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A303 Amesbury to Berwick Down

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7.2 Design and Access Statement

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A303 Amesbury to Berwick Down

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DESIGN AND ACCESS STATEMENT

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Foreword

The A303 Amesbury to Berwick Down scheme ("the Scheme") forms part of a programme of improvements for upgrading the A303/A358 corridor, improving this vital connection between the South West and London and the South East and including the upgrade of remaining single carriageway sections on the route to dual carriageway. This investment is stated as a priority project in the National Infrastructure Plan and Government's commitment is confirmed in the Road Investment Strategy (2015/16-2020/20 Road Period). Subject to achieving an approved Development Consent Order ("DCO"), preliminary works are planned to start in 2020 with the main construction works following in 2021, and the Scheme is due to open to traffic in 2026.

Objectives for the Scheme have been formulated both to address identified problems and to take advantage of the opportunities that new infrastructure would provide. The objectives are defined by the Department for Transport ("DfT"):

- **Transport** - To create a high quality reliable route between the South East and the South West that meets the future needs of traffic;
- **Economic Growth** - to enable growth in jobs and housing by providing a free flowing and reliable connection between the South East and the South West;
- **Cultural Heritage** - To help conserve and enhance the World Heritage Site and to make it easier to reach and explore; and
- **Environment and Community** - To improve biodiversity and provide a positive legacy for nearby communities.

The objectives would be achieved by providing a high quality, two-lane dual carriageway on the A303 trunk road between Amesbury and Berwick Down in Wiltshire. The Scheme would resolve traffic problems and, at the same time, protect and enhance the Stonehenge component of the Stonehenge, Avebury and Associated Sites World Heritage Site, hereafter referred to as "the WHS". The Scheme would be approximately 8 miles (13km) long and comprise the following key components:

a) A northern bypass of Winterbourne Stoke with a viaduct over the River Till valley;
b) A new junction between the A303 and A360 to the west of and outside the WHS, replacing the existing Longbarrow roundabout;
c) A twin-bore tunnel approximately 2 miles (3.3km) long, past Stonehenge; and
d) A new junction between the A303 and A345 at the existing Countess roundabout.

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Executive summary

Introduction

This Design and Access Statement summarises the design policy context and design principles of the Scheme. It sets out how the Scheme has evolved through working with stakeholders, including design changes that have emerged during consultation processes. The Statement then presents the Scheme in design and access terms, demonstrating how the high quality design solution responds to the opportunities and meets the design challenges presented by the site and its setting.

Design policy context

The National Policy Statement for National Networks is the primary planning policy framework for making decisions on development consent applications for Nationally Significant Infrastructure Projects in England. Design and access criteria are set out within the National Policy Statement. The secondary planning policy framework consists of the National Planning Policy Framework, the Wiltshire Council Core Strategy and the Stonehenge, Avebury and Associated Sites World Heritage Site Management Plan, which also contain policies relating to design. Chapter 3 considers relevant policy and confirms how the Scheme has responded to this.

In addition to planning policy compliance, the development of the Scheme has been influenced by principles of good design. The key documents setting out relevant principles are: The Road to Good Design (Highways England), A Design-led Approach to Infrastructure (CABE) and the Design Manual for Roads and Bridges (Highways England).

Demonstration of compliance with key policies of the primary policy framework has been set out in Appendix A.1 of this DAS. Compliance with secondary policy frameworks has been demonstrated within the Case for the Scheme (Application Document 7.1).

Design evolution and engagement

The Scheme presents a significant opportunity to demonstrate good design within a World Heritage Site (WHS). In addition, there is a need for the Scheme to respond to heritage, statutory and non-statutory designated sites and protected species in and around the area. These key opportunities and challenges are identified in Chapter 4, and an overview is provided on the approach taken to stakeholder engagement.

Stakeholder engagement during design development has included: formal and informal workshops, working groups established around areas of specialism and specific issues, one to one meetings, presentations and publicised consultations. As part of the engagement process, the Scheme has been presented to the Highways England Strategic Design Panel, which included representation from Design Council CABE.

High level design principles and design guide

In response to the recognised principles of good design and through extensive engagement with stakeholders, Highways England has developed the following high level design principles which have been used to guide the design approach, expanded upon in Chapter 5 of this document:

- Collaborative approach to design development;

- Considering the wider context as well as the detail;
- Respecting the World Heritage Site;
- One identity for the route, while acknowledging changing landscapes;
- Sustainable design; and
- Accessible and connected network.

Design Rationale

Chapter 6 of this document describes the Scheme for which development consent is being sought and explains the thinking behind key design decisions. A summary of the chapter is provided in the paragraphs below.

The Scheme has been divided into three sections each adopting a tailored design response to the varying landscape context in which it is set.

Western section: Winterbourne Stoke bypass to Longbarrow junction

Provision of a bypass to the north of Winterbourne Stoke would alleviate the impact currently caused by the existing A303 passing through the village. Removing the urban signage and street furniture associated with the trunk road would improve the appearance of the setting to the conservation area to the south of the existing A303. The Winterbourne Stoke bypass has been aligned to follow the existing landscape setting and avoid the ecologically sensitive land of Parsonage Down National Nature Reserve. The bypass has been accommodated into the downland landscape using a combination of cutting landscape integration.

Three green bridges have been proposed in the western section along the new A303 alignment. The bridges provide non-motorised user and agricultural access across the new A303, as well as ecological and landscape benefits.

A new bridge would carry the A303 over the B3083. The bridge includes a segregated verge to accommodate cattle movements along the B3083, which is also a short section of bridleway, and would also act as a wildlife corridors.

The River Till viaduct would carry the road over the River Till Special Area of Conservation, the Site of Special Scientific Interest, and a floodplain. The location of the viaduct utilises natural promontories on the valley sides, crossing the valley at the narrowest point and at right angles to the River Till. The height of the viaduct above the River Till valley and gap between the two decks has been optimised to ensure light levels on the valley floor beneath the structure are such that vegetation can establish and flourish, and to ensure no adverse effects to marine ecology. Informed by the consultation process an environmental screen is proposed on the southern side of the viaduct to reduce the visual and noise impact of vehicles and vehicles headlights for the residents of Winterbourne Stoke.

The new Longbarrow junction would accommodate free-flowing traffic on the A303 and improve local access via the A360. The junction has been located to avoid the Winterbourne Stoke barrow group and reduce impact on the World Heritage Site. To minimise its landscape and visual impact, the carriageway has been set below the existing ground level.

A new largely off-road NMU route is provided between Yarnbury Castle and the existing A360 at Longbarrow junction. This forms part of a route to be delivered by the Scheme which would link Winterbourne Stoke with Amesbury.

Central section: within the World Heritage Site

The initial section of the Scheme within the western part of the World Heritage Site has been set within a cutting. Informed by the consultation process, the use of vertical retaining structures, with a top portion of gradient grassed slope, along the route has been chosen to minimise land take and visual impact.

To the east of the former A360, a wide green bridge would carry a public right of way over the new A303. Its location between scheduled monuments is designed to protect their landscape setting by maintaining the visual and physical connection between the monuments. The location and design of this green bridge was informed through discussions with stakeholders and the consultation process.

The location for the western tunnel portal has regard to solstice lines and impacts on monuments as a whole. Visibility of the western portal has been further reduced by the provision of a cut and cover canopy, increasing the effective tunnel length. The existing ground profile directly above the cut and cover canopy would be reinstated.

The Scheme continues through a twin-bore tunnel in an easterly direction, approximately 2 miles (3.3km) in length. Provision of the tunnel would remove the impact of the existing road in the vicinity of the Stonehenge Monument.

The existing A303 through the World Heritage Site would be converted to a restricted byway, open to non-motorised users, improving access and the overall experience for walkers, cyclists and horse riders. It would also facilitate access and improve links between the heritage assets which are situated within the World Heritage Site but currently severed by the A303.

The location for the eastern tunnel portal was chosen to avoid features within the WHS as well as visual impacts on heritage beyond the WHS. It was refined to avoid impacting on the King Barrow Ridge and ‘The Avenue’. A cut and cover canopy would reduce visibility of the eastern tunnel portal, effectively extending the tunnel length. The portal would be set within a cutting.

The Scheme to Countess roundabout has been specifically designed to reuse part of the existing carriageway. This is to minimise land take in the World Heritage Site and respond to existing environmental constraints adjacent to the route.

Eastern section: Countess roundabout to just beyond the Solstice Park junction

The new flyover above Countess roundabout would make use of space reserved when the junction was originally constructed. The Scheme would include two single-span bridges above a landscaped mound on the existing roundabout, as well as the installation of noise barriers, as informed by the consultation process.

Changes to the existing local highway network are proposed to take place in the eastern section of the Scheme, including a small number of access closures. Changes would improve safety and also enhance the setting of a number of scheduled monuments in this area.

1 Introduction

1.1 Purpose and scope of this document

1.1.1 This Design and Access Statement ("DAS") summarises the design principles of the Scheme. It demonstrates an understanding of the relevant planning policies, including compliance where relevant, and sets out how the Scheme has evolved through working with stakeholders, including design changes that have emerged during consultation processes. The DAS then presents the Scheme in design and access terms, demonstrating how the high quality design solution responds to opportunities and meets design challenges presented by the site and its setting. It also explores how the Scheme addresses climate change and sustainability issues.

1.1.2 This DAS accompanies an application for a Development Consent Order ("DCO"), submitted in accordance with the Planning Act 2008 ("PA 2008"), for the Scheme. Whilst there is no statutory requirement for a DAS to accompany a DCO application, The Planning Inspectorate's Advice note six (Ref 1-1) advises that 'other documents' may include information that the applicant would normally want to submit for the development proposal or which has been requested or suggested by respondents to pre-application consultation and publicity, and which the applicant wishes to include. Given that the Scheme passes through the Stonehenge, Avebury and Associated Sites World Heritage Site ("WHS"), Highways England considers it beneficial to set-out how the design has been developed in this DAS.

1.1.3 This DAS has been prepared with regard to the Government's Planning Practice Guidance: Design (Ref 1-2) and Design and Access Statements: How to Write, Read and Use Them, Commission for Architecture and the Built Environment ("CABE" (now Design Council CABE)) (Ref 1-3).

1.1.4 The guidance advises that the overall approach to a proposal should encompass both design and access in an inclusive way. In terms of design, the guidance indicates that DAS documents should include information on:

a) The process - How the physical characteristics of the Scheme have been informed by a rigorous process which should include the following steps:
   i. Assessment;
   ii. Involvement;
   iii. Evaluation; and
   iv. Design.
b) Use – What the proposal will be used for;
c) Amount – How much would be built on the site;
d) Layout – How the proposal and public and private spaces will be arranged, and the relationship between them and the spaces around the site;
e) Scale – How big the proposal would be (height, width and length);
f) Landscaping – How open spaces will be treated to enhance and protect the character of a place; and

g) Appearance– What the proposal will look like, for example, materials and architectural details.

1.1.5 With regard to access, the CABE guidance states that the DAS should show that all access issues have been considered together:

a) Vehicular and transport links; and

b) Inclusive access – how everyone can get to and move through the place on equal terms regardless of age, disability, ethnicity or social grouping.

1.1.6 Additionally, this DAS also explains how the ten principles of good design set out in Highways England's document The Road to Good Design (Ref 1-4) have been followed. Further detail on these principles is provided in Chapter three.

1.2 Flexibility of design

1.2.1 The application for consent for the Scheme is for the design that is shown on the DCO works plans and engineering sections, the limits of deviation set out in the DCO and the maximum amount of land shown by the red line on the Scheme Land Plans. The design presented in this DAS provides an explanation of how the Scheme could look within those parameters, including mitigation measures proposed by the environmental impact assessment and following stakeholder engagement. Whilst aspects of landscape considerations are considered in this DAS, the detailed landscape design will be developed pursuant to a DCO requirement, based on the mitigation measures set out in the ES. Further work would be required to develop the Scheme into fully detailed design proposals that can be constructed. As such, the DAS presents an indicative design for the scheme.

1.3 Structure of this Design and Access Statement

1.3.1 This DAS is structured as follows:

a) Chapter 2 provides a brief overview of the Scheme;

b) Chapter 3 sets out the design policy context, legislative planning policy relating to design and other design principles and requirements;

c) Chapter 4 summarises how development of the design has taken place, setting out key opportunities and challenges; and how the design has been informed by the stakeholder engagement process;

d) Chapter 5 describes the high level design principles which have set the vision for this project;

e) Chapter 6 sets out the design of the Scheme explaining design decisions to support an understanding of the rationale; and

f) Chapter 7 draws together the conclusion of the design and access considerations.

1.4 The design team

1.4.1 The design team is comprised of appropriately qualified and experienced professionals, including: architects; planners; highway engineers; drainage engineers; landscape professionals; heritage specialists; noise; ecology and other

environmental professionals. The contributions of all disciplines have been crucial to informing a balanced design approach to the Scheme, and are reflected in the collaborative working which has gone into the production of this DAS.

1.4.2 In developing the design since the announcement of the preferred route, the Project Team has worked collaboratively with stakeholders in a range of ways; through structured workshops, regular working groups and one-to-one meetings. This has allowed the design to be informed by a wide range of knowledge and experience. Stakeholder engagement (described further in Chapter 4) has influenced the vision and the methodology, articulated through the high level design principles (Chapter 5).

2 Scheme background

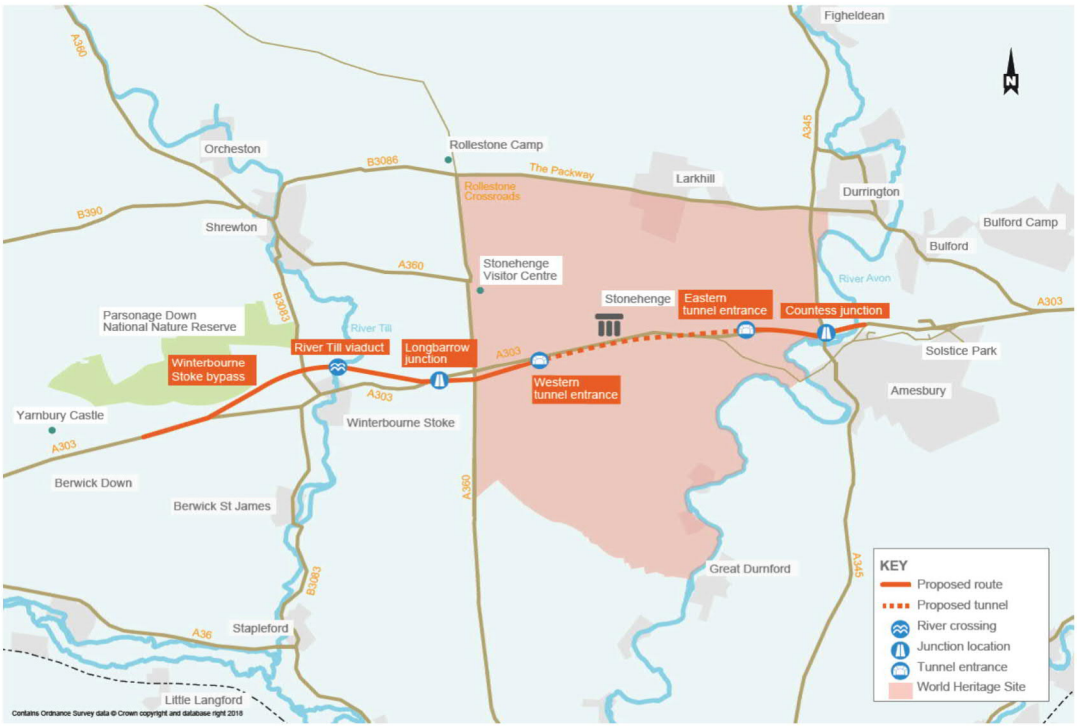
2.1 Background

2.1.1 A detailed explanation of the need for the scheme and the benefits that it will deliver are set out within the Case for the Scheme (Application Document 7.1). The paragraphs below provide an overview to assist the reader in gaining sufficient context before moving into the body of the DAS without the need for cross referral to other documents.

2.1.2 The A303 is a strategic route linking the South West of England to London and the South East and is critical to the local and regional economy. It also plays a big part in the everyday lives of tens of thousands of people as they travel to work and school, and for business and leisure purposes.

2.1.3 At busy times, such as summer weekends and other holiday periods, the A303 suffers from acute congestion. The single carriageway Amesbury to Berwick Down section (Scheme location identified in Figure 2-1) carries traffic levels which are often significantly greater than its design flow; a journey that should take 10 minutes can sometimes take an hour. Lack of capacity constrains local economic growth and contributes to the under-performing economy of the South West. Congestion causes problems of journey time reliability, which leads to rat running on unsuitable local roads, and as a single carriageway road this section suffers from blockages when an incident occurs.

Figure 2-1: Scheme location



2.1.4 The Amesbury to Berwick Down section of the A303 runs through the Stonehenge, Avebury, and Associated Sites World Heritage Site (WHS), passing 165 metres from the iconic stone circle. The sight and sound of traffic has a profound adverse impact on this uniquely significant site. The WHS includes a

large number of related prehistoric monuments within the wider landscape and the road physically and visually interrupts the relationships between them.

2.1.5 Improving this section of road is identified in the latest National Infrastructure Delivery Plan 2016-2021 (Ref 2-1) as one of the key projects and programmes within the roads sector to be prioritised by 2020/21 and forms part of the investment plan set out in the Road Investment Strategy for the 2015/16 – 2019/20 Road Period (Ref 2-2). The Scheme forms part of a wider strategy to improve the road corridor into the South West, which is considered to accord with Design Council CABE design principle 3 (The bigger picture).

2.2 Scheme objectives

2.2.1 Objectives for the Scheme have been formulated both to address identified problems and to take advantage of the opportunities that new infrastructure would provide. The objectives are:

1. **Transport** - To create a high quality reliable route between the South East and the South West that meets future needs of traffic;
2. **Economic growth** - To enable growth in jobs and housing by providing a free flowing and reliable connection between the South East and the South West;
3. **Cultural heritage** - To help conserve and enhance the WHS and make it easier to reach and explore; and
4. **Environment and community** - To improve biodiversity and provide a positive legacy for nearby communities.

3 Design Policy Context

3.1 Key legislative policy documents

3.1.1 The key legislative policy documents relating to design and access can be divided into primary and secondary policy frameworks. The primary policy framework comprises the National Policy Statement for National Networks ("NPSNN") (Ref 3-1). The secondary policy framework consists of the National Planning Policy Framework ("NPPF") (Ref 3-2) and relevant Development plan policy, in this case Wiltshire Council's Core Strategy (Ref 3-3) and the Stonehenge, Avebury and Associated Sites World Heritage Site Management Plan (Ref 3-4). Each of these documents contain policies which relate to design and access and where relevant these have been referenced below. Emerging policy is referenced where this is considered relevant having regard to the weight that is likely to be given to it in the DCO examination process. In addition, the design guidance which has shaped the Scheme design is also referenced.

3.2 Primary policy framework

3.2.1 The NPSNN was published in January 2015. The document sets out the need for, and Government's policies to deliver, development of Nationally Significant Infrastructure Projects ("NSIPs") on the national road networks in England. It provides the primary basis for the Examining Authority to examine the application and for the Secretary of State for Transport to determine the development consent application for the Scheme.

3.2.2 Paragraph 4.28 sets out that 'applicants should include design as an integral consideration from the outset of a proposal'.

3.2.3 Paragraph 4.29 states '…applying "good design" to national network projects should therefore produce sustainable infrastructure sensitive to place, efficient in the use of natural resources and energy used in their construction, matched by an appearance that demonstrates good aesthetics as far as possible'.

3.2.4 Paragraph 4.31 states 'a good design should meet the principal objectives of the Scheme by eliminating or substantially mitigating the identified problems by improving operational conditions and simultaneously minimising adverse impacts…'

3.2.5 Paragraph 4.35 requires applicants to 'demonstrate in their application how the design process was conducted and how the proposed design evolved…'

3.2.6 Consideration of the NPSNN policies has fundamentally influenced the design process. Design and access criteria for NSIPs on the road network are set out in chapters 3, 4 and 5 of the NPSNN. The Case for the Scheme (Application Document 7.1) contains an accordance table setting out how the Scheme achieves overall compliance with the NPSNN. Provision has been made in this DAS to demonstrate detailed compliance with the 'Criteria for "good design" for national networks' section within chapter 4 of the NPSNN. This can be found at Appendix A.1 National Policy Statement for National Networks Accordance Table.

3.3 Secondary policy framework

National Planning Policy Framework (July 2018)

3.3.1 The NPPF published on 24 July 2018 requires good design of the built environment, stating at Paragraph 124 that 'The creation of high quality buildings and places is fundamental to what the planning and development process should achieve' and 'Good design is a key aspect of sustainable development…'

3.3.2 Paragraph 127 states that decisions should ensure that developments: 'function well and add to the overall quality of the area…'; are to be 'visually attractive as a result of good architecture, layout and appropriate and effective landscaping'; 'are sympathetic to local character and history, including the surrounding built environment and landscape setting, while not preventing or discouraging appropriate innovation or change'; 'establish or maintain a strong sense of place…'; 'optimise the potential of the site to accommodate and sustain an appropriate amount and mix of development'; and 'create places that are safe, inclusive and accessible and which promote health and well-being, with a high standard of amenity for existing and future users…'

3.3.3 Paragraph 128 promotes consideration of design quality throughout the evolution and assessment process. It encourages early discussion about design between the applicant, the local planning authority and local community, setting out 'applicants should work closely with those affected by their proposals to evolve designs that take account of the views of the community'. It also states 'applications that can demonstrate early, proactive and effective engagement with the community should be looked on more favourably…'

3.3.4 Paragraph 129 encourages that 'appropriate use of, tools and processes for assessing and improving the design of development' should be applied. These would include 'workshops to engage the local community'. And in addition, 'local planning authorities should have regard to the outcomes from these processes, including any recommendations made by any design review panels'.

3.3.5 Paragraph 130 states that 'Permission should be refused for development of poor design that fails to take the opportunities available for improving the character and quality of an area and the way it functions, taking into account any local design standards or style guides in plans or supplementary planning documents. Conversely, where the design of a development accords with clear expectations in plan policies, design should not be used by the decision-maker as a valid reason to object to development'.

3.3.6 Paragraph 131 states that, 'In determining applications, great weight should be given to outstanding or innovative designs which promote high levels of sustainability, or help raise the standard of design more generally in an area, so long as the fit in with the overall form and layout of their surroundings'.

Development Plan

3.3.7 Wiltshire Council's Core Strategy ("WCS") published in 2015 sets out a spatial vision to deliver stronger, more resilient communities in the county by 2026.

3.3.8 WCS Core Policy 41: Sustainable construction and low-carbon energy, mainly relates to built development rather than infrastructure. However, the policy elements relating to climate change adaption and the use of sensitive approaches to materials at heritage sites are relevant. Compliance with this policy is also covered by criteria v. of Core Policy 57.

3.3.9 WCS Core Policy 57: Ensuring high quality design and place shaping, requires new development to deliver a high standard of design and draw upon local context when designing development. The policy expects the design of new development to make a positive contribution to the character of Wiltshire and sets out criteria for developers which are required to be met to demonstrate this.

3.3.10 WCS Core Policy 59: The Stonehenge, Avebury and Associated Sites WHS and its Setting, specifically protects the Outstanding Universal Value ("OUV") of the WHS. Core Policy 59 gives precedence to the protection of the WHS and its setting allowing development not adversely affecting the WHS and its attributes of OUV; and seeking opportunities to support and maintain the positive management of the WHS. Policy 59 requires developments 'to demonstrate that full account has been taken of their impact upon the WHS and its setting' and that there are no 'individual, cumulative or consequential adverse effect upon the site and its OUV. Consideration of opportunities for enhancing the WHS and sustaining its OUV should also be demonstrated.'

3.3.11 Wiltshire Council is reviewing the Wiltshire Core Strategy adopted in January 2015 (to be recast as the Wiltshire Local Plan) and developing a joint spatial framework with Swindon. It is acknowledged that this process is still in its infancy and has been now paused; therefore, only limited weight can be attached to the document.

Stonehenge, Avebury and Associated Sites World Heritage Site Management Plan (2015)

3.3.12 The Stonehenge, Avebury and Associated Sites WHS Management Plan published in 2015 sets the overarching strategy for achieving the correct balance between conservation, access, the interests of the local community and the sustainable use of the WHS. This document has been crucial in shaping the Scheme and is the overarching driver behind the route remaining low key within landscape.

3.3.13 The primary aim of the strategy is to protect the WHS to sustain its Outstanding Universal Value as agreed by United Nations Educational, Scientific and Cultural Organisation ("UNESCO"), provide access and interpretation for local people and visitors, and allow its continued sustainable economic use. It identifies a series of key issues, which are relevant to the Scheme.

3.3.14 Issue 42 of the Management Plan highlights the impact that roads within the WHS have on the attributes of OUV. This is explored in more specific detail during the supporting text as follows.

3.3.15 Paragraph 11.1.14 states “the A303 continues to have a major impact on the integrity of the wider WHS, the setting of its monuments and the ability of visitors to explore the southern part of the site”. It goes on to state the existing road has “significant impacts on the setting of Stonehenge and its Avenue as well as many other monuments that are attributes of OUV including a number of barrow cemeteries. The road and traffic represent visual and aural intrusion and have a major impact on the tranquillity of the WHS”. Paragraph 11.1.39 refers to signage, clutter, environmentally insensitive design and light pollution.

3.3.16 Issue 45 of the Management Plan identifies that conflict between the movement of pedestrians and cyclists with motorised traffic creates road safety issues in some areas and in others the perception of danger which discourages access, exploration, understanding and enjoyment of the WHS. Paragraph 11.2.1 highlights the need for a solution to help visitors reach the southern part of the WHS, currently severed by the A303.

3.3.17 Reference should be made to the Case for the Scheme (Application Document 7.1) for a demonstration on how the Scheme complies with the Secondary Policy Framework.

3.4 Other design principles and requirements

3.4.1 There are a number of requirements for the Scheme which do not form part of the legislative planning policy context. The following paragraphs set out those highways design principles which have influenced design and have been embodied into the Scheme.

The Road to Good Design (2018)

3.4.2 Highways England is required as part of its operating license to have due regard to the principles of good design, to ensure that the development of the network takes account of geographical, environmental and socio-economic context. Highways England has drafted a design guide, The Road to Good Design (Ref 1-4) outlining their key principles.

3.4.3 The purpose of this document is to challenge thinking about design and quality of roads within England; with the aim of facilitating a shift in design culture towards new roads. It recognises that good design is a powerful tool for achieving a higher quality of life, as well as greater economic vitality and more efficient use of resources.

3.4.4 The document sets out ten defined design principles based on universal ideas of good design. They are not instructions for how to design a road, but act as prompts to improve design quality and outcomes. Design generally combines practical, technical and economic considerations with aspects of place and culture. Universal good design is thus a balance and coordination of aesthetic, functional and technological considerations.

3.4.5 The ten design principles have been encompassed within the three themes of people, places and processes. The design principles are set out in table 3-1.

Table 3-1: Highways England Design Principles

Aspiration	Principle
Connecting people, good road design	1. Makes roads safe and useful 2. Is inclusive 3. Makes roads understandable
Connecting places	4. Fits in context 5. Is restrained 6. Is environmentally sustainable
Connecting processes	7. Is thorough 8. Is innovative 9. Is collaborative 10. Is long-lasting

3.4.6 Full details of the Highways England design principles can be found in Appendix B.1 The Road to Good Design (Highways England Design Principles). Where the Scheme demonstrates compliance with the Highways England design principles it has been referenced throughout this DAS.

3.4.7 The Road to Good Design also champions use of the Highways England Strategic Design Panel, an independent design review panel. The Panel seeks to ensure "the strategic road network displays design quality through being safe, functional and effective, responding positively and sensitively to landscape character, cultural heritage and communities, while also conforming to the principles of sustainable development". The Panel members comprise: the Campaign for Better Transport; the Design Council; Transport Focus; the Chartered Institute of Highways and Transportation; the Institute of Civil Engineers; the Landscape Institute; Historic England; The Prince's Foundation; the Institution of Structural Engineers; the Royal Institute of British Architects; the Campaign to Protect Rural England; Natural England; and the National Trust. The Scheme has been presented to the Design Panel on three occasions. Reference to this can be found in the section 4.4 below.

A Design-led Approach to Infrastructure (2012)

3.4.8 The Design Council CABE supports communities, local authorities and developers involved in built environment projects by providing services in three areas: design review; customised expert support; and training and continued professional development. Recurrent themes have emerged from Design Council CABE's work to date on infrastructure projects. A design-led approach to infrastructure (Ref 3-5), prepared by Design Council CABE, was produced in response to these recurrent themes.

3.4.9 A Design-led Approach to Infrastructure provides design guidance in relation to NSIPs. The document sets out a design approach which takes geographical context into account to ensure NSIPs "respond well to the setting, speaks a confident, architectural language based on their purpose and function and allay concerns of the local community".

3.4.10 The document sets out ten design principles in table 3-2.

Table 3-2: Design Council CABE Design Principles

Ten design principles	
1. Setting the scene	6. Landscape design
2. Multi-disciplinary teamwork	7. Design approach
3. The bigger picture	8. Materials and detailing
4. Site masterplan	9. Sustainability
5. Landscape and visual impact assessment	10. Visitor centre

3.4.11 Full detail of the Design Council CABE design principles can be found in Appendix C.1 A Design-led Approach to Infrastructure (Design Council CABE Design Principles). Where the Scheme demonstrates compliance with the Design Council CABE design principles it has been referenced throughout this DAS.

3.4.12 Design principle 1 (Setting the scene) was considered at the outset of the project; therefore, no specific reference has been made to it within this DAS. Consideration of Design principle 10 (Visitor centre) has not taken place at this stage in the design. Further consideration would be given to this design principle during later design stages.

Technical design standards

3.4.13 The Scheme proposes to upgrade the existing A303 to a high performing dual carriageway. It would benefit from modern safety measures and construction standards, and include technology to manage traffic and provide better information to drivers. This is achieved by designing the route to standards as defined in Design Manual for Roads and Bridges ("DMRB") (June 2018) (Ref 3-6). The DMRB is a suite of documents which contains requirements and advice relating to works on motorways and all-purpose trunk roads for which Highways England is responsible.

3.4.14 The DMRB was prepared jointly by the Overseeing Organisations, which includes Highways England as the strategic highway authority in England (additionally it includes Transport Scotland, The Welsh Government and Department for Infrastructure (Northern Ireland)). It embodies the collective experience of the Overseeing Organisations, their agents and designers. It provides requirements and advice resulting from research, practical experience of constructing and operating motorway and all-purpose trunk roads, and from delivering compliance to legislative requirements.

3.4.15 In addition, tunnel design is required to give consideration to European Directive 2004/54/EC of the European Parliament (Ref 3-7) on minimum safety requirements for tunnels in the Trans-European Road Network, which the A303 forms part of. This Directive applies to tunnels which are over 500m in length and aims to ensure a minimum level of safety for road users in tunnels by the prevention of critical events that may endanger human life, the environment and tunnel installations, as well as protection in case of accidents.

4 Design evolution and engagement

4.1 Introduction

4.1.1 This section sets out the context within which design development has taken place. It identifies the key opportunities and challenges which have influenced thinking on design, as well as the role that stakeholder engagement and consultation has played. The comments received from the independent design review panel, and how they have been incorporated into the Scheme, have also been summarised in this chapter.

4.1.2 The Scheme is a product of an iterative design development process. Highways England design principle 7 (Good road design is thorough) requires the design process to have "an in-depth understanding of people, place and context". From this "the design of all elements of the road environment" should be "considered together and integrated into a responsive design". The Scheme demonstrates an in-depth understanding of those factors which have informed the design rationale. In accordance with design principle 7, the design team has worked collaboratively, and also with stakeholders, to provide an integrated responsive design.

4.2 Key opportunities and challenges

4.2.1 In addition to the policy context, the overarching design rationale for the Scheme has been driven by:

a) The Scheme presents a significant opportunity to demonstrate exemplary design in its response to the significance of the WHS and its OUV. This is considered in detail within the Heritage Impact Assessment (Appendix 6.1 of Application Document 6.3 (Environmental Statement ("ES") Appendices));

b) Following on from the point above, there are also heritage assets such as burial mounds (or 'barrows') located beyond the boundary of the WHS to which the Scheme needs to respond. In addition, there are four Grade I Listed buildings and three Conservation Areas within 500m of the Scheme. The impact of the Scheme on cultural heritage assets has been considered in Chapter 6 of the Environmental Statement (Application Document 6.1);

c) There is a need to respond to the constraints created by statutory and non-statutory designated ecological sites and protected species in and around the Scheme area. These include the River Avon Special Area of Conservation ("SAC"), Salisbury Plain SAC and Special Protection Area ("SPA"), both of European importance, and the River Till Site of Specific Scientific Interest ("SSSI"). The River Till SSSI also forms part of the River Avon SAC. Other important nearby sites include the Parsonage Down SSSI and National Nature Reserve ("NNR") and the RSPB reserve at Normanton Down. The impact of the Scheme on biodiversity has been considered in Chapter 8 of the Environmental Statement (Application Document 6.1);

d) There are protected landscape designations, including the Cranborne Chase Area of Outstanding Natural Beauty (to the south west of Winterbourne Stoke) and the Special Landscape Area (which covers much of the Scheme area). The impact of the Scheme on the landscape has been considered in Chapter 7 of the Environmental Statement (Application Document 6.1). Reference should be made to the independently published Landscape Character Area Assessments (Appendix 7.4 of Application Document 6.3 (ES Appendices)) for further information on the distinctive local landscape characteristics;

e) Consideration has been given to local road network and the settlements of Amesbury, Winterbourne Stoke, Shrewton, Larkhill and Durrington, including their relationship to the A303 and the impact of the route on local connectivity; and

f) The Environmental Impact Assessment ("EIA") process (including the assessment of likely significant environmental effects and the identification of measures to mitigate those effects) has shaped the design. The Scheme has developed as an ongoing process alongside the environmental assessment. EIA results can be found in the Environmental Statement (Application Document 6.1).

4.2.2 Highways England design principle 4 (Good road design fits in context) seeks to ensure that road design demonstrates sensitivity to the landscape, heritage and local community. A key design rationale behind the Scheme has been, as far as practicable, to integrate the new road alignment into the existing sensitive landscape and heritage context with minimal visual prominence. This has been achieved through a number of embedded landscape design principles which are explained in further detail through sections 6.3, 6.4 & 6.5 of this DAS. Consideration of context during the design process and the important influence it commanded over the current Scheme proposals also demonstrates compliance with Highways England design principle 4.

4.2.3 Design Council CABE design principle 5 (Landscape and visual impact assessment) sets out that 'visual impact assessment should be used as a design tool to inform location, orientation, composition and height'. Chapter 7 of the Environmental Statement (Application Document 6.1) provides a landscape visual impact assessment in relation to the Scheme. This includes embedded design mitigation measures which have been incorporated into the Scheme design. Therefore, the Scheme is considered to accord with this principle.

4.2.4 In addition, the design has been influenced by the following technical requirements of the Scheme:

a) Highways and tunnel design safety standards as referenced In section 3.4 of this DAS;

b) Efficient integration with the existing highway and Public Right of Way ("PROW") networks;

c) The long-term durability and maintenance requirements of the Scheme;

d) Sustainability requirements have been used to inform the Scheme's design; and

e) Overall construction cost and budget.

4.2.5 The culmination of these landscape and technical factors ultimately informs the design rationale for the project. This assessment process demonstrates an understanding of context which has informed the design, demonstrating compliance with Design Council CABE design principle 4 (Site masterplan).

4.3 Stakeholder engagement and consultation

4.3.1 A full account of stakeholder engagement and consultation undertaken since the announcement of the preferred route is set out within the Consultation Report (Application Document 5.1). This section of the DAS focusses on how engagement and consultation has influenced the design.

4.3.2 The Scheme design has been informed by stakeholder engagement carried out using the following principles:

a) Early and on-going engagement;

b) Seeking an appropriate level of feedback at each stage during the design process and ensuring that comments received have been taken into consideration;

c) Building long-term relationships with stakeholders to better understand their views and needs; and

d) Ensuring appropriate statutory consultation in accordance with requirements of the PA 2008 and associated guidance.

4.3.3 Highways England's approach to stakeholder engagement, including details of how responses have been considered in the development of the design, is set out in the Consultation Report (Application Document 5.1). This approach is considered to accord with Highways England design principle 9 (Good road design is collaborative) as well as Design Council CABE design principle 2 (Multi-disciplinary teamwork).

Stakeholder engagement

4.3.4 Ongoing engagement from preferred route announcement to the submission of the DCO application has taken place between the design team and stakeholders, including: affected landowners; Wiltshire Council (the host authority); statutory environmental bodies; and heritage stakeholders. A Stakeholder Strategy Board meets regularly and is attended by: DfT; DCMS; Wiltshire Council; the WHS Partnership Panel Chair; English Heritage Trust; Historic England; and the National Trust.

4.3.5 Regular meetings of working groups attended by technical representatives of Wiltshire Council, statutory environment bodies and heritage stakeholders have been used to allow design development with stakeholder input, so as to ensure a better solution within the DCO application. The groups have addressed a range of topics including; infrastructure design; public rights of way; environmental matters; flood risk; heritage matters; and traffic modelling.

4.3.6 In addition, environmental and heritage stakeholders have had direct involvement in the design process through their attendance at weekly design team meetings,

known as 'Solutions Tuesdays', early in the design process allowing transparency of thinking and effective contribution to the solution taken forward.

4.3.7 Reflective of the significance of archaeology both within the WHS and the surrounding area, the project team has been advised by two independent groups; the Heritage Monitoring and Advisory Group ("HMAG") comprising Historic England, Wiltshire Council (Archaeology Service), English Heritage and the National Trust; and the independently appointed Scientific Committee comprising a panel of archaeological experts.

Engagement with UNESCO

4.3.8 The United Nations Educational, Scientific and Cultural Organisation ("UNESCO") World Heritage Committee ("WHC") and the International Council on Monuments and Sites ("ICOMOS" International – a global non-governmental organisation responsible for supporting UNESCO in the implementation of the World Heritage Convention) are also stakeholders. The development of the Scheme has benefitted from three UNESCO/ICOMOS Advisory Missions on the invitation of the UK Government. These were held in: October 2015; February 2017; and March 2018. Feedback from the three missions has informed the design submitted for DCO approval, as well as the way in which factors affecting the WHS have been considered during the development of the design.

4.3.9 A report from the 2018 mission was presented to the WHC at their 2018 annual meeting. The WHC noted work done in developing a design which responded to the WHS and asked that Highways England continue to refine its design to further protect the OUV of the WHS. Highways England continues to engage with UNESCO as the Scheme progresses into consideration of the DCO application and onwards to detailed design and, in due course, construction. Additional measures introduced into the Scheme since the WHC meeting include the widening of Green Bridge Four to approximately 150m to provide physical and visual connectivity between key monuments and help maintain the Outstanding Universal Value of the WHS.

Non-statutory and statutory consultation

4.3.10 Initial engagement on the Scheme began in 2016 with a series of exhibitions raising awareness of proposals for improving the A303/A358 corridor. Highways England undertook a non-statutory consultation from 12 January to 5 March 2017 on route options which informed the choice of the preferred route, announced in September 2017. Statutory consultation then took place from 8 February to 23 April 2018 on the proposed route. This was followed by a supplementary non-statutory consultation from 17 July to 14 August 2018 on three specific changes to the proposals presented for statutory consultation. The stakeholder consultation process accords with Highways England design principle 9 (Good road design is collaborative) and Design Council CABE design principle 2 (Multi-disciplinary teamwork). Further information on the consultation process and the outcomes of consultation can be found in the Consultation Report (Application Document 5.1).

4.3.11 A number of design options were presented at statutory consultation and the public was asked to respond to questions on these. Subsequent to consultation

the design was developed; as a consequence of feedback, through ongoing stakeholder engagement and through ongoing surveys and investigations. Key design elements that were amended following statutory consultation were:

a) Environmental screening to the southern side of the River Till viaduct: to reduce the visual impact of vehicles and vehicle headlights;

b) Vertical retaining walls to western tunnel approach with a grassed slope to a suitable gradient at the top portion: to minimise land take within the WHS and reduce the visual impact of vehicles within the WHS;

c) Fully grassed cut and cover canopies at tunnel portals, with tunnel service buildings external to the tunnel canopy, set below ground within the retaining walls to minimise their visual impact;

d) Placing of Green Bridge Four within the WHS: to provide a physical connection between the north and south halves of the WHS;

e) Landscaped flyover at Countess roundabout in preference to an open span structure arrangement: to provide visual screening for nearby residences; and

f) Noise barrier to flyover at Countess roundabout: to attenuate road noise at nearby houses.

4.3.12 As a result of feedback from the statutory consultation, including feedback from the heritage stakeholders as described above, three further changes were identified and presented at a supplementary non-statutory consultation:

a) A link proposed between Byways 11 and 12 in the WHS was removed from the Scheme. Its removal would ensure that no new unnecessary routes that can be used by motor vehicles are introduced into the WHS landscape;

b) Green Bridge Four was extended to approximately 150m wide to provide physical and visual connectivity between barrow groups and help maintain the OUV of the WHS; and

c) Proposals to modify the traffic flow priorities at Rollestone crossroads to reduce land take.

4.3.13 The Consultation Report (Application Document 5.1) also makes reference to a number of other changes which have had a minor impact on the overall design not referenced above, and which have emerged as a result of responses from the consultation process.

4.4 Independent design review

4.4.1 The Scheme has been presented to Highways England's Strategic Design Panel on three occasions. The first two being in the early stages of design development. More recently, the most significant design review took place with Design Council CABE through Highways England's Strategic Design Panel.

4.4.2 The Design Council CABE review of the Scheme took place in December 2017. The review comprised a presentation from the design team, questioning of the team and panel discussion, after which a formal response to the developing

design was given in January 2018. The following paragraphs summarise this response including how these comments have been dealt with in the Scheme.

Design process

4.4.3 The Design Panel was supportive of the design principles for the Scheme and it made a number of recommendations on the design process, to ensure the overall desire to reduce visual impact on heritage assets did not result in the user experience being sacrificed.

In response to consultations with heritage stakeholders, a decision was taken to prioritise the visual impact on heritage assets and minimise visibility of new structures within the WHS, whilst seeking to balance this as far as practicable with the experience for the driver. By example the introduction of grassed slopes to the top of retaining walls reduces the visual impact of cuttings from within the WHS and also reduces their height from the driver viewpoint. Further justification of this point along with consideration of the user experience can be found in section 6.4 of this DAS.

Design narrative, development consent order and consultation

4.4.4 The panel highlighted how a clear design narrative is crucial in explaining the background to the Scheme, its context, the different drivers for decision making, and why particular options and solutions have emerged. It also highlighted that the consultation process should be a collaborative exercise.

4.4.5 This DAS addresses comments raised by the panel in relation to design narrative. Further information on the background to the Scheme can be found in the Case for the Scheme document (Application Document 7.1). The Scheme context and drivers which influenced the decision-making process have been highlighted throughout this Chapter. The culmination of these factors has been used to inform the high level design principles set out in Chapter 5 of this DAS.

4.4.6 The stakeholder engagement section earlier in this Chapter clearly demonstrates the consultation process as being a collaborative exercise.

User experience

4.4.7 With regards to user experience, the panel's comments asked for more consideration to be given to the connection between road users and their context. They recommended exploring options for how the tunnel and Scheme could retain a sense of location in the wider context.

4.4.8 Further information on user experience can be found in section 6.4 of this DAS.

Landscape and heritage

4.4.9 It was acknowledged that the Scheme would need to respond to two sensitive landscapes; the heritage landscape and wider landscape setting. The comments noted the historic context as a crucial consideration for the Scheme and sought further clarity on how the Scheme would respond to the character of the wider landscape in design terms. The panel recommended that the interrelationship between historic and sensitive landscape contexts be addressed within the application.

4.4.10 The Scheme has been designed in response to multiple landscape settings. Consideration has been given to how these work together within the context of a route wide identity. The high level design principles set out in Chapter 5 of the DAS identify specific design principles for the individual character areas. Using these with mitigation requirements identified through the EIA process, the Scheme has been developed in response to the heritage landscape and wider landscape setting. This has resulted in the engineering aspects of the Scheme being integrated into the existing landscape where key visual receptors have been screened from traffic. The landscape design proposals have been prepared in close consultation with the highways design as well as other environmental disciplines. Further information on the embedded mitigation in relation to landscape and heritage can be found throughout Chapter 6 of this DAS. This approach is considered in line with the requirements of Design council CABE design principle 6 (Landscape design).

Design approach to structures and elements, details and materials

4.4.11 There was a suggestion for a unified approach to the design structures across the Scheme to help strengthen the sense of place. The panel recommended that the design team identify and establish an architectural and visual language supporting the narrative for the Scheme. This extended to details and materials to ensure consistency and quality.

4.4.12 It is Highway England's intention to adopt a route wide identity throughout the designed structures across the Scheme. This would likely draw on references from the WHS landscape. Clarification on materials and design details would be established through the detailed design stage. Further information on this matter can be found in section 6.4 of this DAS.

Portal entrances

4.4.13 The Design Panel was supportive of the proposed locations for the portals, commenting that, in consideration of the constraints, they responded well to the topography and context. It agreed with the approach of being restrained and celebrative, rather than competing with the setting of the WHS. There was concern raised over the preferred option's ability to achieve a successful balance of restrained visual impact and elegance with enjoyment and excitement for the road user. It recommended that this be further explored.

4.4.14 As part of the design development process the architectural articulation of the tunnel portals has been extensively explored. Further information on the tunnel portal design can be found at sections 6.4 of this DAS.

Cuttings

4.4.15 Caution was raised over vertical edges to the cuttings and the impact this would have on the environment for drivers. The panel recommended exploring options which improved the driver experience.

4.4.16 Options in relation to the cuttings were put forward as part of the statutory consultation process and discussed with heritage stakeholders. This indicated support for reducing impact on the WHS. Highways England intends for the Scheme to include vertical retaining walls because of the reduced land take

impacts and particularly ensuring as a minimum no overall adverse effect on the WHS OUV. The top portion of the cuttings would include a grassed slope to a suitable gradient to soften their visual impact.

Viaduct and Till Valley

4.4.17 The sensitive landscape of the River Till valley was acknowledged and the project was asked to explore options that enabled an elegant structure which allows the landscape to flow under. The comments sought a balance between clarity of engineering and sensitivity towards the landscape.

4.4.18 The design of the River Till viaduct has been refined and further information can be found in section 6.3 this DAS. Options in relation to the screen on the River Till viaduct were put forward as part of the statutory consultation process. There was a strong preference to include an environmental screen to the southern side of the viaduct. This approach is considered beneficial from a visual screening perspective.

Countess roundabout

4.4.19 The panel asked that options for bridge structures (as well as the embankment solution presented) be tested. It was noted that a continuous structure could provide benefits.

4.4.20 Options in relation to the Countess roundabout were put forward as part of the statutory consultation process. This indicated support for a flyover comprising two bridges with a central embankment which has been incorporated into the Scheme. The centre of the roundabout would be filled and landscaping.

Green bridges

4.4.21 The Design Panel requested further clarity on the functional requirements of the green bridges and consideration of the design principles of each green bridge.

4.4.22 Green bridges are proposed in locations to facilitate vehicle and non-motorised user (“NMU”) movements over the new A303 route. The have been sympathetically designed for the purposes of reducing visual impact and maintaining landscape and ecological connectivity as part of an integrated landscape approach. Each bridge has been designed to suit the specific landscape and ecological requirements of that location. Further clarity on these green bridges can be found during section Chapter 6 of this DAS.

Wider Benefits

4.4.23 When looking at the wider benefits of the Scheme, the panel requested more focus be placed on how the Scheme could unlock wider benefits and place making opportunities for the residents and users of nearby settlements.

4.4.24 This would form part of a wider legacy package associated with the Scheme. A Benefits Steering Group and Community Forum would be set up to identify the approach to the Scheme’s legacy benefits.

5 High level design principles and design guide

5.1 Introduction

5.1.1 This section of the DAS sets out the key design principles that have driven the design of the Scheme.

5.1.2 Responding to industry-recognised principles of good design, and through extensive collaboration with stakeholders and the wider public, Highways England has crystallised its design approach into the following high-level design principles:

a) Collaborative approach to design development;

b) Considering the wider context as well as the detail;

c) Respecting the World Heritage Site;

d) One identity for the route, while acknowledging challenging landscapes;

e) Sustainable design; and

f) Accessible and connected network.

5.1.3 In setting out and working to these high level design principles, the Scheme has demonstrated compliance with Design Council CABE's design principle 7 (Design approach). The following sections explain these principles.

5.2 Collaborative approach to design development

5.2.1 Stakeholder engagement has been critical to the Scheme, right from the early stages. This ensures that the Scheme is meeting its objectives, and is helping to maximise the benefits and legacy that the Scheme can deliver.

5.2.2 For each stage of design an integrated multi-disciplinary approach is being taken which brings together a range of interests and specialisms, sharing and discussing ideas and potential design solutions. This makes sure that the design is being developed in a balanced way. The different perspectives of integrated multi-disciplinary working help to identify benefits and opportunities, as well as identifying potential challenges at an early stage, allowing timely corrective action. This demonstrates compliance with Design Council CABE design principle 2 (Multi-disciplinary teamwork).

5.2.3 With advances in technology, it is now possible to use 3D visualisation to build a model of a scheme in 'the real world'. This enables virtual panoramic 'tours' from different viewpoints, to understand how elements of design fit into the landscape, and how the finished Scheme would look. Visualisations have been used at consultation to help build understanding with a wide audience. Adoption of this principle is considered to accord with Design Council CABE design principle 3 (The bigger picture).

5.3 Considering the wider context, as well as the detail

5.3.1 The design is influenced by factors beyond the boundaries of the Scheme. Holistic thinking has ensured that the design fits with strategies; at national, regional and local level, as well as considering the needs of stakeholders.

5.3.2 A full understanding of the environment, and the way people and wildlife move through the area, has led to a design that sits within its landscape and serves local communities as well as those passing through. Equally, the choice of materials and their careful detailing as the design of the scheme develops will influence people's enjoyment, maintenance, and the way in which the Scheme will weather and age. Initial thinking on these factors commenced early in the design process and will continue through detailed design.

5.4 Respecting the World Heritage Site

5.4.1 The A303 Amesbury to Berwick Down Scheme is exceptional in that it passes through the Stonehenge, Avebury and Associated Sites WHS. The WHS landscape at Stonehenge is special because of the Stonehenge monument, but also because there are many monuments on ridge lines and other prominent viewpoints. The relationship between the monuments and the landscape, astronomy and the skies is important.

5.4.2 '*The Stonehenge and Avebury WHS is universally important for its unique and dense concentration of outstanding prehistoric monuments and site which together form a landscape without parallel*.' (Stonehenge, Avebury and Associated Sites World Heritage Site Management Plan 2015).

5.4.3 As a result, particular attention has been and continues to be given to the cultural heritage aspects of the design, with specific design principles for the WHS and its setting as follows:

a) Maintain the Outstanding Universal Value of the WHS;

b) Keep the road as invisible as possible;

c) Consider connections and relationships between monuments e.g. barrow groups;

d) Do not use landforms that could confuse the interpretation of the site;

e) New landscaping should convey an impression of the original landscape i.e. rolling downland with no new trees; and

f) High, inspirational standard of design to reflect the international importance of site.

5.5 One identity for the route, while acknowledging changing landscapes

5.5.1 The design philosophy has sought to develop a sense of a coherent scheme which forms part of the national road network but which also responds to its varying context along the length of the road. This will create a route identity so that people using the completed road will recognise an overall design but also see how the Scheme responds to and reflects the areas it passes through.

5.5.2 The design draws on the character of the existing landscape, as well as its heritage and ecology, and the difference between those landscapes outside of the WHS and those within.

5.5.3 For each of the character areas, design principles have been established, as follows:

Western section around the River Till Valley:

a) Minimise impact on valley landscape through careful selection of crossing point;

b) Use of viaduct rather than bridge with earthworks;

c) Reducing shading below viaduct;

d) Landscape and visual benefits by maintaining visual 'flow' of valley floor; and

e) Regrading of approach embankments.

WHS Downland:

a) Establish a restricted byway and create NMU opportunities;

b) Avoid upstanding earthworks;

c) Use of a deep retained cutting;

d) Creation of calcareous grassland;

e) Minimise lighting and signage within WHS to support the aim of dark skies, and supporting the WHS Management Plan; and

f) High quality modern design for road users.

Non-WHS Downland:

a) Integration of the Scheme into rolling downland landscape;

b) Creation of calcareous grassland;

c) Use of false cuttings to aid screening of traffic;

d) Planting strategy to respond to landscape character and Parsonage Down NNR strategy;

e) Enhance north-south and east-west NMU links; and

f) Green bridges for crossings.

Eastern section and River Avon valley:

a) Minimise land take around the Countess roundabout, and utilise the existing roundabout design;

b) No lighting on elevated sections;

c) Appropriate landscape and townscape response;

d) Retention of existing highway planting, supplemented by new trees where reasonably practicable; and

e) Reuse of existing River Avon crossing.

5.6 Sustainable design

5.6.1 Making an important contribution to the conservation and enhancement of the natural, built and historic environment, the Scheme will achieve net environmental gain. It seeks to be multi-functional, resilient and sustainable, allowing for future

adaptation and technical requirements, while minimising waste and the need for new materials.

5.6.2 Sustainability has been integral to the design from the very beginning. Where appropriate, materials would be locally sourced, reclaimed, recycled or have very low carbon impact. Infrastructure has a long lifespan and is therefore designed to take account of potential changes to the frequency and severity of extreme weather due to Climate Change.

5.7 Designing for connections

5.7.1 Connections are an important part of any Highways England scheme. It is important for people using the road to have a good experience, and the design of the road is part of this, from the quality of the road surface, to how easy it is to navigate.

5.7.2 The Scheme has sought opportunities to upgrade and increase the number of safe crossings on the network, in the interests of the safety and convenience of more vulnerable customers and has ensured it effectively integrates with local roads. The Scheme also seeks to improve connectivity for NMU within and around the WHS.

6 Design rationale

6.1 Introduction

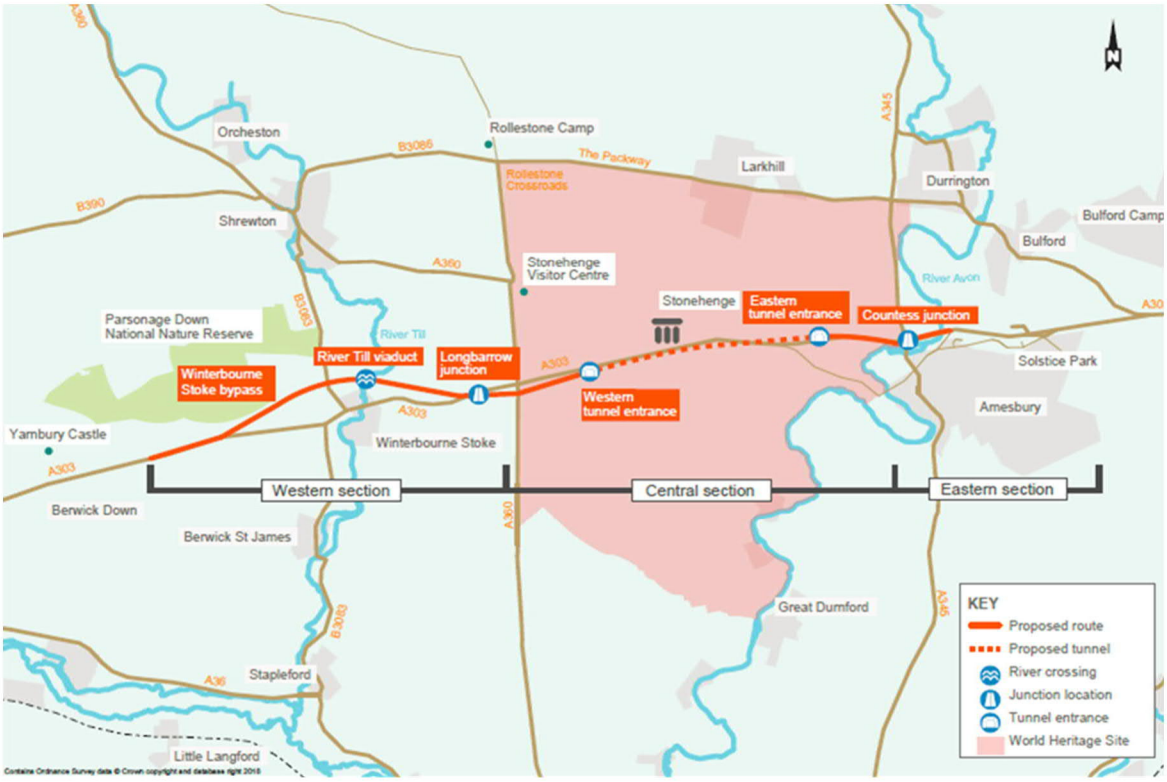
6.1.1 This section explains how the design has responded to the high level design principles which have been informed by the needs of the Scheme, feedback received and the constraints of both the site and policy. It begins with an overview of general design principles relevant to the entire Scheme, with the remainder being divided into the three sub-sections highlighted in Figure 6-1. The Scheme is primarily linear in form and the three sections adopt a tailored design response to the varying landscape context in which they are set. The three sections are broadly:

a) Western section - Winterbourne Stoke bypass to Longbarrow junction;

b) Central section - within the World Heritage Site; and

c) Eastern section - Countess roundabout to just beyond Solstice Park junction.

Figure 6-1: Overview of the Scheme



6.1.2 This DAS follows the CABE guidance (Ref 1-3) for preparing Design and Access Statements to explain the design of the Scheme. Within each of the three geographical sections, the following criteria have been embedded:

a) Use, Layout and Access – Explanation and justification has been provided for the use of space and structures; where these will be located within the application site; and the way in which structures, routes and spaces are set out.

b) Amount and Scale – Explanation and justification for the amount of development proposed has been provided; including approximate dimensions of structures and size of spaces associated with development.

c) Landscaping and Appearance – Explanation and justification for the hard and soft landscaping proposals has been provided, including their purpose and relationship to surrounding context. This will also draw on the biodiversity enhancement measures which are design related. An explanation and justification is provided for the appearance of structures and spaces and relationship to context. For the central section, the design thinking specific to 'user experience' is also considered in relation to the tunnel.

6.2 Scheme wide design principles

6.2.1 This section explains those design principles which apply across the entire Scheme and which do not necessarily respond to the landscape setting. It provides an overview of how safety, highway design and sustainability considerations have directly informed the overall Scheme design.

Safety principles

6.2.2 The Scheme would provide a high performing dual carriageway which would improve safety on the A303 between Amesbury and Berwick Down. A dual carriageway road built to current standards would provide a safer route than the existing single carriageway road and would be more resilient to incidents. Provision of new grade-separated junctions with the A360 and A345 would allow strategic traffic to continue on the route without stopping and would allow local traffic to cross the route without the need to travel on the A303. As drivers revert to using the A303 trunk road, rat-running on local roads would reduce, so reducing risk of accident and improving the environment for the currently affected communities.

6.2.3 Safety within the tunnel has been determined by the relevant tunnel design codes (DMRB and EU Directive 2004/54/EC). The tunnel would incorporate a number of design features to meet the safety requirements, which can be summarised as follows:

a) Escape routes provided between tunnel portals at regular intervals;

b) An emergency walkway with a low kerb to allow stranded vehicles to pull over onto the walkway;

c) Provision of emergency call points located at regular intervals;

d) Vehicle cross-overs provided on tunnel approaches to enable contraflow working when one tunnel bore is closed during planned maintenance or an incident;

e) Emergency services' parking laybys provided at the tunnel service building at both portals;

f) Technological management systems to monitor and manage traffic flows, detecting incidents as required; and

g) Fixed firefighting system.

6.2.4 As set out in Highways England design principle 1 (Good road design makes roads safe and useful), safety is fundamental to good road design. The Scheme has been formulated to improve safety along this stretch of road and therefore clearly demonstrates compliance with this principle.

Highways design

6.2.5 In meeting the requirements of DMRB the highways elements of the Scheme include a dual carriageway, with each carriageway comprising two running lanes with hard strips, verges and a central reserve. The verge width would be increased locally as required to provide the appropriate unobstructed visibility around curves. Further localised increases in verge width would be included to accommodate highway features such as signs, vehicle restraint systems, communication equipment and laybys where required.

6.2.6 Vehicle restraint systems would be provided in accordance with the required standards. This would include a central reserve (including a vertical concrete safety barrier) built in accordance with current standards. There is a requirement to increase the width of the central reserve for appropriate visibility around curves, and locally on the approaches to the tunnel. The bridge parapets on structures such as the River Till Viaduct and Countess flyover, would be also have screens varying in height to accommodate environmental mitigation measures where required.

6.2.7 Laybys would be situated at appropriate spacings throughout the length of the Scheme.

6.2.8 It is intended that road signage would be designed for minimal impact. For example, no signs would be visible above the cutting approaches within the WHS, and signage would not be lit. The exact signage would be determined during the detailed design stage with the intention of keeping the number of signs to an operational minimum. Reducing unnecessary clutter while ensuring the route is easy to read ensures the Scheme would comply with Highways England design principle 3 (Good road design makes roads understandable).

Sustainable design

6.2.9 The Scheme has been designed taking into consideration resilience to climate change through meeting current road design standards which incorporate future climate change allowances.

6.2.10 Chapter 14 (Climate) (sections 14.8 and 14.9) of the Environmental Statement (Application Document 6.1) set out in detail how the Scheme would take account of the projected impacts of climate change.

6.2.11 The Scheme has been designed to reduce the risk of flooding through the use of sustainable drainage systems. The drainage design comprises three distinct areas, the roads west of the tunnel, the tunnel and the roads east of the tunnel. Each of the three areas would use different sustainable drainage features to treat and attenuate the highway runoff prior to discharge. These details have been developed in discussions with the Environment Agency. The drainage design, an outline of which is set out indicatively in the Drainage Strategy(Appendix 11.3 of Application Document 6.3 (ES Appendices)), would also take into account long

term maintenance considerations which would be confirmed during the detailed design stage.

6.2.12 The Scheme addresses Highway England's design principles 6 (Good road design is environmentally sustainable); and 10 (Good road design is long-lasting). The embedded design measures have been incorporated into the Scheme to make it more sustainable. Specifically, the road drainage includes an allowance for the effects of climate change and is therefore adaptable to future needs. The drainage design, an outline of which is set out indicatively in the drainage strategy (Appendix 11.3 of Application Document 6.3 (ES Appendices) would seek to ensure that visible elements (such as infiltration basins and linear ponds) are integrated sympathetically into the landscape. They also provide opportunities for biodiversity enhancement through planting. This holistic approach to the Scheme demonstrates good sustainable design.

6.2.13 Sustainability has been an integral part of the design process. The Scheme has been designed with a long lifespan and the design takes into account the potential for climate change. The Scheme is aiming to achieve an Excellent rating on the Civil Engineering Environmental Quality Assessment and Awards Scheme ("CEEQUAL") sustainability rating scheme delivered by the Building Research Establishment ("BRE"). The Scheme is therefore considered to meet requirements set out by Design Council CABE design principle 9 (Sustainability).

6.3 Western section: Winterbourne Stoke bypass to Longbarrow junction

6.3.1 The Western section of the Scheme comprises the following elements:

a) A bypass to the north of Winterbourne Stoke;

b) Two green bridges constructed over the new A303;

c) Provision of new bridge over the B3083 to carry the A303 over the re-aligned road;

d) A new viaduct over the River Till valley;

e) A new junction with the A360 to be constructed to the west of the WHS boundary, including a green bridge and a new link to Winterbourne Stoke (Longbarrow junction);

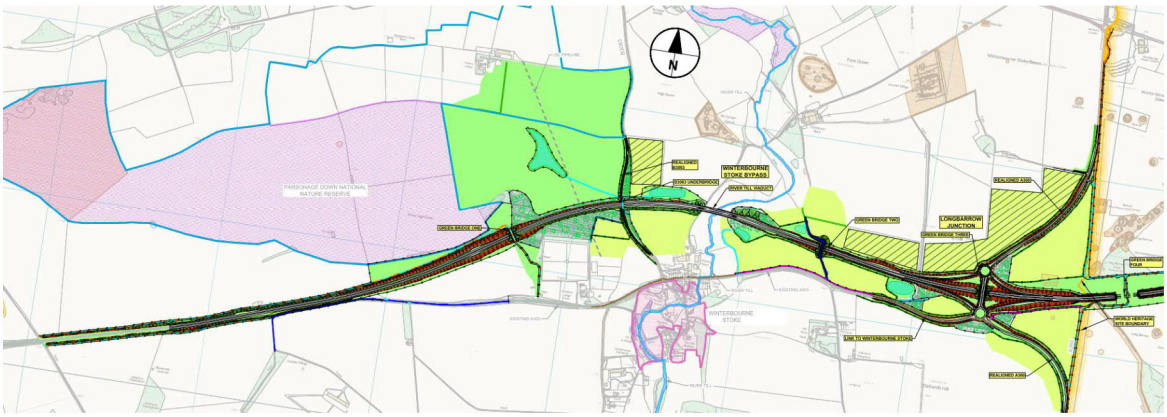
f) Provision of new NMU route along the proposed downgraded section of the A303 from Longbarrow junction to Winterbourne Stoke;

g) Deposition of excavated material to form natural chalk grassland; and

h) Alteration to Rollestone crossroads.

6.3.2 The proposed western section of the Scheme is illustrated in Figure 6-2

Figure 6-2: The Western Section – Winterbourne Stoke bypass to Longbarrow junction



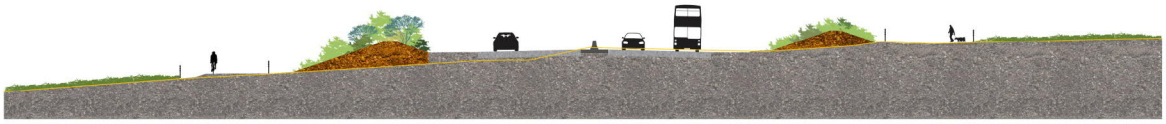
Construction of a bypass to the north of Winterbourne Stoke

6.3.3 Winterbourne Stoke is currently severed by the A303. Much of the village to the south of the A303 is designated as a conservation area. The urban signage and street furniture associated with the trunk road, along with the severance, has a negative effect on the setting to the conservation area. Provision of a bypass to alleviate this impact has been a clear objective of the Scheme since the route selection process. In addition to benefits on the setting of the conservation area, the Scheme intends to further improve the route through the village by narrowing the carriageway for motorised traffic and increasing the width of the NMU pathway. Therefore, the Scheme would improve safety, attractiveness, and environmental quality for NMUs and residents within Winterbourne Stoke.

6.3.4 In accordance with the design principle to integrate the Scheme into its landscape setting, the horizontal and vertical alignment of the western section of the Scheme has been aligned to follow the downland landscape as far as reasonably practical. In so doing it has bypassed the village of Winterbourne Stoke and avoided the ecologically sensitive land of Parsonage Down NNR. A portion of this section is also accommodated within a cutting to mitigate visual impact in the landscape.

6.3.5 Landscape and ecological enhancement would be incorporated along the route as is it passes to the south of Parsonage Down NNR in response to its landscape character. The use of a bund along the northern side of the road would aid landscape integration and increase the perception of separation from users of the PROW that follows this alignment. An indicative cross section of the cutting including the bund along the northern side has been demonstrated in Figure 6-3. Land between the Scheme and the boundary of the NNR to the north, would be created as chalk grassland with occasional native shrubs. This is would ensure this part of the Scheme sits comfortably within the downland landscape.

Figure 6-3: Indicative section through bypass of Winterbourne Stoke before first green bridge looking east



Green bridge one constructed over the new A303

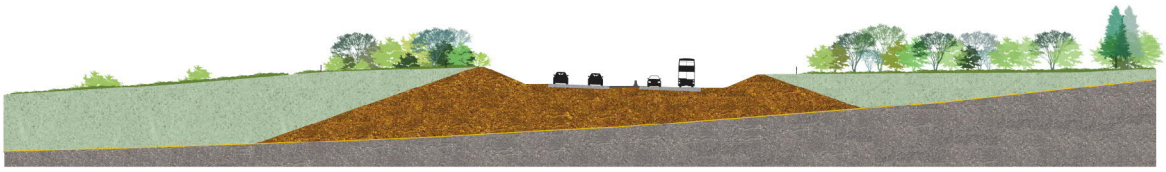
6.3.6 The first of four green bridges would be constructed over the new A303 route northwest of Scotland Lodge Farm near the southeast corner of Parsonage Down. The principle behind a green bridge is to provide a sympathetically designed route over the A303 for the purposes of reducing visual impact and maintaining landscape connectivity as part of the integrated landscape approach. This green bridge would facilitate NMU and agricultural access across the existing A303 while also being planted for ecological benefit. The green bridge would act as a bat corridor. Landscaping would also ensure that traffic on the highway below is screened for users of the PROW. An example of a green bridge on another project is demonstrated at Figure 6-4, and Figure 6-5 is an indicative visualisation of Green Bridge One.

Figure 6-4: Example of a green bridge (Weymouth Relief Road)

Figure 6-4: Indicative visualisation of Green Bridge One

6.3.7 To the east of the green bridge the Scheme would pass onto embankment as it crosses one of the many dry valleys within the study area. Landscaping would provide visual screening of the carriageway and integrate with the existing landform. An indicative cross section through this part of the route can be found at Figure 6-6.

Figure 6-6: Indicative section through embankment through dry valley looking east



Deposition of excavated material to form chalk grassland

6.3.8 In addition to the landscape integration of the highway embankment, an area of farmland which is predominantly in arable use, on the northern side of the Scheme to the east of Parsonage Down, is the preferred location for accommodating excavated material. The excavated material deposition area would be designed to fit with the natural topography, which when viewed from the surrounding landscape would appear natural. Archaeological features within this land would be left undisturbed. Landscape and ecological enhancement would be achieved through the creation of this chalk grassland.

6.3.9 Using the excavated material to form the chalk grassland would remove the need to transport surplus material on the highway network to off-site disposal facilities. This approach is mindful of site context and is considered to demonstrate compliance with Highways England design principle 8 (Good road design is innovative).

Provision of new bridge over the B3083 to carry the A303

6.3.10 A new bridge would carry the A303 across the B3083, which provides local access from Winterbourne Stoke to Shrewton. To avoid lengthy road closure, the proposed single-span bridge structure would be constructed to the west of the existing B3083 necessitating realignment of the road. The bridge would include a segregated verge on the eastern side to accommodate cattle and equestrian movements under the A303.

6.3.11 For the purposes of maintaining visual continuity with the adjacent false cuttings, and providing wildlife corridors, the bridge structure would be widened to accommodate bunds on both sides of the highway.

6.3.12 To the east of the B3083 the A303 route would pass through a cutting. Landscape integration would provide visual and noise mitigation. To aid integration back slopes would be graded out to appear as natural landform and returned to agricultural use.

Construction of a new viaduct over the River Till valley

6.3.13 A twin deck multi-span viaduct would carry the proposed A303 over the River Till SAC and SSSI and its floodplain, with the road approximately 10m above the valley floor. The location of the viaduct utilises natural promontories on the valley sides, which has reduced the works required to construct the approach embankments.

6.3.14 The appearance of the River Till viaduct is the result of careful consideration of a number of factors. A viaduct crossing the valley was selected in preference to embankments and a bridge over the river to minimise impact and avoid the need for earthworks within the valley floor with associated impact on the floodplain and therefore to flood risk. The height of the viaduct above the River Till valley and gap between the two decks would be optimised to ensure light levels on the valley floor beneath the structure are such that vegetation can establish and flourish.

The locations of the viaduct piers have been positioned so that they are not within the SAC or SSSI and to allow the existing bridleway from Winterbourne Stoke to remain at its current location. An indicative visualisation of the proposed viaduct can be found at Figure 6-7.

Figure 6-7: Indicative visualisation of proposed viaduct across the River Till Valley

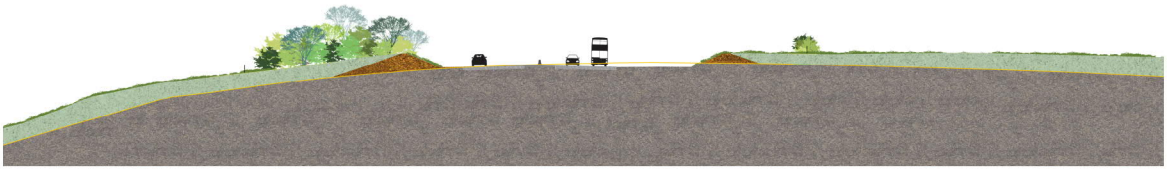
6.3.15 An environmental screen would be installed on the southern side to reduce the visual impact of vehicles and vehicle headlights.

Between the River Till valley and Longbarrow junction

6.3.16 To the east of the River Till viaduct, the Scheme would continue on an embankment before the approach to Longbarrow junction. In order to reduce the visual impact of traffic along the embankment, false cuttings are proposed on both sides of the road. An indicative cross section through the false cutting can be found at Figure 6-8.

6.3.17 As the Scheme ascends the valley, Green Bridge Two has been proposed. This would maintain the existing PROW and agricultural crossing over the new A303 alignment. Green Bridge Two would also provide a safe crossing for wildlife.

Figure 6-8: Indicative section through false cuttings before Green Bridge Two looking east



New Longbarrow junction

6.3.18 The new Longbarrow junction has been positioned to west of the WHS boundary to minimise impact on the WHS, particularly on the Winterbourne Stoke barrow group. The junction layout has been designed to separate traffic moving north-south along the A360 from the strategic network travelling east-west along the A303 and comprises two roundabouts connected by a short length of dual carriageway carried over the A303 on a new green bridge (Green Bridge Three). Slip roads would accommodate traffic movements between the two roundabouts and the A303 and a link to the de-trunked A303 to the west, accessing Winterbourne Stoke. An indicative visualisation of the western approach to the new Longbarrow junction can be found at Figure 6-9.

6.3.19 The design of Longbarrow junction would facilitate NMU access between Winterbourne Stoke and the WHS, through the use of Pegasus crossings, which permit equestrian use as well as cycles and pedestrians. These would be provided across the existing A303 link to Winterbourne Stoke and A360 (south) at the new Longbarrow junction.

Figure 6-9: Indicative visualisation of western approach to new Longbarrow junction

6.3.20 The A303 carriageway at the Longbarrow junction has been set below existing ground levels to minimise its landscape and visual impact, particularly from within the WHS to its west, to ensure the project maintains the OUV of the WHS. Furthermore, the junction has been located to ensure east facing slip roads do not encroach into the WHS. The green bridge would include bunds which screen traffic on this crossing from the WHS and the A303.

6.3.21 Land surrounding the junction would be restored back to farmland. New landforms to the south of the A360 link would be graded back into the adjacent landscape before being restored to agricultural use. Woodland blocks would be proposed around the junction, which together with the hedgerows alongside the highway and the re-grading of earthworks, would assist with the integration of the junction into the landscape and provide visual screening.

6.3.22 Lighting to the existing Longbarrow junction would be removed as part of the Scheme. Provision of traffic signals at the new Longbarrow junction would be considered as part of the detailed design process. These would also be required to assist with safe NMU crossings at the junction.

Provision of new NMU routes

6.3.23 The Scheme has been designed to improve connectivity for walkers, cyclists and horse riders by creating new PROWs and incorporating safe crossing points for users at various points along the route. This also includes off-road provision for horse drawn carriages where this is reasonably practicable.

6.3.24 A new restricted byway is proposed both north and south of the scheme at its western limit. To the north this extends as far as Green Bridge One before crossing the A303 and joining the former A303 just west of Scotland Lodge Farm. To the south this extends as far as the existing bridleway BSJA3, which would be converted to a byway open to all traffic. To the east of this point the route south of and parallel to the A303 would become a byway open to all traffic to maintain the connectivity of this right of way with the former A303 through Winterbourne Stoke. Through Winterbourne Stoke the footway to the north of the existing A303 would be widened to provide a shared-use cycleway. East of the River Till, a new bridleway would be provided parallel with but separated from the existing A303 as far as Longbarrow junction. Between Longbarrow junction and the existing A360, which becomes a restricted byway, a new bridleway would be created just south of the new A303.

Alteration to Rollestone crossroads

6.3.25 Rollestone crossroads is located to the north of Longbarrow junction on the A360. This crossroads would be modified to alter the traffic flow priorities and accommodate long vehicles. Initial proposals were presented at statutory consultation and subsequently modified following feedback. The revised layout formed part of the supplementary consultation. The change made the junction more compact in order to reduce the amount of farmland lost. Whilst it would be located just inside the northwest corner of the WHS, surveys have confirmed that there would be no adverse impact on archaeology.

6.4 Central section: within the World Heritage Site

6.4.1 The Central section of the Scheme comprises the following elements:

a) Approach to western tunnel portal;

b) Provision of Green Bridge Four;

c) Construction of western tunnel portal incorporating fully grassed cut and cover canopy;

d) Construction of a twin-bored tunnel through the WHS approximately 1.9 miles (3km) long;

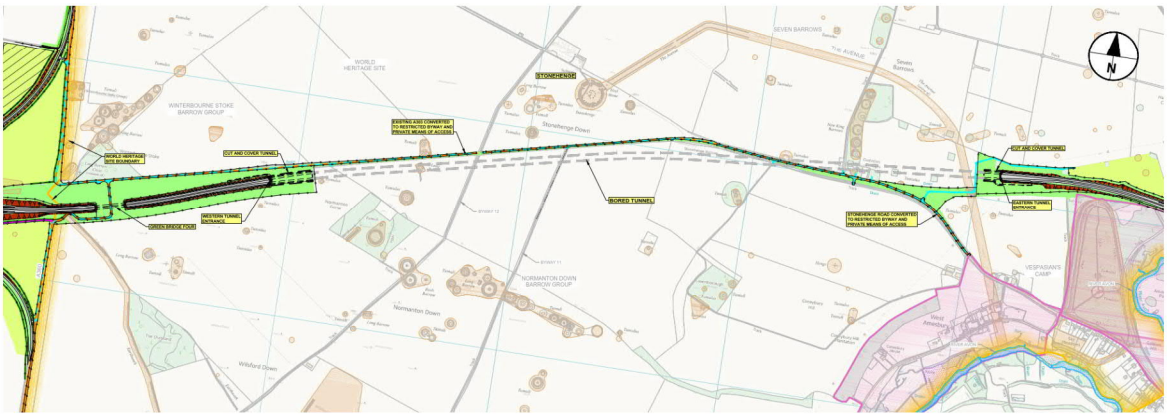
e) Construction of eastern tunnel portal incorporating fully grassed cut and cover canopy;

f) Approach to eastern tunnel portal; and

g) Conversion of the existing A303 route into a restricted byway and improved NMU connectivity within the WHS.

6.4.2 The proposed central section of the Scheme is illustrated in Figure 6-10.

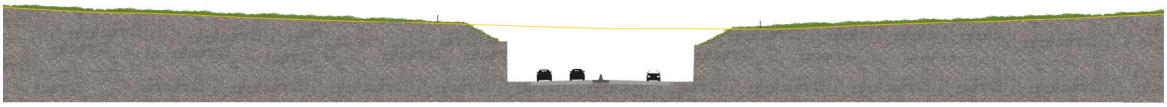
Figure 6-10: The Central Section – within the World Heritage Site



Approach to western tunnel portal

6.4.3 To minimise land take and visual impact from key viewpoints within the WHS, the road within the western part of the WHS would be set within a cutting. Informed by the consultation process, the design decision was made to utilise vertical retaining walls to minimise the physical footprint within the WHS. The top portion of retaining walls would have a grassed slope to a suitable gradient running for the length of the cutting. An indicative cutting profile is shown in Figure 6-11. Land to both the north and south of the cutting, including the slope above retaining walls, would be planted as chalk grassland. Fencing along retaining walls would be provided, its detailed design would be determined through consultation with stakeholders. These measures would assist with the landscape integration of the retained cut.

Figure 6-11: Indicative section through cutting in WHS looking east



6.4.4 The vertical retaining walls would perform a structural role. Whilst detailed design has yet to be undertaken, it is envisaged that these structural elements would have an architectural textured finish to soften the visual impact of the walls.

6.4.5 The finishes would have regard to the WHS landscape; potentially drawing from themes used on the Stonehenge visitor centre. Images which reference the surrounding context, demonstrating colours, schemes and materials, can be found at Figure 6-12. In response to comments from Design Council CABE, the intention would be to adopt a route wide identity through the designed structures across the Scheme. This would ensure consistency and quality in the visual language while strengthening a sense of place for the user. The use of appropriate materials and careful detailing would ensure the Scheme brings long lasting value, in accordance with Highways England design principle 10 (Good design is long lasting), and Design Council CABE design principle 8 (Materials and detailing).

Figure 6-12: Contextual vernacular

Green Bridge Four

6.4.6 To the east of the former A360, Green Bridge Four, which would be approximately 150m wide, would carry a restricted byway over the highway whilst also providing physical and visual connectivity between the northern and southern parts of the WHS. Confirmation of the proposed location and width of this green bridge followed the statutory consultation exercise. It is positioned off the line of the A360 in order to provide better visual and physical connection between monuments to the north and south of the proposed A303.

6.4.7 The restricted byway carried by Green Bridge Four would provide north south connections with the A360 and link with the east west connections to Winterbourne Stoke and Amesbury along the former A303 route. The finished ground level over the bridge would replicate the existing ground levels as far as reasonably practicable.

6.4.8 To avoid light pollution and preserve dark skies within the WHS landscape, lighting under the bridge would only operate between dawn and dusk.

Western tunnel portal

6.4.9 The position of the western tunnel portal has had regard to solstice lines and to avoid impacting on the scheduled Wilsford G1 barrow. It would be located within the WHS, northwest of Normanton Gorse, situated approximately 1.0km east of the existing Longbarrow junction and immediately to the south of the existing A303.

Figure 6-13: Indicative visualisation of proposed Western Tunnel Portal

6.4.10 Highways England has explored extensively the architectural articulation of the tunnel portals. Initial concepts tested whether a visual statement could be made; however, following consultation with heritage stakeholders, the decision was taken to prioritise minimising the visual impact on heritage assets over a physical statement. In further consultation with heritage stakeholders, the design team has developed what is considered a sensitive and appropriate solution for placing portal entrances within the WHS landscape.

6.4.11 An indicative visualisation of the tunnel portal entrance is shown in Figure 6-13. The finished ground level over the portal structure would replicate the existing ground levels as far as practicable.

6.4.12 In undertaking this restrained architectural approach to portal design, the Scheme responds positively and elegantly to the sensitive context. This allows the overall sense of place, character and identity of the WHS to be maintained and enhanced for future generations. For these reasons the Scheme is considered to accord

with Highways England design principle 5 (Good road design is restrained), and Design Council CABE design principle 7 (Design approach).

6.4.13 The tunnel creates an associated requirement for a number of mechanical, electrical, operational and safety systems. The items of plant required to power and control these systems would be housed within tunnel service buildings. These are needed at both tunnel portals. For safety reasons tunnel service buildings and store rooms need to be located outside of the tunnel. They would be built below ground, into the sides of the cutting in order to reduce their visual impact.

6.4.14 To minimise the plan width of the cutting at the approaches to the portals, the retaining structures would have cantilevered elements that would overhang the portal buildings and associated laybys.

Construction of a twin-bore tunnel through the WHS

6.4.15 The Scheme seeks to minimise views of the road within the WHS, with due consideration given to key viewpoints such as the Stonehenge monument. The locations of the entrances to the tunnel have been chosen to sit within the natural topography of the landscape and to avoid impacts on heritage assets. Removing a large portion of the existing A303 road from the WHS would allow important views and physical connectivity between monuments to be restored.

6.4.16 The Scheme would result in improved understanding of the landscape of the WHS. The Stonehenge monument is a key focal point of the WHS, however the relationship between different barrow groups, monuments, ceremonial routes, and the horizon from different viewpoints all contribute to its OUV. By designing the tunnel with care, this Scheme reconnects the WHS landscape and provides visitors with a more authentic impression of the experience of those who built and visited the monuments in previous millennia.

6.4.17 The Scheme would continue through a twin-bore tunnel, following an alignment that is broadly similar to the existing A303. The twin-bore tunnel would be approximately 2 miles (3.3km) in length.

6.4.18 The tunnel would be lit internally for the safety of road users. Whilst lighting would be needed at portals to assist drivers in the transition from tunnel to open sky, this would be designed in order to minimise light spill outside of the portals.

6.4.19 Diversion routes have been determined for abnormally high vehicles as well as other road users restricted from tunnel access, which includes mopeds and horse drawn carriages.

Conversion of the existing A303 route into a restricted byway and improved NMU connectivity within the WHS

6.4.20 The former A303 within the WHS would be converted to a restricted byway as far east as the existing junction with Stonehenge Road, which the new restricted byway would then follow for a short distance. An indicative visualisation of this can be found at Figure 6-14.

6.4.21 Along the length of the byway the road width would be reduced and surfacing more sensitive to the location introduced. Unobtrusive fencing would be provided along the length of the byway. The reduction in width of the hard surface and

restoration to grassland would result in significant historic landscape and ecological benefits. The choice of fencing and surfacing within the WHS would be developed in consultation with relevant stakeholders.

Figure 6-14: Indicative visualisation of former A303 route

6.4.22 The restricted byway would serve a number of purposes. It would provide a route for users (NMUs) prohibited from using the tunnel (walkers, cyclists, horses and horse-drawn carriages). In conjunction with adjoining byways, it facilitates NMU movements between Amesbury and Winterbourne Stoke. It would link with the wider public right of way network and, of note, provide a means for NMUs to access the WHS from either Amesbury or Winterbourne Stoke. Whilst achieving the above, it would also provide a significantly enhanced opportunity for people to explore the WHS.

6.4.23 In accordance with Highways England design principle 2 (Good road design is inclusive), consideration was given to the needs and impacts on all users and communities, which included NMU groups and landowners, during the design process. The needs and requirements of these groups and communities were established through a number of desk studies, assessments and consultations. This fed into and shaped the proposed design, which seeks to enhance the amenity and enjoyment for NMUs.

6.4.24 Given the position of the Scheme within the WHS, dark skies have been an important consideration to maintain the sites connections with astronomy. For this reason, no new permanent road lighting is proposed within the WHS section of the Scheme. This would reduce the amount of light pollution to a level below that currently existing, as well as improving the overall appearance and understanding of the monument in the context of the night sky for visitors.

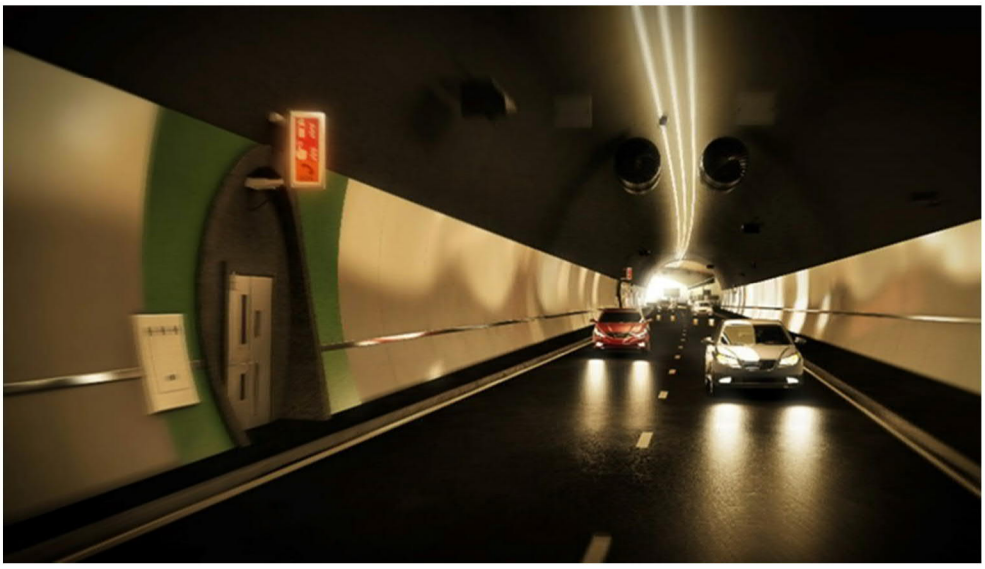
Consideration of the user experience

6.4.25 Concepts for improving the driver experience through the Scheme are currently being explored by Highways England in response to comments made by the Strategic Design Panel and feedback received from the public through consultation. It is anticipated that these would be developed further during the detailed design stage.

6.4.26 The overarching principle for the Scheme as it passes through the WHS has been to place the route sensitively within the landscape and maintain the OUV of the WHS. This would result in drivers losing views of the Stonehenge monument. However, road users would retain their sense of location within the wider context when travelling along the A303 because the tunnel would become a new point of reference on the journey from the South East to the South West.

6.4.27 Further design work will be undertaken on how the tunnel interior would be treated to improve the driver experience. An indicative view of a typical tunnel interior can be found at Figure 6-15. The scheme is seeking to improve on this during the detailed design phase.

Figure 6-15: Indicative view of the inside of the tunnel



6.4.28 The feasibility of innovative passenger immersive technologies to improve the experience of driving through the tunnel is being considered to address comments made by the Strategic Design Panel. It also serves to demonstrate accordance with Highways England design principle 8 (Good road design is innovative).

Eastern tunnel portal

6.4.29 The tunnel would emerge at the eastern tunnel portal which would be located to the east of the King Barrow Ridge and 'The Avenue', just to the north of the existing A303. Natural topographical features and the need to avoid impacts on heritage assets within the WHS, as well as other historic and archaeological features in the immediate vicinity have guided the proposed location of the eastern portal. The Avenue is a key archaeological feature of the WHS and is

currently severed by the existing A303; the Scheme would create future opportunities for the reconnection of The Avenue.

6.4.30 To further mitigate the visual impact of the route within the WHS, the length of the bored tunnel at the eastern portal would effectively be extended by the provision of a cut and cover canopy similar to that at the western end. The finished ground level over the portal structure would replicate the existing ground levels as far as reasonably practicable.

Approach to eastern tunnel portal

6.4.31 As with the western tunnel portal approach, the eastern tunnel portal approach would be set within a cutting formed mostly of grassed slopes.

6.4.32 The slopes would be locally steepened in the location of the 'Nile Clumps' of trees to avoid directly impacting on them.

6.5 Eastern section: Countess roundabout to just beyond the Solstice Park junction

6.5.1 The Eastern section of the Scheme comprises the following elements:

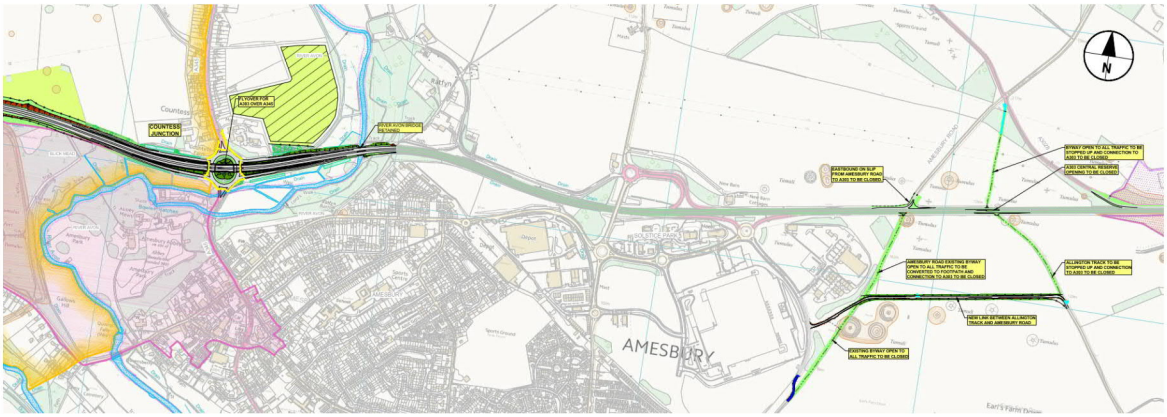
a) Reconnection with the existing road alignment;

b) Construction of a new flyover above the existing Countess roundabout; and

c) Alterations to rights of way to the east of Countess roundabout.

6.5.2 The proposed eastern section of the Scheme is illustrated in Figure 6-16.

Figure 6-16: The Eastern Section – Countess roundabout to just beyond the Solstice Park junction



Reconnection with existing road alignment

6.5.3 From the eastern tunnel portal, through to Countess roundabout, the Scheme would closely follow the line of the existing A303 and reuse part of the existing carriageway. This is to minimise land take within the WHS and to respond to the existing environmental constraints through which the Scheme passes or which lie immediately adjacent.

To the northwest of Countess roundabout there are several listed properties within Countess Farm, and the nearby River Avon is both a designated SAC and SSSI. The Scheme would be contained within the existing highway boundary specifically so that there would be no direct impact on these surrounding sensitive environmental areas.

Construction of a new flyover above the existing Countess roundabout

6.5.4 The new flyover would be constructed within the footprint of the existing roundabout and retaining walls would be used to support the A303 as it rises between the slip roads.

6.5.5 The construction of a new flyover above the existing Countess roundabout makes use of space reserved when the junction was constructed approximately 50 years ago. The flyover has been proposed for the purpose of separating local traffic moving north-south along the A345 Countess Road from the strategic network travelling east-west along the A303. Slip roads on the line of the existing carriageway would accommodate traffic movements between the two roads. An indicative visualisation of the proposed Countess roundabout including the slip roads can be found at Figure 6-18. This separation means that traffic on the A303 would not mix with local traffic using the A345, reducing congestion and improving connectivity between north and south Amesbury.

Figure 6-18: Indicative visualisation of Countess roundabout

6.5.6 The pedestrian subway on the eastern side of the existing Countess roundabout would be removed and signal controlled surface level crossings provided. These

would also serve cyclists wishing to access the nearby the National Cycle Network route.

6.5.7 The A303 would be connected across the roundabout using two single-span bridges, joined by a central earth mound. In recognition of the roundabout's 'gateway' function to Amesbury, trees and shrubs would be planted in the centre of the roundabout and along the slip roads. An indicative visualisation can be found at Figure 6-19.

Figure 6-19: Indicative visualisation of proposed Countess roundabout

6.5.8 A noise barrier would be provided along both sides of the flyover. This would help to reduce vehicle noise experienced at nearby houses, and also screen vehicle movements when viewed from the north and south.

6.5.9 Existing road lighting to the Countess roundabout would be upgraded as part of the Scheme. The replacement lighting would be specified to modern standards to minimise light spill. In line with Scheme considerations of minimising light pollution, no additional lighting is proposed.

Alterations to rights of way to the east of Countess roundabout

6.5.10 For the purposes of improving safety along the A303 and accommodating the Scheme east of Countess roundabout, there would be a number changes to rights of way. Combined with this, a number of new and upgraded rights of way are proposed to improve connectivity between local communities and surrounding rural areas for NMUs. Stopping up existing rights of way would provide safety benefits as well as improving the setting of a number of scheduled monuments. These alterations include the following, which are shown on Figure 6-20:

a) To the north of the A303, the existing entry from Amesbury Road onto the A303 would be closed permanently (the east bound exit would remain open), instead, this traffic would be accommodated at the Double Hedges junction where the A3028 joins the eastbound A303;

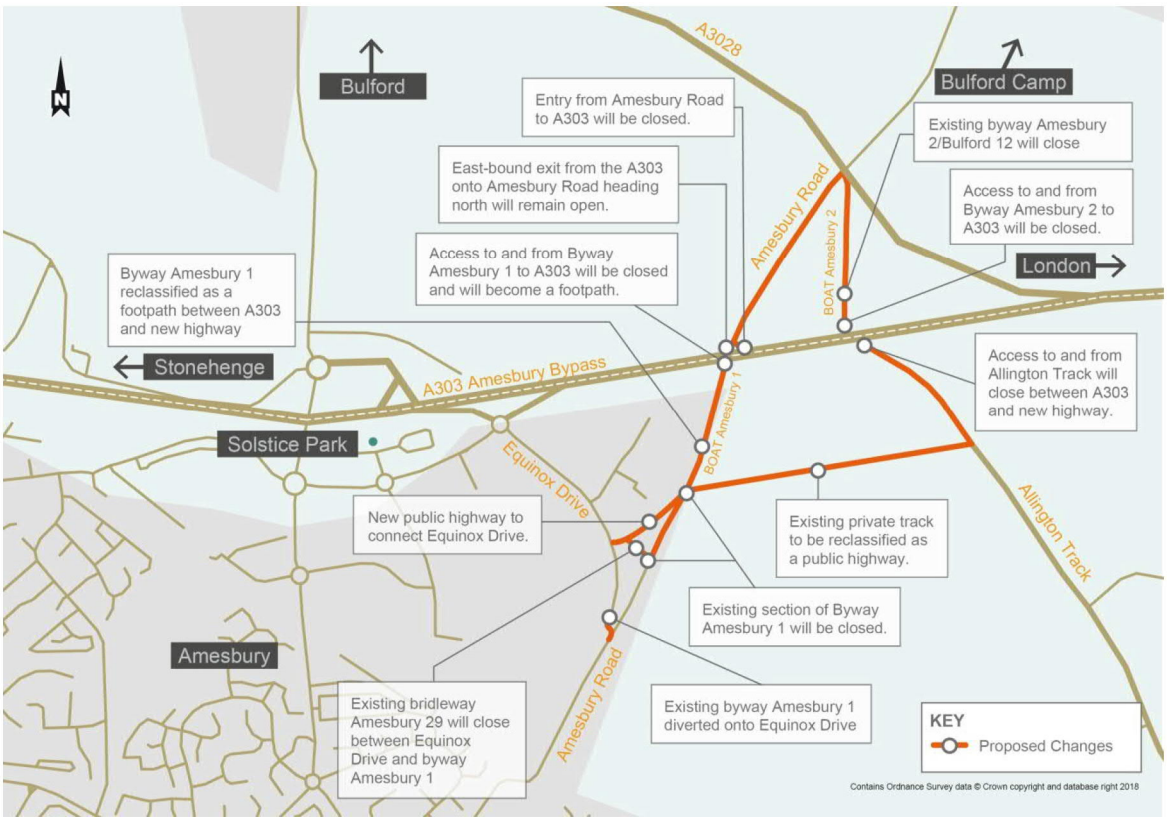
b) To improve safety at the Double Hedges junction, alterations to the entry slip road where the A3028 joins the A303 eastbound would be incorporated to assist with merging with slow traffic either joining or already on the A303;

c) The access onto PROW's from the A303 between Amesbury Road and the A3028 would close; and

d) To the south of the A303, two junctions with the A303 at Amesbury Road (a byway) and Allington Track (an unclassified road) would be closed and the redundant byways stopped up permanently. A new route would be created along the private lane between Allington Track and an existing PROW, Amesbury Road, which would then connect to a new T-junction on Equinox Drive in Solstice Park. This would provide a safer alternative to previous access arrangements through the closed junctions. A footpath would be provided along part of the alignment of the stopped up byway.

e) The byway Amesbury Road would be diverted away from the scheduled barrow monuments to join Equinox Drive. Through the removal of traffic immediately adjacent, the stopping up of rights of way would improve the setting of barrows.

Figure 6-20: Changes to the rights of way at eastern end of Scheme



7 Conclusion

7.1 Overview

7.1.1 This DAS demonstrates how the Scheme design complies with the four scheme objectives formulated to address identified problems and take advantage of the opportunities that this new infrastructure project would provide. The objectives are:

1. **Transport** – To create a high quality reliable route between the South East and the South West that meets the future needs of traffic;
2. **Economic growth** - To enable growth in jobs and housing by providing a free flowing and reliable connection between the South East and the South West;
3. **Cultural heritage** - To help conserve and enhance the World Heritage Site and to make it easier to reach and explore; and
4. **Environment and community** - To improve biodiversity and provide a positive legacy for nearby communities.

7.1.2 In accordance with the Scheme's transport objective, the Scheme would meet the requirements of technical documents set out in Chapter 3 (Design policy context) of the DAS resulting in a high performing dual carriageway between Amesbury and Berwick Down. The provision of new and upgraded junctions along this route (with the A360 and 345) would ensure strategic traffic on the A303 is segregated from local traffic which would improve journey time reliability on the route between the south east and south west. The increase in design capacity would ensure the route meets future needs. Overall, the Scheme would also provide a safer route than the existing, and would be more resilient to incidents.

7.1.3 Provision of a high performing dual carriageway would support the Scheme objective of economic growth through provision of a free-flowing and reliable connection between the south east and the south west.

7.1.4 The Scheme demonstrates a sensitive design approach in its response to the significance of the WHS and maintaining its OUV. Most significantly, placing the road within a twin-bore tunnel would remove the sight and sound of traffic from the vicinity of the stones and would re connect the two halves of the WHS, significantly improving opportunities to explore and enjoy the site.

7.1.5 Detailed consideration has been given to connections and relationships between the monuments within and outside of the WHS. The design and location of the tunnel portals and Green Bridge Four have been chosen to provide the optimum connection between the monuments and to maintain OUV of the WHS.

7.1.6 Stakeholder engagement was entered into early in the design process and has formed an integral part of the design development. The Scheme has been developed with input from stakeholders and the wider public through the consultation process. The Scheme was also presented to an independent design review panel for feedback on the design. A collaborative approach to design development has been central to bringing the Scheme to its current level of development.

7.1.7 The Scheme design has responded to challenges presented by statutory and non-statutory ecological sites and protected species in and around the Scheme area, as well as protected landscape designations and surrounding settlements. Assessment of these have also informed the high level design principles set out in Chapter 5 (High level design principles and design guide) of the DAS. The EIA process and assessment of likely significant environmental effects have also informed the design.

7.1.8 As a result, design measures have been incorporated into the Scheme. These ensure the proposals are integrated within the landscape and where necessary appropriate mitigation has been proposed. The Scheme would deliver landscape and biodiversity benefits through the creation of extensive habitats (for example, to the east of Parsonage Down) as well as improving habitat connectivity.

7.1.9 The Scheme has been designed to facilitate an accessible and connected network. Provision is made for a high performing dual carriageway with improved connections into the local highway network. It would also see improved NMU links along the Scheme corridor. These improvements would connect with an expanded PROW network in the WHS and the wider PROW network, resulting in improvements to accessibility.

7.1.10 Overall, the Scheme proposes an appropriately balanced design response to the key opportunities and challenges presented by the site and the challenging landscapes through which it travels.

8 References

Ref 1-1 How to submit your application, Advice note six: Preparation and submission of application documents, Version 7, The Planning Inspectorate, February 2016.

Ref 1-2 Planning Practice Guidance: Design, Ministry of Housing, Communities & Local Government, March 2014, updated July 2016, https://www.gov.uk/guidance/design (accessed 16 August 2017).

Ref 1-3 Design and Access Statements: How to Write, Read and Use Them, the Commission for Architecture and the Built Environment, 2006.

Ref 1-4 The Road to Good Design, Highways England, 2018.

Ref 2-1 National Infrastructure Delivery Plan 2016-2021, Infrastructure and Projects Authority, March 2016.

Ref 2-2 Road Investment Strategy for the 2015/16 – 2019/20 Road Period, Department for Transport, March 2015.

Ref 3-1 National Policy Statement for National Networks, Department for Transport, December 2014.

Ref 3-2 National Planning Policy Framework, Ministry of Housing, Communities & Local Government, July 2018.

Ref 3-3 Wiltshire Core Strategy, Wiltshire Council, January 2015.

Ref 3-4 Stonehenge, Avebury and Associated Sites World Heritage Site Management Plan 2015, Stonehenge and Avebury WHS Steering Committees, May 2015.

Ref 3-5 A design-led approach to infrastructure, Design Council, November 2012.

Ref 3-6 Design Manual for Roads and Bridges, Highways England, Transport Scotland, Welsh Government, Department for Infrastructure, August 2018.

Ref 3-7 Directive 2004/54/EC of the European Parliament and of the Council, April 2004.

Appendices

Appendix A

A.1 National Policy Statement for National Networks Accordance Table – Design Policies:

NPSNN Paragraph Number	Requirement of the National Policy Statement for National Networks (NPSNN)	Scheme compliance with the NPSNN
4. Assessment principles **Criteria for "good design" for national network infrastructure**		
4.28	Applicants should include design as an integral consideration from the outset of a proposal.	Chapter 4 (Design evolution and engagement) of the DAS clearly demonstrates that sufficient consideration was given to the assessment of key design opportunities and challenges at the outset of the project and that these have been used to inform the design. They include the unique nature of the WHS as well as numerous other factors within the surrounding landscape context. Stakeholder engagement was entered into early in the design process and has formed an integral part of the design development process. The design has been developed with input from stakeholders. Chapter 4 (Design evolution and engagement) of the DAS sets out this process in further detail. The Scheme was presented to Highways England's Strategic Design Panel. This is an independent design review panel which draws on members from numerous organisations including the Design Council. Where reasonably practicable, comments made by the panel have been incorporated into the Scheme. Further information on this process can be found in Chapter 4 (Design evolution and engagement) of the DAS. In response to the key opportunities and challenges, the stakeholder engagement process and comments received via the design panel, Highways England developed a set of high level design principles which have been used to guide the design approach to date. These have been set out in Chapter 5 (High level design principles and design guide) of the DAS.
4.29	Visual appearance should be a key factor in considering the design of new infrastructure, as well as functionality, fitness for purpose, sustainability and cost. Applying "good design" to national network projects should	The overarching design rationale for the Scheme has been driven by the unique nature of the WHS and the surrounding landscape. The high level design principles (which can be found in Chapter 5 (High level design principles and design guide) of the DAS) which have informed elements of the design of the Scheme include the aim of integrating

NPSNN Paragraph Number	Requirement of the National Policy Statement for National Networks (NPSNN)	Scheme compliance with the NPSNN
4. Assessment principles **Criteria for "good design" for national network infrastructure**		
	therefore produce sustainable infrastructure sensitive to place, efficient in the use of natural resources and energy used in their construction, matched by an appearance that demonstrates good aesthetics as far as possible.	the Scheme into the landscape with minimal visibility as a key design factor. Chapter 6 (Design Rationale) of the DAS demonstrates how the Scheme appearance would achieve the design principles in providing good aesthetics, that are also sensitive to place. This design has been prepared in accordance with CABE guidance (Ref 1-3). Functional requirements of the Scheme, as a highways infrastructure project, are led by technical documents setting out parameters for new road design, such as DMRB and the costs involved in those design elements. The relevant technical documents are referenced in Chapter 3 (Design policy context) of the DAS. Chapter 6 (Design Rationale) of the DAS provides a brief description of how the highways design elements as a result of meeting DMRB requirements. Compliance with these requirements would ensure the Scheme is fit for purpose. Chapter 6 (Design Rationale) of the DAS sets out general principles relating to sustainability and climate change that have informed the Scheme design. For example this has led to the design of the River Till viaduct being developed to avoid impact on flood risk and shading to ecological receptors. Further, the drainage design, an outline of which is set out indicatively in the drainage strategy (Appendix 11.3 of Application Document 6.3 (ES Appendices)) would seek to ensure that, the drainage design would be integrated sympathetically into the landscape and be designed for future flows taking account of climate change. Further information on embedded sustainable design can be found in Chapter 6 (Design Rationale) of the DAS. Also set out in Chapter 6 (Design Rationale) of the DAS, the Scheme is aiming to achieve an excellent rating with the CEEQUAL sustainability rating scheme delivered by the BRE. Chapter 6 (Design Rationale) of the DAS references materials generated through tunnel excavations being reused within the Scheme to reduce environmental impacts. Through efficient reuse of materials on site, the Scheme would deliver sustainable infrastructure. The materials which are reused would create a new chalk down landscape which is sensitive to the setting of the

NPSNN Paragraph Number	Requirement of the National Policy Statement for National Networks (NPSNN)	Scheme compliance with the NPSNN
4. Assessment principles **Criteria for "good design" for national network infrastructure**		
		Scheme.
4.30	It is acknowledged however, that given the nature of much national network infrastructure development, particularly SRFIs, there may be a limit on the extent to which it can contribute to the enhancement of the quality of the area.	Reference should also be made to the Scheme compliance response set out in paragraph numbers 4.28 and 4.29 of this Appendix. The Scheme design would contribute towards biodiversity enhancement and habitat connectivity. Chapter 6 (Design rationale) of the DAS sets out the embedded design measures included in the design. The removal of traffic from Winterbourne Stoke would provide enhancements to the setting of the conservation area. Provision of a tunnel through the WHS would result in the removal of the existing A303 route through the WHS with its associated traffic. This would provide enhancements to the WHS over the current situation. Chapter 6 (Design Rationale) of the DAS justifies how the Scheme would contribute to the enhancement of the quality of the different character areas. This DAS has been prepared in accordance with CABE guidance (Ref 1-3).
4.31	A good design should meet the principal objectives of the Scheme by eliminating or substantially mitigating the identified problems by improving operational conditions and simultaneously minimising adverse impacts. It should also mitigate any existing adverse impacts wherever possible, for example, in relation to safety or the environment. A good design will also be one that sustains the improvements to operational efficiency for as many years as is practicable, taking into account capital cost, economics and environmental impacts.	Reference should also be made to the Scheme compliance response set out in paragraph numbers 4.28 and 4.29 of this Appendix. Chapter 2 (Scheme background) of the DAS sets out the objectives for the Scheme which have been developed to address identified problems and take advantage of the opportunities that this new infrastructure would provide. In design terms, the Scheme is considered to address the following: Transport: The Scheme has been designed to meet requirements of technical documents which set out parameters for new road design, such as DMRB referenced in Chapter 3 (Design policy context) of the DAS. In doing so, this would contribute towards providing a high performing reliable route between the South East and South West that meets future needs. Chapter 6 (Design Rationale) of the DAS demonstrates how this would be achieved. This Chapter also sets out how the Scheme would provide a safer route than the existing, which would be more resilient to incidents. Overall, this would

NPSNN Paragraph Number	Requirement of the National Policy Statement for National Networks (NPSNN)	Scheme compliance with the NPSNN
4. Assessment principles **Criteria for "good design" for national network infrastructure**		
		result in an improvement to operational conditions. Economic growth: The Scheme design would provide an improvement to the existing operating conditions of the A303. This would provide a supporting role in enabling growth in jobs and housing through contributing to a free-flowing and reliable connection between the South East and the South West. Cultural heritage: Chapter 4 (Design evolution and engagement) of the DAS highlights the Scheme as presenting a significant opportunity to demonstrate exemplary design in its response to the significance of the WHS and its OUV. Along with numerous other heritage assets around the Scheme this has informed the high level design principles to which the Scheme has been developed. Chapter 6 (Design Rationale) of the DAS explains how the Scheme conserves and enhances the WHS and makes it easier to reach and explore. Most significantly, the Scheme proposes a twin-bore tunnel to remove a large section of the A303 route from the WHS, reconnecting the two halves. The Scheme has been designed with the aim of minimising adverse impact, for example, the location of the tunnel portals has been chosen to avoid impacting on heritage assets. Their visual impact further reduced through provision of cut and cover canopies. Environment and community: Chapter 4 (Design evolution and engagement) of the DAS sets out the need to respond to constraints created by statutory and non-statutory ecological sites and protected species in and around the Scheme area, as well as protected landscapes designations and surrounding settlements. These have also informed the high level design principles to which the Scheme was developed. Chapter 6 (Design Rationale) of the DAS explains how design mitigation measures within the Scheme would improve biodiversity and provide a positive legacy for nearby communities. The sustainability section in Chapter 6 (Design Rationale) of the DAS sets out how the Scheme has been designed with a long lifespan and the design takes into account potential for climate change. Chapter 4 (Design evolution and engagement) of the DAS makes reference to cost

NPSNN Paragraph Number	Requirement of the National Policy Statement for National Networks (NPSNN)	Scheme compliance with the NPSNN
4. Assessment principles **Criteria for "good design" for national network infrastructure**		
		as a consideration in the design.
4.33	The applicant should therefore take into account, as far as possible, both functionality (including fitness for purpose and sustainability) and aesthetics (including the scheme's contribution to the quality of the area in which it would be located). Applicants will want to consider the role of technology in delivering new national networks projects. The use of professional, independent advice on the design aspects of a proposal should be considered, to ensure good design principles are embedded into infrastructure proposals.	Reference should also be made to the Scheme compliance response set out in paragraph numbers 4.29 and 4.31 of this Appendix. Functional requirements of the Scheme, as a highways infrastructure project, are led by technical documents setting out parameters for new road design, such as DMRB referenced in Chapter 3 (Design policy context) of the DAS. These technical documents are set out in Chapter 6 (Design Rationale) of the DAS, and the chapter provides a brief description of the highways design elements as a result of meeting DMRB requirements. Compliance with these requirements would ensure the Scheme is fit for purpose. The Scheme would feature technological equipment to enable operational monitoring and control of traffic during incidents and maintenance would be located along the length of the Scheme. This would include CCTV cameras and variable message signs to provide information to drivers. Stakeholder engagement was entered into early in the design process and has formed an integral part of the design development process. The design has been developed with input from stakeholders. Chapter 4 (Design evolution and engagement) of the DAS sets out this process in further detail. The Scheme was presented to Highway England's Strategic Design Panel. This is an independent design review panel which draws on members from numerous organisations including the Design Council. Where reasonably practicable, comments made by the design panel have been incorporated into the Scheme. Further information on this process can be found in Chapter 4 (Design evolution and engagement) of the DAS. The stakeholder engagement process and use of the strategic design panel demonstrates independent advice has been sought on the design aspects of the Scheme which has ensured good design principles have been embedded into the proposals.
4.34	Whilst the applicant may only have limited choice in the	Reference should also be made to the Scheme compliance response set out in paragraph numbers

NPSNN Paragraph Number	Requirement of the National Policy Statement for National Networks (NPSNN)	Scheme compliance with the NPSNN
4. Assessment principles **Criteria for "good design" for national network infrastructure**		
	physical appearance of some national networks infrastructure, there may be opportunities for the applicant to demonstrate good design in terms of siting and design measures relative to existing landscape and historical character and function, landscape permeability, landform and vegetation.	4.28, 4.29 and 4.31 of this Appendix. Chapter 6 (Design Rationale) of the DAS demonstrates that Highways England has adopted an approach of high quality design in response to the key opportunities and challenges set out in Chapter 4 (Design evolution and engagement) of the DAS. These include the WHS, historic landscape, protected landscapes, statutory and non-statutory ecological designations and proximity to nearby communities. As described in Chapter 6 (Design rationale) of the DAS, embedded mitigation which has been identified as part of the EIA has also informed the design, including mitigation which ensures the Scheme responds to its context and minimises impact on landscape and historic settings. This is summarised in further detail in NPSNN paragraphs 4.31 and 4.33.
4.35	Applicants should be able to demonstrate in their application how the design process was conducted and how the proposed design evolved. Where a number of different designs were considered, applicants should set out the reasons why the favoured choice has been selected. The Examining Authority and Secretary of State should take into account the ultimate purpose of the infrastructure and bear in mind the operational, safety and security requirements which the design has to satisfy.	Reference should also be made to the Scheme compliance response set out in paragraph numbers 4.28 and 4.29 of this Appendix. Chapter 4 (Design evolution and engagement) of the DAS details how the design process was conducted, how different design options were considered and the preferred design chosen. The Scheme has been designed to satisfy the technical standards (DMRB) set out in Chapter 3 (Design policy context) of this DAS, which set out the operational requirements for a highway. These ensure the Scheme can be operated efficiently. Chapter 6 (Design rationale) of this DAS highlights the safety principles which the design has been required to satisfy. These include provision of a high performing dual carriageway between Amesbury and Berwick Down, constructed to current day standards. See response to NPSNN paragraph 4.61 of Appendix A to the Case for the Scheme document (Application Document 7.1). Security implications have been carefully considered as part of the design process. See response to NPSNN paragraph 4.76 of Appendix A to the Case for the Scheme document (Application Document 7.1).

Appendix B

B.1 The Road to Good Design (Highways England Design Principles):

Connecting people, Good road design:

1 makes roads safe and useful

Safety is fundamental to good road design; it is integral to both the usefulness of its function and the confidence of road users and their well-being. Good design creates safe roads which support and link to other wider imperatives, both nationally and locally, and that are fundamentally useful, meeting users' need for mobility effectively.

2 is inclusive

Inclusive environments facilitate dignified and equal use by all. An inter-disciplinary design process involves and places people's needs and views at its heart, nurturing well-being and creating a shared sense of ownership of the road. All users and communities are considered carefully in order to reduce barriers to access and participation, particularly mindful of the most vulnerable.

3 makes roads understandable

Easy to read, a good road is intuitive to use so as to be safe and efficient for all. 'Self-explaining roads' focus on the essentials and eliminate unnecessary and confusing clutter to make them legible, while responding to place and enhancing both environmental and economic outcomes.

Connecting places, Good road design:

4 fits in context

The aesthetic quality of a road and its design in relation to the places through which it passes, is integral to its function and the experience of those that use it. Good road design demonstrates sensitivity to the landscape, heritage and local community, seeking to enhance the place while being true to structural necessities. It builds a legacy for the future.

5 is restrained

Functional, but responding positively and elegantly to the context, good road design allows for the expression of the character and identity of the places and communities through which a road passes. Good road design can enhance a sense of place and add to what we have inherited, particularly through the use of appropriate materials and traditions, but does not make unnecessary superficial or superfluous visual statements.

6 is environmentally sustainable

Making an important contribution to the conservation and enhancement of the natural, built and historic environment, good road design seeks to achieve net environmental gain. It is

multi-functional, resilient and sustainable, allowing for future adaptation and technical requirements, while minimising waste and the need for new materials.

Connecting processes, Good road design:

7 is thorough

The result of robust processes that create a continual cycle of improvement, good road design starts with an in-depth understanding of people, place and context; learning from best practice worldwide. The design of all elements of the road environment are considered together and integrated into a responsive design.

8 is innovative

Responding positively to change, good road design captures opportunities for betterment and develops in tandem with emerging new technologies. Designing to a standard is not the same as achieving good design; an innovative and resourceful approach that is mindful of context is necessary to achieve better outcomes.

9 is collaborative

Collaboration ensures roads are useful to and accepted by the communities they serve. Collaborative working requires a rigorous process that identifies dependencies and wider opportunities, and facilitates effective communication and engagement from the start. Community engagement will be led by a local sense of culture, place and value.

10 is long-lasting

With quality materials and careful detailing, good road design brings lasting value. The design process requires sufficient time for challenges to be resolved before delivery and is adaptable to future needs and technologies as part of the commitment to whole-life operation, management and maintenance.

Appendix C

C.1 A Design-led Approach to Infrastructure (Design Council CABE Design Principles):

1 Setting the scene

Design thinking should be part of creating the vision and designing the brief for a new project. Even while still setting the brief, before a design team has been hired, the applicant and project management should be thinking in design terms and define a clear, design-led framework in which the project can develop. Machinery and internal processing equipment will represent the project's predominant purpose and highest costs - far more than the expenditure for façades and building - but its design will be integral to the scheme's success, both in terms of local acceptance and impact on the surroundings. There should therefore be suitable budget to ensure that building and landscape design match the quality of the technical equipment and that they can be maintained long-term.

2 Multi-disciplinary teamwork

To achieve a scheme that works both functionally and in design terms and, that, moreover, is well received, collaborations between stakeholders must begin early and be sustained. Stakeholders may include, among others, the client, the design team, technical experts, the community and the local planning authority. From the start of planning, the design team should include not just engineers and technical specialists but also architects and landscape designers. By including this expertise and letting them challenge the engineering approach, the applicant can achieve an inspirational, elegant and ambitious structure that has the potential to last for decades, at lower building costs and be relatively maintenance free. Early design input will ensure that efficiency, engineering aspects, town and landscape considerations and compelling design solutions come successfully together. Plant layout can be reorganised to minimise the footprint, mitigate impact on views and improve the relationship with its surroundings.

3 The bigger picture

Design does not start and end with the immediate project or site. Holistic thinking is required to ensure that projects are part of an integrated process that fits into bigger strategies such as regional or sub-regional planning. Potential synergies in an area should be explored in great detail, for example, to use the exhaust heat from new power plants for district heating systems, communal greenhouses and other uses. Large power plants are a major investment and often located in declining post-industrial areas and large brownfield sites. Investment and job opportunities can be very welcome, bringing benefit to the community and potentially creating a sense of local identity. Again, infrastructural requirements can work with wider needs. Visitor centres, for example, can contribute to community life by acting as community facilities and providing meeting rooms and a successful outcome will boost the reputation for future projects.

4 Site masterplan

It is in the nature of nationally significant infrastructure projects to have far-reaching impacts. These can be both hugely positive (utility provision, employment) and potentially negative (noise, traffic, odour, visual blight etc.). Good design will do much to reconcile the infrastructure project with its environment by creating a facility that responds to its context. Understanding the structure of its surroundings, topography and adjacent land use at each site should be the starting point for master-planning. This will inform routing, site organisation and detailed layout. Such work can be hugely important in reducing the size of the facility, leaving the rest of the site free for other uses. For instance, innovative conveyor systems or rearrangement of the process line may achieve a smaller and more efficient plant layout. The value of and impact on existing structures, landscape and archaeology should also be a key consideration and feed into decisions about site clearance and mediation.

5 Landscape and visual impact assessment

Due to their size - and number in the case of power lines and wind farms - infrastructure projects are visible from many viewpoints. They may impact on many different surrounding areas, whether it is densely urbanised townscapes, suburban or sparsely populated rural settings. Each context requires a different appreciation of how to handle scale and how the project relates to the environment.

For power lines and wind farms, visual impact assessment and landscape character assessment is an obvious part of the planning process, but large power plants should also be assessed using the same strict criteria as have been put in place for residential buildings, high-rise buildings and any other major architectural work in terms of their impact and the quality of design. Visual impact assessment should be used as a design tool to inform location, orientation, composition and height. This should take in a large number of viewpoints right from the beginning of design.

For large scale projects, which may spread over the landscape the assessment of verified montages needs to be representative of what the eye actually sees and perceives. Typically, montages are based on a 50 mm lens (as set out in the Landscape Institute's Advice Note 1/11 on Photography and Photomontage for Landscape and Visual Impact Assessment). A 75mm lens can help provide a better representation of the impact of the presence of certain structures such as wind turbines or pylons when seen from afar in a wide landscape and should be used to supplement montages based on a 50mm lens in these circumstances.

6 Landscape design

Intelligent landscape design mitigates the impact of an infrastructure installation and can enhance its setting. It should be developed in parallel with the proposal and take into account site topography; including, for example, existing flora. Good landscape designers minimise tarmac surfaces and provide better road systems, pedestrian routes, car parking and lay-by surfaces. They will often look at using excavated material to reform and shape the site to suit the plant. Wherever possible, the majority of the site should be given back to nature, providing space for leisure, play and wildlife - even up to the point of sinking the structure into the ground. Often remote and protected from human activity sites can become valuable habitats for a wide range of flora and fauna. Well-designed outdoor

spaces will offer pleasure and relaxation for staff and can create a visitor attraction in their own right, perhaps a new destination for school ecology projects.

7 Design approach

A clear architectural concept can manifest itself through symmetry (or asymmetry) and balance, repetition of organisational elements such as the grid, the frame or the bay and resonance between elements of different scales. The structure of the building - the system of bearing elements (girders, columns and walls) - can significantly inform the overall appearance. In a good design, such choices will seem compelling and inevitable, clearly expressing what the project is about and working well with its setting. In a poor project, such choices will often seem arbitrary. On a large scale project the adverse impact on the surrounding environment is amplified by poor decisions in the design, where typically inappropriate, wilful or superfluous, additions are made.

However, difference and variety of design approaches in relation to the context can be virtues. Infrastructure projects benefit society as a whole and should be celebrated. Different structures will require different levels of architectural ambition. There are places for an expressive or assertive approach and places for modesty - dictated both by a project's context and its purpose and status. In most cases less is more: simple (but not simplistic), straightforward designs go well with functional and efficient infrastructure. Nevertheless, real design ability is required to create compelling structures, rather than standard catalogue solutions, ubiquitous distribution sheds surrounded by acres of tarmac.

8 Materials and detailing

High quality materials and careful detailing will limit the need for maintenance and allow schemes to weather and age well. Metal cladding is often the default these days, but there may be other options that better reflect the value of a major civic building. Local materials and traditional building methods, for example, might inform the design.

A building's appearance often tells us something about what purpose it serves, its place in a town or city, what sort of spaces it contains and how it is organised and put together. It can be especially effective to make the building's internal workings visible: glazed surfaces showcase equipment and processes as well as contributing to better working conditions. A lighting expert or artist might be commissioned to develop a design strategy for large surfaces. Light, colour or an art installation can add character and give large elevations structure and rhythm. Intelligent lighting, perhaps using multiple colours, can highlight and strengthen aspects of the design.

Often a good design can be let down by clumsy detailing. Junctions between materials, the framing of materials or panelling for example, well handled, make a major contribution to the success of a project in visual terms. Design intent for key details should be developed alongside the Concept and Scheme Design stages so that the architectural potential can be understood by approval bodies and consultees.

9 Sustainability

Given the complexity of infrastructure projects, sustainability must be integral to the design from the very beginning. A successful proposal will cover every aspect of this, including, to give just a few examples, traffic movements (e.g. delivery and refuse), social inclusion of workers and visitors and the use of biomass. While natural light provides good working conditions for staff, glazed surfaces need to be carefully considered to avoid glare and

light pollution affecting wildlife and residents at night. The site strategy should include biodiversity, planting and sustainable urban drainage systems.

Ideally, building materials should be locally sourced, reclaimed, recycled or have very low carbon impact. Most infrastructure has a long lifespan and should therefore be designed to take account of potential changes to the frequency and severity of extreme weather due to climate change. Aspects of use are likely to change over the structure's lifetime, as will the technologies it contains. A good design will be flexible, able to accommodate changing requirements without major alterations, and adaptable, able to be altered or extended conveniently when necessary. All good design teams are attuned to these issues and employ the latest best- practice to deliver these challenging requirements. There is no reason why infrastructure projects should not win eco awards and achieve high CEEQUAL scorings like Pudding Mill Pumping Station.

10 Visitor centre

Many large infrastructure proposals offer the opportunity to provide a centre where visitors can learn about the plant operation and be introduced to the concepts of sustainability, energy generation, waste management and humanity's impact on the environment in terms of our ecological footprint and the exploit of natural resources. A good visitor centre can be an engaging place of exploration, providing a compelling insight into the need for the infrastructure and an appreciation of its size and scale.

A good visitor experience makes the most of the opportunities: a well-planned tour, for example, will encourage visitors to enjoy the often monumental dimensions of the plant, show them the extraordinary machinery at work and perhaps take them up on the roof for an exciting view. Design can optimise this experience by making sensitive provision for it and creating a unique attraction.

The siting of a visitor centre should be considered carefully, as part of the overall experience of the visitor. It ought not to be shunted out of the way as an inconvenience, but located to celebrate the process and purpose of the plant and enjoy the heroic scale and character of its architecture.

Appendix D Glossary

Term	Meaning
BRE	Building Research Establishment
CABE	Commission for Architecture and the Built Environment
CEEQUAL	Civil Engineering Environmental Quality Assessment and Awards Scheme
DAS	Design and Access Statement
DCO	Development Consent Order
DfT	Department for Transport
DMRB	Design Manual for Roads and Bridges
EIA	Environmental Impact Assessment
ES	Environmental Statement
HMAG	Heritage Monitoring and Advisory Group
ICOMOS	International Council on Monuments and Sites
NMU	Non-Motorised User
NNR	National Nature Reserve
NPPF	National Planning Policy Framework
NPSNN	National Policy Statement for National Networks
NSIPs	Nationally Significant Infrastructure Project
OUV	Outstanding Universal Value
PA 2008	The Planning Act 2008
PROW	Public Right of Way
SAC	Special Area of Conservation
SPA	Special Protection Area
SSSI	Site of Special Scientific Interest
UNESCO	United Nations Educational, Scientific and Cultural Organisation
WCS	Wilshire Council's Core Strategy
WHC	World Heritage Committee
WHS	World Heritage Site

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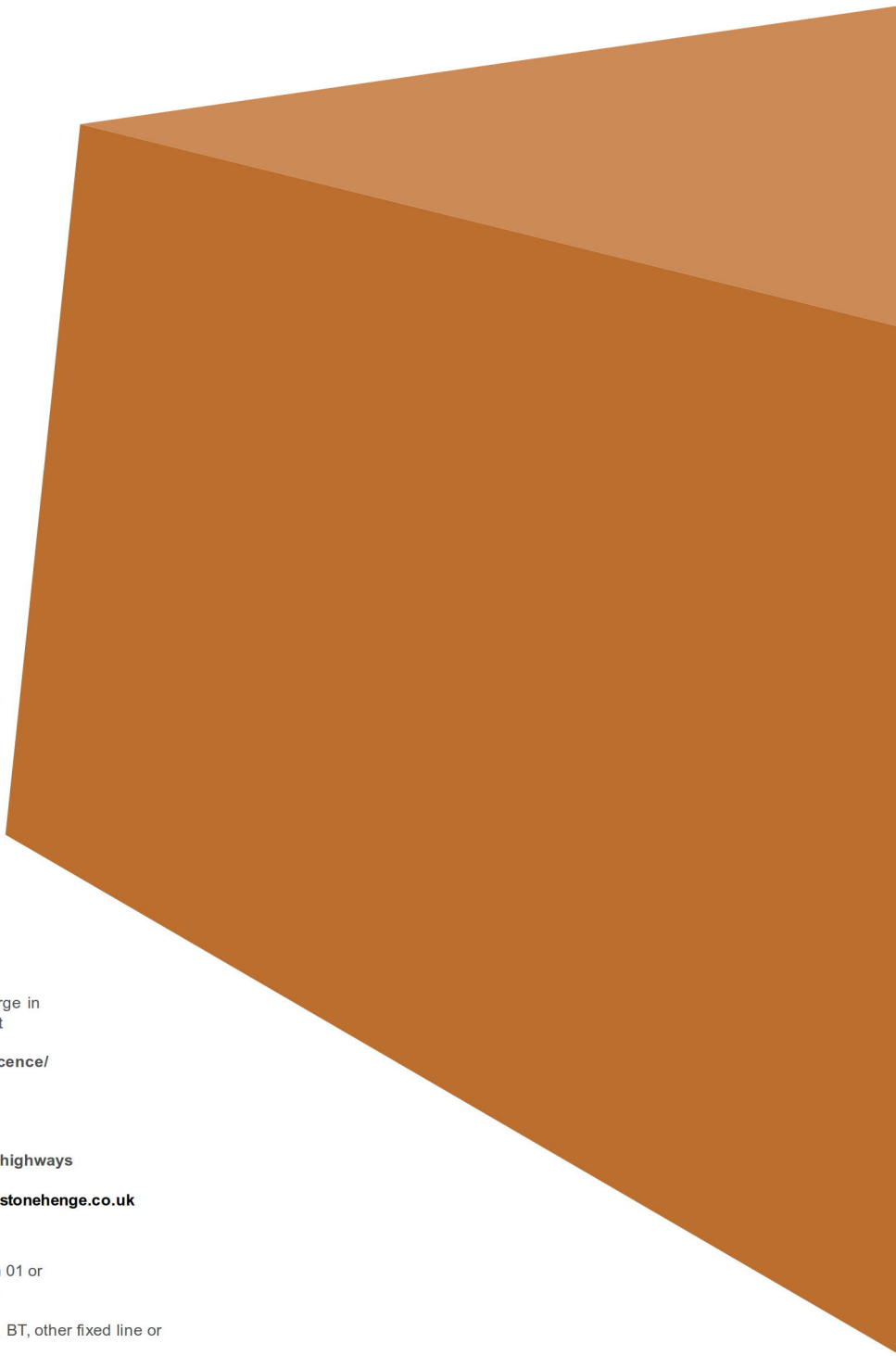

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