A303 Amesbury to Berwick Down

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A303 Amesbury to Berwick Down

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Responses to the ExA's Written Questions - Landscape and Visual (LV.2)

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12 Landscape and Visual (LV.2)

Question LV.2.1

Integrity of landscape and cultural heritage

The integral nature of the landscape, astronomy, the skies, and the monuments of Stonehenge is of enormous importance. The Stonehenge landscape has changed and developed spatially, visually, and emotionally into an enormously significant setting of ceremonial and cultural importance over many thousands of years.

In the Examination, some have argued that this aspect, of paramount importance, has been underappreciated in the ES and the HIA. Criticisms have been made of the failure to consider emerging evidence which might give rise to new theories on the significance and history of the Stonehenge landscape. Also, criticism has been made of the absence of a precautionary approach, which might prevent the Scheme destroying evidence or disrupting ancient topography and important spatial interrelationships within and beyond the WHS.

Please comment, particularly in the light of:

i. HIA, page 23, penultimate paragraph, re: second Attribute (the physical remains in relation to the landscape), 'The Scheme has been developed to avoid known concentrations of archaeological remains…' [APP-195].

ii. Josh Pollard and colleagues' 2017 publication, which identified not only the area adjacent to the western approach, but also a substantial area to the north, several kilometres long, with a remarkable density of Beaker associated material. A risk exists of sterilising this evidence with the construction of the western approach and the Longbarrow junction. (Noted in Part 1, paragraph 9 of the 5/6 June ISH written summary of the Consortium of Archaeologists and Blick Mead Project Team [REP4-047]).

iii. The discovery of two longbarrows to the south in 2017 adding to the remarkable concentration of Neolithic monuments dating from before the construction of Stonehenge. These appear to form a circular array focussed on the top of a dry valley (Wilsford Coombe?), which the western approach cutting would disturb. (Noted in Part 2, paras 11 and 12 of the same written summary [REP4-047], and elsewhere including Dr David Field's Written Representation [REP2-163]).

iv. A much later array dating from the Early Bronze Age is suggested in Section 4 of Paul Garwood's paper, Winterbourne Stoke Crossroads, Early Bronze Age funerary complex. He notes the clustering of monuments in large complexes with linear arrangements, within sight of Stonehenge and its wider environs. Whilst their central focus is Stonehenge they relate in a complex spatial and visual relationship to each other.

v. The failure to make use of viewsheds from particular monuments to gauge the visual connectedness of features within the overall landscape.

vi. Operational Guidelines for the Implementation of the World Heritage Convention (WHC.17/01) notes at paragraph 100 that, for properties nominated under criteria (i) – (vi), boundaries should be drawn to include all those areas and attributes which are a direct tangible expression of the OUV of the property, as well as those areas which in the light of future research possibilities offer potential to contribute to and enhance such understanding.

vii. HIA paragraph 5.10.4 [APP-195] and Highways England's response to ExQ1 CH.1.58 [REP2-025] note that, in the forthcoming WHS boundary review, mooted changes include extension of the existing boundary to the north and west. This suggests extreme caution should be exercised with regard to the Longbarrow junction works. The junction, with its motorway scale partially sunk into the landscape, has the potential to fundamentally alter the ancient topography integral to the above points, interfere with the connected monument arrays, and disturb archaeological remains.

Highways England response

i. HIA, page 23, penultimate paragraph, re: second Attribute (the physical remains in relation to the landscape), 'The Scheme has been developed to avoid known concentrations of archaeological remains…' [APP-195].

1 The Non-technical summary of the HIA cited in the Examining Authority's question notes that "The Scheme has been developed to avoid known concentrations of archaeological remains…" [APP-195, p.23]. This is further developed in the main HIA report, as follows.

2 Scheme design changes in response to the 2017 non-statutory public consultation are set out in the HIA, which notes that *"The most significant improvements to the design, following public consultation, have been changes to the location of the western tunnel portal and the approach route through the western half of the WHS. The preferred route is now much closer to the line of the existing A303, avoiding impacts on newly-discovered barrows just to the east of the A360 (the 'Diamond Group' of Neolithic long barrows on the former D061 / 062 approach alignment and a hengiform enclosure, including a number of other Neolithic and Bronze Age sites, notably the cluster of scheduled round barrows just to the north-east of the Diamond). The modified alignment also avoids any risk of the road intruding on the view of the setting sun from Stonehenge during the winter solstice and reduces impacts on the Royal Society for the Protection of Birds (RSPB) reserve at Normanton Down."* [APP-195, para. 3.7.9].

3 This is further expanded upon in the HIA's discussion of mitigation measures incorporated into the Scheme, in Section 8.2 Iterative design and embedded

mitigation [APP-195, pp. 541-547], which sets out the design changes made to avoid potentially harmful consequences. Design changes to the Scheme within the WHS in response to cultural heritage concerns are set out in HIA Table 9 [APP-195, p. 545-6]. With regard to Longbarrow Junction and the western portal, the focus of the ExA's question LV.2.1 ii to iv, known concentrations of archaeological remains have been avoided, wherever possible, and land take has been minimised.

4 The northern slip road for the A360 from the new Longbarrow Junction potentially impacted on the site of a non-designated barrow [UID 2153 / HER MW17121 on Figure 6.8b Archaeological Assets within the 500m Study Area [APP-074], so the slip road was realigned slightly to the west to avoid this location.

5 The Western portal position has been moved westwards, avoiding impact upon the scheduled barrow UID 2018 / NHLE 1010832 (Wilsford G1) and possible associated archaeology.

6 In order to reduce land-take from the western part of the WHS, junction slip roads for the Longbarrow Junction have been designed to start outside the WHS to limit land-take from the WHS.

7 Land take for the western portal approach road within the WHS has been limited as far as possible by the use of an 8m deep retained cut. The upper 2.5m of the retained cut would be grassed slopes in order to blend into the surrounding landscape (OEMP D-CH5 [REP4-020]).

8 Green Bridge Four has been relocated eastwards from its original position, and substantially widened, reconnecting the landscape containing the Diamond Group and Winterbourne Stoke Crossroads barrows in consultation with HMAG, thus allowing the physical and topographic landscape connection between the groups to be maintained.

9 Maintenance and safety crossovers for tunnel safety and maintenance will be situated outside the WHS, at the new Longbarrow Junction and at Countess Roundabout, avoiding land-take within the WHS and impacts on archaeological remains, and minimising impacts on the setting of the WHS.

10 The measures set out above, taken to avoid known concentrations of archaeological remains, reflect Highways England's recognition of the importance of the archaeology in the Stonehenge landscape.

ii. Josh Pollard and colleagues' 2017 publication, which identified not only the area adjacent to the western approach, but also a substantial area to the north, several kilometres long, with a remarkable density of Beaker associated material. A risk exists of sterilising this evidence with the construction of the western approach and the Longbarrow junction. (Noted in Part 1, paragraph 9 of the 5/6 June ISH written summary of the Consortium of Archaeologists and Blick Mead Project Team [REP4-047]).

11 Highways England notes the research undertaken by Dr Pollard and his colleagues. However, it does not agree that the “remarkable density of Beaker associated material” covering several kilometres to the north will be impacted by the Scheme. The Scheme has been designed to limit land-take within the western approaches; this area will be subject to archaeological excavation and recording.

12 As noted in the Applicant’s response to Question CH.2.5, para. 2, “The Scheme has been designed to minimise the extent of archaeological loss within the WHS and the draft DAMS proposes a comprehensive programme of archaeological mitigation works to ensure the identification, recording and detailed archaeological excavation of affected remains across the Scheme. The remains that are archaeologically excavated are therefore not ‘sterilised’ but are archaeologically recorded to high standards in advance of construction. That material, once published, is then available for reanalysis, re-interrogation and re-interpretation once the archive has been assembled and deposited with a Museum.”

13 Our response below demonstrates this.

See Highways England’s Comments on any further information submitted at Deadline 4[REP5-003, para 34.1.3] which states:

‘The publication referred to by Professor Parker Pearson is understood to be from ‘The Neolithic of Europe: Papers in Honour of Alastair Whittle’ (Pollard, J. et al., 2017. Remembered and Imagined Belongings: Stonehenge in the Age of First Metals. In: P. Bickle, V. Cummings, D. Hofmann and J. Pollard, eds. The Neolithic of Europe: Papers in Honour of Alasdair Whittle. Oxbow, pp. 279–297).

This refers on page 290 to ‘a marked concentration of early Bronze Age worked flint and ceramics from Wilsford Down to the south of the Winterbourne Stoke Crossroads barrow group’; this area is marked on the accompanying Figure 18.8 (a) on page 291. The figure attribution cites Richards 1990 – this is the Stonehenge Environs Project which recovered flint scatters from surface collection in the fields to the west and east of Diamond Wood in the 1980s. This is the immediate context for the evidence from the Scheme.

The ‘substantial area to the north which is several kilometres long’ referred to by Professor Parker Pearson is described in the article referred as, ‘a broad swathe [of Beaker and early Bronze Age settlement] over 2km long running from the west of Stonehenge, up to and beyond the western end of the Stonehenge Cursus/Fargo Wood and to the east on Durrington Down’ (p 290 of Pollard et al 2017). The accompanying figure 18.8 shows that the southernmost extent of this area lies at least 350 m north of the Scheme boundary. Highways England respects Professor Parker Pearson’s evidence but considers that the suggestion that the Scheme impacts a large settlement unparalleled in Britain or Europe is not supported by the evidence from the

evaluation [see REP3-024, paras 2.3.3 – 2.3.7] and in any event any such settlement lies outside the Scheme boundary.'

iii. The discovery of two longbarrows to the south in 2017 adding to the remarkable concentration of Neolithic monuments dating from before the construction of Stonehenge. These appear to form a circular array focussed on the top of a dry valley (Wilsford Coombe?), which the western approach cutting would disturb. (Noted in Part 2, paras 11 and 12 of the same written summary [REP4-047], and elsewhere including Dr David Field's Written Representation [REP2-163]).

14 Highways England note Paul Garwood's theory with regard to the "remarkable concentration of monuments appearing to form a circular array focussed on the top of a dry valley". The significance of these monuments in the landscape, their relatively dense concentration, their location along the east-west Wilsford/Normanton coombe (dry valley) and their layout with respect to local topography which he interprets as a "circular array" have been considered as part of the ES [APP-044, 6.6.25–33; 6.6.93–96]and HIA [APP-195, paras. 6.9.8–12].

15 The HIA cites Roberts et al. 2018 (Roberts, D., Valdez-Tullett, A., Marshall, P., Last, J., Oswald, A., Barclay, A., Bishop, B., Dunbar, E., Forward, A., Law, M., Linford, N., Linford, P., LópezDóriga, I., Manning, A., Payne, A., Pelling, R., Powell, A., Reimer, P., Russell, M., Small, F., Soutar, S., Vallender, J. and Worley, F. 2018. Recent Investigations at Two Long Barrows and Reflections on their Context in the Stonehenge World Heritage Site and Environs. Internet Archaeology 47. Available at https://doi.org/10.11141/ia.47.7.) as follows:

"'*The landscape setting of long barrows has long been acknowledged to be of importance […] localised topography [is] key to the alignment of long barrows, rather than cosmological alignments. Work at WS71 [one of the Diamond Group long barrows investigated for the proposed scheme and by Historic England] and more widely by Exon et al. (2000) suggests that inter-monumental views were also important, and the cluster of long barrows around the head of the dry valley between Wilsford and Normanton Downs may suggest an early significance to this area. We have suggested that the Wilsford Shaft may have formed part of this early landscape focus, given various considerations of its dating and sequence, although in the light of the limitations of the evidence this must remain a very tenuous suggestion.*'" [APP-195, para. 6.9.12].

16 The HIA notes that:

"It has been widely observed that the spatial and visual associations between round barrows and other pre-existing ceremonial and funerary monuments implies a degree of intentionality in terms of their siting (e.g. Woodward and Woodward 1996; Exon et al. 2000; Lawson 2007). It has been observed that 'some cemeteries were formed around earlier monuments, as if there was some continuing tie between the builders of the old and new monuments'

(Lawson 2007, 207). In some instances, the barrows may have been constructed directly above earlier hengiform, or related types of monument (e.g. Gaffney et al. 2012; Bowden et al. 2015, 35–6). Amadio and Bishop (2010, 27) state that 'Each burial or new round barrow was placed deliberately with consideration for existing burials, other monuments and natural features, in locations that were in harmony with the values and significances perceived at that particular time.'" [APP-195, para. 6.9.16].

17 *"Barrows are commonly situated in elevated positions, although they are often located on a 'false crest' or just below the highest position (Lawson 2007, 210). The frequency of this distribution, even in areas with few other contemporary monuments, suggests that the topographical position itself was significant. Although many barrows also seem to have a deliberate association with watercourses and valleys (Woodward 2000, 73). Within the Stonehenge landscape and WHS, several of the barrow cemeteries can be seen to lie in elevated positions overlooking the lower ground, River Avon and dry valleys."* [APP-195, para. 6.9.18].

18 The western approach has been designed specifically to avoid physical impacts on these assets:

19 The Scheme has been designed with regard to the results of geophysical survey and trial trench evaluation which identified the 'Diamond' longbarrows [REP-044, para. 6.6.256];

20 The Scheme has also been designed to hide the road and traffic in a retained cutting. This, along with Green Bridge No. 4, aim to limit the effect of the Scheme on the setting of these Asset Groups as far as is practicable.

21 The Western Portal position has been optimised at the head of the dry valley, avoiding impact upon the scheduled barrow UID 2018/NHLE 1010832 (Wilsford G1).

22 The proposed additional length of canopy up to 200m long would reduce the visibility of the portal in views from monument groups such as the Winterbourne Stoke Crossroads barrows, the Diamond group and the Normanton Down barrows.

23 See Highways England's Comments on any further information requested by the Examining Authority and received at Deadline 4 [REP5-003, para 34.1.24] which states:

"The Applicant notes that the 'two new longbarrows' referred to are located outside of the red line boundary: they were identified during evaluation work in connection with the 2017 consultation options: the preferred route was selected to avoid these monuments [please see response to **LV.2.1** (i) above]. *The HIA identifies the longbarrows that form the grouping discussed by Professor Parker Pearson [APP-195, p. 445-449] and considers the effects of the Scheme on the longbarrows both as part of asset groups (in combination with later, Bronze Age round barrows) and in terms of their relationships to*

each other and to the landscape [APP-195, p. 570]: The longbarrow group is currently severed by the existing A303 and the Scheme assessment finds*:*

"The scheme would remove the sight and sound of traffic on the existing A303. Whilst the Scheme has been designed to reduce the visual intrusion of the cutting within the landscape, the new cutting would affect the physical relationships between the long barrows in the western part of the WHS. The proposed Green Bridge Four (the long landbridge) would help to reduce the severance due to the cutting and would maintain physical landscape connectivity in this area, being specifically placed to ensure that the relationships are maintained between the upstanding long barrows in the Winterbourne Stoke Crossroads Barrows (AG12) and the Diamond Group (AG13)." [APP-195, para. 9.3.2, p.570].

24 As noted in the Applicant's response to Dr Field's Written Representation [REP2-163]:

"The long barrows within the AG12 Winterbourne Stoke Crossroads Barrows and the AG13 Diamond Group are all outside the Scheme order limits and will be preserved in situ during Scheme construction Please see the Detailed Archaeological Mitigation Strategy (DAMS) submitted at Deadline 2 of this Examination REP2-038, Appendix D, Action Area 27.3 for the AG12 Winterbourne Stoke Crossroads Long Barrow. As the AG13 Diamond Group lies outside the order limits, these will not be physically impacted and will remain in situ in private land and under their current agricultural regime. Lake long barrow, which is part of Asset Group AG16 North Kite Enclosure and Lake Barrows, lies further away from the Scheme to the southeast, adjacent to Byway 12.

The Scheme has been designed to reduce the visual intrusion of the retained cutting for the western approach road within the landscape. The proposed Green Bridge No. 4 (the long land bridge) would help to reduce the severance due to the cutting and would maintain physical landscape connectivity in this area, being specifically placed to ensure that the relationships (physical, topographic and visual) are maintained between the two upstanding long barrows in the Winterbourne Stoke Crossroads Barrows (AG12) and the Diamond Group (AG13). Please see 9.3.2 of the Heritage Impact Assessment [APP-195]. The preferred route for the Scheme was selected to minimise effects on archaeology and to avoid known archaeological remains, important sites and monuments […]" [REP3-013, para. 49.1.7.8].

"…As part of the development of the design of the Scheme, Green Bridge No. 4 was moved eastwards and widened from 50m to approximately 150m in order to provide greater physical and visual connectivity between the Winterbourne Stoke Crossroads Barrows and the Diamond Group and, in particular, the two upstanding long barrows in each group in this western part of the WHS. The retained cutting in the western approaches allows visual connectivity to be maintained between the Winterbourne Stoke Crossroads Barrows, the Diamond Group and the Normanton Down Barrows that

contribute to the OUV of the WHS, as agreed with heritage stakeholders. The design of the retained cutting incorporates an upper grassed slope and chalk grassland mitigation to the north and south. This allows the cutting to blend into the surrounding landscape from key views between monument groups […]" [REP3-013, para. 49.1.12].

iv. A much later array dating from the Early Bronze Age is suggested in Section 4 of Paul Garwood's paper, Winterbourne Stoke Crossroads, Early Bronze Age funerary complex. He notes the clustering of monuments in large complexes with linear arrangements, within sight of Stonehenge and its wider environs. Whilst their central focus is Stonehenge they relate in a complex spatial and visual relationship to each other.

25 Highways England notes Dr Garwood's comments regarding the layout of monuments. The layout of monuments and their relationships in the landscape, including intervisibility and inter-relationships between them, and the relationships between them and the topography, are considered in the HIA [APP-195, Section 6.9 in particular, Typological groupings in the Stonehenge landscape (paras. 6.9.39 – 6.9.47)] and the Cultural Heritage Setting Assessment [APP-218]. Highways England accepts the clustering – indeed, the Asset Groupings in the HIA reflect this approach. The complex spatial and visual relationships, and the Scheme's impacts and effects upon them, are considered in detail in the HIA [APP-195, Section 6.9: Asset Groups: baseline description and assessment of Scheme impacts and effects and Section 9: Assessment and evaluation of overall impact of the proposed changes].

26 See Highways England's Comments on any further information submitted at Deadline 4,[REP5-003, para 34.1.6] which states:

27 '*The significance of the Winterbourne Stoke Crossroads barrow group and the impacts of the Western Portal and Longbarrow Junction upon this group and its relationships with other barrow groups were addressed by the Applicant at the issue specific hearing, as recorded in its written summary of oral submissions in relation to agenda item 6 from ISH2 regarding ES Chapter 6 [REP4-030]. The Applicant has undertaken its own assessment of the impact of the Scheme on the aspects referred to in its HIA [APP-195]… Highways England sets out its assessment, and therefore the evidence upon which it places reliance, in the Environmental Statement Chapter 6 – Cultural Heritage [APP-044] and the HIA [APP-195], Highways England disagree with Paul Garwood's assertions in relation to the Scheme causing significant harm to the landscape settings and sensory experience of barrow groups in relation to the Scheme design and the siting of the Western Portal, including the Winterbourne Stoke Crossroads Barrows. Details from Highways England's assessments are set out below.*

28 *With regard to the "spatial and visual relationships among the linear barrow groups which are situated around Stonehenge", the Scheme conceals the*

new infrastructure in key views agreed with HMAG [APP-195, para. 5.3.38-40]. The spatial and visual relationships among the linear barrow groups are considered in HIA Section 6.9, Asset Groups: baseline description and assessment of Scheme impacts and effects. The current setting of the Asset Groups is described and aspects of their current setting that contribute to or detract from their significance and expression of Attributes of OUV are assessed. This includes identification of key views. The anticipated impacts of the Scheme on the fabric and setting of Asset Groups is described and the scale or severity of impact is described. The significance of effect of the Scheme upon attributes of OUV expressed by each Asset Group is assessed.

29 *With regard to the disruption of "those relationships resulting in significant harm to the landscape settings and sensory qualities of those barrow groups and the WHS", these already experience the impacts and effects of the existing A303. Impacts of the existing A303 on Asset Groups and discrete assets are considered in HIA Sections 6.9, Asset Groups: baseline description and assessment of Scheme impacts and effect and 6.10, Discrete and isolated assets: baseline description and assessment of Scheme impacts and effects. Impacts and effects of existing A303 on Attributes of OUV are summarised in the HIA [APP-195, paras. 9.1.5 – 9.1.25]. This notes that:*

30 *"The existing A303 impacts upon the setting of all monuments from which it is visible and audible and the WHS as a whole." [APP-195, para. 9.1.12]*

31 *"The existing A303 severs relationships between a number of monuments and their wider landscape, including Stonehenge, the Normanton Down Barrows (AG19), barrow cemeteries on King Barrow Ridge (AG26) and numerous barrows to the south of the A303." [APP-105, para. 9.1.14]*

32 *"The relationships between many monuments in the WHS are severed by the course of the existing A303, which interrupts sightlines with visual distraction and clutter, and causes physical severance. The existing A303 has a particularly negative impact on visual connections between the Normanton Down Barrow Group (AG19) and monuments such as Stonehenge (AG22), the Old and New King Barrows (AG26), the Avenue Barrows (AG30), the Avenue (AG27), the Cursus (AG23) and various barrows, and in relationships between Stonehenge and a range of monuments to the south, as well as discrete barrows and other ritual / ceremonial sites across the WHS." [APP-195, para 9.1.20]*

33 *"The existing A303 has a negative impact on the setting of a range of monuments and sites including Stonehenge (AG22), the Avenue (AG27), the Cursus (AG23), Normanton Down Barrow Group (AG19), the Winterbourne Stoke Crossroads Barrows (AG12), the Diamond Group (AG13) and other related assets. The A303 not only severs relationships between Asset Groups and discrete assets, it also physically severs a number of barrows, cutting through them or clipping parts of monuments" [APP-195, para. 9.1.22]*

34 *"The existing A303 has visual, aural and access impacts on the Integrity of the WHS" [APP-195, para. 9.1.26 sqq].*

35 *With regard to the disruption of "those relationships resulting in significant harm to the landscape settings and sensory qualities of those barrow groups and the WHS", these already experience the impacts and effects of the existing A303. The existing baseline is set out in the Cultural Heritage Setting Assessment [APP-218, pp. 37–38] and HIA Section 6.9 [APP-195, p. 204], which notes:*

36 *"The A303 runs directly to the south of the group, with the A360 directly to the west. The south-west end of the long barrow (NHLE 1011841) is less than 20m from the crossroads of these routes. Other monuments within the group are also immediately adjacent to the A360, notably those scheduled as NHLE 1011842, 1011843 and 1011047 and the more westerly elements of 1012368. In physical terms, these roads sever the group from the landscape to the south and west, dividing the monuments from others – most notably the Diamond Group (AG13), including scheduled barrow (NHLE 1011045), which shares the alignment of the long barrow and may therefore be an outlier of the Winterbourne Stoke Crossroads group. The visual impact of the roads and their traffic, and traffic noise and emissions, greatly impact upon the quality of the present setting. The monuments all exist within this environment, leaving little sense of place. Views of the long barrow in particular are heavily compromised by the sight and sound of traffic, for example when seen from land to the south of the A303. Longer-distance sightlines, both outwards from, and towards Winterbourne Stoke Crossroads, are all dominated by the road and its traffic. The existing A303 disrupts inter-visibility with the Diamond Group (AG13), the Normanton Down Barrows (AG19) and the Lake Barrows (AG16) to the south. The group currently experiences setting impacts from the rat-running traffic along the B3086 and the A360, which runs through the Asset Group, as well as Stonehenge Visitor Centre traffic including large buses. The group currently experiences setting impacts from high traffic volumes and stationary traffic queuing for the Longbarrow Roundabout. The impact of the existing A303 is assessed as Moderate. The effect of the existing A303 on the OUV of the WHS is assessed as Large Adverse."*

37 *Scheme impacts on causewayed enclosures, long barrows (including short long barrows and oval barrows) and cursuses, and inter-relationships between these typological monument groups, are assessed in the HIA section on Typological groupings in the Stonehenge landscape [APP-195, paras. 6-9.39 –47. HIA paras. 6.9.44-47 address the relationships of the long barrows with each other and with the landscape. The impacts of the Scheme on the relationships between the long barrows is further considered in HIA section 9.3, Potential impacts and effects of Scheme: aspects of OUV. This assesses that:*

38 *"The Scheme would remove the sight and sound of traffic on the existing A303. Whilst the Scheme has been designed to reduce the visual intrusion of*

the cutting within the landscape, the new cutting would affect the physical relationships between the long barrows in the western part of the WHS. The proposed Green Bridge Four (the long landbridge) would help to reduce the severance due to the cutting and would maintain physical landscape connectivity in this area, being specifically placed to ensure that the relationships are maintained between the upstanding long barrows in the Winterbourne Stoke Crossroads Barrows (AG12) and the Diamond Group (AG13).

39 *Taking account of the Very High value of the long barrows […] and contrasting the varying effects on the relevant Asset Groups (AG12, AG13, AG16 and AG19 above – see Table 11), the change is considered to be both Moderate Negative and Minor Positive on the group of long barrows in the western part of the WHS. The overall significance of effect of the Scheme on the long barrows in the western part of the WHS is assessed as Slight Adverse (derived from both Moderate Negative and Minor Positive change on Very High value assets)." [APP-195, paras 9.3.2 – 9.3.3].*

40 *Attributes of setting of the Winterbourne Stoke Crossroads Barrows (AG12), including key views, are set out in HIA Section 6.9 [APP-195, pp. 199-200] and the Cultural Heritage Setting Assessment [APP-218, pp. 37-38]. A photomontage illustrates the view from Winterbourne Stoke Crossroads Barrows long barrow NHLE 1011841 [APP-218, Figure 4] and a 360 degree CGI image View from barrow NHLE 1012368 [APP-218, Figure 5]. The Applicant's Assessment of impact of Scheme, including the impact of the Western Portal and Longbarrow Junction, on the fabric and setting of the Winterbourne Stoke Crossroads Barrows (AG12) and its relationship with other Asset Groups, is addressed in HIA [APP-195, pp. 204–207]. The assessment concludes that:*

41 *"The Scheme would remove the A303 from the immediate environs of the Winterbourne Stoke Crossroads Barrows. It is assessed that this would have a Very Large Beneficial Effect. However, the new cutting would affect the setting of the Asset Group, reducing some of the benefit of the Scheme for this Asset Group. This is assessed as a Moderate Adverse effect. Taking account of the Very High value of the Asset Group and in accordance with Table 5, and combining the Moderate Adverse and Very Large Beneficial Effect effects on setting, the overall significance of effect of the Scheme on the AG12 Winterbourne Stoke Crossroads Group is assessed overall as Moderate Beneficial (derived from both Minor Negative Change and Major Positive Change to a Very High value asset)" '[APP-195, p. 207, Significance of effect]."*

42 The Applicant has not only assessed impacts on the Winterbourne Stoke Crossroads complex itself but also how those impacts relate to the OUV of the WHS. *HIA Section 11, Evaluation of overall impact and significance of effect of Scheme on the OUV of the WHS, considers the impact and effect of elements of the Scheme on Attributes of OUV, Integrity or Authenticity,*

including the western approach road [APP-195, paras. 11.1.13–17], the Western Portal [APP-195, paras. 11.1.18–19], and Longbarrow Junction [APP-195, paras. 11.1.26–27].'

v. The failure to make use of viewsheds from particular monuments to gauge the visual connectedness of features within the overall landscape.

43 As noted in the Applicant's Response to the Examining Authority's Written Questions - 8.10.5 Cultural heritage (CH.1) [REP2-025, p. 5-10, CH.1.4], the setting assessment considered earlier studies including both static viewsheds and experiential traverses [APP-218]. The HIA cites the 2005 Stonehenge WHS Archaeological Research Framework (Darvill (ed) 2005, 35–36), which notes that:

44 "'Visibility and inter-visibility within and across the Stonehenge Landscape has been explored using GIS technology to examine viewsheds under a range of predefined conditions. This analysis demonstrates not only the very strong visual relationship between Stonehenge and numerous contemporary monuments but also the inter-visibility of the sites with each other (Batchelor 1997, 71; Cleal et al. 1995, 34–40; Exon et al. 2000)'" [APP-195, para. 6.2.1].

45 Regarding viewshed analysis, the Environmental Statement Appendix 6.9 - Cultural Heritage Setting Assessment [APP-218] sets out why digitally generated viewsheds can be problematic in terms of reliability for setting assessments:

46 "One of the features of the Stonehenge landscape is that, in places, there are clear and uninterrupted visual relationships between monuments, and relationships between monuments and the topography, sometimes over considerable distances. This landscape has been the subject of several inter-visibility studies, perhaps the most prominent of which is Stonehenge Landscapes: journeys through real-and-imagined worlds (Exon et al. 2000). This adopted a digitally-driven analytical approach which considered, alongside other aspects, both static viewsheds and experiential traverses through the Stonehenge environs. Though drawing from a quantifiable baseline, this study was a deliberately speculative work. In considering the visual aspects of the ancient landscape it also contended with major problems – the first and most fundamental being whether inter-visibility mattered at all, and if so in which cases? Furthermore, as the authors acknowledged, the study was hampered (amongst other things) by the lack of accurate monument dates for practically all of the barrows, and by uncertainty about the extent to which the Stonehenge landscape was wooded, therefore precluding inter-visibility. The temporal aspect adds further complexity, given the dynamic nature of monument-building, woodland clearance, and the changing uses of the landscape during late prehistory and in subsequent periods." [APP-218, para.3.6.8]

47 In respect of the setting assessment undertaken for the ES and the HIA, paragraph 3.6.9 states:

48 “In respect of inter-visibility, the present setting assessment adopts an approach in which it acknowledges where sightlines exist between monuments and Asset Groups in the present day. These are considered a positive attribute of setting for the modern visitor, without prejudice to whether it was a salient factor to those in the past. Retention or re-establishment of sightlines is considered positive; severance is considered negative. The assessment of a given asset does not attempt to consider all visual interconnections, focusing instead on those which are readily apparent and/or most prominent, irrespective of how great the intervening distance. These have been identified from on-site observations, without recourse to existing GIS datasets, which attempt to present a more comprehensive picture of monument inter-visibility, but which are nevertheless still subject to the methodological issues discussed above.” [APP-218, para. 3.6.9].

49 Based on the setting assessment, visual connections and key views between Asset Groups and monuments within Asset Groups are considered in the baseline description and assessment of the Scheme impacts and effects [APP-195, Section 6.9, pp. 177 – 443].

vi. Operational Guidelines for the Implementation of the World Heritage Convention (WHC.17/01) notes at paragraph 100 that, for properties nominated under criteria (i) – (vi), boundaries should be drawn to include all those areas and attributes which are a direct tangible expression of the OUV of the property, as well as those areas which in the light of future research possibilities offer potential to contribute to and enhance such understanding.

50 The Operational Guidelines for the Implementation of the World Heritage Convention “aim to facilitate the implementation of the Convention concerning the Protection of the World Cultural and Natural Heritage (hereinafter referred to as "the World Heritage Convention" or "the Convention”), by setting forth the procedure for:

a. *the inscription of properties on the World Heritage List and the List of World Heritage in Danger;*

b. *the protection and conservation of World Heritage properties;*

c. *the granting of International Assistance under the World Heritage Fund; and*

d. *the mobilization of national and international support in favor of the Convention.” [WHC.17/01, https://whc.unesco.org/en/guidelines/, para. 1].*

51 “The criteria and conditions for the inscription of properties on the World Heritage List have been developed to evaluate the Outstanding Universal

Value of properties and to guide States Parties in the protection and management of World Heritage properties." [WHC.17/01, para. 8].

52 As noted in the HIA [APP-195], the Applicant's assessment, including the assessment of impacts and effects on Integrity and Authenticity, has had regard to the Operational Guidelines for the Implementation of the World Heritage Convention [APP-195, para. 4.1.8; 5.4.12; 5.4.14] and its definition of Attributes of OUV [APP-195, para. 6.6.14]. It also draws upon the 2015 WHS Management Plan (Simmonds & Thomas 2015), which was prepared as part of the requirements of the Operational Guidelines [APP-195, paras. 12.2.1-3].

53 Whilst the definition of the WHS boundary is not within the remit of Highways England, in any event, the Applicant's approach to the assessment has ensured that all those areas and attributes which are a direct tangible expression of OUV, as well as those areas which in the light of future research possibilities offer potential to contribute to and enhance such understanding, have been considered and included in the HIA. This is demonstrated below, in relation to the proposed boundary review more generally.

54 The applicant has taken very seriously its duty to identify those Asset Groups that may contribute to the OUV of the property that sit either partially outside or wholly outside the existing boundary of the WHS [APP-195, Section 5.10, Asset Groups and discrete assets, pp. 114 – 121]. These were identified at an early stage and confirmed, in consultation with the Heritage Monitoring and Advisory Group (HMAG) and the Stonehenge and Avebury WHS Coordination Unit, in order to consider the impacts of various options. All field work has been designed to have the minimum impact possible and all archaeological works on the Scheme, including those located outside the WHS, have been conducted with full consideration of the Research Framework for the Stonehenge, Avebury and Associated Sites WHS (Leivers and Powell 2016).

55 The WHS boundary review is currently being progressed by the Stonehenge and Avebury WHS Coordination Unit and the brief has been prepared. The Stonehenge and Avebury WHS Coordination Unit was consulted during the preparation of the Heritage Impact Assessment (HIA) (6.3 Environmental Statement Appendix 6.1 - Heritage Impact Assessment) [APP-195] and it shared a preliminary assessment of heritage assets and asset groups that may be included in a future boundary review, including assets currently situated outside the WHS, west of the A360.

56 The HIA notes that:

57 "The statement on Integrity contained within the SoOUV states that the 'Provision of buffer zones or planning guidance based on a comprehensive setting study should be considered to protect the setting of both individual monuments and the overall setting of the property'. Although these measures have been considered on several occasions (Simmonds and Thomas 2015),

no formal setting study or dedicated guidance has yet been prepared, and no buffer zones have been established" [APP-195, p. 293].

58 The HIA notes, at paragraph 5.10.4, that "A minor boundary review at the Stonehenge part of the WHS began in 2012, but is still in progress and will be reviewed following the preparation of a WHS Setting Assessment. It was agreed that monuments that were not visible from the immediate vicinity of the WHS and distant features should not be included. The review considers, having regard to the advice in the Management Plan, well-preserved Neolithic or Early Bronze Age sites nominated in the original statement of significance (e.g. Robin Hood's Ball, long barrows) but located beyond the present boundary, and physically related archaeological features that contribute to OUV." These are considered in the HIA [APP-195, para.6.9.38 sqq.].

59 With insufficient certainty available about any potential future changes, any application must necessarily deal with the limits of the WHS as they apply at the time it is made. The implications of the results for the setting of the WHS as presently defined and monuments in the vicinity are assessed in the ES and HIA.

60 In relation to any future extent of the WHS, the WHS inscription sets the boundaries of the site. Any change in the boundaries would be a matter for agreement with UNESCO. While this is outside the scope of the Scheme, the archaeological assessment has carefully considered the archaeology along the full length of the Scheme, whether inside or outside the current WHS boundaries.

61 In undertaking its assessment, the Applicant has identified those Asset Groups that may contribute to the OUV of the WHS that sit either partially outside or wholly outside the existing boundary of the WHS. These were identified at an early stage and confirmed, in consultation with the Heritage Monitoring and Advisory Group (HMAG) and the Stonehenge and Avebury WHS Coordination Unit, in order to consider the impacts of various options. **It is therefore not considered that the potential to revise the WHS boundary would impact the Scheme**.

62 Please see also the response to Written Question CH.1.58 [REP2-025] and the submissions made by Wiltshire Council and Historic England regarding the WHS Property Boundary Review, Highways England's Written Summaries of oral submissions at ISH2- Cultural Heritage [REP4-030, p. 2-4]:

63 "Melanie Pomeroy-Kellinger, on behalf of Wiltshire Council, explained that the setting study had been in development for two years, and whilst the brief was finalised, the study itself had not started due to a lack of funding. Ms Pomeroy-Kellinger noted that the boundary review was on hold, pending completion of the setting study.

64 Henry Owen John of Historic England further explained that any modification to the WHS boundary (or provision of a buffer zone) would be a lengthy and complex process; any modification to the boundary proposed as a result of

the work of Wiltshire Council would then need approval by DCMS and then the World Heritage Committee.

65 The Applicant did not make any submissions in this respect, and it agrees with the submissions made by Wiltshire Council and Historic England. ”

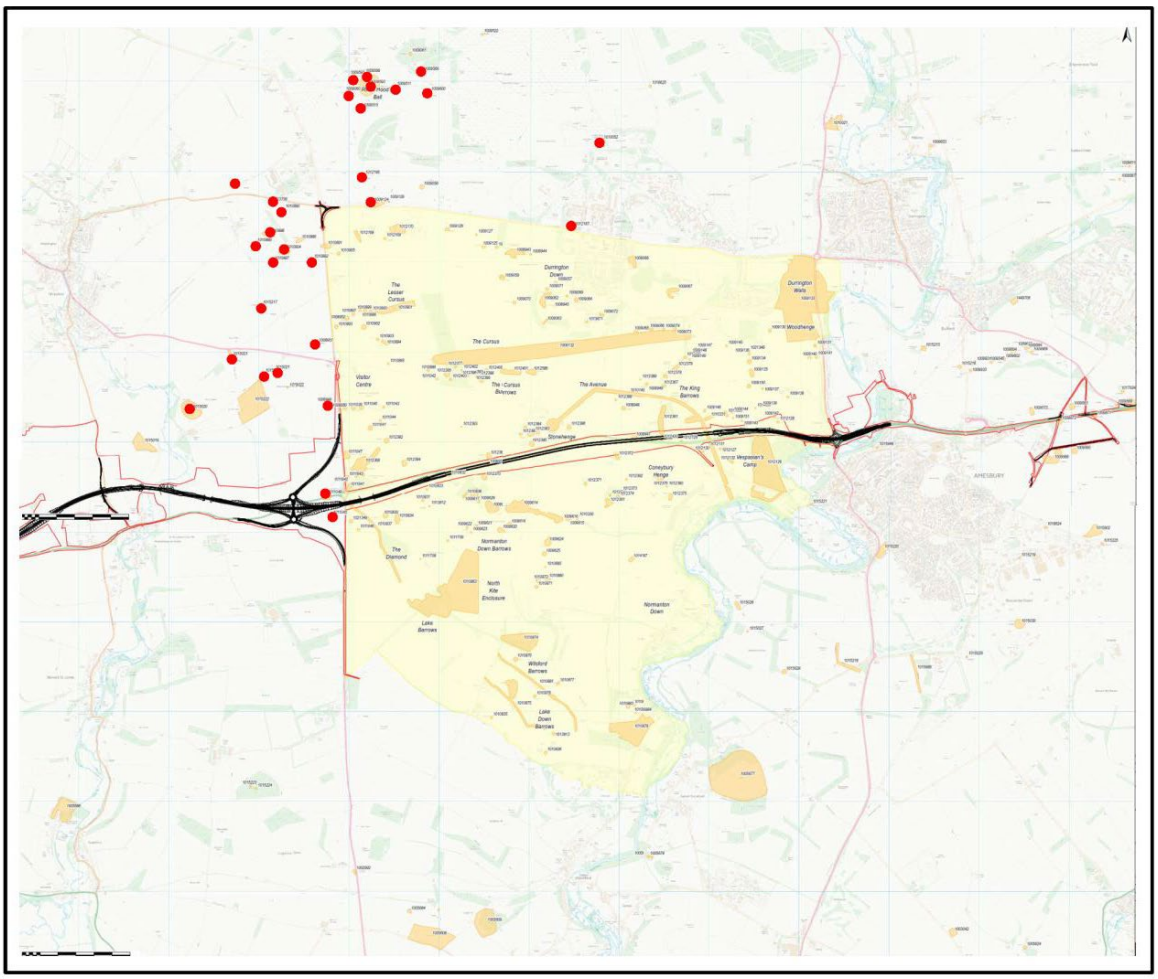
66 Further information regarding the procedures required to modify the boundaries of World Heritage properties are set out in Operational Guidelines for the Implementation of the World Heritage Conventionhttps://whc.unesco.org/en/guidelines/), which notes that minor modifications do not have a significant impact on the extent of a property or affect its Outstanding Universal Value, while a significant boundary modification would entail a new nomination.

vii. HIA paragraph 5.10.4 [APP-195] and Highways England’s response to ExQ1 CH.1.58 [REP2-025] note that, in the forthcoming WHS boundary review, mooted changes include extension of the existing boundary to the north and west. This suggests extreme caution should be exercised with regard to the Longbarrow junction works. The junction, with its motorway scale partially sunk into the landscape, has the potential to fundamentally alter the ancient topography integral to the above points, interfere with the connected monument arrays, and disturb archaeological remains.

67 The assets within and in the vicinity of the works at Longbarrow Junction have been considered in detail, and further detail is provided below in terms of their assessment.

68 **Forthcoming WHS boundary review – mooted changes**

Potential impacts of the proposed Scheme upon the sites proposed for inclusion in the mooted boundary review in 2013 have all been considered in the ES Chapter and the HIA [APP-195]. The following illustration indicates the location of those sites.



69 Archaeological considerations have been afforded the highest priority throughout the development of the Scheme, informing the choice of preferred route and influencing the design of the Scheme.

70 The new Longbarrow junction would be constructed approximately 600m west of the existing Longbarrow roundabout. The junction would consist of two roundabouts connected by a short length of dual carriageway, carried over the A303 (which will be in deep cutting at this point) on a new green bridge with earth bunds on each side, to help mitigate visual impact and to provide ecological connectivity.

71 The proposed new Longbarrow junction has been designed carefully to minimise visual intrusion in views from the WHS. Two scheduled sites on the list of those proposed for inclusion in the WHS are located in the immediate vicinity of the new Longbarrow junction:

72 Bowl barrow 250m SW of Longbarrow Cross Roads, west of A360 (NHLE 1011045)

73 Bronze Age enclosure and bowl barrow 100m W of Longbarrow Cross Roads on Winterbourne Stoke Down (NHLE 1011048)

74 The bowl barrow (NHLE 1011045) is assessed in HIA [APP-195, pp. 209-218] as part of the extensive Diamond Group (Asset Group 13). The route would remove the A303 from the immediate environs of the Diamond Group. It is assessed that this would have a Moderate Beneficial effect. However, the new cutting would affect the setting of the Asset Group, reducing some of the benefit of the Scheme for this Asset Group. This is assessed as a Large Adverse effect. Taking account of the Very High value of the Asset Group the overall significance of effect of the Scheme on AG13 The Diamond Group is assessed as Slight Adverse (derived from both Moderate Negative and Minor Positive impacts on a Very High value asset).

75 Potential scheme impacts on the Bronze Age enclosure and bowl barrow (NHLE 1011048) are assessed in HIA [APP-195, pp. 451-2], which notes that:

76 *"Setting makes a low contribution to the significance of the asset. The monument has no surface expression and has partly been destroyed. The setting is currently severely impacted by existing A303, which cuts through the centre of the scheduled area, splitting the asset in two. Its location is inter-visible with Winterbourne Stoke Crossroads Barrows and the Diamond Group, which has relevance in respect of the bowl barrow included within this scheduling. However, while constituting an archaeological setting, these connections do not greatly add to the understanding or appreciation of this asset.*

77 *The Scheme would have no physical impact on archaeological remains, and would move the A303 to the south of the asset, reconnecting the southern and northern parts of the scheduled monument. The proposed cutting would be situated immediately south of the asset, creating new severance, but reconnection with the Winterbourne Stoke Crossroads Barrows to the east and the greening decommissioning of the A303 would improve the immediate setting of the monument. Inter-visibility with the Diamond Group to the south-east would continue to exist, across the top of the new cutting. However, given the low contribution of setting, such visual changes do not greatly improve the value of the asset. It is assessed that the Scheme would have a Slight Beneficial effect (derived from a Minor Negative Change and Major Positive Change to a Very High Value asset, resulting in both Moderate Adverse and Very Large Beneficial effects)."*

78 Therefore, in terms of the ExA's approach to the Longbarrow junction works and the forthcoming boundary review, the Applicant's assessment provides the necessary conclusions in relation to the sites proposed for inclusion in the WHS as part of any boundary review, in order that the ExA can have regard to those impacts in taking its decision.

79 **Discussion**

The Applicant agrees that the "integral nature of the landscape, astronomy, the skies, and the monuments of Stonehenge is of enormous importance. The Stonehenge landscape has changed and developed spatially, visually, and

emotionally into an enormously significant setting of ceremonial and cultural importance over many thousands of years."

80 However, the Applicant rejects the suggestion that the importance of Stonehenge has been underappreciated in the ES and the HIA. Regarding emerging evidence and new theories, a review of previous archaeological investigations in area and field surveys related to the A303 Scheme is presented in Appendix 6.10 - Previous archaeological and antiquarian investigations within the Stonehenge World Heritage Site and its environs [APP-219]. This considers antiquarian enquiries, research and investigations, earlier 20th century archaeological investigations, and investigations undertaken from 1990 to 2017, including the substantial number of investigations undertaken in recent decades. Such a study can only assess publicly available, published, peer-reviewed studies in the light of the published Research Framework for the Stonehenge, Avebury and Associated Sites WHS (Leivers and Powell 2016). Emerging evidence that may give rise to new theories is almost by definition unpublished and unreported, making it difficult to assess the validity of such evidence and any associated interpretations.

81 The Applicant considers that an appropriately precautionary approach has been adopted, informed by a comprehensive programme of archaeological evaluation surveys. The Applicant does not accept that the loss of archaeological remains and the consequent impact on the OUV of the WHS has been underestimated. The assessment has considered the requirement to contribute to the understanding of and the presentation and transmittal to future generations of the cultural heritage of the WHS. The Applicant has identified in detail the extensive problems that are currently caused or exacerbated by the existing A303 and has further identified why the Scheme is vital in addressing those problems to the benefit of the region including the WHS itself. It is an unpersuasive position to assert that the Scheme should be prevented from being progressed in the face of a speculative argument that future technology may discover more information in this area of the WHS. This is particularly the case having regard to the comprehensiveness of the assessment undertaken and the mitigation measures in place in the draft Detailed Archaeological Mitigation Strategy (DAMS) submitted at Deadline 6. The application documents, in particular the Case for the Scheme [APP-294], have set out the need for the Scheme; it is neither appropriate nor a feasible approach to delay or prevent a development on the basis that there could potentially be better technologies in future. Taking that approach, no infrastructure would ever be delivered, despite the need for it. In any event, were future technologies to be developed, the Applicant has built into the Scheme via the DAMS the ability to allow for archaeological remains that are excavated as part of the Scheme works to be preserved in anticipation of further analysis.

82

83 **Topography and setting**

The location and design of the tunnel portals have been optimised in terms of the natural topography of the area, impact within the WHS and the extent of benefit that will be secured by one of the key aims of the Scheme which is to remove the sight and sound of the A303 traffic from much of the WHS landscape. With accompanying mitigation, the assessments show that the preferred solution is a 2-miles (3.3km) long tunnel extending between portals located adjacent to the existing A303 to the east of The Avenue and to the west of Normanton Down.

84 The Longbarrow junction has been located as close as possible to the point of intersection of the A303 and A360 alignments while at the same time minimising impact on the WHS and other environmental constraints. The A360 links to Longbarrow junction are in a cutting to minimise their visual impact on the adjacent World Heritage Site.

85 The new Longbarrow junction will be unlit improving on the current situation. The approach to lighting (and the principle of minimising light spill) is provided for in the Outline Environmental Management Plan (OEMP) [REP4-020 (D-CH9 to D-CH12, D-CH20), and paragraph 4 of Schedule 2 of the draft development consent order [REP4-018] requires the Scheme to be carried out in accordance with the OEMP. No standard road lighting is proposed on the A303 or at the roundabout at Longbarrow junction. The displacement of the A360 and the removal of the existing Longbarrow roundabout and its lighting would result in reduced impacts on the WHS, including an improvement for the dark skies environment in this area. This contributes to the overall beneficial effect that the Scheme would have for the OUV of the WHS as set out in the ES Chapter 6, Cultural Heritage [APP-044] and ES Appendix 6.1, Heritage Impact Assessment [APP-195].

86 The careful siting within the landform together with proposed woodland planting and hedgerows adjacent to the A360 slip roads (as shown indicatively on the Environmental Masterplan, figure 2.5E [APP-059]) would reduce the visual impact of the new junction in views from the WHS. The existing Longbarrow roundabout and approximately 430m of the existing A303 west of the roundabout would be removed and the land restored to chalk grassland (as shown indicatively on the Environmental Masterplan, figure 2.5E [APP-059]). The junction layout and design have been carefully considered to integrate the new infrastructure, with the connecting carriageway carried on Green Bridge 3 set within 2 metre high bunding [APP-059], and provided with landscape mitigation in the form of hedgerow and woodland planting which, when mature (at year 15), would help conceal traffic using the junction.

87 **Relationships between monuments**

88 With regard to topography and setting, the A360 currently bisects AG13 Diamond Group and the A303 additionally severs the group from AG12 Winterbourne Stoke Crossroads Barrows to the north.

89 The Scheme design removes traffic and severance from within the asset group by realigning the A360 and Longbarrow junction further to the west. Green Bridge No. 4 maintains visual and physical landscape connectivity with AG12 Winterbourne Stoke Crossroads Barrows to the north and access between the two groups via new NMU routes, and this combined with the essential chalk grassland mitigation, improves the visitor's ability to appreciate the setting, in the context of reduced views and sounds of traffic.

90 The A303 will move 150m to the south and be built in cutting to remove the sight and sound of traffic from immediately adjacent to AG12 Winterbourne Stoke Crossroads Barrows. The benefits of this are demonstrated by the photomontages and CGIs presented in the ES Chapter 6, Appendix 6.9 [APP-218] (Figure 4, Figure 5 and Figure 7).

91 With regards to AG13 Diamond Group to the south, the A360 currently bisects the group and the A303 additionally severs the group from AG12 Winterbourne Stoke Crossroads Barrows to the north. The scheme design removes traffic and severance from within the asset group by realigning the A360 and Longbarrow junction further to the west. Green Bridge 4 maintains visual and physical landscape connectivity with AG12 Winterbourne Stoke Crossroads Barrows to the north and access between the two groups via new NMU routes, and this combined with the essential chalk grassland mitigation, improves the visitor's ability to appreciate the setting, in the context of reduced views and sounds of traffic.

92 **Disturbance of archaeological remains**

The area of the western cutting has been surveyed extensively, and the preferred route for the Scheme was selected to avoid known archaeological remains, important sites and monuments. Subsequent design development at the western tunnel approach, including mitigation measures to limit or avoid impacts, has been informed by a comprehensive programme of archaeological evaluation surveys.

93 The research potential of the WHS is recognised in the HIA, which notes: It is not considered that the proposed Scheme will alter the nature, pace or quality of the research that will continue to take place within the WHS. The proposed Scheme will not impact upon the analysis, interpretation and dissemination of the results of field research. Although archaeological evaluations and excavations within the footprint of the proposed Scheme will remove archaeological deposits, the Scheme has been designed to minimise land-take and avoid known archaeological sites. Archaeological interventions in connection with the proposed Scheme are being undertaken to high standards developed with HMAG and the Scientific Committee, and have the

potential to contribute significant data to ongoing research priorities. [APP195, para. 9.3.75]

94 A comprehensive programme of archaeological evaluation has been undertaken, reflecting the sensitivity of the archaeology and its context. As a result, uncertainty as to the likely archaeological findings of the archaeological mitigation works, that will be undertaken at the Preliminary Works phase prior to construction, has been substantially removed. In addition, the majority of archaeological works are being undertaken in the Preliminary Works phase to mitigate against the risk of unforeseen finds being located within the Main Works. Archaeological remains would be excavated and recorded during the Preliminary Works phase, in advance of construction, to avoid, as far as is practicable, previously unknown archaeological remains being uncovered during construction.

95 The draft Detailed Archaeological Mitigation Strategy (DAMS), a revised version of which is submitted at Deadline 6, sets out the structured, iterative detailed archaeological mitigation strategy. The DAMS is rooted in a heritage research-led framework [Section 4] and considers the results and significance of the evaluations and proposes protection of remains in situ where practicable and detailed archaeological excavation and recording where preservation of remains is not possible. The DAMS is being developed further during the Examination in consultation with WCAS, Historic England and HMAG and the final DAMS will be a certified document, implementation of which will be secured by paragraph 5 of Schedule 2 to the draft development consent order [REP4-018]. The input of the Scientific Committee is being sought as part of this process.

96 There are measures in place via the DAMS to ensure features outside of the cutting are appropriately protected. For archaeological remains within the footprint of the cutting, these would be excavated and recorded. This would occur during the Preliminary Works phase, in advance of construction, to avoid, as far as is practicable, previously unknown archaeological remains being uncovered during construction. The comprehensive mitigation strategy is under development to take account of the range of deposits that may be encountered based on the evaluation results.

97 The mitigation measures proposed in the DAMS take an appropriately precautionary approach, having full regard to the results of the assessments undertaken in the ES and the HIA, and informed by a comprehensive programme of archaeological evaluation surveys.

98 The Scheme supports the development of scientific and technical studies and research regarding the UK's cultural heritage. The development consent application for the Scheme is accompanied by what is, in terms of major highways projects, an unprecedented level of detail of investigation in accordance with an archaeological evaluation strategy developed in consultation with HMAG and with input from the Scientific Committee. This has comprised up-to-date geophysical survey of the full red line boundary,

ploughzone artefact sampling across all areas evaluated, and trial trenching to augment the previous work to achieve an overall sample of up to 5% by area outside of the WHS and up to 10% by area within the WHS, and taking into account the emerging results of academic research programmes undertaken over the last decade.

99 The draft DAMS submitted at Deadline 6 acknowledges the potential presented by the archive for future academic research independent of the Scheme in its Outline Publication and Dissemination Proposals.

100 The Applicant believes that these mitigation measures will make a significant contribution to the investigation of the spatial and chronological development of the WHS and thus, to transmitting understanding of its OUV and furthering the public appreciation of the WHS. The draft Public Archaeology and Community Engagement Strategy is set out in Appendix E of the draft DAMS submitted at Deadline 6].

101 **Conclusions**

The integral nature of landscape, astronomy, skies and monuments is encapsulated in the WHS nomination document, which notes that *"'Stonehenge and Avebury, in Wiltshire, are among the most famous groups of megaliths in the world. These two sanctuaries are formed of circles of menhirs arranged in a pattern whose astronomical significance is still unexplained. These holy places and various nearby Neolithic sites offer an incomparable testimony to prehistoric times"* [HBMCE 1985; http://www.stonehengeandaveburywhs.org/assets/Nomination-Document-complete.pdf].

102 These aspects have been considered through the lens of their definition and interpretation within World Heritage Property documentation and published peer-reviewed papers, and are addressed within the HIA [APP-195, Section 6, Site history and description]. The HIA aims to take a holistic approach to assessment, addressing both archaeological themes, and other aspects including tourism and the visitor economy, intangible cultural heritage and spiritual aspects, cultural influences, and public understanding of OUV [HIA, Section 9.3, Potential impacts and effects of Scheme: aspects of the WHS]. Highways England acknowledges the importance of the WHS and the wider area to local people and visitors, spiritual practitioners and archaeological researchers alike.

Question LV.2.2

The effect on landscape character of the proposed Longbarrow junction

ES Appendix 7.7: Schedule of Landscape Effects [APP-227], LLCA 11 Oatlands Hill (page 15) notes the Year 1 Effect of the Scheme as moderate adverse and the Year 15 Effect as slight adverse. The analysis seems to confine itself to the impact on the character of surface cultivation. This appears to ignore the vast changes to the ancient topography and landscape character made by the insertion of a motorway junction and approach cutting. These elements would be of a scale beyond that of the Stones or any of the surrounding monuments, and of a geometric pattern alien to the character of the overall landscape of the WHS and its environs.

Please comment.

Highways England response

1 The assessment for Oatlands Hill has included the changes to topography and landscape character, as well as consideration of the historic landscape characterisation {APP-076] as part of understanding the potential impact to ancient topography.

2 The operation phase assessment on LLCA 11 Oatlands Hill [APP-227 page 15] assesses the change to land use, vegetation patterns and the relationship between the proposed Scheme and the existing ground levels and therefore assesses the changes to the topography as part of the assessment on landscape character. The relationship to the topography is also assessed for the construction phase of the proposed Scheme [APP-227 page 15].

3 The operation impact of the proposed dual carriageway Longbarrow Junction and its associated cutting is assessed as being “large scale highways infrastructure” [APP-227 page 15, section ‘Operation Year 1’, 1st paragraph].

4 The assessment has also considered the Historic Landscape Characterisation [APP- 076] and Historic Landscape Character Areas, which illustrate the proposed land covering Longbarrow Junction as ““re-organised fields” and “prairie fields” [Figure 6.11B, APP-077] as well as the Historic Landscape Baseline Report [APP-215] which notes in paragraph 3.2.10 of Oatlands Hill that:

5 “Rather than through boundary removal, the historic landscape character of the study area was mainly altered in the modern period through the introduction of new boundaries within ‘reorganised fields’ for modern arable agriculture.”

6 APP-215 Table 3.1 summarises the historic character of the reorganised fields as:

7 “These fields are early 20th century in date and represent a re-arrangement of the downland to form arable land. The 1st edition 6" OS map marks this as Fore Down, an area of open grassland probably used for grazing. No obvious traces of earlier activity visible on aerial photographs”

8 APP-215 Table 3.1 summarises the historic character of the “prairie fields” as:

9 “This very large modern field has been created in an area of former downland, as shown on the 1st edition OS map. Traces of more recent field boundaries show on aerial photographs suggesting a very recent amalgamation. No evidence of early activity.”

10 Table 1.5 and of The Cultural Heritage Assessment [APP-271] predicts non-significant effects to the historic landscape covering Longbarrow Junction.

11 The landscape character assessment, in drawing upon the Cultural Heritage Assessment and the relevant attributes of the local landscape character, has therefore considered that the ancient topography of the land across Oatlands Hill has already been altered, such that non-significant effects are predicted [APP-044 paragraph 6.9.33] and that the key characteristics are the elevated parts of Oatlands Hill, which the proposed Scheme does not alter.

12 The geometric pattern of the proposed Longbarrow Junction is not uncharacteristic of this part of the landscape, given that the existing A303 and A360 are linear (geometric) features crossing the landscape west to east and north to south respectively and that Longbarrow Roundabout provides the existing junction between these routes, albeit of a smaller scale than the proposed Longbarrow Junction, such that the LVIA predicts a significant adverse effect at year 1, until the establishment of the landcover when the effect would reduce to minor adverse (not significant).

13 The HIA [APP-195, Section 6.4 Historic landscape context] summarises the Wiltshire and Swindon Historic Landscape Characterisation analysis relevant to the Stonehenge element of the WHS. The legibility of prehistoric field systems in the Longbarrow Junction area is compromised by modern farming and the lack of any chalk downland reversion, which would contribute to enhancing the ‘special’ qualities of the WHS and the surrounding area.

14 Whilst the Applicant acknowledges that the question relates to the impact of Longbarrow Junction and its cutting within the landscape, this must be viewed in the context of the siting of the junction, to remove the existing Longbarrow roundabout (including its lighting), from its current situation partially within the western edge of the WHS, and part of A360, from immediately adjacent to the western boundary of the WHS. These are beneficial changes to the spatial arrangement of the road networks in the

landscape and that whilst Longbarrow Junction is of a larger scale than Longbarrow roundabout, it is still within the same part and character of the landscape as the existing A303.

Question LV.2.3

Visual receptors associated with the route of the existing A303 and Green Bridge 4

i. Have analyses been made of the visual effects of the cutting from points on the ex A303, especially those close to the western portal where the cutting is at its widest and deepest and the ex A303 closest?

By my rough calculation, at Chainage 7200, the cutting is 35m wide and 11m deep, with a width of 60m across the embankment tops. At that point, the ex A303 is only 20m from the permanent fence line and the edge of the embankment, and only 35m from the edge of the cutting.

ii. Have analyses been made of the visual effects of the embankments and cutting from Green Bridge 4?

Highways England response

viii. Have analyses been made of the visual effects of the cutting from points on the ex A303, especially those close to the western portal where the cutting is at its widest and deepest and the ex A303 closest?

1 In terms of the landscape and visual impact assessment [APP-045], the visual effects assessment has not assessed the visual effects of the cutting from points on the existing A303.

2 This is because such an assessment would not be representative of the existing situation, which is the A303 is trafficked and there is not a safe and available pedestrian access on the existing A303. The focus on the existing situation is in accordance with the Guidelines for Landscape and Visual Impact Assessment, Third Edition which states in paragraph 6.1 that “an assessment of visual effects deals with the effects of change and development on the views available to people”. The locations for the visual receptors were also agreed via Scoping and Wiltshire Council, as set out in item LV1 of the Statement of Common Ground [REP4-022].

3 As such, the context of this question is about a future recreational user and a ‘new’ user which is only going to experience this view as a result of the proposed Scheme; whereas the premise of the visual assessment is to assess the change to existing people’s views.

4 This does not mean that the visual assessment has not assessed the likely impact of the western approach cutting. As set out in The Applicant’s response above, existing views were agreed with the Local Planning Authority and the potential for views of the western approach cutting has been considered for all, and where relevant (i.e. the western approach cutting would be visible) the impact of the cutting has been assessed. This is pertinent for recreational users on permissive open access land close to Normanton Gorse (APP-225, page 13, visual receptor no.16) or visitors,

tourists and recreational users where the Avenue crosses King Barrow Ridge (APP-225, page 16, visual receptor 23,).

5 In terms of the design of the Scheme, analysis of future users along the existing A303 has been fully considered, as per section 2.3.56 of Chapter 2: The Proposed Scheme [APP-040]. The placement of the proposed road in deep cutting, to a minimum of 7 metres in depth (ref: D-CH5 of the Outline Environmental Management Plan [REP4-020]) and the upper parts of the retained cutting consisting of rounded slopes is integral to this analysis by placing vehicles and road infrastructure below future users' direct line of sight, such that the focus of their view will be the landscape (see OEMP references D-CH5, D-CH21 and P-LE02).

6 With reference to The Applicant's above response, an analysis of the visual effects for new recreational receptors on the existing A303 (via the proposed restricted byway), at locations such as chainage 7200, has not been undertaken within the landscape and visual impact assessment as they would constitute a 'new' receptor. The Applicant considers in response to the question that the focus of the view would be the landscape due to the cutting being below the receptor.

ix. Have analyses been made of the visual effects of the embankments and cutting from Green Bridge 4?

7 Like the above answer to question i., the proposed public access across Green Bridge 4 would represent a 'new' and 'future' user and therefore has not been not assessed in the visual impact assessment [APP-045], which predicts the change (or impact) of the proposed Scheme against the existing baseline.

8 In design terms, the future user has been fully considered, with the location of the new access route located centrally across Green Bridge no.4, i.e. away from the edges of Green Bridge no.4 as far as practicable, whilst still retaining new public access across this part of the WHS. The Applicant considers in response to the question that the focus of the view would be landscape due to the cutting being below the receptor and that the green bridge would be in the foreground of the view.

Question LV.2.4

Tranquillity

The OED defines tranquillity as serenity, calmness; Chambers Dictionary as calmness, peacefulness; the GLVIA glossary as a state of calm and quietude associated with peace.

Tranquillity is considered within ES Chapter 7: Landscape and Visual [APP-045], where the IAN 135/10 definition of tranquillity is adopted, as remoteness and sense of isolation […] often determined by the presence or absence of built development and traffic. The analysis then relates largely to the perception of noise, although it touches on the perception of vehicles and settlements, and the panoramic extent of views. Figure 7.5 illustrates existing tranquillity across the study area as mapped by the CPRE.

i. How is the CPRE analysis derived? Is it based on noise measurement or on other factors?

ii. Have attempts been made to map projected tranquillity with the Scheme in place?

iii. Have attempts been made to analyse tranquillity in terms of serenity, calmness, and peace rather than the impact of noise, qualities which might be affected by the proximity to major road cuttings or junctions, whether or not accompanied by noise?

iv. Has the connection between tranquillity and the feeling of completeness of the landscape and the interconnectedness of its features been considered?

v. Has the connection between tranquillity and the presence of astronomical features and light pollution in night skies, particularly important on this site, been considered?

These points apply in relation to both the construction and operational phases of the Scheme.

Highways England response

i. How is the CPRE analysis derived? Is it based on noise measurement or on other factors?

1 The CPRE analysis is derived from the analysis of raw data sets from a participatory consultation exercise. These raw data sets consisted of a range of 'factors' including:

"Remoteness from people, habitat type, presence and visibility of rivers and woodlands, presence and visibility of unnatural features as detractors, openness of the landscape, overhead skyglow and identification of noise sources."

2 These raw data sets were modelled to produce a value of relative tranquillity for each 500m x 500m grid square for the whole of England.

3 Therefore, the CPRE analysis is derived from a wide range of relevant factors and did not include noise measurements.

ii. Have attempts been made to map projected tranquillity with the Scheme in place?

4 No, mapping of the projected tranquillity with the Scheme in place has not been undertaken. This is because the assessment on the change to tranquillity has been covered by the written narrative of the impacts to the local landscape character areas [APP-227].

iii. Have attempts been made to analyse tranquillity in terms of serenity, calmness, and peace rather than the impact of noise, qualities which might be affected by the proximity to major road cuttings or junctions, whether or not accompanied by noise?

5 Yes, as part of the field work undertaken during winter and summer conditions across the local landscape character areas, the assessors considered the analysis of tranquillity in terms of calmness and peace as it is part of the definition of tranquillity within the Guidelines for Landscape and Visual Impact Assessment (Third Edition) which is used for the methodology of the Landscape and Visual Impact Assessment, and part of the establishment of landscape value as set out for the local landscape character areas within APP-225. This impact to tranquillity was assessed for the construction and operational phases of the Scheme for these local landscape character areas [APP-227].

6 APP-045 paragraph 7.9.25 summarises that there would be adverse impact to the tranquillity within the Scheme boundary during the construction phase. APP-045 paragraphs 7.9.51 seq. set out that there would be both adverse and beneficial impacts to tranquillity in the operational phases of the Scheme.

iv. Has the connection between tranquillity and the feeling of completeness of the landscape and the interconnectedness of its features been considered?

7 The connection between tranquillity and the feeling of completeness of the landscape and the interconnectedness of its features has been considered because it forms part of the overall assessment on the landscape value of the local landscape character areas. The methodology considers the completeness of the landscape in terms of landscape quality [APP-222, paragraph 7.2.17 item a)] and interconnectedness in terms of representativeness and association [APP-222, paragraph 7.2.17 items d) and h)].

v. Has the connection between tranquillity and the presence of astronomical features and light pollution in night skies, particularly important on this site, been considered?

8 The character of the night sky and the potential impact from lighting during the construction and operational phase of the proposed Scheme in respect of tranquillity have been considered within the landscape and visual impact assessment [APP-045]. The Landscape and Visual Impact Assessment (LVIA) has not however assessed the connection between tranquillity and astronomical features because it is considered that the general appreciation of the night sky is a proportionate level of assessment for the LVIA, whilst a more detailed assessment of astronomical features and their relationship to OUV is undertaken by the Cultural Heritage Setting Assessment.

9 The Environmental Statement Appendix 6.9 – Cultural Heritage Setting Assessment [APP-218, paragraphs 3.6.15-3.6.16] sets out how 'Astronomical and Solstitial Sightlines' are considered in the setting assessment.

10 The Heritage Impact Assessment (HIA) has included analysis of the CPRE tranquillity mapping in relation to Asset Groups [APP-209 Figure 12] and dark skies [APP-209 Figure 13] and discrete designated assets [APP-210 Figure 15] and dark skies [APP-210 Figure 16] with a plan of the indicative location of astronomical sightlines at the Stonehenge element of the Stonehenge, Avebury and Associated Sites WHS and the surrounding area, with end-points on horizons. The plan is provided in HIA Figure 19 [APP-210].

11 The HIA does consider skyglow (which is part of the CPRE data set for tranquillity) on astronomical features; but focuses more upon the relationship between the astronomical features, dark skies and amenity in terms of the observability of the night sky (i.e. views of the night sky/solstice alignments), rather than tranquillity specifically.

12 The HIA considers impacts upon Attribute of OUV 4, The design of Neolithic and Bronze Age funerary and ceremonial sites and monuments in relation to the skies and astronomy [APP-195, paras. 9.4.24–28]. The HIA notes that:

13 *"The removal of the existing A303 to the south of Stonehenge particularly where it crosses the winter solstice sunset alignment, would benefit this Attribute of OUV through the removal of traffic and modern road infrastructure from views towards the winter solstice sunset.*

14 *The Scheme's alignment (and placing the Scheme in to a tunnel) avoids any risk of the road intruding on the view of the setting sun from Stonehenge during the winter solstice. There would be no visibility of any Scheme structures in the backdrop of the horizon sector containing the winter solstice sunset alignment.*

15 *The Scheme would not impact upon the midwinter sunrise solstice alignment of the Durrington Walls Southern Circle Avenue looking down to the south-east towards Countess East. Views of project infrastructure construction components, such as the temporary Countess East compound, would be obscured by intervening topography, as well as modern built form.*

16 *No lighting is proposed for the Scheme. It is designed to reduce light pollution with the use of cuttings, canopies and green bridges. There would therefore be no risk of roadside or tunnel approach lighting affecting the experience of the winter solstice sunset. There is, however, a risk that vehicular lights on the stretch west of the western portal may create a glow, but due to the deep cutting this is not anticipated.*

17 *Overall, it is anticipated that the Scheme would have a Moderate Positive impact on this Attribute of OUV, resulting in a Large Beneficial effect."*

Question LV.2.5

The night sky

Please set out the assumptions, the modelling, and the calculations made to support the conclusions in ES Chapter 7, paras 7.9.124 to 7.9.132 [APP-045].

Pay particular attention to the effects of night sky glow over the Longbarrow junction and western approach cutting; over the Countess flyover; spillage from the western and eastern portals; and the effects of car headlights directed into the night sky from vehicles climbing out the portals and over the flyover.

Highways England response

1 The assumptions on which the conclusions of ES Chapter 7 paras 7.9.124 to 7.9.132 were reached were as set out at paragraphs 2.3.50 seq. of ES Chapter 2 [APP-040], the Outline Environmental Management Plan [APP-187] design sections (please see below) and a review of the Scheme details, i.e. that presented indicatively in the General Arrangement Drawings [APP-012] and in the Engineering Section Drawings [APP-010 and APP-011]. In summary, the assumptions where that:

- The proposed Longbarrow Junction would not be lit, nor would any section of the road, except under Green Bridge Four (day time only), within the tunnel and Countess Roundabout (replacement of existing lighting).
- There would be traffic lights at Longbarrow Junction and therefore a localised source of glare.
- The western approach cutting (i.e. the retaining walls) would not be lit, with the only sources of light being from vehicles within the cutting;
- Tunnel portal lighting would be designed to minimise light spill outside of the portals' footprint;
- There would be no street lighting on Countess Flyover, there would be 1.8 metre high acoustic screens along the elevated section of the flyover;
- There would be temporary lighting in operation when required at the crossover points indicated on the General Arrangement Plans, where traffic could be diverted onto one side of the dual carriageway (the crossover points are located above the existing Countess Roundabout on the Countess Flyover and between Longbarrow Junction and the World Heritage Site); and
- Lighting under Green Bridge Four will only occur between dawn and dusk, be dimmer controlled, and be designed to minimise light spill outside of the bridge footprint.

2 With reference to the above, the relevant sections of the Outline Environmental Management Plan [APP-187] are D-CH8; D-CH9; D-CH10; D-CH11; D-CH11 and D-CH12.

There was no technical modelling for the operational lighting at the time of the assessment and the assessment was therefore based upon professional judgement.

3 The updated OEMP [REP3-007], retains the assumptions and sections of the OEMP stated in The Applicant's response no.2 above, with the addition of the following to improve upon the approach to lighting and reinforce the assessment conclusions:

"D-CH20: There will be no external lighting on the cutting retaining walls, or the external facades of the tunnel control buildings and tunnel portals within the WHS."

4 As stated in APP-045 paragraph 7.3.14 the operational lighting assessment identifies the new sources of light in terms of glare or upward lighting and a professional judgement is undertaken on the impact to the night sky. This is considered appropriate as detailed information on the positioning of lighting during the operational phase and the levels of lighting are not known at this stage and therefore no calculations were undertaken for the operational lighting.

5 *Effects of night sky glow over the Longbarrow junction and the western approach cutting*

There would be a beneficial change to sky glow as the proposed Scheme would remove the existing lighting columns at Longbarrow Roundabout such that there would not be permanent equivalent light sources. Vehicles at the proposed Junction and vehicles on the proposed A303 would be in a deep cutting at this point in the Scheme, which is considered to be beneficial in comparison to the existing surface routes and the sky glow and glare from existing lighting and vehicles. The removal of permanent lighting and the vehicles in cutting contributes to the moderate beneficial effect predicted to the night sky within the WHS as per paragraph 7.9.129 of APP-045.

6 *Effects of night sky glow over the Countess flyover*

Similarly, the Countess Flyover would not be lit, and in consideration of the replacement of the existing lighting with lighting to minimise light spill, there would be a reduction in light spillage in comparison to the existing lighting.

7 *Spillage from the western and eastern portals*

The lighting design was assumed to minimise any light spill outside of the portal's footprint such that in combination with the road being in cutting or in tunnel there would be beneficial change to the character of the night sky from a reduction in light sources within the WHS.

8 *The effects of car headlights directed into the night sky from vehicles climbing out the portals and over the flyover*

With reference to the Engineering Section drawings [APP-010], vehicles would be exiting the western portal on a shallow road profile which in combination with being in cutting would not result in headlights being directed into the night sky. At the eastern portal, the gradient profile upon exiting the tunnel is steeper than at the western portal, however the proposed road would be in cutting and at a lower elevation than the existing landform such that there are not predicted to be adverse changes in comparison to glare from vehicles on the existing A303. Similarly no sky glow is predicted as there would not be permanent lighting outside of the eastern or western portals and the light sources (in the form of headlights) would be transient.

9 In respect of the flyover, which is situated in an area of fixed lighting, the glare from the angled alignment of vehicle headlights as they rise across the flyover would be mitigated by the 1.8m high acoustic barrier and the perception of light above the Countess Roundabout (i.e. the sky glow) would reflect the existing levels of sky glow at Countess Roundabout, whilst the light spillage would be reduced by the replacement of existing lighting columns.

Question LV.2.6

Landscaping scheme

i. Why, in Requirement 8 of the DL4 dDCO, is the submission and approval of the overall landscape scheme limited to Work No 4 and the WHS [REP4-018]?

ii. Are WILTSHIRE COUNCIL and Historic England content that only consultation, rather than agreement, should be in place prior to submission to the SoS for approval?

Highways England response

1 In respect of point (i), which is directed to Highways England, the revisions to Requirement 8 do not result in the submission and approval of the overall landscape scheme being limited to Work No. 4 and the WHS.

2 Requirement 8(1) is the overall obligation against which the whole of Requirement 8 needs to be considered. This provides that no part of the authorised development (so applicable to *any* of the authorised development) is to commence until a landscaping scheme relating to that part has been submitted to, and approved by, the Secretary of State.

3 Requirement 8(2) states explicitly that the provisions within it are 'without limitation on the scope' of Requirement 8(1) – as such those overarching obligations remain and the provisions of Requirement 8(2) need to be considered as subsidiary and supplementary to those overarching obligations.

4 Requirement 8(2) simply provides that for any landscaping scheme submitted under Requirement 8(1) that relates to works within the WHS or forming part of Work No. 4 – i.e. the works within the WHS and the principal work outside the WHS with the potential to affect the setting of the WHS - Historic England will be consulted in respect of it, alongside the planning authority.

5 Therefore, in conclusion, there is no provision for the submission and approval of the overall landscaping scheme to be limited to Work No. 4 and the WHS. Instead, Requirement 8(2) simply provides that for any landscaping scheme submitted that relates to those works, Historic England has a consultative role. The overarching requirement in respect of all landscaping schemes being subject to approval by the Secretary of State for the entirety of the authorised development remains under Requirement 8(1).

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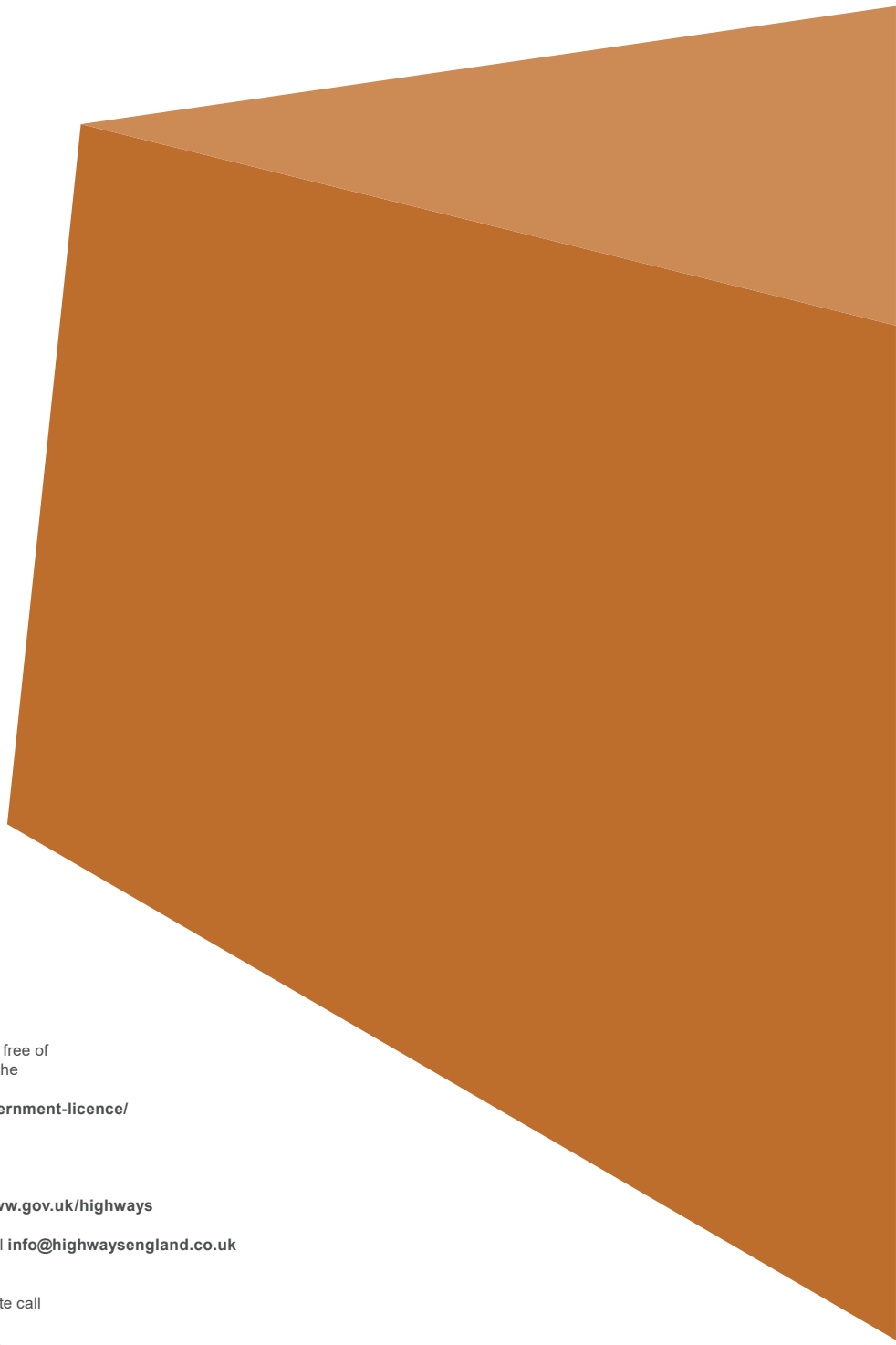

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