High Speed 2 - 1MC06 - Stage One C2 - MWCC – North Portal of Chiltern Tunnels to Brackley

Routewide C2 Landscape Design Report

1MC06-CEK-EV-REP-C002-000245

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☐ Other (please specify)	

A High-Speed Design Partnership

ARCADIS COWI

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Document no: 1MC06-CEK-EV-REP-C002-000245

January 2024 Rev C01

Contents

1.0 Introduction

1.1 Executive Summary
1.2 Introduction
1.3 Baseline Landscape Character Data

2.0 Landscape Design Vision

2.1 HS2 Design Vision
2.2 Landscape Vision
2.3 Landscape Design Principles
2.4 C2 Route-wide Outcomes
2.5 Wider Benefits
2.6 HS2 Phase 1 Environmental Statement
2.7 Design Refinement

3.0 Vision to Practice

3.1 Landscape Strategy
3.1.1 Contractual Requirement Technical Standards (CRT)

3.2 Chilterns – Upper Misbourne Valley (South Heath to Wendover)
3.2.1 Local Landscape Character
3.2.2 Landscape Design Approach

3.3 Clay Vales of Aylesbury (Stoke Mandeville, South West Aylesbury, Hartwell House and Thame Valley)
3.3.1 Local Landscape Character
3.3.2 Landscape Design Approach

3.4 Midvale Ridge (Waddesdon and Quainton)
3.4.1 Local Landscape Character
3.4.2 Landscape Design Approach

3.5 Clay Vales of Buckingham (Calvert, Steeple Claydon, Twyford, Padbury Brook and Chetwode)
3.5.1 Local Landscape Character
3.5.2 Landscape Design Approach

3.6 River Great Ouse Claylands (Newton Purcell, Finmere, Mixbury and Westbury)
3.6.1 Local Landscape Character
3.6.2 Landscape Design Approach

3.7 Cotswolds and Whittlebury Ridge (Turweston)
3.7.1 Local Landscape Character
3.7.2 Landscape Design Approach

4.0 C2 Landscape Design Approach

4.1 Chilterns – Upper Misbourne Valley (South Heath to Wendover)
4.1.1 Landscape Planting
4.1.2 Landscape Earthworks
4.1.3 Landscape Response (Structures, Biodiversity, Heritage)

4.2 Clay Vales of Aylesbury (Stoke Mandeville, South West Aylesbury, Hartwell House and Thame Valley)
4.2.1 Landscape Planting
4.2.2 Landscape Earthworks
4.2.3 Landscape Response (Biodiversity, Structures)

4.3 Midvale Ridge (Waddesdon and Quainton)
4.3.1 Landscape Vision
4.3.2 Landscape Design
4.3.3 Landscape Response (Structures, Biodiversity, Heritage)

4.4 Clay Vales of Buckingham (Calvert, Steeple Claydon, Twyford, Padbury Brook and Chetwode)
4.4.1 Calvert Integration Study
4.4.2 Landscape Planting
4.4.3 Landscape Earthworks
4.4.4 Landscape Response (Structures, Biodiversity, Heritage)

4.5 River Great Ouse Claylands (Newton Purcell, Finmere, Mixbury and Westbury)
4.5.1 Landscape Planting
4.5.2 Landscape Earthworks
4.5.3 Landscape Response (Structures, Biodiversity, Heritage)

4.6 Cotswolds and Whittlebury Ridge (Turweston)
4.6.1 Landscape Planting
4.6.2 Landscape Earthworks
4.6.3 Landscape Response (Structures, Biodiversity, Heritage)

5.0 Landscape Maintenance, Management and Monitoring

5.1 Introduction
5.2 Content of the LMMMP
5.2 Reviews

6.0 Appendices

A.1 Landscape Character & Features
A.2 Stakeholders and Design Panel Review
A.3 Typical Landscape Detail Description
A.4 Bibliography



Figure 1.0.1 Oblique view of Thame Valley Viaduct from the north west (120m from Viaduct)

1.0 Introduction

1.0
Introduction

1.1 Executive Summary
1.2 Introduction
1.3 Baseline Landscape Character Data

Executive Summary

1.1

This report sets out the Landscape Design Approach which has been presented to each of the local planning authorities and community representatives during 2019 and 2020 within the C2 area that lies between South Heath in the Chilterns and Brackley at the eastern extent of the Cotswolds. It follows the guidance set out in HS2 document Landscape Design Approach Requirements, Document no. HS2-HS2-EV-STD-000-000041.

This approach is key to understanding the local context and design principles to be followed. This approach has informed both the Schedule 17 design (2019 to 2023) and Detailed Design (2021 to 2024).

This is an updated and revised version of the documents that were submitted in 2019 and 2020. It outlines the baseline landscape character of the HS2 corridor both at the national and local level and which is used to inform the landscape design approach within each of the Local Character Area. This document has been updated in December 2023 to consider the Schedule 17 and Detailed Design work which have been undertaken since April 2020.

The report outlines the main landscape design themes and principles in relation to planting design and species selection, landscape earthworks design, the landscape response to structures, heritage assets and ecology and biodiversity connectivity. The report also sets out the requirements of the Landscape Maintenance, Management and Monitoring Plan with further outline information being included in the written statements and Design and Access Statements for individual Schedule 17 packages.

It is noted that the landscape planting design is submitted for information only at this stage and will be consented as part of the Bringing Into Use process.

Plans, sketches, and photographs are provided in Appendix A of the report which outlines the key baseline landscape characteristics of each Local Character Area. Appendix B outlines the key stakeholders that have been involved in the design development and the Schedule 17 process to-date. This appendix also provides references to the design panel review landscape related comments for each of the HS2 Key Design Elements (KDE) within C2 which were undertaken from 2017 to 2023 and has informed the Detailed Design.

This document should be read in conjunction with the following list of landscape related design and management documents in the table adjacent.

The HS2 Act has provided deemed planning permission for the proposed work, but requests for approval under Schedule 17 are distinct from regular planning applications. Schedule 17 outlines the conditions of the deemed planning permission and the designated lorry routes. It is a process specifically for approving certain aspects of the railway's design and construction. The responsible organisation must seek approval from the appropriate authority for these matters.

The Schedule 17 scheme designs for each package has been taken forward and developed to secure consent. This process also included pre-app meetings and workshops with the council officers as referenced in Appendix A. Prior to the final submission of drawings presentation were made to the Council Approval Committee at Members Information Group (MIG) meetings.

To implement the design at Greatmoor Sidings, and in addition to the Schedule 17 process, the proposals have been taken through Transport Works Order Act consenting process with the local planning authority regarding the release of conditions.

To implement the design, this has also required additional land outside the Limits of Land Available for Use (LLAU) in Buckinghamshire County Council, which is going through the Town and Country Planning Act (TCPA) approval process. The relevant applications are as follows:

- **A41 narrowing TCPA**
- **Edgcote Road TCPA**
- **Padbury Brook TCPA**
- **Putlowes Farm TCPA**
- **Rosehill Farm TCPA**
- **SCL8 (footbridge) TCPA**
- **Small Dean TCPA**

Table 1. Landscape related Design and Management Document

Document Name	MIDP Number	Status / Purpose/ Type
Landscape and Visual Effects Checklist	Various documents	Internal use for design phase only – Environmental Minimum Requirements (EMR) compliance reports
Environmental General Principal Compliance Note	Various documents	Internal use for design and construction phases only
Landscape Specification	1MC06-CEK-EV-REP-C002-000222	Internal use for construction phase only
Landscape Maintenance, Management and Monitoring Plan (LMMMP)	1MC06-CEK-EV-REP-C002-000173	External use for operational phase
Restoration Plans	Various documents	External use



Figure 1.1.1 Key Design Elements in Buckinghamshire (left to right): Small Dean Viaduct; Wendover Dean Viaduct; Thame Valley Viaduct

Introduction

1.2

This report sets out our Landscape Design Approach which was jointly presented to Buckinghamshire County Council and Cherwell District Council in 2019, and follows the guidance set out in HS2 document Landscape Design Approach Requirements, Document no. HS2-HS2-EV-STD-000-000041 for the HS2 route section known as Central 2 (C2), which is located between the Chilterns Tunnel south portal at South Heath in the Chilterns and the River Great Ouse to the west of Brackley located at the eastern extent of the Cotswolds. This approach has informed both the Schedule 17 design (2019 to 2023) and Detailed Design (2021 to 2024)

The structure of this report firstly sets out how the landscape vision for C2 will apply the principles of the three core design principles of People, Place and Time outlined in HS2 Design Vision, Document no. HS2-HS2-DS-STR-000-000005. The report provides a summary of the baseline information which has been informed by reference to HS2 London-West Midlands Environmental Statement (2013), Natural England's National Character Areas (NCA) and to local landscape character studies published by the local authorities for the route area, and by site surveys undertaken during 2017, 2018 and 2019. Maps, figures and photographs for each of the Local Character Areas are provided in Appendix A of the report.

This report sets out the baseline information for the Schedule 17 and Detailed Design work which has been undertaken since 2019. The landscape design approach has been developed in collaboration with the local planning authorities and this includes discussion on matters such as landscape planting and landscape earthworks, biodiversity connectivity, setting to relevant heritage assets and integration of HS2 structures, highways, access, drainage, and security fencing.

A parallel exercise to the Schedule 17 and Detailed Design work has been the preparation of the Calvert Integration Study (see document reference 1MC06-CEK-LP-REP-C002-000003). This document draws upon the committed design and has been produced to identify opportunities which could deliver local community benefits as well as support health and wellbeing.

Appendix B of the report provides a list of dates of the design panel reviews undertaken from 2017 to 2023 for each of the KDE's within C2 and links to their respective Design and Access Statements which provide a summary of the landscape related comments and design response. The comments arising from these reviews have been incorporated into the KDE's Design and Access Statement to support the relevant application.

A requirement of scheme design is the preparation of an outline Landscape Maintenance, Management and Monitoring Plan (LMMMP). The requirements of the plan are set out in HS2 Document no. HS2-HS2-EV-STD-000-000023. A summary of the LMMMP requirements and the approach is set out in Section 4 of this report.

The Schedule 17 and Detailed Design planting plans have been prepared to include works undertaken by Early Works Contractor in relation to advanced planting areas. The Schedule 17 documents and Detailed Design have also been developed in collaboration with ASC ecology team to identify Ecology Site Management Plans (ESMPs).



Figure 1.2.1 Elevational view of Thame Valley Viaduct central spans from west (150m from Viaduct): summer (top), autumn (middle) and winter (bottom).

Introduction

1.2

The design development has been an iterative process which has been informed by the site clearance works, ongoing vegetation clearance review work and archaeological surveys and designed to meet the environmental minimum requirements for heritage, noise, ecology and hydrology.

Baseline Landscape Character Data Table 1 identifies Natural England's National Character Areas (NCA) and the Local Character Areas (LCA) which have been identified in landscape characterisation documents published by the Local Planning Authority (LPA) and which have been referred to in the preparation of this report.

Large tracts of the land within the LLAU have been temporarily acquired for the construction of the project. Post the construction phase this land will be returned to adjacent landowners to be re-used for agricultural purposes. This land is referred to as restored land. Some parts of this land may include project features such as landscape earthworks and planting in the form of reinstated field boundary hedgerows and drainage ditches and which contribute to the wider mitigation of the project.

The design development at Scheme design identified, through value engineering (VE) a number of locations where changes in the track vertical alignment would provide significant cost savings to the project either as part of its construction or for its operational lifetime.

Most of the VE changes resulted in a track uplift of up to 3m, which is the maximum allowed as part of the vertical limits of deviation and as long as the changes do not result in new or worsening of the environmental effects reported in the ES as amended. The landscape and visual effects of these changes and the mitigation measures are an important part of the post scheme design and S17 design development. Undertakings and Assurances (U&As) are part of the project's Environmental Minimum Requirements and are set out in the "HS2 Register of Undertakings and Assurances" published by the Department for Transport. There are a number of U&As which have a direct impact on the landscape design in terms and include information on more detailed design guidance such as in the Chilterns AONB or specific design requirements (U&A 638) such as at key sites along the route i.e., design consideration to further reduce the impacts of the scheme in views from Bacombe and Coombe Hill in the Chilterns AONB (U&A 1070), the setting to Hartwell House and its historic parkland (U&A 1071 - green banks project) and the Waddesdon Estate (U&A 1069).

In addition, U&As may require the incorporation of a new feature i.e., a new underbridge on the Princes Risborough to Aylesbury railway (PRA line) to accommodate a future new road or to change to reduce the footprint of a mitigation landscape earthworks i.e., at SW Aylesbury to accommodate the future urban expansion of Aylesbury or for additional screen planting i.e., Godington (U&A 2757/2758/2759). The design development of the scheme where U&As are required has been taken forward in collaboration with the relevant key stakeholders and their specialist advisors.



Figure 1.2.2 Oblique view of Wendover Viaduct from field west of King's Lane (200m from Viaduct)

Baseline Landscape Character Data 1.3

Table 1 identifies Natural England's NCAs and the LCAs identified in landscape characterisation documents published by the local planning authority which are directly affected by HS2 and are referred to in the preparation of this report. The geographical locations of these NCAs and LCAs and their relationship with each other are shown in AppendixA.

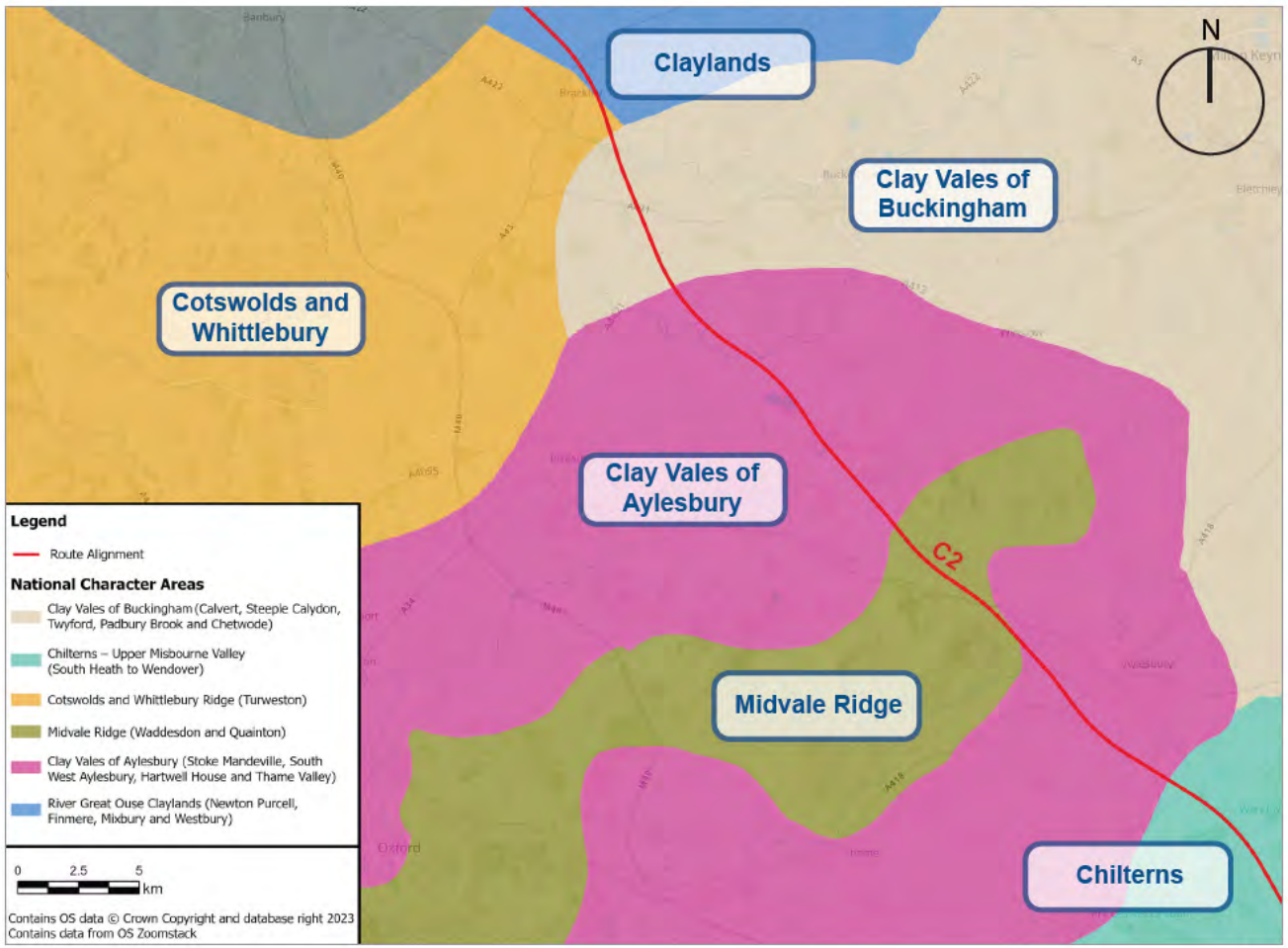


Figure 1.3.1 C2 Landscape Report NCA Boundaries

Table 1. National and Local Character Areas

National Character Area	Local Character Area
NCA 110 Chilterns	Buckinghamshire County Council (formerly Chilterns District Council) - Lee & Buckland Common Undulating Plateau. Buckinghamshire County Council (formerly Aylesbury Vale District Council) - Wendover Gap; - Wendover Foothills (West); and - Risborough Foothills.
NCA 108 Upper Thames Clay Vales	Buckinghamshire County Council (formerly Aylesbury Vale District Council) - Southern Vale; - Haddenham Vale; - Ridge and Hartwell House & Golf Course; - Northern Vale - Westcott Claylands; - Kingswood Wooded Farmland; - Claydon Bowl; - Calvert Clay Pits; - Twyford Vale; and - Preston Bissett Plateau Edge.
NCA 109 Midvale Ridge	Buckinghamshire County Council (formerly Aylesbury Vale District Council) - Northern Vale; - Waddesdon - Eythrope Parkland; and - Westcott Claylands.
NCA 88 Bedfordshire and Cambridgeshire Claylands	Cherwell District Council - Hethe Wooded Estatelands. Buckinghamshire County Council (formerly Aylesbury Vale District Council) - Westbury – Biddlestone Great Ouse Valley.
NCA 107 Cotswolds & NCA 91 Yardley Whittlewood Ridge	Buckinghamshire County Council (formerly Aylesbury Vale District Council) - Oatleys Plateau; and - Westbury – Biddlestone Great Ouse Valley.

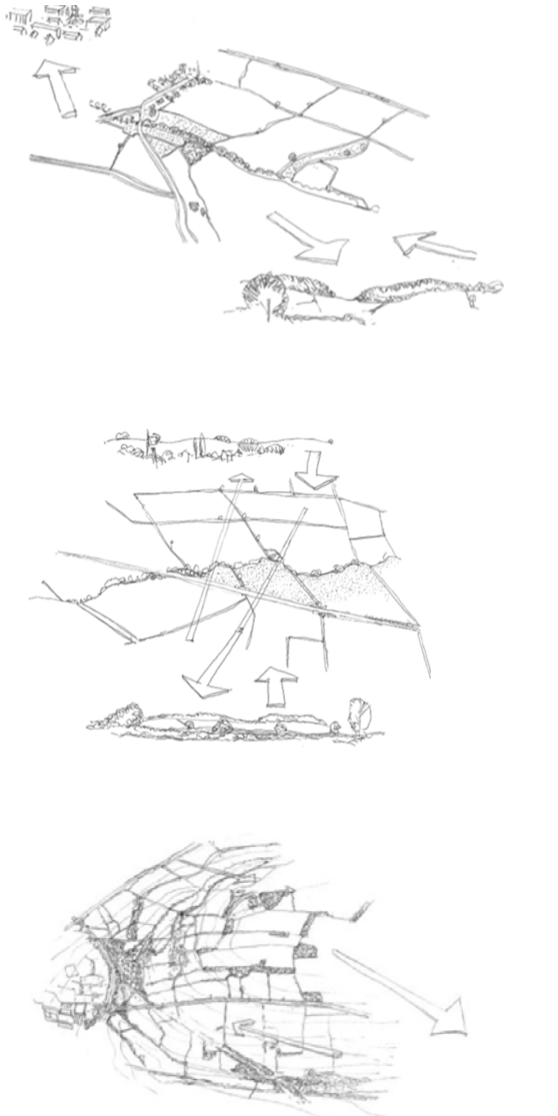


Figure 1.3.2 Response Sketches to Local Character (top, middle, bottom) Southern Vale & Haddenham Vale, Westbury – Biddlesden Great Ouse Valley



Figure 2.0.1 View across balancing pond towards Thame Valley Viaduct (75m from Viaduct)

2.0 Landscape Design Vision

2.0
Landscape Design Vision

2.1 HS2 Design Vision
2.2 Landscape Vision
2.3 Landscape Design Principles
2.4 C2 Route-wide Outcomes
2.5 Wider Benefits
2.6 HS2 Phase 1 Environmental Statement
2.7 Design Refinement

Introduction

This section outlines the approach presented to the local planning authorities to implementing the landscape design vision for the C2 area and how this informs the scheme design submitted as part of the Schedule 17 applications and further Detailed Design.

The adjacent process diagram illustrates the undertaking of the various elements that have informed the Landscape Design Vision.

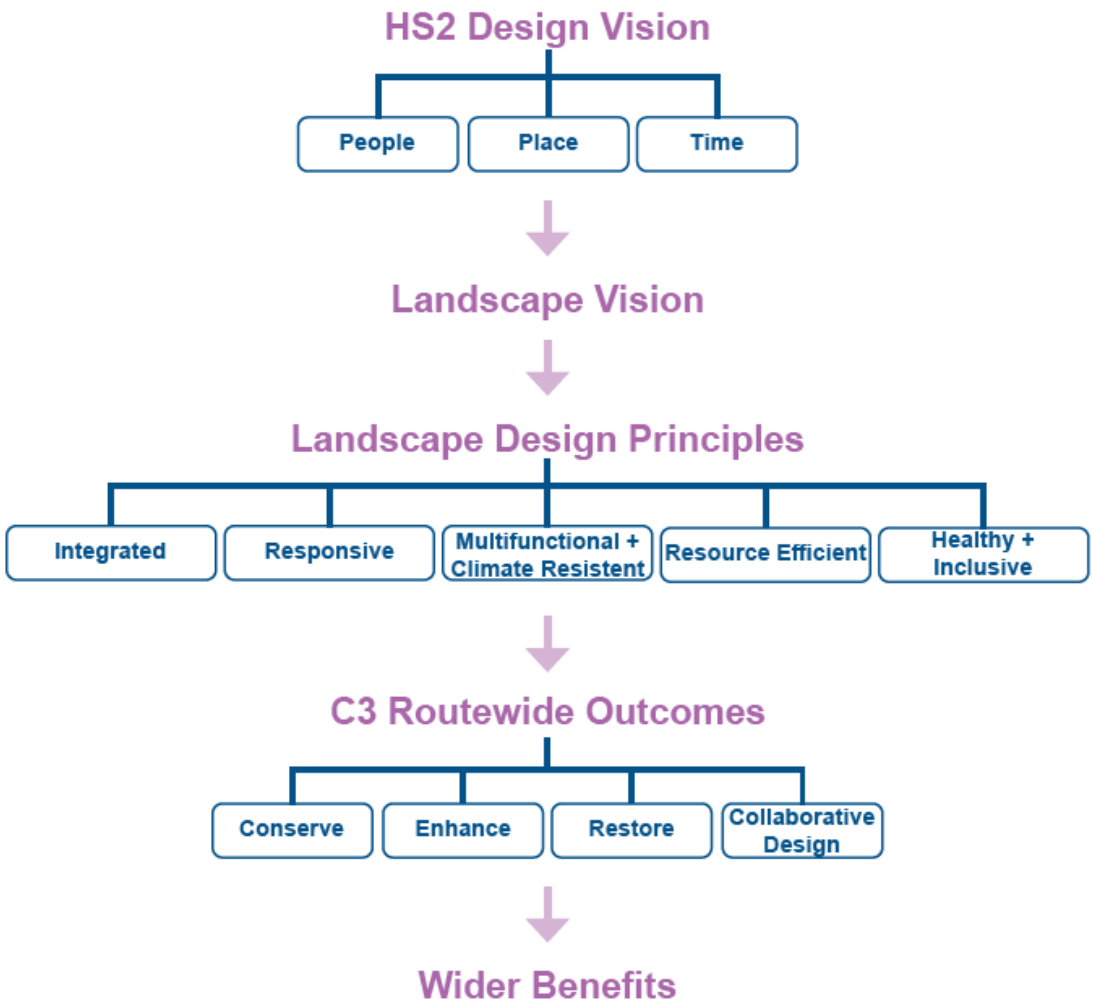


Figure 2.1.1 Landscape Design Vision Process Diagram

HS2 Design Vision

2.1

The landscape vision has taken forward the three core design principles of People, Place and Time as set out in the HS2 Design Vision;

- **People** - to engage with communities and stakeholders and work collaboratively with other project design disciplines

- **Place** - to implement good design which responds to the scale and extent of HS2 infrastructure and its components with the local landscape context along the line of route.

- **Time** - to create a positive lasting legacy and select, where practical to do so, materials which stand the test of time.

The Design Vision Principles

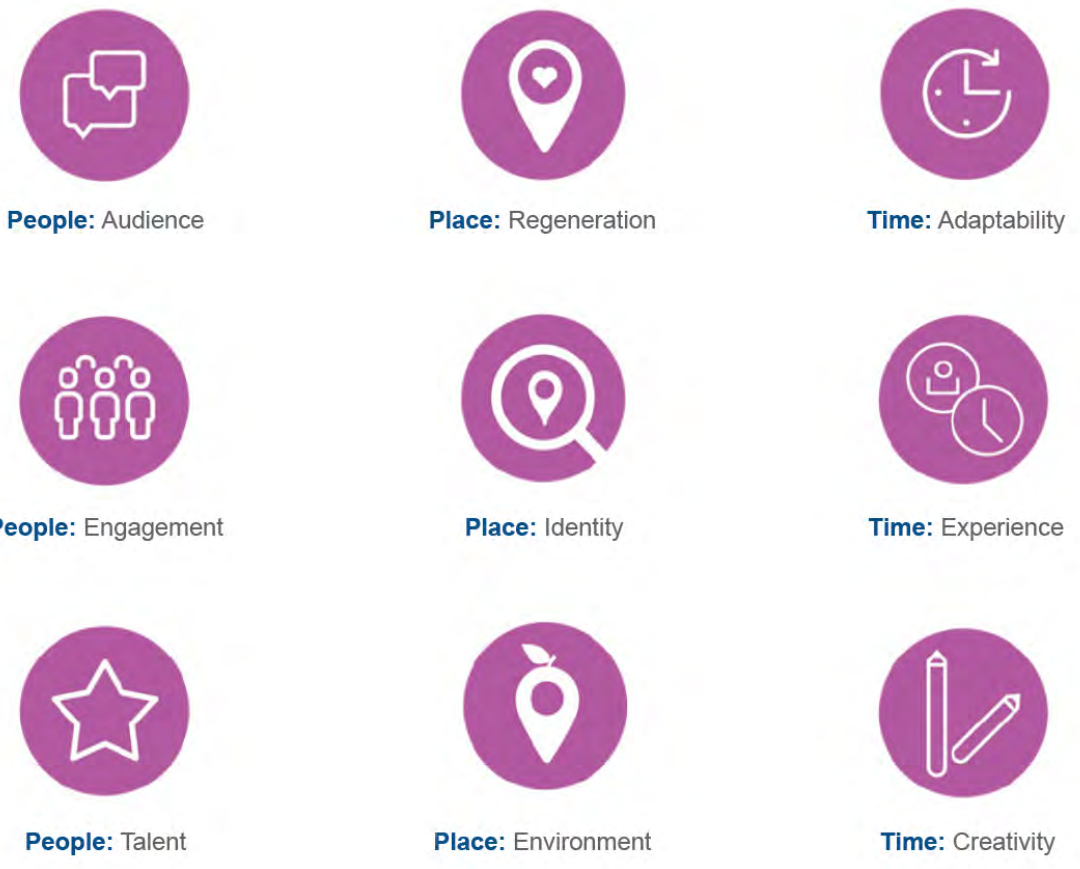


Figure 2.1.2 The Design Vision Principles Symbols

Landscape Vision

2.2



The Landscape Vision as stated in the HS2 Landscape Design Approach is, a regenerative landscape and cityscape that delivers multiple benefits for people, places and the planet to shape a sustainable and resilient future

Landscape Design Principles

2.3

As stated in the HS2 Landscape Design Approach,

1

Integrated

Landscape-led and integrated design that is part of hard working and high performing infrastructure

2

Responsive

Responsive to context, whilst expressing character, quality and a sense of place

3

Multifunctional and climate resilient

Multifunctional and climate resilient, able to adapt to uncertain and unpredictable change over time

4

Resource efficient

Resource efficient, demonstrating environmental responsibility and contributing to the UK's net zero carbon targets by 2050 or sooner

5

Healthy and inclusive

Healthy, inclusive and nature rich, improving quality of life, health and wellbeing of people and their communities



C2 Route-wide Outcomes

2.4

The approach has been developed in two parts. Firstly, there are four common C2 route wide principles which have been adopted and secondly these have been further refined so that the principles respond to the specific requirements of the landscape at the local level. The four common C2 route wide principles are set out adjacent. The location specific principles are set out in Section 3 under each of the LCAs.

Conserve

Through responding to the changing landscape and views along the route and adopt a landscape design approach that creates screening and integration of HS2.

Enhance

The landscape where HS2 is highly visible and adopt a good landscape design approach to create effective integration and screening and provides the opportunity for enhancement of the local clay vale landscape character.

Restore

The landscape where it is in poor landscape condition and through good design bring about positive change and broad environmental benefits.

Collaborative Design

Create a landscape which respects the locally valued distinctiveness of this place, its historic landscape and biodiversity links, and helps set HS2 into the landscape and which fits with the local amenity. Locally, through the implementation of wider good design and negotiation respond to the potential for greater biodiversity links and habitat creation, public access and education.

Right Four common C2 route wide outcomes - Conserve, Enhance, Restore, Collaborative Design

Wider Benefits

2.5

As stated in the HS2 Landscape Design Approach, landscape design provides the opportunity to influence the environment in a positive way. A wide range of benefits can be achieved through a collaborative, interdisciplinary approach, with landscape design as a driving force for the project.

Landscape architects have the ability to deliver outcomes that work for their specific site as well as the wider context. Proposals can contribute to the ambition for a 'Green Corridor'. This is a network of spaces and assets relating to green, blue and grey infrastructure that run along the HS2 route. Some of these benefits will be delivered through the works carried out by HS2 whilst others will be realised through the support of HS2 funds.

Within this report these wider benefits will be highlighted as either primary or secondary by the corresponding symbolism.



Climate change

Creating green and blue infrastructure, enhanced flood resilience and biodiverse habitats encourages climate change adaption by capturing and storing carbon emissions, reducing pollution, managing flood risk and connecting wildlife habitats.



Landscape character

Bringing out the character of the landscape can help people connect to their local environment. Designing thoughtful and interconnected green infrastructure by the principles of conserve, enhance, restore, or transform can promote each area's special qualities.



Ecology and biodiversity

Creating wildlife habitats and ecological networks to help protect, maintain and enhance biodiversity. Ensuring species can move easily through the landscape helps make them less vulnerable to population decline.



Art and culture

Artists in all artforms will be invited to explore and celebrate the natural world along the route. This will create a cultural legacy of new community assets and significant national land art commissions to support community wellbeing and local placemaking.



Water improvement

Improving rivers and other aquatic environments through nature based design and management. These projects improve water quality and aquatic biodiversity, and can help alleviate flooding.



Stronger communities

Acting as custodians by working to maintain or improve facilities. This kind of initiative brings together people from different social groups, creating a sense of unity and social cohesion.

Figure 2.5 Please refer to C2 Figures Register for references.



Food and farming

Careful reinstatement of agricultural land to support farm businesses and productivity. There will be some opportunities for community allotment projects to encourage local sustainable food production.



Socioeconomics, skills, education and employment

Creating high quality open spaces connected to their local communities can increase local property values, provide a range of educational opportunities, support existing and new businesses and create job opportunities.



Access and recreation

Delivering new and improved cycle routes, footpaths and bridleways within a Green Corridor and making these public ways more accessible and inclusive. This promotes healthy exercise, low carbon travel, and connects people to the natural world around them.



Placemaking

Creating quality places where people want to live, work, play and learn. Design that responds to the physical, cultural and social identities that define a place to strengthen the connection between people and the places they share.



Historic environment

Conserving and enhancing the setting and understanding of our heritage. Enjoying these can give people a close connection to their local history and foster a sense of belonging.



Public realm

Designing, creating and managing the public realm which serves stations can create a sense of public pride alongside delivering vibrant spaces and commercial opportunities to support local business and enterprise.



Regeneration

Restoring and regenerating the environment and encouraging long-term sustainability and resilience. Landscape provides a positive context for regeneration opportunities.



Health and wellbeing

Providing more and higher quality green space. Quality outdoor space is good for physical and mental health and can increase life expectancy and decrease health inequality.



Public space

Creating, conserving or improving parks, gardens, playing fields and other public open spaces in towns and cities.

HS2 Phase 1 Environmental Statement

The key aims of the Act for Phase One of HS2 is

- To design the scheme such that significant environmental effects are eliminated, controlled or reduced where reasonably practicable.
- To prevent environmental risks and avoid or control the extent of environmental damage by developing mitigation measures to an appropriate standard and monitoring and enforcing them effectively; and
- To address sustainability principles in on-going design development, taking opportunities for environmental enhancement and compensation where practicable and reasonable.

The Environmental Statement (ES) and its amendments identify the effects of the scheme on the environment, and in relation to landscape its effects on the local character and on visual amenity. The ES in carrying out the assessment of effects has also considered measures to reduce the effects through mitigation measures. Such measure includes “false cuttings” i.e., new landscape earthworks which modify the local landform to screen or integrate the scheme, new planting whether it be screen woodland, or reinstating landscape features lost to the scheme during construction such as field boundary hedgerows or riparian vegetation associated with a watercourse.

A key part of the landscape design approach is to understand the function of each mitigation measure and to develop a design that incorporates them in a seamless way with the local context as well as achieving their objectives within the timescales stated in the ES.

It is therefore a requirement of the design that the landscape and visual effects reported in the ES as amended will not result in any worsening or any new significant adverse effects arising from the scheme.

The design development and any changes to the design since the published ES is therefore managed through a certification process at key stages in the design. For landscape and visual amenity this is covered by the landscape and visual effects checklist process. The checklist follows three simple stages:

- Stage 1 – Screening for material changes: a check to understand whether the changes proposed would alter anything considered in the assessment of landscape and visual effects.
- Stage 2 – Scoping the landscape and visual assessment: an analysis of the material changes identified in Stage 1 to understand whether they have the potential to generate new significant landscape and visual effects.
- Stage 3 – Assessment: an assessment of the changes should Stage 2 of the compliance check highlight the potential for new significant effects.

The following theoretical visibility plan and photomontages demonstrate key actions of managing the mitigation HS2 taken up in the ES for the Wendover Viaduct.

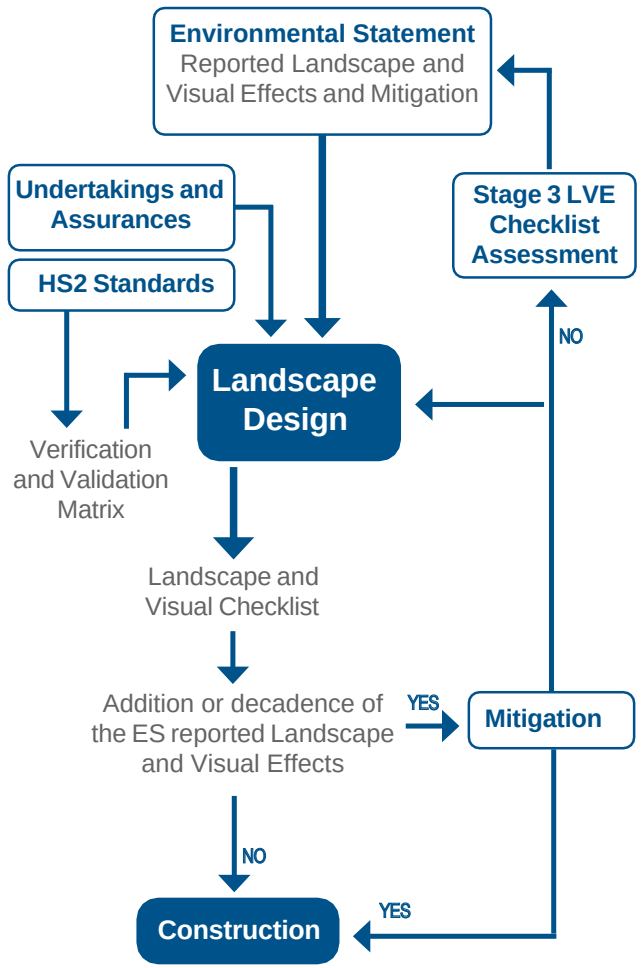


Figure 2.6.1 ES Mitigation Checklist Process Diagram

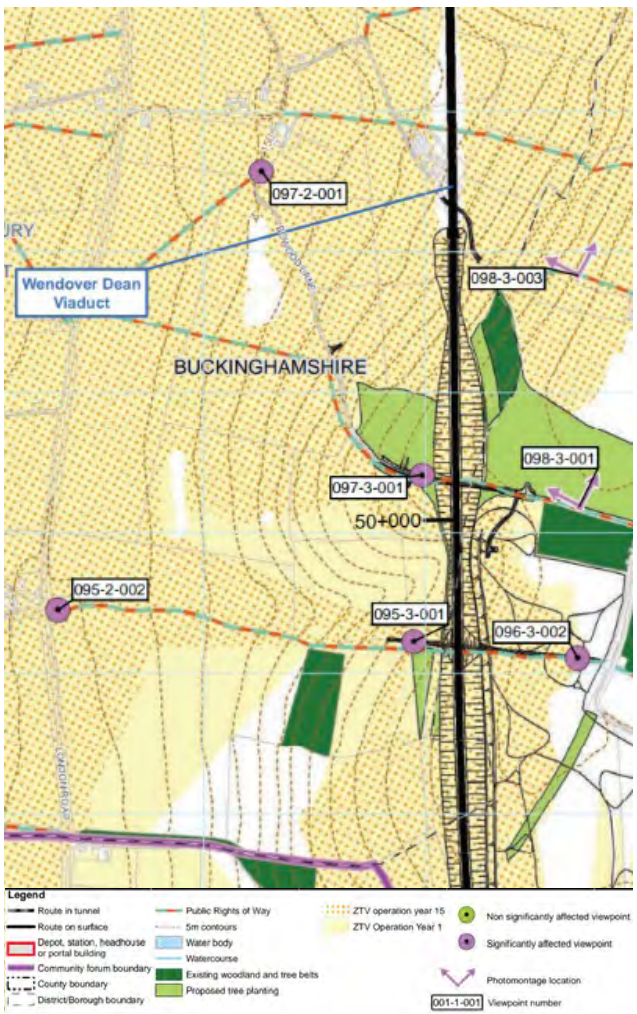


Figure 2.6.2 ES Operational Phase Zone of Theoretical Visibility Plan - Wendover Viaduct



Figure 2.6.3 ES Verifiable Photomontage - baseline (2013) Wendover Viaduct



Figure 2.6.4 ES Verifiable Photomontage - Operation Year 1 (2026) Wendover Viaduct

Design Refinement

2.7

Design development is a key component of this project from Scheme design, through detail design and the consenting process. It is important that the landscape design approach and the need for design to reflect local context is adopted at each stage of the process. The approach therefore has to be robust but to a certain degree to be flexible in order to respond to design changes and to ensure that the scheme does not result in new or worsening of the landscape effects as reported in the ES as amended.

A new feature of the scheme includes the Global Systems for Mobile Communications – Railway (GSM-R) compounds and access which are required route-wide. Their locations are fixed for operational requirements and consequently their footprint impacts on proposed landscape mitigation measures. Each site has been reviewed to consider appropriate modification to the mitigation measures in order to avoid any new, different or worsening of the landscape of the visual effects reported in the Environmental Statement (ES) as amended.

Noise barriers have been modified and at some locations have been increased in height or have become more visible due for example to the implementation of the scheme design VE to change the vertical alignment of the track. At other locations noise barriers have been removed or their position changed from being at cutting crest to being within the cutting. In such cases the impacts of the changes have been considered and where appropriate the landscape design approach has considered new mitigation measures.

The appearance of overbridges has been enhanced through a cohesive architectural design approach throughout the route. In some instances, this has resulted in a change from a single span structure set within a cutting or false cutting as assessed in the ES and amended to a three-span structure. Other changes or modification to the overbridges is a change in the parapet height from the ES assessed 1800mm height over the railway tracks and 1500mm elsewhere to provide a 2015mm height parapet across the full length of the structure. The landscape design for each structure has been developed in collaboration with the bridge architect and the highway engineers to achieve an appropriate design at each location. This has been achieved through consideration of boundary treatments to avoid duplication and to ensure boundary, security fences and vehicle restraint systems (VRS) seamlessly connect with the bridge parapets.

A further development for overbridges has been the introduction of green verges on a number of the overbridges within Buckinghamshire. The intention of the grass verge is to enhance the appearance of the overbridge for its users by reflecting the local rural context within which they sit. The grass verge reduces the presence of the hard verge surface, helping to soften the appearance of the structure and potentially provide benefit for biodiversity connectivity. A detail has been agreed with Buckinghamshire Council and is presently undergoing testing.



Figure 2.7.1: View of the Wendover Dean Viaduct South Abutment from east (240m from Viaduct).



Figure 3.0.1 Oblique view of Wendover Viaduct looking across the 'bowl' of the side valley.

3.0 Vision to Practice

3.0
Vision to Practice

3.1 Landscape Strategy
3.1.1 Contractual Requirement Technical Standards (CRT)

3.2 Chilterns – Upper Misbourne Valley (South Heath to Wendover)
3.2.1 Local Landscape Character
3.2.2 Landscape Design Approach

3.3 Clay Vales of Aylesbury (Stoke Mandeville, South West Aylesbury, Hartwell House and Thame Valley)
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Landscape Strategy

3.1

The landscape within the C2 area is varied and has been subdivided into six nationally distinct areas, based on Natural England's National Character Areas. In

the south is the nationally important and designated landscape of the North Chilterns chalk downland. To the north are the low-lying Clay Vales of Aylesbury and Buckingham which are separated by the Midvale Ridge of Aylesbury, which is defined by a band of east west running low sandstone hills with far reaching views out across the vale landscapes to the north and south.

The north end of C2 within the environs of Brackley has a more complex transitional landscape where the eastern extent of the Cotswolds limestone landscape merges with the western extents of the Bedfordshire and Cambridgeshire Claylands and the Whittlewood Ridge limestone plateau. The main component of this transitional landscape is the River Great Ouse valley. Further description of the National and Local landscape Character Areas within C2 are provided in Appendix

Table 2. HS2 Landscape related design documents and standards

Document Reference	Title
HS2-HS2-AR-GDE-000-000015	HS2 Art Approach
HS2-HS2-CV-STD-000-000001	HS2 Design Vision
HS2-HS2-EV-STR-000-000010	HS2 Landscape Design Approach
HS2-HS2-CV-SPE-000-023000	Notes for Guidance on the Specification for Civil Engineering Works - Series NG 3000: Landscape and Ecology
HS2-HS2-CB-SPE-000-013000	Specification for Civil Engineering Works – Series 3000: Landscape & Ecology
HS2-HS2-CB-STD-000-000001	Technical Standard – Spatial Arrangement
HS2-HS2-EV-STR-000-000005	Plant Procurement Strategy
HS2-HS2-EV-STR-000-000006	Meadow and Wetland Plant Procurement Strategy
HS2-HS2-EV-STD-000-000005	Technical Standard – Lineside Vegetation
HS2-HS2-EV-STD-000-000008	Technical Standard – Soiling Handling for Land Restoration
HS2-HS2-EV-STD-000-000017	Technical Standard - Ecology
HS2-HS2-EV-STD-000-000018	Technical Standard – Plant Procurement Specification
HS2-HS2-EV-STD-000-000019	Technical Standard – Grassland Procurement Specification
HS2-HS2-EV-STD-000-000021	Technical Standard – Landscape Earthworks Design
HS2-HS2-EV-STD-000-000023	Technical Standard – Landscape Maintenance, Management and Monitoring Plan
HS2-HS2-EV-STD-000-000041	Technical Standard – Landscape Design Approach Requirements



Figure 3.1.1 View Wendover Viaduct from field to east of Bowood Lane (190m from Wendover Viaduct)

Landscape Strategy

3.1

3.1.1 Contractual Requirement Technical Standards (CRT)

Landscape Design Approach – Requirements (Document no.: HS2-HS2-EV-STD-000-000041).

This report provides a summary of the actions and requirements adopted by the EKFB / ASC landscape design for the C2 area which cover the four EKFB company sections referred to as AA (South Heath to Stoke Mandeville), NCA (SW Aylesbury to Grendon Underwood), CA (Calvert) and T2G (Twyford to Greatworth).

Public Open Space, Recreation and Play Areas (Document no.: HS2-HS2-EV-STD-000-000024).

The landscape design for the C2 area does not provide for any formal public open space, play areas, recreational facilities or formal recreation as described the glossary for the Standard. The focus of the landscape design within C2 is on informal recreation in the form of highway designs for rural Public Rights of Way, Restricted By ways and Bridleways. In designing these routes and associated verges and boundary treatments the design has considered the local context.

Of note is the design of a bespoke artist designed public art seat near to SCL/8 footbridge over the East West Railway, west of Addison Road overbridge within Company Section CA. The seat will be positioned on the footpath network within a new landform on the north side of the bridge. The seat will be constructed from timber felled nearby as part of the scheme construction.

Public Realm Design (Document no.: HS2-HS2-EV-STD-000-000042).

The landscape design for the C2 area does not involve the design of formal spaces associated with the proposed HS2 stations and interfaces with adjacent highways. Although public realm design is relatively limited within C2 there are several proposed features that could be described as public realm. These are the viewing platform at the Quainton Railway Centre within Company Section NCA, and the underpass at Stoke Mandeville (Risborough Road) within Company Section AA.

The treatment of Risborough Road underpass follows a simple design approach of a concrete structure providing pedestrian and cyclist provision and which is accessed by a straight route from the stopped-up carriageway on either side. Elsewhere within C2 the public realm is limited to rural highway designs.

It is noted that the Calvert IMD has a formal external design associated with the main building and which has been designed by others under a separate contract and therefore excluded from this report.

Process for determining appropriate mitigation and/ or 'reasonable adjustments' for construction related impacts on people with protected characteristics (Document no.: HS2-HS2-EV-POL-000-000022).

The Equality Act lists protected characteristics – groups of people – who should be free from less favourable treatment. The highway design approach for the scheme provides reasonable access for all footpaths, cycleways, bridleways and restricted by ways. The landscape design in collaboration with the highway designers has looked at how best these features can be integrated into the landscape without compromising the need for reasonable access. This reasonable access requirement has been adopted for all such locations which are directly impacted by the scheme within the limits of land available for use. However, beyond these limits the paths revert to their existing situation.



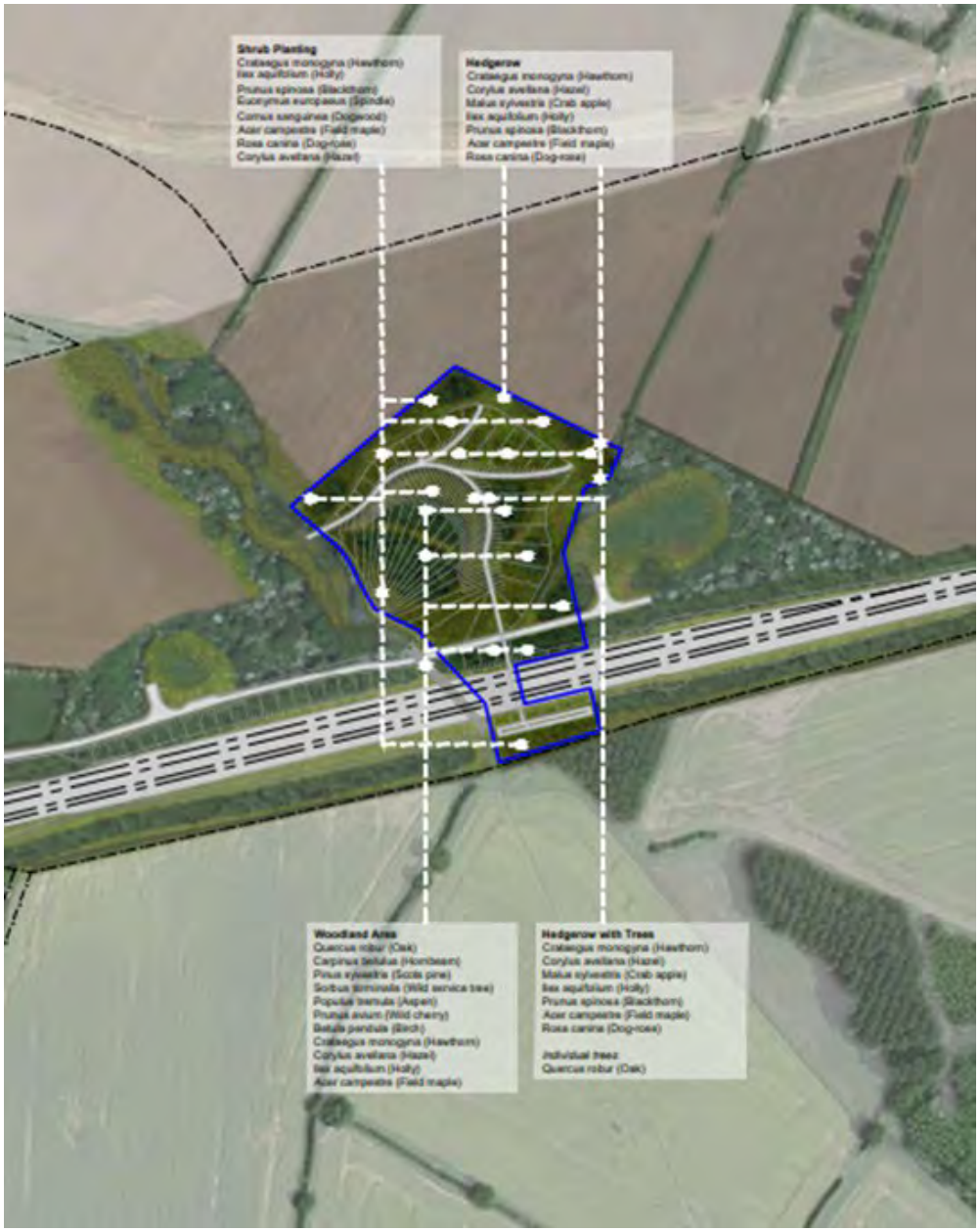


Figure 3.1.2 Plan area of landform north of SCL/8, Landscape Planting context north of SCL/8

Chilterns – Upper Misbourne Valley (South Heath to Wendover)

3.2

3.2 Local Landscape Character

The majority of the landscape within the Chilterns NCA falls within a designated Area of Outstanding Natural Beauty (AONB). This is a diverse chalk downland landscape with a strong sense of place and community and comprises the Lee and Buckland Common Farmland Undulating Valley Slopes (upper slopes & plateau); Wendover Gap LCA (chalk valley), Chiltern Scarp - Wendover West LCA and Chiltern

Scarp -Coombe Hill LCA (chalk escarpment); Wendover Foothills (LCA) and Risborough Foothills LCA (chalk foothills) and Wendover LCA (spring line settlement) (See Appendix A).

The most notable feature of this landscape is the extensively wooded north-west facing escarpment and associated broad sweeping views over the adjacent Aylesbury Vale such as from the Monument on National Trust land at Coombe Hill (260m AOD) and from the Ridgeway national trial at Bacombe Hill.

Typically, the landscape comprises a patchwork of mixed agriculture with woodland, set within hedged boundaries. Arable farming is concentrated on deep, well drained soils of the Upper Misbourne valley, a typical chalk downland dry valley, and along the scarp foot and foothills in the north. Wendover, an historic spring line nucleated settlement, featuring historic buildings, and dating back to medieval times, sits in a natural break or gap in the scarp at the head of the Upper Misbourne valley, which provides an important north south road link (A413) and the Chilterns Railway London to Aylesbury line.

There are extensive Public Rights of Way (PRoW) which traverse this area; and include the national Ridgeway path and Icknield Way Trail.

Other local paths include Chiltern Way and Aylesbury Ring. Above the valley floors, undulating terrain and extensive clay-with-flint soils give rise to a diversity of land management practices including mixed farming, woodland, including blocks of ancient woodland at Jenkins Wood and Jones Hill Wood and pockets of common land. Settlement on the plateau is characterised by dispersed farmsteads and villages, linked by historic, small-scale routes such as Kings Lane and includes sunken lanes such as Leather Lane and Bowood Lane.

The Bronze Age is represented by Grim's Ditch, an ancient earth boundary which, although is located on private land is clearly defined in the landscape by a line of mature trees visible in northerly views from Leather Lane.



Figure 3.2.1 National Landscape Character Map - South Heath to Wendover



Figure 3.2.2 Local Landscape Character Map - South Heath to Wendover

LEGEND

- HS2 Route
- Existing Railway
- Main Road

National Character Areas:

- Chilterns

Local Character Areas:

- Lee and Buckland Common
- Misbourne Upper Chalk River Valley
- Wendover Gap
- Wendover Settlement
- Chiltern Scarp - Wendover West
- Chiltern Scarp - Coombe Hill
- Wendover Foothills
- Risborough Foothills

Landscape Features:

- Area of Natural Beauty (AONB)
- Ancient Woodland
- Sites of Special Scientific Interest (SSSI)
- Historical Parks
- Conservation Area
- Recreational Routes



Figure 3.2.3 Landscape Features Map - South Heath to Wendover

Chilterns – Upper Misbourne Valley (South Heath to Wendover)

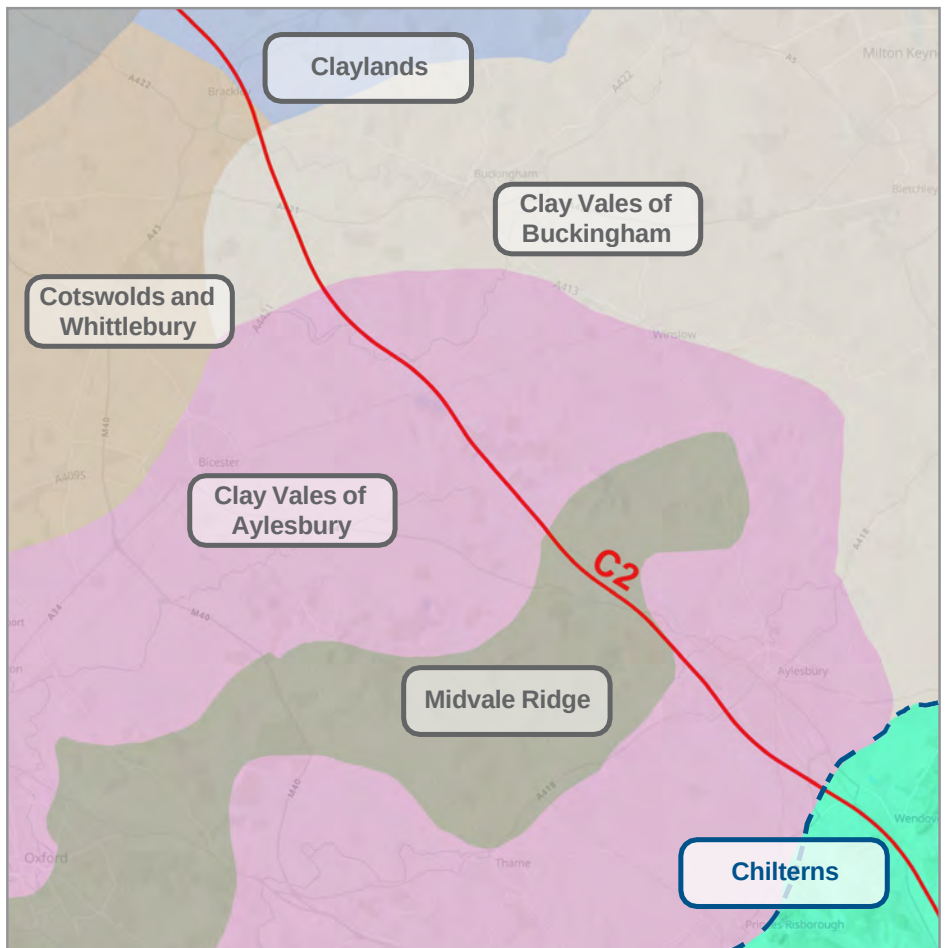
3.2

HS2 Route

In the south part of this area, HS2 traverses the west edge of the undulating, mostly in deep cutting (South Heath cutting) and gently rolling ridgeline at the west edge of higher ground within the Lee & Buckland Common Farmland LCA & Lee Undulating Valley Slopes LCA, approximately at the interface with the upper slopes of the Wendover Gap LCA to the west. HS2 then emerges into the Upper Misbourne valley, crossing the Wendover Gap LCA on a series of structures, shallow cuttings and embankments.

The north end of this LCA has a strong visual relationship with the higher ground within the Chiltern Scarp (Wendover West) LCA. To the west of the settlement of Wendover, HS2 passes through the undulating and lower ground of the Wendover Foothills LCA and Risborough Foothills LCA in Green Tunnel and cutting. The latter two LCAs have a strong visual relationship with higher ground of the Chiltern Scarp (Coombe Hill) LCA.

This area is covered by the following five Schedule 17 application areas, Chilterns P1 South Heath, AVDC P1 Bowood Lane area, AVDC P2 Wendover Dean, AVDC P3 Small Dean and AVDC P4 Nash Lee and one TCPA application for highway and underbridge changes at Small Dean.



KEY PLAN





Figure 3.2.4 View from Small Dean Lane to north abutment (top) View of Small Dean Viaduct from the north on the



Figure 3.2.5 Close view of the Wendover Viaduct central spans over Wendover Gap (60m from Viaduct).

Chilterns – Upper Misbourne Valley (South Heath to Wendover)

3.2.2 Landscape Design Approach

The landscape design approach for the Chilterns NCA is aimed at conserving the high value, nationally important sensitive chalk downland landscape to achieve the HS2 landscape design vision. The landscape design principles are focused on screening and integration of HS2 and respond to the area's distinctive landscape character, sense of place, tranquility, historic environment and biodiversity. The landscape design in the Chilterns NCA is primarily informed by the Chilterns AONB Forum Group Detailed Design Principles document, and the National Trust regarding the view from their property at Coombe Hill.

The landscape planting approach for the Chilterns NCA reflects the varying nature of the native species vegetation pattern within the LCAs and is designed to reflect the local context and existing vegetation that will enhance and reinforce the green infrastructure setting of Community Forum Areas (CFA) 9 and 10 (see Appendix C for information on Landscape Detail Descriptions and drawing references). The typical species mix selection for this area has been subject to further discussion with the local planning authority (BCC) as part of the Schedule 17 and Bringing Into Use processes and has informed the species choices at Detailed Design to protect, maintain and enhance the biodiversity of the area whilst enabling climate resilience by capturing and storing carbon emissions and reducing pollution. There have also been discussions held with the Chilterns Conservation Group in regard to plant species and grass seed mixes.



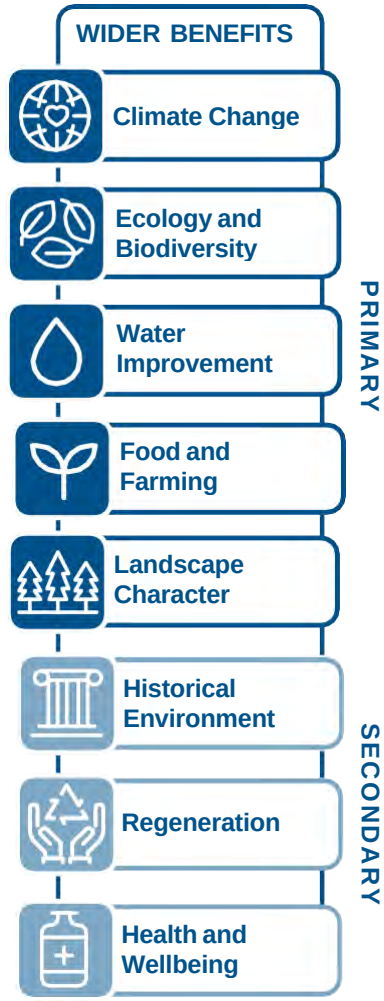
Figure 3.2.6 Ariel view of Small Dean Viaduct, A413 and associate

The landscape earthworks approach for the Chilterns NCA reflects the varying nature of the topography within the LCAs and where possible the earthworks design encourages careful reinstatement of land for farming purposes that will contribute towards local sustainable food production and productivity. This has been partly informed by comments from the respective Design Panel presentations for the KDEs in the area and in discussion with the local planning authority as part of the Schedule 17 process and at Detailed Design. U&A 639 is an important EMR in that it requires the design development to ensure any earthwork created in the Chilterns AONB is sensitively integrated into its surroundings by respecting natural contours and existing landscape features.

The three KDEs within the Chilterns AONB are the Wendover viaduct, Small Dean viaduct and Wendover green tunnel. The landscape design for these elements demonstrates collaborative design principles to conserve and enhance the setting and has been informed by comments from the respective Design Panel presentations and discussions with the local authorities as part of the Schedule 17 process and at Detailed Design. The existing landscape also contains a number of scattered historic features which include ancient sunken lanes (Holloways) and an ancient earthwork which are conserved to give people a close connection to their local history.

The landscape design seeks to reinforce and transform green infrastructure corridors along the route through a combination of woodland and linear tree belt planting, field boundary, lane side and Holloway hedgerows and wildflower grassland. These landscape elements will help to create wildlife habitats and ecological network that provide biodiversity connectivity across and along HS2 by linking in with the engineering assets at the green tunnel, viaducts, overbridges, underbridges and the water management features such as filtration ponds. The filtration ponds are designed and integrated within the landscape design for nature based design and management to alleviate flooding and improve water quality in the longer term.

The landscape design approach supports the Chilterns NCA's chalk downland landscape, adding to the wooded escarpment and sweeping views, providing a visually appealing and calming environment. It complements the Public Rights of Way, Ancient woodlands and common land contributing to not only biodiversity and nature-rich experiences, but also outdoor activities and physical exercise, positively impacting mental health and wellbeing. Overall, the landscape design approach for the Chilterns NCA offers a combination of natural beauty, community, and heritage that promotes well-being.



Clay Vales of Aylesbury (Stoke Mandeville, South West Aylesbury, Hartwell House and Thame Valley) 3.3

3.3.1 Local Landscape Character

To the north of the Chilterns NCA is the low-lying open Clay Vales NCA, which provides the setting to the nationally important Chilterns AONB to the south. At the local level the clay vale landscape type is divided into the north and south vale, and which are separated by a differing narrow belt of low hills and ridges landscape type which lies to the west of Aylesbury and defined by the A418 Oxford Road. The clay vale landscape type comprises the Southern Vale LCA and Haddenham Vale LCA to the south west and west of Aylesbury, respectively. The Northern Vale LCA lies to the north west. The low hills and ridges landscape type comprises the Hartwell House and Golf Course LCA, which encompasses the house's former historic parkland. The remainder of this area is occupied by the historic settlement of Aylesbury and the modern satellite settlement of Berryfields.

This is a settled typically flat landscape which comprises, in the south, a narrow, transitional fertile landscape which historically was associated with cherry orchards of black plum or damson and jam making. Northwards the clay vale is defined by a series of low- lying floodplains which drain north to the River Thame.

Within the lower lying areas, the wet ground conditions and heavy clay soils discourage cultivation and grazed pasture dominate. The watercourses are typically fringed with willow and black poplar. On the superficial deposits of alluvium and terraced gravels, which create a gently undulating topography, arable farmland is more common.

Fields are typically large and regular shaped and delineated by hedgerows. There is little woodland cover within this landscape, with trees tending to appear within clumps of riparian vegetation and other vegetation associated with farmsteads and field ponds.

The settlement of Aylesbury and Berryfields on either side of the broad, open shallow valley of the River Thame form a notable developed backdrop to rural views within the area. Other smaller settlements within this area include Stoke Mandeville and Stone. The Chalk scarp of the Chilterns is prominent in many views out of the area to the south. There is a good network of local footpaths and four main local recreational routes which cross this landscape which are the Round Aylesbury Walk, Thame Valley Walk, Midshires Way and North Buckinghamshire Way. The National Trust's Grade 1 listed Hartwell House and its Grade II* listed historic parkland is an important heritage asset located north of the A418 between the rural settlement of Stone and the western urban edge of Aylesbury.

The Roman Road of Akeman Street traverses the north part of this area. The A41 is the main transport corridor which crosses the north part of this area between Aylesbury and the rural settlement of Waddesdon.

During the design development proposals have come forward for new urban development adjacent to HS2 on land between it and the south west edge of Aylesbury (Southcourt), which extends north from the A4010 bypass / Princess Risborough to Aylesbury Railway (PRA line) to the A418 and parkland of Hartwell House.

In addition, there is a new solar farm in the area of land to the north west quadrant of the HS2 / PRA line overbridge. The baseline affecting the Haddenham Vale LCA will change as a result of this new development since the publication of the HS2 Environmental Statement. Further discussion on this is provided in the landscape design section below.

This area is covered by the following five Schedule 17 application areas, AVDC P5 Stoke Mandeville, AVDC P6a A418, AVDC P6b SW Aylesbury, AVDC P7 Hartwell House and AVDC P8 Thame Valley.



Figure 3.3.1 National Landscape Character Map - Clay Vales of Aylesbury



Figure 3.3.2 Local Landscape Character Map - Clay Vales of Aylesbury



Figure 3.3.3 Landscape Features Map - Clay Vales of Aylesbury

LEGEND

- HS2 Route
- Existing Railway
- Main Road

National Character Areas:

- Chilterns
- Upper Thames Clay Vales

Local Character Areas:

- Stoke Mandeville Vale
- Longwick Vale
- Haddenham Vale
- Aylesbury Settlement
- Hartwell House and Golf Course
- Northen Vale

Landscape Features:

- Sites of Special Scientific Interest (SSSI)
- Historical Parks
- Scheduled Monuments
- Conservation Area
- Recreational Routes

Clay Vales of Aylesbury (Stoke Mandeville, South West Aylesbury, Hartwell House and Thame Valley) 3.3

HS2 Route

HS2 traverses the wet, low lying and almost flat landscape of the Clay Vales NCA in a series of shallow cuttings and low embankments. The south part of the clay vale landscape within Southam Vale LCA and Haddenham Vale LCA, has a strong association with the scarp landscape of the Chilterns. Within the former LCA, the A4010 is realigned to bypass the settlement of Stoke Mandeville to its west and north side. The vale landscape north of Stoke Mandeville is heavily influenced by the south west urban edge of Aylesbury.

This landscape is expected to undergo major change as a result of Aylesbury's proposed south western urban expansion between HS2 and the present urban edge and the construction of the A4010 bypass, which forms part of the scheme. North of the A418, the scheme cuts the more gently rolling and well treed landscape defined and by the historic parkland landscape of Hartwell House (Hartwell House & Golf Course LCA). HS2 severs the eastern part of this LCA, which is presently occupied by a golf course from the house. Further northwards the scheme crosses the broad, open and shallow floodplain of the River Thame on a long, low viaduct within the south part of the Marston Vale LCA. This LCA has a strong relationship with the low wooded hills of the Waddesdon - Eythrope Parkland landscape within the Midvale Ridge NCA to the west and north west.

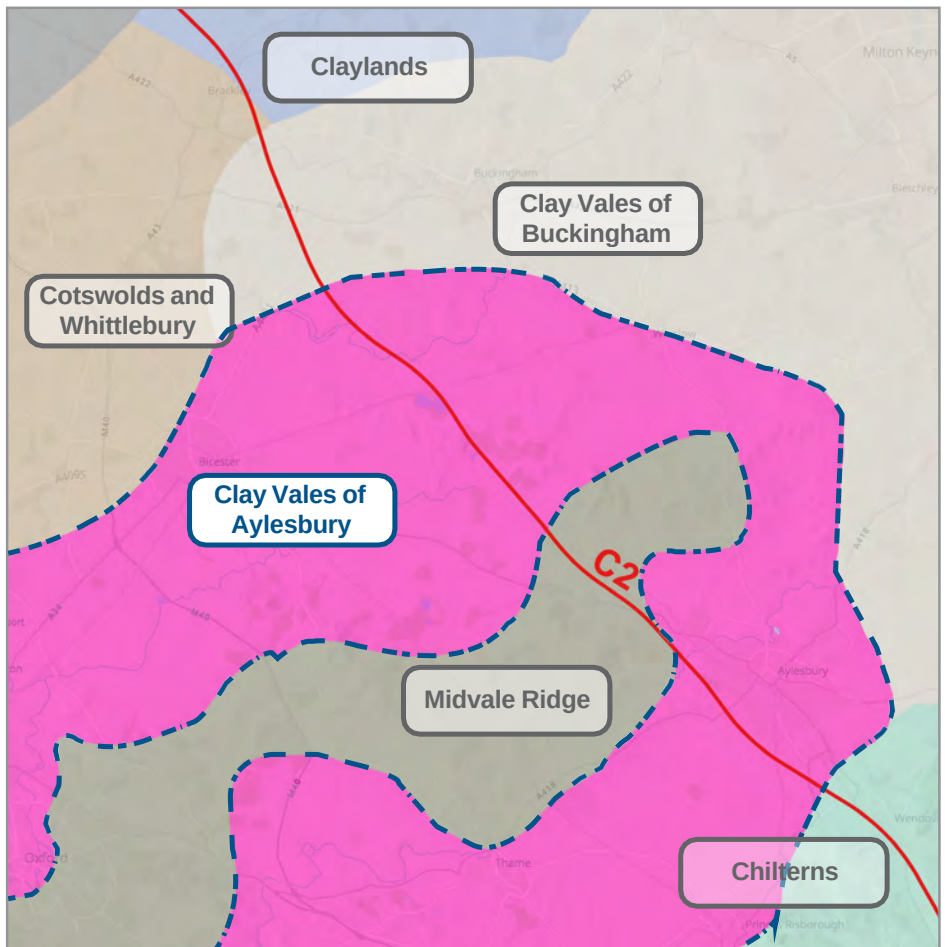




Figure 3.3.4 View of south abutment of Thame Valley Viaduct over shallow flood plain of River Thame (80m from Thame Valley Viaduct)

Clay Vales of Aylesbury (Stoke Mandeville, South West Aylesbury, Hartwell House and Thame Valley) 3.3

3.3.1 Landscape Design Approach

The landscape vision for this Clay Vales NCA is two-fold; firstly it is aimed at conserving the clay vale landscape which forms the setting to the Chilterns AONB to the south; and secondly to enhance the distinct character of the clay vale landscape where HS2 is highly visible. The landscape design approach has sought to effectively screen and integrate HS2 in the landscape, as well as design opportunities for enhancement such as at Hartwell House and within its former historic parkland and the Thame Floodplain through the introduction of greater biodiversity connectivity and habitat creation, public access and education.

The landscape design approach within the south part of the Clay Vales NCA and which falls within the setting to the Chilterns AONB has been informed by the Chilterns AONB Forum Group Detailed Design Principles document. The design approach within the grounds of the Hartwell House historic parkland have been informed by discussion with the National Trust and Ernest Cooke Trust. These principles and discussions have informed the discussion with the local planning authority (BCC) as part of the Schedule 17 process and further Detailed Design.

The landscape planting design for the Clay Vales NCA reflects the local native species found within the low lying and typically wet clay soils of this landscape and is designed to reflect the local context and existing vegetation that will enhance and reinforce the green infrastructure setting of CFA 11 (see Appendix C for Landscape Detail Descriptions and drawing references).

The typical species mix selection for this area has been subject to further discussion with the local planning authority (BCC) and with National Trust at Hartwell House as part of the Schedule 17 and Bringing Into Use processes and has informed the species choices at Detailed Design to protect, maintain and enhance the biodiversity of the area whilst enabling climate resilience by reducing carbon emissions and pollution.

The landscape earthworks approach for the Clay Vales NCA reflects the typically low lying and flat nature of the topography within the LCAs and is sensitively integrated into its surroundings by respecting natural contours and existing landscape features. This has partly been informed by discussion with the National Trust and Ernest Cooke Trust within the Hartwell House historic parkland area and in discussion with the local authority (BCC) as part of the Schedule 17 process and at Detailed Design. It is noted that scheme design VE 030 introduced a track uplift of up to 1.5m, but typically less than +1m affecting Aylesbury south cutting, Aylesbury south embankment, Aylesbury north embankment and Oxford Road embankment.

Scheme design VE 106 introduced a track uplift of up to 0.8m affecting the north end of Thame Valley Viaduct and the adjacent Thame Valley North embankment. Where possible, the earthworks design encourages careful reinstatement of land for farming purposes that will contribute towards local sustainable food production and productivity.

The Thame Valley viaduct is the KDE in this clay vales landscape. Its landscape design demonstrates collaborative principles to conserve and enhance the setting. Feedback from the Design Panel presentation and local authority discussions influenced the design, along with the Schedule 17 process and Detailed Design. Some overbridges were affected by VE 030 track uplift, resulting in minor changes of +1m or less and modifications to approach ramps. No structures in this area are impacted by VE106. Bridleway SBH/19 and Footpath SBH/27 overbridges in Haddenham Vale LCA will be replaced with one structure between them.

The landscape design aims to strengthen green infrastructure corridors, creating wildlife habitats and ecological networks along HS2. These elements connect with viaducts, overbridges, drainage ditches, culverts, and water management features. Filtration ponds are integrated for nature-based design and management, reducing flooding and improving water quality in the long term. Enhancements at Hartwell House and its historic parkland, as well as the Thame Floodplain, provide public access for education, recreation, and improved community well-being.



Figure 3.3.5 Detail view of Thame Valley Viaduct linked piers in relation to supporting local water management and biodiversity (10m from Thame Valley Viaduct)



Midvale Ridge (Waddesdon and Quainton) 3.4

3.4.1 Local Landscape Character

The Midvale Ridge NCA forms a relatively narrow band of low-lying limestone hills stretching east–west across the route. It is surrounded by the flat lands of the Aylesbury and Buckinghamshire clay vales, giving extensive views across the surrounding countryside.

The Midvale Ridge comprises the low hills and ridges landscape type to the north and south of the Waddesdon – Eyethrope Parkland LCA and Quainton Hill LCA respectively. These two LCAs are separated by the lower lying shallow valleys landscape type of the Westcott Claylands LCA and the Northern Vale LCA lying to the west and east.

Waddesdon Hill (147m AOD) and Lodge Hill (159m AOD) to the west and Quainton Hill (187m AOD) to the east are notable local topographical features. It is a predominantly agricultural area with a mixed arable/ pastoral farming landscape and is notably more wooded in character than the surrounding lower lying landscapes and much is designated as ancient woodland.

This is a mixed pastoral and arable landscape with large, geometric fields, mostly resulting from late 18th and 19th century enclosures, divided by hedges and regularly spaced hedgerow trees punctuated by blocks of woodland and many small settlements including Waddesdon and Quainton. There is a good network of local footpaths and six main local recreational routes which cross this landscape which are the Swan's Way, Midshires Way, Aylesbury Ring, Outer Aylesbury Ring, Bernwood Jubilee Way and North Buckinghamshire Way.

The National Trust's Grade 1 listed Waddesdon Manor and Grade 1 listed historic parks and gardens, along with the Grade II listed historic parks and gardens at Eythrope Park to the south are important distinctive designed features in the landscape.

This area is covered by the following two Schedule 17 application areas, AVDC P9 Putlowes to Waddesdon and AVDC P10 Waddesdon to Quainton and a TCPA application for Putlowes Access and the A41 narrowing at Waddesdon.

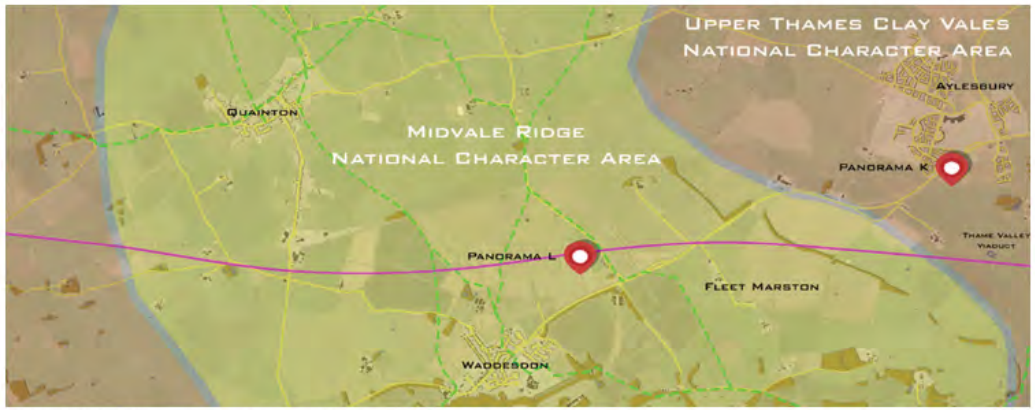


Figure 3.4.1 National Landscape Character Map - Midvale Ridge



Figure 3.4.2 Local Landscape Character Map - Midvale Ridge

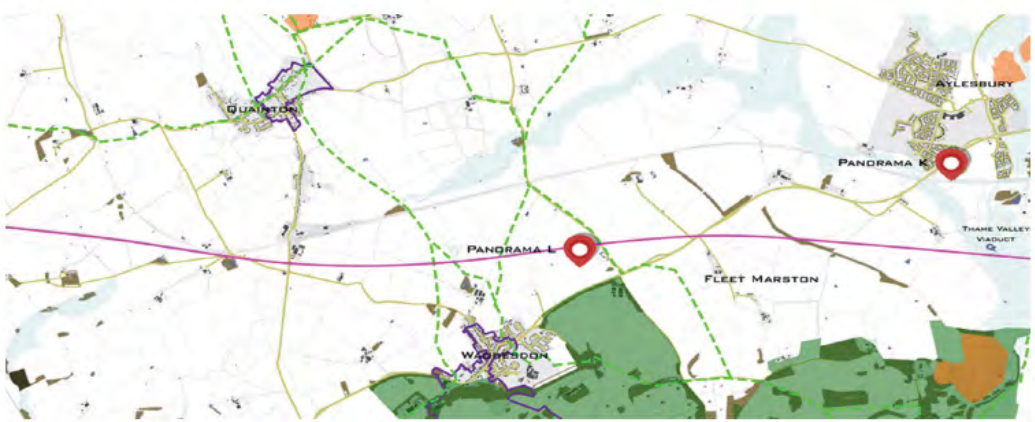


Figure 3.4.3 Landscape Features Map - Midvale Ridge

LEGEND

- HS2 Route

National Character Areas:

- Upper Thames Clay Vales
- Midvale Ridge

Local Character Areas:

- Northen Vale
- Waddeson - Eyethrope Parkland
- Quainton Hill
- Westcott Claylands
- Kingswood Wooded Farmland

Landscape Features:

- Sites of Special Scientific Interest (SSSI)
- Historical Parks
- Scheduled Monuments
- Flood Plain
- Conservation Area
- Recreational Routes

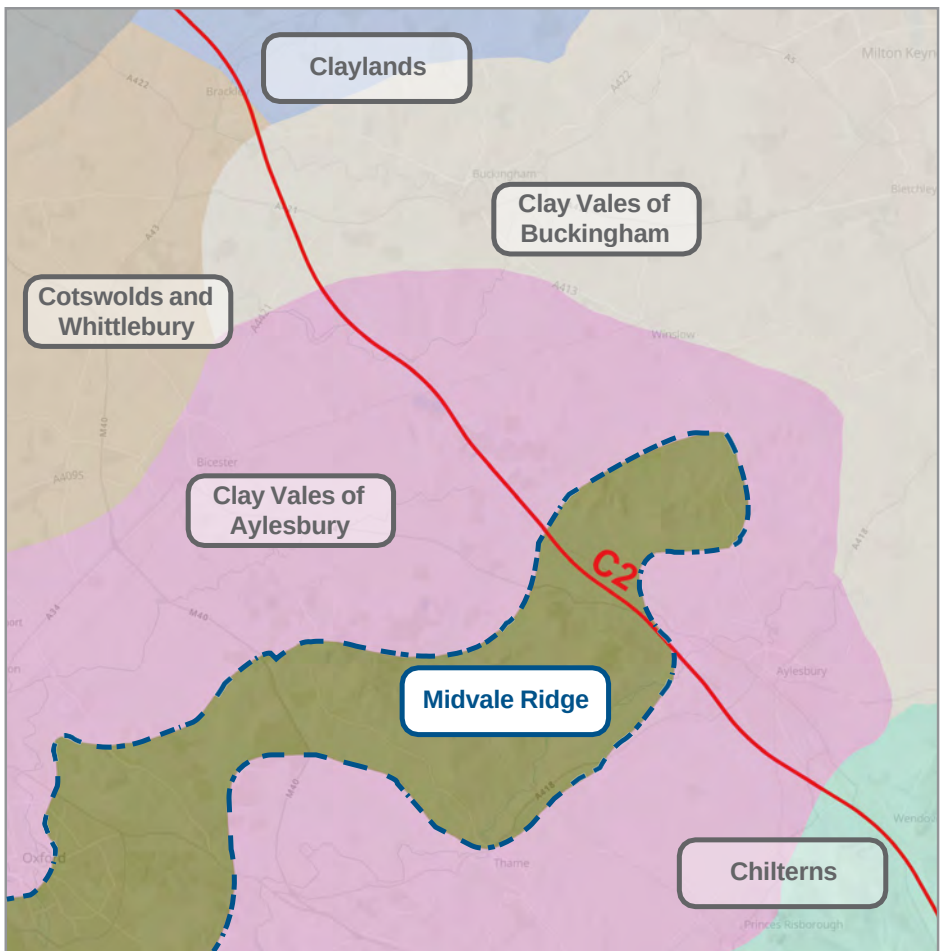
Midvale Ridge (Waddesdon and Quainton)

3.4

HS2 Route

HS2 traverses the Midvale Ridge NCA within a low lying, rolling claylands landscape between the rural settlements of Waddesdon to the south and Quainton to the north in a series of cuttings and low embankments. The south edge of this area falls within the transitional north edge of the low lying, flat, large-scale landscape of the Northern Vale LCA. In this part of the area the busy A41 is realigned to the east of HS2 and then passes over it at a new location to the north of its present alignment, before tying back into the A41 at the approach to the settlement of Waddesdon. A section

of the present A41, which sits adjacent to Waddesdon Manor estate will become redundant. Northwards the remainder of the area is defined by the gently sloping low ground of typically open, medium size arable fields of the Westcott Claylands LCA. The limestone hills of Lodge Hill to the south and Quainton Hill to the north provide the backdrop to this landscape. In the south, and east of the settlement of Waddesdon, HS2 cuts through a local ridgeline resulting in a notable cutting (Waddesdon South Cutting).



KEY PLAN



Figure 3.4.4 Aerial photograph of Waddesdon from the north

Midvale Ridge (Waddesdon and Quainton) 3.4

3.4.2 Landscape Design Approach

The landscape vision for the Midvale Ridge LCA is to conserve the locally valued lower lying clay vale landscape, which in the south part of the area also forms the setting to National Trust's Grade 1 listed Waddesdon Manor and associated designated Grade 1 listed historic parks and gardens. The landscape design principles are focused on screening and integration of HS2 and respond to the area's distinctive landscape character, sense of place, tranquillity, historic environment, and biodiversity. The landscape design within the setting to Waddesdon Manor has been informed by discussion with the National Trust and the Waddesdon Estate and includes proposals for the treatment of the redundant A41. These principles and discussions have further informed the wider design development discussion with the local planning authority (BCC) during the Schedule 17 process and at Detailed Design.

The landscape planting design for the Midvale Ridge NCA reflects the local native species found within the low lying and typically wet clay soils of this landscape and is designed to reflect the local context and existing vegetation that will enhance and reinforce the green infrastructure setting of CFA 12 (see Appendix C for information on Landscape Detail Descriptions and drawing references).

The typical species mix selection for this area has been subject to further discussion with the local planning authority (BCC) as part of the Schedule 17 and Bringing Into Use processes and has informed the species choices at Detailed Design to protect, maintain and enhance the biodiversity of the area whilst enabling climate resilience by capturing and storing carbon emissions and reducing pollution.

The landscape earthworks approach for the Midvale Ridge NCA reflects the typically low lying and flat nature of the topography within the LCAs and is sensitively integrated into its surroundings by respecting natural contours and existing landscape features. This has partly been informed by discussion with the National Trust and Ernest Cooke Trust within the Hartwell House historic parkland area and in discussion with the local authority as part of the Schedule 17 process and at Detailed Design. It is noted that scheme design VE 106 introduced a track uplift of +0.8m affecting the Putlowes cutting, Bicester Road Embankment, + 3m at Waddesdon South cutting, +2m at Waddesdon South embankment and +1m at Waddesdon North cutting. Where possible, the earthworks design encourages careful reinstatement of land for farming purposes that will contribute towards local sustainable food production and productivity.

Although there are no KDEs within Midvale Ridge NCA, this area does include the Station Road (A41) overbridge and new GSM-R compounds. The landscape design for these structures demonstrates collaborative design principles to conserve and enhance the local setting. It is noted that a number of the overbridges have been affected by VE 106 track uplift. Most are relatively minor changes of less than +1m. The exception is at WAD/4 accommodation overbridge which has been raised by 2.7m. The change has also resulted in modification to their approach ramps.

The landscape design seeks to reinforce and transform green infrastructure corridors along the route through a combination of linear tree belts, field boundary and lane side hedgerows, riparian vegetation along watercourses and wetland habitat creation. These landscape elements will help to create wildlife habitats and ecological network that provide biodiversity connectivity across and along HS2 by linking into the engineering assets at the overbridges, drainage ditches and culverts and water management features (balancing ponds). The filtration ponds are designed and integrated within the landscape design for nature-based design and management to alleviate flooding and improve water quality in the longer term.

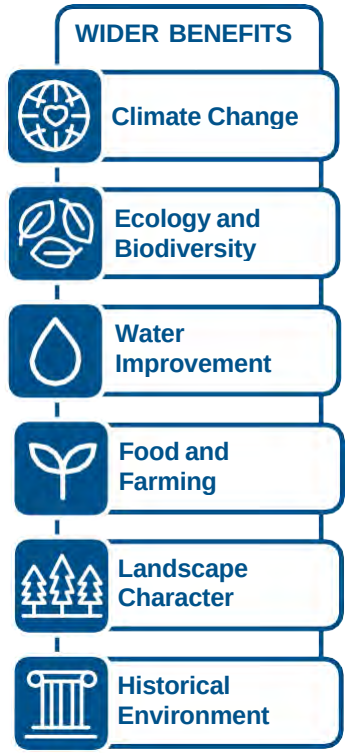




Figure 3.4.5 Oblique view of Station Road Overbridge from the south looking north (250m from structure) showing cycle tunnel to the east.

Clay Vales of Buckingham (Calvert, Steeple Claydon, Twyford, Padbury Brook and Chetwode) 3.5

3.5.1 Local Landscape Character

This Clay Vales NCA at the local level can be divided into two distinct areas, and which are delineated by East West Rail (Network Rail) to the north of the settlement of Calvert. The south comprises the wooded rolling lowlands landscape type with an outcrop of the low hills and ridges landscape type in the south east, with the former being defined by the Kingswood Wooded Farmland LCA, and Claydon Bowl LCA and the later by the Finemere Hill LCA. The remainder is occupied by an industrial and post-industrial landscape defined by the Calvert Clay Pits LCA. The north comprises a combination of the shallow valleys landscape type and the undulating clay plateau landscape type with the former defined by the Twyford Vale LCA and the latter by the Preston Bissett Plateau Edge LCA.

The Clay Vales landscape to the south is notably more wooded in character and this is further reinforced by strong hedgerows with mature oak trees and this in combination with the pattern of topography helps to create a sense of unity, enclosure and remoteness compared to other locations within the vale landscape. The settlement of Calvert itself was built to serve the former brick works and clay pits, with the former workings being a major component of this landscape. Several of the workings to the north of Calvert have been turned into attractive waterfilled pits for recreational activity and habitat creation.

To the south is a major landfill operation and associated railhead, and along with the nearby large scale Greatmoor energy from waste plant results in a disjointed landscape.

Overtime the landfill area will be restored to create new wooded and recreational amenity land. To the east of Calvert is the National Trust's Grade I listed Claydon House and its Grade II listed historic park and garden which sits in the centre of a bowl with high ground on the edge. The house and parkland are relatively remote and separated from vale landscape to the south west and west, although the south west setting to the estate extends in the direction of Home Wood and Balmore Wood, in the vicinity of Finemere Hill (129m AOD). There are designed rides through these woods which are oriented towards Claydon House. Finemere Hill forms a notable topographic feature in the south east of the area. There is an area of lower lying ground to the north west of Claydon House within which the East West Railway (Network Rail) forms a local feature as it crosses a shallow open valley to the south of Steeple Claydon.

North of the East West Rail (Network Rail) is a more typical clay vale landscape defined by the low-lying shallow floodplain of the Padbury Brook and associated alluvium and gravel terraces, creating a gently undulating topography. It is a mainly pastoral landscape with dairy herds and hedges. Woodland is sparse with trees within the valley being mostly associated with the riparian vegetation along the watercourses.

The fields are typically medium size and the field pattern in this area is predominantly the result of 18th and 19th century enclosure with some smaller fields of pre 18th century sinuous enclosures. The route of the former Great Central Railway presently bisects this landscape. Beyond the valley the landscape is typified by sloping ground giving rise to a flatter mixed farmland clay plateau with scattered woodland blocks. The landscape is typically pre 18th century.

This landscape has a dispersed settlement pattern of nucleated settlements which include Twyford, Steeple Claydon and Preston Bissett. Around villages the fields are generally smaller and more irregular. There is a good network of local footpaths and two main local recreational routes which cross this landscape which are the Bernwood Jubilee Way and Cross Bucks Way.

This area is covered by the following tenSchedule 17 application areas, AVDC P11 Quainton to Grendon Underwood, AVDC P12 Sheephouse Wood and various applications of differing complexity under AVDC P13 (13a Calvert South, 13b Calvert North, 13c Calvert IMD, 13d EWR western tie in, 13e Addison Road overbridge and 13g SCL/8 Footbridge), AVDC P14 Twyford to Chetwode, CDC P1 Godington and AVDC P15 Chetwode to Mixbury. In addition, this area includes the application for the Greatmoor Sidings TWAO and five applications under the TCPA for Edgcott Road, Padbury Brook, Putlowes Farm, Rosehill Farm and SCL/8 (footbridge).



Figure 3.5.1 National Landscape Character Map - Clay Vales of Buckinghamn

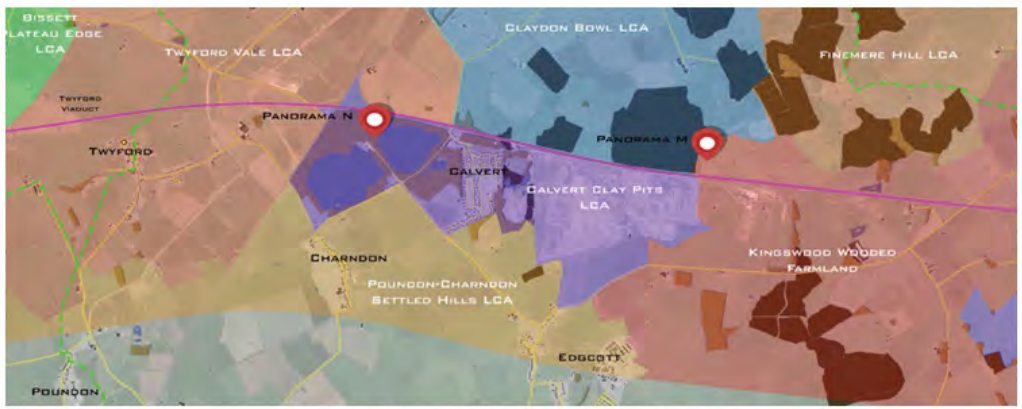


Figure 3.5.2 Local Landscape Character Map - Clay Vales of Buckinghamn



Figure 3.5.3 Landscape Features Map - Clay Vales of Buckinghamn

LEGEND

- HS2 Route

National Character Areas:

- Upper Thames Clay Vales

Local Character Areas:

- Kingswood Wooded Farmland
- Finemere Hill
- Claydon Bowl
- Calvert Clay Pits
- Twyford Vale
- Preston Bissett Plateau Edge

Landscape Features:

- Ancient Woodland
- Sites of Special Scientific Interest (SSSI)
- Historical Parks
- Water Feature
- Flood Plain
- Recreational Routes

Clay Vales of Buckingham (Calvert, Steeple Claydon, Twyford, Padbury Brook and Chetwode)

3.5

HS2 Route

HS2 traverses the rolling clay vales lowlands within the Kingswood Wooded Farmland LCA mostly on low embankment or at grade (Doddershall embankment and Grendon Underwood embankment) with a short section in shallow cutting (Woodlands Cutting). Where it traverses the Calvert Clay Pits LCA it is mostly in shallow cutting (Calvert cutting). Along this section HS2 runs parallel to and adjoins the existing Network Rail railway line which services the present FCC waste transfer sidings at Calvert. As part of the scheme the present sidings will be relocated to the south of Sheephouse Wood and east of HS2 within the Kingswood Wooded Farmland LCA. North of the East West Network Rail railway line to the north of Calvert HS2 traverses the more open, gently sloping shallow valley of the east flowing Padbury Brook and tributary within the Twyford Vale LCA on embankment and a series of structures (Twyford Viaduct and Godington East and West Viaducts).

The proposed Calvert Infrastructure Maintenance Depot (IMD) is located in the south part of this LCA between the settlements of Calvert and Steeple Claydon. Within the adjacent higher ground of the undulating Preston Bissett Plateau Edge LCA HS2 crosses mostly in cutting (Twyford cutting and Chetwode cutting), with the exception of an area of lower ground which is situated at the north end of the LCA, where the scheme is on low embankment (Barton Hartshorn embankment).

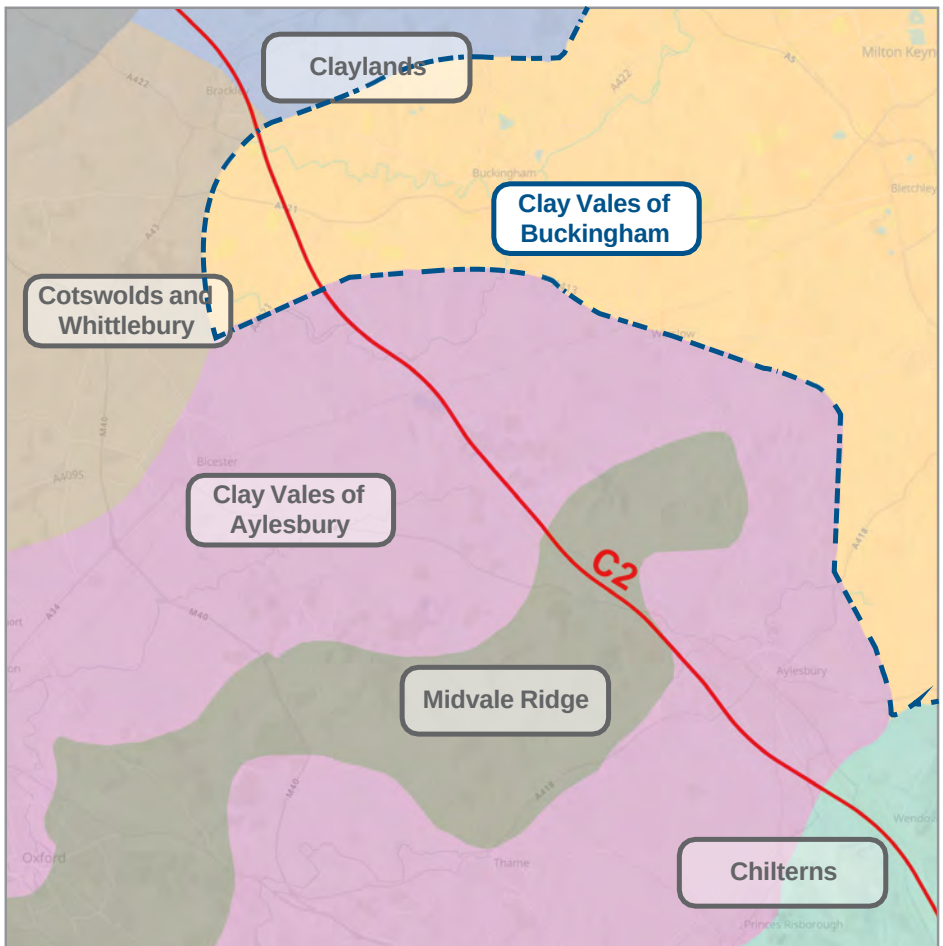




Figure 3.5.4 View from shallow valley field to north of Padbury Brook showing Twyford Viaduct south embankment and parapet.

Clay Vales of Buckingham (Calvert, Steeple Claydon, Twyford, Padbury Brook and Chetwode) 3.5

3.5.2 Landscape Design Approach

HS2 traverses the rolling clay vales lowlands within The landscape vision for this Clay Vales NCA is to conserve the locally valued clay vale landscape which provides the setting to the National Trust's property at the Grade 1 listed Claydon House and adjacent to the rural settlement of Chetwode. Here the vision is to effectively screen and integrate HS2. At locations where HS2 is highly visible such as Twyford embankment adjacent to the settlement of Twyford, the vision is to create effective integration and screening and provide opportunity for enhancement. In the south and central part of the area where HS2 runs along the interface of the Claydon Bowl LCA and Calvert Clay Pits LCA and at the Calvert IMD and the adjacent East West Rail the vision is to create an opportunity to bring about positive change and environmental benefit.

The landscape design for this area has partly been informed by comments from the Design Panel presentation for the Calvert IMD and subsequent design development as part of a joint integrated study initiative, along with discussion with the National Trust in regard to the setting to Claydon House. These principles and discussions have informed the wider design development discussion with the local planning authorities (BCC and Cherwell DC) as part of the Schedule 17 process and further Detailed Design.

The landscape planting for the Clay Vales NCA reflects the local native species found within the low lying and typically wet clay soils of this landscape. The planting design approach varies across Community Forum Areas (CFA) and is designed to reflect the local context and existing vegetation to enhance and reinforce the green infrastructure setting of CFA 13 (see Appendix C for information on Landscape Detail Descriptions and drawing references). The typical species mix selection for this area has been subject to further discussion with the local planning authorities (BCC and Cherwell DC) as part of the Schedule 17 and Bringing Into Use processes and has informed the species choices at Detailed Design.

The landscape earthworks design for the Clay Vales NCA responds to the topography associated with the typically low lying and flat nature of the area. It is noted that as part of scheme design VE 118 a track uplift of +3m was implemented at Calvert cutting and Twyford embankment assets. This uplift also raised the IMD platform by +3m (Twyford Vale LCA). In addition, VE 107 implemented a track uplift of +3m at Chetwode cutting (Preston Bisset Plateau Edge). The track uplift also affects Chetwode embankment to the south, albeit by +1m at its north end.

The KDEs within this clay vales landscape are the Sheephouse Wood Bat Structure (SWBS) and the Calvert IMD. The landscape design for these elements demonstrates collaborative design principles and has been informed by comments from the respective Design Panel presentation and in discussion with the local authority (BCC) as part of the Schedule 17 process. There are other structures within this area including green bridges and three viaducts which have also been discussed.

This landscape includes National Trust's Grade 1 listed Claydon House and its associated Grade 1 listed historic park and garden and the line of the former Great Central Railway. The landscape design ensures the preservation of these historical assets and their associated environment.

The landscape design seeks to reinforce and transform green infrastructure corridors along the HS2 route These landscape elements will help to provide biodiversity connectivity across and along HS2 by linking into the HS2 advanced works habitat creation areas and the engineering assets at the viaducts, overbridges, green bridges, drainage ditches and culverts and water management features (balancing ponds). The Sheephouse Wood Bat Mitigation Structure and accompanying assets are designed and integrated within the landscape design for nature-based design and management to safeguard the local biodiversity.



Figure 3.5.5 Elevational view of SWBMS Arches and rigid perforated panels in mid-grey colour to be integrated within landscape design and local biodiversity - image used in Public Consultation Events held in Calvert.



River Great Ouse Claylands (Newton Purcell, Finmere, Mixbury and Westbury)

3.6

3.6.1 Local Landscape Character

This part of the Claylands NCA is a transitional landscape between the broad, gently undulating, clay lowland plateau to the south and the limestone plateau to the north. This transitional landscape comprises a varied range of landscape types over a relatively small area and includes clay wooded ridge / estatelands to the south, as identified by the Tingewick Plateau LCA, the limestone farmed plateau type in the environs of the rural settlement of Mixbury, as identified by the Hethe Wooded Estatelands LCA, and the incised valley landscape type to the north, as identified by the Westbury – Biddlestone Great Ouse Valley LCA (see Appendix A).

This is a predominantly productive claylands arable landscape with medium scale rectilinear field pattern and delineated with hedgerows. This and the riparian vegetation along the Great Ouse, the linear tree belts associated with the network of disused railway lines and occasional woodland blocks give a sense of enclosure and place. The wider landscape is relatively sparsely populated, with settlements typically located along the river valley (Westbury) and along the major road corridor (Finmere), now bypassed, which was positioned at the former junction of the A421 and A4421. Much of the area retains a strong rural feel and there is a good network of local footpaths including the Westbury Circular Walk. This area is covered by the following three Schedule 17 application areas, CDC P2 Newton Purcell to Finmere, CDC P3 Mixbury and in part by AVDC P16 Turweston cutting.



Figure 3.6.1 National Landscape Character Map - River Great Ouse Claylands



Figure 3.6.2 Local Landscape Character Map - River Great Ouse Claylands



Figure 3.6.3 Landscape Features Map - River Great Ouse Claylands

LEGEND

- HS2 Route

National Character Areas:

- Upper Thames Clay Vales
- Bedfordshire and Cambridgeshire Claylands

Local Character Areas:

- Preston Bissett Plateau Edge
- Tingewick Plateau
- Hethe Wooded Estatelands
- Twyford Vale
- Westbury - Biddlestone Great Ouse Valley

Landscape Features:

- Ancient Woodland
- Sites of Special Scientific Interest (SSSI)
- Scheduled Monuments
- Water Feature
- Flood Plain
- Recreational Routes

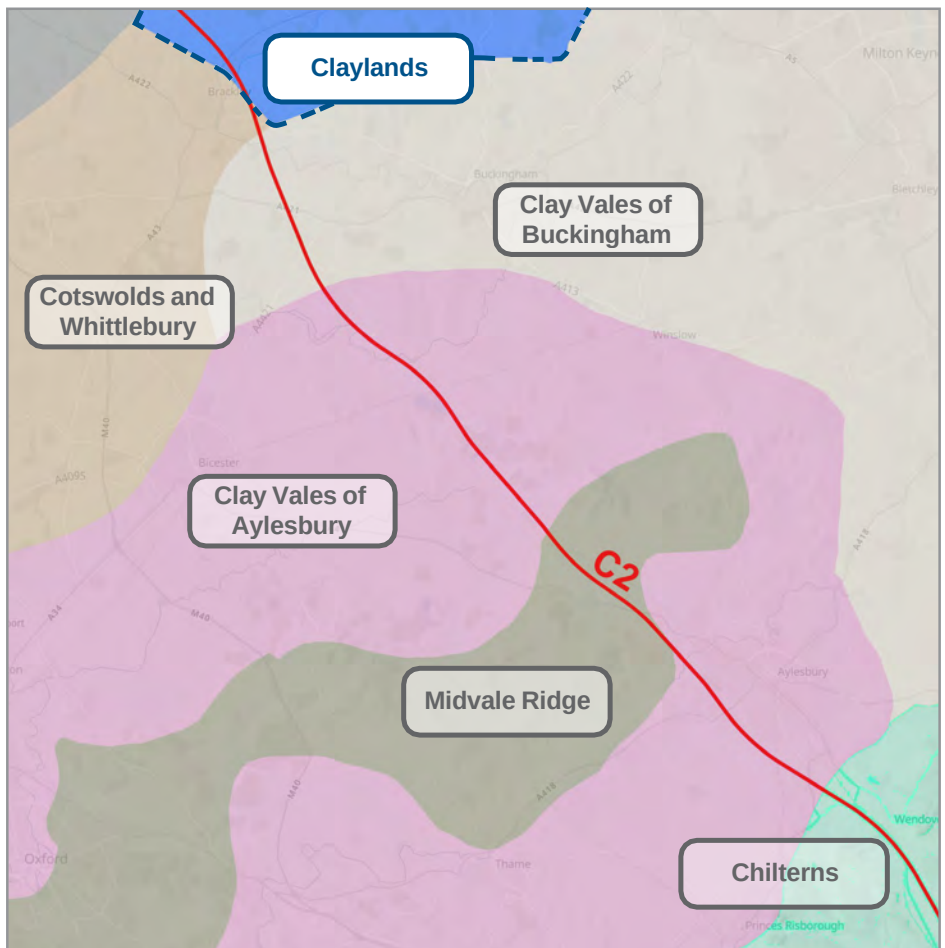
River Great Ouse Claylands (Newton Purcell, Finmere, Mixbury and Westbury)

3.6

HS2 Route

HS2, north of the A4410 and up to the A421 follows the line of the former Great Central Railway. It traverses the limestone plateau of the Hethe Wooded Estatelands LCA, passing to the east of the settlement of Mixbury, mostly in cutting (Barton to Mixbury cutting and Mixbury cutting). However, between the cuttings HS2 sits on a short section of shallow embankment (Mixbury embankment), where it crosses a tributary of the River Great Ouse. Within this area there are associated overbridges which take the A4410 and A421, local roads, farm accesses and PRoW over HS2. North of Mixbury cutting, HS2 emerges on to the embankment (Westbury embankment) to cross the River Great Ouse within the Westbury – Biddlestone Great Ouse Valley LCA.

The most prominent element of HS2 within this area is Westbury Viaduct located to the west of the settlement of Westbury, before passing on to the embankment (Grovehill embankment) on the north side. The landscape earthworks design provides for false cuttings on both sides of HS2 on the approach embankments to the viaduct to help integrate and screen HS2 into the wider valley landscape and its views.



KEY PLAN



Figure 3.6.4 Elevation view of Westbury Viaduct north abutment showing parapet ‘splay’ detail earthworks, weathering steel ‘cheek wall’ and integration of stepped access at the abutment (100m from Viaduct)

River Great Ouse Claylands (Newton Purcell, Finmere, Mixbury and Westbury)

3.6.2 Landscape Design Approach

The landscape vision for this transitional Claylands NCA is to conserve the locally valued limestone plateau landscape of the Hethe Wooded Estatelands LCA. At locations where HS2 is highly visible such as Westbury Viaduct within the Westbury – Biddlestone Great Ouse Valley LCA and adjacent to the settlement of Westbury, the vision is to create effective integration and screening and provide opportunity for enhancement.

The landscape design within this area has undergone design development in discussion with the local planning authority (BCC and Cherwell DC) as part of the Schedule 17 process and formed the basis for Detailed Design. This collaborative approach helps to build stronger communities by involving local planning authority as stakeholders in the decision-making process and ensuring that their interests and concerns are addressed. By considering the local context, the design can contribute to the improvement of local socioeconomics by promoting sustainable development and potentially attracting investment and tourism.

The landscape planting for the Claylands LCA area reflects the local native species found within the low plateau and river valley landscape types. The planting design approach varies across Community Forum Areas (CFA) and is designed to reflect the local context and existing vegetation to enhance and reinforce the green infrastructure setting of CFA14 (see Appendix C for information on Landscape Detail Descriptions and drawing references).

The typical species mix selection for this area has been subject to further discussion with the local planning authorities (BCC and Cherwell DC) as part of the Schedule 17 and Bringing Into Use processes and has informed the species choices at Detailed Design.

The landscape earthworks design for the Claylands NCA responds to the topography associated with the open shallow valley of the River Great Ouse and the design has been developed in discussion with the local planning authority (BCC) as part of the Schedule 17 process.

It is noted that as part of scheme design VE 125 implemented a track uplift of +1.8m at the north end of the Westbury Embankment and by +2.2m at Grovehill embankment.

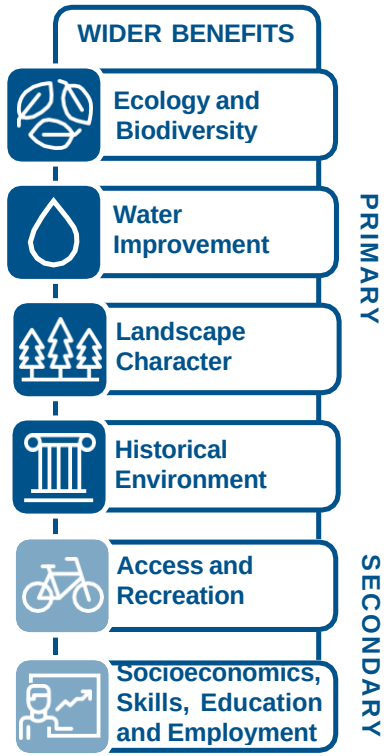
The landscape design seeks to reinforce and transform green infrastructure corridors along the HS2 route. Landscape elements along the route, will help to provide biodiversity connectivity across and along HS2 by linking into the HS2 advanced works habitat creation areas and the engineering assets at the viaduct, overbridges and water management features (balancing ponds).

The filtration ponds are designed and integrated within the landscape design for nature-based design and management to alleviate flooding and improve water quality in the longer term.

This landscape encompasses the former Great Central Railway line and various disused historical railway structures. The design process considers the presence of these historical elements, aiming to both honour the area's heritage and uphold a sense of historical continuity through their preservation and integration.

The creation of green infrastructure corridors and the integration of historical elements within the landscape design approach ensures the potential opportunities for access to natural environments and recreational activities. This can include walking, cycling, and other outdoor pursuits, contributing to a healthier and more active lifestyle for residents and visitors.




WIDER BENEFITS
Ecology and Biodiversity
Water Improvement
Landscape Character
Historical Environment
Access and Recreation
Socioeconomics, Skills, Education and Employment
PRIMARY
SECONDARY

Cotswolds and Whittlebury Ridge (Turweston) 3.7

3.7.1 Local Landscape Character

This is a south west to north east orientated low and gently undulating limestone plateau landscape which sits at the interface of the Cotswolds NCA to the west and Whittlebury Ridge LCA to the east. The landscape comprises an incised valley landscape type to the north, as identified by Westbury – Biddlestone Great Ouse Valley LCA and a wooded ridge plateau landscape type as identified by Oatleys Plateau LCA.

The River Great Ouse flows in a south to south east direction between the rural settlement of Turweston and the settlement of Brackley. The busy A43 dominates the river valley as it bypasses Brackley to the east. From the top of the plateau, east of Turweston, the land slopes away gently in most directions, giving occasional long views between woodland blocks, over the surrounding countryside, and a sense of being elevated, open and expansive. The plateau landscape retains a rural character due to its sparse settlement pattern. The use of local limestone in the built form in Turweston gives a sense of both place and history. Fields are medium sized with mature, species rich hedgerows and numerous hedgerow trees with mixed farming dominating the landscape. There is a good network of local footpaths and one main local recreational route, the Westbury Circular Walk, which cross this landscape.

This area is covered by the Schedule 17 application area AVDC P16 Turweston cutting.



Figure 3.7.1 National Landscape Character Map - Cotswolds and Whittlebury Ridge



Figure 3.7.2 Local Landscape Character Map - Cotswolds and Whittlebury Ridge



Figure 3.7.3 Landscape Features Map - Cotswolds and Whittlebury Ridge

LEGEND

HS2 Route

National Character Areas:

- Bedfordshire and Cambridgeshire Claylands
- Yardley - Whittlewood Ridge
- Cotswolds

Local Character Areas:

- Westbury - Biddlestone Great Ouse Valley
- Oatleys Plateau
- Brackley Settlement
- Tove Catchmant Undulating Claylands

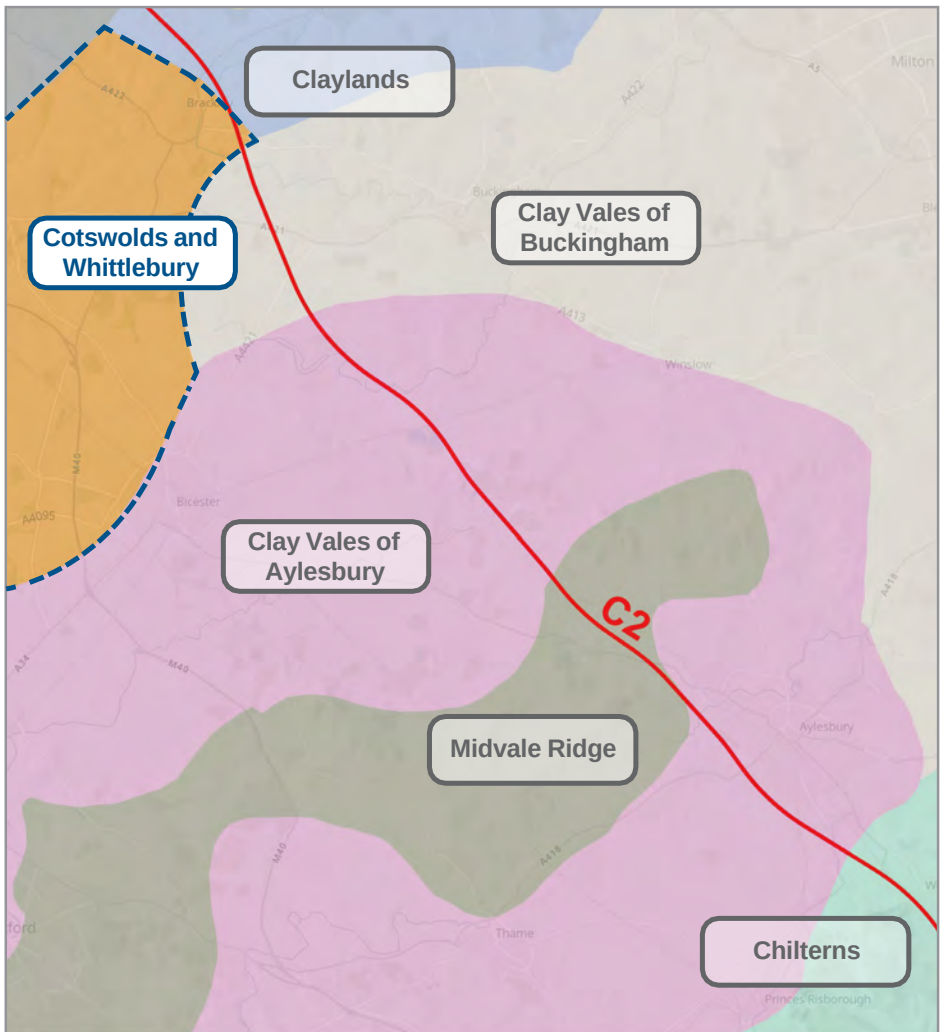
Landscape Features:

- Sites of Special Scientific Interest (SSSI)
- Historical Parks
- Scheduled Monuments
- Flood Plain
- Conservation Area
- Recreational Routes

Cotswolds and Whittlebury Ridge (Turweston) 3.7

HS2 Route

HS2 crosses the Oatleys Plateau LCA in deep cutting (Turweston cutting) before re-emerging on to the embankment (Turweston embankment) to cross once again the River Great Ouse within the Westbury Biddlestone Great Ouse Valley LCA. There are associated overbridges taking the A422, and a farm access and PRoW over the track with the latter being a green bridge.



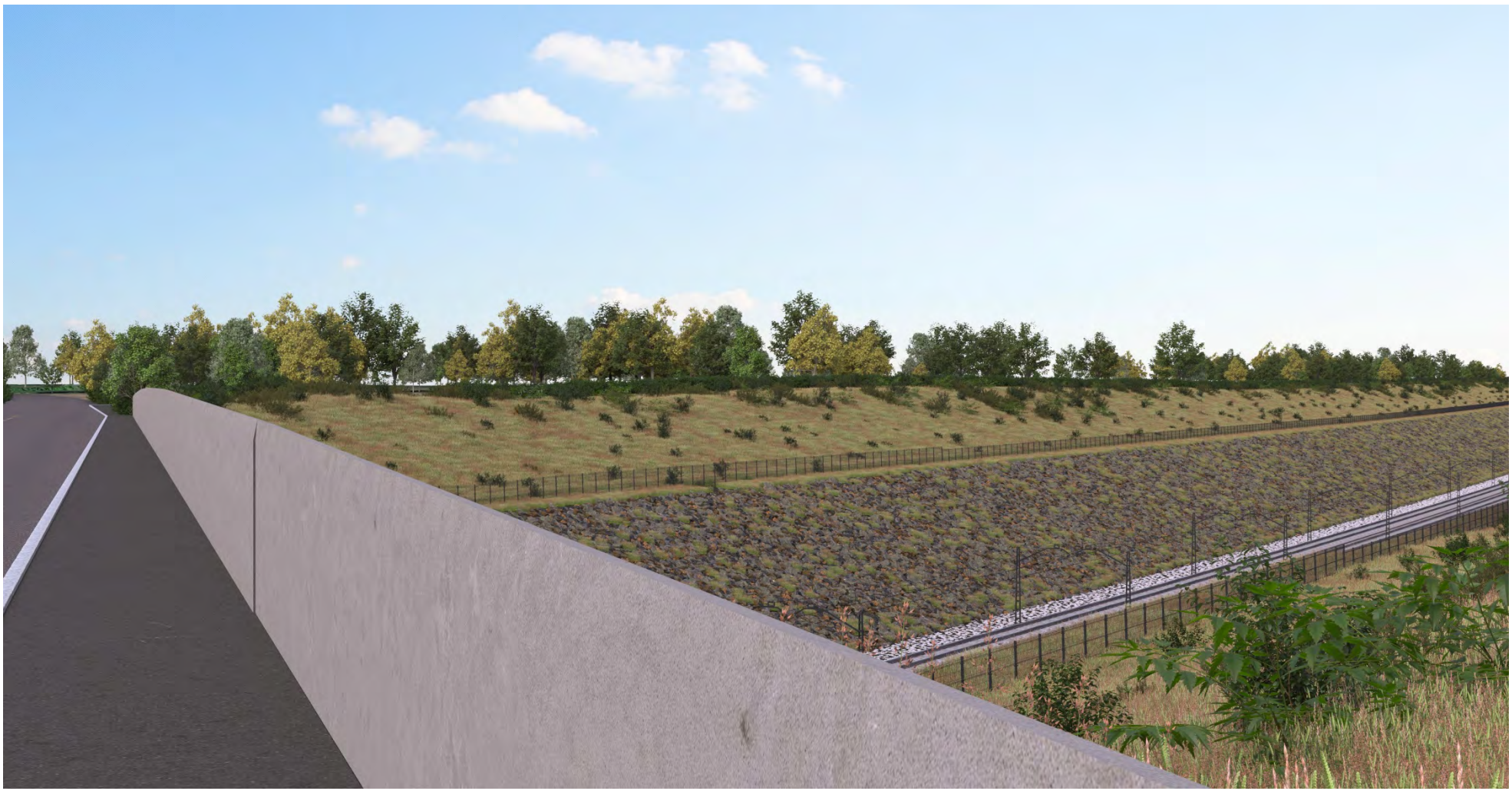


Figure 3.7.4 Turweston Cutting from A422 Brackley Road looking North (2-3m above ground level)

Cotswolds and Whittlebury Ridge (Turweston) 3.7

3.6.2 Landscape Design Approach

The landscape vision for the Cotswolds and Ridge NCAs is to conserve the locally valued limestone plateau landscape within the Oatleys Plateau LCA. At locations where HS2 is highly visible such as on the Turweston embankment within the low lying shallow open river valley of the Westbury – Biddlestone Great Ouse Valley LCA, the vision is to create effective integration and screening.

The landscape design within this area has undergone design development in discussion with the local planning authority (BCC) as part of the Schedule 17 process and at Detailed Design. This collaborative approach helps to build stronger communities by involving local planning authority as stakeholders in the decision-making process and ensuring that their interests and concerns are addressed. By considering the local context, the design can contribute to the improvement of local socioeconomics by promoting sustainable development and potentially attracting investment and tourism.

The landscape planting for the Cotswolds and Ridge NCA area reflects the local native species found within the low plateau and river valley landscape types. The planting design approach varies across Community Forum Areas (CFA) and is designed to reflect the local context and existing vegetation to enhance and reinforce the green infrastructure setting of CFA 14 (see Appendix C for information on Landscape Detail Descriptions and drawing references).

The typical species mix selection for this area has been subject to further discussion with the local planning authority (BCC) as part of the Schedule 17 and Bringing Into Use processes and has informed the species choices at Detailed Design.

The landscape earthworks design for this area is limited to engineering slopes. A key design development of the Turweston cutting asset is a two-stage slope with a steeper 1v to 2h lower rock slope and a slacker 1v to 3 upper slopes. A ledge provides the transition between the two slopes at approximately 2/3rds distance up the cutting side. The ledge will accommodate the security fence line so that it is set down form the main cutting crest. The upper slope will then be planted to help blend the cutting into the plateau landscape. The design has been developed in ongoing discussion with the local planning authority (BCC) as part of the Schedule 17 process.

It is noted that as part of scheme design VE 125 implemented a track uplift of +2.4m within Turweston cutting and has also increased the height of Turweston embankment to the north by also +2.4m.

Although there are no KDEs within the Cotswolds and Ridge NCAs this area does include Turweston green bridge. The structures on this section are unaffected by the VE 125 track uplift.

The landscape design seeks to reinforce and transform green infrastructure corridors along the HS2 route.

Landscape elements along the route, will help to provide biodiversity connectivity across and along HS2 by linking into the HS2 advanced works habitat creation areas and the engineering assets at the viaduct, overbridges and water management features (balancing ponds).

The filtration ponds are designed and integrated within the landscape design for nature-based design and management to alleviate flooding and improve water quality in the longer term.

The creation of green infrastructure corridors and the integration of historical elements within the landscape design approach ensures the potential opportunities for access to natural environments and recreational activities. This can include walking, cycling, and other outdoor pursuits, contributing to a healthier and more active lifestyle for local residents and visitors.





Figure 3.7.5 Turweston Cutting 15yrs Landscape screening comparison.

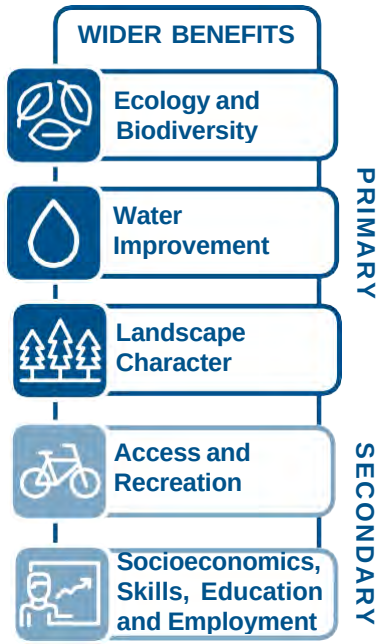




Figure 4.0.1 Close view of Thame Valley Viaduct (50m from Viaduct)

4.0 C2 Landscape Design Approach

4.0
C2 Landscape Design Approach

4.1 Chilterns – Upper Misbourne Valley (South Heath to Wendover)
4.1.1 Landscape Planting
4.1.2 Landscape Earthworks
4.1.3 Landscape Response (Structures, Biodiversity, Heritage)

4.2 Clay Vales of Aylesbury (Stoke Mandeville, South West Aylesbury, Hartwell House and Thame Valley)
4.2.1 Landscape Planting
4.2.2 Landscape Earthworks
4.2.3 Landscape Response (Biodiversity, Structures)

4.3 Midvale Ridge (Waddesdon and Quainton)
4.3.1 Landscape Planting
4.3.2 Landscape Earthworks
4.3.3 Landscape Response (Structures, Biodiversity, Heritage)

4.4 Clay Vales of Buckingham (Calvert, Steeple Claydon, Twyford, Padbury Brook and Chetwode)
4.4.1 Calvert Integration Study
4.4.2 Landscape Planting
4.4.3 Landscape Earthworks
4.4.4 Landscape Response (Structures, Biodiversity, Heritage)

4.5 River Great Ouse Claylands (Newton Purcell, Finmere, Mixbury and Westbury)
4.5.1 Landscape Planting
4.5.2 Landscape Earthworks
4.5.3 Landscape Response (Structures, Biodiversity, Heritage)

4.6 Cotswolds and Whittlebury Ridge (Turweston)
4.6.1 Landscape Vision
4.6.2 Landscape Design
4.6.3 Landscape Response (Structures, Biodiversity, Heritage)

Introduction

This section provides a comprehensive summary of the measures taken to address various landscape design aspects in each identified character area. These aspects encompass planting, earthworks, and the landscape's design response to structures, biodiversity, and heritage assets.

The visualisations used to depict and understand these aspects represent the current stage of design progression. It should be noted that these visualisations may not fully reflect the final construction as they are subject to potential modifications.



Figure 4.1.1 Wendover Dean Viaduct (150m from Viaduct)

Chilterns – Upper Misbourne Valley (South Heath to Wendover) 4.1

The Chilterns NCA is predominantly an Area of Outstanding Natural Beauty (AONB) with a diverse chalk downland landscape, featuring woodlands, farmland, and historic settlements. The landscape design approach aims to conserve the area's sensitive chalk downland. It focuses on planting and earthworks that screen and integrate HS2 while considering the area's distinctiveness, tranquillity, historic landscape, and biodiversity.



Figure 4.1.2 Detail view of Wendover Dean Viaduct pier (90m from Viaduct)

Chilterns – Upper Misbourne Valley (South Heath to Wendover)

4.1

Landscape Planting

Lee & Buckland Common Undulating Plateau LCA. The planting design introduces new woodland blocks to tie into the historic pattern of ridgeline woodland and associated field boundary and lane side hedgerows.

Some of the woodland blocks form part of the advanced planting works being undertaken by a separate contract. Pockets of line side vegetation have been introduced within the upper slopes of the cutting to help break up the linear, unnatural appearance of the vegetation along the top of the South Heath cutting slope.

Wendover Gap LCA. The planting design responds to two different types of vegetation within this area. On the valley sides slopes at Wendover Dean and at Rocky Lane the landscape planting reinstates the existing

field boundary and lane side hedgerow pattern to link up the existing field boundaries and the network of new drainage ditches, balancing ponds and infiltration ponds in this area. Within the valley floor the planting design responds to a local more modern well tree landscape which is influenced by the north south infrastructure planting associated with the A413 and Chilterns Railway line corridor. This local enclosed treed valley floor provides a gateway for the users of the A413 between the rural chalk downland landscape of the Upper Misbourne valley to the south and the settlement of Wendover to the north.

West of the settlement of Wendover, the landscape planting responds to the linear north south pattern of the existing Wendover Bypass, Chilterns Railway and settlement edge vegetation. Line side vegetation is proposed along the Small Dean north embankment to help integrate this large scale engineered feature into the landscape and to break up the line of the noise barrier which is proposed to run along the top of this embankment in views form the Bypass and settlement edge.

Wendover Foothills (West) LCA and Risborough Foothills LCA. The planting design reinstates the historic field boundary and lane side hedgerow planting, along with a new linear woodland belt on both sides, to help screen HS2 in distant elevated views from Coombe Hill and associated National Trust Land to the south west and from the users on the A413 Wendover Bypass and B4009 to the east.

The landscape planting as previously discussed accompany the photo shown adjacent and plans following.

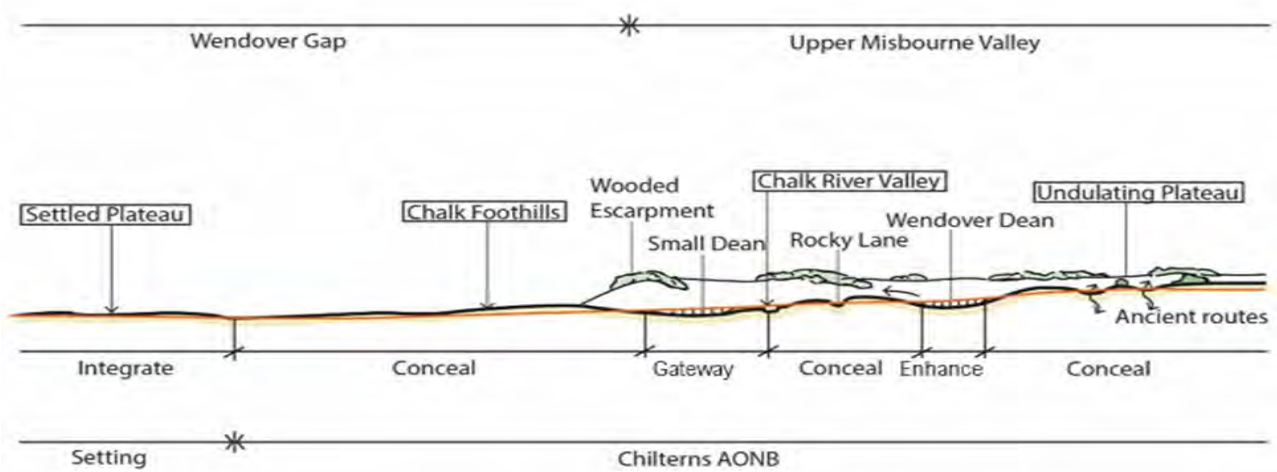


Figure 4.1.3 Diagrammatic Cross Section showing HS2 Route through Chilterns AONB north of the Chilterns Tunnel



Figure 4.1.4 Upper Misbourne Valley - South easterly view from Little London looking to Wendover Dean



Figure 4.1.5 Wendover Dean Planting Plan (Woodland and Hedgerows)

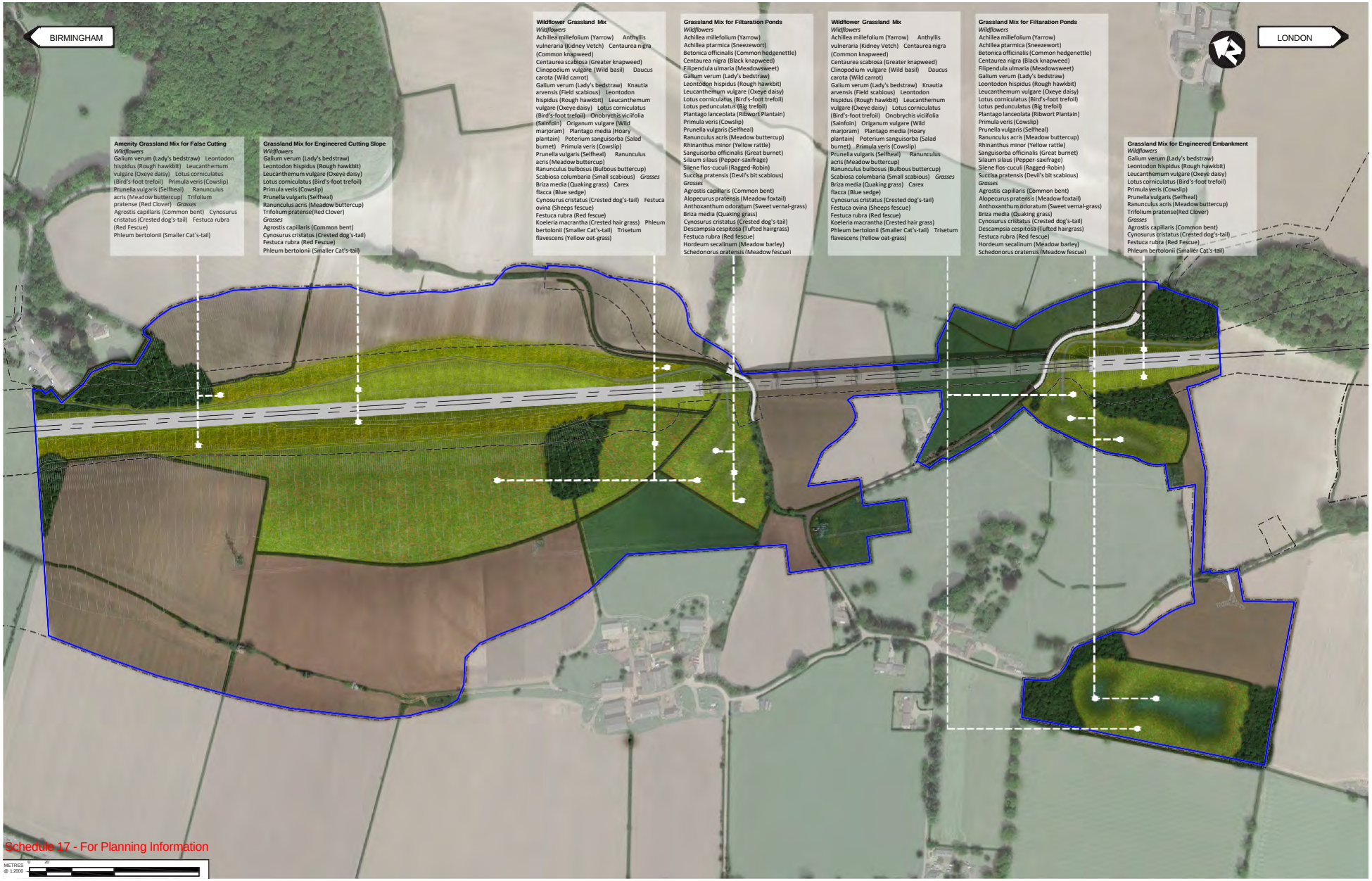


Figure 4.1.6 Wendover Dean Planting Plan (Grasslands)

Chilterns – Upper Misbourne Valley (South Heath to Wendover)

Landscape Earthworks

Lee & Buckland Common Undulating Plateau LCA. There is limited scope for new landscape earthworks within this area due to the sensitivity of the gently rolling local ridgeline along which HS2 traverses, and which include a number of important assets such as ancient woodland, ancient lanes, Grim's Ditch scheduled monument and the setting to historic farmsteads along Kings Lane to the east. The landscape earthworks are limited to pockets of land around the North Chilterns tunnel portal to help set it and the associated buildings into the landscape. An area of sustainable placement with shallow slopes, located on the east side of HS2 within a large open field at Hunts Green, helps to set down into the landscape and screen the South Heath Auto Transformer Station (ATS).

Wendover Gap LCA. The landscape earthworks design responds to localised variations in the topography and how visible they are as features in the landscape. Key landscape earthworks are proposed at Rocky Lane cutting (both sides), Small Dean south embankment (west side) and Small Dean north embankment (both sides). They all form prominent and visible feature and as such the key design driver has been to design them to integrate and set down HS2 into the lower slopes of the valley side and to help screen it in local and wider views across the Upper Misbourne valley.

The landscape earthworks as previously discussed accompany the visuals and sections following.

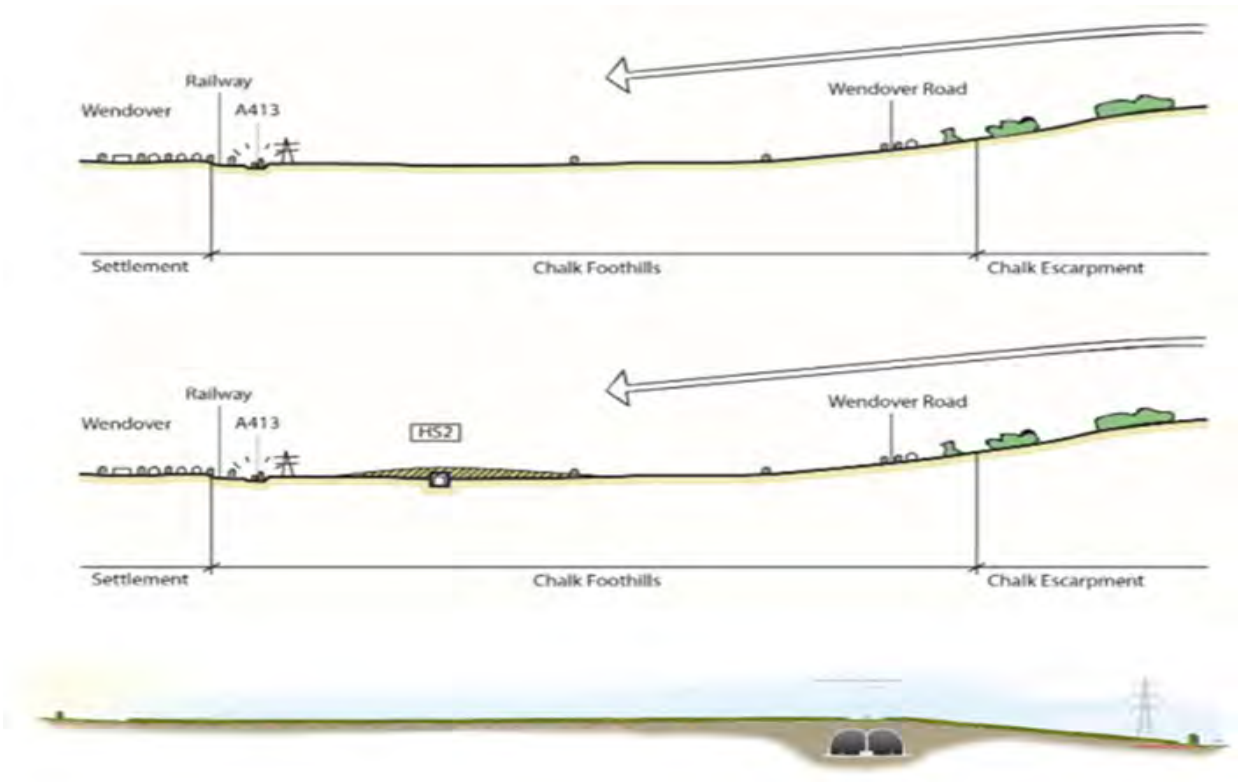


Figure 4.1.7 Diagrammatic Cross Section showing HS2 Tunnel Route through Chalk Foothills

Rocky Lane cutting

The west (downhill) side outward facing slope is to have a 1 in 6 at the south west end, where the land will be managed as wildflower grassland habitat. Northwards the outward slope is slackened out to a 1 in 8 slope so that it can be returned to agriculture. The east (uphill) side is slackened to a 1 in 8 slope and gently graded out to existing contours so that it blends and acts seamlessly with the new landform on the west (downhill) side in easterly views looking up from lower ground

with the valley. The south end of these earthworks will then blend in with the 1 in 2 engineered abutment slope which ties in with the north abutment to the Wendover Dean viaduct.

It is noted that post S17 consent for this earthwork along with the adjacent Wendover Dean North and South embankments (previously engineered slopes with minor slope grading at the toe) have subsequently been modified and this is presently being reviewed prior to a S17 resubmission to Buckinghamshire Council.

Small Dean north embankment

This is a modified engineered embankment of varying height which with varied slope profiles of 1v 2h to 1v 4h on the downside and 1v 2 and 1v 3h on the upside. This asset is an important feature as it links the Small Dean Viaduct and Wendover Green Tunnel South Portals KDEs and as such has been scrutinized by the

Independent Design Panel (IDP) as part of that process. A low earth bund sits atop the upside embankment slope in order to help reduce the massing of the 5m high noise barrier, that sits on top in lower lying views, from the A413 and from Bacombe Lane overbridge.

The upside earthworks have had to be locally adjusted to accommodate the position of a 400kV pylon tower. The earthworks design has also retained much of the A413 roadside vegetation which acts as a buffer to the embankment behind it. The upper north part of this earthwork has been profiled to seamlessly integrate with the earthwork which wraps the Wendover Green Tunnel south portal. Further integration of the embankment and the noise barriers into the landscape is provided

by the landscape planting. On the upside or A413 side the slopes will be planted with a mosaic of grassland, shrubs and trees and on downside or AONB side with a mix of trees and shrubs.

Small Dean south embankmet

The west (downhill) side outward facing slope is to have a 1 in 8 for the south part with a view to returning it to agriculture. The north part of this earthwork is to be gradually steepened so that it blends with the 1 in 2 engineered abutment slope which ties in with the south abutment to the Small Dean viaduct. Where the slope is steeper than 1 in 8, this will be planted up with trees to help create a managed (coppiced) woodland setting to the Small Dean viaduct.

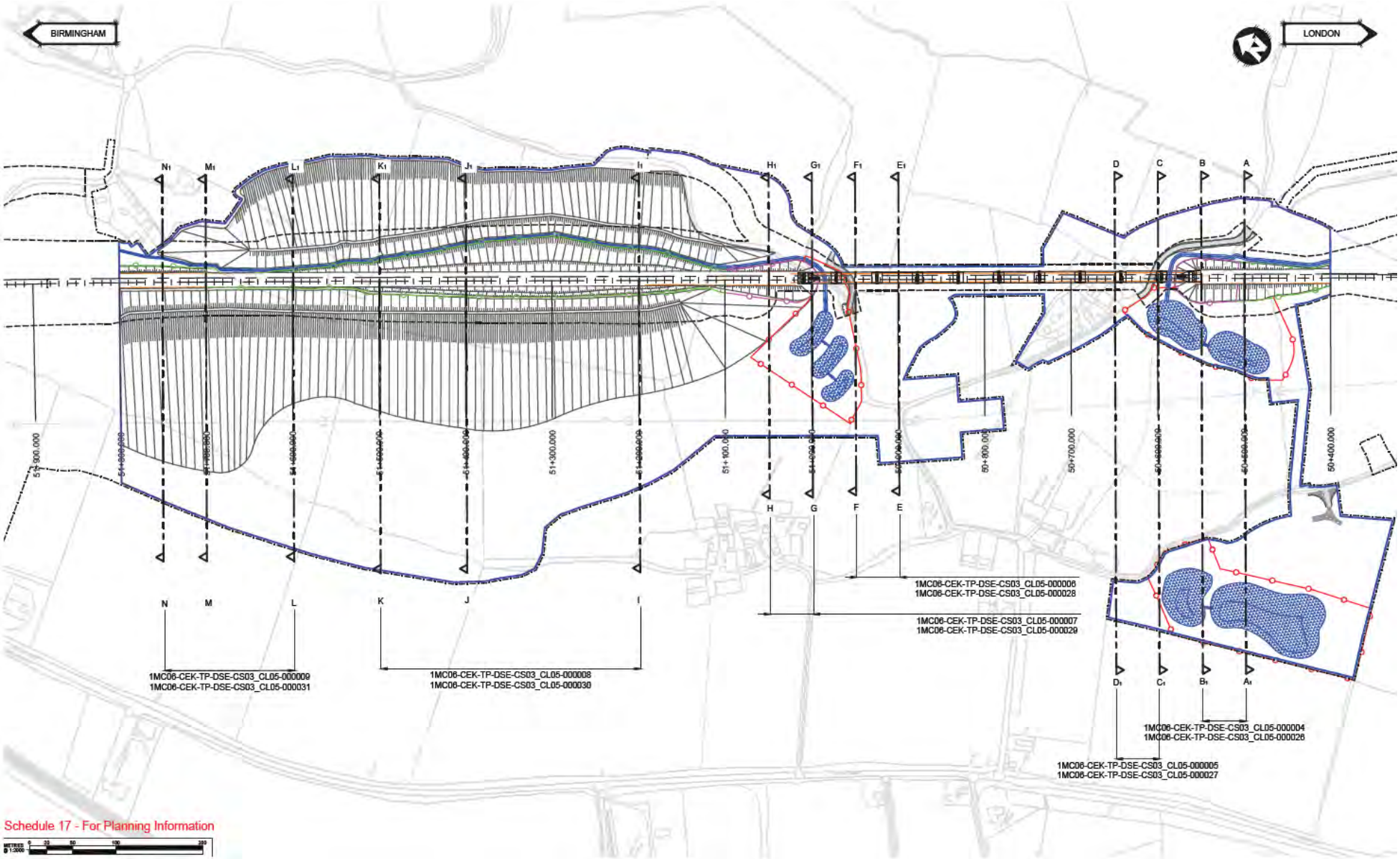


Figure 4.1.8 Wendover Dean Earthworks Plan

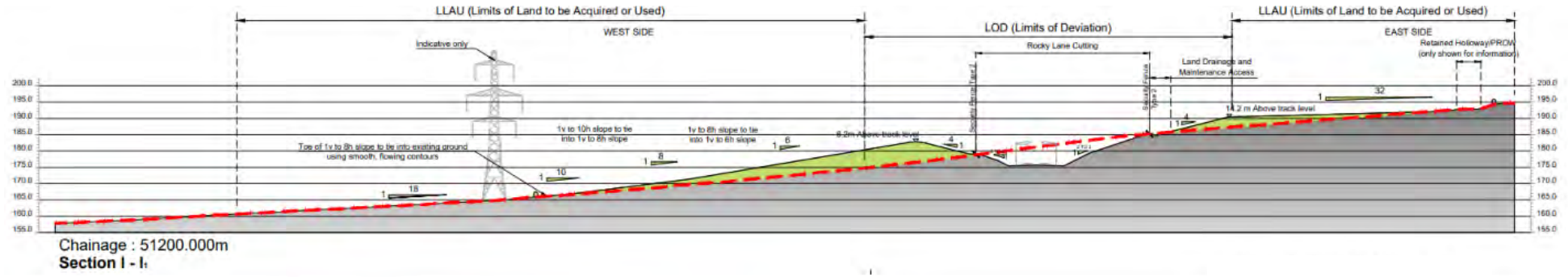


Figure 4.1.9 Rocky Lane Cutting

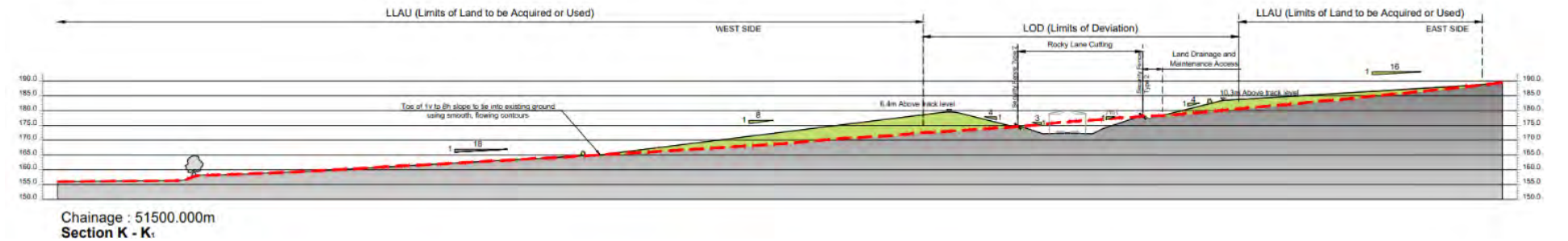


Figure 4.1.10 Small Dean South Embankment



Figure 4.1.11 Wendover Dean / Upper Misbourne Valley - Elevated view looking west from Chiltern Way.

Chilterns – Upper Misbourne Valley (South Heath to Wendover)

Wendover Foothills (West) LCA & Risborough Foothills LCA

The landscape earthworks design responds to the undulating, low lying rolling nature of the landscape and the visual relationship this area has with the more elevated ground of the scarp landscape to the south west. It provides new landform on either side of the Wendover green tunnel, extending out to the LLAU on both sides so that the land rolls over the top of it. The outward facing slopes of the new landform is relaxed to a maximum of a 1 in 8 slope so that most of this area can be returned to agriculture. There was an alternative design of the landform which looked at retaining the Wendover Cricket Club and the introduction of a retaining wall between the green tunnel and the playing pitch. However, the Cricket Club has now been moved and the land has been reinstated.

as part of the wider landscape design approach to the green tunnel. Further north where HS2 emerges from the green tunnel north portal, the landscape earthworks design responds to the low-lying topography by providing a false cutting at Wendover north cutting (west side) to integrate and set down the HS2 alignment into the landscape and to help screen it in wider elevated views from the scarp landscape to the south west.



Figure 4.1.12 Aerial view from above the Wendover Green tunnel South Portal showing new landform looking south along HS2 alignment.



Figure 4.1.13 Aerial view of earthworks and planting screening at the Wendover Green Tunnel South Portal from east (200m from portal entrance)

Chilterns – Upper Misbourne Valley (South Heath to Wendover)

4.1.3 Landscape response to structures

Wendover Dean viaduct (Wendover Gap LCA) - The focus of the landscape is to integrate the very visible viaduct's engineered abutment earthworks into the landscape so that they, in combination with the viaduct creates a balanced, uniform appearance, and allows the landscape to flow beneath the structure. In addition, the location of the filtration ponds adjacent to the viaduct abutments and the alignment of the farm access tracks and PRoW have also been considered so that they fit seamlessly with the existing features.

Through a combination of careful and sensitive engineering, architectural and landscape design the porous portal vents are proposed to be positioned on the roof rather than on the sides, which allows the porous portal sides to be backfilled. The backfill will be profiled to blend in with the earthworks over and on the approaches to the tunnel and in association with a mosaic chalk wildflower grassland, scrub and woodland will overtime help conceal these features. As part of the discussion with BCC a viewing area above the north portal had been considered during the Schedule 17 process.



Figure 4.1.14 View of Wendover Dean Viaduct from Durham Farm site, demonstrating landscape flow beneath structure. (40m from Viaduct).

There are four new GSM-R compounds within the Chilterns AONB (Points 20, 21, 23 and 24). These are at Wendover Dean (new standalone compound), Rocky Lane, within existing Auto Transformer Station (ATS) compound, and at either end of the Wendover Green Tunnel (within the Tunnel Portal compounds). The location of the latter three means that this new feature can rely on the existing mitigation measures that are already in place to help integrate HS2. The mitigation associated with the new compound at Wendover Dean is subject to further design development.

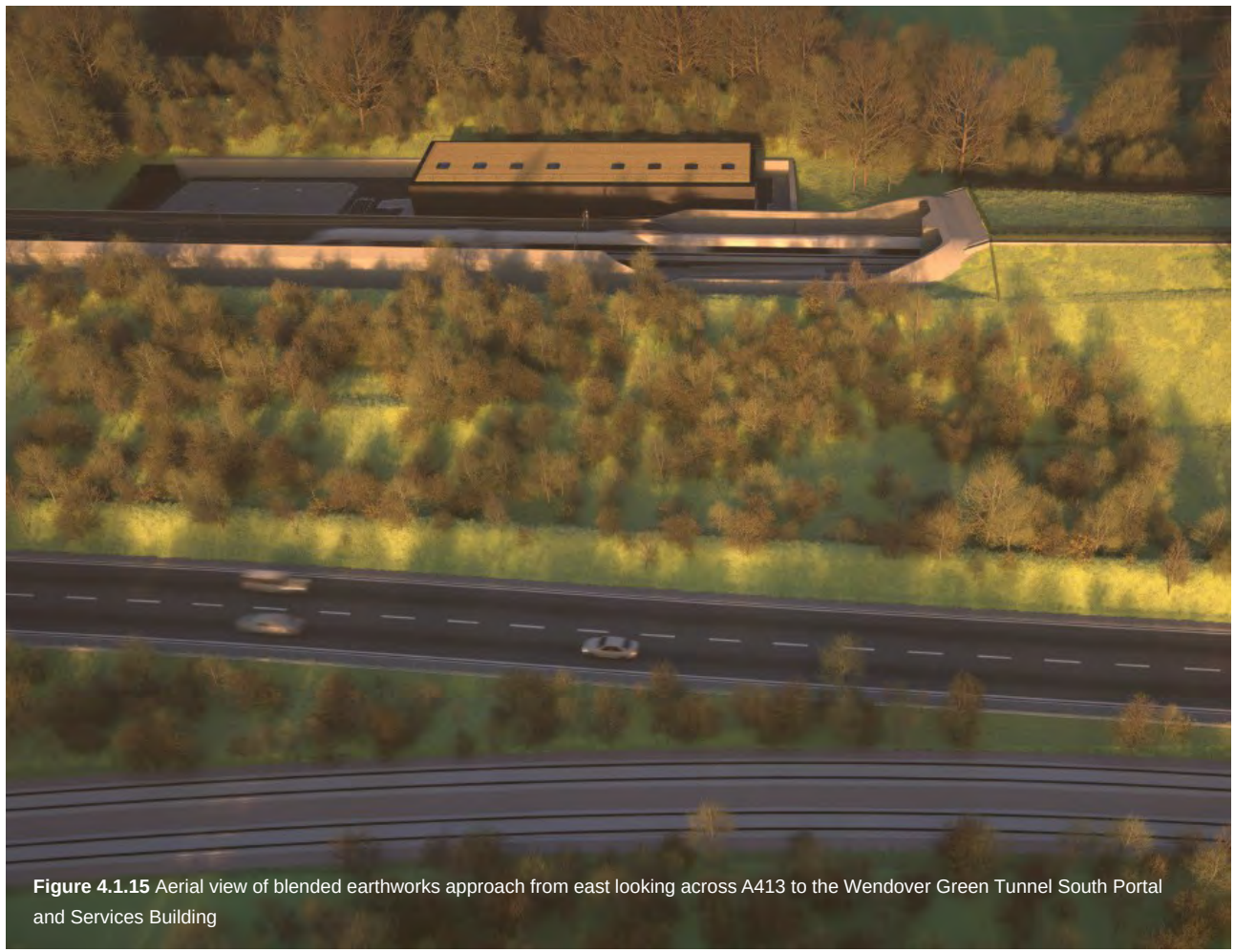


Figure 4.1.15 Aerial view of blended earthworks approach from east looking across A413 to the Wendover Green Tunnel South Portal and Services Building

Chilterns – Upper Misbourne Valley (South Heath to Wendover)

Landscape response to Biodiversity connectivity

The landscape design seeks to reinforce and transform green infrastructure corridors along the route through a combination of woodland and linear tree belt planting, field boundary, lane side and Holloway hedgerows and wildflower grassland. These landscape elements will help to provide biodiversity connectivity across and along HS2 by linking in with the engineering assets at the green tunnel, viaducts, overbridges, underbridges and the water management features such as filtration ponds.

The landscape response to biodiversity as previously discussed accompany the visuals shown adjacent.



Figure 4.1.16 Close view of pier and wildflower grassland planting at Small Dean Viaduct (30m from Viaduct)



Figure 4.1.17 Oblique view of Wendover Dean Viaduct looking across filtration pond, supporting local water management and biodiversity (200m from Viaduct)

Chilterns – Upper Misbourne Valley (South Heath to Wendover)

4.1

Landscape response to Heritage assets

The existing landscape contains a number of scattered historic features which include ancient sunken lanes (Holloways) and an ancient earthwork.

Holloways (Lee & Buckland Common Undulating Plateau LCA and Wendover Gap LCA). Where HS2 severs the existing Holloway and the lane is realigned, the landscape design approach is to retain the existing feature and for the new alignment, working with the highway designers, to recreate the intimate Holloway character. A specific Holloway highway design has been developed as part of the Schedule 17 process which has set the new alignment down through new earthworks to create low false cuttings on both sides with associated hedgerow and tree line planting. This approach has also been applied to other new lanes within the AONB including Small Dean Lane and Grove Farm access.

Grim's Ditch (Lee & Buckland Common Undulating Plateau LCA and Wendover Gap LCA), which presently is delineated in the wider landscape by a line of mature trees. Grim's Ditch is directly impacted by HS2 with a subsequent reduction in the length of the mature tree line which defines it. Discussion with Historic England has been held on how the scheme could minimise the land-take of the South Heath cutting on the heritage asset. The outcome of those discussions has agreed to investigate the introduction of retaining walls at the toe of the cutting slope on both sides of the track. The design development at this location is ongoing and will require S17 consent form Buckinghamshire Council.



Figure 4.1.18 Elevated view of Wendover Dean Viaduct from above the A413 / London Road towards north portal and Holloway section (1075m from Viaduct).

Clay Vales of Aylesbury (Stoke Mandeville, South West Aylesbury, Hartwell House and Thame Valley) 4.2

The landscape design approach for the Clay Vales NCA aims to both conserve and enhance the clay vale landscape, particularly where HS2 is visible. It focuses on integrating and screening HS2, while also prioritising biodiversity through habitat creation at the Thame Floodplain and improved public access and educational opportunities at the Hartwell House site. The design principles of the Chilterns AONB Forum Group, and discussions with the National Trust and Ernest Cooke Trust have informed the landscape design approach.



Figure 4.2.1 Close view of Thame Valley Viaduct in event of flooding



Figure 4.2.2 Longitudinal elevation view of Thame Valley Viaduct and floodplain environment from west.

Clay Vales of Aylesbury (Stoke Mandeville, South West Aylesbury, Hartwell House and Thame Valley) 4.2

4.2.1 Landscape planting

Southern Vale LCA. The planting design introduces blocks of new woodland within the south part of this area within the vicinity of the B4009 Nash Lane overbridge and to the footbridge north of it. This woodland, although not a feature of this landscape, helps set these features in to it and screen them and HS2 in local views and the more distant elevated views from the Chilterns scarp to the south west. Elsewhere the planting design introduces intermittent belts of planting and hedgerows to help break up the line of the scheme in local views and the more distant elevated views to the south west and to reflect the 18th century parliamentary pattern of field enclosure in the area.

Wetland habitat creation is proposed adjacent to the scheme in the vicinity of the watercourses which cross the area. The planting design along the A4010 bypass in the north part of the area introduces roadside hedgerows to the back of both verges.

Haddenham Vale LCA. The planting design introduces a strong liner belt of woodland on the east side of HS2, north of the Chilterns Railway up to the A418 Oxford Road, which will form the buffer between the proposed south west expansion of Aylesbury, HS2 and the landscape of the wider Haddenham Vale LCA to the west.



Figure 4.2.3 Winter view of Thame Valley Viaduct with intermittent belts of planting and hedgerows (650m from Viaduct)

Hartwell House & Golf Course LCA. The planting approach for this area is set out under the following Landscape response to Heritage assets.

Northern Vale LCA. The planting design introduces new hedgerows reflects the pattern of the pre 18th century irregular enclosures of the area to help integrate the alignment within the low-lying landscape when seen in views form the more elevated ground to the west in the vicinity of Waddesdon Hill.

The landscape planting as previously discussed accompany the visuals shown adjacent and plans following.

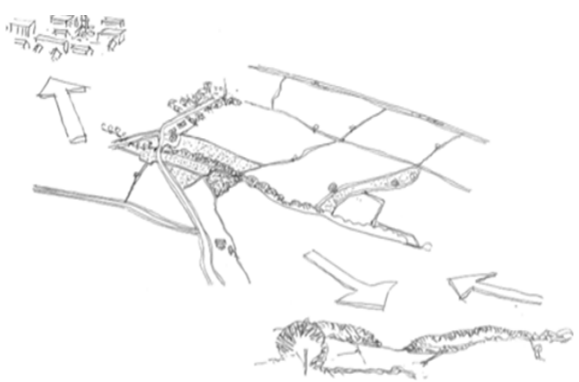


Figure 4.2.4 Response sketch to Southern Vale LCA & Haddenham Vale LCA



Figure 4.2.5 Oblique view of Thame Valley Viaduct across balancing pond supporting wetland habitat and biodiversity

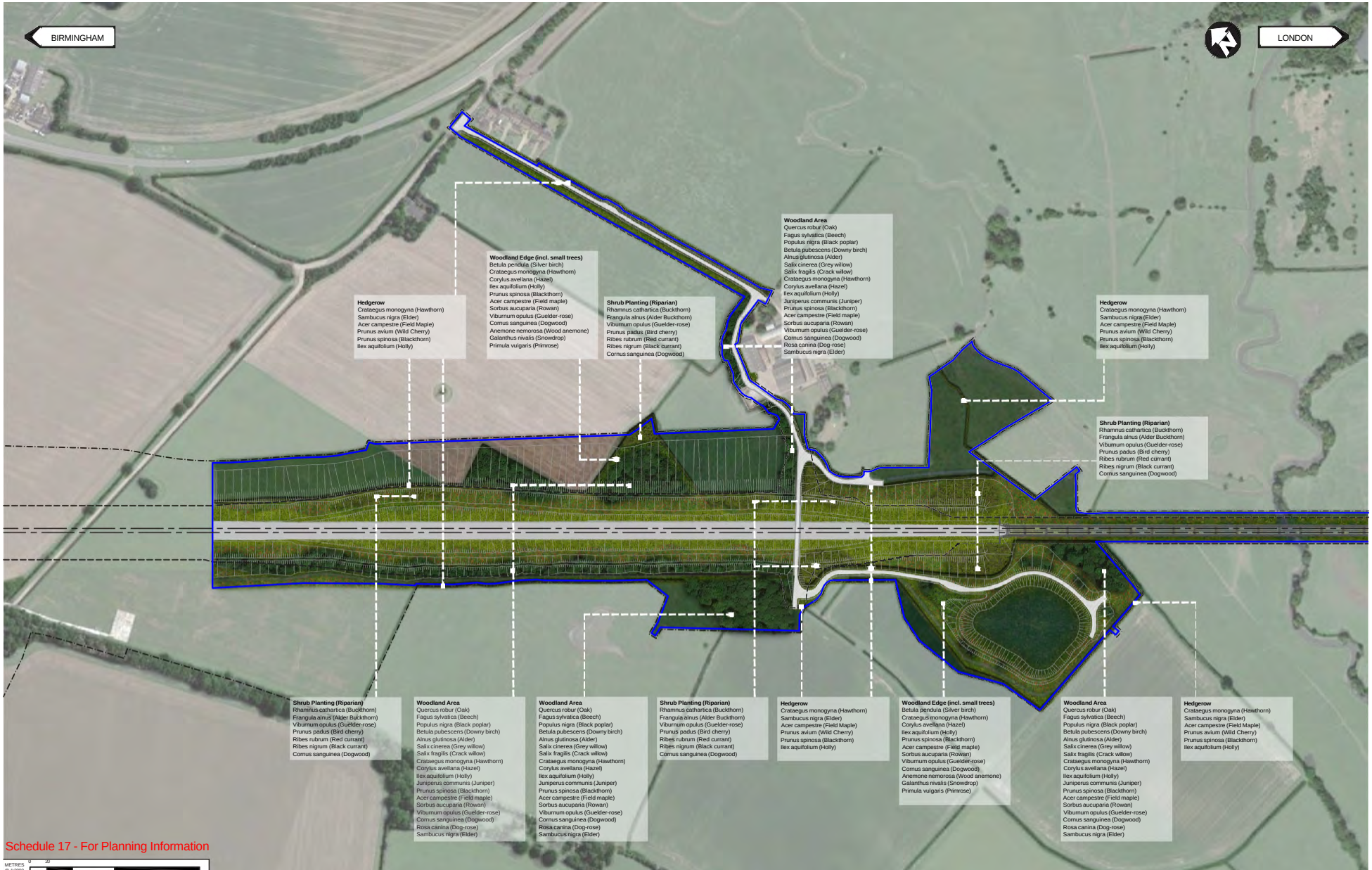


Figure 4.2.6 Thame Valley Planting Plan (Woodland and Hedgerows)

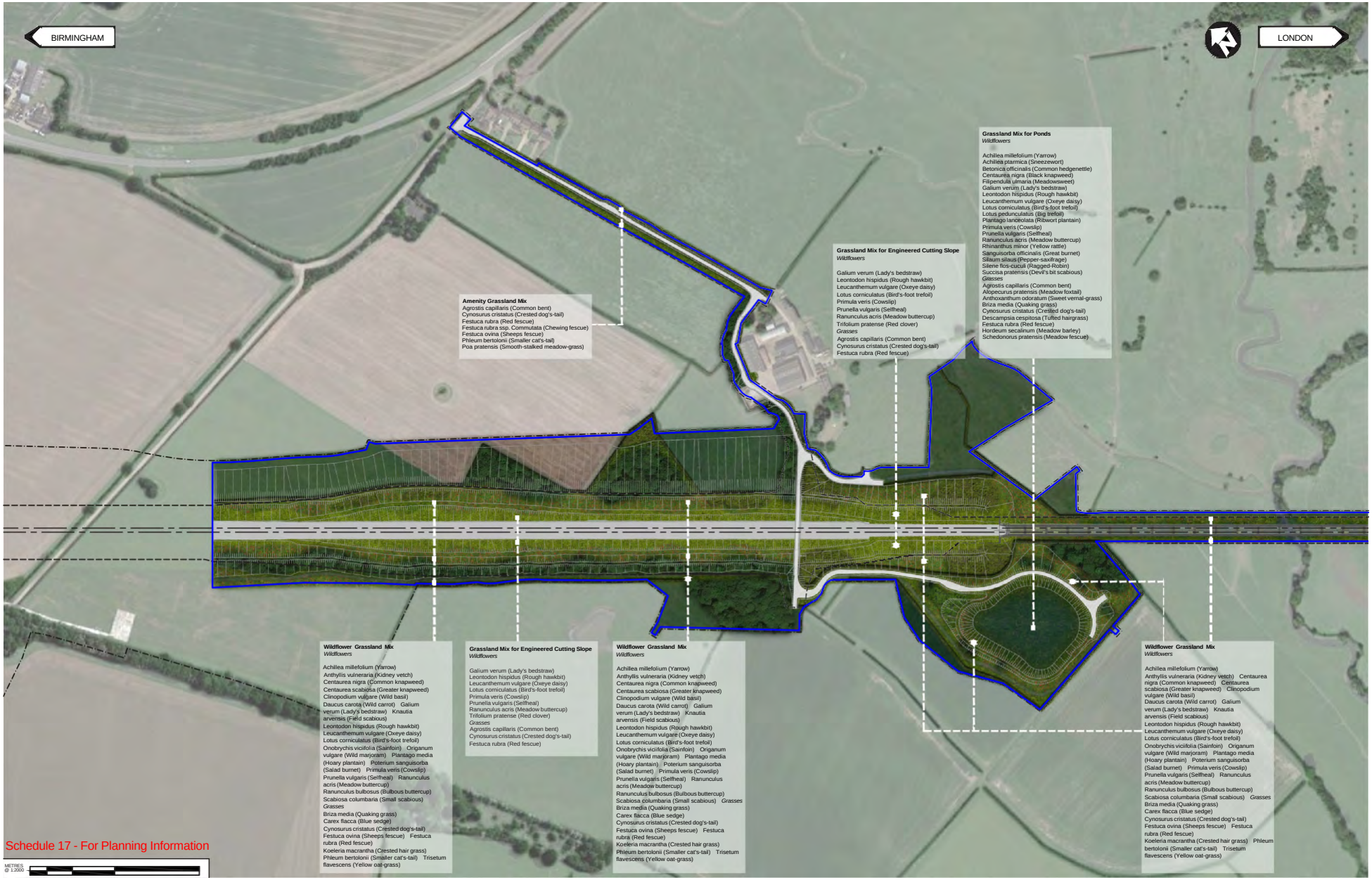


Figure 4.2.7 Thame Valley Planting Plan (Grasslands)

Clay Vales of Aylesbury (Stoke Mandeville, South West Aylesbury, Hartwell House and Thame Valley) 4.2

4.2.2 Landscape earthworks

Southern Vale LCA. False cutting within the north part of the Stoke Mandeville cutting and the south part of the Aylesbury South cutting (east side) to help set down HS2 and the associated accommodation bridge in the landscape and screen it in views form the settlement of Stoke Mandeville. The outward facing slopes of the new landform is relaxed to a maximum of 1 in 8 so that they can be returned to agriculture.

Haddenham LCA. False cuttings are provided along both the Aylesbury south embankment and Aylesbury north embankment (both sides) to help set down HS2 and the associated PRA line overbridge, the accommodation overbridges and the A418 overbridge in the landscape and screen it in views form the settlement of Aylesbury. The western outward facing slopes of this new landform is relaxed to a maximum of 1 in 8 so that they can be returned to agriculture. The eastern outward slopes have been designed to a 1 in 4 to minimise footprint of the scheme on the adjacent future development land. The Detailed Design of these earthworks takes account of the various footpath and bridleways which presently cross over the HS2 alignment at this location and are integrated with the emerging urban form on the east side.

It is noted that recent design development is looking to remove a 800m section of the landscape earthworks on the east side of HS2.

This affects a section of the Aylesbury south cutting and Aylesbury south embankment in order to accommodate a new link road which forms part of the adjacent new urban development. The design development of this area is ongoing.

The Hartwell House & Golf Course LCA. A key element of the landscape earthworks design is the Green Banks Project which have been introduced to the scheme through U&A 1071. This required the provision of new landscape earthworks and an idea for a green wall on the downside, adjacent to HS2 in the immediate environs of Hartwell House. As a consequence of the discussions with the National Trust and their advisor new landscape earthworks are positioned on both sides of HS2 with a crest height of 5m above rail to help Integrate and screen the Oxford Road embankment and associated noise barriers. In order to minimise the footprint of the earthworks the inward slope facing i.e., the slope facing HS2 has been designed to be as steep as possible i.e., 1v to xh, with an outward slope of 1v to 4h so that it can be planted up with woodland.

The presence of mature vegetation not only provides an effective screen to Hartwell House but also helps to contain HS2 within its immediate setting. As a result, the downside earthworks here are relatively shorter in length compared to the upside.

The idea of the green wall was considered early on but in discussion with then the National trust and their advisor it was agreed that it was not practical due to concerns about its overall effectiveness, over shading from the adjacent taller mature trees, irrigation and maintenance challenges. An alternative design to plant a dense evergreen hedge at the back of the noise barrier access was agreed, which would supplement the effective screening already offered by the existing trees.

During the design development consultation process with National Trust, they raised a concern regarding the impact of the ES assessed landscape earthworks on the important treed avenue which provided a key historic vista from the front entrance of the House, positioned on the downside of HS2 at Whaddon Hill cutting. The purpose of the earthworks was to provide a natural screen to the security fence and overhead catenary system (OCS), but its footprint would directly impact on a number of establishing existing trees which form the avenue. It was initially agreed in discussion with the National Trust and their advisor to remove the earthwork as it was considered that its effectiveness as a screen, taking account distance, would be limited and that the screening could be provided by a hedgerow running parallel with the HS2 security fence.

It is noted that this earthwork was requested by the National Trust as part of the partitioning during the passing of the HS2 Act.

Subsequently as part of the AVDC P7 Schedule 17 application a smaller version of the earthworks with a much-reduced footprint was reintroduced to provide the screening of the security fence and OCS. The smaller footprint meant the establishing avenue trees would be saved and removed the need for a hedgerow along the line of the security fence.

Northern Vale. The earthworks landscape design responds to the low lying, open character of this landscape and provides a false cutting along Putlowes cutting and Bicester Road Embankment (both sides) to help set down HS2 and the associated accommodation bridge in the landscape to minimise its impacts on the setting of the historic parkland landscapes to the west and views out from areas of elevated ground, such as the publicly accessible Waddesdon Hill. The outward facing slopes of the new landform is relaxed to a maximum of 1 in 8 so that they can be returned to agriculture.

The landscape earthworks as previously discussed accompany the visuals and sections shown sections following.



Figure 4.2.8 Response sketch to highlighting avenue feature with correspondence to Hartwell House and Golf Course LCA



Figure 4.2.9 Photograph of north front of Hartwell House

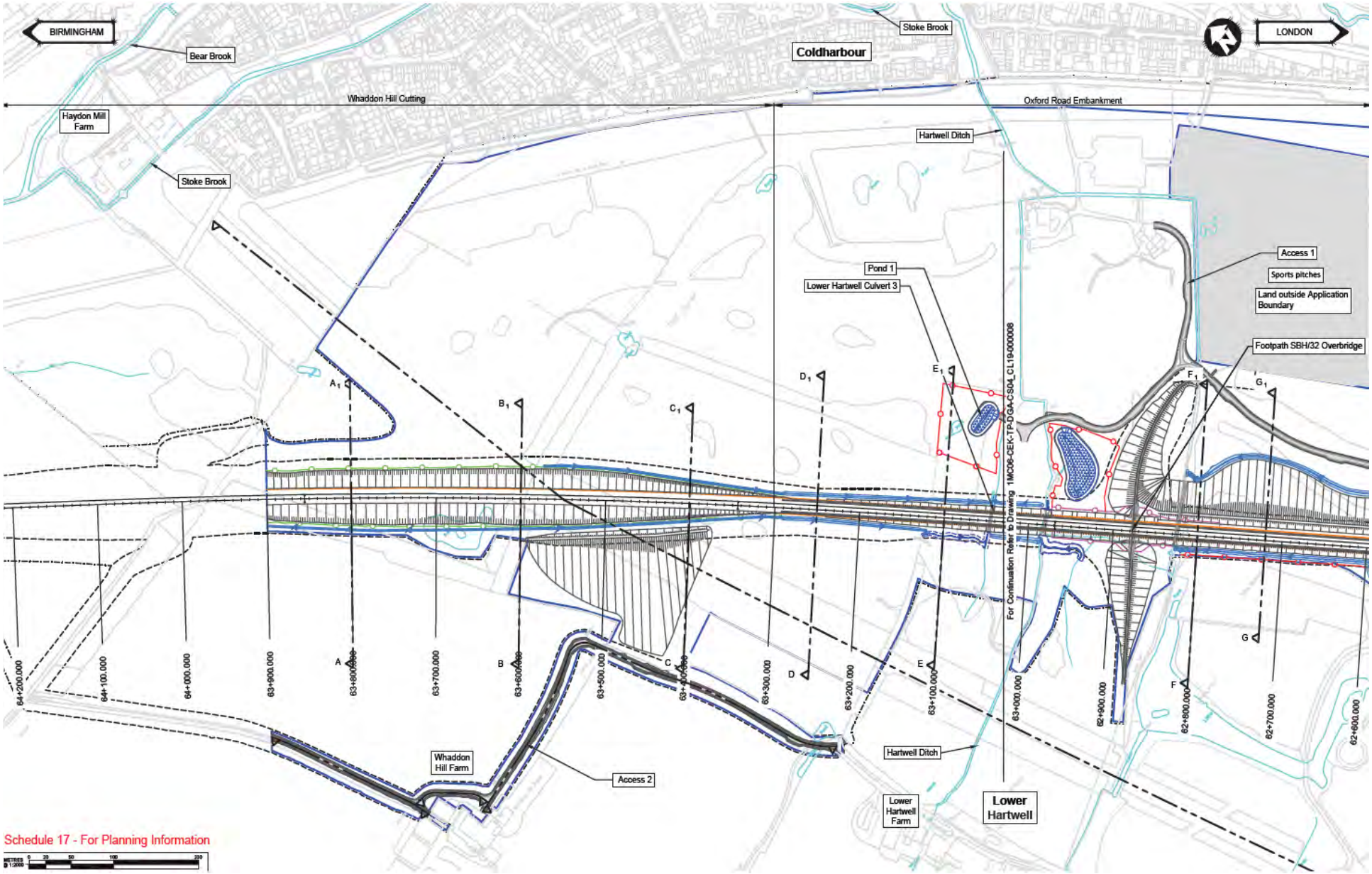


Figure 4.2.10 Hartwell Earthworks Plan

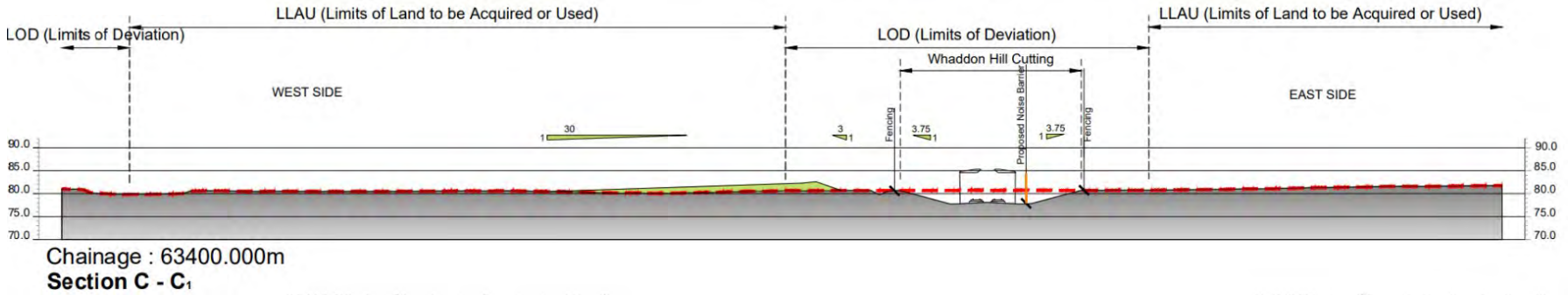


Figure 4.2.11 Whaddon Hill Cutting

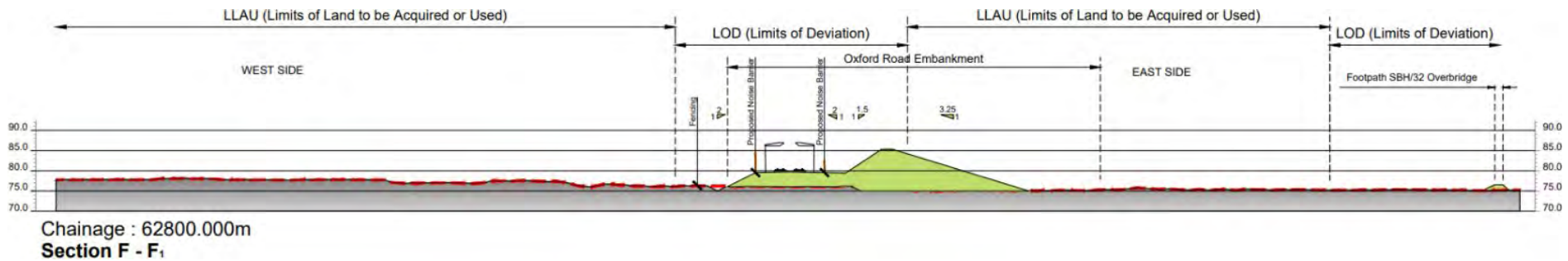


Figure 4.2.12 Oxford Road Embankment



Figure 4.2.13 Photo of Hartwell House grounds

Clay Vales of Aylesbury (Stoke Mandeville, South West Aylesbury, Hartwell House and Thame Valley)

4.2.3 Landscape response to Biodiversity connectivity

The landscape design seeks to reinforce and transform green infrastructure corridors along the route through linear tree belts, field boundary and lane side hedgerows, riparian vegetation along watercourses and wetland habitat creation. These landscape elements will help to provide biodiversity connectivity across and along HS2 by linking into the engineering assets at the viaduct, overbridges, drainage ditches and culverts and water management features (balancing ponds).

Landscape response to structures

The KDE within this clay vales landscape is the Thame Valley viaduct. The landscape design for this asset has been informed by comments from the Design Panel presentation as well as the discussion with the local authority (BCC) as part of the Schedule 17 process and at Detailed Design.

It is noted that some overbridges have been affected by VE 030 track uplift. Most are relatively minor changes of +1m or less. The change has also resulted in modification to their approach ramps. There are no structures within this area which are affected by VE106. It is also noted that two overbridges Bridleway SBH/19 and Footpath SBH/27 within the Haddenham Vale

LCA are to be replaced with one structure positioned between the two.



Figure 4.2.14 Detail view of Thame Valley Viaduct pier, showing support for wetland habitat and water management during a flood event.

Thame Valley Viaduct (Northern Vale LCA) - HS2 crosses the River Thame and its associated floodplain to the north west of Aylesbury on a low long viaduct. This part of the Thame Valley is relatively inaccessible, although the horizontal beam and noise barrier of this structure would form a visible line across the floodplain in mid distance views form the public footpath network and isolated farmsteads to the south west and in some isolated mid distance views to the north east. The low elevation of the structure, with an air draught of approximately 3.0m results in severance of the existing field pattern within the floodplain and an unattractive dark, inhospitable space beneath the viaduct.

A key design consideration for this structure has been to reconnect the floodplain and flood compensation areas on both sides of the viaduct and to maximise opportunities for wetland habitat creation. The landscape design has introduced swales and reed beds which run along both sides of the viaduct and created depressions under the viaduct between the piers into which the reed beds can encroach. These elements will provide biodiversity benefit as well as security and protection for the viaduct.

There are two new GSM-R compounds within this section (Points 26 and 31). These are at Stoke Mandeville (new standalone compound) and Putlowes Farm (new standalone compound), The mitigation associated with these new compounds are subject to further design development. It is noted that the footprint of Point 31 (Putlowes) impacts on a section of ES mitigation landscape earthworks.



Figure 4.2.15 View of Thame Valley Viaduct across balancing pond, supporting flood plain and wetland habitat (75m from Viaduct)

Midvale Ridge (Waddesdon and Quainton) 4.3

The landscape design approach for the Midvale Ridge LCA aims to preserve the locally valued clay vale landscape, which includes the iconic Waddesdon Manor and its historic parks and gardens. The approach will ensure that HS2 blends into the surroundings

as it incorporates input from the National Trust and Waddesdon Estate.

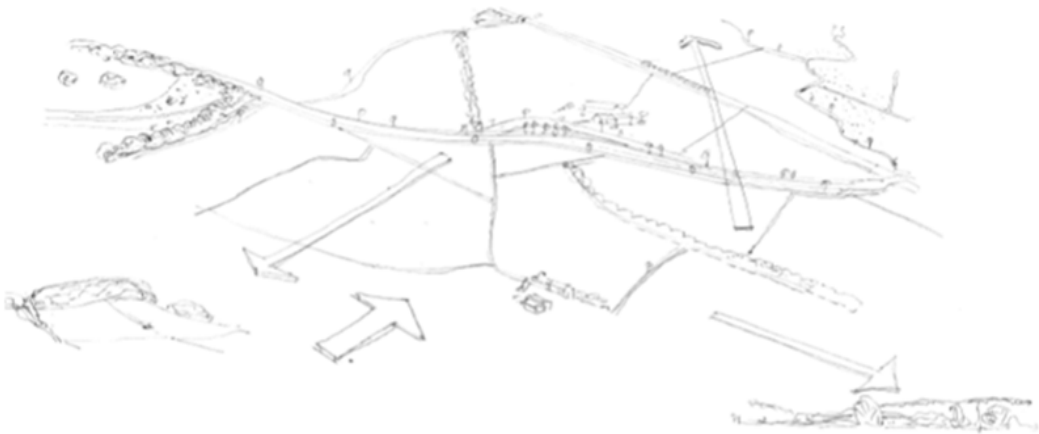


Figure 4.3.1 Response sketch to Northern Vale and Waddesdon- Eythrope Parkland landscape character areas



Figure 4.3.2 Midvale Ridge Historic Hedgerow pattern with featured Oak trees.

Landscape planting

The landscape planting design for the Midvale Ridge NCA reflects the local native species found within the low lying and typically wet clay soils of this landscape. The planting design approach varies across Community Forum Areas (CFA) and is designed to reflect the local context and existing vegetation to enhance and reinforce the green infrastructure setting of CFA 12 (see Appendix C for information on Landscape Detail Descriptions and drawing references). The typical species mix selection for this area has been subject to further discussion with the local planning authority (BCC) as part of the Schedule 17 and Bringing Into Use processes and has informed the species choices at Detailed Design.

Northern Vale LCA. The planting design introduces new woodland blocks and linear tree belts to help set down the scheme into the landscape and in particular hide it in the wider setting to the Waddesdon Manor historic parkland to the west. The planting design for the A41 diversion introduces a mixture of roadside hedgerows located at the back of the verge linking in with new tree belts and tree blocks which help to set down the new A41 junctions into the landscape and minimise their impacts on the adjacent setting to the Waddesdon Manor estate.

Westcott Claylands LCA. The planting design introduces new hedgerows to reflect the pattern of 18th and 19th century enclosures of the area to help integrate the alignment within the low-lying landscape when seen in views form the more elevated ground to the east in the vicinity of Quainton Hill. The planting design introduces roadside hedgerows along the Station Road realignment at the north end of the area.

The landscape planting as previously discussed accompany the plans following.

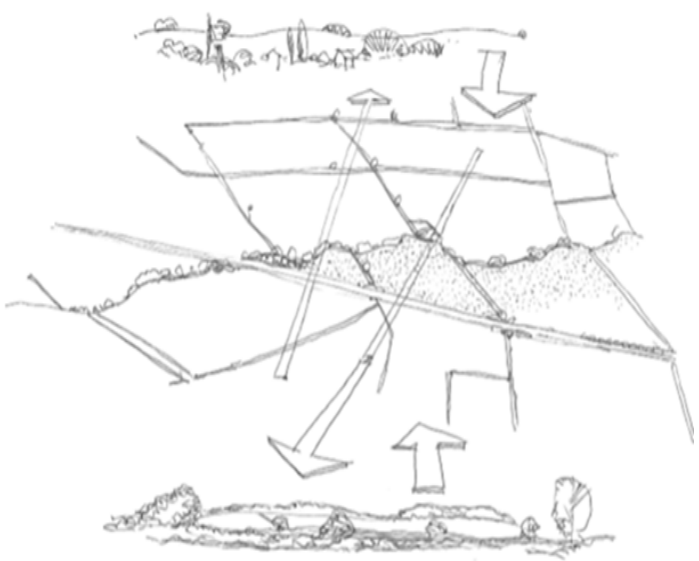


Figure 4.3.3 Response sketch to Westcott Claylands and Kingswood Wooded Farmland landscape character areas.

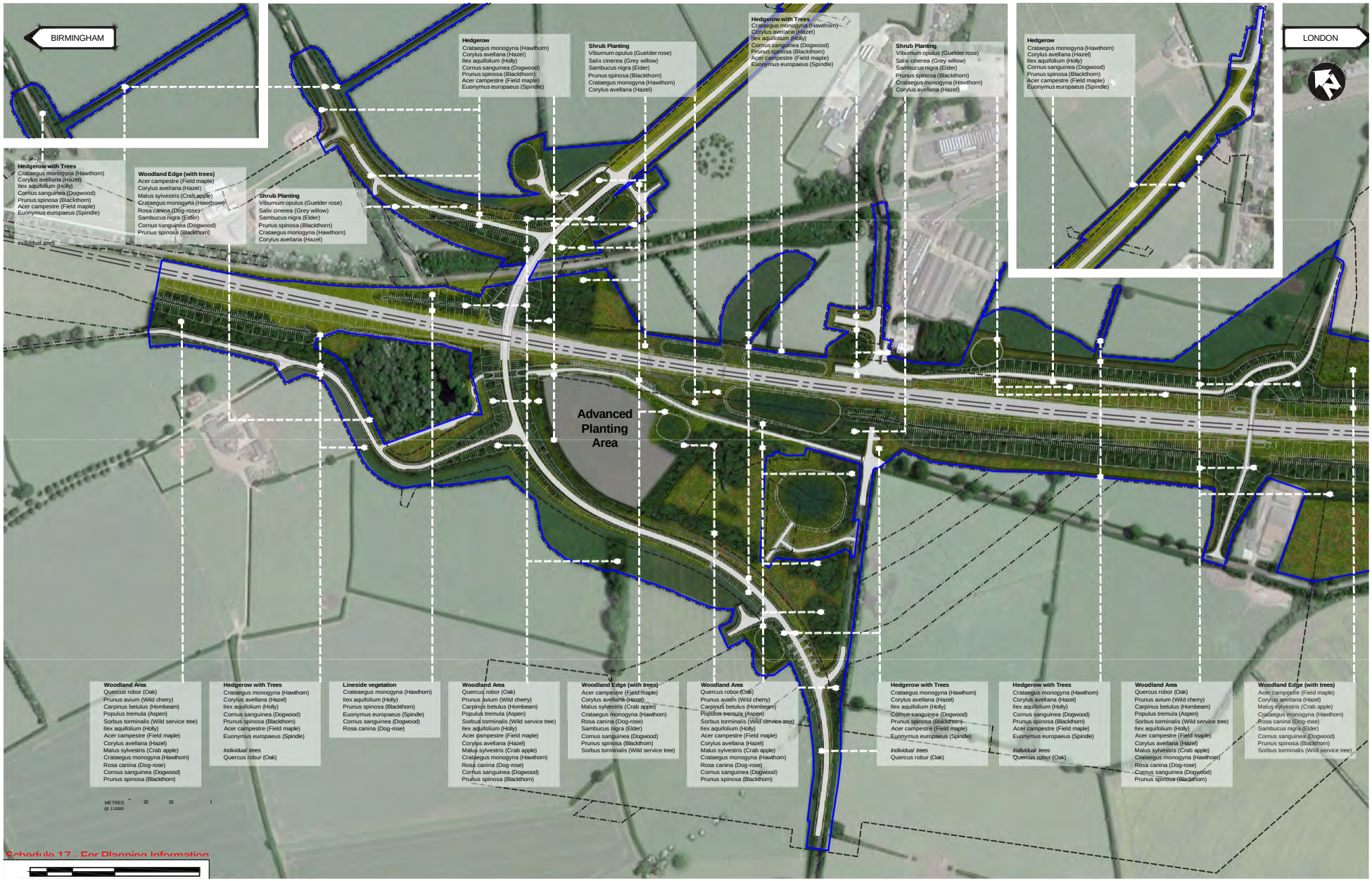


Figure 4.3.4 Waddesdon to Quainton Planting Plan (Woodland and Hedgerows)

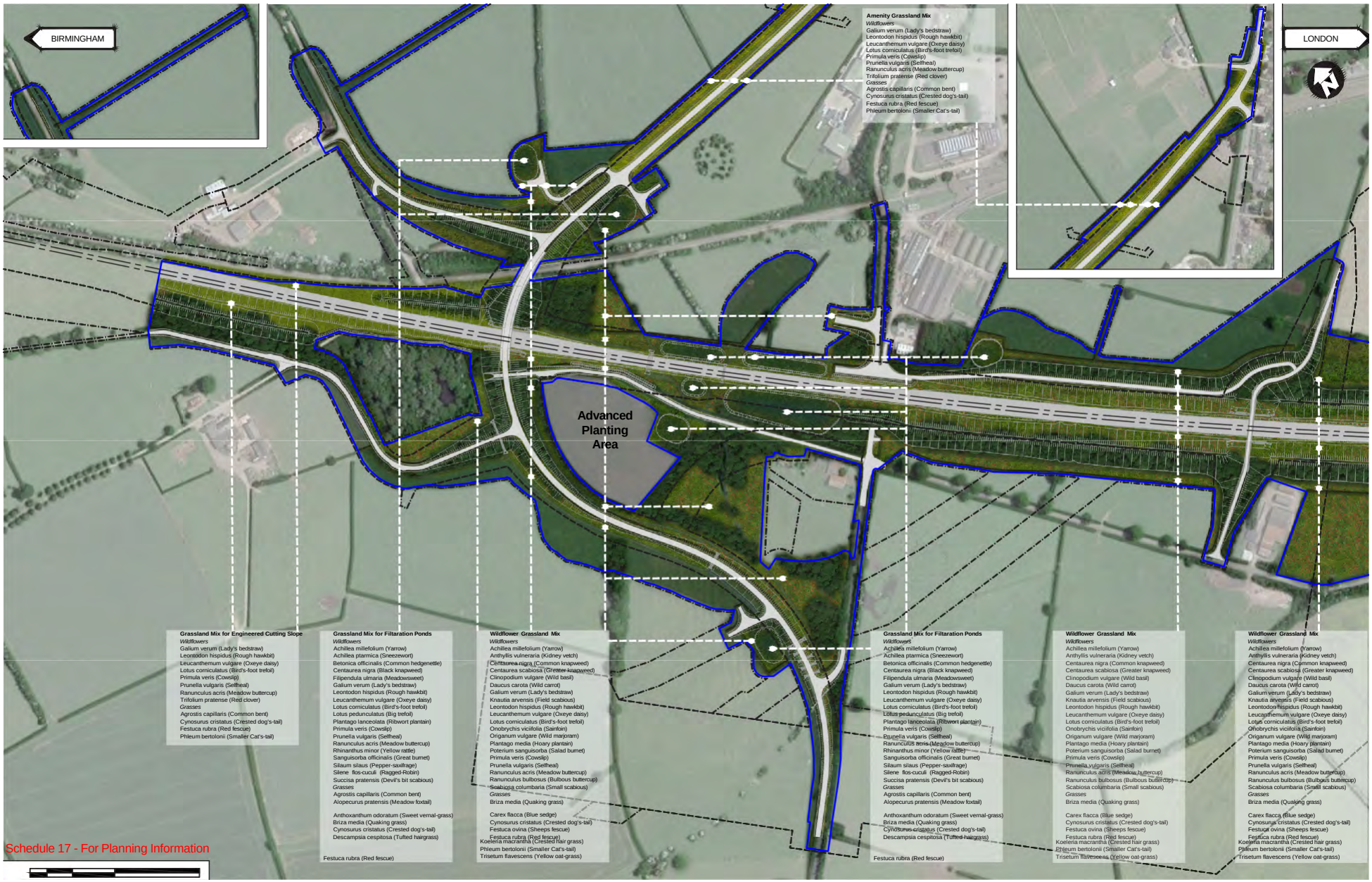


Figure 4.3.5 Waddesdon to Quainton Planting Plan (Grasslands)

Midvale Ridge (Waddesdon and Quainton) 4.3

Landscape earthworks

Northern Vale LCA. The earthworks landscape design responds to the low lying, flat, open character of this landscape and provides a false cutting along the north part of the Bicester Road Embankment (both sides) to help set down HS2 and the new A41 overbridge in the landscape and to minimise its impacts on the setting of the Waddesdon Manor estate historic parkland to the west.

Westcott Claylands LCA. The earthworks landscape design responds to the low lying, sloping, open character of this landscape and provides a false cutting along Waddesdon South cutting (west side) to help reinforce the integration and screening of HS2 from the settlement of Waddesdon. Northwards, the earthworks design provides a false cutting which extends from the north end of Waddesdon South cutting to the middle part of the Quainton South embankment (both sides) to help set down HS2 in the landscape and to minimise its impacts on views from the settlement of Quainton and more distant elevated views from Quainton Hill to the east. The western outward facing slopes of these new landforms is relaxed to a 1 in 8 so that they can be returned to agriculture.

The landscape earthworks as previously discussed accompany the adjacent plan and sections.

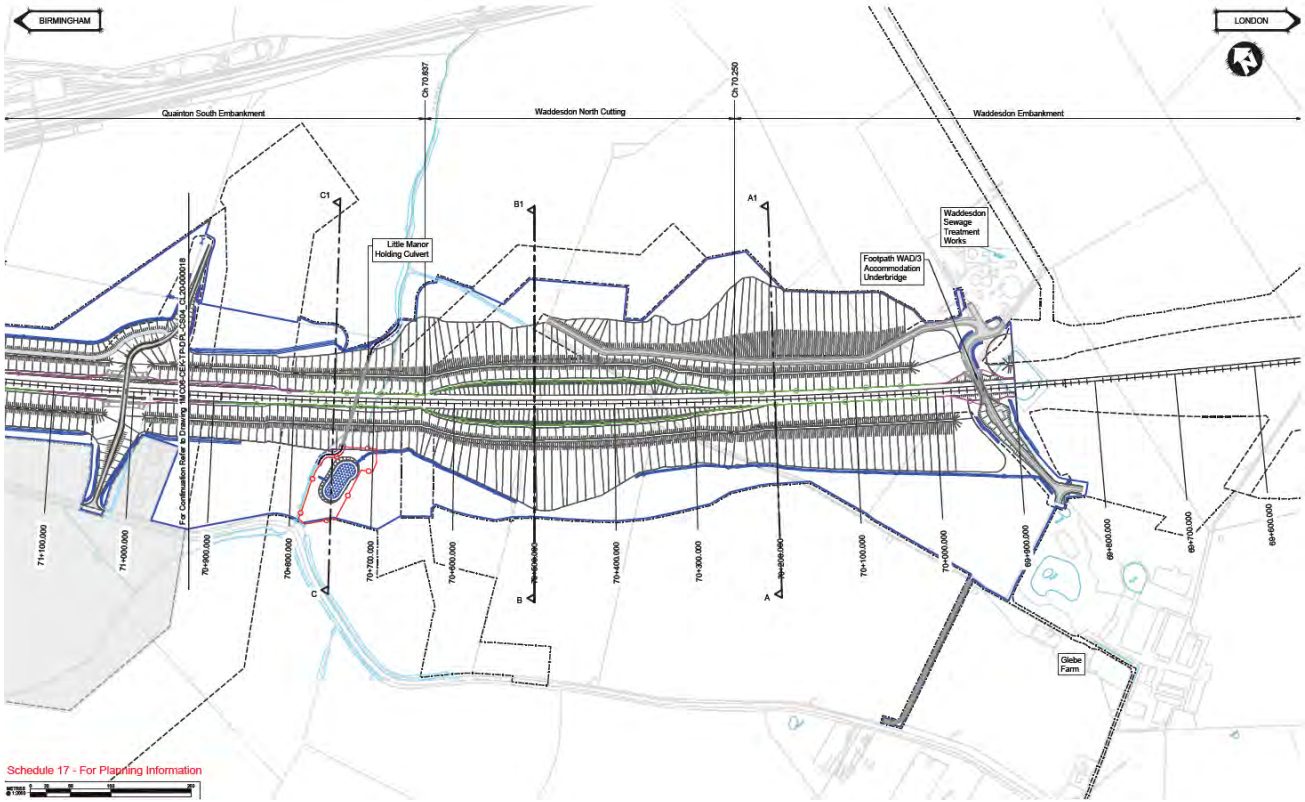


Figure 4.3.6 Waddesdon to Quainton Earthworks Plan

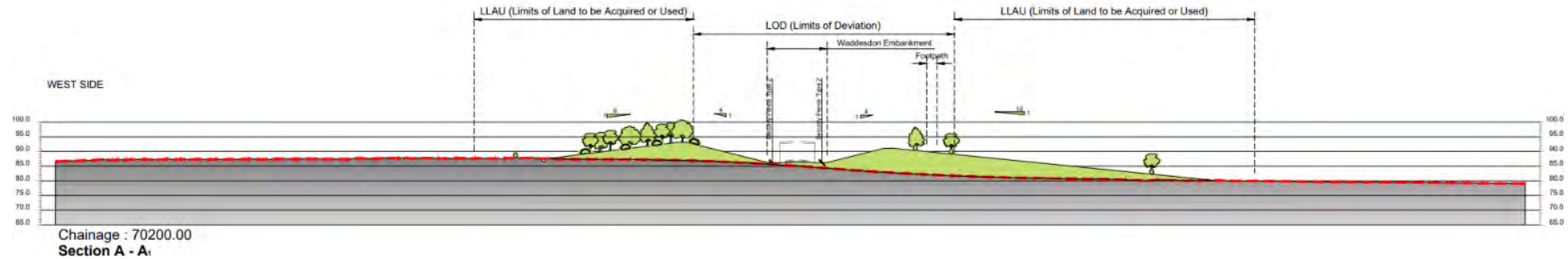


Figure 4.3.7 Waddesdon Embankment

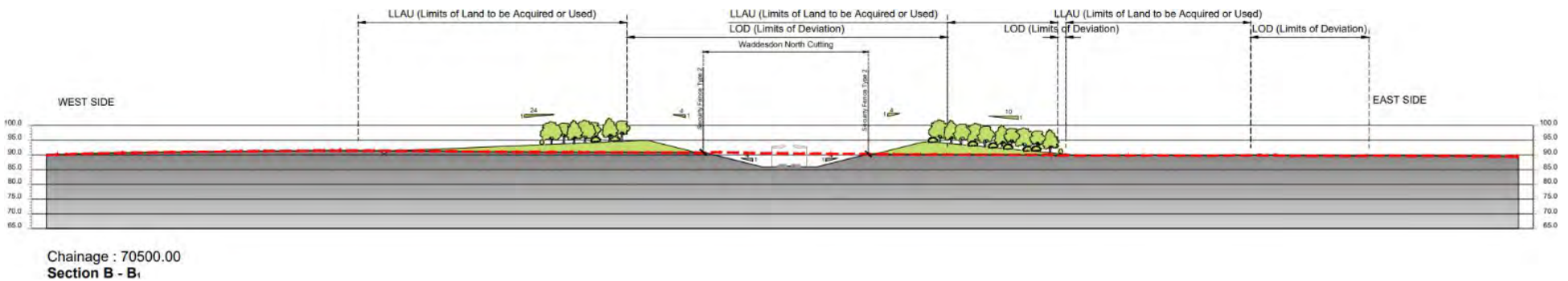


Figure 4.3.8 Waddesdon North Cutting

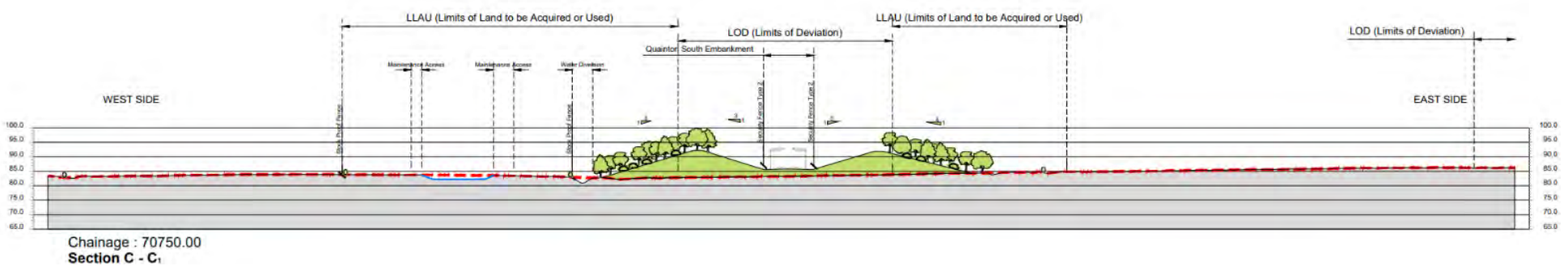


Figure 4.3.9 Quainton South Embankment

Midvale Ridge (Waddesdon and Quainton) 4.3

Landscape response to Biodiversity connectivity

The landscape design seeks to reinforce and transform green infrastructure corridors along the route through linear tree belts, field boundary and lane side hedgerows, riparian vegetation along watercourses and wetland habitat creation. These landscape elements will help to provide biodiversity connectivity across and along HS2 by linking into the engineering assets at the overbridges, drainage ditches and culverts and water management features (balancing ponds).

Landscape response to structures

The Station Road (A41) overbridge carries the trunk road over HS2 just east of the Waddesdon Estate. The design of this structure has been modified in line with the design development of all overbridges and includes a taller parapet of single height across the length of the structure. Grass verges are also proposed.

There are two new GSM-R compounds within the Midvale Ridge (Points 32 and 33). These are at Fleet Marston within the existing Auto Transformer Station (ATS) compound and at the north end of Waddesdon south cutting (new standalone compound). The former, as a new feature within an existing compound, can rely on the existing mitigation measures that are already in place to help integrate HS2. The mitigation associated with the new compound at Waddesdon south cutting is subject to further design development. It is noted that the footprint of Point 33 (Waddesdon south cutting) impacts on a section of ES mitigation landscape earthworks.

Landscape response to Heritage assets

The existing landscape includes the National Trust's Grade 1 listed Waddesdon Manor and its associated Grade 1 listed historic park and garden

Waddesdon Manor sits within the Waddesdon – Eythrope Parkland LCA which lies to the west of HS2 and mostly on elevated ground. The south east edge of the parkland borders the existing A41 which is severed by HS2, resulting in the A41 realignment and a section of the existing road being stopped up, albeit still requiring use as part of the local road network. Elements of the scheme such as the lit roundabout junctions on the realigned A41, the A41 overbridge and Bicester Road embankment sit in close proximity to park and as a result will impact on its eastern setting. U&A sets out a number of landscape design features which are required to provide further integration of the scheme. This includes strengthening the woodland around the new road junction immediately west of the A41 overbridge, and a new copse on the west side of the A41 junction immediately adjacent to the estate boundary, along with proposals for the A41 road narrowing and proposals for ecology planting between the stopped up A41 and Bicester Road embankment.

Several landscape design iterations for the realigned A41 and its redundant section have been developed in consultation with Buckinghamshire Council, the National Trust and Waddesdon Estate and in particular the design for the area outside the Grand Lodge. The design opportunities for the A41 road narrowing have been severally constrained by highway safety considerations required by Buckinghamshire Council and by existing road verge utilities. Although the carriageway width for the former section of the

A41 has been narrowed the junction arrangement outside the Grand Lodge still maintains the existing T junction arrangement. South of this point, the A41

has been further narrowed to provide farm access and HS2 maintenance access only. New roadside planting along the A41 road narrowing section is constrained by existing and proposed verge utilities. The TCPA for the A41 road narrowing has recently been submitted to BCC for approval.



Figure 4.3.10 Oblique view of Station Road Overbridge through green verge screen planting to the southeast (400m from structure). Cycle path opening is also obscured from view.

Clay Vales of Buckingham (Calvert, Steeple Claydon, Twyford, Padbury Brook and Chetwode)

4.4

4.4.1 Calvert Integration Study

The HS2 Calvert Area Context Integration Study (CIS) aims to identify core opportunities for integration within the Calvert area, building on the area's unique physical, social and environmental context. An improved understanding of this context and close analysis of key opportunities will help HS2, the local authority and local partners to build a rich, positive legacy within the area. Effective integration is a key element of HS2 Ltd's Design Vision, helping to meet objectives relating the three core areas of People, Place and Time. It is implicit throughout the design vision that successful design involves the highest quality of local integration beyond the delivery of the railway, through innovative design initiatives seeking to improve user experience for local people.

The HS2 Calvert Area CIS was commissioned by the HS2 Urban Design and Integration team in 2022.

The study is delivered in full by EKFB and ASC, subcontractors of HS2 Ltd for this area of Phase 1.

The study culminates in the recommendation of a range of key opportunities for six themed recreational routes for further development, which will improve the user experience of the area and celebrate and enhance its existing character.



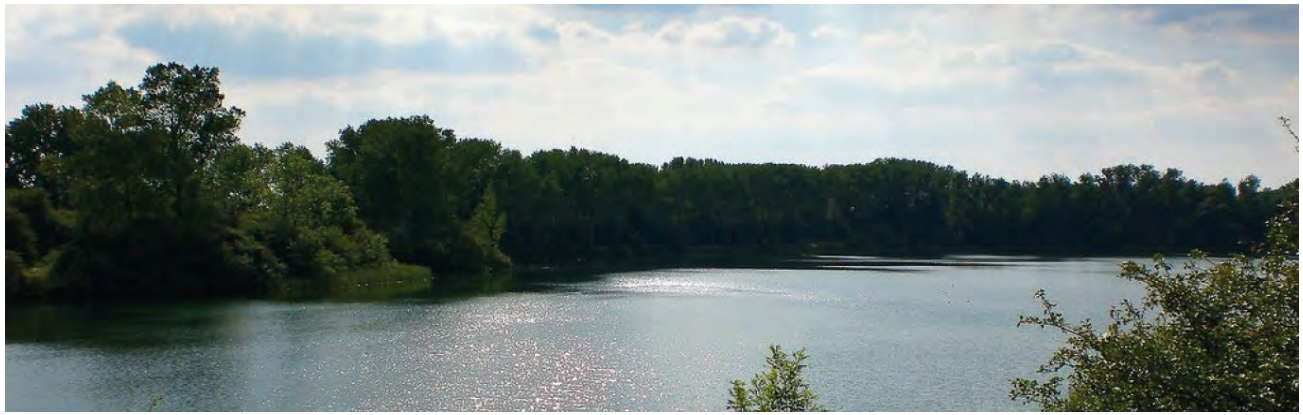
Figure 4.4.1 HS2 Calvert area context Integration illustrative graphic.
Source: HS2 Calvert Integration Study EKFB

The vision is for the routes to explore the history, culture and ecology of that surrounding landscape through public realm opportunities, which in turn can help achieve strategic goals for the wider area and region. A range of placemaking exemplars are listed in this section, with recommendations for how the CIS opportunities could be incorporated into the area.

This study aims to further support constructive dialogue and coordination with the Local Authority and all other relevant landholders and stakeholders, in order to help shape the future of the area, identifying potential delivery partners and funding streams.

Following the issue of this study, the next step will be to discuss each of these recommendations, alongside discussions with Buckinghamshire Council, prospective stakeholders and delivery partners to consider if/how initiatives can be funded and delivered. Whilst the

CIS opportunities sit outside of HS2's statutory remit, HS2 are keen to engage in strategic and exploratory discussions about existing opportunities or those which emerge from the study.



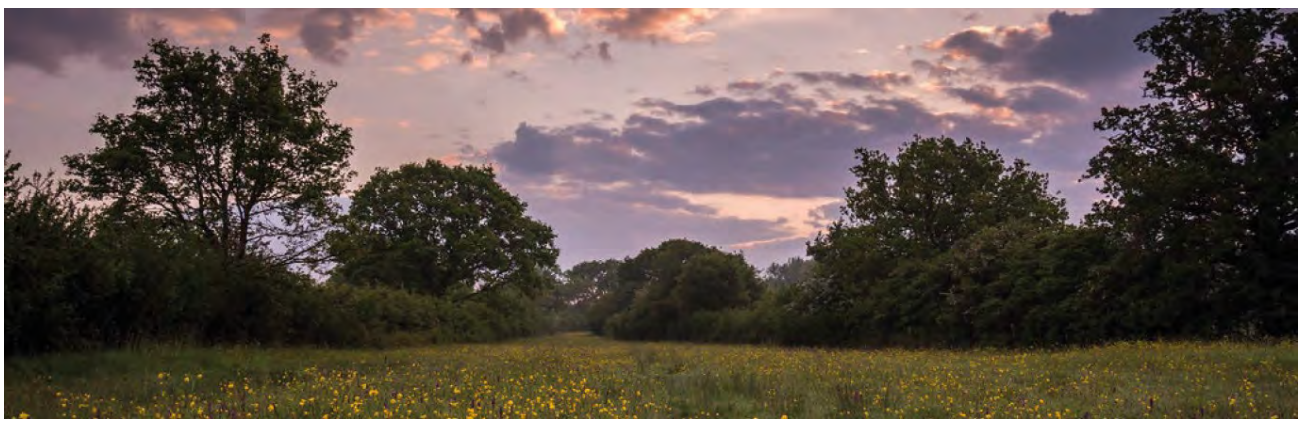




Figure 4.4.2 Calvert area photography and environment (top, middle, bottom) Padbury Brook and treeline, meadow and treeline, meadow
Source: HS2 Calvert Integration Study EKFB

Clay Vales of Buckingham (Calvert, Steeple Claydon, Twyford, Padbury Brook and Chetwode) 4.4

The landscape design approach for the Clay Vales NCA focuses on conserving the valued clay vale landscape. Informed by the Calvert Integration Study, this approach ensures that HS2 is effectively screened while also creating opportunities for positive change and environmental benefits.



Figure 4.4.3 SWBMS from the west (100m from structure). Looking across screening hedgerow and tree lined Public Right of Way.

4.4.2 Landscape planting

Kingswood Wooded Farmland LCA. A key focus of the planting design in the Greatmoor area is to connect the HS2 advanced works bat mitigation planting with the HS2 bat mitigation crossings i.e., the green bridges at Bridleway QUA/36 and Bridleway GUN/28 and the underbridge at Footpath CAG/2. This is achieved through a combination of new tree lines and hedgerows. In addition, the planting design considers the relocation of the FCC waste transfer sidings to Greatmoor, when seen in views from the more elevated ground to the south east in the vicinity of Finmere Hill. Elsewhere the planting design introduces new hedgerows and woodland to reflect the pattern of 18th and 19th century enclosures, particularly in the area of Doddershall Hall in the south of the area to help integrate HS2 within the halls setting. Other new features of note which the planting design integrates, and screens are the National Grid substation and the Quainton Auto Transformer Feeder Station, located on the east side of HS2, off Edgcott Road.

Calvert Clay Pits LCA and Claydon Bowl LCA. A key focus of the planting design in the Calvert area is to connect the HS2 advanced works bat mitigation planting with the HS2 bat mitigation crossings i.e., the green bridges at SCL/13, Calvert and Station Hill. This is achieved through a combination of new tree lines and hedgerows. A key HS2 feature in this landscape, which the planting design considers, is the large scale, linear Sheephouse Wood Bat Mitigation Structure (SWBMS), in the south part of the area. This along with the design of the green bridges has been developed in discussion with the architect, local planning authority (BCC), Natural England and Bernwood bat mitigation license holder and is considered further below under the section Landscape Response to Structures. Elsewhere the planting design introduces new hedgerows and woodland to help integrate and screen the HS2 features in views from the settlement of Calvert as well as reinforce the planting edge to the Calvert Jubilee Local Wildlife Site, on the west side of HS2 and the north of Calvert.

The landscape planting as previously discussed accompany the following plans.

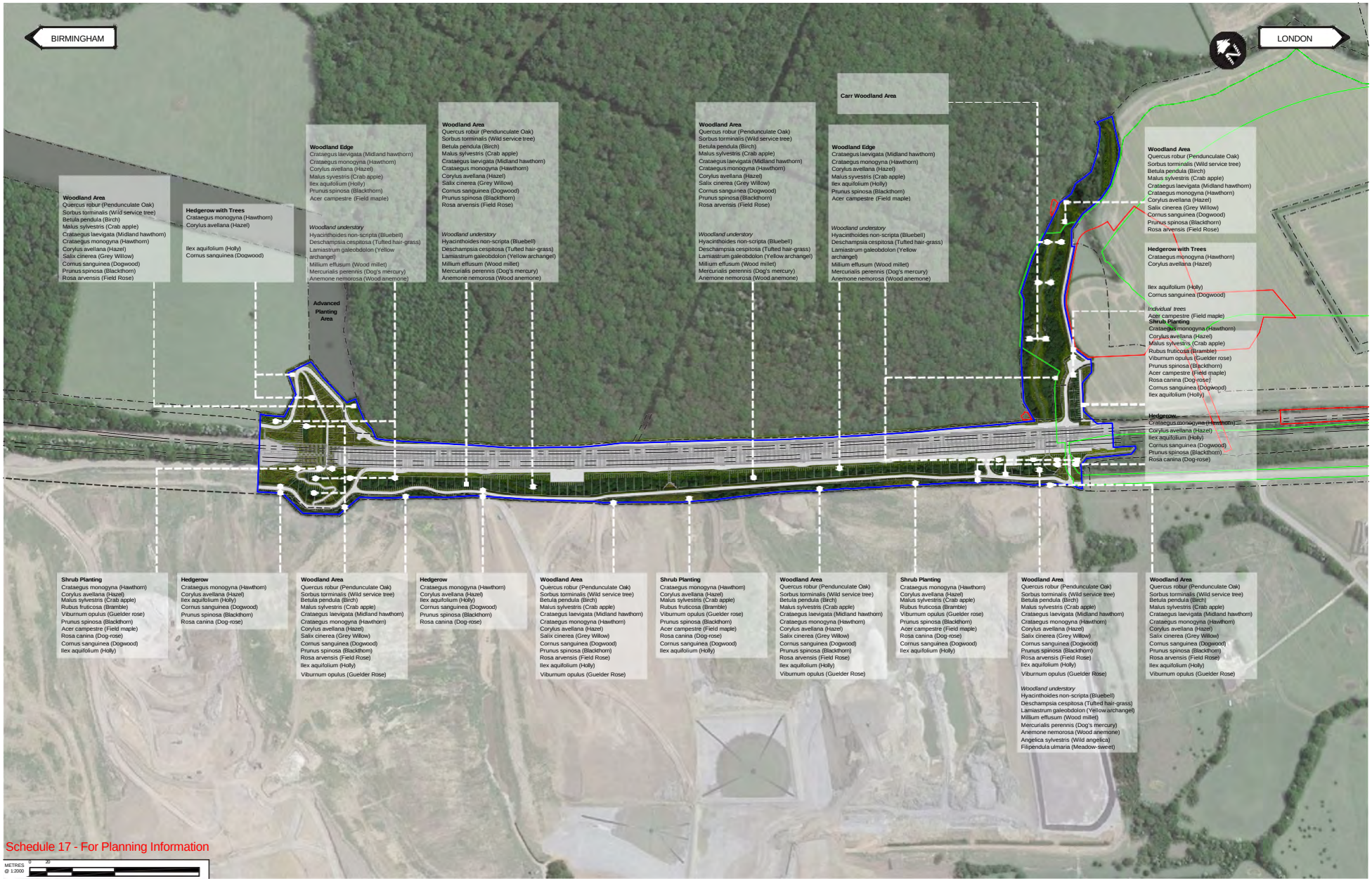


Figure 4.4.4 Sheephouse Wood Planting Plan (Woodland and Hedgerows)

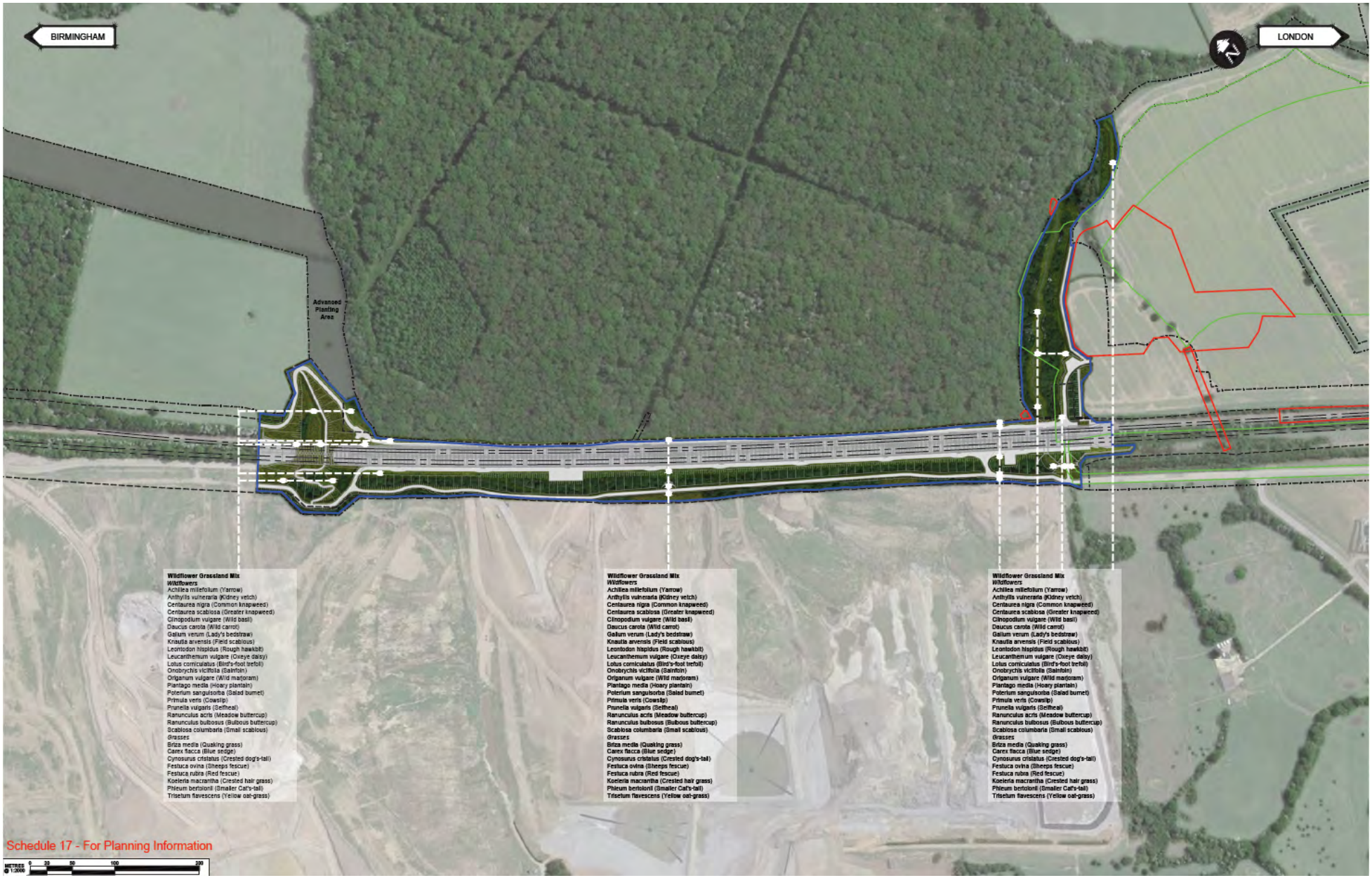


Figure 4.4.5 Sheephouse Wood Planting Plan (Grasslands)

Clay Vales of Buckingham (Calvert, Steeple Claydon, Twyford, Padbury Brook and Chetwode) 4.4

Claydon Bowl LCA. The north part of this area, which is defined by a shallow open valley to the south of the settlement of Steeple Claydon, is affected by the East

West Rail (Network Rail). It is noted that the IMD sidings in this area, i.e., east of Addison Road overbridge have been removed and this has resulted in a review of the landscape design approach at this location.

This approach includes the removal of the screening landscape earthworks other than for an area of earth mounding to integrate the relocated SCL/13 footbridge. The planting design introduces new hedgerows and woodland to reflect the pattern of pre 18th century enclosure and to help integrate East West Rail, the associated Addison Road overbridge and SCL/13 footbridge into the landscape.

Twyford Vale LCA. A key HS2 feature in this landscape, which the planting design will need to consider, is the Calvert IMD. Primarily, the planting design introduces new hedgerows, woodland and habitat creation to help integrate and screen the IMD into the landscape, as well as reinforces opportunities for providing community access. North west of the IMD at Twyford embankment and Cowley embankment the planting design, through

a combination of wetland habitat, amenity areas and woodland helps to integrate the false cutting which runs along the west side of HS2. A focus of the planting design in this area has been to create opportunities for community space, particularly adjacent to the settlement of Twyford to integrate HS2 within the low lying open, shallow valley landscape of Padbury Brook.

A key Schedule 17 design issue as a result of the track uplift was the need to strengthen the planting on the upside of HS2 i.e., where available land within the LLAU is limited, in order to help break up the appearance of the higher embankment and noise barrier in views from the east. In the consented Schedule 17 application for this asset, the indicative landscape design approach strengthened the planting at this location through a combination of hedgerow planting along the toe of

the embankment slope i.e., where land availability is limited, the introduction of new woodland blocks where achievable and shrub planting on the slackened 1v to 3h embankment slope had achieved this objective. There is now a further design challenge as a consequence

of the embankment widening at Detailed Design which has steepened the embankment slope to 1v to 2h. The design is still being developed at this location and will require a further Schedule 17 application.

Preston Bissett Plateau Edge LCA. HS2 passes close to several communities in this area which include Chetwode and Barton Hartshorn to the east and Newton Purcell to the north west. The planting design introduces woodland blocks and hedgerows to reflect the pattern of pre 18th century enclosure of the area to help integrate the alignment within the low-lying landscape when seen in views from the settlements

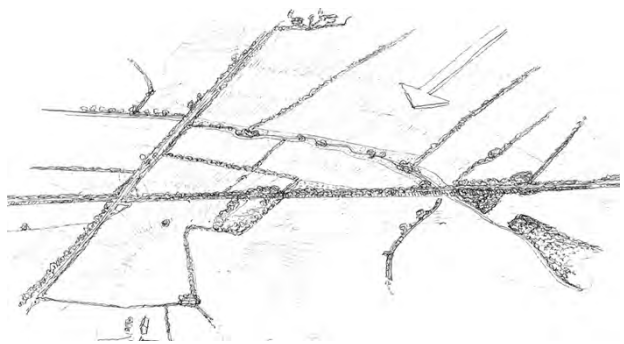


Figure 4.4.6 Response sketch to Claydon Bowl landscape character area



Figure 4.4.7 Response sketch to Twyford Vale landscape character area



Figure 4.4.8 View along diverted Padbury Brook Valley showing planted screening of HS2 at Twyford Viaduct (200m from Viaduct)

Clay Vales of Buckingham (Calvert, Steeple Claydon, Twyford, Padbury Brook and Chetwode) 4.4

4.4.3 Landscape Earthworks

Kingswood Wooded Farmland LCA. The landscape earthworks design in this area comprises a false cutting along Doddershall embankment and Woodlands cutting (west side) to help reinforce the integration and screening of HS2 from Doddershall Hall.

Claydon Bowl LCA. The north part of this area, which is defined by a shallow open valley to the south of the settlement of Steeple Claydon, is affected by the East West Rail (Network Rail). The ES assessed landscape earthworks have been removed east of Claydon Road due to the reduction in the footprint of the IMD, which now terminates to the west of it and outside the LCA. The railway corridor within this LCA now comprises 4 tracks associated with the EWR which traverses the area on low embankment and shallow cutting. The cutting have been increased in height and footprint

Twyford Vale LCA. In association with the Calvert IMD, which is located in the southern part of the area, the landscape earthworks design comprises a false cutting which runs along its north side and is provided to help integrate and screen its industrial features in views form the north and north east.

The landscape earthworks has been increased in height from 5m above IMD as assessed in the ES to a varied height crest of up to 7m to help screen the main IMD office building. It is noted that the main office building incorporates a gently curving green roof.

This has been discussed with the local planning authority (BCC) and forms part of the submitted but still to be consented AVDC P13c application.

To the north west of the IMD at Twyford and within the wider context of the Padbury Brook, a false cutting is proposed at Twyford embankment (west side) and Cowley embankment (west side). The purpose of the false cuttings is to create a buffer and visual screen to HS2 from the village and its environs, and in particular the 6m high noise barrier which sits on the downside of Twyford embankment. The landscape earthworks in discussion with the LPA have been designed to give variation in the crest height and in the profile of the outward facing slope to help integrate them into the flat landscape on either side of the Padbury Brook.

At the north end of this LCA at Chetwode embankment (east side) a further false cutting has been provided to help integrate HS2 within the low-lying landscape which form the transition between the low-lying vale landscape and the gently rising slopes of the Preston Bisset Plateau Edge landscape, as it emerges out of the adjacent Chetwode cutting.

Preston Bissett Plateau Edge LCA. The landscape earthworks design in this area comprises a false cutting along both sides of Chetwode cutting. This includes a new false cutting (upside) in the environs of The Green at Chetwode to help contain the intimate and contained

This is important as this character would otherwise leak away with the associated views out to the west. These works also help integrate the CHW/18 accommodation overbridge in the setting of the adjacent Grade II listed Sunflower Farm. A further earthwork has been introduced on the downside adjacent to Manthorne Farm in order to help screen the noise barrier within the cutting which would otherwise be a new visible feature as a consequence of the VE 107 track uplift in views from the adjacent PRoW CHW/18 (Bernwood Jubilee Trail).

The ES assessed earthworks on the opposite upside, have been raised in line with the uplift and new earthworks to the north have been added in the environs of the adjacent Grade II listed The Hermitage to help Integrate HS2 and in particular the noise barrier which is affected by the track uplift, within the setting of the listed building. North of the listed building and Manthorne Farm the ES assessed false cuttings on both sides of the cutting have been increased in height and footprint to reinforce the sense of the buffer between HS2 and the adjacent heritage and residential receptors.

Barton to Mixbury cutting (both sides) and is provided to help set down HS2 in the landscape and to minimise its impacts on the setting of and views from the settlements of Chetwode, Barton Hartshorn and Newton Purcell.

The landscape earthworks discussed accompany the following sections.

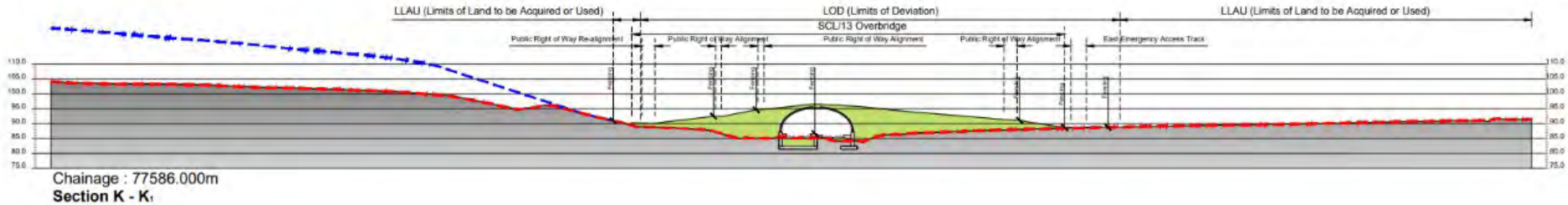


Figure 4.4.9 Calvert Cutting

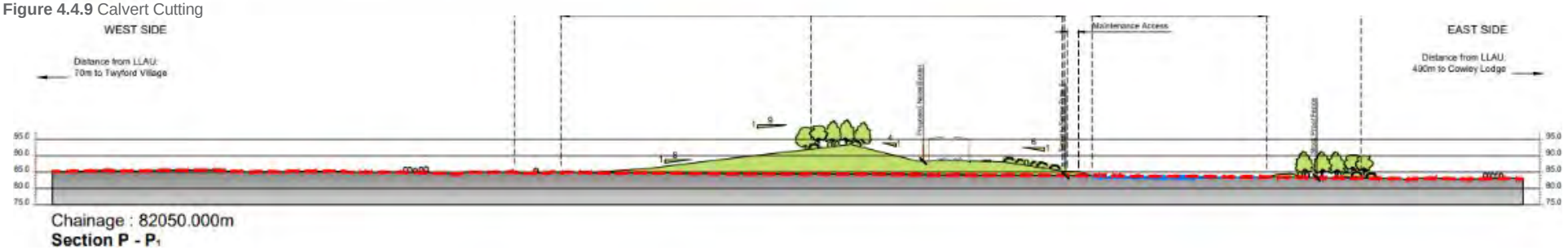


Figure 4.4.10 Twyford Embankment

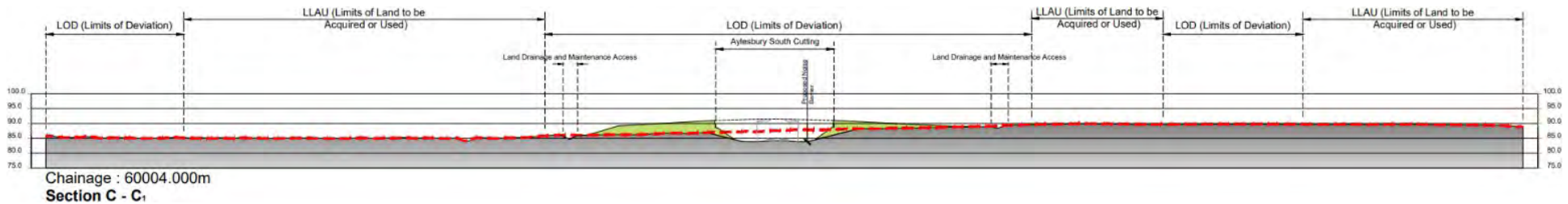


Figure 4.4.11 Chetwode Embankment

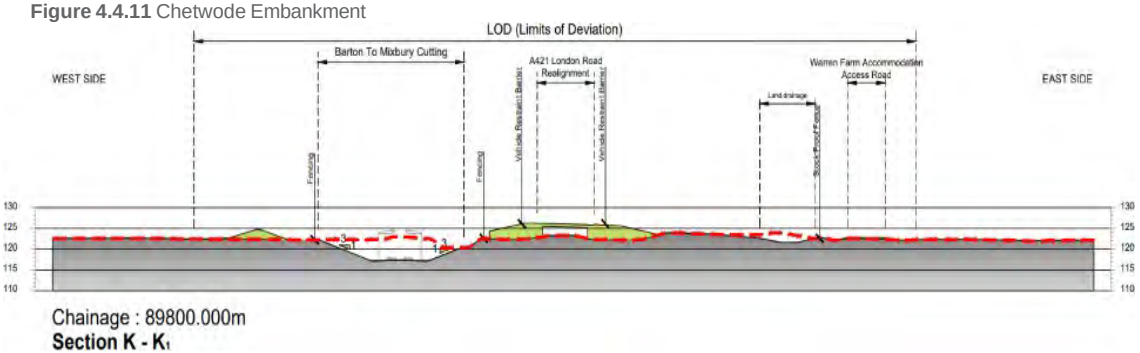


Figure 4.4.12 Barton to Mixbury Cutting

Clay Vales of Buckingham (Calvert, Steeple Claydon, Twyford, Padbury Brook and Chetwode) 4.4

4.4.4 Landscape response to structures

It is noted that a number 0f the overbridges will be affected by the VE 118 and VE 107 track uplifts. For VE 118 the most notable change is at East West Rail, Perry Hill and West Street overbridges which are all raised by +3m; Addison Road and SCL/8 overbridges are raised by +2m is at WAD/4 accommodation overbridge which has been raised by 2.7m. The change at all other structures covered by VE 118 is relatively minor with a raise of +1.2m or less. For VE 107 the most notable change is at Footpath CHW/18 Accommodation overbridge which has an uplift of +2.5m. The change at School End overbridge is relatively minor with a raise of less than +1m.

The change at School End overbridge is relatively minor with a raise of less than +1m. The change has also resulted in modification to the structures approach ramps. Sheephouse Wood Bat Mitigation Structure (SWBMS) is a notable large scale, unique structure of the HS2 project. The SWBMS is set against the designated ancient woodland of Sheephouse Wood within the Claydon Bowl LCA, on the east side and the FCC landfill (Calvert Clay Pits LCA) sits on the west side. It could be described as an above ground tunnel which is required to provide protection to the local bat community at Sheephouse Wood.

The design of the structure has been developed not only in terms of providing the required protection to bats but also in regard to local context.

The design has therefore been changed from a box frame structure over HS2 assessed at ES to a simple single arch structure which spans both HS2 and the adjacent Network Rail. It is noted that the requirement to extend the structure over HS2 was a result of the Network Rail (EWR) TWAO which indicated a single structure over HS2 with an add incongruous cantilever structure over Network Rail. The landscape design approach has been developed in the context of the important existing woodland and the extensive tracts of bat mitigation planting to the east and the FCC industrial landscape to the west, which overtime will be restored to a rural landscape of tree belts and open grassland.

The landscape design has been developed in collaboration with the architect to provide a new woodland belt on the west side of the SWBMS to help embed it within its woodland setting. It is considered that the structure will form a unique one-off feature for HS2 and has the potential to become a focal rural element within an emerging new accessible rural landscape. The structure has recently been submitted to the LPA for consent.

Calvert IMD (Twyford Vale LCA). The design of the IMD and its integration has been developed in collaboration with the IMD building architects. Key elements of the design are the integration of the IMD drainage, landscape earthworks bund (see earthworks section above) and the associated planting on the north side of the IMD.

This is a key element to help integrate the architecture into the flat low-lying landscape of the Twyford Vale LCA and in elevated views further afield within the Claydon Bowel LCA.

Green bridges (Kingswood Wooded Farmland LCA, Calvert Clay Pits LCA and Claydon Bowl LCA). There are a group of six green bridges in the Calvert area which provide biodiversity connectivity across both Network Rail and HS2 corridor. The landscape approach has been developed in collaboration with the ecologists and as such the ecology requirements are broadly for each i.e., to provide a planted protected safe central corridor for bats across the structure, the landscape design has been developed also to take account of local context and to connect the planting on the structure with the planting on its approach earthworks and adjacent to it.

In essence the design on the structure itself comprises two parallel linear belts of native species shrubs, with a minimum height of +4m, but allowing the canopy to establish higher. On the approach ramps tree species are introduced to help create the transition to the adjacent woodland or tree belt context. However, the arrangement of the planting on the approach embankments has also had to consider the other function of the green bridge such as access for landfill vehicles and maintenance access at Bridleway Gun/28 and a local road at School Hill.

The sensitive treatment of these structures and their integration into the landscape have been discussed with the local planning authority (BCC) as part of the Schedule 17 process. It is noted both Bridleway GUN/28 and Bridleway QUA/36 were submitted under the TWAO process.

Twyford, Godington East and Godington West viaducts (Twyford Vale LCA and Godington Hall Rolling Farmland LCA). These structures sit along the Padbury Brook between the settlements of Twyford and Chetwode in the north part of the area. The landscape design associated with these structures relates to wetland habitat creation, the establishment of riparian vegetation along the watercourse, with new woodland blocks to help break up the structures in local views along and across the shallow valley. The design proposals at these locations have been developed in discussion with the local planning authority (BCC) as part of the Schedule 17 process and subsequently consented.

There are four new GSM-R compounds within this section (Points 37, 39, 40 and 41). These are at Calvert Green (new standalone compound), Calvert IMD within the proposed platform, Twyford Mill (new standalone compound) and School Lane, Chetwode (new standalone compound). The mitigation associated with these new compounds are subject to further design development. It is noted that the footprint of Point 40 (Twyford Mill) and Point 41 (School Lane) impact on various blocks of ES mitigation landscape planting.



Figure 4.4.12 Elevational view of the SWBMS proposal integrated through new tree planting along its western edge

Clay Vales of Buckingham (Calvert, Steeple Claydon, Twyford, Padbury Brook and Chetwode) 4.4

Landscape response to Biodiversity connectivity

The landscape design seeks to reinforce and transform green infrastructure corridors along the route through linear tree belts, field boundary and lane side

hedgerows, riparian vegetation along watercourses and wetland habitat creation. These landscape elements will help to provide biodiversity connectivity across and along HS2 by linking into the HS2 advanced works habitat creation areas and the engineering assets at the viaducts, overbridges, green bridges, drainage ditches and culverts and water management features. The Sheephouse Wood Bat Mitigation Structure and accompanying assets are designed and integrated within the landscape design for nature based design and management to safeguard the local biodiversity.

The landscape response to biodiversity as previously discussed accompany the visuals shown adjacent.

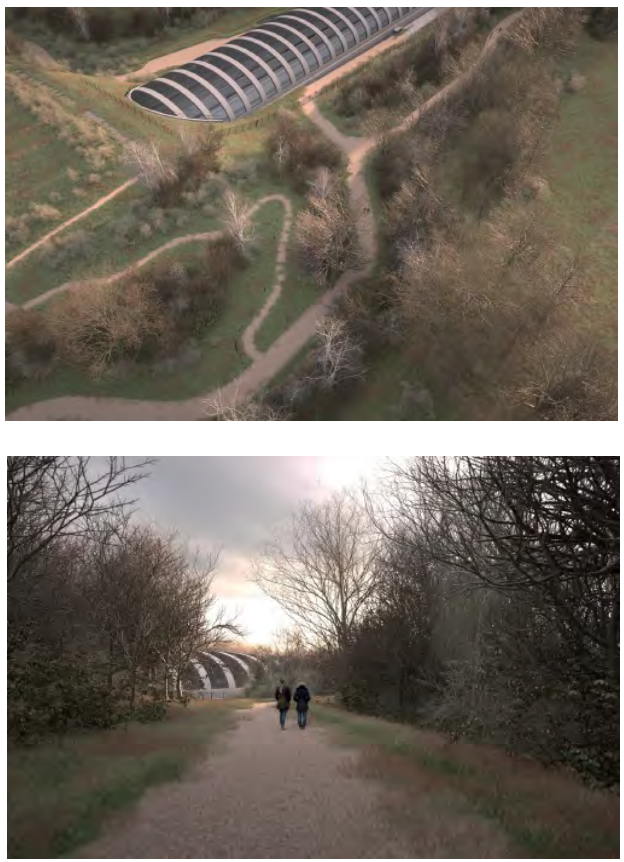


Figure 4.4.13 Top: aerial view of footpath and Green Overbridge Bottom: view along footpath towards SWBMS, framed by proposed tree and hedgerow planting.

Landscape response to Heritage assets

This landscape includes National Trust's Grade 1 listed Claydon House and its associated Grade 1 listed historic park and garden and the line of the former Great Central Railway.

Claydon House (Claydon Bowl LCA). This property is relatively remote from HS2 although there is likely to be some inter-visibility between the house and SCL/8 footbridge north west. The removal of the eastern extension of the IMD i.e., the area east of Addison Road overbridge is considered a benefit in regard to this property but the relocation of SCL/8 eastwards as a requirement of U&A, and the introduction of a +10m high ramp structure on the south side within a limited area of land availability has raised a landscape design challenge to help integrate the structure into the local landscape. This work has informed the discussion with the local planning authority (BCC) as part of the Schedule 17 process.

The Great Central Railway forms a linear north to south feature across this area as it runs parallel to and west of HS2. In the south it is an existing operational part of Network Rail. In the north it is redundant and is associated with strong linear belts of tree and scrub vegetation. The landscape design proposal has retained as much of this linear vegetation as possible as and acts as a buffer to the landscape and visual receptors to the west.



Figure 4.4.14 North end of SWBMS showing footpath and interface with Green Overbridge

River Great Ouse Claylands (Newton Purcell, Finmere, Mixbury and Westbury)

The landscape design approach for the Claylands area is sensitive to the area's transitional nature as it sets to preserve the locally valued limestone plateau landscape of the Hethe Wooded Estatelands LCA. Through focusing on enhancing the related structural, biodiversity and heritage assets it works to effectively integrate and screen in prominent areas like Westbury Viaduct.

4.5.1 Landscape planting

Hethe Wooded Estatelands LCA. The planting design introduces new woodland blocks and hedgerows to help further integrate HS2 into the landscape and in particular to tie the Mixbury embankment into the woodland context of the local side valley located to the east of the settlement of Mixbury. Extensive woodland planting is proposed on the outward facing false cutting slopes of the Westbury embankment to help integrate it into the wider context of River Great Ouse valley. The planting design for the A4410 and A421 introduces roadside hedgerows with trees located at the back of the verge.

Westbury – Biddlestone Great Ouse Valley LCA. The planting design introduces new woodland blocks, riparian vegetation and hedgerows to help integrate HS2 into the landscape and in particular to tie the false cutting slopes of the Grovehill embankment into the wider context of the River Great Ouse valley.

The landscape planting as previously discussed accompany the following plans.



Figure 4.5.1 Oblique view of Westbury Viaduct from the east looking west showing new woodland block planting (150m from Viaduct)

4.5.2 Landscape earthworks

Westbury - Biddlestone Great Ouse Valley LCA. The landscape earthworks design in this area comprises a false cutting along Grovehill embankment (both sides) to help reinforce the integration and screening of HS2 from within the River Great Ouse valley.

The landscape earthworks as discussed accompany the following plan and sections.



Figure 4.5.2 Response sketch to Preston Bissett Plateau Edge and Hethe Wooded Estatelands landscape character area



Figure 4.5.3 Elevation view of Westbury Viaduct with screen planting in the foreground (75m from Viaduct)

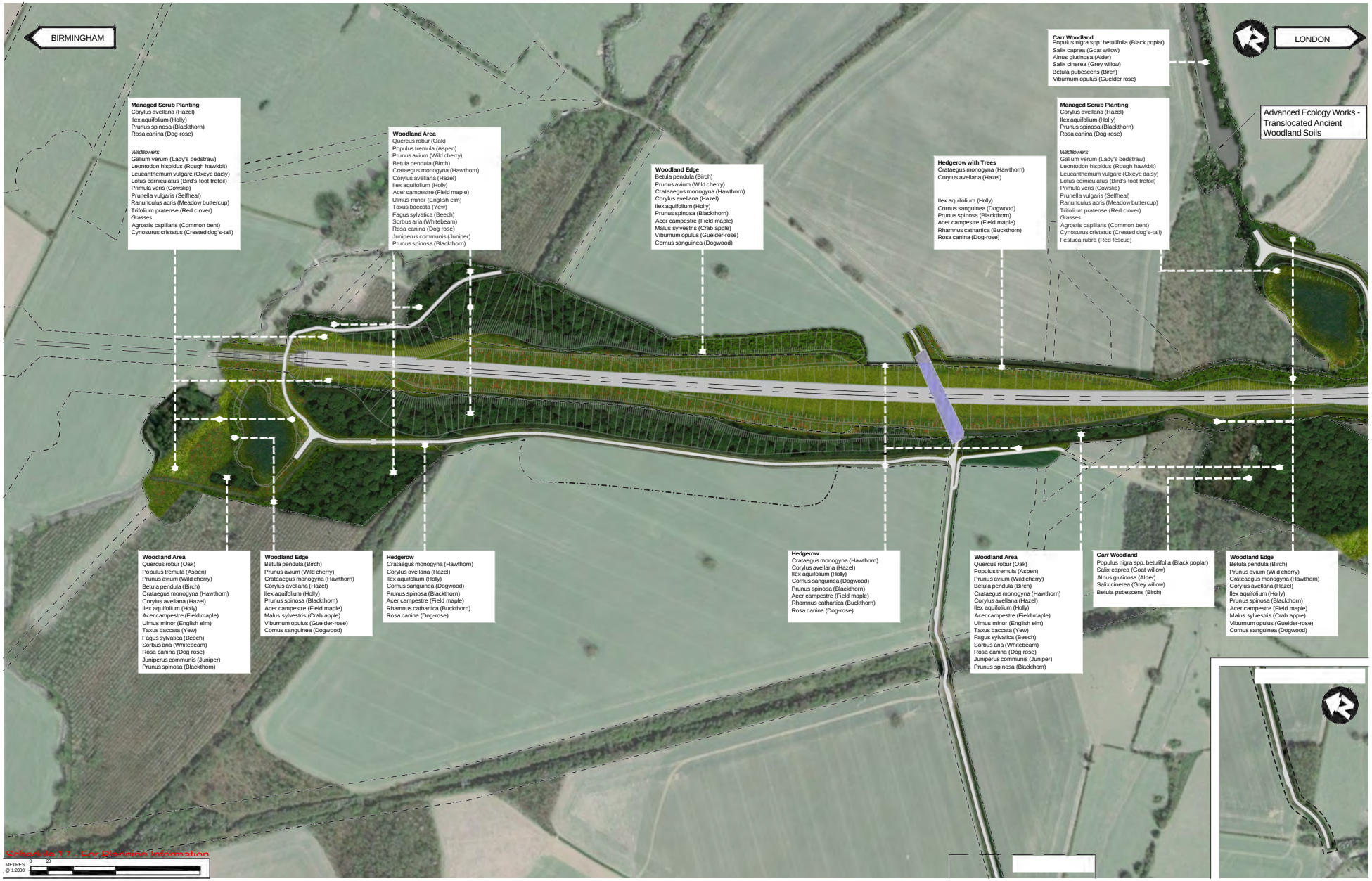


Figure 4.5.4 Mixbury Planting Plan (Woodland and Hedgerows)

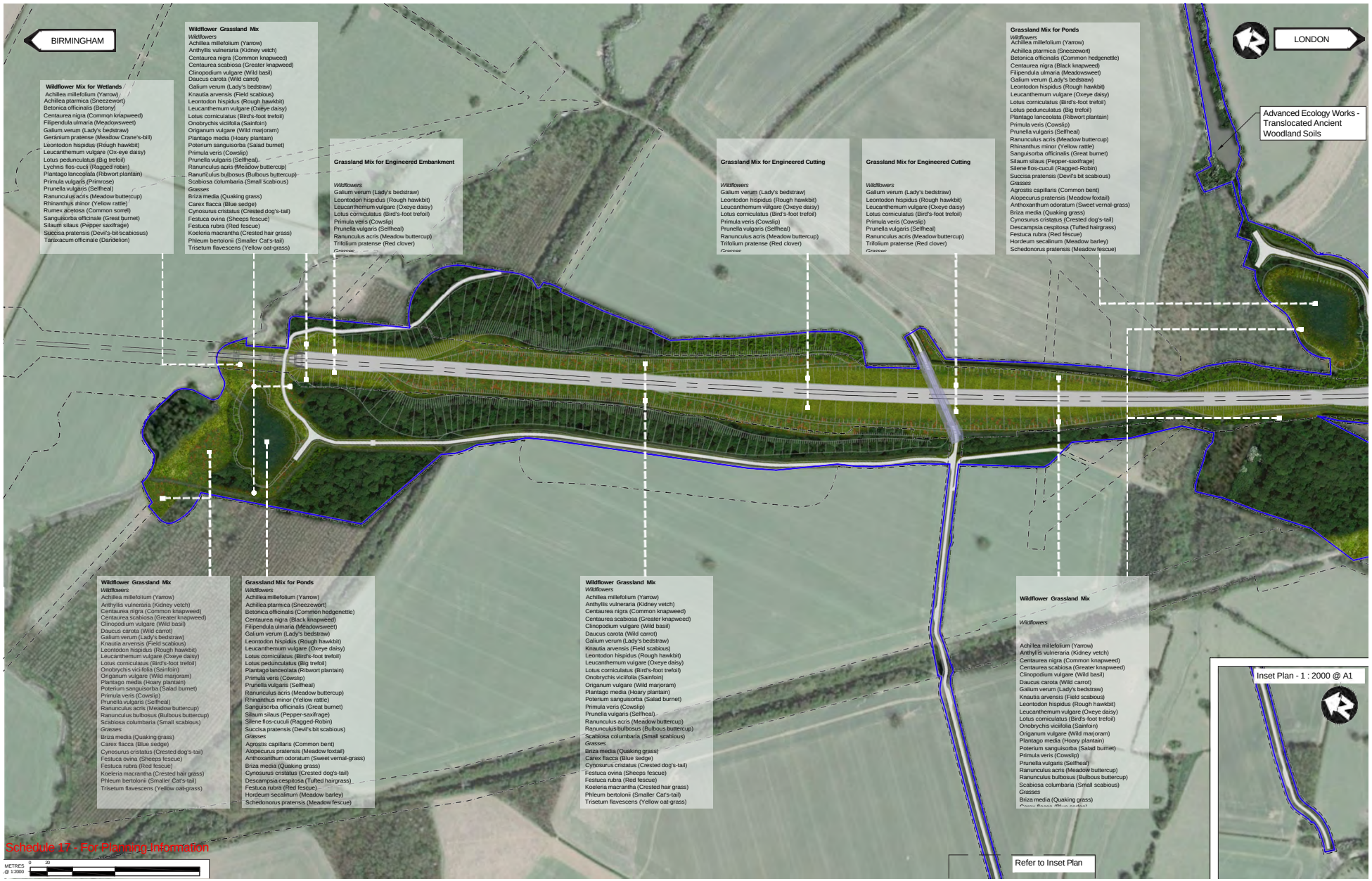


Figure 4.5.5 Mixbury Planting Plan (Grasslands)

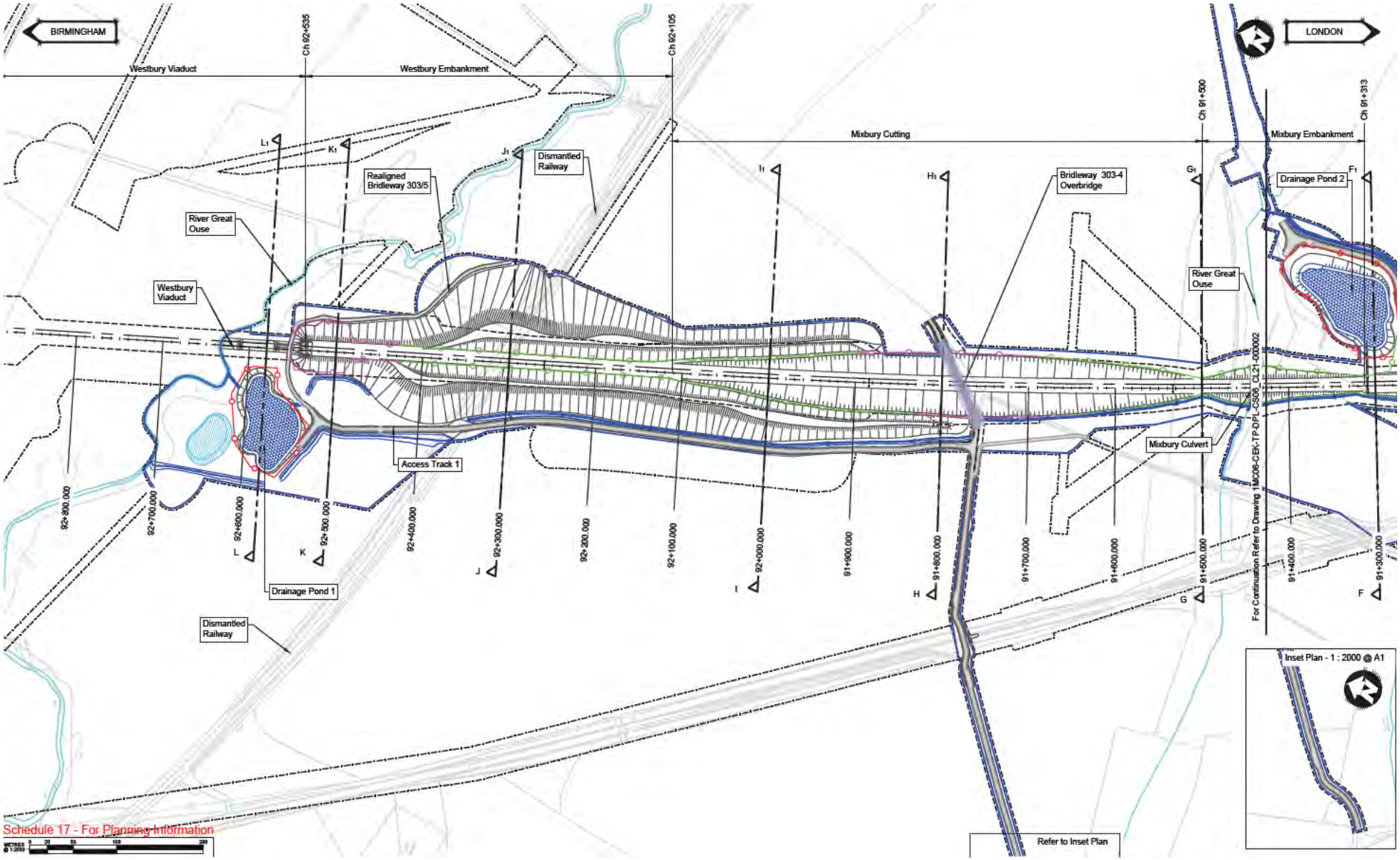


Figure 4.5.6 Mixbury Earthworks Plan

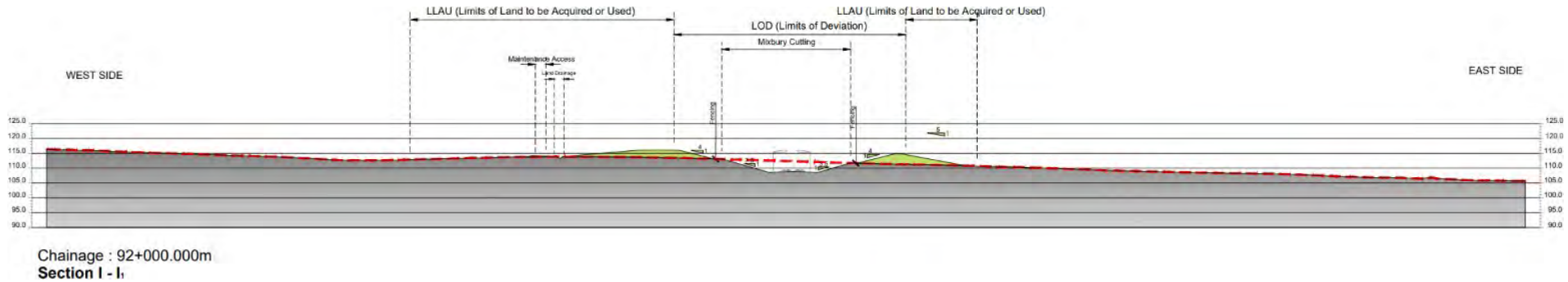


Figure 4.5.7 Mixbury Cutting

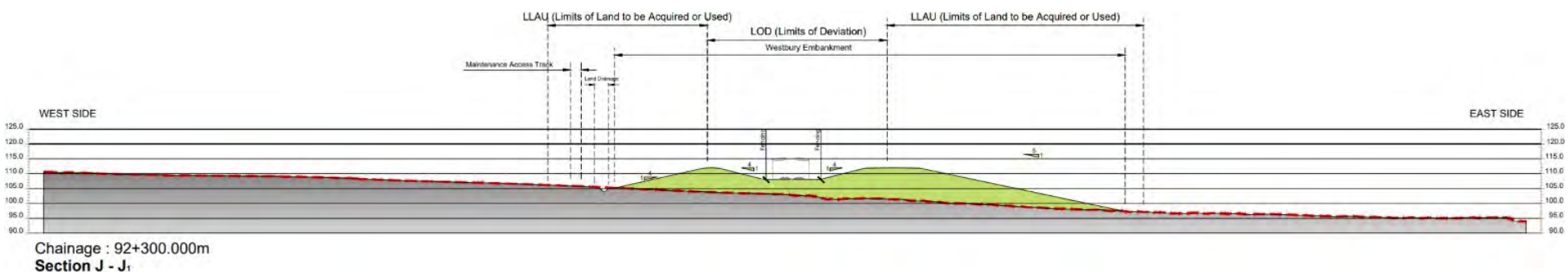


Figure 4.5.8 Westbury Embankment

River Great Ouse Claylands (Newton Purcell, Finmere, Mixbury and Westbury)

4.5.3 Landscape response to structures

Westbury Viaduct (Westbury - Biddlestone Great Ouse Valley LCA). This structure sits across the River Great Ouse to the west of the settlement of Westbury in the north part of the area. As a result of VE125 the viaduct has been raised by +1.8m at its south end by +2.2m at its north end. The uplift has resulted in a new retaining wall being required at the base of both abutments. These are presently being designed. The landscape design associated with these structures proposes wetland habitat creation, the establishment of riparian vegetation along the watercourse, with new woodland blocks to help break up the structures in local views along and across the shallow valley. The design development at these locations has been informed through discussions with the local planning authority (BCC) as part of the Schedule 17 process.

The mitigation associated with these new compounds are subject to further design development. It is noted that the Point 40 (Finmere) sits within the middle of an ESMP site.

Landscape response to Biodiversity connectivity

The landscape design seeks to reinforce and transform green infrastructure corridors along the route through linear tree belts, field boundary and lane side hedgerows, riparian vegetation along watercourses and wetland habitat creation. These landscape elements will help to provide biodiversity connectivity across and along HS2 by linking into the HS2 advanced works habitat creation areas and the engineering assets at the viaduct, overbridges and water management features.

Landscape response to Heritage Assets

This landscape includes the line of the former Great Central Railway and other redundant historic railway infrastructure.

The former route of the Great Central Railway forms a linear north to south feature across this area, and within the south part of the area between the A4410 and A421 it is directly impacted by HS2 before their respective alignments diverge. Further north and on the south side of the River Great Ouse valley is another disused railway. The associated vegetation along these disused railways forms local features in the landscape. The landscape design proposal retains as much of this linear vegetation and integrates these features with the new HS2 planting.



Figure 4.5.9 Elevation view of Westbury Viaduct south abutment from the east looking west over wetland habitat, showing screen planting to the north

Cotswolds and Whittlebury Ridge (Turweston) 4.6

The landscape design approach for the Cotswolds and Whittlebury Ridge NCAs aims to preserve the limestone plateau landscape within the Oatleys Plateau LCA, while ensuring the effective integration of prominent HS2 visible features like the Turweston embankment in the Westbury to Biddlestone Great Ouse Valley area.

4.6.1 Landscape planting

Oatleys Plateau LCA. The planting design introduces new woodland blocks and hedgerows to help further integrate HS2 into the landscape and in particular to tie the Mixbury embankment into the woodland context of the local side valley located to the east of the settlement of Mixbury. Extensive woodland planting is proposed on the outward facing false cutting slopes of the Westbury embankment to help integrate it into the wider context of River Great Ouse valley. The planting design for the A422 introduces roadside hedgerows with trees located at the back of the verge. Westbury – Biddlestone Great Ouse Valley LCA.

The planting design introduces new woodland blocks, riparian vegetation and hedgerows to help integrate HS2 into the landscape and in particular to tie the false cutting slopes of the Turweston embankment into the wider context of the River Great Ouse valley.

The landscape planting as previously discussed accompany the following plans.

4.6.1 Landscape earthworks

The landscape earthworks design for this area is limited to engineering slopes. A key design development of the Turweston cutting asset is a two-stage slope with a steeper 1v to 2h lower rock slope and a slacker 1v to 3 upper slopes. A ledge provides the transition between the two slopes at approximately 2/3rds distance up the cutting side. The ledge will accommodate the security fence line so that it is set down form the main cutting crest. The upper slope will then be planted to help blend the cutting into the plateau landscape. The design has been developed in ongoing discussion with the local planning authority (BCC) as part of the Schedule 17 process.

The landscape earthworks as discussed accompany the following plan and sections.

4.6.2 Landscape response to structures

The structures on this section are unaffected by the VE 125 track uplift.

Turweston green bridge (Oatleys Plateau LCA). There is one green bridge in the Turweston area which provides biodiversity connectivity across HS2. The landscape treatment of this structure and its integration into the landscape has been developed in discussion with the local planning authority (BCC) as part of the Schedule 17 process and at Detailed Design.

There is one new GSM-R compound within this section (Point 48). This is at Turweston embankment (standalone compound).

Landscape response to Biodiversity connectivity

The landscape design seeks to reinforce and transform green infrastructure corridors along the route through linear tree belts, field boundary and lane side hedgerows, riparian vegetation along watercourses and wetland habitat creation. These landscape elements will help to provide biodiversity connectivity across and along HS2 by linking into the HS2 advanced works habitat creation areas and the engineering assets at the overbridges, green bridges and water management features (balancing ponds)

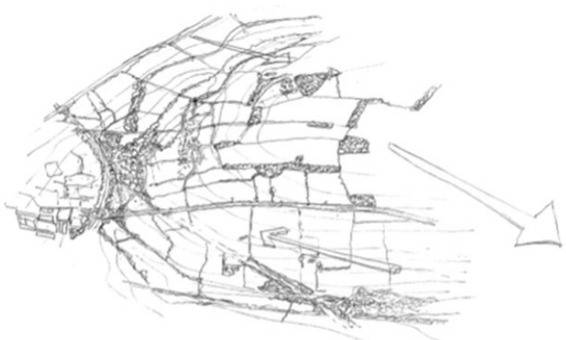


Figure 4.6.1 Response sketch to Biddlesden Great Ouse Valley and Oatleys Plateau landscape character area

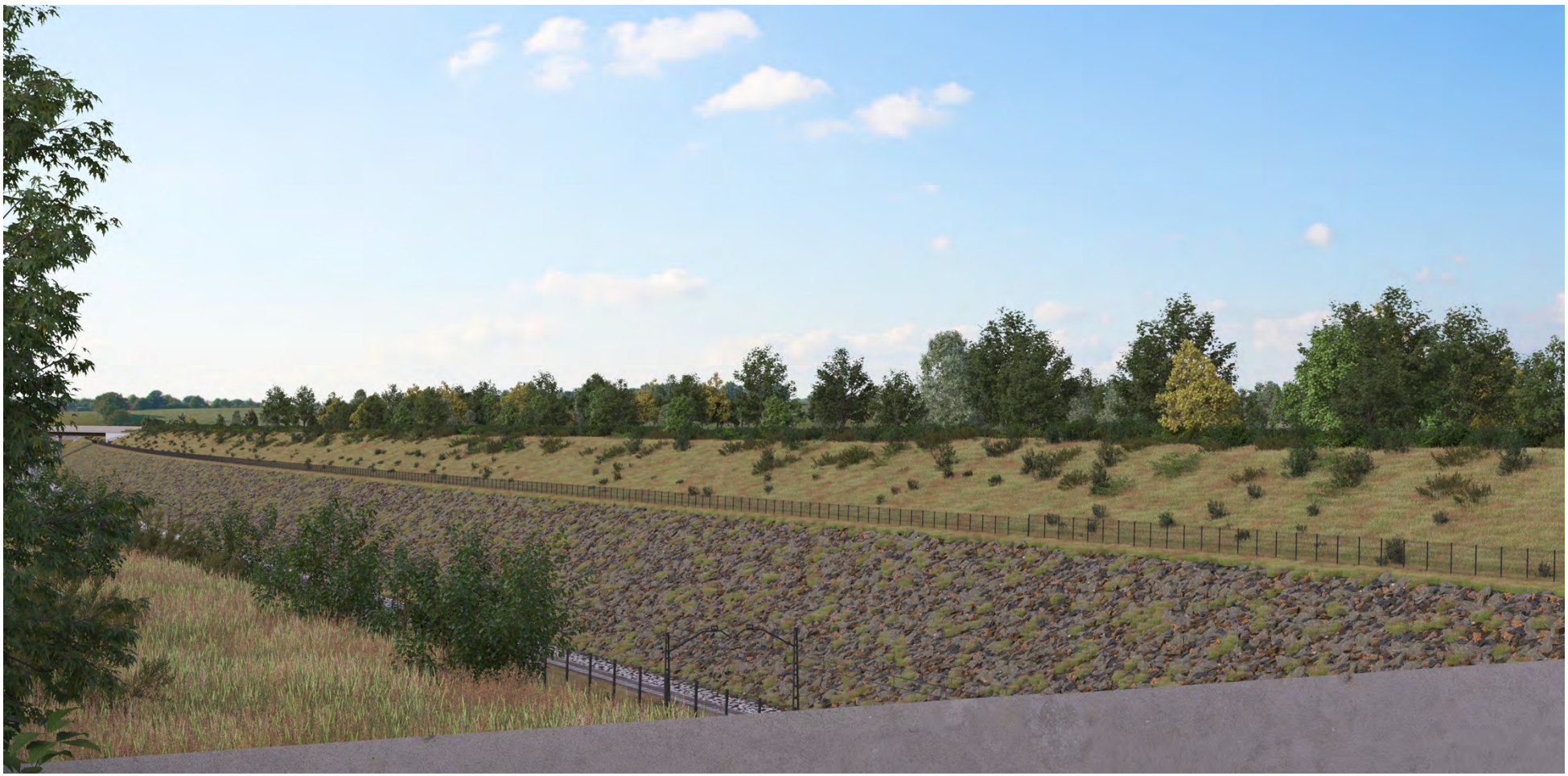


Figure 4.6.2 Turweston Cutting from Turweston Green Overbridge looking south (2-3m above ground level)

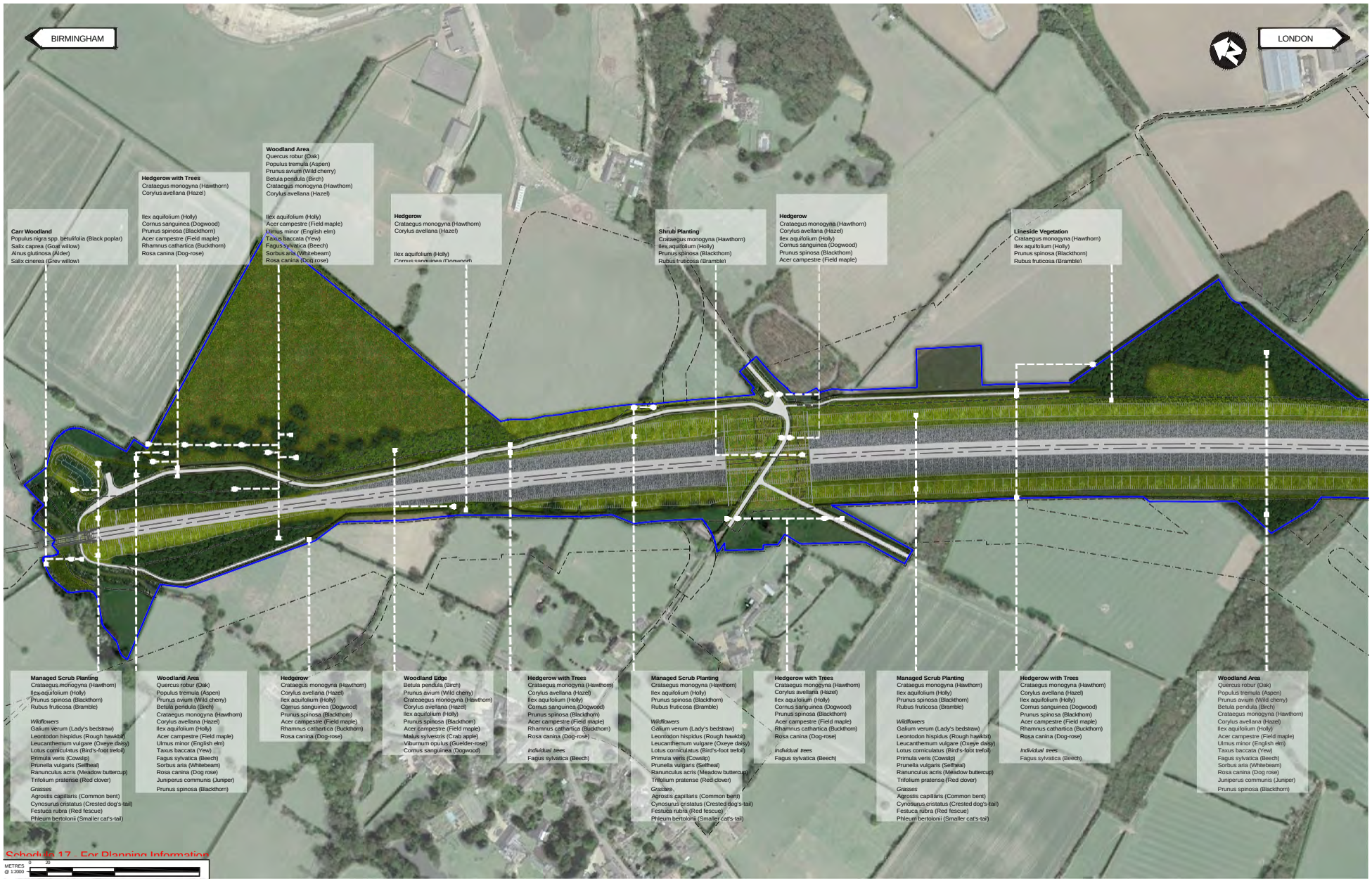


Figure 4.6.3 Westbury to Turweston Planting Plan (Woodland and Hedgerows)

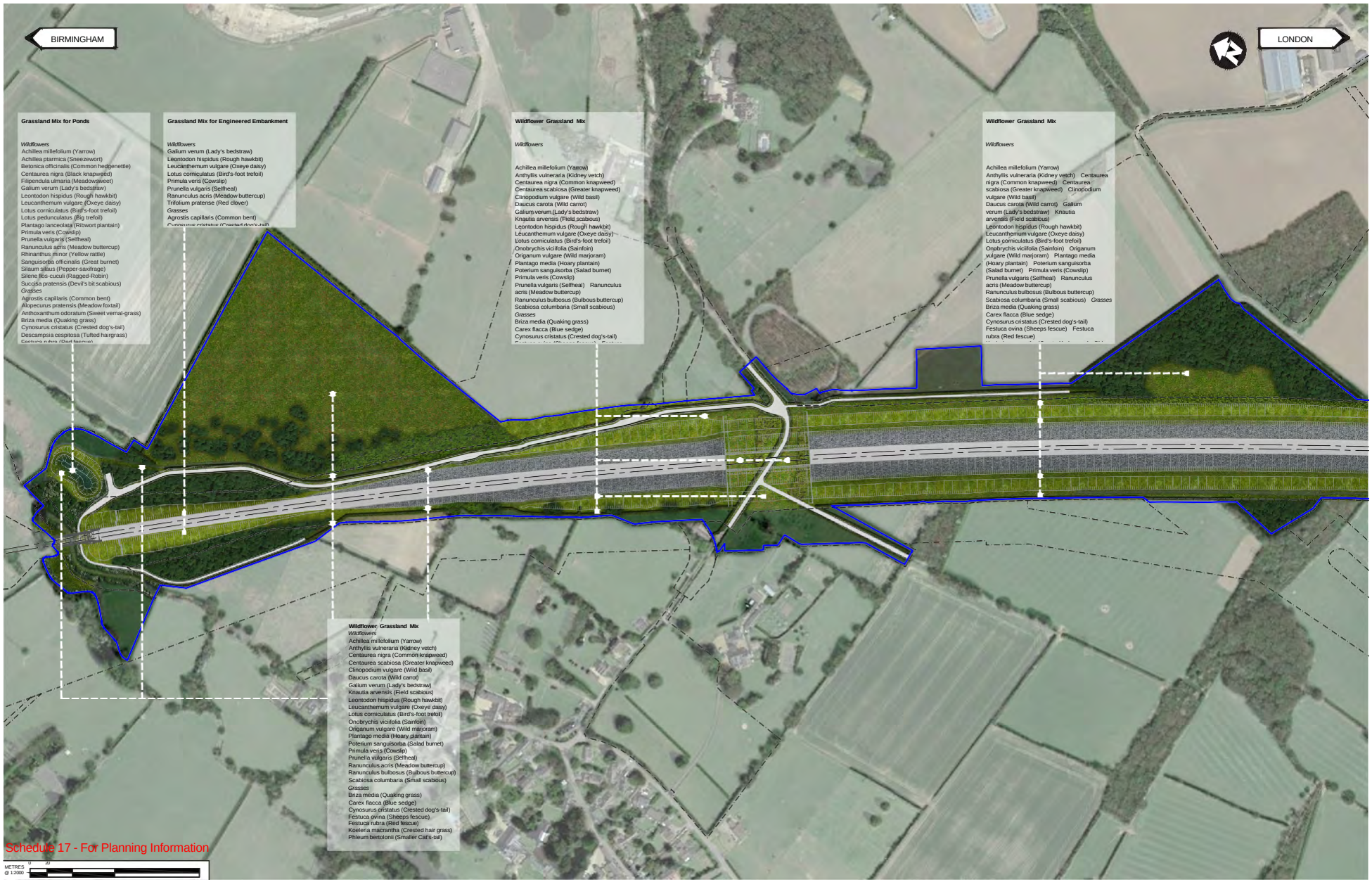


Figure 4.6.4 Westbury to Turweston Planting Plan (Grasslands)

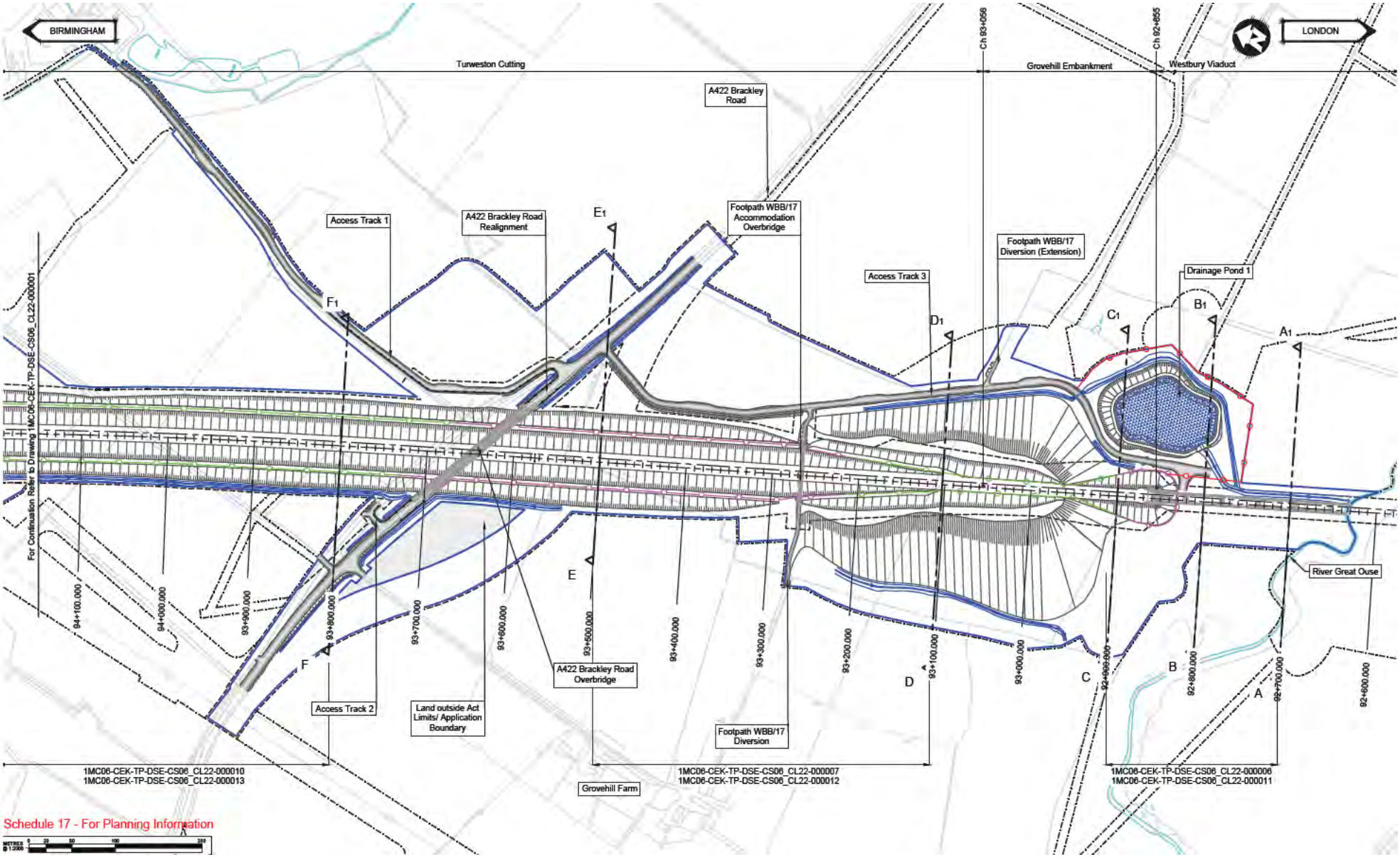


Figure 4.6.5 Westbury to Turweston Earthworks Plan

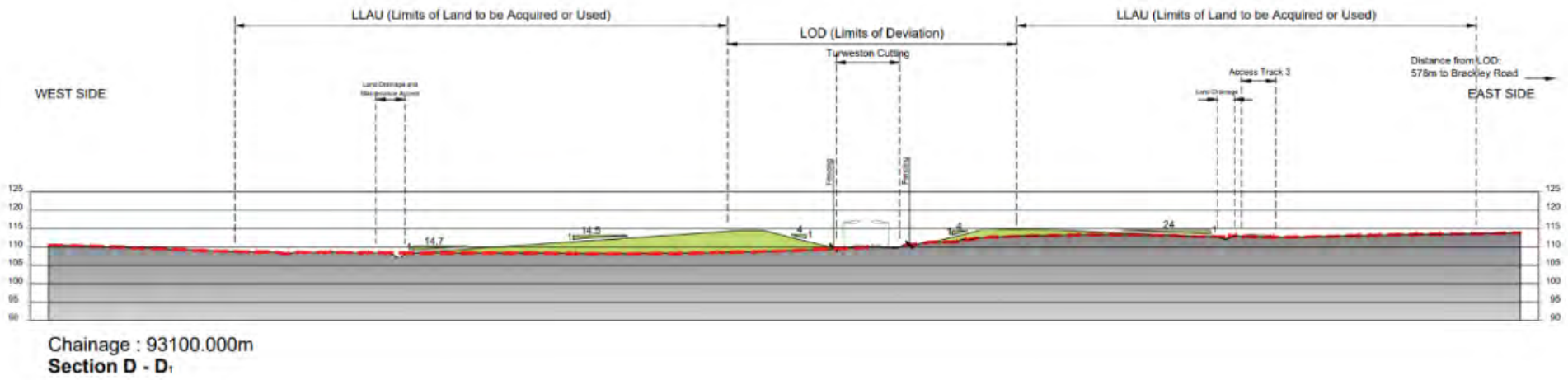


Figure 4.6.6 Turweston Cutting Section 1

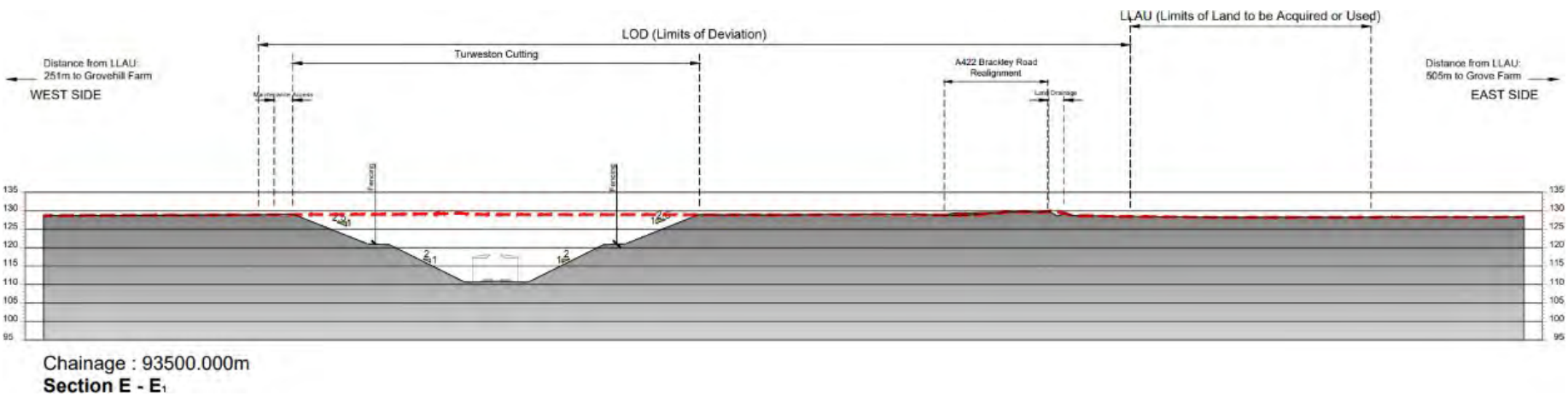


Figure 4.6.7 Turweston Cutting Section 2



Figure 5.01 View of north abutment and Small Dean Lane from the west

5.0 Delivery, Implementation and Operation

5.0
Delivery, Implementation and Operation

5.1 Environmental Minimum Requirements Annex 4: Environmental Memorandum
5.2 Landscape Detailed Design - GIS
5.3 Landscape Maintenance, Management and Monitoring Plan (LMMMP)
5.4 Ecology Site Management Plans (ESMP)
5.5 Operation & Maintenance Manuals (OMM)

Delivery, Implementation and Operation 5.0

The principles for the future landscape maintenance and management of HS2 are set in the HS2 Technical Standard Landscape Design Approach document ref. HS2-HS2-EV-GDE-000-000010. The requirements for the landscape maintenance, management and monitoring are set out in HS Technical Standard Landscape Maintenance, Management and Monitoring document ref. HS2-HS2-EV-STD-000-000023 and applies to all existing retained vegetation, habitat and landscape elements, including areas within the HS2 operational security fence (see HS2 Technical Standard Lineside Vegetation Management Strategy document ref. HS2-HS2-EV-STR-000-000009), during both the construction and operational phases.

5.1 Environmental Minimum Requirements Annex 4: Environmental Memorandum

The Environmental Memorandum relates to the environmental aspects of the design and covers a range of topics including nature conservation, water resources, landscape and visual, soils, and agriculture and forestry. The aims of the Memorandum are.

- Design should seek to eliminate, control, or reduce the significant environmental effects where reasonably practicable.

- Designing in mitigation measures to an appropriate standard along with monitoring and effective enforcement.

- Designing in sustainability principles and opportunities foe enhancement and compensation where practical and reasonable.

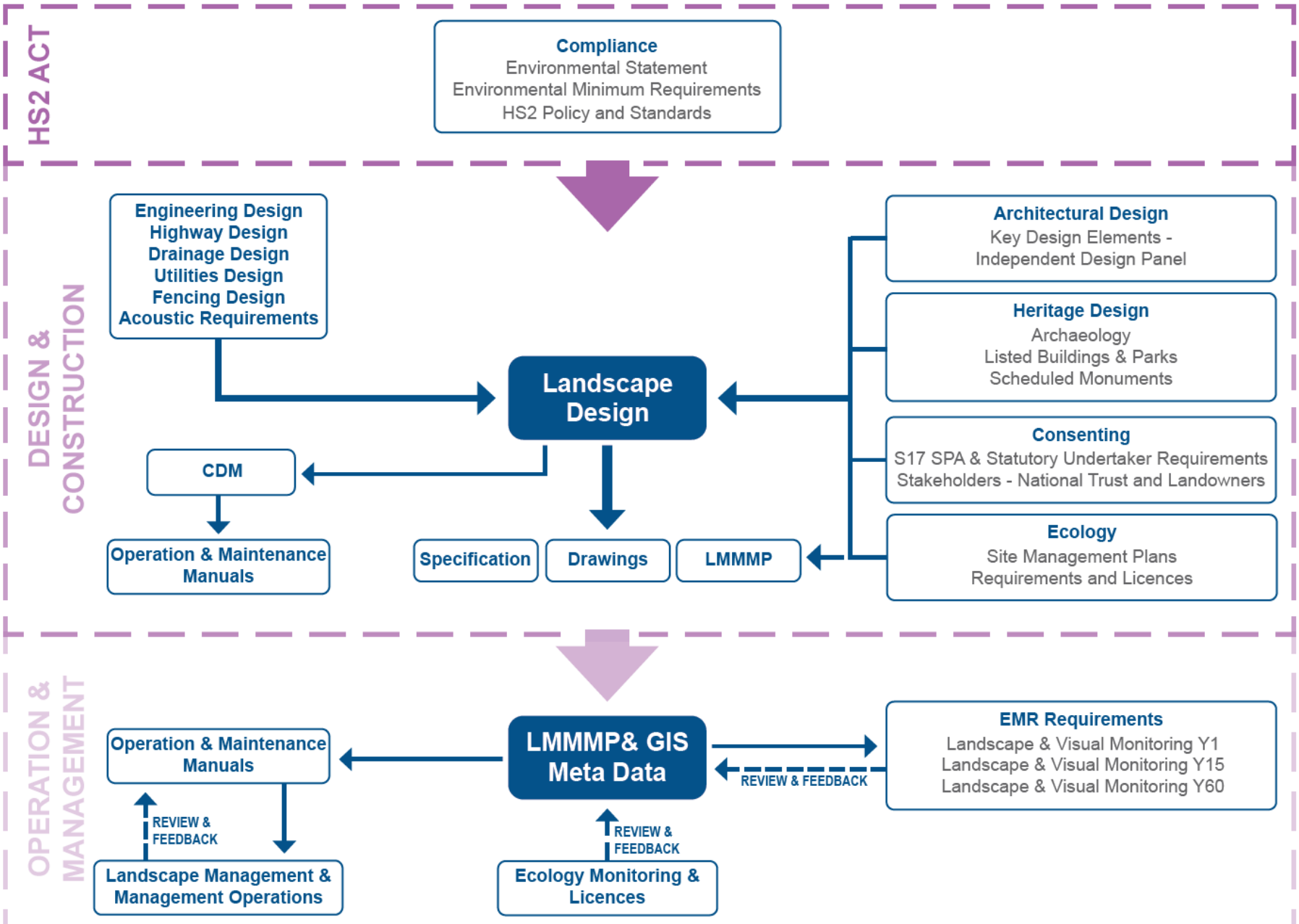
The Memorandum requires high quality design that is sensitive to the landscape character of the local area and is in line with HS2 Information Paper D1: Design Policy.

The design will seek to ensure. Landscape and external places are safe, efficient and meet the whole-life operation and maintenance alongside buildability. It contributes to the government's pursuit of sustainable development as set out in the NPPF. It is cohesive with a strong aesthetic ethos. It considers experience. It limits adverse environmental and visual impacts. It identifies potential regeneration opportunities.

The Memorandum recognises that the landscape planting will form a key part of the HS2 green corridor legacy as set out in HS2 Information Paper E11: Green Infrastructure and the Green Corridor.

The Memorandum recognises that landscaped areas will need to be maintained to an appropriate horticultural standard to ensure its successful establishment and achieves its mitigation objectives as required by HS2 Information Paper E16: Maintenance of Landscape Areas.

Figure 5.0.2 Delivery, Implementation and Operation process Diagram

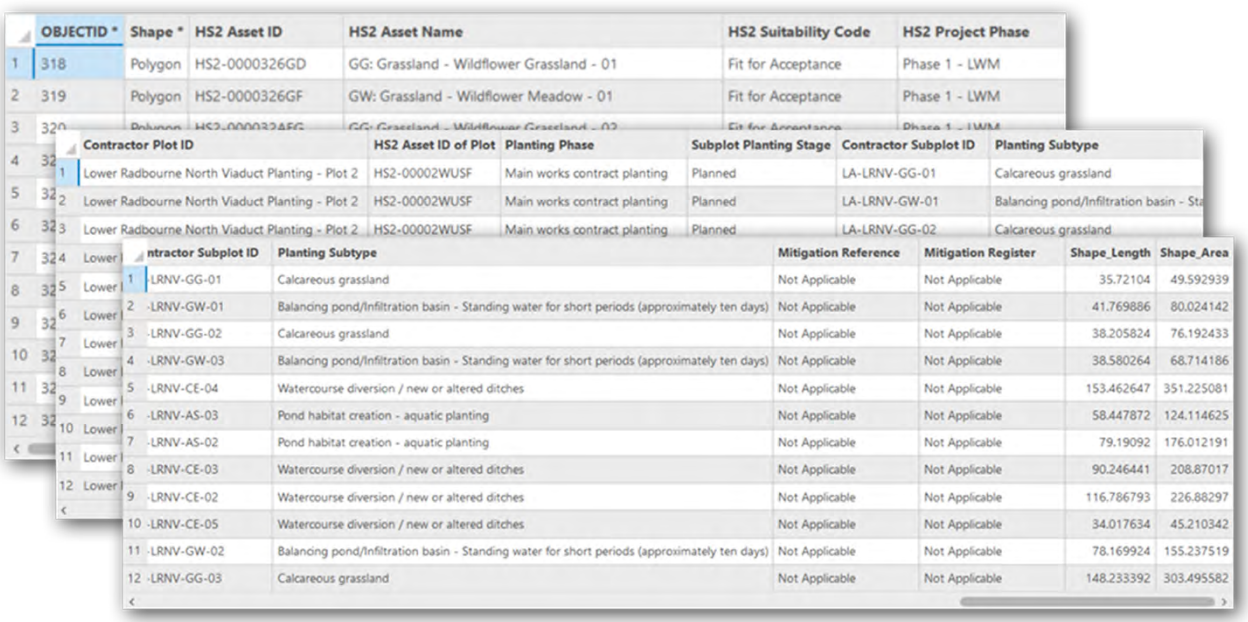

HS2 ACT
Compliance
Environmental Statement
Environmental Minimum Requirements
HS2 Policy and Standards
DESIGN & CONSTRUCTION
Engineering Design
Highway Design
Drainage Design
Utilities Design
Fencing Design
Acoustic Requirements
Landscape Design
CDM
Operation & Maintenance Manuals
Specification
Drawings
LMMMP
Architectural Design
Key Design Elements -
Independent Design Panel
Heritage Design
Archaeology
Listed Buildings & Parks
Scheduled Monuments
Consenting
S17 SPA & Statutory Undertaker Requirements
Stakeholders - National Trust and Landowners
Ecology
Site Management Plans
Requirements and Licences
OPERATION & MANAGEMENT
Operation & Maintenance Manuals
REVIEW & FEEDBACK
Landscape Management & Management Operations
LMMMP& GIS Meta Data
REVIEW & FEEDBACK
REVIEW & FEEDBACK
Ecology Monitoring & Licences
EMR Requirements
Landscape & Visual Monitoring Y1
Landscape & Visual Monitoring Y15
Landscape & Visual Monitoring Y60

Delivery, Implementation and Operation 5.0

5.2 Landscape Detailed Design - GIS

The landscape detail design models are transformed from CAD to GIS through an FME workbench. The FME workbench also facilitates the transfer of any relevant attribute data associated with the CAD model. This attribute information is then allocated to fields and domains within the GIS environment. Attributes such as unique identifier numbers (UIADs), landscape

planting codes, planting types, and Ecological Mitigation Site Plan (ESMP) information are extracted into the attribute table within GIS, from the CAD-tagged models. Additional information is incorporated into the attribute tables within ArcGIS Pro to ensure that the feature layers meet HS2 Schema requirements.



	OBJECTID *	Shape *	HS2 Asset ID	HS2 Asset Name	HS2 Suitability Code	HS2 Project Phase
1	318	Polygon	HS2-0000326GD	GG: Grassland - Wildflower Grassland - 01	Fit for Acceptance	Phase 1 - LWM
2	319	Polygon	HS2-0000326GF	GW: Grassland - Wildflower Meadow - 01	Fit for Acceptance	Phase 1 - LWM

	Contractor Plot ID	HS2 Asset ID of Plot	Planting Phase	Subplot Planting Stage	Contractor Subplot ID	Planting Subtype
1	Lower Radbourne North Viaduct Planting - Plot 2	HS2-00002WUSF	Main works contract planting	Planned	LA-LRNV-GG-01	Calcareous grassland
2	Lower Radbourne North Viaduct Planting - Plot 2	HS2-00002WUSF	Main works contract planting	Planned	LA-LRNV-GW-01	Balancing pond/Infiltration basin - Sta
3	Lower Radbourne North Viaduct Planting - Plot 2	HS2-00002WUSF	Main works contract planting	Planned	LA-LRNV-GG-02	Calcareous grassland

	ntractor Subplot ID	Planting Subtype	Mitigation Reference	Mitigation Register	Shape_Length	Shape_Area
1	-LRNV-GG-01	Calcareous grassland	Not Applicable	Not Applicable	35.72104	49.592939
2	-LRNV-GW-01	Balancing pond/Infiltration basin - Standing water for short periods (approximately ten days)	Not Applicable	Not Applicable	41.769886	80.024142
3	-LRNV-GG-02	Calcareous grassland	Not Applicable	Not Applicable	38.205824	76.192433
4	-LRNV-GW-03	Balancing pond/Infiltration basin - Standing water for short periods (approximately ten days)	Not Applicable	Not Applicable	38.580264	68.714186
5	-LRNV-CE-04	Watercourse diversion / new or altered ditches	Not Applicable	Not Applicable	153.462647	351.225081
6	-LRNV-AS-03	Pond habitat creation - aquatic planting	Not Applicable	Not Applicable	58.447872	124.114625
7	-LRNV-AS-02	Pond habitat creation - aquatic planting	Not Applicable	Not Applicable	79.19092	176.012191
8	-LRNV-CE-03	Watercourse diversion / new or altered ditches	Not Applicable	Not Applicable	90.246441	208.87017
9	-LRNV-CE-02	Watercourse diversion / new or altered ditches	Not Applicable	Not Applicable	116.786793	226.88297
10	-LRNV-CE-05	Watercourse diversion / new or altered ditches	Not Applicable	Not Applicable	34.017634	45.210342
11	-LRNV-GW-02	Balancing pond/Infiltration basin - Standing water for short periods (approximately ten days)	Not Applicable	Not Applicable	78.169924	155.237519
12	-LRNV-GG-03	Calcareous grassland	Not Applicable	Not Applicable	148.233392	303.495582

Figure 5.0.3 Attribute table from GIS showing the landscape detail design information associated with each asset.

This attribute information will be instrumental in both the implementation phase and the maintenance of the landscape once established. The GIS delineates the boundaries for each planting type and provides crucial information for landscapers. This includes ensuring the use of correct seed mixes, verifying whether the area falls within an ESMP site, adhering to correct dimensions, and scheduling the right plants for different flora species. This GIS information will also aid those involved in the maintenance and upkeep of the landscape areas, by providing unique identifies to easily find and isolate planting areas, and having a detailed record of what is intended to be grown in any specific location.

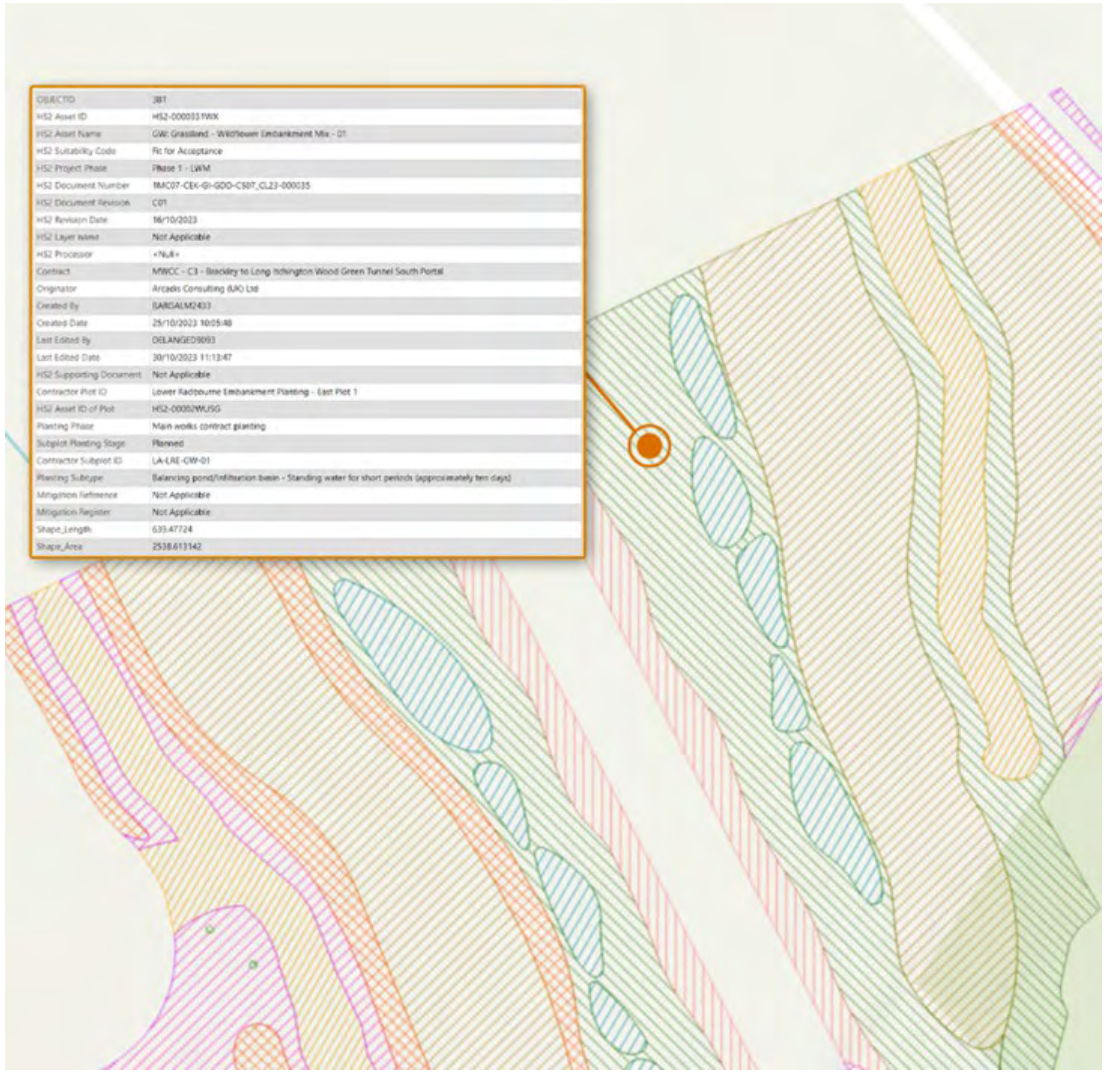


Figure 5.0.4 Visualisation of different landscape detail design areas in ArcGIS Pro, including associated attribute information.

Delivery, Implementation and Operation 5.0

5.1 Landscape Maintenance, Management and Monitoring Plan (LMMMP)

A route-wide Landscape Maintenance, Management and Monitoring Plan (LMMMP) for the C2 route has been prepared as part of the Schedule 17 and Detailed Design process (see document reference 1MC06-CEK-EV-REP-C002-000173). The LMMMP sets out the management, maintenance and monitoring requirements for the soft estate created as part of the HS2 scheme.

The route-wide LMMMP serves as a master document. It provides information for the aftercare tasks of all landscape typologies/ treatments for the EKFB HS2 Company sections referred to as AA, NCA, CA and T2G. For the purposes of Document Control the Master document is saved for both the C2 and C3 areas. It is intended to form the central source of information for these aftercare requirements which should be used by the management team responsible for the aftercare. It plays a key part in linking the Aims and Commitments Detailed Design proposals, Specifications GIS map based systems and HS2 Technical Standards. This 'Master' LMMMP is to be supported by Annex LMMMP documents, which are produced for each Detailed Design L1 Assets. The intention is that the Annex documents will be summary documents which reference the relevant aftercare tasks listed within this Master document for its specific area.

The LMMMP is a standalone document which sits alongside the Detailed Design landscape planting drawings and specification. Adjacent is a flowchart diagram which outlines the structure of the LMMMP for the C2 route.

The main works LMMMP will exclude planting associated with areas of ancient woodland as the requirements are site dependent and have been set out within Annex documents and ESMPs by the HS2 advanced works contract.

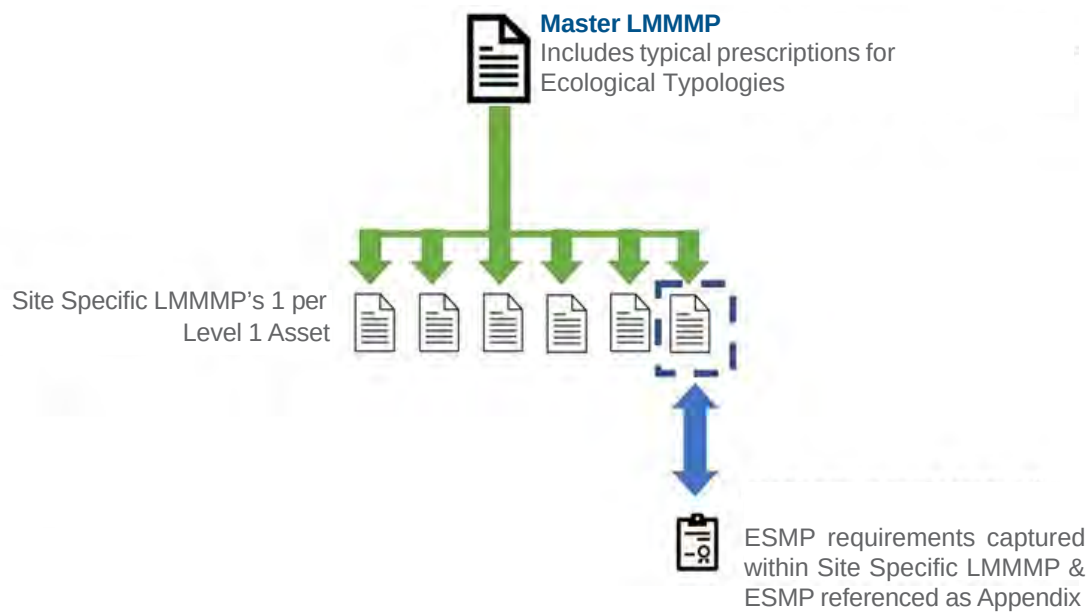


Figure 5.0.5 Diagram used to outline the contents of LMMMP Diagram

Reviews

Reviews to ensure the management regimes are suitable and the anticipated aims and objectives are being achieved are a key element of the establishment and long term management of the vegetation. Review regimes have been formally assigned (e.g. every 5 or 10 years, depending upon the type). Reviews can also be undertaken as a reactive measure following site inspection, monitoring or change in management. An initial review for all types at year 5 has been included which is called an Adapted Review, where action can be taken at an early stage of the establishment period. The intention of the review is to consider if the aims and objectives of the typologies are being achieved, and if not, if an intervention is required. These reviews should be documented within the Annex documents



Figure 5.0.6 View of Thame Valley Viaduct from southwest (50m from Viaduct)

Delivery, Implementation and Operation 5.0

Content of the LMMMP

Different management and maintenance tasks have been defined depending upon the time period the planting typology is within. Three main time periods are used within this document:

Rectification period - the post implementation period for which the contractor is contractually responsible for the planting.

Establishment period - the time after rectification when the planting matures to meet its intended aim.

Management period - the time after the planting has reached maturity.

Details of the different planting typologies and their featured elements covered by the LMMMP as follow on the page adjacent;



Figure 5.0.7 View of Wendover Viaduct from Boxwood Lane accross Wildflower Grassland Habitat (180m from Viaduct)

Existing retained vegetation
The basis of the LMMMP for this element is a BS5387 survey undertaken by an arboriculturist and covers all retained vegetation within the HS2 estate and on land adjacent to HS2 assets outside the estate where there is a risk that the retained vegetation could impact on its safe operation. This section also includes operations within Woodland Edge Management Zones - where existing vegetation is likely to become more exposed due to changes and targeted maintenance is required to manage risks.

Invasive non-native species
The LMMMP is based on the requirements set out in the HS2 Ecology Standard doc ref HS2-HS2-EVD-STD-000-0000017. Management requirements of non-native species has been developed in collaboration with the ecologist.

Woodland
The LMMMP covers a range of woodland element types and their management. This includes;

- Woodland planting including woodland edge;
- Woodland habitat creation;
- Woodland screen planting; and.
- Scrub (areas of natural regeneration and succession).

Hedgerows
The LMMMP covers a range of hedgerow element types and their management. This includes;

- Hedgerow planting; and
- Retained hedgerows.

Grassland habitat
The LMMMP covers all grass seeding element types and their management. This includes;

- Species rich grassland
- Calcareous grassland
- Acid grassland
- Neutral grassland
- Wet grassland
- Natural regeneration grassland
- Heathland; and Amenity grassland (areas of public access for leisure and recreation).

Feature Planning
The LMMMP covers ornamental tree, shrub and herbaceous element types and their management within areas typically associated with public access for leisure and recreation.

Street trees - The LMMMP covers specimen street trees and their management which are typically within the urban environment, but also includes specimen trees which may be required for example to re-establish historic features such as an avenue of trees.

Green Verges
The LMMMP covers the maintenance requirements for green verges separately, given they have specific requirements due to their proximity to the adopted highway.

Lineside Management
This type of planting comprises shrubs or bushes which are located track side of the security fence. This requires specific maintenance requirements in accordance with the HS2 Lineside vegetation standards. As such requirements are separated into its own section within the LMMMP.

Hard landscape areas
The LMMMP covers hardscape element types and their maintenance which are associated with buildings and or structures such as viaducts as well as areas associated with public access.

Delivery, Implementation and Operation 5.0

5.2 Ecology Site Management Plans (ESMP)

The Ecological Site Management Plans (ESMP) are relevant for ecological mitigation sites where additional management regimes are required. The ESMPs are separate documents which are referenced within the Annex documents as site specific requirements.

The Environmental Memorandum requires the preparation of Ecology Site Management Plans (ESMP) for each site-specific habitat creation area. The

ESMP sets out the ecology objective for the site, its detailed planting proposals, the measures to be taken to establish and maintain the site, and its monitoring regime in order to measure success. The duration for any monitoring regime will need to consider HS2 Information Paper E26: Indicative Periods for the Management and Monitoring of Habitats.

The Ecological Site Management Plan shown adjacent illustrates the measures and approach taken to as previously referenced for a site in the Stoke Mandeville area.

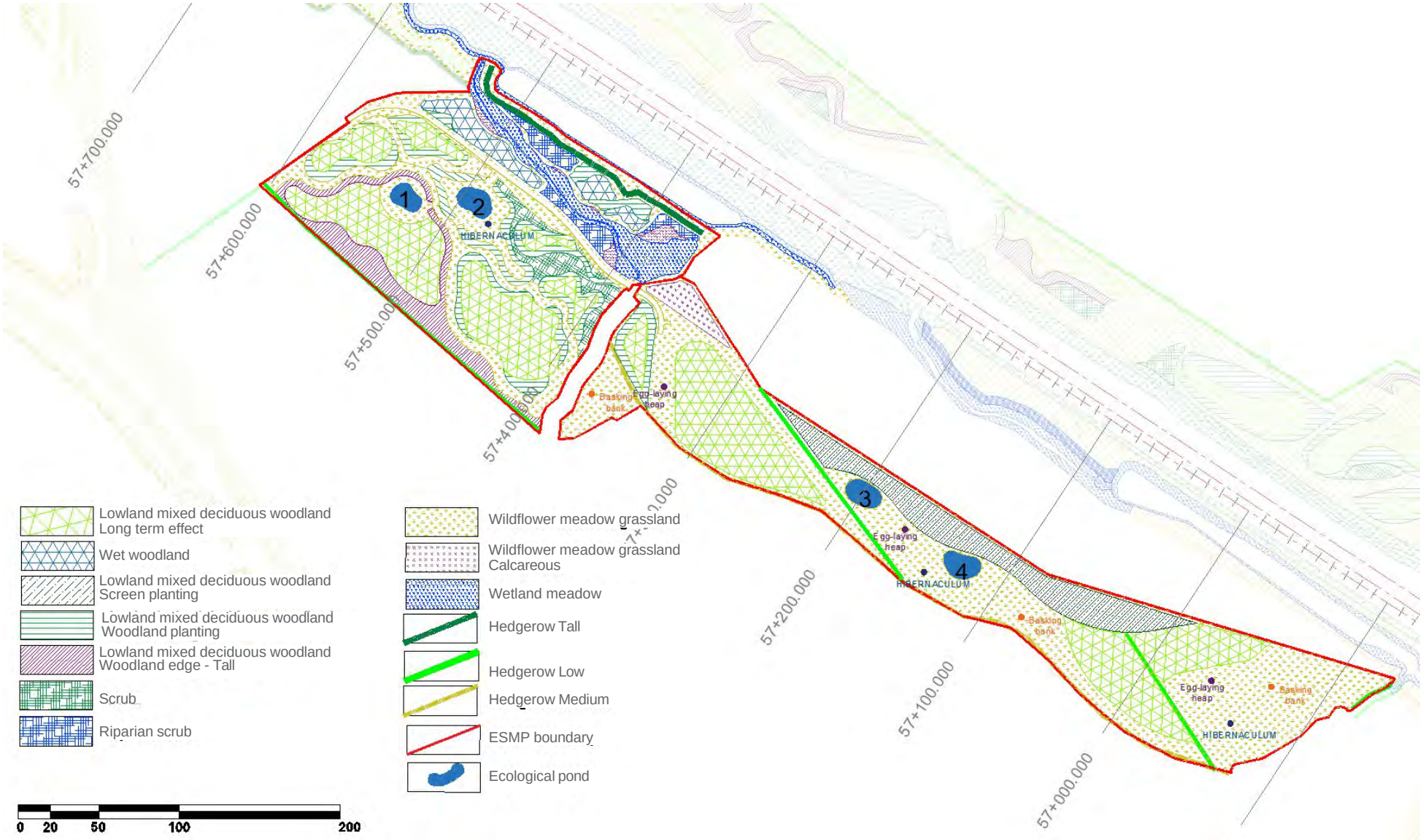


Figure 5.0.8 Stoke Mandeville ESMP main works

Delivery, Implementation and Operation 5.0

5.3 Operation & Maintenance Manuals (OMM)

The Operations and Maintenance (O&M) Manual contributes to and helps to build a concise and comprehensive Asset Management Delivery Plan (AMDP) for the landscape (Lineside and Non-Lineside). It has an intrinsic link with the LMMMP - a HS2 requirement which sets out the tasks required to look after the landscape treatments and their frequency.

The O&M is intended to as a wrapper around the LMMMP to provide further information about these tasks, include how that are anticipated to be undertaken.

More specifically, the O&M Manual helps HS2's overall maintenance strategy and RAM assurance demonstration for operating the High-Speed Railway.

The O&M Manual will be updated at regular intervals to ensure that the approach taken is aligned with the project's progress. The ownership of the RAM Management Plan always remains within the IPT Design and Engineering, under the leadership of the EKFB

Rail Systems Interface, RAMS and Interoperability Manager. For Detailed Design, partial O&M Manuals will be submitted including information on items 1, 2, 3, 4,

5, 6 and 10 highlighted in Section 1.2. This will enable sign-off of L3s for Detailed Design. The completed O&M Manual will be delivered at the end of Construction (items 7, 8 and 9).The Landscape O&M Manual covers general activities associated with this asset type and does not provide any asset specific details. The Planting Typologies are the component parts of the schemes landscape design, grouped into a series of types (i.e.- Woodland, Grassland, Hedgerow, etc).

They are described in more detail within the Master LMMMP, with a summary provided below. Asset specific information (where required) is to be included in the Appendices post construction. The planting typologies within the HS2 are split into 8no. types across various assets along the HS2 route:

- Woodland
- Lineside Vegetation
- Hedgerow
- Feature Planting
- Existing Vegetation
- Grassland
- Green Verge
- Ponds and Watercourses

To achieve the aims of HS2 landscape design approach and balance the functional and operational requirements of the railway it is critical that the design considers aftercare requirements in areas of operational railway / lineside, visual mitigation / screening, highways, green bridges, green verges to bridges and various interfaces.

CDM and CSM risks are recorded and mitigated where possible through the design phase. As part of the L3 design assurance process, HAZID workshops are held with all stakeholders to identify remaining risks, owners and residual mitigation actions. The means of communicating these risks, in addition to the CDM registers, is also identified.

The landscape treatments are designed to be permanent parts of the wider landscape and play a key role in integrating HS2 into the landscape. Given the nature of landscape treatments, three defined time periods have been defined which have differing management and maintenance tasks depending upon which period they are within. These periods are:

· Rectification Period (0 – 2 years)
· Establishment Period (from year 3 onwards, typical until years 5 or 10 depending upon treatment)
· Management Period (from year 11 onwards).

The tasks required to maintain the landscape treatments and when they should be undertaken are set out within the 'Master' LMMMP document.

The detailed maintenance procedures for the landscape treatments are dependent upon the location and situation of the planting – which defines various interfaces. The majority of landscape operations can be undertaken using traditional operations which a competent landscape contractor familiar with undertaking aftercare within a commercial environment will undertake on a day-to-day basis. Consideration has been made to certain interface situations where traditional techniques are either impractical or a safe system of work has been proposed to reduce risks.

Providing adequate access for maintenance is a critical aspect in achieving successful maintenance of the landscape treatments.

Due consideration has been given to the access requirements during the design stages to ensure access to each area requiring maintenance is available without needing to pass through the operational railway land (i.e. inside the HS2 security fencing), or adjacent neighbouring land parcels outside of HS2's control. This has been achieved through a defined maintenance access strategy with dedicated maintenance access routes. The maintenance access layouts are illustrated as part of each asset deliverables.

The Plant and Equipment associated with the landscape assets that are required to undertake the operations and maintenance activities are listed below (but not limited too):

- Excavators, Tractors and tool carriers (wheeled and tracked), including low centre of gravity tractors such as Metrac.
- Mowing equipment / attachments (including flails, collectors, bailers) including robotic equipment for steep slopes.
- Hedge cutting equipment (including finger bar and flails).
- Watering equipment (bowers, sprayers and standpipes).
- Spraying equipment (knapsack and machine mounted)
- Other typical landscape implements (hedge cutters, fertiliser spreader, scarifier) handheld tools (strimmers, hedge cutters, chainsaws); and
- Drones for surveys and inspections.

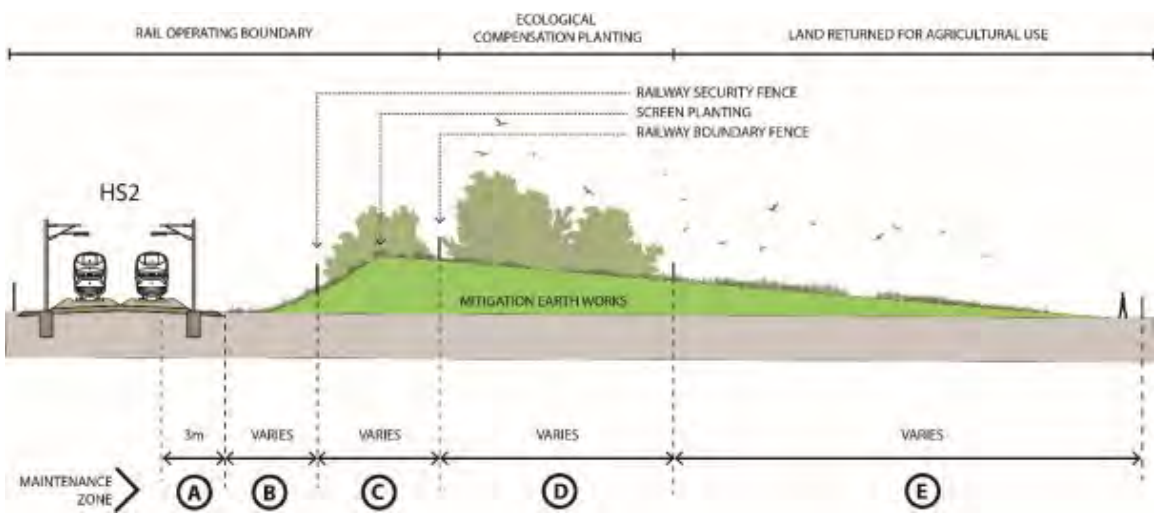


Figure 5.0.9 Indicative maintenance requirements for each zone. Note areas for 'ecological compensation' are not required on all parts of the route.



Figure 6.0.1 Elevational view of Small Dean Viaduct

6.0 Appendices

6.0
Appendices

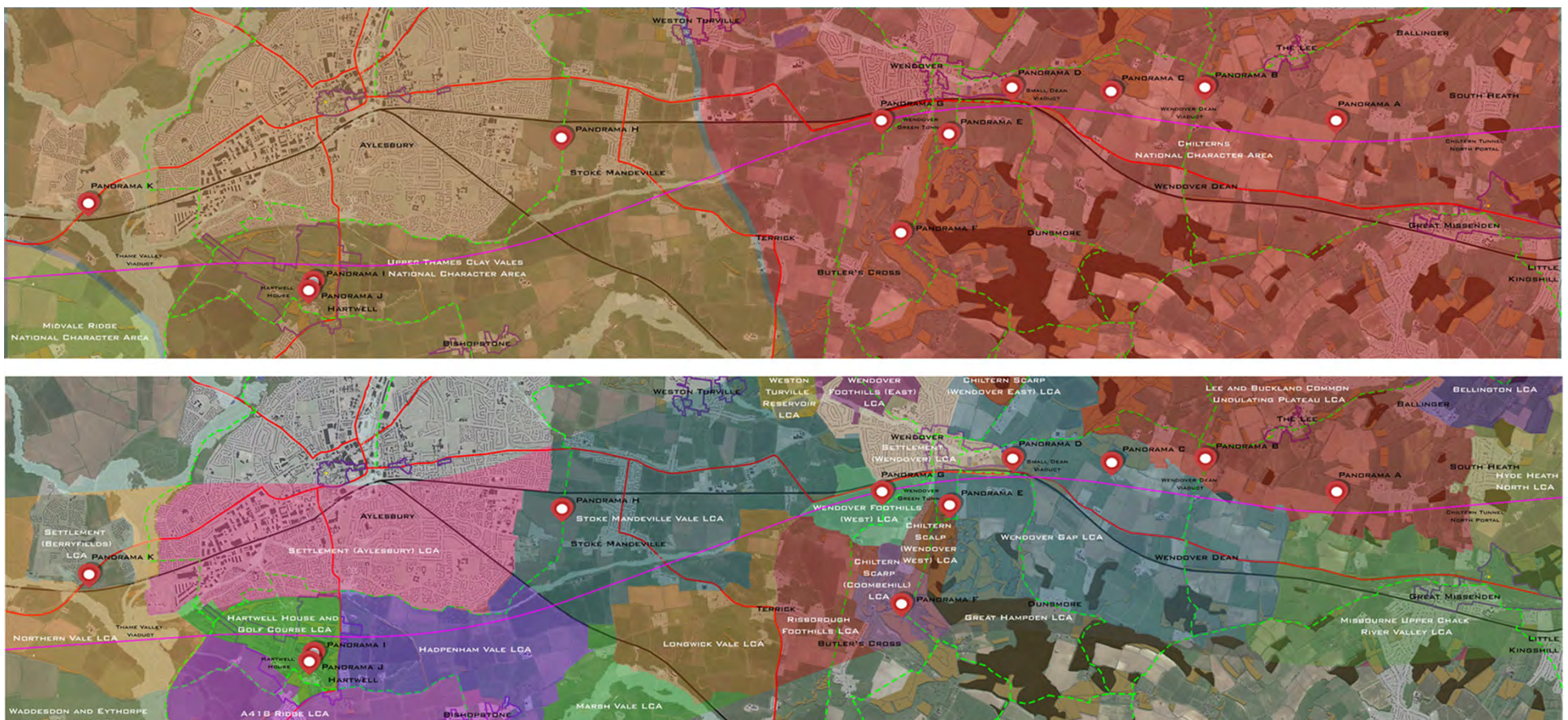
A Landscape Character & Features
B Stakeholders and Design Panel Review
C Typical Landscape Detail Description
D Bibliography

Landscape Character & Features

A.1

SOUTH HEATH TO THAME VALLEY

National and Local Character Areas



Landscape Character & Features

A.1

SOUTH HEATH TO THAME VALLEY

Landscape Features



Landscape Character & Features

A.1

CHILTERNS AONB

Landscape Context

Landscape

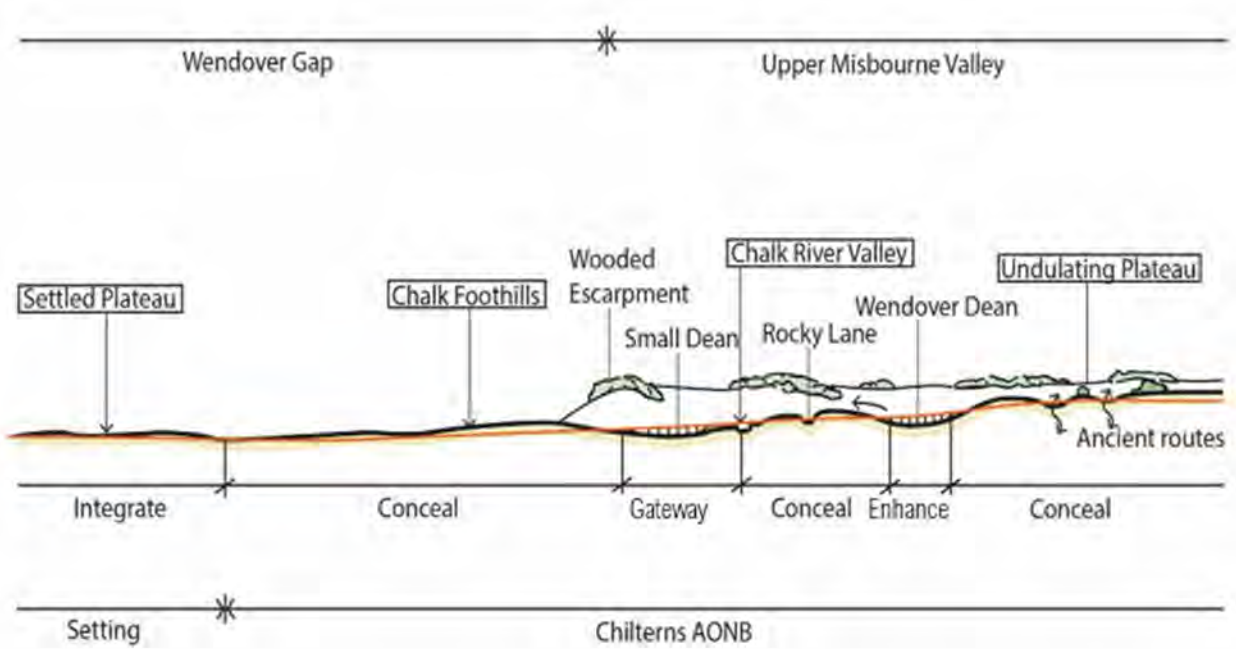
Recognise and respond to the nationally important landscape character, the scenic beauty and tranquility of the AONB and seek to integrate, conceal and present HS2 into its local context through good design.

Ecology

Seek to reduce fragmentation by facilitating ecological permeability of the route and creating landscape scale habitat connectivity.

Heritage

Recognise the importance and heritage value of Grim's ditch and the heritage value of archaeological features which add time depth
Recognise the importance of the historic field pattern
Recognise the importance of the distinctive historic landscape features such as droveways and holloways
Identify opportunities for creating new 'heritage'/ tomorrow's listed structures



Landscape Character & Features

A.1

CHILTERNS AONB: UPPER MISBOURNE VALLEY

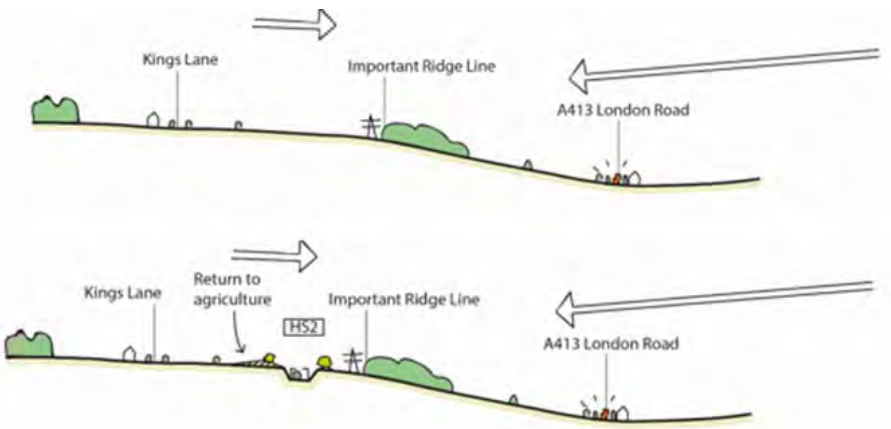
Lee and Buckland Common Undulating Plateau LCA

Recognise the importance and value of the extensive woodland cover which includes hanging woodland and provides enclosure and backdrop to views as well as biodiversity interest.

Recognise the importance of the narrow lanes enclosed by hedge banks and tall hedgerows including outgrown beech hedgerows which contribute to the rural character (green lanes).

Recognise the importance of the pre18th century regular and irregular fields interspersed with pockets of woodland and ancient woodland which are visible reminders of the historic use of land and parliamentary enclosures.

Recognise the sensitivity of the transition with the Misbourne Valley landscape, where the upper slopes form the enclosing view line from the valley. Conversely recognise the intimate scale and enclosed character of the area with occasional long views into the Misbourne Valley







Landscape Character & Features

A.1

CHILTERNS AONB: UPPER MISBOURNE VALLEY

Wendover Foothills West and Risborough Foothills LCA

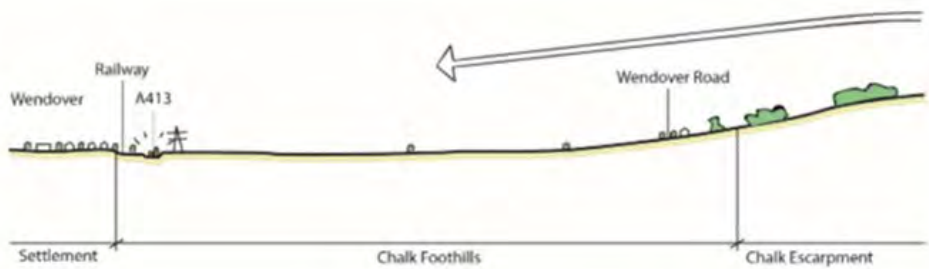
Recognise the importance of the existing field pattern and the native hedgerows with their hedgerow trees, along with the need to retain and manage or replace and where necessary in fill gaps within the LLAU. Maintain existing hedgerows by traditional cutting regimes.

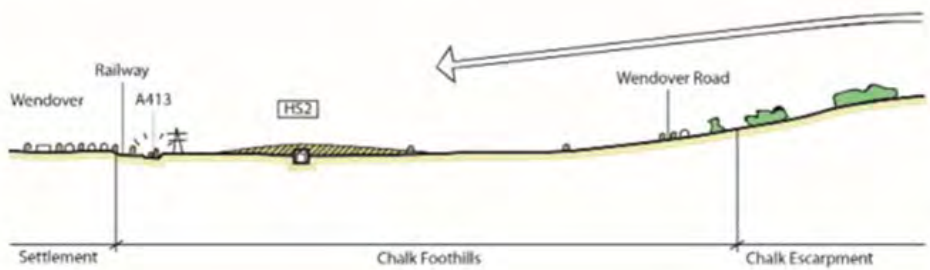
Recognise the importance of planting of new woodland on the lower slopes

Recognise the importance of calcareous, improved and semi-improved grassland and the need for traditional management by grazing.

Recognise the connectivity of habitats and in particular the fen habitats









Landscape Character & Features

A.1

CLAY VALES OF AYLESBURY

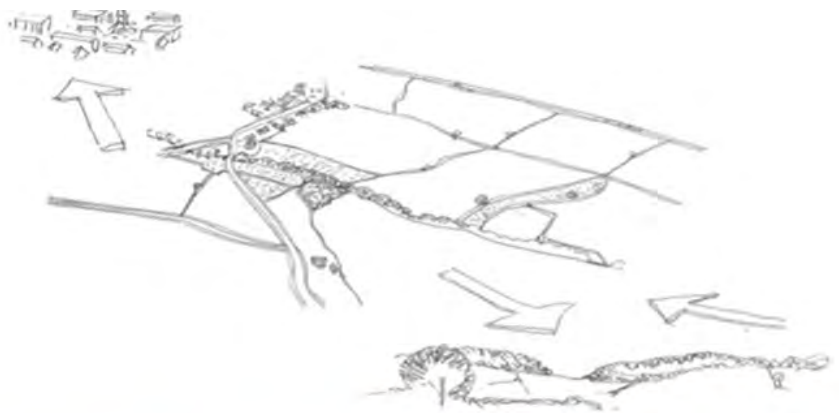
Southern Vale LCA & Haddenham Vale LCA

Recognise the importance and value of the original field pattern and the need to retain and manage or replace and where necessary infill hedgerow gaps within the LLAU. Manage and maintain through traditional cutting regimes.

Recognise the importance of planting woodland coverts and hedgerow trees to enhance the landscape structure and screen suburban edges and road corridors. Manage and maintain using traditional management techniques.

Recognise the importance of native vegetation in particular black poplar along streams and other watercourses.

Recognise and improve connectivity, particularly of areas of neutral grassland.





Landscape Character & Features

A.1

CLAY VALES OF AYLESBURY

Hartwell House and Golf Course LCA

Recognise the importance and value attached to the parkland setting to Hartwell House and grounds, including the value of its woodland cover for its distinctive contribution to visual amenity in the wider landscape setting.

Recognise the importance of the distinctive avenue feature and reinforce existing planting to provide separation and screening to the urban edge, including the screening of the recreational facilities, clubhouse and car parking areas to fully integrate within the landscape.

Recognise the importance and value of the unimproved and semi-improved grassland and the need to improve ecological diversity and the connectivity of habitats.







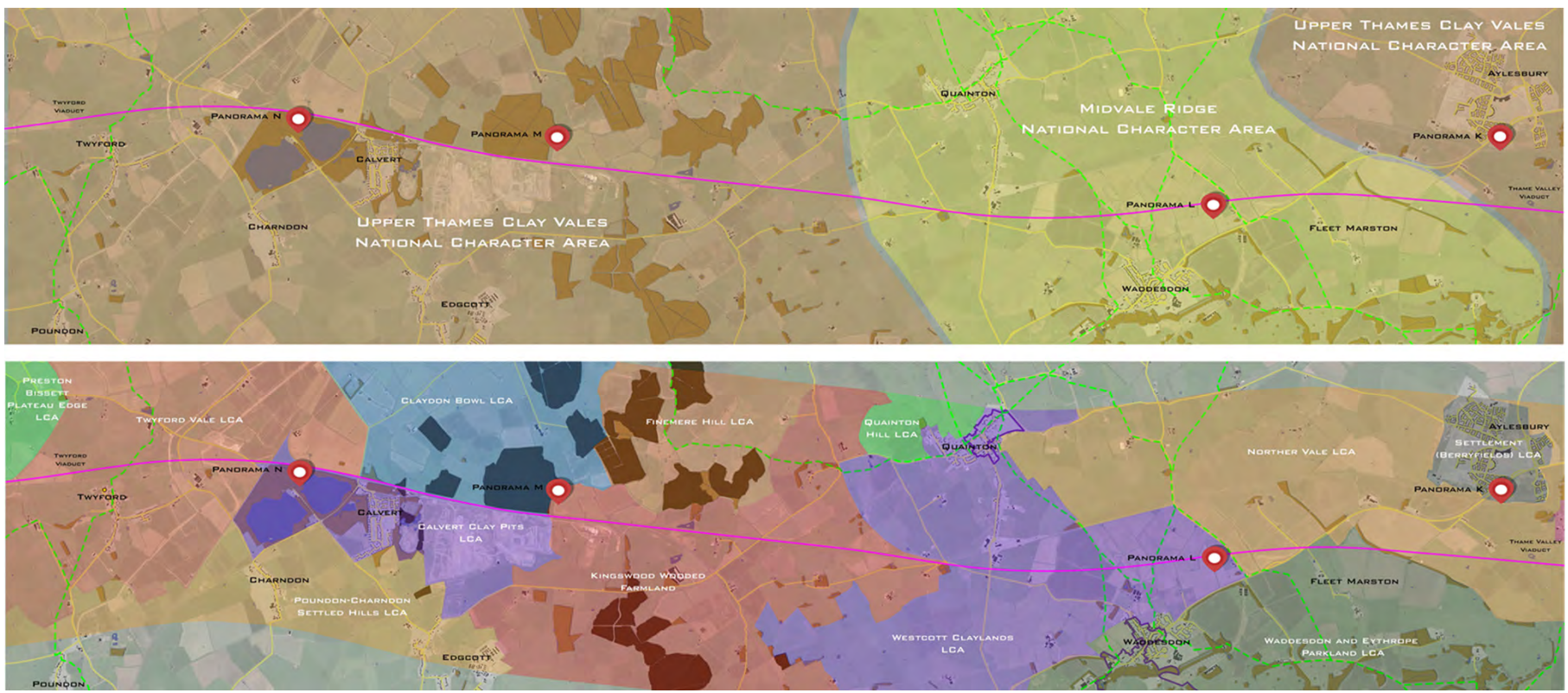
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Landscape Character & Features

A.2

THAME VALLEY TO TWYFORD

National and Local Character Areas



Landscape Character & Features

A.2

THAME VALLEY TO TWYFORD

Landscape Features



Landscape Character & Features

A.2

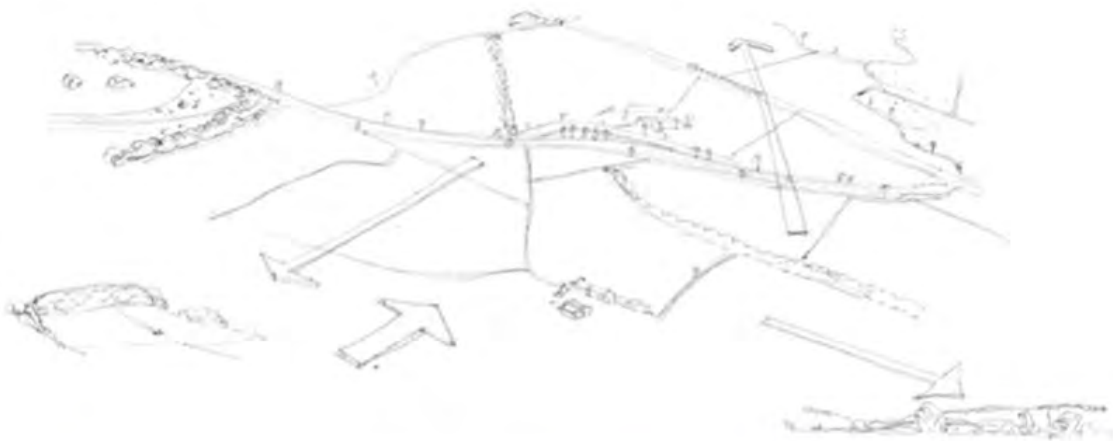
CLAY VALES OF AYLESBURY / MIDVALE RIDGE

Northern Vale LCA & Waddesdon-Eythrope Parkland LCA

Recognise the importance of the original field pattern and the need to retain and manage or replace these hedgerows, along with planting of new woodlands, hedgerow trees and the planting of native vegetation including black poplar, along streams and other watercourses.

Recognise the importance and value of historic meadows and areas of neutral grassland and the need to provide connectivity between habitats, including the creation of buffer strips of grassland and bank side vegetation to provide more diverse habitats.

Recognise the importance of the setting of key heritage features.





Landscape Character & Features

A.2

MIDVALE RIDGE & CLAY VALES OF BUCKINGHAM

Westcott Claylands LCA and Kingswood Wooded Farmland LCA

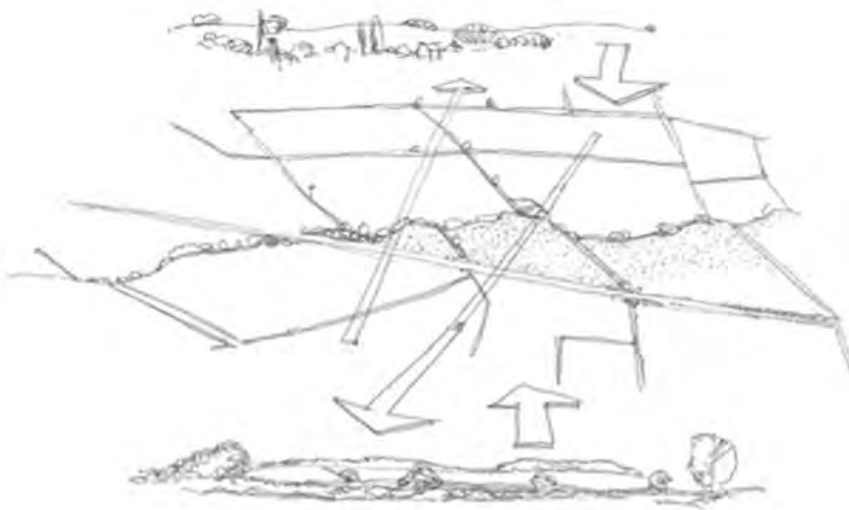
Recognise the importance of the historic hedgerow pattern and replace or infill gaps and establish new hedgerow trees. Oak trees are a feature of hedgerows in this area. Seek to maintain hedgerows through traditional cutting regimes.

Recognise the importance and value of meandering stream side vegetation and promote the management and conservation of vegetation including the pollarding of willow.

Recognise the importance of woodland and promote the establishment of new woodland

Recognise the importance and biodiversity value of neutral, calcareous unimproved and semi-improved grassland and encourage good management practices.

Recognise the importance of habitat connectivity and close to watercourses promote the use of permanent pasture, with low stocking density and flooding regimes to promote biodiversity and landscape enhancement.



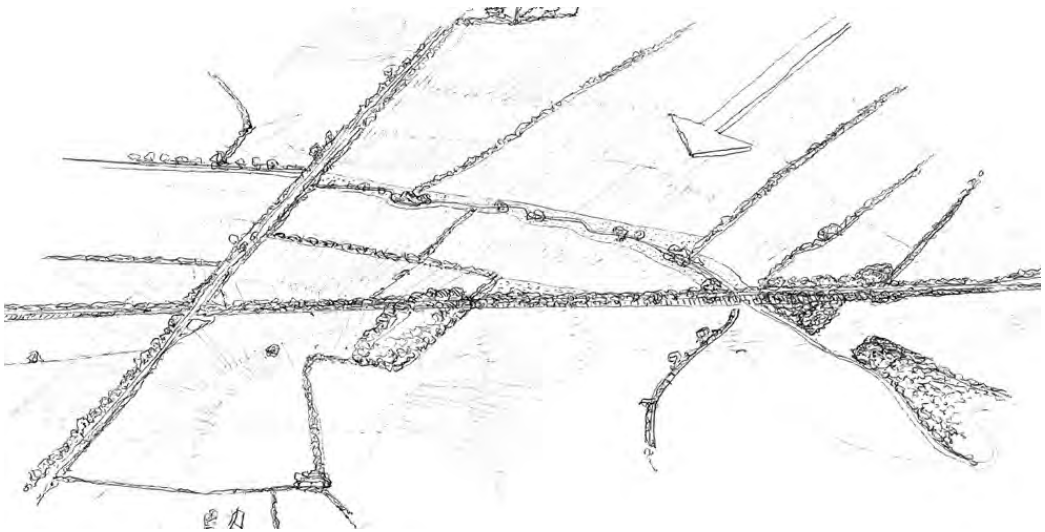


Landscape Character & Features

A.2

CLAY VALES OF BUCKINGHAM

Claydon Bowl LCA





Landscape Character & Features

A.2

CLAY VALES OF BUCKINGHAM

Twyford Vale LCA

Recognise the importance of the historic hedgerow pattern by infilling gaps and establishing new hedgerow trees and encourage the management of hedgerows through traditional cutting regimes.

Recognise the importance and promote the management and conservation of vegetation adjacent to the meandering watercourses including the pollarding of willows and promote connectivity of habitats.

Recognise the importance of the historic meadows and unimproved and semi-improved grassland. Seek opportunities to promote the use of permanent pasture, with low stocking density and flooding regimes to promote biodiversity and landscape enhancement.



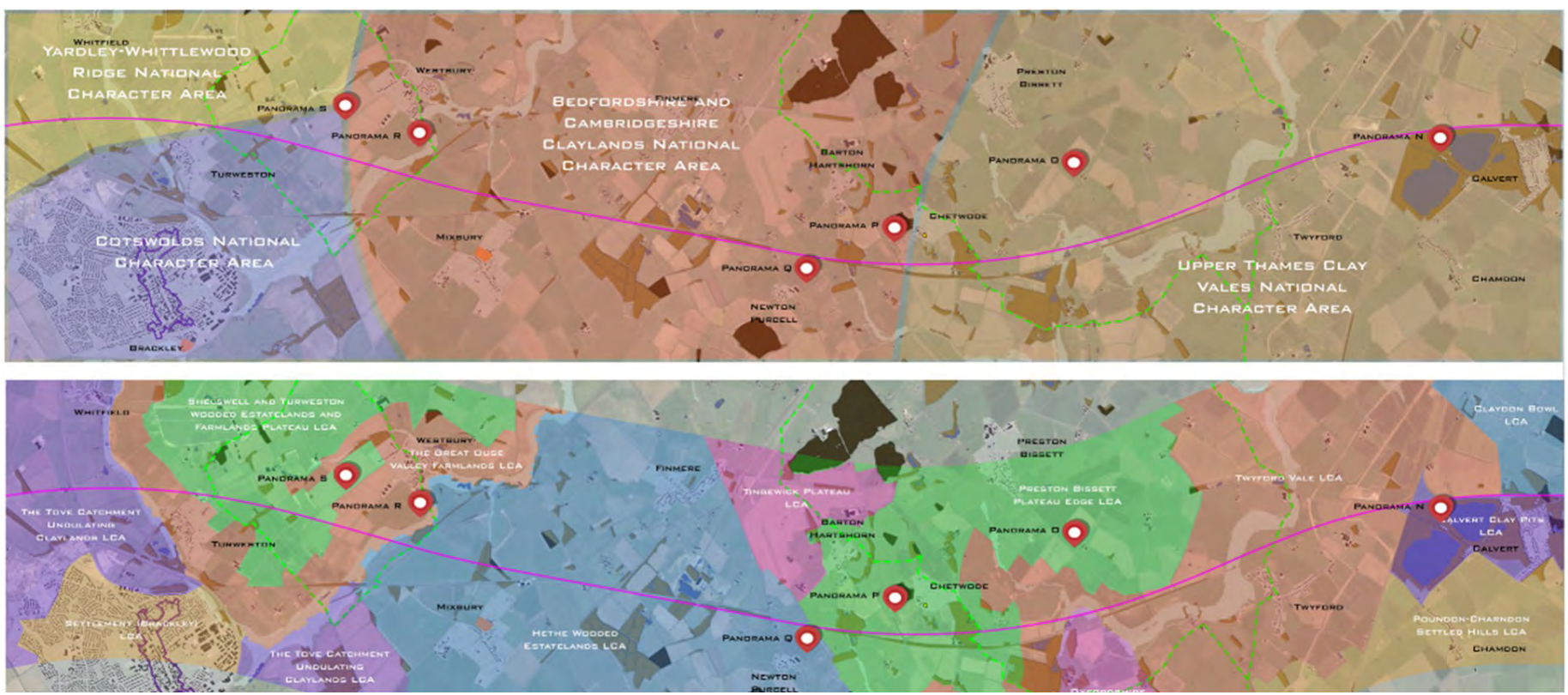


Landscape Character & Features

A.3

TWYFORD TO BRACKLEY

National and Local Character Areas



Landscape Character & Features

A.3

TWYFORD TO BRACKLEY

Landscape Features



Landscape Character & Features

A.3

RIVER GREAT OUSE CLAYLANDS

Preston Bissett Plateau Edge LCA and Hethe Wooded Estatelands LCA

Recognise the importance and value of the historic hedgerow pattern and replace where it has been lost to enhance the landscape character and strengthen connectivity of habitats. Encourage the establishment of new hedgerow trees. Maintain and improve the condition of existing hedgerows through traditional cutting regimes

Recognise the importance of new woodland planting to minimise the impact of new infrastructure and manage using traditional techniques to create and manage a wide diversity of habitats.

Recognise the importance of neutral grassland

Recognise the importance of the character of minor roads by the planting and management of hedgerows and verges and limiting urbanising elements such as signs and kerbs.





Landscape Character & Features

A.3

COTSWOLDS AND WHITTLEBURY RIDGE

Westbury – Biddlesden Great Ouse Valley LCA and Oatleys Plateau LCA

Recognise the importance and value of the existing historic hedgerow pattern and plant up with new hedgerow trees. Seek to restore the historic hedgerow pattern where it has been lost to enhance the landscape character and strengthen the ecological diversity and implement management through traditional cutting regimes.

Recognise the importance of woodland and through planting and management using traditional techniques create and manage a wide diversity of habitats.

Recognise the importance of historic meadows and unimproved and semi-improved grassland close to watercourses and promote the use of permanent pasture, with low stocking density and flooding regimes to promote biodiversity and landscape enhancement.





Key Stakeholders

B

Introduction

The landscape design is being developed in recognition of other documents specifically prepared by key stakeholders. These include the Chilterns AONB

Forum Group Detailed Design Principles (2018) and National Trust's design requirements for their assets at Coombe Hill, Hartwell House, Waddesdon Manor

and Claydon House. In addition, the landscape design associated with a number of KDEs, namely Wendover Dean viaduct, Small Dean viaduct, Wendover Green Tunnel south portal, Thame viaduct, Sheephouse Wood bat structure and Calvert IMD, are subject to the HS2 Design Panel Review process.

Key Stakeholders

The landscape design has been developed in collaboration with a number of key stakeholders. A list of the key stakeholders is set out in Table B1.

Table B1. Key Stakeholders

Stakeholder	Engagement / Consultation Topic	Date and Reference Document
Chilterns AONB Forum Group (Natural England)	Chilterns AONB Detailed Design Principles / Schedule 17	Refer to the Written Statements submitted under Schedule 17 for Chiltern District Council Package 1 South Heath Cutting (Document Reference 1MC06-CEK-TP-STA-CS03_CL105-000004) (April 2022); AVDCP1 South Heath to Wendover (Document Ref. 1MC06-CEK-TP-STA-CS03_CL05-000003) (April 2022); AVDCP2 Wendover Dean Viaduct (Document Ref. 1MC06-CEK-TP-STA-CS03_CL06-000001) (October 2021); AVDCP3 Small Dean (Document Ref. 1MC06-CEK-TP-STA-CS03_CL05-000002) (December 2022) and AVDCP4 Nash Lee (Document Ref. 1MC06-CEK-TP-STA-CS03_CL06-000004) (August 2022).
Historic England	Grim's Ditch, Hartwell House Wall / Schedule 17	Grims Ditch has not yet been submitted for approval under Schedule 17. Hartwell House Wall was the subject of a Listed Building Consent. Refer to the Hartwell House Design and Access Statement (Document Ref. 1MC06-CEK-EV-STA-CS04_CL18-000001).
National Trust, Ernest Cooke Trust and Waddesdon (Roth-schild) Manor Estate	Coombe Hill AONB, Hartwell House and Parkland – Green Banks project, Waddesdon Manor and Parkland (A41 narrowing), Claydon House	Refer to AVDCP7 Hartwell (Document Ref. 1MC06-CEK-TP-STA-CS04_CL19-000003) (September 2022).
Buckinghamshire County Council (BCC)	Highway matters / Schedule 4	

Stakeholder	Engagement / Consultation Topic	Date and Reference Document
Aylesbury Vale District Council (part of BCC from April 2020)	Schedule 17	Refer to the Written Statements submitted under Schedule 17 for AVDCP1 South Heath to Wendover (Document Ref. 1MC06-CEK-TP-STA-CS03_CL05-000003) (April 2022); AVDCP2 Wendover Dean Viaduct (Document Ref. 1MC06-CEK-TP-STA-CS03_CL06-000001) (October 2021); AVDCP3 Small Dean (Document Ref. 1MC06-CEK-TP-STA-CS03_CL05-000002) (December 2022); AVDCP4 Nash Lee (Document Ref. 1MC06-CEK-TP-STA-CS03_CL06-000004) (August 2022); AVDCP5 Stoke Mandeville (Document Ref. 1MC06-CEK-TP-STA-CS03_CL17-000001) (December 2022); AVDCP6a South West Aylesbury (Part A) (Document Ref. 1MC06-CEK-TP-STA-CS04_CL18-000001) (April 2022); AVDCP7 Hartwell (Document Ref. 1MC06-CEK-TP-STA-CS04_CL19-000003) (September 2022); AVDCP8 Thame Valley (Document Ref. 1MC06-CEK-TP-STA-CS04_CL19-000002) (August 2022); AVDCP9 Putlowes to Waddesdon (Document Ref. 1MC06-CEK-TP-STA-CS04_CL20-000002) (December 2021); AVDCP10 Waddesdon to Quainton (Document Ref. 1MC06-CEK-TP-STA-CS04_CL20-000001) (August 2022); AVDCP11 Quainton to Grendon Underwood (Document Ref. 1MC06-CEK-TP-STA-CS05-000001) (May 2022), AVDCP12 Sheephouse Wood (Document Ref. 1MC06-CEK-TP-STA-CS05-000003)(August 2022); AVDCP13A Calvert South (Document Ref. 1MC06-CEK-TP-STA-CS06_CL09-000001) (December 2022); AVDCP13B Calvert North (Document Ref. 1MC06-CEK-TP-STA-CS06_CL09-000002) (September 2021); AVDCP14 Twyford to Chetwode (Document Ref. 1MC06-CEK-TP-STA-CS06_CL10-000001) (December 2022); AVDCP15 Chetwode to Mixbury (Document Ref. 1MC06-CEK-TP-STA-CS06_CL10-000002) (September 2022) and AVDCP16 Westbury to Turweston (Document Ref. 1MC06-CEK-TP-STA-CS06_CL22-000001) (June 2022).
Chilterns District Council (part of BCC from April 2020)	Schedule 17	Refer to the Written Statements submitted under Schedule 17 for Chiltern District Council Package 1 South Heath Cutting (Document Reference 1MC06-CEK-TP-STA-CS03_CL105-000004) (April 2022).
Cherwell District Council	Schedule 17	Refer to the Written Statements submitted under Schedule 17 for CDCP1 Godding-ton (Document Ref. 1MC06-CEK-TP-STA-CS06_CL10-000004) (September 2021); CDCP2 Newton Purcell to Finmere (Document Ref. 1MC06-CEK-TP-STA-CS06_CL21-000002) (December 2022) and CDCP3 Mixbury (Document Ref. 1MC06-CEK-TP-STA-CS06_CL21-000001) (August 2022).

Stakeholder	Engagement / Consultation Topic	Date and Reference Document
Chilterns Conservation Group	Schedule 17 Chilterns AONB (Bacombe Hill) habitat and plant species	Refer to the Written Statements submitted under Schedule 17 for Chiltern District Council Package 1 South Heath Cutting (Document Reference 1MC06-CEK-TP-STA-CS03_CL105-000004) (April 2022); AVDCP1 South Heath to Wendover (Document Ref. 1MC06-CEK-TP-STA-CS03_CL05-000003) (April 2022); AVDCP2 Wendover Dean Viaduct (Document Ref. 1MC06-CEK-TP-STA-CS03_CL06-000001) (October 2021); AVDCP3 Small Dean (Document Ref. 1MC06-CEK-TP-STA-CS03_CL05-000002) (December 2022) and AVDCP4 Nash Lee (Document Ref. 1MC06-CEK-TP-STA-CS03_CL06-000004) (August 2022).
Bedfordshire, Buckinghamshire and Oxfordshire Wildlife Trust (BBOWT)	Schedule 17 mainly focusing on the Calvert area	AVDCP13A Calvert South (Document Ref. 1MC06-CEK-TP-STA-CS06_CL09-000001) (December 2022); AVDCP13B Calvert North (Document Ref. 1MC06-CEK-TP-STA-CS06_CL09-000002) (September 2021);

Design Panel Review

B

The landscape design associated with the KDE's within C2 have been presented and discussed at a number of design panels during 2017, 2018 and 2019. The design panel review comments for each KDE is set out in Table B2 below. A further round of design panel reviews for each KDE will be undertaken during the Schedule 17 process.

Table B2. Key Design Elements - Design Panel Review comments

HS2 Asset	Design Panel Response (Landscape related)
Wendover Dean viaduct	Design Panel Review Dates: 17/10/17, 08/05/18…… Please refer to the Design and Access Statement AVDCP02 Wendover Dean Viaduct (see document reference 1MC06-CEK-TP-STA-CS03_CL05-000002) for a summary of landscape related comments and design response explaining how the feedback has been incorporated during design development.
Small Dean Viaduct	Design Panel Review Dates: 17/10/17, 08/05/18…… Please refer to the Design and Access Statement AVDCP03 – Small Dean and Wendover Green Tunnel (see document reference 1MC06-CEK-TP-STA-CS03_CL06-000001) for a summary of landscape related comments and design response explaining how the feedback has been incorporated during design development.
Wendover green tunnel south portal	Design Panel Review Dates: 17/10/17, 22/05/18…… Please refer to the Design and Access Statement AVDCP03 – Small Dean and Wendover Green Tunnel (see document reference 1MC06-CEK-TP-STA-CS03_CL06-000001) for a summary of landscape related comments and design response explaining how the feedback has been incorporated during design development.

HS2 Asset	Design Panel Response (Landscape related)
Thame Valley viaduct	Design Panel Review Dates: 25/10/17, 02/05/18…… Please refer to the Design and Access Statement AVDCP08 – Thame Valley Viaduct (see document reference 1MC06-CEK-TP-STA-CS04_CL19-000001) for a summary of landscape related comments and design response explaining how the feedback has been incorporated during design development.
Sheephouse Wood bat structure	Design Panel Review Dates: 13/11/17, 10/07/18…… Please refer to the Design and Access Statement AVDCP12 – Sheephouse Wood Bat Mitigation Structure (see document reference: 1MC06-CEK-TP-STA-CS05-000002) for a summary of landscape related comments and design response explaining how the feedback has been incorporated during design development.

Typical Landscape Detail Description C

This document provides descriptions of the information included on Typical Landscape Detail Drawing sheets.

SHEET 1 – EARTHWORKS - DETAILS OF PLANTING ON FALSE AND MAIN LINE WORKS - Sections for false cutting earthworks and embankments showing planting treatment and slope details. Shows planting intentions for HS2 Trackside/Public facing sides of slopes and embankments. Call out boxes are used to show applicable planting mixes for each detail using hatch symbols from general arrangement plans. All at scale of 1:200 @ A1.

SHEET 2 – PLANTING NOT ON FALSE CUTTINGS BUNDS - Sections showing planting treatments for HS2 planting areas that are not on bunds. Indicates soil depth, high level tree pit information. Planting Typologies covered include: Grass, Wildflower, Restored Land, Shrub planting and Woodland planting.Call out boxes are used to show applicable planting mixes for each detail using hatch symbols from general arrangement plans. Details not to scale.

SHEET 3 – HEDGE DETAILS TYPE A, A1, B, B1, B2 and B3 - Sections and plans showing hedge planting detail options for single row and double-staggered hedgerow planting. Showing information on plant spacing, drainage and pit details. Legend shows relevant hedge detail for each hedge mix legend symbol on general arrangement plans.

SHEET 4 – HEDGE DETAILS TYPE C, C1, D, D1, E
Sections and plans showing hedge planting details for double-staggered hedgerow, Habitat connectivity Hedgerow, and infill hedgerow planting. Showing information on plant spacing, drainage, soil depths, and pit details. Legend shows relevant hedge detail for each hedge mix legend symbol on general arrangement plans.

SHEET 5 – TREE PLANTING DETAILS
Sections showing tree pit and stake details. Includes information on soil specification and surface treatment. Some information on drainage and irrigation.

SHEET 6 – TREE PLANTING ON SLOPE - MULCH MAT - Sections and plans showing angled tree pit and stake details. Includes information on soil specification and surface treatment. Some information on drainage and irrigation.

SHEET 7 – HEDGE PLANTING NEAR SERVICES
Section details showing hedge planting near services (e.g. road, pylon, ditch, drainage) with details of minimum offset distances for plant to relevant services

SHEET 8 – PLANTING MATRIX - TREE PLANTING
Plans showing woodland planting matrix with short, medium and long term options. Planting consists of various plant groups of Feathered and Transplant trees and shrubs. Plant numbers and spacing information included.

SHEET 9 – LINE SIDE PLANTING DETAILS
Sections showing planting details adjacent to the HS2 Line in various settings (e.g. on embankments, cuttings and false cutting and at Grade). Information on fencing, plant heights and offsets.

SHEET 10 – CUTTING & EMBANKMENT PLANTING
Sections showing planting treatments and soil specification on trackside slopes and embankments. Also shows planting offsets from the track. Call out boxes are used to show applicable planting mixes for each detail using hatch symbols from general arrangement plans.

SHEET 11 – EARTHWORKS - PLANTING ON TOP OF BUND - Sections showing woodland and wildflower planting treatments on a bund. Shows information on topsoil and subsoil depth and drainage for woodland areas. One section focuses on slope stabilisation mats to prep site for application of topsoil.

SHEET 12 – HIGHWAYS EMBANKMENT SLOPE PLANTING Sections showing planting treatments and soil specification on slopes adjacent to a road. Focuses on Woodland, wildflower and shrub planting typologies. 2 options presented for each typology: For slopes steeper that 1:3.5 gradient and for slopes less than that 1:3.5 gradient. Call out boxes show relevant planting mixes for each detail using hatch symbols from general arrangement plans.

SHEET 13 – ECOLOGY HEDGE PLANTING
Sections and plans showing hedge planting details for staggered ecological hedge planting. Showing information on plant spacing, drainage, soil depths, and pit details. Legend shows relevant hedge detail for each hedge mix legend symbol on general arrangement plans.

SHEET 14 – WOODLAND PLANTING OFF SETS - SHEET 1 - Sections showing tree and shrub planting offsets between proposed planting and Highway/ Footpath/Lighting Column/Fences/Existing Planting. Call out boxes are used to show applicable planting mixes for each detail using hatch symbols from general arrangement plans.

SHEET 15 – WOODLAND PLANTING OFFSETS - SHEET 2 - Sections showing tree and shrub planting offsets between proposed planting and Fence/Ditch/ Head Wall/ Ponds. SHEET 16 – UTILITY OFFSET PLANTING SHEET 1Sections showing tree and shrub planting offsets between proposed planting and utilities. Also shows positioning for root barrier around services.

SHEET 16 – UTILITY OFFSET PLANTING SHEET 1
Sections showing tree and shrub planting offsets between proposed planting and utilities. Also shows positioning for root barrier around services.

SHEET 17 – FENCING AND PLANTING DETAILS
Sections showing details for the installation of various fences (e.g. Stock proof, Timber post and rail, deer fences, and Security fences). Also shows minimum distances between fences and planting.

SHEET 18 – BAT CULVERT REQUIREMENTS
Plan and Sections showing relationship between proposed planting and Bat culverts. Also includes maintenance specifications for tree heights to direct bat flight paths.

SHEET 19 – BAT MITIGATION PLANTING INFORMATION - Plan and Sections showing overbridge bar flight line and how proposed planting is used to mitigate potential conflict between bats and vehicles.

SHEET 20 – PLANTING NEAR EXISTING RESIDENTIAL PROPERTY - Sections and plan showing shrub and woodland planting layout and offsets near existing residential properties.

SHEET 21 – TREE PLANTING NEAR PONDS, HIGHWAYS AND DRAINAGE- Sections showing tree and shrub planting offsets between proposed planting and Ditch/Ponds/Underground Chambers/Filter Drain.

SHEET 22 – PLANTING NEAR HS2 BUILDING
Plan and Sections showing shrub and woodland layout and planting offsets near HS2 Buildings.

SHEET 23 – PLANTING ON EXISTING LAND SOIL
Sections showing planting specification on existing soils. Also shows offsets between proposed planting and existing vegetation.

SHEET 24 – PLANTING NEXT TO HIGHWAYS
Sections showing planting offsets for shrub and woodland planting near roads with and without visibility splays.

SHEET 25 – PLANTING ON A HOLLOWAY - 1 :15 BANKS - Sections showing planting treatments on existing and proposed Holloways. Also shows offsets for shrub and woodland planting.

SHEET 26 – PLANTING BEHIND VRS, HIGHWAYS INFORMATION - Sections showing typical planting near Road VRS barriers. Shows various situations including with visibility splay area; adjacent to B road; and, shrub, screen and woodland planting near a Road VRS.

SHEET 27 – PLANTING AROUND GSMR MASTS COMPOUNDS - Sections showing mitigation planting zones around GSMR structures within the HS2 scheme. Shows planting sizes and treatments in the various zones at Year 0 and Year 15.

SHEET 28 – EARTHWORK BLENDING BETWEEN HEIGHTS - Section ad plan showing specification for blending between proposed earthworks of different heights. Includes information on slope and soil depth.

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Keeping you informed

We are committed to keeping you informed about work on HS2. This includes ensuring you know what to expect and when to expect it, as well as how we can help.

Residents' Charter and Commissioner

The Residents' Charter is our promise to communicate as clearly as we possibly can with people who live along or near the HS2 route.
www.gov.uk/government/publications/hs2-residents-charter

We also have an independent Residents' Commissioner whose job is to make sure we keep to the promises we make in the Charter and to keep it under constant review. Find reports at:
www.gov.uk/government/collections/hs2-ltd-residents-commissioner

You can contact the Commissioner at:
residentscommissioner@hs2.org.uk

Construction Commissioner

The Construction Commissioner's role is to mediate and monitor the way in which HS2 Ltd manages and responds to construction complaints. You can contact the Construction Commissioner at: complaints@hs2-cc.org.uk

Property and compensation

You can find out all about HS2 and properties along the line of route by visiting:
www.gov.uk/government/collections/hs2-property

Find out if you're eligible for compensation at:
www.gov.uk/claim-compensation-if-affected-by-hs2

Holding us to account

If you are unhappy for any reason you can make a complaint via the helpline. For more details on our complaints process, please visit our website:
www.hs2.org.uk/how-to-complain

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