

A303 Amesbury to Berwick Down

TR010025

Deadline 4

**8.30.5 - Written summaries of oral submissions put at
Noise, Vibration, Health and Wellbeing
hearing on 12th June 2019**

APFP Regulation 5(2)(q)

Planning Act 2008

The Infrastructure Planning (Examination Procedure) Rules 2010

June 2019



Infrastructure Planning

Planning Act 2008

The Infrastructure Planning (Examination Procedure)

Rules 2010

A303 Amesbury to Berwick Down

Development Consent Order 20[**]

**Written summaries of oral submissions put at Noise, Vibration,
Health and Wellbeing hearing on 12th June 2019**

Regulation Number:	Regulation 5(2)(g)
Planning Inspectorate Scheme Reference	TR010025
Application Document Reference	8.30.5
Author:	A303 Amesbury to Berwick Down Project Team, Highways England

Version	Date	Status of Version
Rev 0	21 June 2019	Deadline 4 Issue

Table of Contents

1	Introduction.....	2
2	Written summary of the Applicant’s oral submissions.....	3
3	POLICY AND GUIDANCE	3
4	ENVIRONMENTAL STATEMENT CHAPTER 9 [APP-047].....	4
5	NOISE IMPACTS AND MITIGATION MEASURES DURING THE CONSTRUCTION AND OPERATIONAL PERIODS	9
6	VIBRATION IMPACTS AND MITIGATION MEASURES DURING THE CONSTRUCTION AND OPERATIONAL PERIODS	14
7	EFFECTS ON WELLBEING AND PUBLIC SECTOR EQUALITY DUTY	17
8	MITIGATION AND MONITORING.....	19

Introduction

- 1.1.1 This document summarises the oral submissions made by the Applicant at the Issue Specific Hearing on Noise and Vibration, Health and Wellbeing held on Wednesday 12 June 2019.
- 1.1.2 Where the Examining Authority requested further information from the Applicant on particular matters, or the Applicant undertook to provide further information during the hearing, the Applicant's response is set out in or appended to this document.
- 1.1.3 This document does not purport to summarise the oral submissions of parties other than the Applicant, and summaries of submissions made by other parties are only included where necessary in order to give context to the Applicant's submissions in response, or where the Applicant agreed with the submissions of another party and so made no further submissions itself (this document notes where that is the case).
- 1.1.4 The structure of this document follows the order of items as set out in the agenda for the issue specific hearing on noise and vibration, health and wellbeing ("the Agenda"). Numbered agenda items referred to are references to the numbered items in the Agenda.

Written summary of the Applicant's oral submissions

3 <u>POLICY AND GUIDANCE</u>	
<u>Agenda Item</u>	<u>Highways England response</u>
<i>i. The National Policy Statement for National Networks</i>	Reuben Taylor QC, on behalf of Highways England ("the Applicant") explained that the Scheme's compliance with relevant noise and vibration policy in the National Policy Statement for National Networks ("NPSNN") is addressed in Chapter 9 of the Environmental Statement ("the ES") [APP-047], section 9.9 (para 9.9.69-9.9.84), and in Appendix A of the Case for the Scheme and NPS Accordance Table [APP-294].
<i>ii. Wiltshire Council Core Strategy</i>	Reuben Taylor QC explained that Wiltshire Council's Local Impact Report [REP1-057] confirms that the Scheme is in compliance with Wiltshire Council's Core Strategy Policy 57. Paul Brown QC, on behalf of Wiltshire Council , confirmed the Council's view in this regard.
<i>iii. WHO Guidelines</i> <i>iv. Noise Policy Statement for England</i> <i>v. Planning Practice Guidance - Noise</i>	The Examining Authority asked for an overview of the policy and guidance in relation to noise and how they all fit together in relation to the Scheme, specifically by reference to an interim target of 55dB for night time noise. Reuben Taylor QC explained that the approach to the noise assessment contained in the ES reflects that contained in the Noise Policy Statement for England ("NPSE"), by identifying the Significant Observed Adverse Effect Level ("SOAEL") and the Lowest Observed Adverse Effect Level ("LOAEL"). Guidelines from the World Health Organisation ("WHO") are had regard to in setting the relevant levels. The National Planning Practice Guidance ("NPPG") was also taken into account, by assessing the Scheme's predicted impacts against the LOAEL and SOAEL. Suzanne Scott, on behalf of the Applicant , explained that WHO Guidelines are one of the things taken into account when setting the LOAEL and SOAEL – specifically the 1999 Community Noise Guidelines ("CNG"), the 2009 Night Noise Guidelines ("NNG") and the 2018 Environmental Noise Guidelines ("ENG"). The night time LOAEL is explicitly defined in the NNG as 40 dB, and the night time SOAEL of 55 dB (the interim target) also comes directly from the NNG as the level above which there is evidence that the risk of cardiovascular disease increases. The 2009 NNG remain current and are not superseded by the ENG. The daytime LOAEL is based on the onset of moderate community annoyance from the CNG and the SOAEL on the onset of cardio-vascular health effects from the CNG, as well as the Noise Insulation Regulations threshold. Clive Bentley, on behalf of Stonehenge Alliance , queried how the guidance contained in the NPPG in respect of the assessment of impacts of the Scheme on tranquillity has been taken into account in the assessment.

	<p>Ms Scott explained that Chapter 7 (Landscape and Visual) of the ES [APP-045] contained an assessment of tranquillity in accordance with the Design Manual for Roads and Bridges ("DMRB").</p> <p>Richard Hammond, on behalf of the Applicant, confirmed that noise was considered as part of the assessment of impacts on tranquillity contained in the ES – this included considering the impacts on Landscape Character Areas, amongst other things.</p> <p>Paul Brown QC confirmed that Wiltshire Council was content with the policy and approach to assessment of tranquillity.</p>
4 <u>ENVIRONMENTAL STATEMENT CHAPTER 9 [APP-047]</u>	
<u>Agenda Item</u>	<u>Highways England response</u>
<p><i>i. Noise assessment in respect of tunnel portals and cuttings</i></p>	<p>The Examining Authority asked how the ES has considered whether an increase in traffic speed and flow can result in higher noise levels.</p> <p>Suzanne Scott explained that the DMRB acknowledges that although putting a road into a tunnel will eliminate the noise from the enclosed section, there is potential for additional noise to be emitted at either end of the tunnel, and that a noise absorptive surface within the entrance of the tunnel will reduce this. Therefore, this approach has been adopted in the scheme design and is secured in the revised OEMP [REP3-006] submitted at deadline 3 (D-NOI6). Cuttings (and false cuttings) mitigate traffic noise levels in the same way as a noise barrier by blocking line of sight from the road to a receptor. Overall, noise levels would reduce along the current alignment of the A303 but increase along the new alignment outside of the tunnel portals.</p> <p>The Examining Authority asked for a specific reference to a noise profile to show effects at the tunnel portals.</p> <p>Ms Scott explained that the noise models used for the assessment were based on a 3D model which takes into account topography. The 2D traffic noise change contour plans as submitted with the Environmental Statement illustrate this for the short term change in the opening year in Figure 9.4 [APP-167] and the long term change from the opening year to 15 years after opening Figure 9.5 [APP-168].</p> <p>Reuben Taylor QC suggested the issue might be a presentational one in terms of the scale of the plans. He confirmed the Applicant would produce a further drawing at a different scale to enable interested parties to better establish the predicted change in traffic noise levels at the tunnel portals. This drawing with reference HE551506-AMW-DR-GI-00607 is appended to this note at Appendix 1.</p> <p>Howard Smith on behalf of Mrs P Sandell, asked whether the cottages situated at Park Farm will experience more or less noise as a result of the Scheme.</p> <p>Ms Scott noted that the closure of Stonehenge Road at that location as a result of the Scheme, together with the new road being in a deep cutting at the nearest location to the cottages, will mean there should be a beneficial impact at this location. This is illustrated in Figure 9.4 [APP-167].</p>

	<p>King Arthur Pendragon queried whether as a result of the higher speeds experienced by traffic as a result of the Scheme, there would be a high pitched whine at Stonehenge, as opposed to the current 'hum'.</p> <p>Ms Scott noted that the nature of the traffic noise would be the same as now, but at Stonehenge itself there would be a reduction in noise levels due to the traffic being within the tunnel. The fact that thin road surfacing would be introduced as part of the Scheme would also reduce the noise impacts as a result of higher traffic speeds.</p> <p>Barry Garwood queried the depth of the cuttings that would be introduced as part of the Scheme and also whether a lower speed limit had been assessed.</p> <p>Mr Taylor QC responded by confirming that lower speed limits had not been assessed in the ES as this was not considered by the Applicant as part of the Scheme in line with the Scheme's Objectives. In addition, he confirmed that he was instructed that the eastern cutting would be approximately 11 metres deep at their deepest point, but would get shallower as it continues eastwards.</p> <p>The Examining Authority asked about the noise effects at the lip of the cuttings and possible deflection effects – specifically, could the Applicant provide comment on frequency and shapes over which noise travels?</p> <p>Ms Scott responded that the noise travels over the top of a cutting as it would do over a barrier - it bends and needs to travel further. The effect is different at different frequencies. The noise modelling used for the assessment in the ES takes into account the shape of the cutting and how the traffic noise will travel.</p>
<p>ii. Effect of topography and road levels relative to noise forecasts</p>	<p>The Examining Authority explained it was interested particularly in how topography has been incorporated into the assessments in the ES in respect of the proposed River Till Viaduct and at Countess.</p> <p>Suzanne Scott explained that topography has been included in the noise model. The differences in level will have an impact on noise effects. For a person on the ground below the proposed structures, one would experience a lower noise level than if stood next to the existing A303 at grade, due to the increase in distance between that person and the road. It should also be noted that elevating a road can affect noise interaction with the ground, the ground type has an effect – in particular, whether the ground is reflective like smooth concrete or absorptive ground such as vegetation.</p> <p>The Examining Authority further queried how the fact that the Countess flyover is slightly curved might affect noise impacts.</p> <p>Ms Scott replied that the height of the carriageways and alignment of the flyover has been modelled. The precise effect depends on the location of the receptor in question as there are a range of factors which need to be taken into account.</p> <p>Reuben Taylor QC, in response to general comments made by Mr Garwood as to noise impacts of the Scheme on Winterbourne Stoke, directed interested parties to para.9.9.39 of the ES [APP-047], which explains that a moderate or major reduction in traffic noise levels is expected at some properties in Winterbourne Stoke in the opening year of the Scheme. Specifically, the ES describes this as a significant beneficial effect of the Scheme.</p> <p>Howard Smith, on behalf of Mr Whiting (Scotland Lodge Farm), queried whether the tunnel arisings have been taken into account in the noise assessment – specifically how chalk will react to noise impacts.</p>

	<p>Ms Scott responded that an assessment of construction impacts is contained in the ES. Following construction, grassland will be created in the area in question. Vegetation is absorptive in nature (as opposed to reflective) which would impact on the noise effects experienced. It should be noted that during construction, the existing A303 alignment would still be in use, so the noise levels would be the same as now.</p> <p>Post Hearing Note: <i>The Applicant notes that the area of tunnel arisings is located to the north of the proposed bypass and is therefore not located between Scotland Lodge Farm and the bypass.</i></p> <p>Mr Taylor QC confirmed that grassland would be created in the area in question and would not be turned into concrete, as has been asserted at previous hearings.</p> <p>In response to points made by Ms Sebborn about potential impacts to her home (Bowles Hatches), Mr Taylor QC confirmed that the Applicant had met with Ms Sebborn following the open floor hearings to discuss the blight claim mechanism but it was understood no claim has yet been made. Low noise surfacing would be implemented as part of the Scheme (D-NOI1 of the OEMP [REP3-006]), including on the parts of the Scheme near Ms Sebborn's home. Paul Brown QC and Mr Taylor QC confirmed that both Wiltshire Council and the Applicant would look at whether Ms Sebborn's legal costs might be able to be covered under the blight claim regime.</p>
<p>iii. Background noise levels 'do minimum' and 'do something' alternatives</p>	<p>The Examining Authority queried whether any figures showing absolute noise levels in both the 'do minimum' and 'do something' scenarios had been submitted.</p> <p>Suzanne Scott explained that such figures were not required by the DMRB, so did not form part of the ES, but stated that they could be produced. As a result, it was agreed that the Applicant would submit these at Deadline 4. The figures are appended to this note at Appendix 2, with drawing numbers HE551506-AMW-DR-GI-00608 and HE551506-AMW-DR-GI-00609, for the Do-Minimum and Do-Something absolute traffic noise levels in the opening year respectively.</p> <p>Rollo Maughfling queried that if the western portal of the Scheme is not yet constructed, how can noise levels be assessed. Wind direction is an important factor and it was asserted that no evidence had been produced in respect of peace and tranquillity.</p> <p>Ms Scott explained that the assessment in the ES takes account of wind direction by assuming moderate adverse wind conditions at every receptor. Mitigation measures set out in the OEMP [REP3-006] at the portals would minimise noise impacts from the portals, including thin road surfacing and absorptive materials on the roof and walls of the tunnel entrance/exit.</p> <p>In response to a query from Mr Garwood, Mr Taylor QC confirmed that no assessment of the noise impacts on drivers within the tunnel had been undertaken.</p>
<p>iv. Assessment of tranquillity within the World Heritage Site (WHS)</p>	<p>The Examining Authority asked the Applicant to set out how the tranquillity assessment has been undertaken, including factors that had been taken into account.</p> <p>Mr Hammond explained that the assessment of tranquillity undertaken in the ES is based on the definition in Interim Advice Note 135/10 ("IAN135/10") which states (and as referenced in paragraph 7.6.75 of APP-045):</p>

“the remoteness and sense of isolation, or lack of it, within the landscape, which is often determined by the presence or absence of built development and traffic.”

The assessment also took into account the Guidelines for Landscape and Visual Impact Assessment, Third Edition ("GLVIA3") which states in relation to the assessment of the operational stage of a scheme that:

“the noise and movement of vehicles may affect perceptions of tranquillity in the landscape.” (para 4.18)

The assessment also took into account baseline data from the Campaign to Protect Rural England ("CPRE") which is presented in APP-083 and published landscape character assessments, as well as data obtained from the noise assessment undertaken for the Scheme, presented in Chapter 9 of the ES [APP-047]. Extensive field work was undertaken to understand perception which is included in landscape value and followed through into judgments on sensitivity and the effects on receptors. The findings of the tranquillity assessment are contained in Chapter 7 of the ES [APP-045] within the assessment of local landscape character areas.

Clive Bentley, on behalf of Stonehenge Alliance, made submissions in response to a query from the **Examining Authority** as to how his adopted approach and conclusions differed from the Applicant's.

King Arthur Pendragon submitted that the Applicant had not consulted with certain groups in respect of tranquillity.

In response to the points made by Mr Bentley, **Mr Taylor QC** explained that it is important to note that the assessment put forward by Mr Bentley and Stonehenge Alliance focusses only on the Stonehenge monument itself. In the conclusions of Mr Bentley, at paragraph 5.12 it is acknowledged that the removal of the road 'will result in considerable improvement in tranquillity in the wider area'. Mr Taylor QC submitted that the point of difference between the Applicant and Mr Bentley appears to relate to the fact that the areas around the monument will not be tranquil due to tourists being present. The Applicant acknowledges tourists will be present, but what will change as a result of the Scheme is a reduction in traffic noise. Indeed, a reduction in traffic noise is an objective of the relevant World Heritage Site Management Plan.

In relation to the submission made by King Arthur Pendragon, **Mr Taylor QC** directed interested parties to the Consultation Report [APP-026] which demonstrates extensive consultation throughout the evolution of the Scheme.

Mr Taylor QC added that in respect of Mr Bentley's methodology, the Applicant does not intend to comment on it, given the overall conclusions of Mr Bentley and the Applicant are not too dissimilar. In response to a further submission from Mr Bentley as to the differences between the Applicant and Mr Bentley's assessment, Mr Taylor QC, clarified that the issue between the parties is in relation to the marked beneficial improvement of traffic noise at the monument due to the reduction in road traffic noise. Fundamentally, it is not a question of methodology – the conclusions are the most important factor. Mr Taylor QC further submitted that it is for the Examining Authority to assess the information before it and draw its own conclusions.

In response to a further point from Mr Bentley, **Ms Scott** agreed that Mr Bentley's and the Applicant's measurements at the Stonehenge monument in terms of road noise are broadly similar. However, the important thing to note is that the noise assessment of the scheme does not take into account tourists at the monument, only road traffic noise.

Mr Bentley further queried the Applicant's significant beneficial effect conclusion given the small reduction in overall noise at the monument (less than 3dB). **Mr Taylor QC** explained that the Applicant's tranquillity assessment considered the World Heritage Site as

a whole, not just the Stonehenge monument. Aim 6 of the World Heritage Site Management Plan confirms the aim of reducing the influence of vehicular noise. The criteria of 3dB cited applies to road traffic noise alone, not noise sources generally. Mr Taylor QC concluded by emphasising the fact that the Applicant has undertaken an assessment of tranquillity in respect of the World Heritage Site as a whole which is what is required, informed by the World Heritage Site Management Plan - the benefits identified are in relation to that overall approach, not specific to the Stonehenge monument.

Post Hearing Note: *The Applicant notes that a 3 dB reduction in traffic noise is the onset of a potentially significant beneficial effect in the short term, the actual anticipated reduction in traffic noise at the Stonehenge Monument is rather greater, as illustrated on Figure 9.4 of the ES [APP-167].*

Following consideration of the agenda item below, **Mr Bentley** asked to revisit some points on this agenda item. Mr Bentley submitted that IAN 135/10 suggests that the overall level of background noise should be taken into consideration and queried, in this context, what data had been used and how it had been taken into account.

Mr Hammond reiterated the point made by him earlier that the assessment of tranquillity had been prepared working alongside those preparing the noise assessment – that is where the baseline data derives from and can be found in Chapter 9 of the ES [APP-047].

Mr Bentley submitted in addition that whilst the CPRE data is useful (long term trends in tranquillity), CPRE are looking to improve it as it is known to be flawed.

Mr Taylor QC, responded in relation to the baseline noise data, directing interested parties to Chapter 9 of the ES [APP-047]. In section 9.6, there is a large and detailed assessment of baseline noise (including material provided to Mr Hammond for him to take into account in the tranquillity assessment). This includes an indication of noise monitoring locations, including Figure 9.1, and a summary of noise monitoring results (Table 9.9). Further details of the monitoring programme are provided at Section 9.6 including comments on the future baseline adopted for the assessment. There is a large amount of data available. The baseline noise survey locations, as well as the noise assessment methodology, were agreed with Wiltshire Council. There is a very good understanding of the noise climate across the areas affected by the Scheme, not least within the World Heritage Site.

In respect of the specific CPRE point made, **Mr Hammond** stated that he does not disagree with Mr Bentley's comments on CPRE data and that the Landscape Institute Advice Note on Tranquillity sets out the challenges of the CPRE data. However, the CPRE data is just one of a number of factors involved in the baseline review and the Applicant's main assessment is based on fieldwork, which is where the key observations have been made - on the ground in winter and summer conditions.

<p>v. Seasonal differences</p>	<p>The Examining Authority asked the Applicant to comment on how the loss of foliage and different traffic levels at different times of year affect noise impacts.</p> <p>Suzanne Scott replied that whilst there are seasonal differences in traffic flow, the ES is based on annual average traffic flow as the methodology in the DMRB requires. A sensitivity test was carried out to consider the effects of holiday traffic on the A303 (i.e. 'busy periods' – mainly Fridays, weekends and Bank Holidays) - the relevant section of the ES is found in paras 9.9.61 - 9.9.62 [APP-047]. The Do- minimum scenario during those busy periods results in lower speeds, thus creating less traffic noise. Alternatively, the Do-something scenario has traffic running at normal speeds, with higher noise levels as a result. In the Do-minimum scenario during 'busy' periods, in general more traffic uses the minor roads as traffic avoids the A303 past Stonehenge. With the Scheme in operation this traffic remains on the A303. Therefore, the benefit of the Scheme on the minor roads to the north currently used as an alternative to the A303 is generally slightly greater in busy periods.</p> <p>On the A303, in locations such as Countess, in the Do-minimum 'busy' scenario traffic noise levels are generally slightly lower compared to the annual average weekday situation due to a number of factors including, lower speeds due to congestion and lower flows as the capacity is reduced by the congestion. The magnitude of the adverse impact of the Scheme in the vicinity of Countess is therefore slightly larger in busy periods, as Do-minimum traffic noise levels are reduced.</p> <p>The Examining Authority queried whether the loss of foliage, amongst other seasonal variations, has any material bearing. In response Ms Scott confirmed that the methodology adopted in the ES does not take account of foliage changes as it is so variable. It is acknowledged in the DMRB that foliage can make some difference but a deep and dense width is required, consistently all the way up through the foliage, to have any benefit. Therefore, as a worst-case, foliage is not taken into account into the assessment as either a benefit or disbenefit.</p>
<p>5 <u>NOISE IMPACTS AND MITIGATION MEASURES DURING THE CONSTRUCTION AND OPERATIONAL PERIODS</u></p> <p><u>With particular regard to:</u></p>	
<p><u>Agenda Item</u></p>	<p><u>Highways England response</u></p>
<p><i>i. Countess Roundabout, flyover, slip roads</i></p>	<p>The Examining Authority referenced representations it had received which identified effects on sensitive receptors in the vicinity of Countess. Specifically, representations have been received from Amesbury Abbey identifying 31 Mews Flats as well as the home itself. A query was put to the Applicant as to whether these receptors had been taken into account in the noise assessment.</p> <p>Suzanne Scott responded that Amesbury Abbey, Mews 1 and Mews 2, and other properties around these had been taken into account within the noise impact assessment. In response to a further query from The Examining Authority, Ms Scott commented that the identified property, 'Lindisfarne' on Ratfyn Road, is an individual property at the top end of Ratfyn Road and is identified in the ES in respect of potential qualification under the Noise Insulation Regulations.</p>

	<p>The Examining Authority then invited comments from interested parties in respect of noise impacts in the vicinity of Countess Roundabout.</p> <p>Patrick Robinson, on behalf of the National Trust raised points around the proposed noise barriers, particularly around the balance between effectiveness of noise mitigation and design and visual impacts. The National Trust would like to be consulted on the barriers as a result.</p> <p>Howard Smith, on behalf of Mr Rowlands commented that he would welcome further discussion around the Countess Roundabout area and the proposed noise mitigation.</p> <p>Reuben Taylor QC, directed interested parties to item D-NOI2 in the OEMP [REP3-006] which provides for the installation of the noise barriers in question. More generally, detailed discussions continue with the National Trust in relation to issues affecting its properties in the area. The Examining Authority will be updated when agreement is reached on these issues.</p> <p>Mr Taylor QC also confirmed that discussions are continuing with Mr Smith and the residents of Ratfyn Farm. It should be noted that the ES does not identify any likely significant adverse effects from operational noise on Ratfyn Farm.</p> <p>In response to a query from The Examining Authority in respect of wind direction and tranquillity and Vespasian's Camp, Ms Scott confirmed that wind direction is intrinsic to the noise assessment. It is not based on a particular wind direction, but always assumes a worst-case scenario, from source to receptor.</p> <p>Mr Smith submitted that contrary to submissions by the Applicant based on the noise contours, there would be an increase in noise as Ratfyn Farm, given that traffic will be more free-flowing in the area. Mr Taylor QC responded to clarify that there would be no <i>significant</i> adverse effect on Ratfyn Farm – significance thresholds allow for negligible increases in noise to not be identified as a significant effect.</p> <p>The Examining Authority queried (a) where the qualitative nature of the proposed noise barriers is set out; and (b) if the fact that the ES states that current Highways England roads consist of thin surfacing, is the reliance on that as a mitigation not double counting.</p> <p>Ms Scott responded in respect of (a), and confirmed that noise barriers will need to meet relevant British Standards and obtain specific test certificates in this light – the important element is the mass of the barrier in question. Mr Taylor QC confirmed that the Applicant will consider whether reference to relevant standards in respect of the noise barriers should be added to the next iteration of the OEMP. The Applicant has since considered this and updated item D-NOI2 in the revised version of the OEMP submitted at Deadline 4. In respect of (b) Ms Scott confirmed that whilst the majority of the existing A303 consists of low noise surfacing (including to the east of Countess), the key point is that the greatest benefit of this surface comes from when traffic is travelling at higher speeds.</p> <p>King Arthur Pendragon queried whether any work has been done by the Applicant in relation to other fuels, for example taking into account a shift to use of electric vehicles.</p>
--	---

	<p>In response, Mr Taylor QC explained that in line with the Calculation of Road Traffic Noise methodology, no account was taken in the assessment of fleet mix. However, by their nature, electric vehicles tend to be quieter. Mr Taylor QC confirmed the Applicant would consider the query and respond in more detail at Deadline 4.</p> <p>Post Hearing Note: <i>the Applicant's response to the query around electric vehicles can be found below:</i></p> <p><i>The Transport Analysis Guidance (TAG) data book issued by the Department for Transport contains a forecast of the proportion of vehicles using petrol, diesel or electric vehicles for each class of vehicles up to 2050, reflecting agreed government policies. The current version of the TAG data book (issued in May 2019) forecasts that in the scheme opening year of 2026 6.76% of cars will be electric vehicles and 2.40% of light goods vehicles (LGV). By 2041 (15 years after opening of the Scheme) 34.42% of cars are forecast to be electric vehicles and 16.61% of LGVs. In both years 0% of heavy duty vehicles (HDV) are forecast to be electric vehicles. Therefore the majority of vehicles are anticipated to be conventional rather than electric in all the traffic noise assessment scenarios for the scheme.</i></p> <p><i>Road traffic noise levels are a combination of 'rolling noise' generated by the interaction of tyres with the road surface and 'propulsion noise' generated by the vehicle itself (engine, exhaust etc.). In 2015 the CEDR Transnational Road Research Programme reported the results of an investigation into the noise emissions from electric vehicles. A literature review completed as part of the investigation concluded that at high speeds all studies agree that all vehicles behave similarly as rolling noise is dominant, and at constant low speeds most authors conclude that electric vehicles are quieter than conventional vehicles, due to reduced propulsion noise at low speeds. Based on measurements completed as part of the investigation overall noise emissions from electric cars are estimated as being around 5 dB lower than a conventional vehicle at 20 km/h and around 2.5 dB lower at 30 km/h. Additionally the character of electric vehicle noise has the potential to be different from conventional vehicle noise. The CEDR study included research on the subjective response to various fleet mixes ranging from 0% electric vehicles to 100% electric vehicles which suggests that a widespread transition from conventional to electric vehicles on national roads would not harm the subjective experience of people near those roads, and indeed would likely improve that experience. UN Regulation 138 requires manufacturers to ensure additional sound is emitted by electric vehicles for speeds up to 20 km/h for safety reasons. Given these added sounds are required to replace the audible warning provided by conventional engines the overall noise level of vehicles up to 20 km/h is unlikely to vary between propulsion types.</i></p> <p><i>On the basis of the above forecasts of electric vehicle usage, and the potential magnitude of the difference in overall vehicle noise levels emitted by electric vehicles, the increased uptake of electric vehicles in the future is anticipated to have a small beneficial effect on traffic noise levels where traffic speeds are low. Such effects are not considered to change the overall conclusions of the road traffic noise assessment of the Scheme as reported in the Environmental Statement.</i></p>
<p>ii. River Till crossing</p>	<p>The Examining Authority queried whether the provision of a barrier at the River Till on the south side of the proposed viaduct, but not on the north, meets the requirements of the NNNPS in respect of minimising noise effects of the Scheme.</p> <p>Suzanne Scott explained that with regards to the barrier on the southern side, it was not deemed essential mitigation from a noise or visual perspective. The reduction in an adverse effect is limited to one property (Foredown House). When deciding on the mitigation measures that should be implemented, the Applicant has taken into account consultation responses, and there was a strong response</p>

	<p>in favour of including a solid barrier on the southern side. In respect of the absence of a barrier on the north side, in terms of minimising noise, the key factor is sustainable development – for example, cost vs benefit, the absolute noise benefit, receptors that would benefit and other knock-on impacts. In this location, there are no residential receptors or other sensitive receptors such as schools. Potentially users of parts of the nearby public right of way could benefit from a reduction in the increase in traffic noise, but other parts close to the existing A303 get a benefit so on balance, the Applicant considers that it does not justify funding a noise barrier on the north side.</p> <p>Kate Fielden, on behalf of Stonehenge Alliance, queried whether there would be any noise impacts on the Site of Special Scientific Interest ("SSSI") at Parsonage Down, particularly in relation to wind direction. Ms Scott explained that the mitigation measures in place in the design close to Parsonage Down (false cuttings), coupled with the distance between the River Till viaduct and the receptor in question, would likely result in no effects at Parsonage Down from a barrier on the north side of the River Till. The Applicant explained this in further detail to Ms Fielden after the hearing.</p>
<p>iii. Tunnel portals and cuttings leading to them</p>	<p>In response to a query from the Examining Authority, Ms Scott explained that the exact specification of the proposed absorptive finishes to the walls and roof of the tunnel entrances/exits will be determined at the detailed design stage - the requirement for such finishes is included in item D-NOI6 of the OEMP [REP3-006].</p> <p>Ms Scott added in response to a further query that the key area for the absorptive finishes in question is inside the tunnel entrance/exit. The retained cuts on the tunnel portal approaches are not as important from a noise mitigation perspective and absorption on the retained cuts has not been included in the assessment. The precise extent of the absorption inside the tunnel entrance/exit will be settled during detailed design, but 50 to 100 metres is currently being considered. In terms of the finishes to the retained cuts, this has been considered but the main benefit of the cuttings is the barrier effect where mass is the key in terms of effectiveness. The OEMP [REP3-006] contains, at item D-NOI5, a specific reference to the retaining wall surfaces being designed to reduce the reflection of noise.</p>
<p>iv. Effects of noise on wildlife, farm animals, livery businesses</p>	<p>The Examining Authority queried where in the ES an assessment of the noise impact on farm animals and livery businesses had been carried out.</p> <p>Suzanne Scott explained that with regard to impacts on wildlife, the noise assessment results are fed through to ecology experts, who have looked at the impacts on wildlife both during construction and operation. The details of this assessment can be found in Chapter 8 of the ES [APP-046], and it covers a range of species. Farm animals are not explicitly included within the noise assessment as they are not within the DMRB methodology. However, impacts on livery businesses are assessed through the receptor locations within the assessment study area. Ms Scott further confirmed in response to a query that there was no direct assessment of impacts on farm animals or animals within livery businesses, that in terms of noise farm animals and liveries are widely seen adjacent to operational highways. An overall assessment of the impact on rural businesses was included in Chapter 13 of the Environmental Statement [APP-051].</p> <p>Howard Smith, on behalf of two livery businesses submitted that predicted noise levels <i>will</i> affect horses and the running the livery business will be difficult as they are prone to sudden noise.</p>

	<p>Ms Scott explained that if construction noise was the concern, the construction compound would not itself be a significant source of noise, as the main construction activities would take place at the scheme itself. All the mitigation measures contained in the OEMP [REP3-006] in respect of noise from compounds would not just benefit people but livestock and horses too. In addition, there is no impact piling in the vicinity of Countess or Scotland Lodge Farm and that is committed to in the OEMP (D-NOI4 and MW-BIO3 respectively).</p> <p>In response to a query from Barry Garwood, Reuben Taylor QC explained that potential indirect noise impacts on wildlife, in terms of disturbance, have been identified in Chapter 8 of the ES [APP-046].</p>
<p>v. Effects on specific receptors</p>	<p>The Examining Authority invited the Applicant to comment on direct noise impacts to Travelodge and Foredown House.</p> <p>Suzanne Scott explained the following in respect of the two receptors identified:</p> <p><u>Foredown House</u></p> <p>This receptor was included within Chapter 9 of the ES for both construction and operational impacts (Receptor C18 for construction). It is identified in the ES as being at risk of experiencing an adverse effect during construction. These impacts are mitigated by the measures set out in the OEMP, including shorter working hours in this area (item MW-G13) and a commitment to no impact piling at the River Till (item MW-BIO3). Information on mitigation measures would also be included within the Noise and Vibration Management Plan (item MW-NOI3) and CEMP (item PW-G1) to be developed under the OEMP, in consultation with Wiltshire Council.</p> <p>During operation, the assessment recognises there would be a significant adverse effect at Foredown House. Mitigation has been included within the scheme design, such as the use of false cuttings in that area, in order to minimise the effect at Foredown House.</p> <p><u>Travelodge</u></p> <p>Travelodge was identified as a construction noise receptor (C4 and C5) in the assessment – no significant adverse effects are predicted as no routine night-time works are proposed in this area.</p> <p>This receptor was also included in the operational noise assessment. Mitigation proposed includes noise barriers and thin surfacing to reduce the impact – these are contained in the OEMP (D-NOI2 and D-NOI1 respectively). The worst-case effect is a minor increase in noise levels and is not flagged as a significant operational noise effect.</p>
<p>AOB – construction impacts</p>	<p>Reuben Taylor QC explained that the Applicant would like the Examining Authority and interested parties to understand the methodology applied when predicting noise impacts during construction. In particular, it should be noted that the methodology results in both a conservative and robust assessment which has knock on effects in terms of certain receptors experiencing noise levels above SOAEL.</p>

	<p>Suzanne Scott explained that the Applicant has reviewed how the construction noise assessment has been carried out. The term 'robust' has been used in respect of the assessment in relation to, for example, the choice of plant used (e.g. not the quietest), positioning plant at the closest approach to receptors, and no benefit from site hoarding has been assumed.</p> <p>Mr Taylor QC, explained that the further work undertaken by the Applicant is a sensitivity test to consider how the controls already contained in the OEMP, such as the commitment to best practicable means for the contractor, could affect the construction noise levels at receptors which are predicted to be above SOAEL. For example, the use of quieter plant than that assumed as part of the construction assessment. Indicative results suggest that some potentially significant construction noise adverse effects could be removed as a result of different assumptions taking into account the OEMP measures. It should be noted that specific controls are not proposed to be explicitly secured in the OEMP – it is considered they are adequately secured under the existing commitments.</p> <p>Further information on this sensitivity test is provided in a technical note appended to this note at Appendix 3.</p>
<p>6 <u>VIBRATION IMPACTS AND MITIGATION MEASURES DURING THE CONSTRUCTION AND OPERATIONAL PERIODS</u></p> <p><u>With particular regard to:</u></p>	
<u>Agenda Item</u>	<u>Highways England response</u>
<i>i. Stonehenge Cottages</i>	<p>Suzanne Scott, noted that further discussions had taken place with Wiltshire Council in respect of the temporary re-housing of residents of Stonehenge Cottages during construction. This commitment is now subject to a specific obligation in the OEMP [REP3-006] - MW-NOI6.</p>
<i>ii. River Till</i>	<p>In response to comments by the Examining Authority and the Environment Agency relating to piling methods in respect of the River Till, Reuben Taylor QC directed those parties to item MW-BIO3 in the OEMP which secures non-impact piling at the River Till.</p>
<i>iii. Archaeology, ancient monuments, cultural assets</i>	<p>The Examining Authority invited the Applicant to respond on the issue of sensitivity of archaeological assets to vibration and potential impacts.</p> <p>Neil Macnab, on behalf of the Applicant explained that the design decision to implement a bored tunnel is to preserve surface archaeology – this, rather than a cut and cover tunnel, was a deliberate design decision in order to avoid damage and disturbance as far as possible to surface sites that contribute to the Outstanding Universal Value of the World Heritage Site. Regarding the barrows, the western portal would be 25 metres from the Bowl barrow south of the A303 and north west of Normanton Gorse (Wilsford G1 barrow) NHLE 1010832. Mr Macnab explained that his understanding is that this barrow was excavated as a rescue excavation in the 1960s and so has been completely archaeologically excavated and the burials removed and back filled.</p> <p>Mr Macnab explained that a further barrow nearby - Long barrow 250m north of Normanton Gorse (NHLE 1008953) – does not consist of substantial earthwork and is 1.8m in height. It is a consolidated earthwork and has settled, has no voids and its southern end was excavated in 19th century and the burials removed. These excavations have been backfilled. In addition, this barrow was</p>

	<p>situated in an airfield during WWI. Two archaeological trenches were excavated in 1992 to investigate the barrow and its condition. Mr Macnab explained that his understanding is that the barrow suffered damage during WWI, as well as extensive damage from animal burrowing. Subsequent condition surveys in 2002 and 2010 confirmed further extensive animal burrowing being apparent during the condition surveys. Geophysical survey also found the western ditch includes a metal pipe assumed to be associated with WWI activities</p> <p>Mr Macnab explained that the proposed tunnel in this location would be about 18.5m below the surface and the Long barrow 250m north of Normanton Gorse (NHLE 1008953) would be subject to low-level vibration from the tunnel boring machine but it has been concluded by relevant specialists that this would not affect these archaeological assets in terms of ground stability or the archaeology within them.</p> <p>Mr Macnab further explained that most archaeological artefacts in the soil are usually fragmented or broken and are supported in a consolidated soil matrix, so they are not surrounded by voids and so low-level vibration from the tunnel boring machine will impact minimally on this archaeological resource and the integrity of the assets.</p> <p>Mr Macnab referenced examples of tunnelling projects elsewhere in the world where archaeological sensitivity was a factor. These include under World Heritage Sites including (a) the historic centre of Rome, (b) the works of Antoni Gaudi in Barcelona, (c) the historic centre of Porto in Portugal and (d) the Antonine Wall in Scotland. With regard to tunnelling in chalk, the Channel Tunnel western terminal directly bores under a scheduled Medieval ringwork with bailey and approach causeway, incorporating a bowl barrow on Castle Hill (NHLE 1014864) on a steep slope (SM 1014864) with no recorded material damage to that substantial earthwork.</p> <p>Reuben Taylor QC added that the OEMP [REP3-006] makes provision for the protection of heritage from potential vibration impacts, see MW-NOI5 and MW-NOI6. The details of the proposed vibration monitoring would be contained in the noise and vibration management plan to be prepared - MW-NOI3. Paragraph 5 of Schedule 2 to the draft Development Consent Order ("the dDCO") requires the Applicant to comply with the detailed archaeological mitigation strategy ("the DAMS"). Both the DAMS [REP2-038] and OEMP require a heritage management plan to be prepared (item MW-CH1 in the OEMP). These will be developed in consultation with the Heritage Monitoring and Advisory Group ("HMAG") and Wiltshire Council. Item MW-CH7 in the OEMP requires monitoring of heritage assets during construction.</p> <p>King Arthur Pendragon queried what the Applicant was doing in respect of protecting unknown human remains.</p> <p>In response, Mr Macnab explained that a detailed geophysical magnetometer survey and ground penetrating radar survey have been carried out within the western and eastern portal area as well as trial trenches. To date, one crouched burial has been found in the western portal – this demonstrates a low level of burial activity within the landscape. In respect of the tunnelled section, Mr Macnab confirmed that the Applicant is relying on the Hidden Landscapes Project to provide data.</p> <p>The Examining Authority invited further comments from interested parties.</p> <p>Kate Fielden, on behalf of Stonehenge Alliance commented that the sampling work done is "not 100%" and the Stonehenge Hidden Landscapes Project still has lots of work to do. In addition, whilst some assets may be degraded that does not mean there is no more useful information from them.</p>
--	---

Dr Reeves, on behalf of Stonehenge Alliance, raised concerns around ground movement / settlement during tunnelling works.

Mr Maughfling queried whether the Applicant is categorically ruling out vibration damage to the Stonehenge stones themselves.

The Examining Authority queried the effects of settlement generally, specifically whether there are separate measures proposed to deal with this.

Mr Taylor QC responded to each of the points as necessary:

In respect of the extent of sampling work not being "100%", the reason for that is sampling 100% of the proposed route would not be proportionate prior to consent being granted for the Scheme. Any further sampling required pre-construction, should consent for the Scheme be granted, would be discussed between the Applicant and HMAG.

Mr Macnab has already responded to the implications of tunnel boring for buried archaeology - these lie within a consolidated soil matrix so the impacts are likely minimal.

In regard to the submissions from Stonehenge Alliance in respect of ground movement / settlement, particularly in relation to the paper put in at Deadline 3 citing British Museum standard, the trigger level within that paper refers to 0.1 mm/sec PPV. This trigger level is specifically designed to stop objects walking on shelves in a museum. As such, it is plainly inappropriate for that trigger level to be implemented for the Scheme in the context of the points made by Mr Macnab in respect of the sensitivity of buried archaeological assets to vibration.

In respect of settlement and compaction, the Applicant is involved in ongoing discussion with HMAG and Wiltshire Council. Specifically, in terms of settlement implications for heritage assets, interested parties should refer to the Land Instability Risk Assessment [APP-278]. This was conducted on a set of conservative assumptions – it does identify potential risk of settlement above the centreline of the tunnel of 20-30mm and the 1mm contour extends 55m from the centreline of the tunnel. However, this is a highly conservative estimate. There is predicted to be less than 1mm movement beyond 55m from the centre line of the tunnel.

In respect of buried archaeology, as mentioned previously, these are held within a consolidated soil matrix and if that matrix settles the archaeology will also settle as a piece. There are elements in OEMP [REP3-006] in relation to control of settlement, just as there are in relation to vibration (see MW-CH8 for example).

In regard to the Stonehenge stones themselves, vibration impacts on them are assessed again on a conservative basis. In Table 9.15 of Chapter 9 of the ES [APP-047], 0.16 mm/sec PPV is forecast. For context, it should be noted that the Crossrail project used a trigger level of 3 mm/sec PPV and this was considered appropriate to protect listed buildings in central London.

Marie Ayliffe, on behalf of the Applicant, explained that mitigation is embodied within the selection of the tunnel machines given the sophistication of modern machines. Head interventions can be dealt with at the tunnel horizon itself and equally to deal with the flints that we know to exist in the chalk geology.

	<p>Mr Taylor QC, stated that in relation to further comments on the content of the DAMS, he understood there will be opportunity for interested parties to comment on the next version.</p> <p>Ms Ayliffe made two further points in respect of tunnelling and settlement:</p> <p>The Applicant has undertaken a conservative phased assessment of excavation induced ground movement which is based on an empirical 'Greenfield' method, which is established best practice approach, and supplemented this with more sophisticated Finite Element Analysis that considers specific parameters to reflect the actual geology at Stonehenge. The maximum predicted settlement is reported in addition to the longitudinal zone of influence of tunnelling. This develops a settlement profile, within the 1mm settlement contours, which are well established principles in tunnelling. In respect of strain (difference in depth compared to relative position) the Applicant has taken the same approach in relation to archaeology (i.e. the barrow would move as a whole) as taken for tunnelling through an embankment. As a result, there would not be rapid changes in settlement / changes across the landscape as a consequence of the tunnelling.</p> <p>In respect of grouting and potential for voids, the Applicant has Professor Rory Mortimer advising on the engineering properties of the phosphatic chalk to understand its likely behaviour during excavation. The Applicant will take no chances in understanding the ground being tunnelled and mitigation is embodied in the type of tunnelling machine, as mentioned previously. This will be a closed faced machine and the Applicant confirms that more sophisticated means of detecting changes as tunnelling progresses are used than was previously available for the Channel Tunnel as referenced by the interested parties. Forward probing can be carried out which basically provides horizontal boreholes at the tunnel face and geophysics can also be employed to determine the nature of the ground ahead of the TBM. There would be sensors on the tunnel boring machine to monitor performance and measure the annular void around the machine. The Applicant will be able to review the tunnel arisings as well as the void around the cutting shield, all of which are validated by surface monitoring and back-calculation against the predicted settlement. The main contingency would be grouting within the tunnel alignment and this has been done on previous tunnelling projects including in London under the Thames in chalk.</p>
7 <u>EFFECTS ON WELLBEING AND PUBLIC SECTOR EQUALITY DUTY</u>	
<u>Agenda Item</u>	<u>Highways England response</u>
<p><i>i. Consideration of the cultural importance of the WHS as it affects people's wellbeing</i></p> <p><i>ii. Respect for religious beliefs</i></p> <p><i>iii. Access to WHS</i></p>	<p>The Examining Authority invited interested parties to comment on this agenda item.</p> <p>Ms Lois Lloyd, Mr Maughfling and King Arthur Pendragon all gave short presentations focussing on the potential impact of the Scheme on the cultural importance of Stonehenge to them personally and as part of wider groups. These particularly covered issues around the use of byways around Stonehenge. Ms Lloyd also raised issues around access to Stonehenge, particularly for disabled people. Some points covered related to separate proposals by Wiltshire Council in relation to the prohibition of vehicular traffic on byways AMES11 and 12.</p> <p>Kate Feilden commented that the introduction of a new bus service to aid access should be considered.</p>

Barry Garwood supported comments made by others in respect of disabled access.

Mr Taylor QC responded specifically to some of the points raised:

The Applicant takes the wellbeing of the Stonehenge community very seriously, and has taken this into careful consideration when assessing the impacts of the Scheme. The Applicant's approach is set out both in the ES, and in the Equality Impact Assessment [APP-296].

In regard to archaeology and buried remains, there are special mitigation arrangements included within the draft DAMS and OEMP to address these issues – this links to the points made previously.

In relation to access issues, specifically Byway 12, the Applicant's position remains as described at the Open Floor Hearings. The Scheme proposals in respect of public rights of way are set out in the relevant plans and there are no proposals put forward by the Applicant to change the ability to access Byway 12 as part of the Scheme whatsoever. Instead, it is Wiltshire Council that is proposing a change to the DCO (not the Applicant) in this regard.

Such a change would require careful consideration. Firstly, whether the change to the byways proposed by Wiltshire Council is justified as a result of the impacts of the Scheme. Secondly, whether such a change would be a material change, and the consequences of that procedurally. In the view of the Applicant, this includes considerations relating to the public sector equality duty, as well as rights under Articles 9 and 14 of the European Convention on Human Rights. Consideration would also need to be had for wellbeing, generally.

In addition to those considerations, there are other procedural and assessment requirements (not least those in respect of Environmental Impact Assessment), For example, does what is proposed fall within the scope of the ES. The Applicant's view is that what is proposed by Wiltshire Council goes beyond the scope of the Scheme. Further detail on this matter is covered in the written summary of the Traffic and Transport issue specific hearing and in submissions made by the Applicant at Deadline 4.

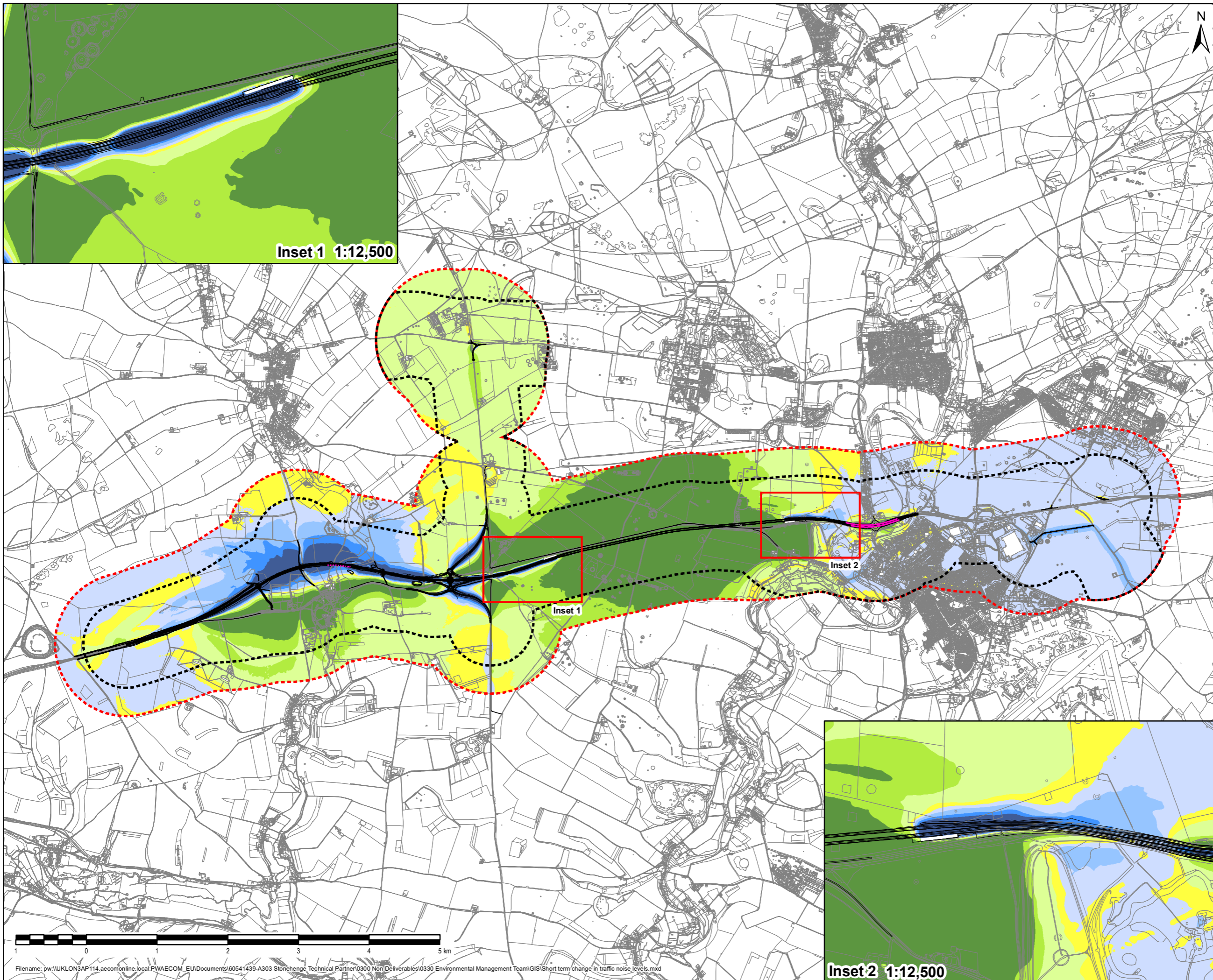
In relation to the point made about bus services, the question is whether extra bus services would be required to mitigate the impacts of the Scheme. The Applicant's position is that they are not.

In response to a question from the **Examining Authority** as to how the public sector duty has been discharged, **Laura Walker, on behalf of the Applicant** explained that compliance with the duties in the Equality Act 2010 has been demonstrated through the Equality Impact Assessment [APP-296] ("EqIA"). The EqIA has assessed impact on protected characteristic groups as defined by the Act and includes religion and belief. It assessed the findings of the ES, including in respect of cultural heritage and people and communities (including in relation to the importance of the World Heritage Site). Responses from stakeholder and public engagement have also been taken into consideration and further specific engagement has also taken place with protected groups, including religious groups. The EqIA also addresses the need for continued engagement with these groups, so as to minimise disruption.

In response to a comment from **Ms Fielden** in respect of a loss of the free view of the Stonehenge stones, **Steve McQuade, on behalf of the Applicant** explained that para 13.9.93 of the ES [APP-051] identifies that a new restricted byway would be created along the existing line of the A303. This would improve access to natural space in the location by the provision of this route. Byway 12

	<p>running North-South will not be directly affected and the only changes are the loss of the left-in and out movements onto the A303 from this Byway. These movements will be retained for non-motorised users. Mr McQuade also provided reassurance that Byway 12 will not be gated and this is provided for in the OEMP [REP3-006] - item P-PRoW4.</p> <p>Mr McQuade also confirmed that the current permissive access to National Trust land in the vicinity of the Stonehenge stones would not be affected by the Scheme. In addition, in respect of Solstice events, the Scheme would not materially change access and event management of such events, as currently undertaken.</p>
<p>8 <u>MITIGATION AND MONITORING</u></p> <p><u>Suitability and effectiveness of measures to mitigate significant adverse impacts, including:</u></p>	
<p><u>Agenda Item</u></p>	<p><u>Highways England response</u></p>
	<p><i>This item was covered in discussions on other items in the Agenda</i></p>

APPENDIX 1: Short term change in traffic noise levels at tunnel portals



NOTES / LEGEND

- Proposed route alignment
- 600m Noise Prediction Study Area
- 1km Study Area
- Noise Barrier
- Solid Parapet
- Building

Do Something Short Term Change: 2026 Do Something Minus 2026 Do Minimum LA10, 18h dB at 4m (free-field)

- >=5.0 Major increase
- +3.0 to +4.9 Moderate increase
- +1.0 to +2.9 Minor increase
- 0 to +0.9 Negligible increase
- <0 to -0.9 Negligible decrease
- 1.0 to -2.9 Minor decrease
- 3.0 to -4.9 Moderate decrease
- <=-5.0 Major decrease

Noise change bands correspond to the DMRB short term magnitude of change criteria. Note these are different to the long term magnitude of change bands used on Figure 9.3 and 9.5

Revision Details	By	Check	Date	Suffix

Purpose of Issue
Information Requested by the Examining Authority at Issue Specific Hearing on 12/06/2019

Client
Highways England

Working on behalf of
highways england

Project Title
A303 AMESBURY TO BERWICK DOWN

Drawing Title
**FIGURE 9.4
SHORT TERM CHANGE IN TRAFFIC NOISE LEVELS – 2026 DO-SOMETHING MINUS 2026 DO-MINIMUM INSETS ADDED AT PORTALS**

Designed	SS	Drawn	BM	Checked	CC	Approved	SS	Date
								21/06/19

Internal Project No. 60598638

Scale @ A3 1:50,000 Zone SW

© Crown copyright and database rights 2018 Ordnance Survey 100030649.

Highways England	Temple Quay House	2 The Square, Temple Quay	Bristol	BS1 6HA
Drawing Number HE551506	Highways England PIN	Originator AMW	Volume GEN	Rev 01
SCHEME WIDE	DR	GI	00607	
Location	Type	Role	Number	

APPENDIX 2: Do-Minimum and Do-Something Noise Levels in opening year



NOTES / LEGEND

- 600m Noise Prediction Study Area
- 1km Study Area
- Building

2026 Do Minimum Traffic Noise Levels

LA10, 18h dB at 4m (free-field)

- <= 45
- > 45 <= 50
- > 50 <= 55
- > 55 <= 60
- > 60 <= 65
- > 65 <= 70
- > 70 <= 75
- > 75

© Crown copyright and database rights 2018 Ordnance Survey 100030649.

Revision Details	By	Check	Date	Suffix

Purpose of Issue
Information Requested by the Examining Authority at Issue Specific Hearing on 12/06/2019

Client
Highways England Working on behalf of

Project Title
A303 AMESBURY TO BERWICK DOWN

Drawing Title
2026 DO-MINIMUM TRAFFIC NOISE LEVELS

Designed	Drawn	Checked	Approved	Date
SS	BM	CC	SS	19/06/19

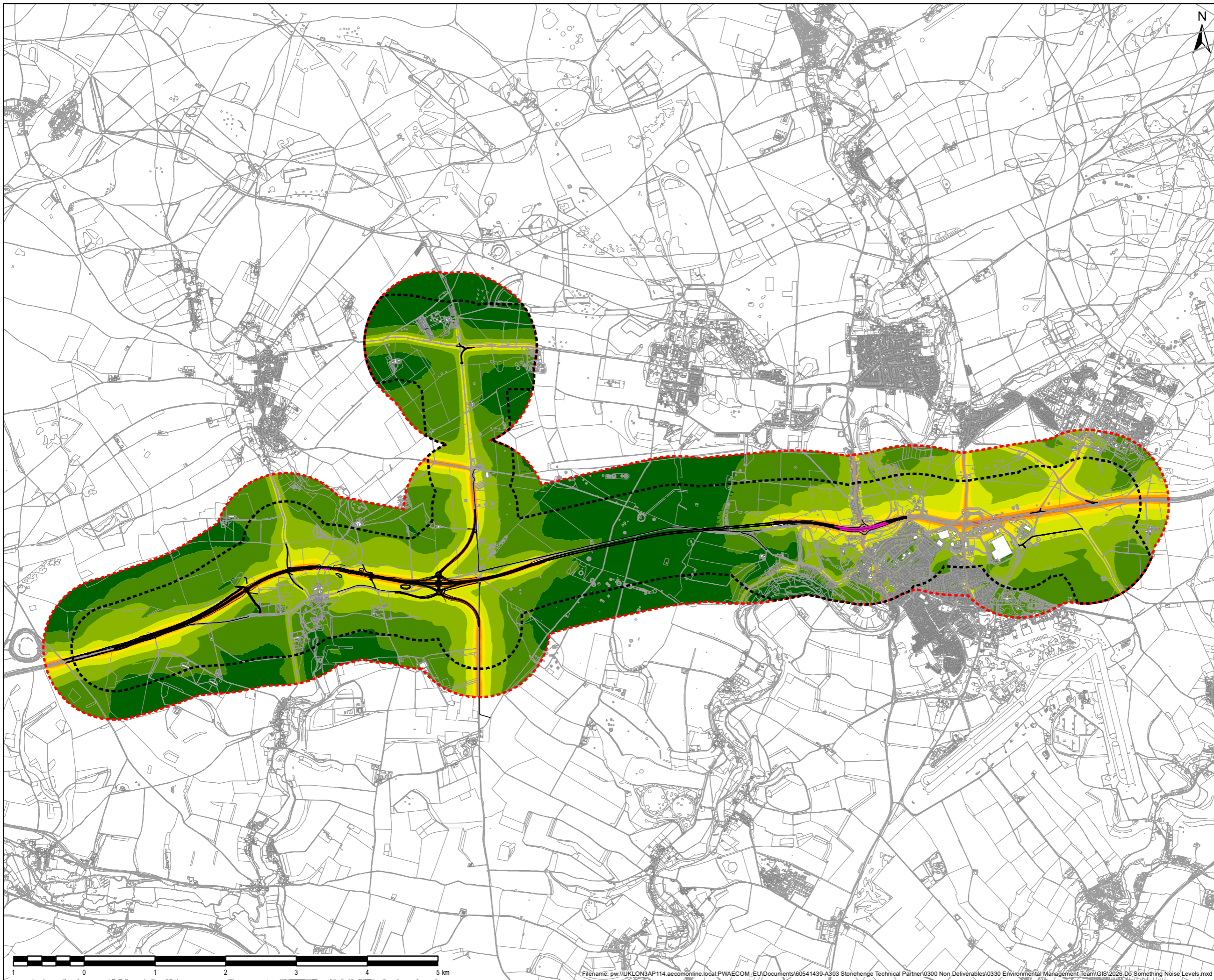
Internal Project No. **60598638**

Scale @ A3 **1:50,000** Zone **SW**

Highways England
Temple Quay House
2 The Square, Temple Quay
Bristol
BS1 6HA

Drawing Number	Highways England PIN	Originator	Volume	Rev
HE551506	AMW	GEN		02
SCHEME WIDE	DR	GI	00608	
Location	Type	Role	Number	





- NOTES / LEGEND
- 600m Noise Prediction Study Area
 - 1km Study Area
 - Building
 - Noise Barrier
 - Solid Parapet
 - Proposed route alignment
- 2026 Do Something
Traffic Noise Levels
LA10, 18h dB at 4m (free-field)**
- <= 45
 - > 45 <= 50
 - > 50 <= 55
 - > 55 <= 60
 - > 60 <= 65
 - > 65 <= 70
 - > 70 <= 75
 - > 75

© Crown copyright and database rights 2018 Ordnance Survey 100030649.

Revision Details	By	Check	Date	Suffix

Purpose of Issue
Information Requested by the Examining Authority at Issue Specific Hearing on 12/06/2019

Client
Highways England Working on behalf of

Project Title
A303 AMESBURY TO BERWICK DOWN

Drawing Title
2026 DO-SOMETHING TRAFFIC NOISE LEVELS

Designed	Drawn	Checked	Approved	Date
SS	BM	CC	SS	19/06/19

Internal Project No. 60598638
Scale @ A3 1:50,000 Zone SW

Highways England
Temple Quay House
2 The Square, Temple Quay
Bristol
BS1 6HA

Drawing Number	Highways England PIN	Originator	Volume	Rev
HE551506	AMW	GEN	02	
SCHEME WIDE	DR	GI	00609	
Location	Type	Role	Number	



APPENDIX 3: Construction Noise Sensitivity Analysis

Technical Note

Project:	A303 Amesbury to Berwick Down				
Title:	Construction Noise Assessment Sensitivity Analysis Technical Note				
Doc ID:	HE551506-AMW-ENV-SW_ZZ_ZZ_ZZ-TD-EN-0140				
Date:	20/06/19	Version:	1	Status:	Final
Doc Cat.	Unrestricted	Author:	LW		

Revision	Date	Prepared by	Reviewed by	Approved by
P01	20/06/19	Lisa Watt	Suzanne Scott	Steve McQuade

Introduction

The construction noise assessment set out in Chapter 9 Noise and Vibration of the Environmental Statement (ES) [APP-047] identified the risk of potentially significant adverse noise effects during construction. The assessment was based on reasonable worst case assumptions. Additional sensitivity testing has been undertaken to determine the potential reductions in noise levels that could be achieved by the selection of quieter plant and the use of site hoardings and screens.

Discussion

The construction noise assessment set out in Chapter 9 Noise and Vibration of the Environmental Statement (ES) [APP-047] is based on a number of robust assumptions including assuming all plant working at the closest approach to the receptor. The predicted construction noise levels represent the highest noise levels that would be expected during each quarter period. Whilst the noise assessment has assumed that these highest noise levels would last for the entire length of the relevant quarter, in practice noise at the levels assumed could exist only for a matter of days, or even hours. There would be regular periods within each quarter, even during the course of a single day, when the assumed plant would not be in operation, for example during breaks or changes in the working routine.

As detailed in paragraph 9.3.22 of the ES, the identification of significant adverse construction noise effects is primarily based on exceedance of the relevant Significant Observed Adverse Effect Level (SOAEL), and the risk of an exceedance occurring for more than 10 days in any 15, or 40 days or more in 6 months.

Additional sensitivity testing has been carried out to quantify potential reductions in construction noise levels that could be achieved by selection of quieter plant detailed in BS 5228:2009+A1:2014 and the use of site hoarding and screens. The selection of quiet plant and the use of site hoarding and screens is required as part of the application of Best Practicable Means (BPM). The use of BPM is secured in the Outline Environmental Management Plan (OEMP) [REP3-006] in MW-NOI1 and PW-NOI1. Compliance with the OEMP is secured by Paragraph 4 of Schedule 2 of the draft development consent order.

Technical Note

The sensitivity testing has focused on receptors where a risk of potential significant adverse effects during construction was identified in Chapter 9 of the ES [APP-047], namely at Countess Roundabout (receptors C8, C9 and C10, para 9.9.8 of the ES) and receptor C18, Foredown House at the River Till (para 9.9.11 of the ES).

By selecting the quietest plant detailed in the tables within Annex C and D of BS5228, plant source noise levels are reduced by between 3-5 dB. In practice there is plant available which is quieter than that detailed in the tables within Annex C and D of BS5228 and it is likely that further reductions could be expected beyond the 3-5 dB.

BS 5228 advises that the provision of acoustic barriers can provide a reduction in noise levels of 5 dB when the top of the plant is just visible over the noise barrier, and 10 dB when the plant is completely screened from a receptor. The use of site hoardings and screens would however, have only limited effectiveness for those construction activities undertaken at height at Countess Roundabout.

Construction noise levels have been estimated on a quarterly basis during the construction phase between 2021 Q3 until 2023 Q1 at receptors C8, C9, C10 (Countess roundabout receptors) and C18 (Foredown House). This period of the construction phase, 2021 Q3 until 2023 Q1, is where the risk of potential significant adverse construction noise impacts was previously identified in Chapter 9 of the ES [APP-047].

The results of the sensitivity testing indicate that by selecting quieter plant and using site hoardings and screens, predicted construction noise levels do not exceed the SOAEL throughout the works at Foredown House (C18) near the River Till crossing. At Diana's House (C10) at Countess Roundabout noise levels are below the SOAEL throughout the construction works. Therefore, the sensitivity testing indicates that there is the potential to avoid significant adverse construction noise effects at these locations.

At Lord's Croft (C9) to the south of Countess Roundabout, the sensitivity testing indicates that exceedances of the SOAEL could be reduced to a maximum of 2 dB and limited to only one quarter. Therefore, the risk of levels above the SOAEL occurring for more than 10 days in 15, or 40 days in 6 months is likely to be significantly reduced, and therefore there is the realistic potential to avoid significant adverse construction noise effects at this location.

At Countess Farm (C8), the closest receptor to the works at Countess Roundabout, the SOAEL is predicted to be exceeded, for short durations, during the early years of the construction. The number of quarters predicted to exceed the SOAEL is reduced from 8 as reported in the ES to 3. There is still a risk of noise levels above the SOAEL occurring for more than 10 days in 15, or 40 days in 6 months, and therefore the potential for a significant adverse construction noise effect remains at this receptor, though the magnitude and duration is reduced.

Conclusion

The initial sensitivity testing based on the selection of quieter plant detailed in BS 5228:2009+A1:2014 and the use of site hoarding has demonstrated that the risk of significant adverse noise effects during construction can be avoided at the majority of receptors. A risk remains of construction noise levels above the SOAEL at the closest receptors to works at Countess Roundabout during construction of the flyovers and slip roads. However, the risk of noise levels above the SOAEL occurring for more than 10 days

Technical Note

in 15, or 40 days in 6 months is reduced.

The assessment undertaken does not include noise reductions that could be achieved through the implementation of other BPM measures such as the use of enclosures and alternative quieter working methods. The OEMP requires the contractor to adopt BPM to minimise noise and vibration (PW-NOI1 and MW-NOI1) and to produce a Construction Noise and Vibration Management Plan (PW-NOI3, MW-NOI3).

If you need help accessing this or any other Highways England information, please call **0300 123 5000** and we will help you.

© Crown copyright 2017.

You may re-use this information (not including logos) free of charge in any format or medium, under the terms of the Open Government Licence. To view this licence: visit www.nationalarchives.gov.uk/doc/open-government-licence/ write to the **Information Policy Team, The National Archives, Kew, London TW9 4DU**, or email psi@nationalarchives.gsi.gov.uk.

This document is also available on our website at www.gov.uk/highways

If you have any enquiries about this publication email info@highwaysengland.co.uk or call **0300 123 5000**.*

*Calls to 03 numbers cost no more than a national rate call to an 01 or 02 number and must count towards any inclusive minutes in the same way as 01 and 02 calls. These rules apply to calls from any type of line including mobile, BT, other fixed line or payphone. Calls may be recorded or monitored.