Southampton to London Pipeline Project

Deadline 4

Outline Landscape and Ecological Management Plan (LEMP)

Application Document: 8.50

Planning Inspectorate Reference Number: EN070005

Revision No. 1.0

January 2020

Contents

Acronyms and Abbreviations

Acronym	Definition
CEMP	Construction Environmental Management Plan
CoCP	Code of Construction Practice
DCO	Development Consent Order
ECoW	Environmental Clerk of Works
EPS	European Protected Species
ES	Environmental Statement
LEMP	Landscape and Ecological Management Plan
LNR	Local Nature Reserve
NJUG	National Joint Utilities Group
NNR	National Nature Reserve
REAC	Register of Environmental Actions and Commitments
RPA	Root Protection Area
SANG	Suitable Alternative Natural Greenspace
SAC	Special Area of Conservation
SINC	Sites of Importance for Nature Conservation
SNCI	Sites of Nature Conservation Importance
SPA	Special Protection Area
SSSI	Site of Special Scientific Interest
TPO	Tree Preservation Order
TPZ	Tree Protection Zone

1 Introduction

1.1 Overview

1.1.1 Esso Petroleum Company, Limited (Esso) has submitted an application for a Development Consent Order (DCO) 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 is referred to as the project within this document.

1.1.2 Esso has already replaced 10km of pipeline between Hamble and Boorley Green in Hampshire and is now replacing the 90km of pipeline between Boorley Green and the Esso West London Terminal storage facility in Hounslow. The areas of land to be permanently or temporarily used for the project are known as the Order Limits.

1.1.3 The project will be broken down into a number of stages. These will be based on geographical areas and could in some instances follow planning authority boundaries but would also consider the location of technically challenging sections of works such as a trenchless crossing beneath a major road or river, which may transcend planning boundaries.

1.1.4 Works to install and commission the pipeline are expected to start from grant of DCO and be completed by early 2023. Certain advance works may take place prior to development consent where consented under alternative regimes, for example, the Town and Country Planning Act 1990.

1.1.5 The development authorised by the DCO must be undertaken in accordance with the Landscape and Ecological Management Plan (LEMP) pursuant to Requirement 12 of the DCO.

1.2 Purpose of the Outline LEMP

1.2.1 An Environmental Impact Assessment (EIA) 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. All of these measures were collated into the Register of Actions and Commitments (REAC) (Environmental Statement (ES) Chapter 16 (**Application Document APP-056**).

1.2.2 The purpose of the Outline 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 within the REAC to be actioned within the project.

1.2.3 The Outline LEMP has been produced to set out how the final LEMP would be structured and to provide clarity on what the final LEMP would contain. The final LEMP will provide a consistent approach to the control of construction activities for the project. The LEMP will cover 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 an 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 and the Site of Special Scientific Interest (SSSI) working plans set out in Annex B of the Habitats Regulation Assessment Report, which are added as Appendix A to this Outline LEMP (**Document Reference 8.50**). The LEMP must also include an implementation timetable and must be carried out as approved.

1.2.5 Further consultation will be undertaken with the relevant planning authorities, Natural England and landowners, when developing the final LEMP for approval prior to construction. It is anticipated that relevant planning authorities would, at their discretion, consult relevant statutory bodies, including Natural England and other relevant consultees, such as the local wildlife trusts.

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. The main responsibility for implementing these control measures will fall to Esso's principal contractor. The principal contractor will provide further detail of its plans and proposals as part of the submission the final LEMP for approval.

1.3 Structure of the LEMP

1.3.1 This Outline 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.

1.3.2 Section 3 of this Outline LEMP provides an overview of the main landscape and ecological designations which provide the planning policy context for the Outline 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. This Outline LEMP contains the following appendices that will be included in the final LEMP:

- Appendix A – SSSI Working Plans – these show the method of working in SSSIs and areas as set out in Annex B of the Habitats Regulations Assessment Report (**Application Documents APP-130 and APP-131**).
- Appendix B – Vegetation Reinstatement Plans – an illustrative sample showing a rural environment within the South Downs National Park and urban environment near Ewshot, to provide an example of the level of detail that will be provided in the Vegetation Reinstatement Plans to be included in the final LEMP.
- Appendix C – Approach to Ancient Woodland and Veteran Trees.
- Appendix D – Site specific method statements – HCX 130.
- Appendix E – Environmental Mitigation Areas.

1.3.3 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 (**Document Reference 3.1 (5)**) as follows.

- Vegetation Retention and Removal Plans will be notified to the relevant planning authorities in accordance with Requirement 8(1)(a) of the DCO. These plans will be based on the final design alignment which will take 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 and 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.
- Landscape and Ecological Reinstatement Plans will be included as part of the LEMP in accordance with Requirement 8(1)(b) of the DCO and will reflect the requirements of Section 5 of the LEMP.

1.3.4 This Outline LEMP contains in Appendix B illustrative sample vegetation reinstatement plans showing a rural environment within the South Downs National Park and urban environment near Ewshot. These provide an example of the level of detail that will be provided for the full length of the pipeline installation in the final LEMP. The sample plans are based on the indicative pipeline alignment and could be subject to change.

1.3.5 The Outline Construction Environmental Management Plan (CEMP) (**Application Document APP-129**) originally included Annex I, Arboricultural Management Plan. Esso now considers this detail would be better incorporated within the contents and scope of the Outline LEMP rather than the Outline CEMP. The relevant details can be found in:

- Section 4.3: Retention and protection of existing trees;
- Section 4.4: Removal of trees; and
- Section 5.3: Reinstatement of trees.

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

1.3.7 The Outline LEMP should be read in conjunction with the Code of Construction Practice (CoCP) (**Document Reference 6.4 Appendix 16.1 (3)**), the Site Specific Plans and relevant Outline plans that have been produced for the project. In the case of the Outline plans, the DCO requires that the final plans be in accordance with the Outline plans that will be 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) (**Document Reference 6.4 Appendix 16.1 (3)**): 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;
  - hedgerows;
  - schools; and
  - sports pitches and golf courses
- Site Specific Plans: These have been developed for areas where there are a number of different site sensitivities and complexities between the environmental and engineering constraints. The Site Specific Plans contain the vegetation retention and removal plans for these sites. These locations were identified during the examination process as areas that would require careful design and routeing. The locations where Site Specific Plans have been developed are:
  - Queen Elizabeth Park;
  - Turf Hill;
  - Fordbridge Park;
  - Southwood Country Park;
  - St Catherines SANG;
  - St James School;
  - Ashford Road; and
  - Ashford Town Centre (to be submitted for Deadline 5).
- Outline Construction Environmental Management Plan (CEMP) (**Document Reference 8.51**): This sets out generally how environmental management would

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 Outline 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.

- Outline Community Engagement Plan (**Document Reference 8.52**): This sets out how the project will communicate with the local community. It sets out the roles and responsibilities for engagement on the project.
- Draft European Protected Species (EPS) Licences: These set out the proposed measures to avoid harm and disturbance to protected species, including great crested newts and rare reptiles. The application includes the draft licences and also the Letters of No Impediment from Natural England. The final licences would be agreed with Natural England following determination. The final LEMP will contain details as to how the licences will be implemented.

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, as set out within the Register of Environmental Actions and Commitments (REAC) in ES Chapter 16 (**Application Document APP-056**). These are indicated by a reference number, for example '(G21)'. The overarching good practice measures that would reduce landscape and ecological impacts are listed Table 2.1. There are a number of more detailed commitments relating to specific aspects of the Outline LEMP, which are included at the start of the relevant section.

Table 2.1 Good Practice Measures Relevant to the Outline 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 Annex 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, 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 consider and apply the relevant protective principles set out in the National Joint Utilities Group Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees ('NJUG Volume 4' (2007)). 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.
HRA1	Heathland within statutory or non-statutory designated wildlife sites would be reinstated using natural regeneration, unless otherwise agreed with Natural England.

3 Landscape and Ecological Features

3.1 Landscape and Ecological Designations

3.1.1 The landscape and ecological designations relevant to the Outline 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).

3.1.2 At its southern extent, the pipeline route passes through approximately 25km of the South Downs National Park between Bishops Waltham and Alton. East of Chertsey, the route runs through Woburn Hill and Chertsey Meads Area of Landscape Importance. The route also runs through Southwood Country Park, south of Southwood.

3.1.3 The following landscape designations are also relevant to the Outline LEMP:

- Registered Parks and Gardens of Special Historic Interest at Chawton House and Woburn Farm;
- National Trails, South Downs and Thames Path;
- Common Land at West End Common and Chobham Common;
- Open Access Land at Chobham Common, along the Maultway B3015 along Red Road B311, southeast of Lightwater and at Turf Hill;
- Ancient Woodland;
- Tree Preservation Orders; and
- Conservation Areas at Basingstoke Canal and Farnborough Hill, where trees are afforded a similar level of protection to Tree Preservation Orders.

3.1.4 Other important tree classifications comprise:

- potential ancient woodland;
- veteran and potential veteran trees; and
- notable trees.

3.1.5 The statutory ecological designations relevant to the Outline LEMP are:

- Thursely, Ash, Pirbright and Chobham Special Area of Conservation (SAC);
- Thames Basin Heaths Special Protection Area (SPA);
- National Nature Reserve (NNR) at Chobham Common;
- Sites of Special Scientific Interest (SSSI) at Bourley and Long Valley (Forest of Eversley, east of Church Crookham), Colony Bog and Bagshot Heath (east of Fleet), Chobham Common; and
- Chertsey Meads Local Nature Reserve (LNR) (east of Chertsey).

3.1.6 Non-statutory designated sites that are also relevant to the Outline LEMP are Sites of Importance for Nature Conservation (SINC) in Hampshire and Sites of Nature Conservation Importance (SNCI) in Surrey. These comprise:

- Ewshot Meadows SINC;
- Wakefords Copse, Crondall SINC
- Cove Brook Grasslands SINC;
- Cove Valley, Southern Grassland SINC;
- Blackwater Valley, Frimley Bridge SINC;
- Frimley Hatches SNCI;
- Frith Hill SNCI;
- Frimley Fuel Allotments SNCI;
- Monk's Walk North and West (incl. M3 Exchange Land) SNCI;
- Pannell's Farm SNCI; and
- Chertsey Meads SNCI.

3.1.7 Other important ecological features which the pipeline route impacts, but which are not formally designated, comprise:

- Habitats of Principal Importance in England, i.e. Priority Habitats that include: Lowland Heathland; Lowland Meadows; Purple Moor Grass and Rush Pastures; Hedgerows; and Wet Woodland; and
- Notable plants within designated sites and protected and notable species, e.g. aquatic macroinvertebrates; bats; badger; breeding birds; hazel dormouse; reptile species, including sand lizard; great crested newt; riparian mammals; and fish.

3.2 Summary of Main Land Uses Crossed by the Pipeline Poute

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 Agricultural land is located throughout the route, but especially within the southern part of the route, south of Crondall. This mostly comprises arable land, with some pasture (improved and semi-improved), typically separated into fields by hedgerows and tree belts.

3.2.3 Soils within the southern part of the route can be broadly categorised as follows:

- south of Bishops Waltham soils are predominantly seasonally wet slightly acid but base-rich loamy and clayey;
- across the South Downs soils are predominantly shallow lime-rich over chalk or limestone; and
- between Four Marks and Crondall there are freely draining slightly acidic or lime rich loamy soils.

3.2.4 Soils within the northern part of the route can be broadly categorised as follows:

- between Crondall and Chertsey, soils are largely naturally wet or freely draining very acid, sandy and loamy;
- north of Chertsey, there are loamy and clayey floodplain soils with naturally high groundwater; and
- there are freely draining, slightly acidic loamy soils north of the River Thames.

Woodland

3.2.5 North of Crondall, the Order Limits run through some large areas of woodland, including broadleaved, coniferous and mixed. Examples include the Forest of Eversley, east of Church Crookham, and woodland at Frith Hill, east of Frimley. The Order Limits have avoided designated Ancient Woodland in line with overarching Commitment O2: '*Design route alignment to avoid all areas of existing classified Ancient Woodland*'. There are areas of potential ancient woodland (less than 2ha) including at Durley Mill Copse and Greendane Copse (see Appendix C Approach to Ancient Woodland and Veteran Trees) for more details.

Priority Habitats (Including Heathland)

3.2.6 Between Frimley and Chertsey, the Order Limits run through areas of heathland including Westend Common, Turf Hill and Chobham Common. Soils are predominantly naturally wet or freely draining very acid, sandy and loamy within heathland areas.

3.2.7 There are areas of semi-natural habitat at Cove Brook (coastal and floodplain grazing marsh Priority Habitat) and Chertsey Meads LNR which supports Lowland Meadows Priority habitat. There are also semi-natural habitats confined to the edges of flooded former gravel pits where neutral grassland exists.

Amenity Land (Including Parks and Sports Grounds)

3.2.8 Parks are mainly located within the northern section of the route and include Southwood Country Park and Queen Elizabeth Park at Farnborough and Fordbridge Park at Ashford. Chertsey Meads at Chertsey provides an area of public open space south of the River Thames. Other community land includes Cove Brook, Frith Hill and Turf Hill.

3.2.9 Golf courses are mainly located within the northern section of the route and include Four Marks Golf Club at Four Marks, Oak Park Golf Club at Crondall, Pine Ridge

Golf Club at Frimley, Foxhills Golf Club, Ottershaw, and Abbey Moor Golf Course at Chertsey.

3.2.10 There are a number of sports grounds and playing fields along the route. These include playing fields associated with schools such as Farnborough Hill School and St James Senior Boys School and sports grounds such as Abbey Rangers Football Club and Cove Cricket Club.

Residential Areas

3.2.11 In addition to the land uses identified above, the Order Limits would pass through residential areas including urban areas of Farnborough, Frimley and Ashford. The Order Limits also border several settlements including Bishop's Waltham, Alton, Fleet, Lightwater, Addlestone and Chertsey.

4 Vegetation Retention and Removal

4.1 Planning and Programming of Vegetation Removal

4.1.1 As set out in Requirement 12 of the DCO, the final LEMP must include an implementation timetable. This would take 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 and also areas with specific requirements, for example:

- working within Bourley and Long Valley SSSI, Colony Bog and Bagshot Heath SSSI and Chobham Common SSSI, including methods to protect soil during construction including reducing topsoil stripping and/or providing matting as set out in Appendix A;
- working in areas identified with the potential presence of Schedule 9 plant species or other invasive species;
- techniques that would be used for the removal, storage and transplantation of any vegetation which is to be reused, relocated or transplanted; and
- site-specific measures in relation to Ancient Woodland and Veteran Trees as set out in Appendix C.

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 Annex 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.

Commitment number	Commitment
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).

4.2.2 The vegetation retention and removal plans to be submitted in accordance with Requirement 8(1)(a) of the DCO (the Vegetation Retention and Removal Plans), will be determined by Esso's contractor following the selection of the final 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 Article 41 of DCO Article 41 – 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 will, where applicable, implement the SSSI working plans contained at Appendix A in accordance with Requirement 12(1) of the DCO:

4.2.5 The Vegetation Retention and Removal Plans will show:

- final working areas (taking into account narrow working and trenchless crossings where applicable) and the final pipeline trench alignment;
- vegetation to be retained;
- Tree Protection Zones (TPZs) of trees to be retained (for individual trees or tree groupings);
- other landscape and ecological features to be retained such as hedgerows, ponds and trees with bat roosts;
- measures to protect vegetation, including trees, such as protective matting or fencing;
- locations where a method statement has been produced for bespoke measures to protect a feature, for example a Veteran Tree; and
- Vegetation to be removed.

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.

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.

Commitment number	Commitment
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 aboriculturalist.
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 consider and apply the relevant protective principles set out in the National Joint Utilities Group Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees ('NJUG Volume 4' (2007)). 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.
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.

4.3.2 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 of the narrow working limit would be retained and shown as such in the Vegetation Retention and Removal Plans. The full list of narrow working locations is listed in Annex A of the CoCP (**Document Reference 6.4 Appendix 16.1 (3)**).

4.3.3 There are also areas where the project has made commitments to avoid features within the Order Limits (embedded design measures) set out in Table 2.1 of the CoCP (**Document Reference 6.4 Appendix 16.1 (3)**). For example, Commitment D7, North of Sailors Lane (SU5849323046), which states, *'Ensure pipe alignment is located to the west away from woodland block… To avoid impact on Priority Habitat – large woodland block.'*. The vegetation and trees listed within these commitments would be retained, and this will be reflected in the Vegetation Retention and Removal Plans.

Retention and Protection of Woodland and Trees

4.3.4 The CoCP (**Document Reference 6.4 Appendix 16.1 (3)**) contains a construction methodology for typical works within woodland. When crossing a woodland, the working area would be typically reduced to 15m wide. Trees not being retained would be removed from the working area. As with typical woodland management, tree stumps would 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.

4.3.5 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 will be reflected in the Vegetation Retention and Removal Plans. This 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'.

4.3.6 Appendix C sets out the agreed mitigation hierarchy for the protection of Ancient (and potential ancient) Woodland and Veteran (and potential veteran) Trees. The starting assumption is that the project will seek to locate the pipeline trench outside of a 15 buffer around designated trees where practicable. 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 Root Protection Area (RPA). Where avoidance of the RPA is also not practicable, specialist construction measures for use within the RPA would be adopted and set out in a method statement.

4.3.7 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 aboriculturalist'* (Commitment G86).

4.3.8 For all other trees, *'the contractor(s) would consider and apply the relevant protective principles set out in the National Joint Utilities Group Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees ('NJUG Volume 4' (2007)). 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).

4.3.9 All retained trees will be protected during construction to reduce the risk of accidental damage and compaction of roots. If retained trees are within the vicinity of works, the following hierarchy of methods would be adopted:

- The extent of TPZ shall be identified in the Vegetation Retention and Removal Plans and delineated with fencing. The TPZ may be identified using tree groupings rather than individual trees. In this case, an arboriculturalist will advise on the TPZ using experience based on the site features.
- Where some encroachment into TPZs is unavoidable, an arboriculturist will assess and specify temporary ground protection if deemed necessary to avoid compaction. This will be based upon the extent of encroachment into the TPZ (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.

4.3.10 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.

4.3.11 Where location specific method statements are required, such as those prepared in accordance with Appendix C to outline the works around Ancient Woodland, potential ancient woodland and Veteran Trees, they will be prepared in conjunction with the final pipeline alignment and will be included in the final LEMP.

4.3.12 The location of protection measures, such as fencing, will be shown on the Vegetation Retention and Removal Plans.

4.3.13 There is limited potential for 'windthrow' (trees uprooted or damaged by wind) of trees by the project. This is because there are limited locations where trees are being removed from the edge of a woodland in exposed locations. As a precautionary approach, where there are trees being removed on the edge of woodland areas in exposed locations, the contractor will undertake a risk assessment of the potential for windthrow and, if required, will identify risk reduction measures in the final LEMP and the Vegetation Retention and Removal Plans. Measures could include prioritising the removal or coppicing of weaker specimens, taking care not to create wind tunnels which could exacerbate the risk of windthrow, to create a softer, more scalloped, woodland edge.

Protection of Watercourses

4.3.14 The crossing of major rivers by the project, including the River Thames and the River Ash, 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 developed to describe how the remaining watercourses would be crossed using open methods (**Document Reference 6.4 Appendix 16.1 (3)**). This includes Commitment O1, '*to only utilise a 10m width when crossing. In order to retain and protect 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 (**Document Reference 3.1 (5)**).

4.3.15 In addition, appropriate buffer zones would be established within Order Limits adjacent to identified watercourses (G39). These would be indicated on the

Vegetation Retention and Removal Plans. Appropriate buffer zones would be determined by the ECoW based on knowledge of the site and also in discussion with the Environment Agency and the Lead Local Flood Authority through the protective provisions on flood risk activities.

4.3.16 Measures relating to pollution prevention are set out in Outline CEMP, Appendix B Outline Water Management Plan.

Retention and Protection of Ecological Features

4.3.17 The CoCP (**Document Reference 6.4 Appendix 16.1 (3)**) contains the locations where there are embedded measures (Table 2.1) and narrow working (Annex A) are proposed. These include locations where there are specific ecological features that would need to be retained and protected. In addition, further 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.

4.3.18 Habitat features that would be retained and protected are set out in the following commitments, which will be implemented by Esso and reflected in the Vegetation Retention and Removal Plans where applicable:

- Commitment HRA4: '*Topsoil stripping would be reduced to a minimum extent within European designated sites and SSSIs except where identified within the HRA. (Some unavoidable stripping would take place as part of the trenching for the pipeline and in construction compounds where matting is not a workable alternative)*.'
- Commitment 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*.'
- Commitment 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 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.*'
- Commitment 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*.'
- Commitment G60: '*Where there would be a risk of animal entrapment, a means of escape would be installed into all excavations left open overnight*.

Retention and Protection of Hard Landscape Features

4.3.19 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.

Retention and Protection of Specific Features

4.3.20 There may be the need to produce a bespoke method statement for construction near specific retained landscaping features. An example of which is hedgerow (HCX130), near Chawton, where the hedgerow forms a continuation of an ancient coppice within Chawton House Registered Park and Garden. In such cases, a bespoke method statement would be developed to outline the proposed working method with regards to the feature. The bespoke method statement for HCX130 is contained in Appendix D. This and any other bespoke method statements would be included in Appendix D of the final LEMP.

4.4 Vegetation and Tree Removal

General Approach to Removal of Vegetation

4.4.1 The Vegetation and Removal Plans will show the locations where vegetation would be removed.

4.4.2 The vegetation clearance would 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

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 and those to be coppiced would be shown on the Vegetation and Removal Plans.

4.4.4 In addition, at heathland SSSIs, targeted scrub and secondary woodland within the Order Limits would be removed to help reinstate heathland habitat following the works (Commitment HRA2). Further details can be found in Section 5.4.

Hedgerows

4.4.5 The Vegetation Retention and Removal Plans will 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*'. The selection of the location would be based on the least impactful 10m width, taking into account other local considerations. For example, this could

include taking advantage of gaps within an existing hedge where possible. Further details can be found in the construction methodology for hedgerows in the CoCP (**Document Reference 6.4 Appendix 16.1 (3)**).

Ecological Considerations

4.4.6 The final LEMP will contain details for site specific vegetation removal, such as in areas that provide suitable habitat for protected species. For example, 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).

4.4.7 Where there is evidence of water voles from pre-construction surveys, vegetation from within the working width (up to 5m either side of the trench) would be removed using a strimmer until only bare earth remains. The strimmed area would extend to the top of the bank and a further 2m beyond. All arisings from the strimmed area would be raked off and removed. The area would be maintained as unsuitable for water voles as the works are carried out (Commitment G197).

4.5 Transplantation (Including Turf Stripping)

4.5.1 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*'. Further details, including specific locations, would be provided in this section of the final LEMP.

4.5.2 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 is proposed to retain the diverse seedbank and allow quicker establishment of land use following construction. Locations would be determined based on the age and condition of the existing vegetation and whether the translocation is likely to be successful. Specific locations where translocation would be undertaken and suitable receptor sites would be set out in the final LEMP and shown on the Vegetation and Removal Plans and Landscape and Ecological Reinstatement Plans.

4.5.3 Where translocation is proposed, a site-specific method statement would be developed when the areas are known, to identify appropriate techniques used for the removal, storage and transplantation of any vegetation which is to be reused, relocated or transplanted (Commitment G89). Where turf stripping is to be undertaken, a site-specific method statement would be produced to outline how the turf would be stripped, stored and reinstated. This would include techniques for uplift, storage and maintenance of turfs once lifted and procedure for re-laying.

4.5.4 Locations where transplantation or turf stripping would be undertaken comprise the following.

- Bourley and Long Valley SSSI and Chobham Common SSSI: Individual plants of creeping willow (*Salix repens*) and common wintergreen (*Pyrola minor*), 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 (Commitment G55).
- Cove Brook Grassland SINC and Cove Valley, Southern Grassland SINC: Broadleaved semi-natural woodland habitat could be reinstated partly with translocation of retained rooted material.
- Blackwater Valley: If Open Cut is used at this location, the impacted reedbed habitat could be restored using retained excavated material as well as natural regeneration.
- NW1: Durley Meadows: This comprises Purple Moor Grass and Rush Pastures Priority Habitat. Turf would be stripped, stored and reinstated above the trench for an approximate distance of 35m between approximate grid references SU 52306 16340 to SU 52329 16365. The exact methodology for this would be defined in a site-specific method statement.
- NW21: Chertsey Meads LNR and SINC: Chertsey Meads partly comprises areas of Lowland Meadows Priority Habitat. Post construction reinstatement would comprise using existing turf that was stripped and suitably stored during the construction phase. The exact methodology for this would be defined in a site-specific method statement.
- Watercourses: Typically, in-stream vegetation within the crossing area would be temporarily translocated within the watercourse slightly up or down stream 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. Further details can be found in the construction methodology for watercourses in the CoCP (**Document Reference 6.4 Appendix 16.1 (3)**).
- Sports pitches and golf courses: Typically, the only area that would require topsoil to be removed would be 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 the CoCP (**Document Reference 6.4 Appendix 16.1 (3)**).

4.6 Removal of Invasive Species

4.6.1 Invasive species include rhododendron, Himalayan balsam and Gaultheria species. Invasive non-native species have been identified across and adjacent to the Order Limits (see Appendix 7.4 of the ES (**Application Document APP-084**)). Pre-construction surveys would locate the distribution and extent of all invasive species. Current known sites include:

- Cove Brook;

- Queen Elizabeth Park;
- Frith Hill;
- Turf Hill;
- Chobham Common; and
- Fordbridge Park.

4.6.2 A pre-construction walkover would be undertaken at least one month prior to works commencing to identify the presence of Schedule 9 plant species or other invasive species. In areas where Schedule 9 plant species or other invasive species are identified, a method statement would be produced. The method statement will 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 (G42). It will also include how vegetation would be removed from the site in accordance with the CEMP, Appendix C Site Waste Management Plan (**Document Reference 8.51**). The method statement would be approved by the ECoW and supported by an ecologist.

4.6.3 Where invasive shrub species are removed (such as rhododendron), stumps would be treated to prevent regrowth. In larger areas away from retained trees, stumps may be excavated, mulched or ground out. Areas of invasive species will be shown on the Vegetation Retention and Removal Plans.

5 Landscape and Ecological Reinstatement

5.1 Introduction

5.1.1 This section will set out the general principles for how reinstatement would be undertaken on the project. It will include 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 (**Document Reference 3.1 (5)**) 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 two sample Landscape and Ecological Reinstatement Plans, which are based on the indicative alignment of the pipeline. These illustrate examples of the Landscape and Ecological Reinstatement Plans that would be provided for the full extent of the pipeline route within the final LEMP to show locations where specific measures would be applied.

5.1.4 The final Landscape and Ecological Reinstatement Plans to be included in the LEMP will show:

- existing features retained;
- location of 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 bat boxes.

5.2 General Reinstatement Proposals

5.2.1 The final LEMP will include an implementation timetable of reinstatement, in accordance with Requirement 12 of the DCO ((**Document Reference 3.1 (5)**)) (paragraph 2), which states that '*the LEMP must include an implementation timetable and must be carried out as approved*'. Reinstatement would be undertaken in the first available planting season following completion of installation.

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. For example, an exception would be where there are invasive species, heathland restoration is planned, or where planting over the 6.3m pipeline easement where native shrub planting would be used. 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 (*Salix repens*) and common wintergreen (*Pyrola minor*) 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 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.
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.

5.2.3 The Landscape and Ecological Reinstatement Plans would 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 acceptance of the planting once the five-year aftercare period has been completed.

5.2.4 Landscape reinstatement will follow the following principles:

- Trees and shrubs will be of local provenance and shall be supplied in accordance with British Standard (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. In these cases, the proposed species will be discussed with the relevant planning authority prior to the final LEMP being produced.
- 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.

5.2.5 Indicative proposed species mixes and typical stock sizes for the main planting reinstatement types are set out in the following sections, to 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). However, these mixes will be further refined in the final LEMP, in conjunction with landowners and the relevant planning authorities, in order to reflect the specific species composition suitable for each location based on existing soil and drainage conditions.

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, as indicated in Table 5.2. 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.

Broadleaved Woodland

5.3.2 Broadleaved woodland areas, including north of the Hale Bourne, east of Lightwater, and north and south of Quetta Park, would be reinstated using the native, broadleaved woodland mix outlined in Table 5.2. This would be refined on the Landscape and Ecological Reinstatement Plans in the final LEMP, where relevant, to reflect the native species composition identified in ES Appendix 7.1 (**Application Documents APP-080 and APP-081**).

Table 5.2: Indicative Native Broadleaved Woodland Mix

Common name	Latin name	Height cm	Stock type
Field Maple	*Acer campestre*	60-80	1+1; Transplant - seed raised
Horse Chestnut	*Aesculus hippocastanum*	60-80	1+2; Transplant - seed raised
Common Alder	*Alnus glutinosa*	40-60	1+1; Transplant - seed raised

Common name	Latin name	Height cm	Stock type
Beech	*Fagus sylvatica*	40-60	1+1; Transplant - seed raised
Crab apple	*Malus sylvestris*	40-60	1+1; Transplant - seed raised
Black poplar	*Populus nigra*	60-80	0/1; Cutting
Wild cherry	*Prunus avium*	40-60	1+1; Transplant - seed raised
Pedunculate oak	*Quercus robur*	40-60	1+1; Transplant - seed raised
Crack Willow	*Salix fragilis*	60-80	0/1; Cutting
Small-leaved lime	*Tilia cordata*	40-60	1+1; Transplant - seed raised
Dogwood	*Cornus sanguinea*	40-60	1+1; Transplant - seed raised; branched; 2 breaks
Hazel	*Corylus avellana*	40-60	1+1; Transplant - seed raised; branched; 2 breaks
Hawthorn	*Crataegus monogyna*	40-60	1+1; Transplant - seed raised
Common Privet	*Ligustrum vulgare*	60-80	1+1 or 1/1; branched; 3 breaks
Honeysuckle	*Lonicera periclymenum*	60-80	Caned; several shoots; 2 breaks
Blackthorn	*Prunus spinosa*	40-60	1+1; Transplant - seed raised; branched; 2 breaks
Dog Rose	*Rosa canina*	60-80	1+1; Transplant - seed raised; branched; 3 breaks
Grey Willow	*Salix cinerea*	60-80	0/1; Branched; 2 breaks
Elder	*Sambucus nigra*	60-80	1+1; Transplant - seed raised; branched; 3 breaks
Wayfaring Tree	*Viburnum lantana*	40-60	1+1; Transplant - seed raised; branched; 2 breaks

Coniferous Woodland

5.3.3 Reinstatement of coniferous woodland is proposed within some golf courses, including Pine Ridge Golf Course and Foxhills Golf Course, and Windlemere SANG to reflect the existing species composition. Coniferous woodland areas would be reinstated using the coniferous mix outlined in Table 5.3. This would be refined on the Landscape and Ecological Reinstatement Plans, where relevant, to reflect the existing species composition identified in ES Appendix 7.1 (**Application Documents APP-080 and APP-081**).

Table 5.3: Indicative Coniferous Woodland Mix

Common name	Latin name	Height cm	Stock type
European larch	*Larix decidua*	40-60	1+1; Transplant - seed raised
Scots pine	*Pinus sylvestris*	40-60	1+2; Transplant - seed raised
Yew	*Taxus baccata*	40-60	3x; leaders; furnished to base
Holly	*Ilex aquifolium*	40-60	Leader with laterals

Mixed Broadleaved and Coniferous Woodland

5.3.4 Reinstatement of mixed broadleaved and coniferous woodland is proposed at Southwood Country Park, Frimley Fuel Allotments and the Forest of Eversley at

Church Crookham to reflect the existing native species composition. Appropriate broadleaved and coniferous species mixes would be reinstated using the mixed broadleaved and coniferous mix outlined in Table 5.4. This would be refined on the Landscape and Ecological Reinstatement Plans, where relevant, to reflect the existing species composition identified in ES Appendix 7.1 (**Application Documents APP-080 and APP-081**).

Table 5.4: Indicative Mixed Broadleaved and Coniferous Woodland Mix

Common name	Latin name	Height cm	Stock type
Field maple	*Acer campestre*	60-80	1+1; Transplant - seed raised
Silver birch	*Betula pendula*	40-60	1+1; Transplant - seed raised
Downy birch	*Betula pubescens*	40-60	1+1; Transplant - seed raised
Hornbeam	*Carpinus betulus*	60-80	1+1; Transplant - seed raised
Aspen	*Populus tremula*	60-80	1+1; Transplant - seed raised
Wild cherry	*Prunus avium*	40-60	1+1; Transplant - seed raised
Rowan	*Sorbus aucuparia*	40-60	1+1; Transplant - seed raised
Hazel	*Corylus avellana*	40-60	1+1; Transplant - seed raised; branched; 2 breaks
Hawthorn	*Crataegus monogyna*	40-60	1+1; Transplant - seed raised
Common Privet	*Ligustrum vulgare*	60 -80	1+1 or 1/1; Branched; 2 breaks
Dog Rose	*Rosa canina*	60-80	1+1; Transplant - seed raised; branched; 3 breaks
Goat Willow	*Salix caprea*	125-150	0/1/2; Transplant - cutting raised; 3 breaks
Elder	*Sambucus nigra*	60-80	1+1; Transplant - seed raised; branched; 3 breaks
Guelder Rose	*Viburnum opulus*	60-80	1+2; Transplant - seed raised; branched; 3 breaks
European larch	*Larix decidua*	40-60	1+1; Transplant - seed raised
Scots pine	*Pinus sylvestris*	40-60	1+2; Transplant - seed raised
Yew	*Taxus baccata*	40-60	3x; leaders; furnished to base
Holly	*Ilex aquifolium*	40-60	Leader with laterals

Reinstatement of Hedgerow and Woodland Field Boundary

5.3.5 The construction methodology for hedgerows in the CoCP (**Document Reference 6.4 Appendix 16.1 (3)**) 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, as indicated in Table 5.5.

5.3.6 Hedgerows will be typically 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 would not be replaced over the 6.3 m pipeline easement but would be located either side of this

area (in the remaining 3.7m). The reinstated hedgerow would 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.

5.3.7 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 would be set out in the final LEMP. A higher proportion of feathered tree species would be used for reinstatement of woodland field boundaries compared to a hedgerow, to establish a replacement tree line/woodland belt.

Table 5.5: Indicative Native Hedgerow and Woodland Field Boundary Mix

Common name	Latin name	Height cm	Stock type
Hazel	*Corylus avellana*	60-80	1+2; Transplant - seed raised; branched; 3 breaks
Dogwood	*Cornus sanguinea*	60-80	1+2; Transplant - seed raised; branched; 3 breaks
Hawthorn	*Crataegus monogyna*	60-80	1+1; Transplant - seed raised
Holly	*Ilex aquifolium*	60-80	Leader with laterals
Common Privet	*Ligustrum vulgare*	60-80	1+1 or 1/1 0/2; branched; 3 breaks
Blackthorn	*Prunus spinosa*	60-80	1+1; Transplant - seed raised; branched; 2 breaks
Field Rose	*Rosa arvensis*	60-80	1+1; Transplant - seed raised; branched; 2 breaks
Dog Rose	*Rosa canina*	60-80	1+1; Transplant - seed raised; branched; 3 breaks
Common Elder	*Sambucus nigra*	60-80	1+1; Transplant - seed raised; branched; 3 breaks
Goat Willow	*Salix caprea*	60-80	1+1; Transplant - seed raised
Wayfaring Tree	*Viburnum lantana*	60-80	1+2; Transplant - seed raised; branched; 3 breaks
Field Maple	*Acer campestre*	125-150	2x; Feathered; 3 breaks
		60-80	1+1; Transplant - seed raised
Alder	*Alnus glutinosa*	125-150	2x; Feathered; 2 breaks
Silver Birch	*Betula pendula*	125-150	2x; Feathered; 3 breaks
Beech	*Fagus sylvatica*	125-150	2x; Feathered; 2 breaks
		60-80	1+2; Transplant - seed raised
Wild Cherry	*Prunus avium*	100-125	2x; Feathered
Pedunculate oak	*Quercus robur*	125-150	2x; Feathered; 2 breaks
		60-80	1+2; Transplant - seed raised
Grey Willow	*Salix cinerea*	125-150	0/2; branched; 3 breaks
		60-80	0/1; branched; 2 breaks
Whitebeam	*Sorbus aria*	150-175	2x; Feathered; 3 breaks

Reinstatement of Individual Trees

5.3.8 Where individual mature trees may need to be removed, for example at Queen Elizabeth Park, Turf Hill or Fordbridge Park, they will be replaced with a mix of feathered and extra heavy trees from, but not limited to, the species indicated in Table 5.6. The final specification set out in the final LEMP will draw on the baseline information from the arboricultural surveys and discussions with the landowner and the relevant planning authority.

5.3.9 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).

Table 5.6: Indicative Tree Species

Common name	Latin name	Girth cm	Height cm	Stock type
Field Maple	*Acer campestre*	6-8	250-300	2x; Feathered; 5 breaks
Horse Chestnut	*Aesculus hippocastanum*	14-16	300-350	3x; Extra Heavy Standard; clear stem 175-200cm; 5 breaks
Alder	*Alnus glutinosa*	6-8	250-300	2x; Feathered; 5 breaks
Silver Birch	*Betula pendula*	8-10	250-300	2x; Feathered; 5 breaks
Downy Birch	*Betula pubescens*	10-12	300-350	2x; Feathered; 7 breaks
Himalayan Birch	*Betula utilis*	4-6	200-250	2x; Feathered; 5 breaks
Hornbeam	*Carpinus betulus*	14-16	400-450	3x; Extra Heavy Standard; clear stem 175-200cm; 5 breaks
Sweet Chestnut	*Castanea sativa*	14-16	400-450	3x; Extra Heavy Standard; clear stem 175-200cm; 5 breaks
Blue Atlas Cedar	*Cedrus atlantica 'Glauca'*	-	200-250	3x; leader with laterals
Beech	*Fagus sylvatica*	8-10	250-300	2x; Feathered; 5 breaks
Common Walnut	*Juglans Regia*	14-16	400-450	3x; Extra Heavy Standard; clear stem 175-200cm; 5 breaks
Dawn Redwood	*Metasequoia glyptostroboides*	16-18	min 450	4x; Extra Heavy Standard; clear stem 175-200cm
Corsican Pine	*Pinus nigra maritina*			
Black Poplar	*Populus nigra*	14-16	425-600	3x; Extra Heavy Standard; clear stem 175-200cm; 5 breaks
Wild Cherry	*Prunus avium*	14-16	400-450	3x; Extra Heavy Standard; clear stem 175-200cm; 5 breaks
Purple-leaved Cherry	*Prunus cerasifera 'Nigra'*	14-16	400-450	3x; Extra Heavy Standard; clear stem 175-200cm; 5 breaks
Oak	*Quercus robur*	14-16	400-450	3x; Extra Heavy Standard; clear stem 175-200cm; 5 breaks
Red Oak	*Quercus rubra*	14-16	400-450	3x; Extra Heavy Standard; clear stem 175-200cm; 5 breaks
False Acacia	*Robinia pseudoacacia*	14-16	400-450	3x; Extra Heavy Standard; clear stem 175-200cm; 5 breaks
Rowan	*Sorbus aucuparia*	14-16	400-450	3x; Extra Heavy Standard; clear stem 175-200cm; 5 breaks

Common name	Latin name	Girth cm	Height cm	Stock type
Lime	*Tilia cordata*	14-16	400-450	3x; Extra Heavy Standard; clear stem 175-200cm; 5 breaks

5.4 Reinstatement of Lowland Heathland

5.4.1 Removal of trees in heathland areas is beneficial for the conservation of this particular habitat and to keep its ecological value, which depends on an open and diverse vegetation structure. Therefore, targeted scrub and woodland removal would be undertaken in heathland areas during construction and would not be replaced as part of the reinstatement proposals. These sites will be reinstated using natural regeneration unless otherwise agreed with Natural England (Commitments HRA1 and HRA2). In these locations, a site-specific method statement would be developed. Once installation is complete, the soil would be replaced and no seeding would be undertaken.

5.4.2 Targeted scrub and woodland removal and natural regeneration will be undertaken at the following sites:

- Bourley and Long Valley SSSI (targeted scrub and woodland removal at EM52 and EM53);
- Colony Bog and Bagshot Heath SSSI (targeted scrub and woodland removal at EM56 and EM57);
- Chobham Common SSSI (targeted scrub and woodland removal at EM60); and
- Blackwater Valley SINC (if Open Cut is required).

5.4.3 The final LEMP will provide comprehensive plans showing the location of the areas of scrub and woodland removal and the natural reinstatement once the pipeline alignment is known.

5.5 Reinstatement of Grassland

5.5.1 Areas of grassland and verges disturbed by construction activities 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 will show the land use type and proposed species mix composition. Examples would include the following.

- Species rich grass: Species-rich areas (as identified in ES Appendix 7.1 (**Application Documents APP-080 and APP-081**) will be seeded with a flower rich mixture suitable to the specific ground conditions, such as acid, neutral, calcareous, sandy, clay and loamy soils, based on existing grass types identified in ES Figure 7.4 (**Application Document APP-061**). Example locations include Ewshot Meadows SINC and Turf Hill.
- Pasture and non-amenity grassland: Disturbed areas of pasture shall be seeded with a similar species mix to that of the existing land use and based on

discussions with the landowner. Proposed species and composition mixes are outline in Table 5.7.

- Amenity grass: School grounds, golf courses and road verges in urban areas affected by construction activities shall be seeded with a mixture suitably resilient for pathways and play and based on discussions with the landowner. Indicative species and composition mixes are outline in Table 5.8.

Table 5.7: Indicative Mixture Composition of Pasture Grassland

Common name	Latin name	Percentage
Crested Dogstail	*Cynosurus cristatus*	12%
Cocksfoot	*Dactylis glomerata*	9%
Strong-creeping Red-fescue	*Festuca rubra*	12%
Perennial Ryegrass	*Lolium perenne*	35%
Smaller Cat's-tail	*Phleum bertolonii*	6%
Meadow Fescue	*Schedonorus pratensis (Festuca pratensis)*	12%
Red Clover	*Trifolium pratense*	3%
Small Leaved White Clover	*Trifolium repens*	2%

Table 5.8: Indicative Mixture Composition of Amenity Grassland

Common name	Latin name	Percentage
Common Bent	*Agrostis capillaris*	2.5%
Highland Bent	*Agrostis castellana*	2.5%
Slender-creeping Red-fescue	*Festuca rubra*	50%
Perennial Ryegrass	*Lolium perenne*	25%
Smooth-stalked Meadow-grass	*Poa pratensis*	20%

5.6 Reinstatement of Hard Landscaping

5.6.1 Details of hard landscape features to be reinstated or replaced, for example reinstating fencing, walls or bank features that were removed during installation. Details would be provided in the final LEMP and would be shown on the Landscape and Ecological Reinstatement Plans, samples of which are provided in Appendix B of this Outline LEMP.

5.7 Ecological Habitat Creation and Improvements

5.7.1 Parts of the working area would be reinstated using natural regeneration, which would reinstate heathland in existing scrub areas. See Section 5.4 for further details.

5.7.2 In addition, a number of Environmental Mitigation Areas have been identified and are shown in the General Arrangement Plans to the DCO (**Document Reference 2.6 (4)**). These areas would be used for native species tree planting, hedge infilling and new hedge planting, as detailed in Appendix E (LV1). These features will be shown in the final LEMP figures. Species mixes for this planting will be as shown for native broadleaved woodland and hedgerow and woodland field boundaries set out in Tables 5.2 and 5.5.

5.7.3 In addition, provision of habitats would be undertaken in accordance with the project commitments and as a requirement of EPS licences. This will include replacing hibernacula and refugia and providing bat and barn owl boxes in accordance with commitments G53, G56 and G58. Further details will be added to this section following the approval of the licences by Natural England.

5.7.4 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 (**Document Reference 3.1 (5)**). The programme of aftercare operations would be developed for inclusion in the final LEMP.

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 prior 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 indicative proposed aftercare arrangements based on planting/habitat type. The indicative operations will be refined, with further details set out in the final LEMP.

6.2 Woodland, Trees and Hedgerows

6.2.1 The five-year aftercare would include 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; and

- water individual larger specimen trees that have been planted, as required, during the five-year aftercare. In addition, water other scrub and tree planting areas as required during, for example, periods of prolonged drought.

6.3 Lowland Heathland

6.3.1 The five-year aftercare would include periodic inspections by a suitably experienced professional to:

- undertake annual checks by an ecologist to assess vegetation composition and structure (see Section 7); and
- remove invasive species such as bracken and birch.

6.3.2 Where negative elements are identified during monitoring, such as colonisation of trees, shrubs or bracken, further or more intensive management may be needed and would be discussed and agreed with Natural England and the landowner.

6.4 Pests and Diseases

6.4.1 The periodic checks of reinstatement planting would include a check for any obvious signs of pests or diseases, including ash die back or reoccurrence of invasive species. Any instances recorded would be reported on the quarterly inspection reports and appropriate action taken.

7 Ecological Monitoring

7.1 Monitoring at Designated Ecological Sites

7.1.1 A programme of post-construction monitoring and objectives/targets for designated ecological sites would be agreed and implemented in accordance with DCO requirements at the following sites:

- Bourley and Long Valley SSSI;
- Colony Bog and Bagshot Heath SSSI;
- Chobham Common SSSI/NNR; and
- Chertsey Meads LNR

7.1.2 The programme and content of post construction monitoring would be agreed with Natural England and recorded within the Landscape and Ecological Management Plan (Commitment G47).

7.1.3 In the areas listed in Commitment G47, the monitoring plan would be developed to set out the habitat management objectives and actions for site. Annual monitoring would be undertaken at these sites to inform the five-year aftercare period, which would be reviewed as required. The monitoring plan would be developed with Natural England and the landowner. Further details of the monitoring plan would be set in the final LEMP. The monitoring plan would set out any ongoing actions or management requirements that may be required beyond the five-year aftercare period.

7.2 Monitoring in Relation to Protected Species

7.2.1 In addition, further measures may be required by the conditions of species licencing, as required by the licencing authority, Natural England. These would last for a minimum of one year but may extend to the full five years of aftercare.

7.2.2 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.

7.2.3 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

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

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Appendices

A. SSSI Working Plans

B. Landscape and Ecological Reinstatement Plans (samples provided in Outline LEMP, full set to be provided in the final LEMP)

C Approach to Ancient Woodland and Veteran Trees

D Site specific method statements (HCX 130)

E Environmental Mitigation Areas

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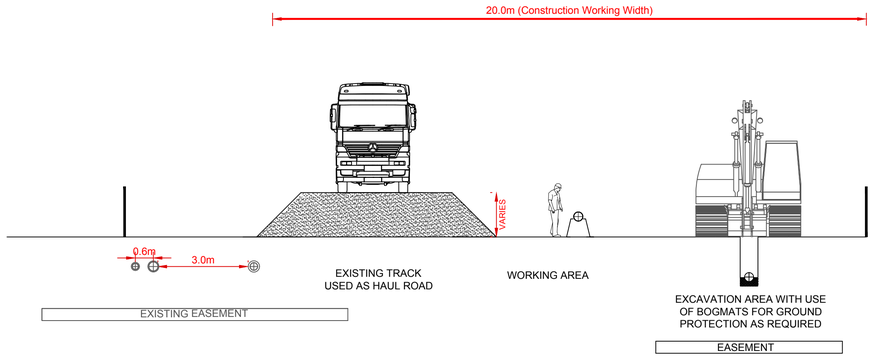

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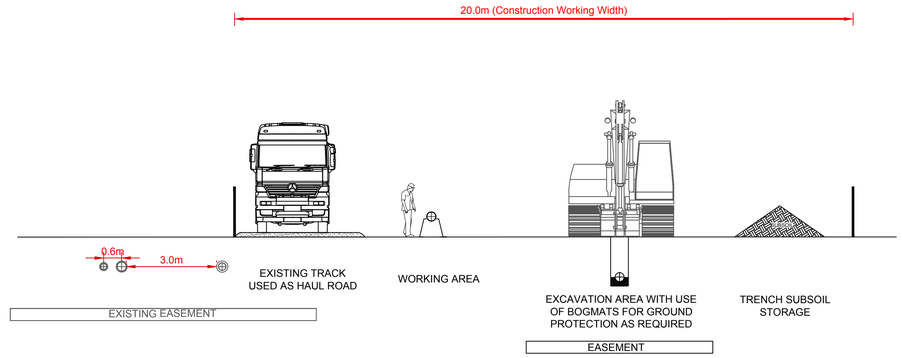

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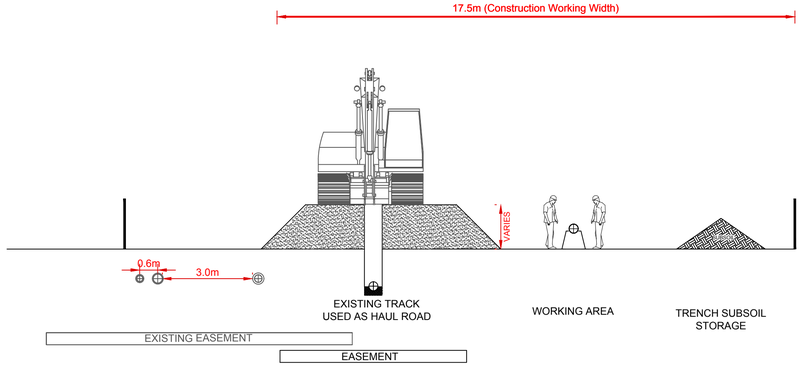

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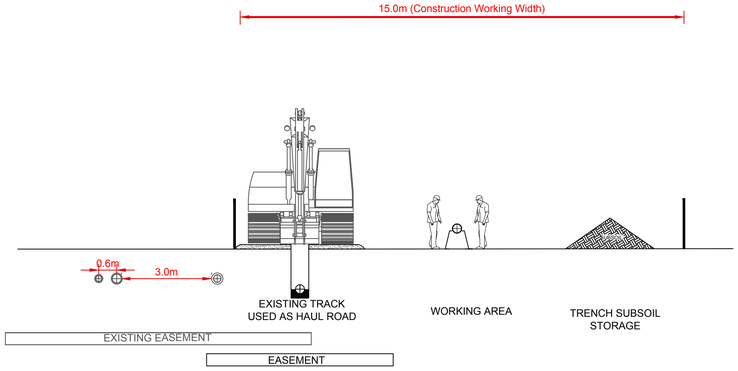

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STANDARD WORKING
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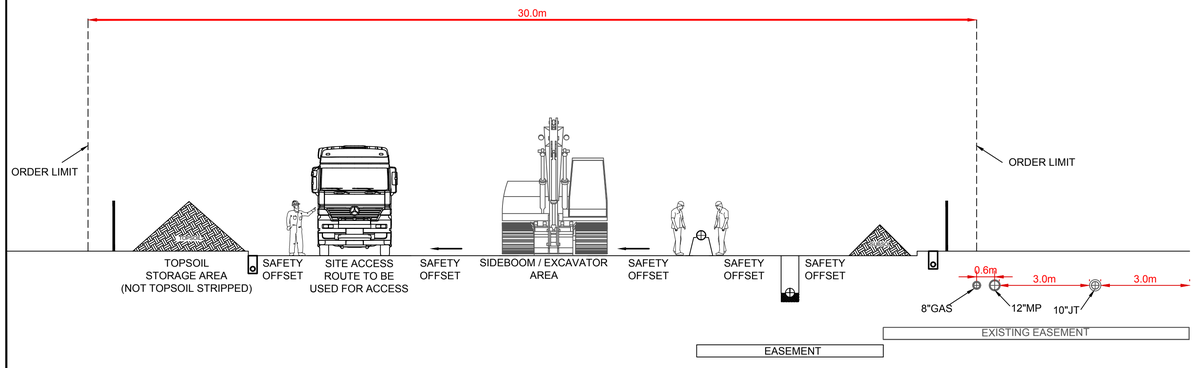

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NARROW WORKING (WOODLAND)
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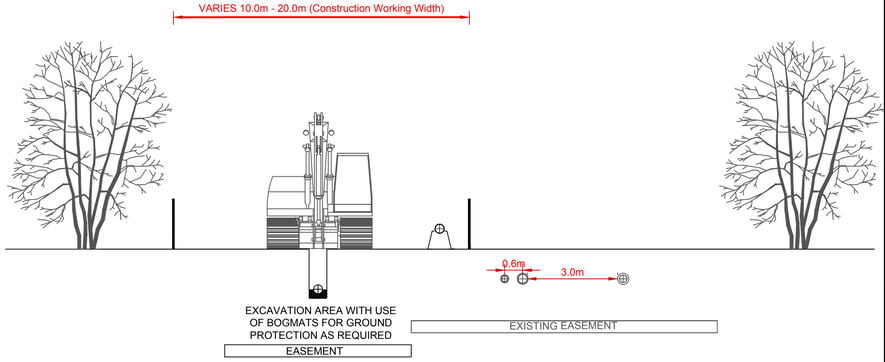

NOTES

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3. DIFFERENT OPTIONS MAY BE ADOPTED IN CERTAIN LOCATIONS DEPENDENT ON ENVIRONMENTAL AND PHYSICAL CONSTRAINTS.
4. CONFIRMATION OF TEMPORARY WORKS ARE SUBJECT TO GROUND CONDITIONS.
5. WIDTH OF TRACK VARIES ACROSS SSSI AND EUROPEAN SITES.
6. IN SOME AREAS EXISTING PIPELINES MAY BE LOCATED ON THE OPPOSITE SIDE OF THE WORKING AREA.
7. THERE MAY BE AREAS WHERE THE EXISTING PIPELINES ARE NOT IN CLOSE PROXIMITY TO THE WORKING AREA.
8. TOPSOIL STRIPPING WOULD BE REDUCED TO A MINIMUM EXTENT WITHIN SSSI AND EUROPEAN SITES EXCEPT WHERE IDENTIFIED WITHIN THE HRA (SOME UNAVOIDABLE STRIPPING WILL TAKE PLACE AS PART OF THE TRENCHING FOR THE PIPELINE AND IN CONSTRUCTION COMPOUNDS WHERE MATTING IS NOT A WORKABLE ALTERNATIVE).
9. THESE DRAWINGS ARE IN ASSOCIATION WITH APFP Reg. (2009) 5(2)(o).

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Rev	Rev. Date	Purpose of revision	Drawn	Checkd	Rev'd	Apprv'd
C01.1	02.05.2019	DCO SUBMISSION	AR	DS	SC	PH
P02.2	19.02.2019	FOR ESSO REVIEW AND COMMENT	AR	MO	MO	PH
P02.1	11.02.2019	FOR ESSO REVIEW AND COMMENT	AR	MO	DS	PH
P01.2	17.01.2019	FOR ESSO REVIEW AND COMMENT	AR	MO	ND	PH
P01.1	14.01.2019	FOR REVIEW AND COMMENT	AR	MO	ND	PH

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Drawing title
B1 - TYPICAL WORKING STRIP CROSS SECTION OPTIONS SSSI & EUROPEAN SITES (1 OF 2)

Drawing status: Fit for Stage Approval

Scale	1:100 @ A1
	DO NOT SCALE
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Rev	C01.1
Client no.	

Drawing number: B2325300-JAC-000-CIV-DRG-000407

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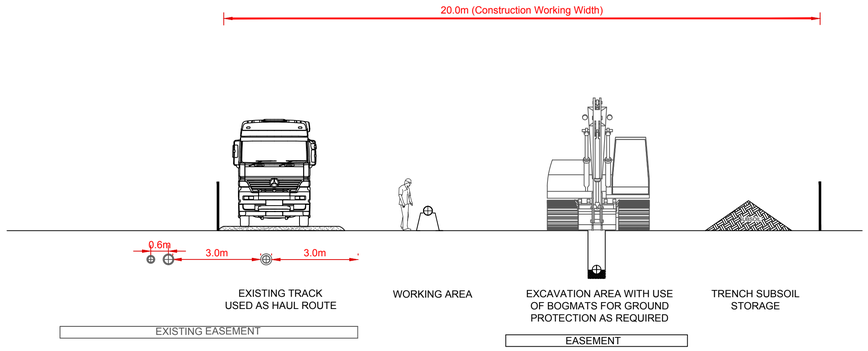
LOOKING NORTH OR EAST



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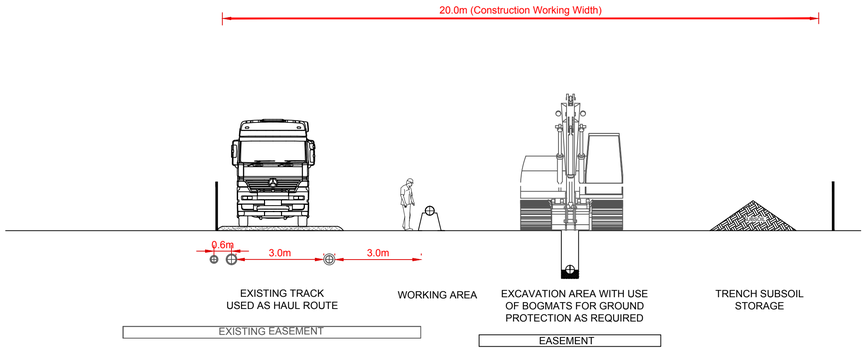

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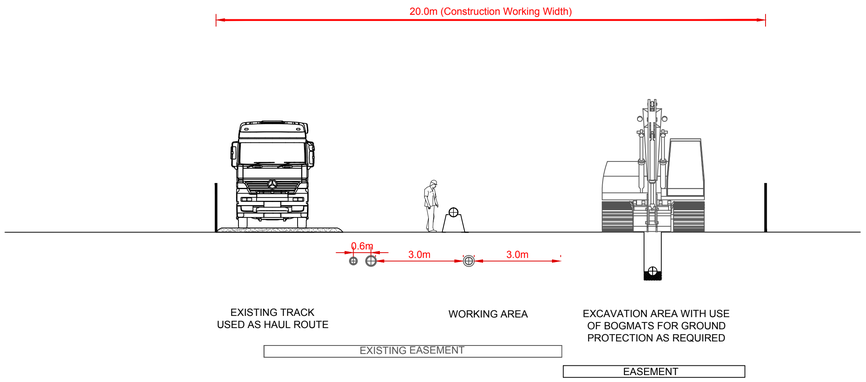

NOTES

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Rev	Rev. Date	Purpose of revision	Drawn	Checkd	Rev'd	Apprv'd
C01.1	02.05.2019	DCO SUBMISSION	AR	DS	SC	PH
P02.2	19.02.2019	FOR ESSO REVIEW AND COMMENT	AR	MO	MO	PH
P02.1	11.02.2019	FOR ESSO REVIEW AND COMMENT	AR	MO	DS	PH
P01.2	17.01.2019	FOR ESSO REVIEW AND COMMENT	AR	MO	ND	PH
P01.1	14.01.2019	FOR REVIEW AND COMMENT	AR	MO	ND	PH

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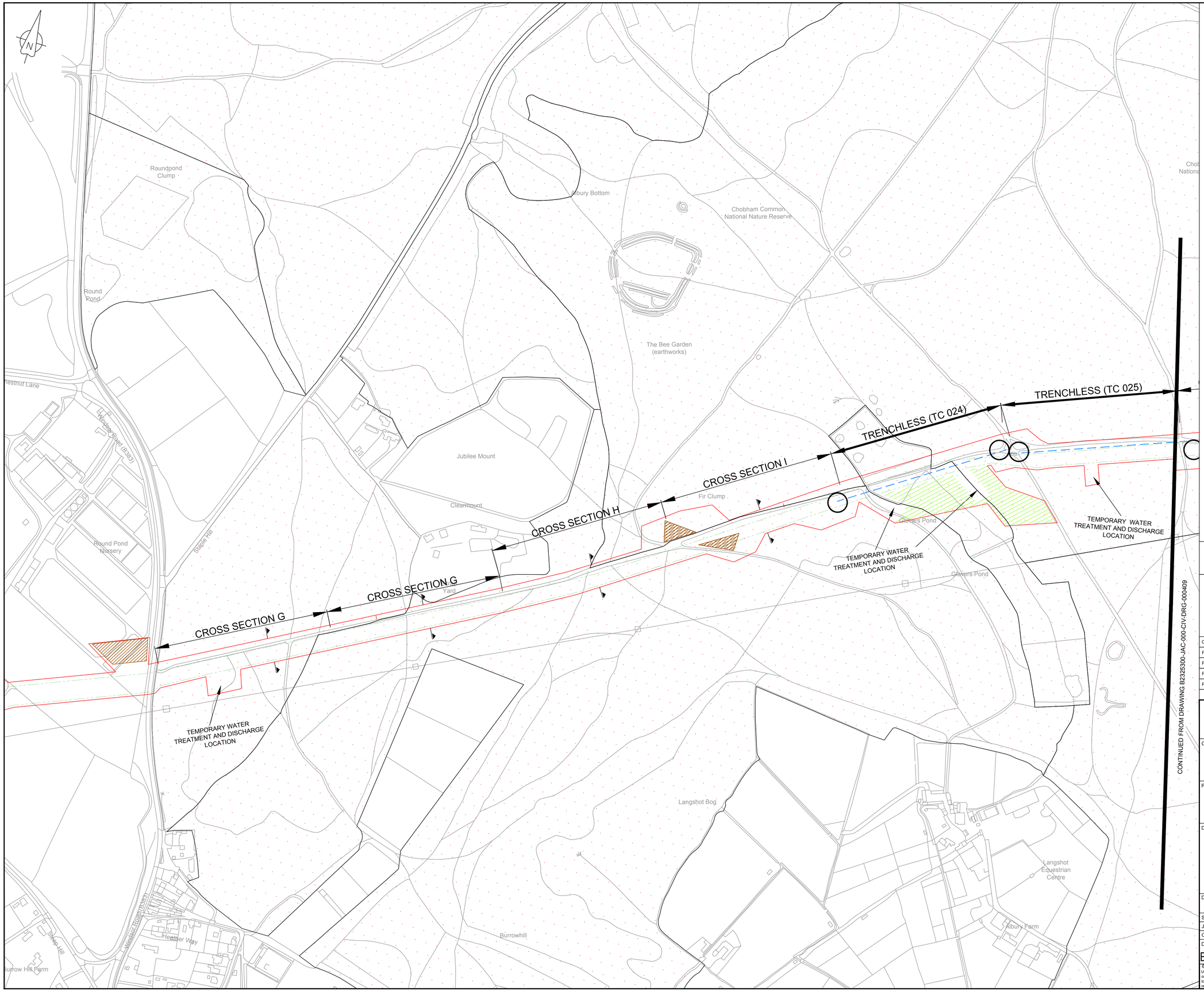

NOTES

1. DETAILS SHOWN ON THIS DRAWING ARE SUBJECT TO FURTHER DEVELOPMENT AT DETAILED DESIGN STAGE.
2. SECTIONS LABELLED ON PLANS CROSS REFERENCE TO SECTIONS SHOWN ON DRAWING B2325300-JAC-000-CIV-DRG-000407: WORKING STRIP CROSS SECTION OPTIONS SSSI & EUROPEAN SITES (1 OF 2) AND B2325300-JAC-000-CIV-DRG-000415: WORKING STRIP CROSS SECTION OPTIONS SSSI & EUROPEAN SITES (2 OF 2) .
3. IN SOME AREAS THESE CROSS SECTIONS MAY BE INVERSED WHERE EXISTING LINES ARE LOCATED ON THE OPPOSITE SIDE OF THE WORKING AREA.
4. MORE INFORMATION ON MITIGATION CAN BE FOUND WITHIN THE REGISTER OF ENVIRONMENTAL ACTIONS AND COMMITMENTS (REAC) IN ES CHAPTER 16 ENVIRONMENTAL MANAGEMENT AND MITIGATION.
5. FOR A DESCRIPTION OF TYPICAL CONSTRUCTION METHODS REFER TO CHAPTER 3 OF THE ENVIRONMENTAL STATEMENT.
6. AT HEATHLAND SSSI, 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 (HRA2).
7. HEATHLAND WITHIN STATUTORY OR NON-STATUTORY DESIGNATED WILDLIFE SITES WOULD BE REINSTATED USING NATURAL REGENERATION UNLESS OTHERWISE AGREED WITH NATURAL ENGLAND (HRA1).
8. THIS DRAWING IS IN ASSOCIATION WITH APFP Reg. (2009) 5(2)(o and l).

LEGEND

- DIRECTION OF CROSS SECTION
- ORDER LIMITS
- LIMITS OF DEVIATION
- DIRECTIONAL DRILLING LENGTH
- SSSI
- MITIGATION AREAS (WITHIN ORDER LIMITS)
- HORIZONTAL DIRECTIONAL DRILLING COMPOUND

0 50 100 150 200 250 m

SCALE 1 : 2500

Rev	Rev. Date	Purpose of revision	Drawn	Checkd	Rev'd	Apprv'd
C01.1	02.05.2019	DCO SUBMISSION	AR	DS	SC	PH
P02.2	19.02.2019	FOR ESSO REVIEW AND COMMENT	AR	MO	MO	PH
P02.1	11.02.2019	FOR ESSO REVIEW AND COMMENT	AR	MO	DS	PH
P01.2	17.01.2019	FOR ESSO REVIEW AND COMMENT	AR	MO	ND	PH
P01.1	09.01.2019	FOR REVIEW AND COMMENT	AR	MO	ND	PH

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KT22 8UX

Project: Southampton to London Pipeline Project

Drawing title

B3 -CHOBHAM COMMON SSSI PLAN WEST

Drawing status: Fit for Stage Approval

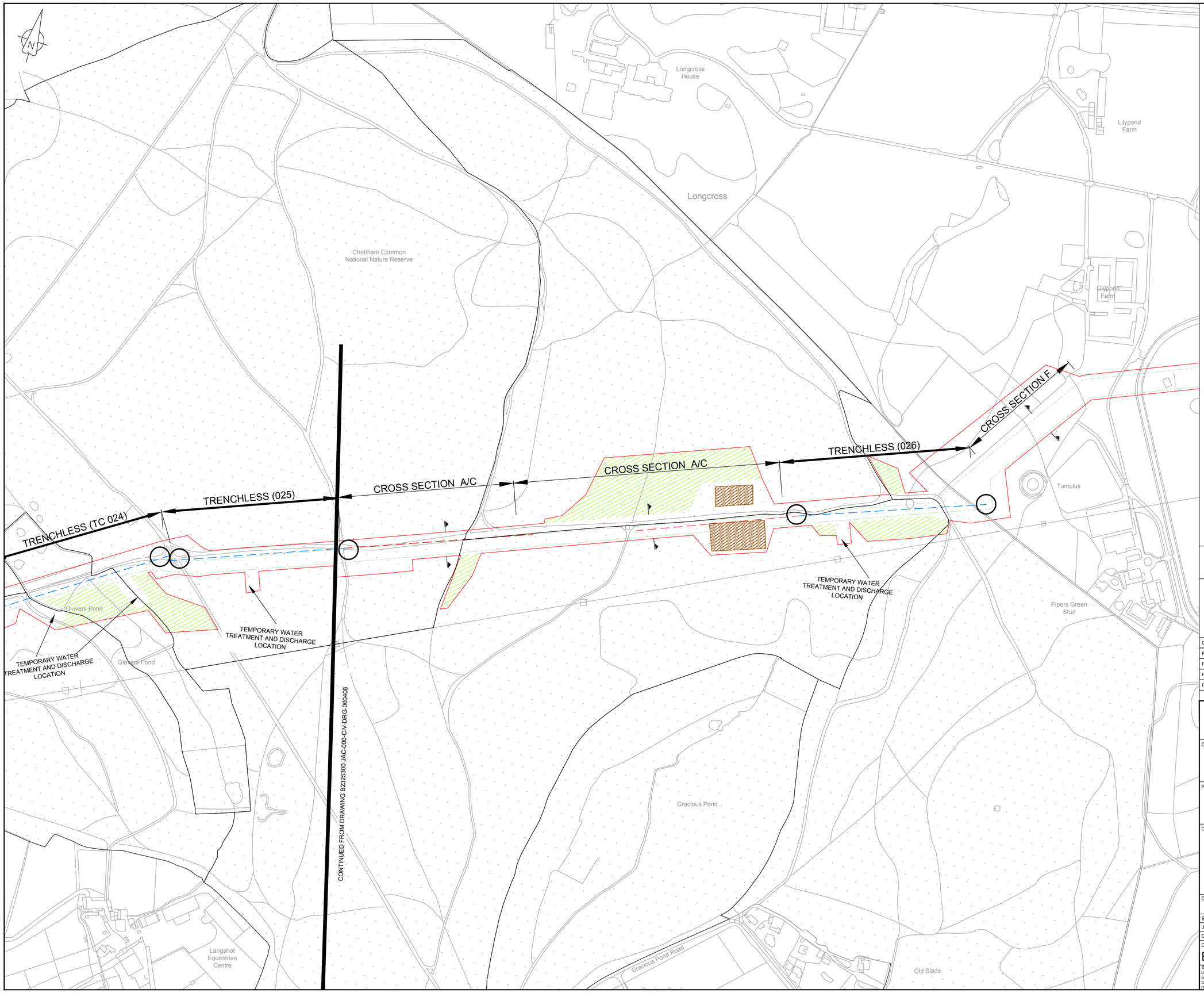
Scale: 1:2500 @ A1 — DO NOT SCALE

Jacobs No.: B2325300

Client no.:

Rev: C01.1

Drawing number: B2325300-JAC-000-CIV-DRG-000408



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5. FOR A DESCRIPTION OF TYPICAL CONSTRUCTION METHODS REFER TO CHAPTER 3 OF THE ENVIRONMENTAL STATEMENT.
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7. HEATHLAND WITHIN STATUTORY OR NON-STATUTORY DESIGNATED WILDLIFE SITES WOULD BE REINSTATED USING NATURAL REGENERATION UNLESS OTHERWISE AGREED WITH NATURAL ENGLAND (HRA1).
8. THIS DRAWING IS IN ASSOCIATION WITH APFP Reg. (2009) 5(2)(o and l).

LEGEND

- DIRECTION OF CROSS SECTION
- ORDER LIMITS
- LIMITS OF DEVIATION
- DIRECTIONAL DRILLING LENGTH
- MITIGATION AREAS (WITHIN ORDER LIMITS)
- SSSI
- HORIZONTAL DIRECTIONAL DRILLING COMPOUND

0 50 100 150 200 250 m

SCALE 1 : 2500

Rev	Rev. Date	Purpose of revision	Drawn	Checkd	Rev'd	Apprv'd
C01.1	02.05.2019	DCO SUBMISSION	AR	DS	SC	PH
P02.2	19.02.2019	FOR ESSO REVIEW AND COMMENT	AR	MO	MO	PH
P02.1	11.01.2019	FOR ESSO REVIEW AND COMMENT	AR	MO	DS	PH
P01.2	17.01.2019	FOR ESSO REVIEW AND COMMENT	AR	MO	ND	PH
P01.1	09.01.2019	FOR REVIEW AND COMMENT	AR	MO	ND	PH

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KT22 8UX

Project: Southampton to London Pipeline Project

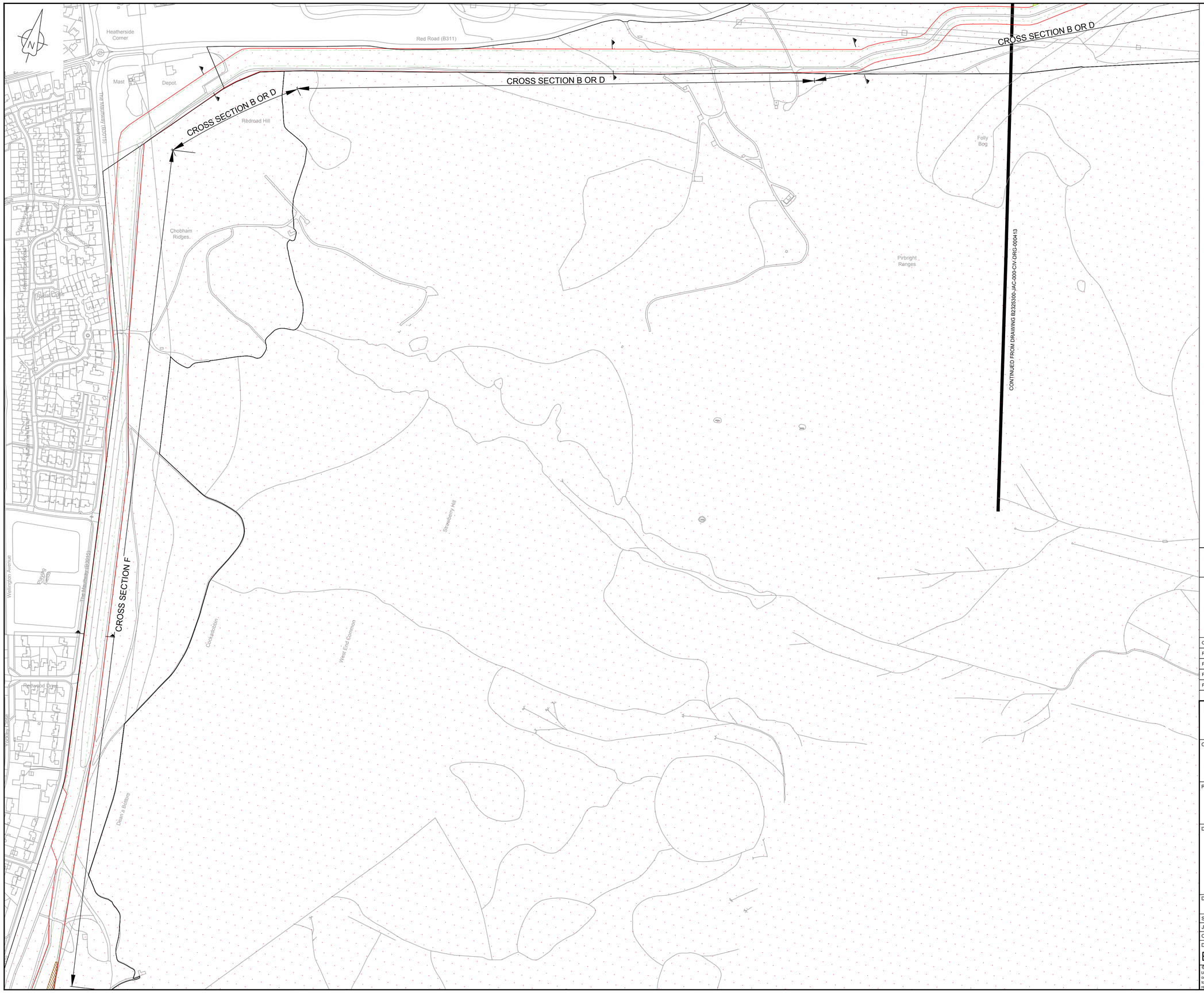
Drawing title: B4 - CHOBHAM COMMON SSSI PLAN EAST

Drawing status: Fit for Stage Approval

Scale	1:2500 @ A1	DO NOT SCALE
Jacobs No.	B2325300	Rev C01.1
Client no.		

Drawing number: B2325300-JAC-000-CIV-DRG-000409

DRAFT



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7. HEATHLAND WITHIN STATUTORY OR NON-STATUTORY DESIGNATED WILDLIFE SITES WOULD BE REINSTATED USING NATURAL REGENERATION UNLESS OTHERWISE AGREED WITH NATURAL ENGLAND (HRA1).
8. THIS DRAWING IS IN ASSOCIATION WITH APFP Reg. (2009) 5(2)(o and l).

LEGEND

- DIRECTION OF CROSS SECTION
- ORDER LIMITS
- LIMITS OF DEVIATION
- SSSI
- MITIGATION AREAS (WITHIN ORDER LIMITS)

0 50 100 150 200 250 m

SCALE 1 : 2500

Rev	Rev. Date	Purpose of revision	Drawn	Checkd	Rev'd	Apprv'd
C01.1	02.05.2019	DCO SUBMISSION	AR	DS	SC	PH
P02.2	20.02.2019	FOR ESSO REVIEW AND COMMENT	AR	MO	DS	PH
P02.1	11.02.2019	FOR ESSO REVIEW AND COMMENT	AR	MO	DS	PH
P01.2	17.01.2019	FOR ESSO REVIEW AND COMMENT	AR	MO	ND	PH
P01.1	17.10.2019	FOR REVIEW AND COMMENT	AR	MO	ND	PH

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KT22 8UX

Project: Southampton to London Pipeline Project

Drawing title

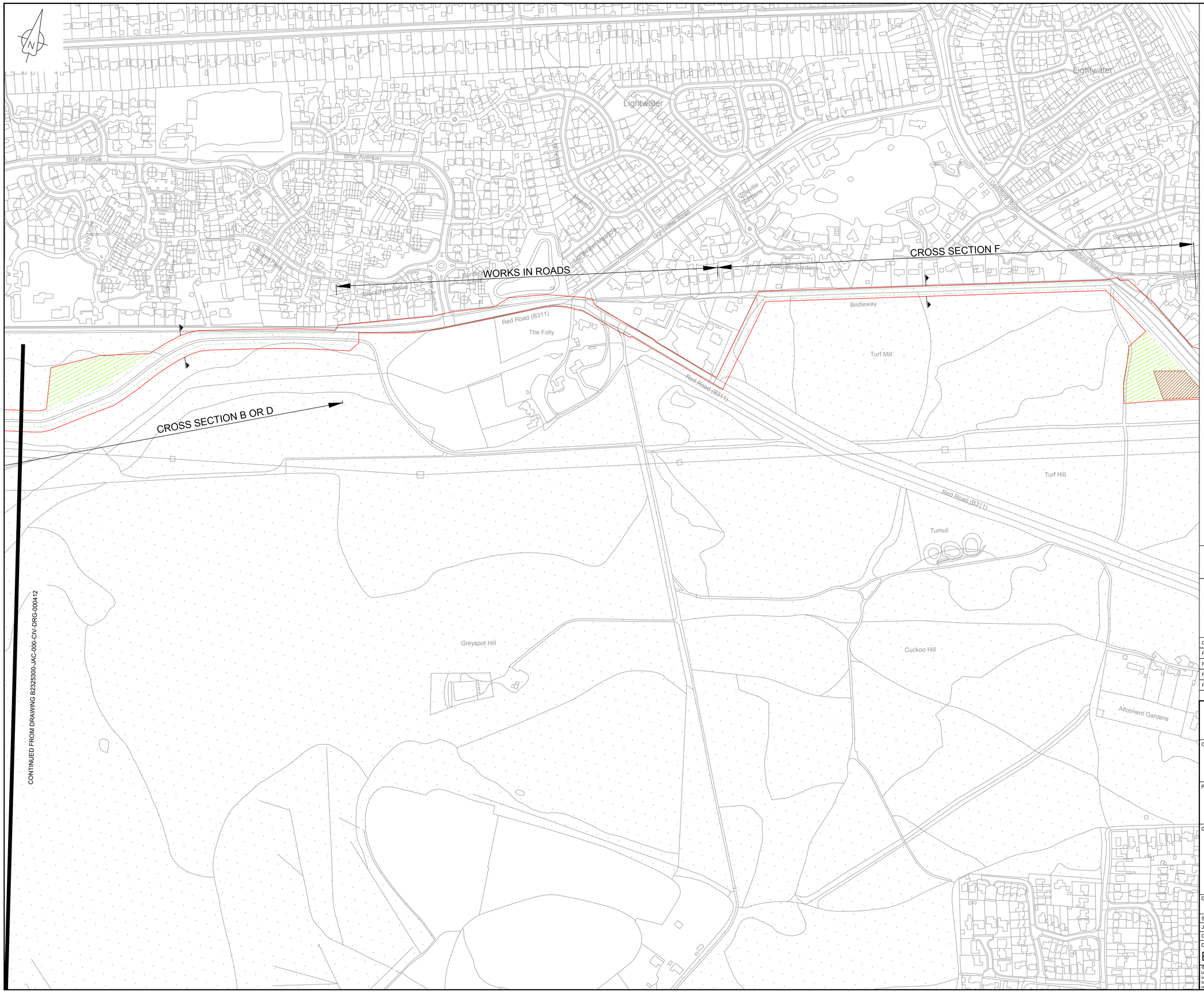
B5 - COLONY BOG & BAGSHOT HEATH SSSI PLAN WEST

DRAFT

Drawing status: Fit for Stage Approval

Scale	1:2500 @ A1	DO NOT SCALE
Jacobs No.	B2325300	Rev C01.1
Client no.		

Drawing number: B2325300-JAC-000-CIV-DRG-000412



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LEGEND

- DIRECTION OF CROSS SECTION
- ORDER LIMITS
- LIMITS OF DEVIATION
- SSSI
- MITIGATION AREAS (WITHIN ORDER LIMITS)

0 50 100 150 200 250 m

SCALE 1 : 2500

Rev	Rev. Date	Purpose of revision	Drawn	Checkd	Rev'd	Apprv'd
C01.1	02.05.2019	DCO SUBMISSION	AR	DS	SC	PH
P02.2	20.02.2019	FOR ESSO REVIEW AND COMMENT	AR	MO	MO	PH
P02.1	11.01.2019	FOR ESSO REVIEW AND COMMENT	AR	MO	DS	PH
P01.2	17.01.2019	FOR ESSO REVIEW AND COMMENT	AR	MO	ND	PH
P01.1	09.01.2019	FOR REVIEW AND COMMENT	AR	MO	ND	PH

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Leatherhead,
Surrey.
KT22 8UX

Project: Southampton to London Pipeline Project

Drawing title

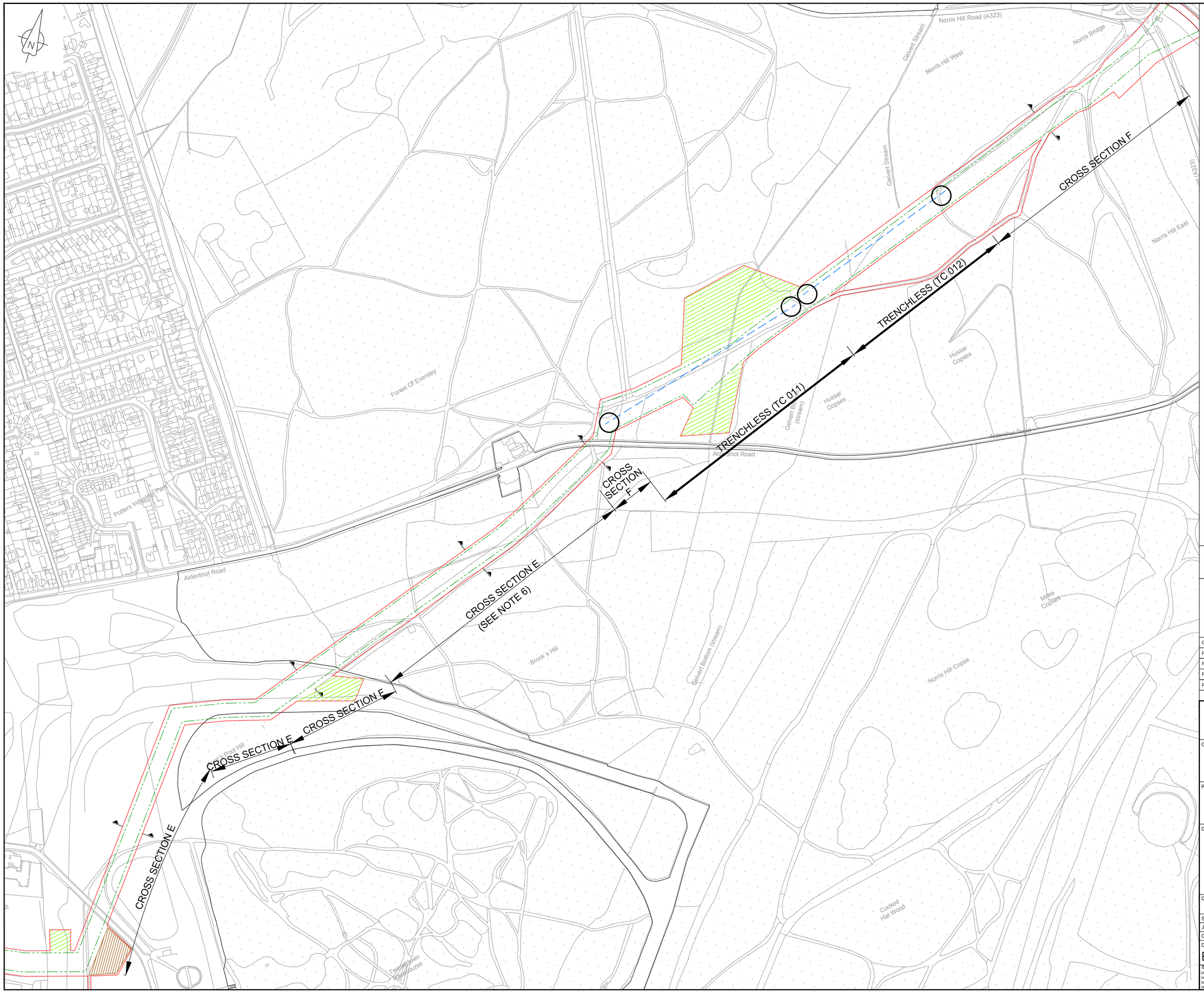
B6 - COLONY BOG & BAGSHOT HEATH SSSI PLAN EAST

Drawing status: Fit for Stage Approval

Scale	1:2500 @ A1	DO NOT SCALE
Jacobs No.	B2325300	Rev C01.1
Client no.		

Drawing number: B2325300-JAC-000-CIV-DRG-000413

DRAFT



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LEGEND

- DIRECTION OF CROSS SECTION
- ORDER LIMITS
- LIMITS OF DEVIATION
- DIRECTIONAL DRILLING LENGTH
- MITIGATION AREAS (WITHIN ORDER LIMITS)
- SSSI
- HORIZONTAL DIRECTIONAL DRILLING COMPOUND

0 50 100 150 200 250 m

SCALE 1 : 2500

Rev	Rev. Date	Purpose of revision	Drawn	Checkd	Rev'd	Apprv'd
C01.1	02.05.2019	DCO SUBMISSION	AR	DS	SC	PH
P02.2	19.02.2019	FOR ESSO REVIEW AND COMMENT	AR	MO	MO	PH
P02.1	11.02.2019	FOR ESSO REVIEW AND COMMENT	AR	MO	DS	PH
P01.2	17.01.2019	FOR ESSO REVIEW AND COMMENT	AR	MO	ND	PH
P01.1	14.01.2019	FOR REVIEW AND COMMENT	AR	MO	PH	ND

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Project: Southampton to London Pipeline Project

Drawing title

B7 - BOURLEY & LONG VALLEY SSSI PLAN

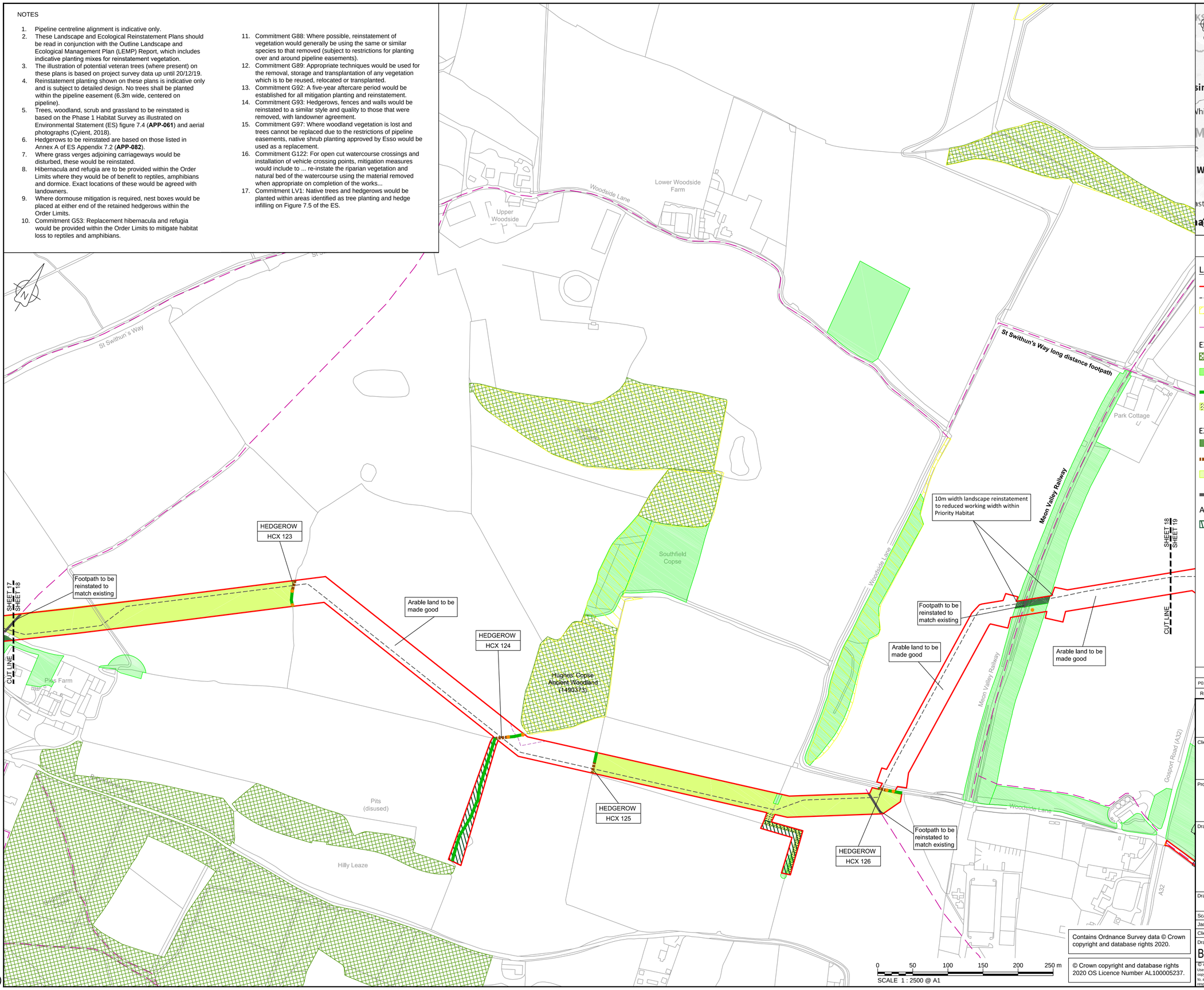
Drawing status: Fit for Stage Approval

Scale	1:2500 @ A1	DO NOT SCALE
Jacobs No.	B2325300	Rev C01.1
Client no.		

Drawing number: B2325300-JAC-000-CIV-DRG-000414

NOTES

1. Pipeline centreline alignment is indicative only.
2. These Landscape and Ecological Reinstatement Plans should be read in conjunction with the Outline Landscape and Ecological Management Plan (LEMP) Report, which includes indicative planting mixes for reinstatement vegetation.
3. The illustration of potential veteran trees (where present) on these plans is based on project survey data up until 20/12/19.
4. Reinstatement planting shown on these plans is indicative only and is subject to detailed design. No trees shall be planted within the pipeline easement (6.3m wide, centered on pipeline).
5. Trees, woodland, scrub and grassland to be reinstated is based on the Phase 1 Habitat Survey as illustrated on Environmental Statement (ES) figure 7.4 (**APP-061**) and aerial photographs (Cyient, 2018).
6. Hedgerows to be reinstated are based on those listed in Annex A of ES Appendix 7.2 (**APP-082**).
7. Where grass verges adjoining carriageways would be disturbed, these would be reinstated.
8. Hibernacula and refugia are to be provided within the Order Limits where they would be of benefit to reptiles, amphibians and dormice. Exact locations of these would be agreed with landowners.
9. Where dormouse mitigation is required, nest boxes would be placed at either end of the retained hedgerows within the Order Limits.
10. Commitment G53: Replacement hibernacula and refugia would be provided within the Order Limits to mitigate habitat loss to reptiles and amphibians.
11. Commitment 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).
12. Commitment G89: Appropriate techniques would be used for the removal, storage and transplantation of any vegetation which is to be reused, relocated or transplanted.
13. Commitment G92: A five-year aftercare period would be established for all mitigation planting and reinstatement.
14. Commitment G93: Hedgerows, fences and walls would be reinstated to a similar style and quality to those that were removed, with landowner agreement.
15. Commitment 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.
16. Commitment 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...
17. Commitment LV1: Native trees and hedgerows would be planted within areas identified as tree planting and hedge infilling on Figure 7.5 of the ES.



LOCATION PLAN
SCALE 1:500,000

LEGEND

- ORDER LIMITS
- INDICATIVE PIPELINE CENTRELINE
- SITE OF IMPORTANCE FOR NATURE CONSERVATION (SINC)
- PUBLIC RIGHTS OF WAY (PROW)

EXISTING FEATURES TO BE RETAINED

- ANCIENT WOODLAND TO BE RETAINED
- TREES AND WOODLAND (INCLUDING NOTABLE TREES) TO BE RETAINED
- HEDGEROWS TO BE RETAINED
- IMPROVED GRASSLAND PASTURE TO BE RETAINED

EXISTING FEATURES TO BE REINSTATED

- TREE AND WOODLAND REINSTATEMENT PLANTING
- HEDGEROW REINSTATEMENT PLANTING
- REINSTATEMENT OF IMPROVED GRASSLAND PASTURE
- FOOTPATH TO BE REINSTATED TO MATCH EXISTING

ADDITIONAL LANDSCAPE AND ECOLOGY MITIGATION

- HEDGEROW INFILLING
- DORMOUSE NEST BOXES

Rev	Rev. Date	Purpose of revision	Drawn	Checkd	Rev'd	Apprv'd
P01.2	29/01/20	DRAFT FOR DCO SUBMISSION		---	---	---

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Project: Southampton to London Pipeline Project

Drawing title
SAMPLE LANDSCAPE AND ECOLOGICAL REINSTATEMENT PLANS SHEET 18 (BASED ON INDICATIVEPIPELINE LOCATION)

Drawing status: Initial Status or WIP

Scale	1:2500	DO NOT SCALE
Jacobs No.	B2325300	Rev P01.2
Client no.		

Drawing number: B2325300-JAC-000-ENV-DRG-111152

0 50 100 150 200 250 m
SCALE 1 : 2500 @ A1

C:\pwworking\jacobs_uk_water&utilities_ss4\egintl_elstubs\dms51045\B2325300-JAC-000-ENV-DRG-111152.dwg - 29/01/2020 17:31:25 - A1Frame - ElstubS

NOTES

1. Pipeline centreline alignment is indicative only.
2. These Landscape and Ecological Reinstatement Plans should be read in conjunction with the Outline Landscape and Ecological Management Plan (LEMP) Report, which includes indicative planting mixes for reinstatement vegetation.
3. The illustration of potential veteran trees (where present) on these plans is based on project survey data up until 20/12/19.
4. Reinstatement planting shown on these plans is indicative only and is subject to detailed design. No trees shall be planted within the pipeline easement (6.3m wide, centered on pipeline).
5. Trees, woodland, scrub and grassland to be reinstated is based on the Phase 1 Habitat Survey as illustrated on Environmental Statement (ES) figure 7.4 (**APP-061**) and aerial photographs (Cyient, 2018).
6. Hedgerows to be reinstated are based on those listed in Annex A of ES Appendix 7.2 (**APP-082**).
7. Where grass verges adjoining carriageways would be disturbed, these would be reinstated.
8. Hibernacula and refugia are to be provided within the Order Limits where they would be of benefit to reptiles, amphibians and dormice. Exact locations of these would be agreed with landowners.
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17. Commitment LV1: Native trees and hedgerows would be planted within areas identified as tree planting and hedge infilling on Figure 7.5 of the ES.

LOCATION PLAN
SCALE 1:500,000

LEGEND

- ORDER LIMITS
- INDICATIVE PIPELINE CENTRELINE
- SITE OF IMPORTANCE FOR NATURE CONSERVATION (SINC)
- POTENTIAL ANCIENT WOODLAND
- TREE PRESERVATION ORDER (TPO)
- PUBLIC RIGHTS OF WAY (PROW)
- WATERCOURSE
- WATERCOURSE CROSSING

EXISTING FEATURES TO BE RETAINED

- ANCIENT WOODLAND TO BE RETAINED
- POTENTIAL VETERAN TREE GROUPS TO BE RETAINED (WITHIN 15M OF THE ORDER LIMITS)
- TREES AND WOODLAND (INCLUDING NOTABLE TREES) TO BE RETAINED
- HEDGEROWS TO BE RETAINED
- SCRUB TO BE RETAINED
- NEUTRAL GRASSLAND - SEMI-IMPROVED TO BE RETAINED
- NEUTRAL GRASSLAND - UNIMPROVED TO BE RETAINED
- IMPROVED GRASSLAND PASTURE TO BE RETAINED
- AMENITY GRASSLAND TO BE RETAINED

EXISTING FEATURES TO BE REINSTATED

- TREE AND WOODLAND REINSTATEMENT PLANTING
- HEDGEROW REINSTATEMENT PLANTING
- REINSTATEMENT OF SCRUB
- REINSTATEMENT OF NEUTRAL GRASSLAND - SEMI-IMPROVED
- REINSTATEMENT OF NEUTRAL GRASSLAND - UNIMPROVED
- REINSTATEMENT OF POOR SEMI-IMPROVED GRASSLAND
- REINSTATEMENT OF IMPROVED GRASSLAND PASTURE
- REINSTATEMENT OF AMENITY GRASSLAND
- FOOTPATH TO BE REINSTATED TO MATCH EXISTING

ADDITIONAL LANDSCAPE AND ECOLOGY MITIGATION

- DORMOUSE NEST BOXES
- GOOD PRACTICE HABITAT MEASURES TO BE IMPLEMENTED AS REQUIRED, E.G. COMMITMENT G53

HEDGEROW HCX 212
HEDGEROW HCX 213
HEDGEROW HCX 214
HEDGEROW HCX 215
Footpath to be reinstated to match existing
Footpath to be reinstated to match existing
15m width landscape reinstatement to reduced working width within Ewshot Meadows SINC and SANG
15m width landscape reinstatement to reduced working width within Wakefords Copse SINC
Project assumption is that construction activities would take place within the western side of the carriageway and their would be no impact on Greendane Copse Ancient Woodland.
Meadow near Soanes Copse SINC
Riddings Copse and Shaw SINC
Ewshot Meadows SINC
Wakeford Copse, Crondall SINC
Greendane Copse Ancient Woodland (1487529)
Quetta Park
Church Crookham
Naishes Lane
Ewshot Lane
Beacon Hill Road
Rifle Range
Fleet Business Park
Hampton's Farm
Homecroft Farm
Recreation Ground
Beacon Hill Farm
Water Tower
Reservoir (Covered)
SHEET 29
SHEET 30
SHEET 31
CUT LINE

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0 50 100 150 200 250 m
SCALE 1 : 2500 @ A1

Rev	Rev. Date	Purpose of revision	Drawn	Checkd	Rev'd	Apprv'd
P01.2	29/01/20	DRAFT FOR DCO SUBMISSION		---	---	---

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Project: Southampton to London Pipeline Project

Drawing title
SAMPLE LANDSCAPE AND ECOLOGICAL REINSTATEMENT PLANS SHEET 30 (BASED ON INDICATIVE PIPELINE LOCATION)

Drawing status: Initial Status or WIP

Scale	1:2500	DO NOT SCALE
Jacobs No.	B2325300	Rev P01.2
Client no.		

Drawing number: B2325300-JAC-000-ENV-DRG-111153

Southampton to London Pipeline Project

Esso Petroleum Company, Limited

Approach to Ancient Woodland and Veteran Trees

Document No. |

2020/01/30

Southampton to London Pipeline Project
Approach to: Ancient Woodland and Veteran Trees

Project No:	B2325300
Document Title:	Approach to Ancient Woodland and Veteran Trees
Document No:	
Revision:	P01.5
Date:	2019/10/01
Suitability Code	

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Contents

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 desk top 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 29 August 2019). 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 also set out in the Register of Environmental Actions and Commitments (REAC) in ES Chapter 16 (**Application Reference APP-056**). 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 (**Application Reference APP-128**), which would be secured through Requirement 5 (Code of Construction Practice) of the draft Development Consent Order (**Application Reference APP-026**).

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 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 trees, where at risk of damage, would be supervised by the ECoW.
G87	Vegetation clearance, retention, protection and replanting/reinstatement drawings would be produced prior to the construction phase. 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 three-year aftercare period would be established for all mitigation planting and reinstatement.
G95	The contractor(s) would consider and apply, where practicable, the relevant protective principles set out in the National Joint Utilities Group Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees ('NJUG Volume 4' (2007)). 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.
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.

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 would be used to inform the future 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 is 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 would 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 An initial assessment has been completed identifying which designated trees are likely to fall within each tier of the mitigation hierarchy. This initial assessment is based on a current project understanding and may change as further details or new constraints become known. However, the mitigation hierarchy would always apply, seeking a 15 buffer first where practicable, then avoiding the RPA, followed by the use of specialist construction techniques within the RPA.

2.3.4 The mitigation hierarchy and the schedules of designated trees (Appendices A, B and C) will be included within the project's Code of Construction Practice.

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*' (Table 16.1 of ES Chapter 16 Environmental Management and Mitigation (**Application Reference APP-056**).

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**). These are listed in Appendix A.

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 Appendix A lists each area of Ancient Woodland within 15m of the Order Limits, the potential impact from the project and which tier of the mitigation hierarchy could apply based on current project assumptions.

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 based on current project assumptions, 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 to based on the current project assumptions	Approximate extent of mitigation measure (linear metres)
Not applicable; no likely impact.	Five woodlands: • Plantation near Bramdean Common - 1490746; • Woodland south of Neatham Manor - 1490082; • Skains Copse / Combe Wood - 1489102; • Fan Grove – 1493.326; • Greendane Copse - 1487529.	N/A
A1 (15m buffer)	Six woodlands: • 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
	• Skains Copse / Combe Wood - 1489100 (except as noted below);	190m
	• Halebourne Copse 1494014.	95m
	• Holme Wood, Broadlands Row - 1491028	12m
A2 (RPA buffer)	Three woodlands: • Copse near Betty Mundy's Bottom - 1490774 (south-western corner);	12m

Mitigation hierarchy	Ancient Woodland plots that the mitigation hierarchy would be applied to based on the current project assumptions	Approximate extent of mitigation measure (linear metres)
	• Joan's Acre Wood - 1491165	30m
	• Holme Wood, Broadlands Row - 1491028	90m
A3 (Specialist techniques)	One woodland: • 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. The potential impact on these areas of potential ancient woodland is set out in Appendix B.

Further Mitigation Principles

4.2.3 Appendix B lists each area of potential ancient woodland within 15m of the Order Limits, the potential impact from the project and which tier of the mitigation hierarchy could apply based on current project assumptions. Table 4.1 summarises the number of potential ancient woodlands that based on current project assumptions, 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 to based on the current project assumptions	Approximate extent of mitigation measure (linear metres)
Not applicable; no likely impact.	One woodland: • AW2.	N/A
A1 **(15m buffer)**	Five woodlands: • AW3;	78m
	• AW5;	212m
	• AW12 (Exception – see A2);	33m

Mitigation hierarchy	Potential ancient woodland plots that the mitigation hierarchy would be applied to based on the current project assumptions	Approximate extent of mitigation measure (linear metres)
	• AW16;	25m
	• AW30.	217
A2 (RPA buffer)	One woodland • AW12 (where Limits of Deviation narrow);	11m
A3 (Specialist techniques)	One woodland:	
	• AW15a.	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 recognized 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. However, three veteran trees within 15m of the Order Limits have subsequently been added to the inventory (checked 29 August 2019). These are all located along Ashford Road, Staines, and are listed in Appendix C.

5.2.2 Arboricultural surveys have recorded those trees that display features consistent with a potential veteran tree in accordance with BS 5837:2012.

5.2.3 There are nine potential veteran trees within the Order Limits and 13 potential veteran trees within 15m of the Order Limits. RPAs have been calculated for each potential veteran tree.

Further Mitigation Principles

5.2.4 The project has considered the 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).

5.2.5 For the purposes of the assessment and the application of the mitigation hierarchy, potential veteran trees are assumed to be Veteran Trees. Appendix C lists the Veteran Trees and potential veteran trees within 15m of the Order Limits. It also lists the potential impact from the project and which tier of the mitigation hierarchy could apply based on current project assumptions.

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.

5.2.6 Table 5.2 summarises the number of inventory Veteran trees and potential veteran trees that based on current project assumptions, are likely to fall within each tier of the mitigation hierarchy.

*1Stem diameter, as measured at 1.5m above highest adjacent ground level.
*[2] 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 current project assumptions
Not applicable; no likely impact.	N/A
B1 **(Up to 15m buffer)**	17 potential veteran trees and two potential veteran tree group: • T4; • S400-T1; • S400-T2; • S400-T4; • T13; • T105; • S700-T12; • S1200-T4; • G47; • T39; • T40; • T41; • S1800-T6; • S1800-T7; • S1800-T45; • T102; • T56; • T52; • G170.
B2 **(RPA buffer)**	N/A
B3 **(Specialist techniques)**	Three Veteran trees: • 193108 (Survey ref: S2300-T46); • 193090 (Survey ref: S2300-T12); • 194703 (Survey ref: S2300-T64). One potential veteran tree: • T59.

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 A: Schedule of Ancient Woodland

Table A1: Designated Ancient Woodlands within 15m of the Order Limits

Name and Location[3]	Description in Relation to the Project[4]	Potential Impact Based on Current Project Assumptions	Further Mitigation Principles
ID: 1490774 Copse near Betty Mundy's Bottom	0.36ha of ancient replanted woodland adjacent to the Order Limits.	Potential impact on RPA on edge of woodland from construction activities.	A1, except where Order Limits narrow; A2.
ID: 1490766 and1491165 Joan's Acre Wood	6.03ha of ancient replanted woodland within two contiguous plots adjacent to the Order Limits.	Potential impact on RPA on edge of woodland from construction activities.	A1
ID: 1490746 The Plantation near Bramdean Common	6.56ha of ancient replanted woodland approximately 11m from the Order Limits.	None. (Only hedge infilling proposed within Order Limits along existing track.)	Not applicable.
ID: 1490373 Hughes Copse	1.60ha of ancient replanted woodland, with southern tip within approximately 6m of the Order Limits. Nearest stem is approximately 10m from Order Limits.	Potential impact on southern tip of woodland from construction activities.	A1
ID: 1490375 and1490233 Noar Copse	3.75ha of ancient and semi natural woodland within two contiguous plots adjacent to the Order Limits.	Potential impact on RPA on edge of woodland from construction activities.	A1
ID: 1491028 Holme Wood, Broadlands Row	1.64ha of ancient and semi natural woodland adjacent to the Order Limits.	Potential impact on RPA on edge of woodland from construction activities.	A3
ID: 1490082 Woodland south of Neatham Manor	0.8ha of ancient and semi natural woodland with north-western corner adjacent to the Order Limits.	None. (Pumping of water to an existing stream.)	Not applicable.

[4] Assessment only considers plots of designated Ancient Woodland that fall wholly or partially within 15m of the Order Limits.

Name and Location[3]	Description in Relation to the Project[4]	Potential Impact Based on Current Project Assumptions	Further Mitigation Principles
ID: 1489100 Skains Copse / Combe Wood	4.27ha of ancient and semi natural woodland adjacent to the Order Limits.	Potential impact on RPA on edge of woodland from construction activities. Impact would be reduced by narrow working (NW33[5]) to cross the perpendicular hedgerow and culvert (restricted to approximately 10m width at 'pinch point').	A1, except in vicinity of NW33 pinch-point; A3.
ID: 1489102 Skains Copse / Combe Wood (Overlaps with TPO 90/00380/HDC 689)	19.8ha of ancient and semi natural woodland adjacent to the Order Limits.	Existing access track to be utilised for construction activities/access adjacent to woodland, to avoid impact on RPAs.	Not applicable.
ID: 1487529 Greendane Copse	8.3ha of ancient replanted woodland with adjacent to the Order Limits.	None. (Project assumption is that construction activities would take place within the western side of the carriageway.)	Not applicable.
ID: 1494014 Halebourne Copse	5.66ha of ancient and semi natural woodland adjacent to the Order Limits.	Potential impact on RPA on edge of woodland from construction activities.	A1
ID: 1493326 Fan Grove	3.83ha of ancient and semi natural woodland with south-eastern adjacent to the Order Limits.	None. (Trenchless construction.)	Not applicable.

[5] 'Narrow working' abbreviated as 'NW'. The number '33' relates to the narrow working commitment number.

Appendix B: Schedule of Potential Ancient Woodland

Table B1: Summary of potential ancient woodland within 15m of the Order Limits

Reference Name and Location	Description in Relation to the Project	Potential Impact Based on Current Project Assumptions	Proposed Further Mitigation
AW2: Woodland west of Nether Hill Lane along Ford Lake Stream, northeast of Boorley Green	0.26ha woodland copse within and immediately adjacent to the Order Limits.	None. (Trenchless crossing)	Not applicable.
AW3: Durley Mill Copse, west of Brown Heath, north of Gregory Lane	0.86ha linear woodland copse, just within the Order Limits at the northern extent and within approximately 6m of the Order Limits at the southern extent.	Potential impact on RPA on edges of woodland from construction activities.	A1
AW5: Copse near Betty Mundy's Bottom (proportion of copse adjacent to Ancient Woodland 1490774)	1.23ha remnant of woodland adjacent to and partially overhanging the Order Limits.	Potential impact on RPA on edge of woodland from construction of activities.	A1
AW12 Overgrown hedgerow/ strip of woodland at Neatham Down, west of Monk Wood	549m long overgrown hedgerow/strip of woodland that would be crossed by the Order Limits.	Potential impact on RPA from construction activities, limited by construction being centred along existing gap in trees/field access and narrow working. (Bat mitigation area for installation of bat boxes proposed within majority of woodland strip within Order Limits.)	A1, except where limits of deviation narrow; A3
AW15a: Strip of woodland west of Ewshot Wood	0.16ha strip of woodland, partially within Order Limits.	Potential impact on RPA from construction of activities, despite narrow working (NW33) restricted to approximately 10m width.	A3
AW16 Greendane Copse	0.64ha woodland. A small part of northern woodland edge is just within 15m of the Order Limits.	Potential impact on edge of woodland RPA from construction activities, despite narrow working (NW10).	A1
AW30: Strip of woodland at Silverlands, west of Addlestone and south of B386	1.12ha woodland would be crossed by Order Limits and/or be immediately adjacent to the Order Limits.	Trenchless crossing proposed would limit potential impact. However, potential impact on RPA on southern edge of woodland from construction activities, despite narrow working (NW26).	A1

Appendix C: Schedule of Veteran and Potential Veteran Trees

Table C1: Summary of Veteran Trees within 15m of the Order Limits

Reference Name and Location	Description in Relation to the Project	Potential Impact Based on Current Project Assumptions	Proposed Further Mitigation
Veteran Trees on the Inventory (29 August 2019)			
Tree ID: 193108 (Survey ref: S2300-T46) East of Ashford Road, Staines. (Within group TPO TPO001STA 001STAA001.)	Oak with stem approximately 2.5m from the Order Limits.	Project assumption is that construction activities would take place within the carriageway, resulting in limited impact on RPA.	B3
Tree ID: 193090 (Survey ref: S2300-T12) West of Ashford Road, Staines.	Common ash, with stem approximately 9m from the Order Limits.	Project assumption is that construction activities would take place within the carriageway, resulting in limited impact on RPA.	B3
Tree ID: 194703 (Survey ref: S2300-T64) East of Ashford Road, Staines. (Within group TPO TPO001STA 001STAA001.)	Oak with stem approximately 6m from the Order Limits.	Project assumption is that construction activities would take place within the carriageway, resulting in limited impact on RPA.	B3
Potential Veteran Trees Identified by Project Tree Surveys			
Survey ref: T4 Just east of Minchingfield Lane, to the east of Durley Street.	Oak boundary tree adjacent to the Order Limits.	Potential impact on RPA from construction activities.	B1
Survey ref: S400-T1 South-east of Hinton Ampner.	Old coppice stool of field maple within hedge, adjacent to the Order Limits.	Potential impact on RPA from construction activities.	B1
Survey ref: S400-T2 South-east of Hinton Ampner.	Common ash immediately adjacent to Order Limits.	Potential impact on RPA from construction activities.	B1
Survey ref: S400-T4 South-east of Hinton Ampner.	Common ash within the Order Limits.	Potential impact on RPA from construction activities.	B1
Survey ref: T13 North of West Tisted.	Oak within the Order Limits.	Potential impact on RPA from construction activities.	B1
Survey ref: T105 South of Petersfield Road, Ropley.	Beech adjacent to the Order Limits.	Potential impact on RPA from construction activities in the vicinity of drill pit to the east.	B1

Reference Name and Location	Description in Relation to the Project	Potential Impact Based on Current Project Assumptions	Proposed Further Mitigation
Survey ref: S700-T12 Jubilee Clump, Manor Farm, Farringdon.	Beech with stem approximately 7m from the Order Limits.	Potential impact on RPAs from construction activities/access.	B1
Survey ref: S1100-T11 Within potential ancient woodland AW12 at Neatham Down, west of Monk Wood.	Ash with stem within 4m of the Order Limits.	Assessed as part of AW12 in Appendix B.	Refer to AW12 in Appendix B.
Survey ref: S1200-T4 Within woodland south of West End.	Oak with stem approximately 10m from the Order Limits.	Potential impact on RPA from construction activities.	B1
Survey ref: G47 North of Hampton's Farm, Ewshot Lane, Ewshot (within TPO 05/01198/HDC A60925).	Remnant field boundary with oak and field maple within the Order Limits.	Potential impact on RPA/ from construction activities.	B1
Survey ref: T39 On western edge of Church Crookham Football Field.	Oak within the Order Limits.	Potential impact on RPA from construction activities, despite narrow working (NW10).	B1
Survey ref: T40 Southern edge of Southwood Golf Course.	Oak within the Order Limits.	Potential impact on RPA from construction activities. Carriageway to the south would limit impact on RPA from construction activities to the south.	B1
Survey ref: T41 South of Queen Elizabeth Park Carpark West.	Willow within Order Limits.	Potential impact from construction activities/compound. (No impact from trenchless crossing.)	B1
Survey ref: S1800-T6 Near entrance to Farnborough Hill School, Farnborough.	Oak with stem within approximately 12m of the Order Limits.	Potential impact on RPA from construction activities despite narrow working (NW18) restricted to 15m width.	B1
Survey ref: S1800-T7 Near entrance to Farnborough Hill School, Farnborough.	Oak with stem within approximately 8m of the Order Limits.	Potential impact on RPA from construction activities despite narrow working (NW18) restricted to 15m width.	B1
Survey ref: S1800-T45 Near eastern edge of Farnborough Hill School playing field, Farnborough.	Sweet chestnut just within the Order Limits.	Potential impact on RPA from construction activities despite narrow working (NW18) restricted to 15m width.	B1

Reference Name and Location	Description in Relation to the Project	Potential Impact Based on Current Project Assumptions	Proposed Further Mitigation
Survey ref: T102 On edge of woodland south of Halebourne Copse, Chobham.	Alder with adjacent to the Order Limits.	Potential impact on RPA/ from construction activities.	B1
Survey ref: T106 On edge of Ancient Woodland 1494014, Halebourne Copse, Chobham.	Tree with stem approximately 2m from the Order Limits.	Assessed as part of Ancient Woodland 1494014 in Appendix A.	Refer to Ancient Woodland 1494014 in Appendix A.
Survey ref: T59 South of B386 Longcross Road and west of Accommodation Road, Chertsey.	Oak within field boundary, within the Order Limits.	Potential impact on RPA/ from construction activities.	B3
Survey ref: T56 South of B386 Longcross Road and west of Accommodation Road, Chertsey.	Oak within field boundary, just within the edge of the Order Limits.	Potential impact on RPA from construction activities.	B1
Survey ref: T52 South of B386 Longcross Road and west of Accommodation Road, Chertsey.	Oak within field boundary, with stem approximately 11m from the Order Limits.	Potential impact on RPA from construction activities.	B1
Survey ref: G170 On edge of woodland at Foxhills Golf Club, Chertsey.	Oaks with stem approximately 12m from the Order Limits.	Potential impact from construction activities. (Narrow working (NW26) commitment is aimed at reducing impacts on the golf course (not trees).	B1

Southampton to London Pipeline Project

Hedge - HCX 130 Technical Note

Revision No. 1.0

December 2019

Contents

1 Introduction

1.1 Context

1.1.1 This Technical Note has been prepared by Esso Petroleum Company, Limited (the Applicant) as part of the examination for development consent for the Southampton to London Pipeline project (the project).

1.1.2 Development consent is sought for the construction of a cross-country pipeline by the Applicant. This is to replace an existing pipeline that is approaching the end of its economic life. The replacement pipeline will run from Boorley Green in Hampshire to the Applicant's West London Terminal storage facility in the London Borough of Hounslow.

1.1.3 The project is a Nationally Significant Infrastructure Project (NSIP) within section 14(1)(g) of the Planning Act 2008 (as amended) ('the 2008 Act") for which development consent is required under section 31 of the 2008 Act. Development consent is required before the development can proceed.

1.1.4 An application for development consent for the SLP project was made by the Applicant to the Planning Inspectorate (PINS) on 14 May 2019. This application was accepted for examination by PINS on 11 June 2019.

1.2 Purpose of the Technical Note

1.2.1 During a site visit in April 2019, the South Downs National Park Authority (SDNPA) confirmed its objection to open cut methodology being used to install through a hedgerow to the east of Chawton Registered Park and Garden, which has a specific cultural association with Jane Austen. This hedgerow is identified in the application as HCX 130, works number WCX020.

1.2.2 This Technical Note has been produced in order to provide an outline methodology that the project could implement to retain the hedgerow, for the SDNPA to review.

2 HCX 130

2.1 Background

2.1.1 The Order Limits contained in the project's application for development consent are wholly outside of the Registered Park and Garden, (which is crossed by the existing pipeline).

2.1.2 During a site visit in April 2019, the South Downs National Park Authority (SDNPA) confirmed its objection to open cut methodology being used to install through a hedgerow to the east of Chawton Registered Park and Garden, which has a specific cultural association with Jane Austen. This hedgerow is identified in the application as HCX 130, works number WCX020.

2.1.3 The hedgerow that SDNPA is concerned about extends out eastwards from the Registered Park and Garden designation. The location identified for the hedgerow crossing lies outside of that designation.

2.1.4 The SDNPA requested that the project consider means to retain the part of this hedgerow within the Order Limits because it is a continuation of the culturally associated hedgerow.

2.2 Historic and Cultural Importance

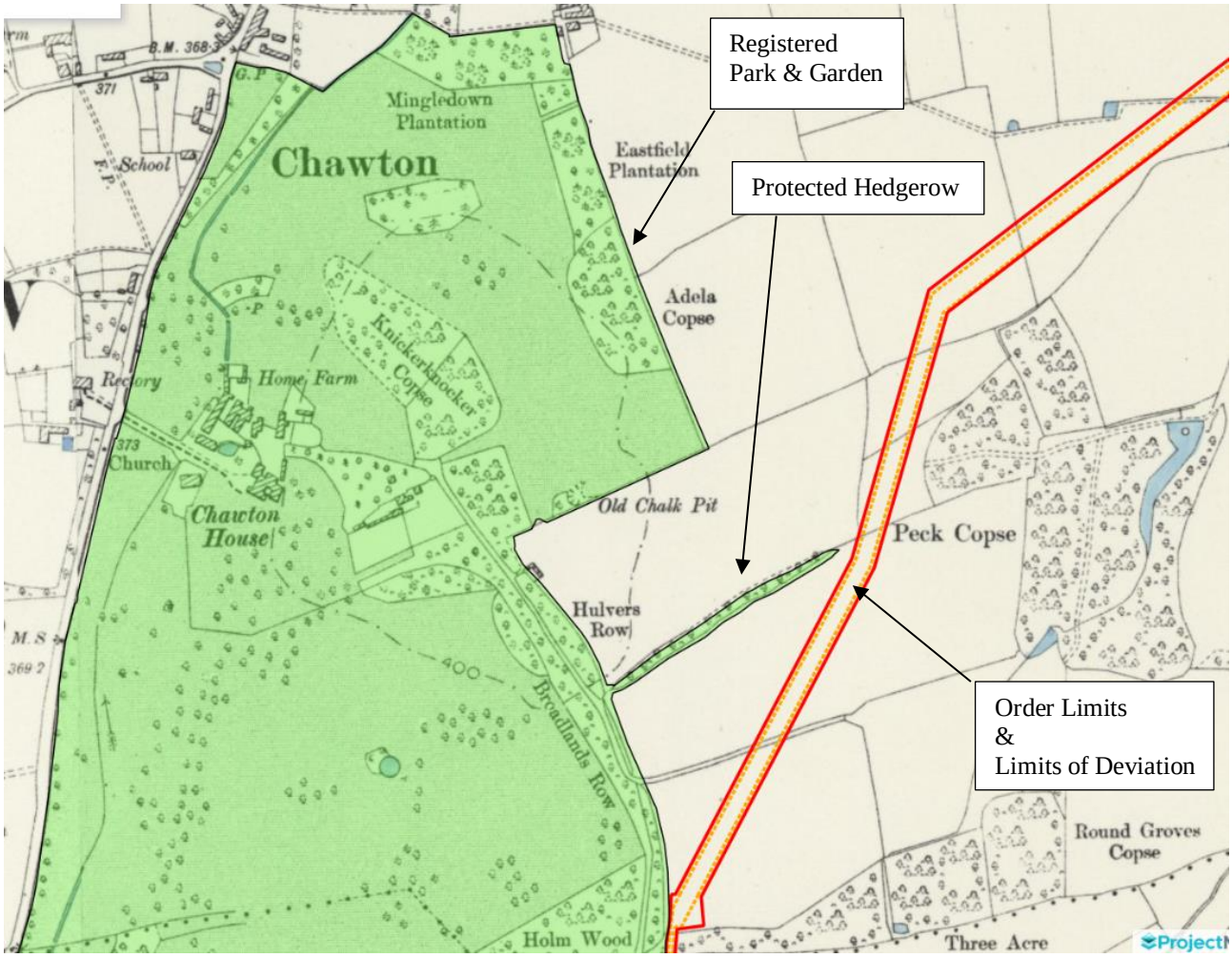
2.2.1 The project has identified that a hedgerow, known as Hedge – HCX 130 - located east of Chawton Park, would be impacted by the construction of the replacement pipeline. This hedge has been identified as important under the Hedgerow Regulations 1997.

2.2.2 Historic England reference the hedgerow within the description of Chawton House Registered Park and Garden*:*

2.2.3 *'The ancient coppice row which runs north-east from Broadlands Row supplied Jane Austen with the setting for the conversation between Captain Wentworth and Louisa Musgrove, `in the hedge-row behind [Anne], as if making their way along the rough wild sort of channel, down the centre' (Persuasion, Chapter 10).*

2.2.4 Figure 1 is the Ordnance Survey map from 1888, with the application Order Limits overlaid

Figure 1: 1888 Ordnance Survey Map showing Registered Park & Garden and Application Order Limits



3 DCO application proposals for crossing HCX 130

3.1.1 The section of hedge within the Order Limits is labelled as HCX 130 in Figure 2 and Figure 3 which show the winter and summer aerial photography respectively.

Figure 2: Winter Aerial Imagery showing section of hedgerow within Order Limits

Figure 3: Summer Aerial Imagery showing section of hedgerow within Order Limits

3.1.2 The area of hedgerow outside of the Registered Park and Garden is made up of native species including field maple, hazel, blackthorn hawthorn, elder, rose and spindle.

3.1.3 The DCO application proposes to remove 10m of the hedgerow within the Order Limits to allow space for pipeline installation. This includes a haul road, installing the pipeline using open cut methodology, and then reinstating the hedgerow with native species.

3.1.4 The application contains a number of commitments that both reduce the temporary installation impacts and, make sure that the works appropriately address the retention and protection of the surrounding hedgerows as set out in Table 1 below.

Table 1: Commitments

Commitment Reference	Measures Description	Where is it secured in the Draft DCO
O1	Commitment to only utilise a 10m width when crossing through boundaries between fields where these include hedgerows, trees or watercourses.	CoCP - Requirement 5
G87	Vegetation clearance, retention, protection and replanting/reinstatement drawings would be produced prior to the construction phase. The contractor(s) would implement these plans including agreed mitigation where practicable.	CoCP - Requirement 5, Hedgerows and trees - Requirement 8 and LEMP - Requirement 12
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).	CEMP - Requirement 6, Hedgerows and trees - Requirement 8 and LEMP - Requirement 12
G91	The contractor(s) would retain vegetation where practicable and in accordance with, as a minimum, the vegetation retention drawings.	CoCP - Requirement 5, Hedgerows and trees - Requirement 8 and LEMP - Requirement 12
G92	A three-year aftercare period would be established for all mitigation planting and reinstatement. [Note that at the draft DCO Issue Specific Hearing on 27 November 2019 the Applicant committed to extend this to a five year period]	CoCP - Requirement 5, Hedgerows and trees - Requirement 8 and LEMP - Requirement 12
G93	Hedgerows, fences and walls would be reinstated to a similar style and quality to those that were removed, with landowner agreement.	CoCP - Requirement 5 and Hedgerows and trees - Requirement 8

4 Options for Retaining the Hedge

4.1.1 In response to the concerns expressed by SDNPA, the project has reviewed historical maps and its position remains that the Registered Park and Garden boundary captures all of the culturally important coppiced hedgerow.

4.1.2 However, the project wishes to respond to the SDNPA's concerns, and recognises that the section of hedgerow to be crossed has a relationship to the setting of the culturally important hedgerow within Chawton Park Registered Park and Garden.

4.1.3 As such, the project has reviewed methods that could be used to retain the hedgerow and allow the pipeline to be installed beneath the hedge. These include the following:

- Option 1 - coppice the hedge down to 150mm above ground level and apply a layer of wood chip to protect and cushion stumps prior to, bridging the retained stumps with boarding and timber to form a haul road and then the pipe pushed under the hedge adjacent to this.
- Option 2 – lay the hedge by partially cutting through the stems (pleaching) and laying them over sideways, and use bog mats/suitable protection to bridge over the laid over hedge to form a haul road and then the pipe pushed under the hedge adjacent to this.

Option 1

4.1.4 Description of the installation and haul road methodology:

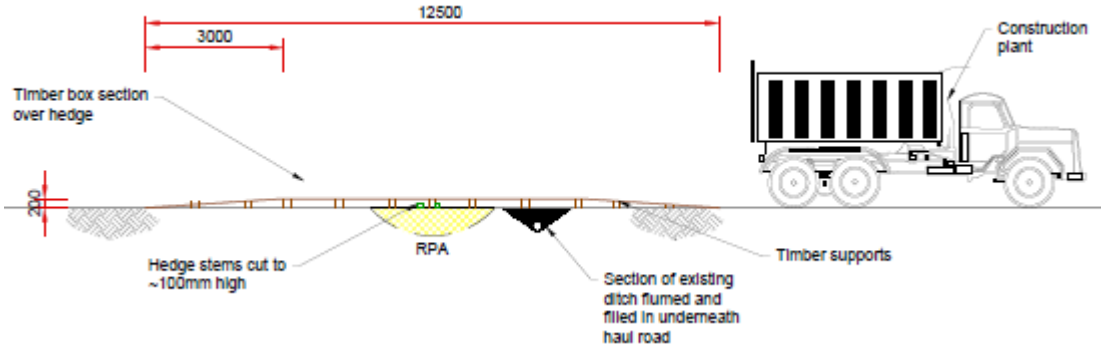
Preparation and haul road installation

1. Across a narrowed width of approximately 5m, the existing hedge will be coppiced down leaving stumps approximately 150mm above existing ground level.

2. A layer of wood chip 100-150mm deep will be applied around the stumps to provide a level of protection and to help retain moisture.

3. A horizontal framework of timber will be installed in between the hedge stumps as shown Figure 3 below.

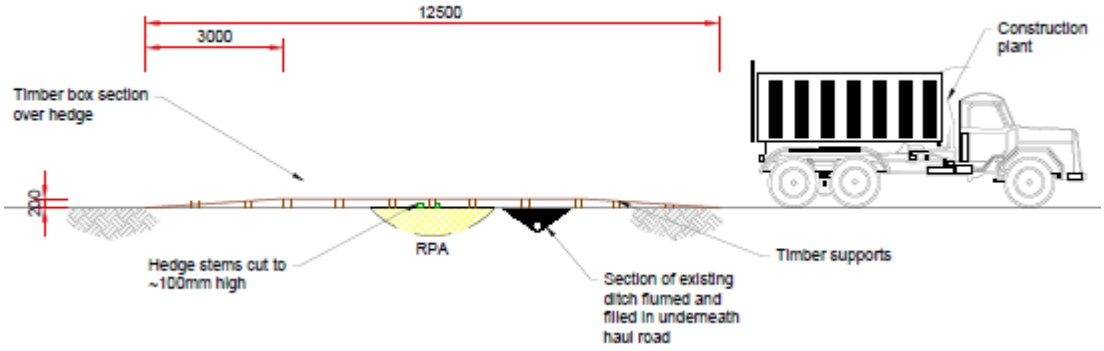
Figure 4: Indicative Section showing temporary timber and boarding to bridge over cut hedge stems



4. Boarding or bog matts will then be installed above the timber. The boarding will be supported by the timbers thereby ensuring that the hedge stumps are not directly trafficked on. Gaps will be left between each board to ensure the ingress of rainwater. This arrangement will be used to enable construction vehicles to cross from one side of the hedge to the other.

5. The Ecological Clerk of Works will ensure that the condition of the coppiced stumps is monitored and appropriate care given to ensure that they remain watered and in suitable condition for the duration that the haul road is in place.

Figure 5: Indicative Section showing temporary timber and boarding to bridge over cut hedge stems

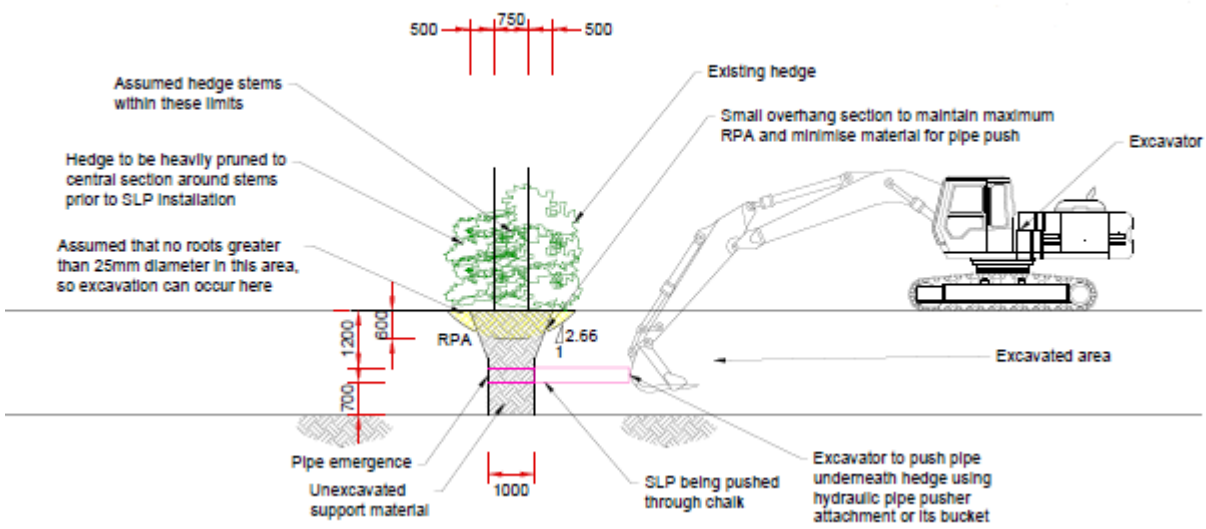


Pipeline installation

6. A trench will be excavated either side of the hedge stopping at a distance of around 0.5m from the hedge stem limits, as it is unlikely that any significant roots (>25mm) critical to the health of the hedge would be found in this area.

7. The excavator bucket will then be used to excavate under the hedge roots as shown in Figure below. This excavation will be done from either side of the hedge to leave circa 1m width of unexcavated material directly under the hedge.

Figure 6: Indicative Section showing installation SLP under hedge



8. A section of pipe will then be lowered into the trench and set to the right level to meet the minimum cover depth for the installed pipeline.

9. Using a hydraulic pipe push attachment on the excavator arm, a length of pipe would be pushed through the unexcavated material directly under the hedge using a hydraulic pipe pusher attachment on an excavator arm or using the bucket of an excavator as shown in Figure .

10. The pipe installed beneath the hedge will be welded to pipe lengths on either side, using the pipe reception trenches for access.

11. The trench under the hedge roots and pipe reception trenches will be filled with free draining gravel around the pipe, with excavated fill material on top to replicate existing drainage to encourage root growth.

Removal of haul road

12. Following completion of works in the area for which the haul road is required to be in operation, the timber bridging will be removed and the undamaged hedge stems left to regrow.

4.1.5 This method would allow the haul route to continue through the hedge without long term damage to the hedge occurring. By pushing the pipe beneath the hedge there would not be a ‘gap’ in the hedge. Regrowth would be uniform across the full width of the reduced hedgerow.

Option 2

4.1.6 Description of the installation and haul road methodology:

1. Across a narrowed width of approximately 5m, the existing hedge will be heavily pruned. The stems will then be professionally laid.

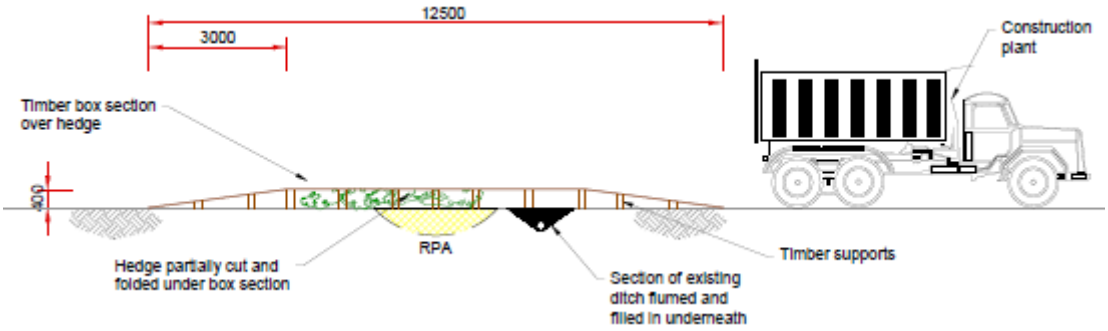
2. A layer of wood chip 100-150mm deep will be applied around the stems to provide a level of protection and to help retain moisture. A horizontal framework of timber will be installed in between the laid over hedge as shown in Figure 6.

3. Steps 3 – 9 from Option 1 above will be followed.

4. The bog mats or timber bridging will be removed and vertical posts installed in between the laid stems.

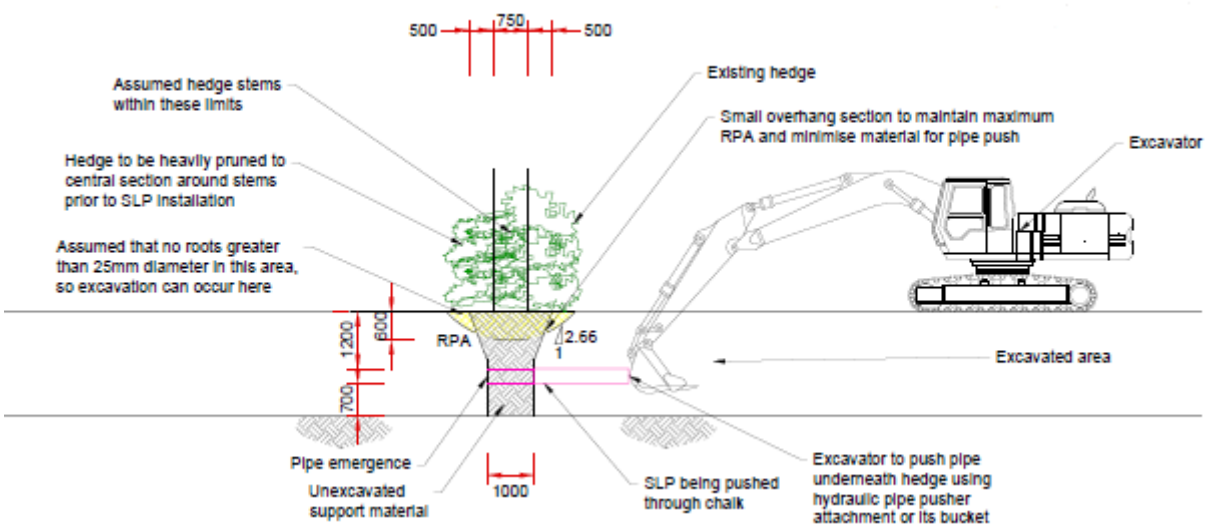
5. The laid stems will be lifted and woven around the vertical posts to provide a traditional laid hedge.

Figure 7: Indicative Section showing temporary timber and boarding to bridge over laid hedge stems



4.1.7 This method would allow the haul route to continue through the hedge without significant damage to the hedge occurring. By pushing the pipe beneath the hedge there would not be a ‘gap’ in the hedge. Regrowth would be uniform and occur quickly due to the hedge stems remaining partially intact throughout the process.

Figure 8: Indicative Section showing installation SLP under hedge



5 Conclusion

5.1.1 The project considers that the most beneficial option to be selected would be Option 2 – lay the hedge over sideways, then use bog mats/suitable protection to bridge over the laid over hedge, then push the pipe under the hedge adjacent to this.

Proposed Use and Location of Environmental Mitigation Areas

Area No	Mitigation Type	Approximate Geographic Location
EM01	Bat Boxes	Wintershill, Bishop's Waltham
EM02	Great Crested Newts	Ashton Lane, Bishop's Waltham
EM03	Bat Boxes	Cross Lane, Bishop's Waltham
EM04	Hedge Infilling	Ashton Lane, Bishop's Waltham
EM05	Bat Boxes	Belmore
EM06	Tree Planting	Stake's Lane
EM07	Bat Boxes	Lower Preshaw Lane
EM08	Hedge Infilling	Sailor's Lane
EM09	Hedge Infilling	Wheely Down Farm Lane
EM10	Tree Planting	Wheely Down Farm Lane
EM11	Bat Boxes	Joan's Acre Wood
EM12	Bat Boxes	Riversdown Road
EM13	Hedge Infilling	Tithelands Lane
EM14	Tree Planting	Uncle Bills
EM15	Hedge Infilling	Clinkley Road, West Tisted
EM16	Hedge Infilling	Clinkley Road, West Tisted
EM17	Tree Planting	Stapley Lane, West Tisted
EM18	Bat Boxes	Soames Lane, Merryfield
EM19	Tree Planting	Smuggler's Lane
EM20	Bat Boxes	Kitwood Lane
EM21	Tree Planting	Hawthorn Lane, Four Marks
EM22	Hedge Infilling	Brightstone Lane
EM23	Bat Boxes	Brightstone Lane
EM24	Hedge Infilling	Brightstone Lane
EM25	Hedge Infilling	Brightstone Lane
EM26	Bat Boxes	Gaston Lane, Upper Farringdon
EM27	Great Crested Newts	Selbourne Road
EM28	Great Crested Newts	Caker Lane
EM29	Bat Boxes	Monk Wood
EM30	Hedge Infilling	Clay's Lane
EM31	Hedge Infilling	Clay's Lane
EM32	Great Crested Newts	West End, Upper Froyle
EM33	Bat Boxes	West End, Upper Froyle
EM34	Great Crested Newts	Unnamed road, Upper Froyle
EM35	Great Crested Newts	Unnamed road, Upper Froyle
EM36	Great Crested Newts	Unnamed road, Upper Froyle
EM37	Great Crested Newts	Gid Lane, Upper Froyle
EM38	Bat Boxes	Dippenhall Road
EM39	Hedge Infilling	Dippenhall Road
EM40	Bat Boxes	Heath Lane, Crondall
EM41	Tree Planting	Redlands Lane, Crondall

Area No	Mitigation Type	Approximate Geographic Location
EM42	Great Crested Newts	Ewshot Hill, A287
EM43	Great Crested Newts	Ewshot Hill, A287
EM44	Habitat Creation	Naishes Lane
EM45	Habitat Creation	Naishes Lane
EM46	Habitat Creation	Naishes Lane
EM47	Habitat Creation	Naishes Lane
EM48	Habitat Creation	Naishes Lane
EM49	Bat Boxes	Naishes Lane
EM50	Bat Boxes	Bourley Road
EM51	Bat Boxes	Aldershot Road
EM52	Habitat Creation	Aldershot Road
EM53	Habitat Creation	Aldershot Road
EM54	Bat Boxes	Cove Road, Farnborough
EM55	Bat Boxes	Frith Hill Road
EM56	Habitat Creation	Red Road, Lightwater
EM57	Habitat Creation	Guildford Road, Lightwater
EM58	Great Crested Newts	A322, Lightwater
EM59	Great Crested Newts	Blackstroud Lane East
EM60	Habitat Creation	Chobham Common
EM61	Habitat Creation	Chobham Common
EM62	Habitat Creation	Chobham Common
EM63	Habitat Creation	Chobham Common
EM64	Habitat Creation	Chobham Common
EM65	Habitat Creation	Chobham Common
EM66	Habitat Creation	Chobham Common
EM67	Bat Boxes	Longcross Road
EM68	Bat Boxes	Accommodation Road
EM69	Great Crested Newts	Longcross Road
EM70	Great Crested Newts	The Broadway, B377
EM71	Great Crested Newts	The Broadway, B377