement (ES) set out the assessment of the project on Ancient Woodland and potential ancient woodland. The assessment concluded that there were unlikely to be significant effects in relation to these (see ES Chapter 7 **Application Document APP-047**).
- 1.1.4 During ongoing discussions with Natural England and the Forestry Commission with regards to agreeing the Statements of Common Ground, the Applicant has agreed to provide further information around the assessment of designated trees based on the current project understanding. This has also provided an opportunity to consider standing advice from Natural England and the Forestry Commission (2018) and to provide further details on a mitigation hierarchy for the protection of designated trees.
- 1.1.5 For the purposes of this document, 'designated trees' comprise of:
- Ancient Woodland (including potential ancient woodland); and
 - Veteran Trees (including potential veteran trees).
- 1.1.6 For the purposes of the project, '*Ancient Woodland*' are areas of woodland identified on the Ancient Woodland Inventory. '*Potential ancient woodland*' are areas of woodland less than 2ha in size that have been identified by the project as potentially being ancient woodland through desktop and / or field surveys but are not on the Ancient Woodland Inventory. '*Veteran Trees*' are trees with veteran status on the Woodland Trust Ancient Tree Inventory. '*Potential veteran trees*' are those identified during the arboricultural surveys undertaken for the project and which are not currently listed on the Woodland Trust Ancient Tree Inventory.
- 1.1.7 No Ancient Trees are recorded within 15m of the Order Limits on the Woodland Trust Ancient Tree Inventory (checked 8 December 2020). No potential ancient trees have been identified during the arboricultural site surveys, therefore, Ancient Trees and potential ancient trees are not considered further within this document.

2 Project Overview for Trees

2.1 Design Evolution and Commitments

- 2.1.1 ES Chapter 4 (**Application Reference APP-044**) outlines how the project corridor and Order Limits have been defined to avoid important tree groupings, such as Ancient Woodland. There are several areas where the design was changed because of trees, either by narrow working commitments or by amending the Order Limits.
- 2.1.2 Table 2.1 outlines the general commitments that have been made for the project in relation to trees. These are all secured through the Landscape and Ecological Management Plan (Requirement 12). Those commitments related to trees and construction and the locations where narrow working would be undertaken are set out in the Code of Construction Practice for the project and are secured through Requirement 5 (Code of Construction Practice) of the Development Consent Order.

Table 2.1: Project Commitments Relating to Trees

Ref	Commitment Description
O1	Commitment to only utilise a 10m width when crossing through boundaries between fields where these include hedgerows, trees or watercourses.
O2	Design route alignment to avoid all areas of existing classified Ancient Woodland.
G65	Working widths would be reduced in specific locations where trees or hedges are present. Where notable, TPO, Ancient Woodland and veteran trees would be retained within or immediately adjacent to the Order Limits, the trees and their root protection areas would be protected where they extend within the Order Limits and are at risk. This would be by means of fencing or other measures.
G86	Works to notable, TPO and veteran trees, where at risk of damage, would be supervised by the ECoW and supported by an experienced arboriculturalist.
G87	In accordance with Requirement 8 of the DCO, vegetation clearance, retention, protection and replanting/reinstatement drawings would be produced prior to the construction phase (including where applicable as part of a Site Specific Plan). The contractor(s) would implement these plans including agreed mitigation where practicable.
G88	Where possible, reinstatement of vegetation would generally be using the same or similar species to that removed (subject to restrictions for planting over and around pipeline easements).
G91	The contractor(s) would retain vegetation where practicable and in accordance with, as a minimum, the vegetation retention drawings.
G92	A five-year aftercare period would be established for all mitigation planting and reinstatement.
G95	The contractor(s) would apply the relevant protective principles set out in the British Standard 5837:2012 Trees in relation to design, demolition and construction . This would be applied to trees within the Order Limits which would be preserved through the construction phase, and to trees outside of the Order Limits where such measures do not hinder or prevent the use of the relevant working width for construction.
G97	Where woodland vegetation is lost, and trees cannot be replaced in situ due to the restrictions of pipeline easements, native shrub planting approved by Esso would be used as a replacement, in accordance with the vegetation reinstatement plans to be approved by the relevant planning authorities as part of the LEMP. The approved vegetation reinstatement plan will also include replacement tree planting where appropriate.



Ref	Commitment Description
G175	For trenchless crossings TC001 to TC015, TC019, TC021 to TC028, TC030 to TC040, vegetation would be retained except where emergency access is required to trenchless equipment or ecological works have been proposed. At TC029 vegetation would be retained to the east of Hardwick Lane but not to the west side due to the requirement for access. At TC016, TC017 and TC018, there would be limited removal of vegetation along the alignment of the existing pathway to allow for pipe stringing.
G200	Trees that are removed as a result of the construction of the project will be replaced on a one for one basis in accordance with the vegetation reinstatement plans approved under the LEMP. Where possible, replacement tree planting will be located in close proximity to the original tree. It should be noted that such tree reinstatement would not apply to areas where tree removal is for habitat improvement reasons, such as at Chobham Common and this has been agreed with Natural England and the relevant landowners.

2.2 Arboricultural Survey

2.2.1 Appendix 3 of the Scoping Report (**Application Reference AS-019**) set out the proposed approach to surveying trees within and in the vicinity of the Order Limits, to provide baseline information for the ES. The survey involved arboricultural specialists surveying trees in accordance with British Standard 5837:2012 Trees in Relation to Design, Demolition and Construction – Recommendations (BS 5837:2012). This information has been used to calculate root protection areas (RPAs) and has been used to inform the detailed routing of the pipeline.

2.3 Mitigation Hierarchy

2.3.1 It should be noted that the ES adopts a worst-case scenario whereby, with certain exceptions, it assumed that all trees within the Order Limits would be removed to facilitate installation of the project. This was because the project assumed Limits of Deviation within which the pipeline trench would be excavated, rather than a specific pipeline alignment, at such an early stage in the design process.

2.3.2 Since removal of all trees within the Order Limits is not the intention, this document sets out the mitigation hierarchy that is to be employed during the detailed route alignment design and installation. The starting assumption is that the project will seek to locate the pipeline trench outside of a 15 buffer around designated trees (including the RPAs) where practicable (A1 and B1 in the following sections). If this is not practicable, for example due to engineering or other environmental constraints, then the project would avoid locating the pipeline trench within the RPA (mitigation A2 and B2). Where avoidance of the RPA is also not practicable, a specialist construction measures for use within the RPA would be adopted and set out in a method statement (A3 and B3).

2.3.3 Site Specific Plans (SSPs) providing location-specific construction methodologies have been prepared as documents certified as part of the DCO. These include SSPs for Queen Elizabeth Park and Southwood Country Park, where veteran and potential veteran trees have been identified. Construction within those sites must be in accordance with those plans and therefore the mitigation hierarchy applied in these areas is based on the pipeline alignment shown within the SSP.

2.3.4 For all areas outside of an SSP, the Landscape Retention and Removal Plans identify the tier of the mitigation hierarchy that applies to designated trees.

3 Ancient Woodland

3.1 Definition

3.1.1 In the Standing Advice '*Ancient Woodland, Ancient Trees and Veteran Trees: protecting them from development*', Ancient Woodland is defined as '*any area that's been wooded continuously since at least 1600 AD* (Natural England and Forestry Commission, 2018). *It includes:*

- *ancient semi-natural woodland mainly made up of trees and shrubs native to the site, usually arising from natural regeneration [and]*
- *plantations on ancient woodland sites - replanted with conifer or broadleaved trees that retain ancient woodland features, such as undisturbed soil, ground flora and fungi.*' (Forestry Commission and Natural England, 2018).

3.2 Project Approach to Ancient Woodland

Survey and Assessment

3.2.1 All designated Ancient Woodland on the Ancient Woodland Inventory dataset (Natural England, 2018) within 15m of the Order Limits was mapped. (Appendix A). Areas of designated Ancient Woodland are referred to within the ES Appendix 7.3 Ancient Woodland Factual Report (**Application Reference APP-083**).

3.2.2 The Order Limits were designed to avoid areas shown on the Ancient Woodland Inventory as per Commitment O2 '*Design route alignment to avoid all areas of existing classified Ancient Woodland*'.

3.2.3 There are 12 areas (which incorporate 14 inventory 'plots', as some larger woodlands are split into more than one plot on the inventory) of designated Ancient Woodland within 15m of the Order Limits, as illustrated on Figure 10.3 of the ES (**Application Document APP-064**).

3.2.4 Arboricultural surveys to map the stems of trees at the edge of Ancient Woodlands have helped define the extent of the woodland for determining protective buffers during construction.

Further Mitigation Principles

3.2.5 The project has considered the Forestry Commission and Natural England Standing Advice (2018) which states that '*For ancient woodlands, you should have a buffer zone of at least 15 metres to avoid root damage...*'.

3.2.6 The Landscape Retention and Removal Plans show areas of Ancient Woodland within 15m of the Order Limits and which tier of the mitigation hierarchy applies.



Table 3.1: Principles of the mitigation hierarchy for Ancient Woodlands

Mitigation hierarchy		Further Mitigation Principle
This would apply where practicable	A1 (15m buffer)	A minimum buffer width of 15m shall be maintained between the pipeline trench and the Ancient Woodland Inventory boundary. Appropriate and readily visible demarcation shall be maintained to define the 15m buffer where this extends within the Order Limits and to control access during construction. Installation of the pipeline will be kept outside of this 15m buffer. Where not practicable to exclude all potentially compacting activities within 15m of Ancient Woodland boundaries, appropriate ground protection measures shall be put in place within the 15m buffer to mitigate the potential effects on trees.
If A1 was not practicable due to other site constraints, A2 would apply,	A2 (RPA buffer)	A minimum buffer equivalent to the extent of the RPA shall be maintained between the pipeline trench and Ancient Woodland boundary. Appropriate and readily visible demarcation shall be maintained to define the RPA buffer where this extends within the Order Limits and to control access during construction. Installation of the pipeline will be kept outside of this RPA buffer. Where not practicable to exclude all potentially compacting activities within the RPA buffer, appropriate ground protection measures shall be put in place to mitigate the potential effects on trees.
If A2 was not practicable due to other site constraints, A3 would apply,	A3 (Specialist techniques)	Where not practicable to exclude the pipeline trench from within the RPA of Ancient Woodland boundaries, site-specific measures that would be employed to mitigate the effects on the RPA, for example, hand digging / vacuum excavation under arboricultural supervision. These would be recorded in a method statement

3.2.7 Table 3.2 summarises the Ancient Woodlands that are likely to fall within each tier of the mitigation hierarchy.

Table 3.2: Summary of mitigation hierarchy for Ancient Woodlands within 15m of the Order Limits

Mitigation hierarchy	Ancient Woodland plots that the mitigation hierarchy would be applied based on the current project assumptions	Approximate extent of mitigation measure (linear metres)
Not applicable; no likely impact.	Four woodlands: <ul style="list-style-type: none"> • Plantation near Bramdean Common - 1490746; • Woodland south of Neatham Manor - 1490082; • Skains Copse / Combe Wood - 1489102; and • Fan Grove – 1493.326. 	N/A
A1 (15m buffer)	Eight woodlands: <ul style="list-style-type: none"> • Copse near Betty Mundy’s Bottom – 1490774 (Exception - see A2); 	30m
	• Joan’s Acre Wood - 1490766 / 1491165;	190m
	• Hughes Copse - 1490373;	48m
	• Noar Copse - 1490375 / 1490233;	212m
	• Greendane Copse - 1487529.	65m
	• Skains Copse / Combe Wood - 1489100 (except as noted below);	190m
	• Halebourne Copse 1494014.	95m
	• Holme Wood, Broadlands Row - 1491028	12m



Mitigation hierarchy	Ancient Woodland plots that the mitigation hierarchy would be applied based on the current project assumptions	Approximate extent of mitigation measure (linear metres)
A2 (RPA buffer)	Two woodlands: <ul style="list-style-type: none"> • Copse near Betty Mundy's Bottom - 1490774 (south-western corner); 	12m
	<ul style="list-style-type: none"> • Holme Wood, Broadlands Row - 1491028 	90m
A3 (Specialist techniques)	One woodland: <ul style="list-style-type: none"> • Skains Copse / Combe Wood - 1489100 (in vicinity of NW 33 pinch-point). 	25m

4 Potential Ancient Woodland

4.1 Definition

Forestry Commission and Natural England Standing Advice (2018), states that ‘Ancient woodlands smaller than 2 hectares are unlikely to appear on... Natural England’s Ancient Woodland inventory’. Therefore, for the purposes of this strategy, the term ‘potential ancient woodland’ is used to refer to woodland that corresponds to the definition of designated Ancient Woodland set out in Section 3 of this document, but is less than 2ha in size and is not recorded on the inventory. The approach taken to the identification of potential ancient woodland is set out below.

4.2 Project Approach to Potential Ancient Woodland

Survey and Assessment

4.2.1 A desk study was undertaken to identify areas of potential Ancient Woodland, as set out in ES Appendix 7.3 Ancient Woodland Factual Report (**Application Reference APP-083**). Although it was not possible to avoid all potential ancient woodland within the Order Limits during the pipeline routing, the project approach to the mitigation hierarchy for potential ancient woodlands is to treat them the same as designated Ancient Woodland using the measures outlined in Table 3.1.

4.2.2 Since submission of the application for Development Consent, additional desk survey has been undertaken to refine the precautionary assessment undertaken within ES Appendix 7.3 Ancient Woodland Factual Report (**Application Reference APP-083**). The additional work concluded that there are seven potential ancient woodlands within 15m of the Order Limits.

Further Mitigation Principles

4.2.3 The Landscape Retention and Removal Plans show areas of potential ancient woodland within 15m of the Order Limits and which tier of the mitigation hierarchy would apply. Table 4.1 summarises the number of potential ancient woodlands that are likely to fall within each tier of the mitigation hierarchy.

Table 4.1: Summary of mitigation hierarchy for Potential Ancient Woodlands within 15m of the Order Limits

Mitigation hierarchy	Potential ancient woodland plots that the mitigation hierarchy would be applied based on the current project assumptions	Approximate extent of mitigation measure (linear metres)
Not applicable; no likely impact.	One woodland: <ul style="list-style-type: none"> AW2 (Woodland west of Nether Hill). 	N/A (Trenchless crossing)
A1 (15m buffer)	Five woodlands: <ul style="list-style-type: none"> AW3 (Durley Mill Copse); 	78m
	<ul style="list-style-type: none"> AW5 (Copse near Betty Mundy’s Bottom); 	212m
	<ul style="list-style-type: none"> AW12 (Neatham Down) (Exception – see A2); 	33m
	<ul style="list-style-type: none"> AW16 (Greendane Copse) ; 	25m
	<ul style="list-style-type: none"> AW30 (Woodland at Silverlands). 	217



Mitigation hierarchy	Potential ancient woodland plots that the mitigation hierarchy would be applied based on the current project assumptions	Approximate extent of mitigation measure (linear metres)
A2 (RPA buffer)	One woodland <ul style="list-style-type: none"> • AW12 (Neatham Down) (where Limits of Deviation narrow); 	11m
A3 (Specialist techniques)	One woodland: <ul style="list-style-type: none"> • AW15a (Woodland west of Ewshot Wood). 	52m

5 Veteran and Potential Veteran Trees

5.1 Definition

- 5.1.1 BS 5837:2012 defines a Veteran tree as a *'tree that, by recognised criteria, shows features of biological, cultural or aesthetic value that are characteristic of, but not exclusive to, individuals surviving beyond the typical age range for the species concerned'*. BS 5837:2012 also provides a footnote that *'These characteristics might typically include a large girth, signs of crown retrenchment and hollowing of the stem. [BS 3998:2010]'*

5.2 Project Approach to Veteran and Potential Veteran Trees

Survey Approach

- 5.2.1 At the time of submission of the application for Development Consent, there were no veteran trees recorded on the inventory within 15m of the Order Limits. Since application (checked 8 December 2020), three Veteran Trees have been added to the inventory within 15m of the Order Limits along Ashford Road, Staines and four Veteran Trees have been added to the inventory within 15m of the Order Limits at Queen Elizabeth Park, Farnborough.
- 5.2.2 Arboricultural surveys have recorded those trees that display features consistent with a potential veteran tree in accordance with BS 5837:2012. The potential veteran trees are listed in Table 5.2. RPAs have been calculated for each potential veteran tree.

Further Mitigation Principles

- 5.2.3 The project has considered the Standing Advice on protecting Veteran trees from development which states *'A buffer zone around[a]... veteran tree should be at least 15 times larger than the diameter of the tree. The buffer zone should be 5m from the edge of the tree's canopy if that area is larger than 15 times the tree's diameter'* (Forestry Commission and Natural England, 2018).
- 5.2.4 For the purposes of the assessment and the application of the mitigation hierarchy, potential veteran trees are considered on the same basis as Veteran Trees. The Landscape Retention and Removal Plans identify potential veteran trees and the tier of the mitigation hierarchy that would apply.



Table 5.1: Principles of further mitigation for Veteran and potential veteran trees

Mitigation hierarchy		Further Mitigation Principle
This would apply where practicable	B1 (Up to 15m buffer)	A buffer width of 5m from the edge of the canopy of the Veteran or potential veteran tree, or up to fifteen times the tree stem diameter ¹ , whichever is the greater, up to a maximum of 15m ² from the stem, shall be maintained between the pipeline trench and the veteran or potential veteran tree. Appropriate and readily visible demarcation shall be maintained to define the buffer where this extends within the Order Limits and to control access during construction. Installation of the pipeline will be kept outside of this buffer. Where not practicable to exclude all potentially compacting activities within the buffer (up to 15m), appropriate ground protection measures shall be put in place to mitigate the potential effects on trees.
If B1 was not practicable due to other site constraints, B2 would apply,	B2 (RPA buffer)	A minimum buffer equivalent to the extent of the RPA shall be maintained between the pipeline trench and the Veteran or potential veteran tree. Appropriate and readily visible demarcation shall be maintained to define the RPA buffer where this extends within the Order Limits and to control access during construction. Installation of the pipeline will be kept outside of this RPA buffer. Where not practicable to exclude all potentially compacting activities within the RPA buffer, appropriate ground protection measures shall be put in place to mitigate the potential effects on the RPA.
If B2 was not practicable due to other site constraints, B3 would apply,	B3 (Specialist techniques)	Where not practicable to exclude the pipeline trench from within the RPA of Veteran or potential veteran trees, site-specific measures that would be employed to mitigate the effects on the RPA, for example, hand digging/ vacuum excavation under arboricultural supervision. These would be recorded in a method statement.

5.2.5 Table 5.2 summarises the number of inventory Veteran Trees and potential veteran trees that are likely to fall within each tier of the mitigation hierarchy.

¹2 Stem diameter, as measured at 1.5m above highest adjacent ground level.

²2 The buffer for protecting Veteran and potential veteran trees has been capped at a maximum of 15m, the same buffer dimension in the Natural England/ Forestry Commission standing advice for Ancient Woodland.



Table 5.2: Summary of veteran and potential veteran trees within 15m of the Order Limits

Mitigation hierarchy	Veteran and potential veteran trees that the mitigation hierarchy would be applied to based on the pipeline alignment shown on the relevant SSP or the current project assumptions for other locations
Not applicable; no likely impact.	Two Veteran trees (not affected due to trenchless crossing) <ul style="list-style-type: none"> • S2700-T19 (Willow in Queen Elizabeth Park); • S2700-T22 (previously T41) (Willow in Queen Elizabeth Park).
B1 (Up to 15m buffer)	15 potential veteran trees and one potential veteran tree group: <ul style="list-style-type: none"> • T4 (Oak east of Minchingfield Lane); • S300-T2 (Ash near Betty Mundy's Bottom); • S400-T1 (Field maple south east of Hinton Ampner); • S400-T2 (Ash south east of Hinton Ampner); • S400-T4 (Ash south east of Hinton Ampner); • T13 (Oak to the north of West Tilsted); • T105 (Beech south of Petersfield Road); • S700-T12 (Beech at Jubilee Clump, Manor Farm); • S1200-T4 (Oak within woodland south of West End); • T40 (Oak on southern edge of Southwood Golf Course); • S1800-T6 (Oak near entrance to Farnborough Hill School); • S1800-T7 (Oak near entrance to Farnborough Hill School); • S1800-T45 (Sweet chestnut near eastern edge of Farnborough Hill School); • T102 (Alder on edge of woodland south of Halebourne Copse); • T106 (Oak on edge of Halebourne Copse) • G170 (Oak on edge of woodland at Foxhills Golf Course).
B2 (RPA buffer)	Three Veteran trees: <ul style="list-style-type: none"> • 193108 (Survey ref: S2300-T46) (Oak east of Ashford Road); • 193090 (Survey ref: S2300-T12) (Ash west of Ashford Road); • 194703 (Survey ref: S2300-T64) (Oak east of Ashford Road). Two potential veteran trees: <ul style="list-style-type: none"> • S300-T1 (Field maple close near Betty Mundy's Bottom); • S2400-T219 (Ash at north western end of Fordbridge Park).
B3 (Specialist techniques)	Two Veteran trees: <ul style="list-style-type: none"> • S2700-T5 (Beech at Queen Elizabeth Park); • S2700-T8 (Beach at Queen Elizabeth Park).



6 References

Forestry Commission and Natural England (November 2018). Ancient woodland, ancient trees and veteran trees: protecting them from development. Accessed 25 July 2019. <https://www.gov.uk/guidance/ancient-woodland-and-veteran-trees-protection-surveys-licences>

Woodland Trust (July 2019). Planning for Ancient Woodland Planners' Manual for Ancient Woodland and Veteran Trees. Accessed 9 September 2019. <https://www.woodlandtrust.org.uk/mediafile/100825449/planners-manual-for-ancient-woodland.pdf?cb=d69433f72bf14b388b637d1046700a4f>



Appendix D: Methodology for Working Near Trees

1 Introduction

1.1 Purpose of the Methodology

1.1.1 This methodology has been produced to support the Landscape and Ecological Management Plan (LEMP) by providing further details about how works would be undertaken in and around root protection areas (RPAs).

2 General Principles

2.1.1 Table 1.1 outlines the commitments that the project has made in relation to RPAs.

Table 1: Commitments

Commitment Reference	Measures Description	Where is it secured in the Draft DCO
G95	The contractor(s) would apply the relevant protective principles set out in the British Standard 5837:2012 Trees in relation to design, demolition and construction. This would be applied to trees within the Order Limits which would be preserved through the construction phase, and to trees outside of the Order Limits where such measures do not hinder or prevent the use of the relevant working width for construction.	DCO Requirement 12 (LEMP)
G65	Working widths would be reduced in specific locations where trees or hedges are present. Where notable, TPO, Ancient Woodland and veteran trees would be retained within or immediately adjacent to the Order Limits, the trees and their root protection areas would be protected where they extend within the Order Limits and are at risk. This would be by means of fencing or other measures.	DCO Requirement 6 (CEMP) and DCO Requirement 12 (LEMP)
G86	Works to notable, TPO and veteran trees, where at risk of damage, would be supervised by the ECoW and supported by an experienced arboriculturist.	DCO Requirement 5 (CoCP) and DCO Requirement 8 (Hedgerows and trees)

2.1.2 In accordance with clause 6.3 of British Standard (BS) 5837:2012, works at ground level will be undertaken under the supervision of an arboriculturist and / or Environmental Clerk of Works (ECoW).

2.1.3 Working in accordance with clause 6.2 of BS 5387:2012, barriers and / or ground protection will be used to demarcate RPAs on site. A joint RPA may be provided around groups of trees with the RPA reflecting the greatest RPA. In accordance with clause 6.2.1.1 of BS 5387:2012 all barriers and ground protection will be installed prior to works in the area commencing.

2.1.4 In accordance with good practice to avoid ground compaction, as referenced in clause 8.4 of BS 5387:2012, no materials (including fencing material prior to installation), plant or equipment will be stored in an RPA at any time. This will be briefed to all employees working in or adjacent to an RPA, and be monitored by, the arboriculturist and / or ECoW. In addition, plant will not be allowed to idle or be



parked in the RPA. This will be briefed to all plant operators, and be monitored by, the arboriculturalist and / or ECoW. Where exclusion is not practical, alternative appropriate ground protection would be used following, discussion with the arboriculturalist.

- 2.1.5 In accordance with clause 6.2.2.4 of BS 5387:2012, project signage will also be installed to identify the RPA.

3 Protection of RPAs

3.1 Barriers

- 3.1.1 The type of barriers will be provided dependent on the level of risk posed to the RPA and to suit the location in accordance with clause 6.2.2.3 of BS 5387:2012, as agreed with the arboriculturalist on site. This may be post and rope, or netlon-type fencing in low risk areas, plastic style pedestrian barriers in medium risk areas or, in high risk areas, welded mesh panels on rubber feet with stabiliser struts, commonly known as heras fencing.

A barrier will be erected to demarcate the RPA and to prevent works encroaching into the RPA. In accordance with clause 6.2.2.1 of BS 5387:2012, the site team will maintain the barriers so that they remain rigid and complete, for as long as they are in-situ.

3.2 Vehicle Access within an RPA

- 3.2.1 It will not always be practical to keep construction vehicles outside of the RPA in all instances. In some cases, temporary construction access may be required within some RPAs, as identified in clause 6.2.3.1 of BS 5387:2012. Where this is required the barriers will be set back as far as is required and clause 6.2.3.2 of BS 5387:2012 will apply. Temporary ground protection will be designed and installed in accordance with the requirements of clause 6.2.3.3 of BS 5387:2012.

- 3.2.2 Proprietary systems, as noted in point C of clause 6.2.3.3 of BS 5387:2012, will be installed where construction plant is required to traffic within the RPA. The proprietary system will be suitable to the duration and type of vehicular disturbance. It may include the following, as advised by the arboriculturalist:

- Proprietary geo-cell: A permeable geotextile membrane is laid in the RPA followed by placement of the geo-cell. Geo-cell is available in various thicknesses which can be built up to provide the appropriate protection as detailed by the arboriculturalist. The geo-cell is then filled with clean angular stone fill. When works are complete the geo-cell can be teased from the angular stone, leaving the stone on the surface of the membrane. The stone can then be removed using hand tools or plant, such as a vac-ex truck, that operates from an intact adjacent section of geo-cell. This enables the removal of the stone working backwards out of the RPA.
- Proprietary trackway / trackmat: A permeable geotextile membrane is laid in the RPA followed by a thickness of clean angular stone fill as detailed by the arboriculturalist. The proprietary trackway / trackmat is then laid on top and fixed together. Reversing this process removes the temporary ground protection. As with the geo-cell, the stone can be removed using hand tools or plant, such as a vac-ex truck, that operates from an intact adjacent section of ground protection. This enables the removal of the stone working backwards out of the RPA. If acceptable to the arboriculturalist, the trackway / trackmat will be placed



directly on the ground.

- 3.2.3 The proprietary systems are re-usable and will be moved around the project as required by the programme of works.

3.3 Pedestrian Access within an RPA

- 3.3.1 Where there are likely to be frequent worker (pedestrian) movements only in the RPA, lighter ground protection will be installed prior to works commencing, in accordance with clause 6.2.3.3 of BS 5837:2012:

- Wood chips: A permeable geotextile membrane is laid in the RPA followed by placement of the wood chips to a depth of 100mm or that specified by the arboriculturalist. If required by the arboriculturalist, a proprietary pedestrian walkway board will be placed on the wood chips and connected. Wood chips will only be used where they have been generated as a result of the tree pruning / removal works as part of the project.
- Walkway Boards: A proprietary pedestrian walkway board will be placed on a compression resistant layer or suspended onto a driven scaffold frame.

3.4 Working around Roots in Streets

- 3.4.1 Where roots are encountered in a street environment RPA, as described in clause 6.2.3.1 of BS 5837:2012, the existing road pavement will be left in place to provide the ground protection. The arboriculturalist will confirm that the existing road pavement is suitable to provide appropriate ground protection to tree roots.

4 Open Cut Works in an RPA

- 4.1.1 Open cut works in an RPA, whether in a rural or urban setting, will be undertaken under the supervision of an arboriculturalist and / ECoW. The following hand dig excavation techniques, individually or in combination, will be used to reduce any potential damage to the roots during open cut works:

- Use of an air lance or air spade. An air lance or air spade provides a concentrated air flow in a high velocity stream jet. This penetrates and dislodges the soil without damage to roots and is an accepted method of excavating safely in accordance with clause 7.2.1 of BS 5837:2012. An air compressor is used to power the lance / spade. An air lance / spade is most effective in granular soils or made ground but can be used in clay-type soils. An experienced operator will be able to effectively dislodge the soil around the roots for removal by vacuum excavation or traditional methods i.e. excavator or manual removal.
- Manual excavation. All operatives will be briefed and supervised by the arboriculture specialist and / or ECoW.
- Use of a vacuum excavation (vac-ex) wagon. A vac-ex wagon can be used depending on ground conditions which will be assessed by the arboriculturalist and / or ECoW. Soil is displaced by suction power where high-volume air flow – suction – is generated to create the excavation. The suction dislodges the soil without damage to roots and is an accepted method of excavating safely in accordance with clause 7.2.1 of BS 5837:2012. The soil displaced during excavation can be stored to use later for reinstatement activities.

- 4.1.2 Hand excavation will be reviewed by the arboriculturalist as works commence and proceed. Where on initial excavation there is an absence of roots within the works area, and in agreement with the arboriculturalist, a small rubber tracked excavator



may be used to excavate the pipeline trench. All excavated spoil will be removed from the area or placed on temporary ground protection to be used for back filling upon completion.

- 4.1.3 Any roots uncovered during the works will be assessed and treated in accordance with clauses 7.2.2, 7.2.3 and 7.2.4 of BS 5837:2012.
- 4.1.4 Roots, whilst exposed, will be wrapped in dry hessian or covered to prevent desiccation and to protect them from temperature changes. Any wrapping will be removed prior to backfilling, which will take place as soon as practical once the pipeline has been installed.
- 4.1.5 As stated in the Code of Construction Practice, upon reinstatement the roots will be surrounded with topsoil, sharp sand (builders' sand will not be used due to its high salt content) or other loose inert granular fill, before soil or other medium is replaced. This material should be uncontaminated and free from injurious objects. Temporary ground protection will be removed in a backwards direction away from the tree so as always to be positioned on protection and not on unprotected ground. Once the work area is cleared of ground protection the recently backfilled spoil will be watered.