

A303 Amesbury to Berwick Down

TR010025

Deadline 2
8.10.5 Cultural heritage (CH.1)

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The Infrastructure Planning (Examination Procedure) Rules 2010

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5 Cultural Heritage (CH.1)

Question CH.1.1

Para 6.4.1(f)

- i. When will the further archaeological evaluation of the part of the route covered by the Winterbourne Stoke bypass and the River Till crossing be available?
- ii. How is this and the archaeological evaluation fieldwork at Countess East and Amesbury Road to be incorporated in the ES assessments?
- iii. When will all other outstanding archaeological evaluation programmes be completed and will it then be necessary to amend the assessment of effects in the ES?
- iv. The ExA understands from para 45 of Wiltshire Council's [RR-2365] that an addendum to ES Chapter will be prepared once the field evaluations are complete – can you confirm?

Response

- i. **When will the further archaeological evaluation of the part of the route covered by the Winterbourne Stoke bypass and the River Till crossing be available?**
 1. The archaeological evaluation and survey reports were submitted to the Examination on 12 April, as promised at the Preliminary Meeting (see Examination Library Reference REP1-039 – REP1-056). These reports included reporting on confirmatory surveys and sampling consisting of geophysical survey and trial trenching on the Winterbourne Stoke Bypass (REP1-041, 049, 050, 052, 053). The River Till Crossing was included in the geophysical survey (REP1-041).
- ii. **How is this and the archaeological evaluation fieldwork at Countess East and Amesbury Road to be incorporated in the ES assessments?**
 2. The archaeological evaluation and survey reports provide the detail behind the results and baseline already reported in paragraphs 6.6.13-6.6.52 and 6.6.53-6.6.111, Appendix 6.2 and Figure 6.8 respectively of the Environmental Statement, and also incorporate the results of the confirmatory surveys and sampling on the Winterbourne Stoke Bypass, at Countess East and Amesbury Road. The results of this confirmatory survey and sampling work were reviewed against the archaeological baseline, approach to mitigation and assessment of effects presented in the Environmental Statement Chapter 6 - Cultural Heritage [APP-044] and Environmental Statement Appendix 6.2 - Archaeology Baseline Report [APP-211] and they confirm its findings. No changes to the conclusions as to the likely significant effects of the scheme were identified or were required. As a result, no change to the assessments in the Environmental Statement are required.

- iii. When will all other outstanding archaeological evaluation programmes be completed and will it then be necessary to amend the assessment of effects in the ES?**
3. All archaeological evaluation programmes have been completed, and the results reported in the reports submitted on 12 April. As set out in Highways England's letter dated 19 April enclosing Deadline 1 submissions, there are three reports requested to be published by HMAG which are to be published at Deadline 3: two short technical reports relating to the Western Portal Approaches on charcoal and snails respectively, and an assessment of flint and tree throw distributions. For the reasons set out in response to (ii) above, the assessment findings in the Environmental Statement remain valid and it is not necessary to amend the assessment.
- iv. The ExA understands from para 45 of Wiltshire Council's [RR-2365] that an addendum to ES Chapter will be prepared once the field evaluations are complete – can you confirm?**
4. No addendum to the Environmental Statement will be provided, as the results reported in the Environmental Statement are not changed as a result of the archaeological evaluation and survey reports, as set out above.

Question CH.1.2

Para 6.4(i)

- i. How will settlement of the surrounding ground and the effects on ground water associated with the tunnel and cutting works be monitored?
- ii. What would be the acceptable limits with regard to the effect on heritage assets, and how would these be secured in the DCO?
- iii. Please set out the measures to be taken to ensure the protection of the assets during these works, and the range of responses available to unfavourable reactions.

Response

- i. **How will settlement of the surrounding ground and the effects on ground water associated with the tunnel and cutting works be monitored?**
 1. Settlement: The Land Instability Risk Assessment (Environmental Statement Appendix 10.6 [APP-278]) includes the initial tunnelling induced ground settlement. Settlement impacts may occur in areas associated with the tunnel and cutting works. Settlement can result in a change to surface and sub-surface conditions. The effects of settlement may not be noticeable at ground level because the undulation of the natural surface is much greater and tends to mask subsidence movements. The level of impact that can occur to surface and sub-surface features depends on the magnitude of movement that occurs, and the sensitivity of each feature to these movements. Movements that are sensitive to one feature might easily be accommodated by another.
 2. Items PW-CH1 and MW-CH1 of the Outline Environmental Management Plan (OEMP) [APP-187] require the preliminary works and main works contractors to produce Heritage Management Plans indicating how the historic environment is to be protected in a consistent and integrated manner, coordinated with all other relevant environmental topics. This includes the potential indirect impacts on heritage from activities such as ground vibration, ground movement / subsidence and dewatering. Items PW-NO14 and MW-NO15 of the OEMP [APP-187] identify industry guidance that the preliminary works and main works contractors are to follow in relation to controls and working methods for managing vibration. This guidance specifically refers to groundborne vibration from tunnelling. They also require the preliminary works and main works contractors to identify any potentially vibration sensitive cultural heritage assets and actions to control or mitigate impacts, including monitoring.
 3. Notwithstanding the above, in the next iteration of the OEMP a specific item will be added to require a ground movement monitoring strategy to be developed by the main works contractor
 4. Groundwater: In terms of archaeological preservation it is not anticipated that any waterlogged or anoxic palaeoenvironmental deposits would be affected by the insignificant predicted changes to the groundwater regime, or that changes would

result in any adverse dewatering or re-watering of deposits (paragraphs 11.9.6 and 11.9.7 of Chapter 11 [APP-49] and Table 6.4 and para 6.6.4 of Appendix 11.4 [APP-282]). Dewatering during construction would be minimised as far as reasonably practicable. The current proposal assumes the use of a closed-face Tunnel Boring Machine (TBM) that limits the requirement for dewatering during construction. The assessment of risk and identification of any required mitigation measures will be achieved through the Outline Environmental Management Plan (OEMP) (ref: MW-WAT8) (Environmental Statement Appendix 2.2 [APP-187] and the Groundwater Management Plan required by item MW-WAT10.

5. Item MW-WAT10 of the OEMP requires the main works contractor to develop a Groundwater Management Plan (GMP), which is to include provisions for the main works contractor to develop a groundwater level monitoring programme. The implementation of the OEMP is secured by Requirement 4 of schedule 2 of the draft DCO.
6. The groundwater-related monitoring strategy for the tunnel impacts is set out in the, Groundwater Risk Assessment (Environmental Statement Appendix 11.4 [APP-282, section 7.2]). The OEMP sets out that the Groundwater Management Plan required by item MW-WAT10 must include the groundwater level and water quality monitoring and reporting programme.

ii. What would be the acceptable limits with regard to the effect on heritage assets, and how would these be secured in the DCO?

7. Settlement: The predicted effects of excavation induced ground settlement have been considered as part of a staged assessment used in tunnelling to determine the zone of influence and potential structures and archaeology affected during construction (see Environmental Statement Appendix 10.6 - Land Instability Risk Assessment [APP-278, Section 6.4]. The installation of monitoring equipment and programme of monitoring to monitor ground movement above the tunnel will be included as part of the Heritage Management Plan required by item PW-CH1 and MW-CH1 of the Outline Environmental Management Plan.
8. Environmental Statement Chapter 6 - Cultural Heritage [APP-044] notes that “It is assumed that ground settlement will be minimal at the surface from the boring of the twin bored tunnel and any changes to heritage assets on the surface would be negligible and imperceptible to the eye.” [APP-044, para. 6.4.1 (i)], and “It is assumed that vertical and lateral displacement from the excavation of deep cuttings or the retained cut will be minimal and any changes to heritage assets on the surface would be negligible and imperceptible to the eye” [APP-044, para. 6.4.1 (j)]. These assumptions were made pursuant to section 6.4 of the Land Instability Risk Assessment [APP-278] which indicates that ground surface movement above the tunnel will be limited to 20-30mm as a maximum.
9. The monitoring methodology instigated as part of the Heritage Management Plan will consider acceptable levels and identify the associated action in response as part of a pre-planned contingency plan. The general principle is to control the

works such that unacceptable levels are not breached, and put in place a warning of trends which may approach unacceptable levels.

10. The Land Instability Risk Assessment (Environmental Statement Appendix 10.6 [APP-278]) includes the initial tunnelling induced ground settlement and demonstrates that the Stonehenge Monument falls well outside the 1mm settlement contour used to delineate the zone affected by the works. For this reason, monitoring at the Stonehenge Monument is not required.
 11. Groundwater: For groundwater, the predicted changes in groundwater levels in the ES do not result in any significant effects and are well within the range of seasonal variability of ground water levels. The Applicant notes that Environmental Statement, Appendix 11.4 - Groundwater Risk Assessment, Road Drainage and the Water Environment notes that *“Trigger levels for notification of changes beyond those predicted will be developed towards the end of the baseline monitoring period and prior to the commencement of construction.”* [APP-282, para. 7.2.5]. The assessment of risk and identification of any required mitigation measures for ground water will be achieved through the Outline Environmental Management Plan (OEMP) (ref: MW-WAT8) (Environmental Statement Appendix 2.2 [APP-187] and the Groundwater Management Plan required by item MW-WAT9.
- iii. Please set out the measures to be taken to ensure the protection of the assets during these works, and the range of responses available to unfavourable reactions.**
12. To confirm the absence of any adverse influence regardless of predicted effects, monitoring regimes shall be developed by the appointed contractor. It is anticipated that for settlement, this will include monitoring points (settlement markers such as steel pins, inclinometers and extensometers) with manual monitoring by carrying out a levelling survey or by a fixed monitoring instrument. The installation of monitoring equipment and programme of monitoring to monitor ground movement above the tunnel will be included as part of the Heritage Management Plan required by item PW-CH1 and MW-CH1 of the Outline Environmental Management Plan For groundwater levels, it will involve a piezometer telemetry system; groundwater quality monitoring will be undertaken for a range of baseline parameters. The assessment of risk and identification of any required mitigation measures for ground water will be achieved through the Outline Environmental Management Plan (OEMP) (ref: MW-WAT8) (Environmental Statement Appendix 2.2 [APP-187] and the Groundwater Management Plan required by item MW-WAT9. The contractor’s monitoring during construction will continue until such time as there is no further movement measured. The implementation of the OEMP is secured by Requirement 4 of schedule 2 of the draft DCO
 13. For both groundwater (paragraphs 11.9.6 and 11.9.7 of Chapter 11 [APP-49]) and for settlement [The Land Instability Risk Assessment (Environmental Statement Appendix 10.6 [APP-278, Sections 6.4], significant effects are not predicted. The monitoring regimes outlined above will ensure that the predicted

levels of settlement and groundwater level will be monitored by the appointed contractor. In the unlikely event of monitoring showing that that is not the case and heritage assets being subject to significant effects, responses could include appropriate in-tunnel mitigation measures.

14. The approach to dealing with asset protection requires a detailed consideration of the most appropriate method to use during tunnelling based on an assessment and understanding of the geological and hydrogeological conditions in addition to the acceptable levels determined for the heritage assets as referenced in part (ii). Our current proposal assumes the use of a closed-face TBM for the main tunnel construction as this is considered to be the best option for tunnelling under these conditions as it provides greater control on settlement and removes the need for dewatering. It will be the responsibility of the contractor to ensure risks are assessed and mitigated in their safe systems of work during construction.
15. As part of this plan, the contractor will develop contingencies using a suite of tool box items from further investigation, assessment and monitoring during construction to identify measures to ensure the protection of assets. This could range from simply slowing down the TBM to instigating ground stabilisation measures including grouting. Where the need for ground stabilisation is identified this will be undertaken from inside the main tunnel bore where it is safe and practicable to do so in preference to surface intervention. Other methods for the ground stabilisation specifically for construction of the cross-passage tunnels could include fissure grouting and local face depressurisation facilitated from the main TBM tunnels; further enhanced ground support can be provided by the installation of pipe umbrellas or spiles. These methods have been successfully employed on the recent (2013) Crossrail C310 Thames Tunnel project through the chalk aquifer.

Question CH.1.3

How would the effects of vibration on heritage assets incurred during construction, either directly or arising from haulage or compound activities, be monitored and harm prevented?

Response

1. The Outline Environmental Management Plan (OEMP) [APP-187] sets out general and topic-specific principles and requirements for the control, mitigation and monitoring of potential construction impacts. With regard to vibration this includes the use of Best Practicable Means (BPM) (PW-NOI1, MW-NOI1) and the development of the Construction and Environmental Management Plan, to which the Noise and Vibration Management Plan will be appended [MW-G7], in consultation with Wiltshire Council [OEMP item: MW-G5]., which will include the proposed monitoring regime. The OEMP is secured by paragraph 4 in Schedule 2 to the draft Development Consent Order [APP-020].
2. The draft Detailed Archaeological Mitigation Strategy (DAMS), submitted at Deadline 2, developed in consultation with Wiltshire Council Archaeology Service (WCAS) and the Heritage Monitoring and Advisory Group (HMAG) will be a certified document and its implementation is secured by paragraph 5 of Schedule 2 of the draft Development Consent Order [APP-020]. The DAMS includes details of archaeological mitigation and also identifies areas to be protected in situ, including the placement of ground movement and vibration monitoring stations above and perpendicular to the line of the tunnel.
3. The DAMS and the OEMP both require the development of a Scheme-wide Heritage Management Plan for the Main Works phase (detailed in the OEMP [APP-187, MW-CH1]) which will indicate how the historic environment is to be protected in a consistent and integrated manner including the effects of construction (including vibration). This will include the monitoring of heritage assets scheduled in the OEMP [APP-187, MW-CH7] that may be sensitive to vibration and agreement on actions to control/mitigate impacts to minimise as far as reasonably practicable vibration and settlement impacts on archaeological remains. The HMP will be developed in consultation with HMAG. The DAMS also sets out a monitoring programme for areas that are being preserved in situ (for example, those heritage assets situated above the tunnel). This will include condition surveys in advance of the works, and monitoring at identified sensitive assets during the works.
4. Chapter 9 of the ES, Noise and Vibration, [APP-047] outlines the assessment completed for vibration impacts during the construction works. Based on the proposed working methods and plant provided by the contractor, the assessment focusses on vibration from the operation of the Tunnel Boring Machine (TBM) and the use of vibratory rollers/compactors for pavement works. At Stonehenge the vibration levels are half the Lowest Observed Adverse Effect Level (LOAEL) for annoyance (paragraph 9.9.21), therefore no impact is anticipated.

5. The Heritage Impact Assessment [APP-195, para. 9.2.8] notes that the tunnel passes directly beneath a long barrow 250m north of Normanton Gorse (NHLE no. 1008953). The long barrow is a small, consolidated earthwork which has settled to its present state over c.5000 years and is unlikely to contain any voids. Significant impacts due to construction vibration are not anticipated, however, as a precautionary approach, monitoring at this feature is proposed during tunnelling works.
6. Haulage and compound activities are not anticipated to be a significant source of vibration. The surface of the haul roads and site compounds will be maintained in good condition as stated in the OEMP [APP-187, MW-AIR2]. The draft DAMS submitted at Deadline 2 identifies a number of locations where suitable fill material on top of a protective barrier membrane will be used to bury sensitive archaeological remains to ensure that they are not disturbed during construction and to preserve them for future generations. These include areas at the Winterbourne Stoke and Countess compounds. Site specific Method Statements will be developed by the contractor which will set out suitable methodologies for filling areas without disturbing or impacting sensitive archaeological remains, and also for removing the fill at the end of construction. The Method Statements will be prepared in consultation with HMAG and Wiltshire Council. Toolbox talks will be undertaken to inform construction supervision staff and site operatives of the relevant procedures.

Question CH.1.4

Para 6.5.4: HIA Study Area

The HIA study area comprises the whole of the Stonehenge part of the Stonehenge, Avebury and Associated Sites WHS and its setting, thereby excluding parts of the overall WHS.

How are we to judge the effect of the scheme on the WHS as a whole?

Response

1. The Heritage Impact Assessment (HIA) (see Environmental Statement Appendix 6.1, [APP-195]) was prepared in line with the Guidance on Heritage Impact Assessments for Cultural World Heritage Properties adopted by the International Council on Monuments and Sites (ICOMOS 2011), which aims to deliver relevant assessments. The guidance notes that "It should describe the condition of the whole and of individual attributes and components, physical characteristics, sensitive viewpoints and intangible associations which may relate to attributes. This should focus on areas affected in particular but must include a description of the whole."
2. The elements of the WHS that would be affected by the Scheme have been assessed in the Heritage Impact Assessment [APP-195], and therefore the conclusions with respect to the impact on the WHS as a whole and its OUV are for the entire WHS.
3. The HIA is underpinned by a number of joint documents that address both the Stonehenge and Avebury parts, including the retrospective Statement of Outstanding Universal Value (UNESCO 2013), the 2015 World Heritage Site (WHS) Management Plan (Simmonds & Thomas 2015), and the Research Framework for the Stonehenge, Avebury and Associated Sites WHS (Leivers & Powell 2016).
4. The HIA was carried out in accordance with the methodology set out in the HIA Scoping Report, which was endorsed by the Heritage Monitoring and Advisory Group and UNESCO/ICOMOS [APP-195, section 3.3, paras 3.3.4-3.3.6 and REP1-008, Section 5.6]. The selection of this study area was guided by previous assessment work related to developments within the Stonehenge part of the WHS [APP-195, para. 5.10.9], and the scope of the HIA was discussed and agreed with HMAG and the WHS Coordination Unit.
5. A baseline overview of the Avebury element of the WHS is provided in the HIA [APP-195, section 6.11], and relevant summary information on Avebury is also incorporated into the HIA sections on tourism and visitor experience [APP-195, section 6.12] and impacts and effects on the Avebury part of the WHS [APP-195, section 9.3].
6. The HIA acknowledges that the effects of the Scheme may extend beyond the boundaries of the Stonehenge part of the WHS, and therefore also considers indirect, secondary, in-combination and cumulative impacts and effects upon the

OUV of the Avebury part of the WHS [APP-195, para. 5.10.2]. The HIA notes that "In the main, only the Stonehenge element of the WHS would be affected by the Scheme, and this part of the combined WHS is the predominant focus of this HIA. However, where the Scheme has the potential for temporary effects on the Avebury part of the WHS, for instance following possible changes in visitor patterns during construction, these are also assessed." [APP-195, para. 6.6.5]. Given the distance of the works from the Avebury element of the WHS (40km), the Scheme will have no direct physical impacts on it.

7. In terms of in-direct impacts on Avebury, as set out in the Heritage Impact Assessment, paragraphs 9.3.66 and 9.3.67 [APP-195], there was insufficient baseline data from heritage partners regarding current visitor flows and characteristics to enable assessment of potential change during scheme construction or operation. However, it is pertinent to note that the characteristics of visitors to Stonehenge and Avebury are distinct; those visiting Stonehenge are often either from the international market, visiting iconic tourist attractions, or part of an organised tour; those visiting Avebury are often more dedicated, in-country visitors interested in the prehistoric period and its monuments. As the existing A303 will remain open throughout construction, and because of the different nature of visitor each site attracts, it is not anticipated that visitors and tour operators will change their tour schedule to visit Avebury rather than Stonehenge during construction, or following scheme opening and in the operational phase. It is therefore expected that the construction or operation of the Scheme will not have an in-direct impact on Avebury.

Question CH.1.5

Para 6.6.27 *et seq*

What evidence is there of changes to the Neolithic population associated with immigration of the Beaker people, and how does this relate to different phases in the construction and use of Stonehenge and its monuments?

Response

1. The Neolithic to Bronze Age transition and 'Beaker tradition' material culture, as well as hypotheses regarding migration, are described in Environmental Statement Appendix 6.2 - Archaeology Baseline Report [APP-211, Section 3.5], and the results of the Beaker People Project/Beaker Isotope Project: mobility, migration and diet in the British Early Bronze Age are summarised in Environmental Statement Appendix 6.1 Annex 4, 'previous archaeological and antiquarian investigations within the Stonehenge part of the WHS' [APP-199, para. 8.8.2]. The chronological development of the Stonehenge monument is detailed in Environmental Statement Appendix 6.2 - Archaeology Baseline Report [APP-211, paras. 3.5.12–3.5.17], which also considers the chronological sequence of archaeological features and sites in the wider landscape in the Early to Middle Neolithic (c. 4000 – 2900 BC) [APP-211, section 3.4], the Late Neolithic (c. 2900 – 2200 BC) and Early to Middle Bronze Age (c. 2600 – 1600 BC and c. 1600 – 1200 BC) [APP-211, section 3.5]. There is continuing debate in academic circles as to whether the arrival of 'Beaker tradition' material culture was associated with immigrants to Britain or not. It would be highly conjectural to try to tie the different phases in the construction and use of Stonehenge and its monuments to a particular group of immigrants / indigenous people on present evidence. Highways England therefore cautions against entering into this academic debate at this time with regard to this examination as it does not have a bearing on the outcome of the examination.

Question CH.1.6

Para 6.6.32 *et seq*

The archaeological remains which might be disturbed by the construction of the new Longbarrow junction appear quite significant.

- i. What scope is there for adjusting the layout to allow greater preservation in situ?
- ii. What other means of protection are proposed?

Response

i. What scope is there for adjusting the layout to allow greater preservation in situ?

1. As set out in Table 6.11 of the Environmental Statement Chapter 6 [APP-044], and as has been agreed with Wiltshire Council and HMAG, the enclosure, Oatlands Hill, Oval or C-shaped enclosure (UID2072, MWI7210) is of medium (Regional) value. The enclosure does not contribute to the OUV of the WHS, being of Late Bronze Age date and is not of schedulable quality. On that basis it would not qualify as "quite significant".
2. However, in carrying out a thorough assessment of the proposed Scheme, options were considered for preserving the archaeological remains in situ. This assessment concluded that none of the feasible alternatives had fewer impacts than the element proposed as part of the Scheme. Appropriate archaeological mitigation measures for that element are set out in the draft Detailed Archaeological Mitigation Strategy (DAMS) for the C-shaped enclosure (Site 16.2) and associated archaeological remains, in order to archaeologically excavate and record the site during the preliminary works phase and prior to construction (the Main Works phase).
3. In order to assist the Examining Authority, we set out below the options that were considered to preserve the archaeological remains in situ, alongside an explanation of why the option was unfeasible therefore had to be discounted. As these unfeasible options make clear, there is no scope for adjusting the layout to allow greater preservation in situ:
4. Moving the junction 300m to the west: This option was considered, however it would bring the junction too close to the village of Winterbourne Stoke and would negatively impact upon traffic flows. As such, this option was rejected.
5. Shifting the South dumbbell (of the proposed Longbarrow Junction) 100m to the east: This option would result in a skewed bridge, resulting in increased engineering complexity and cost. It would also bring the roundabout too close to the World Heritage Site (WHS) and the west off slip would require land-take within the WHS. This option was rejected for these reasons.
6. Shifting the South dumbbell 170m to the west: This option would result in a skewed bridge (resulting in increased engineering complexity and costs),

departures from standards for visibility reasons in both roundabout approaches and exits and would require the construction of a 160m long retaining wall for the westbound off slip, which would be 12m high at its highest point and would be visible from the WHS (AG12 Winterbourne Stoke Crossroads Barrows). This option was rejected for these reasons.

ii. What other means of protection are proposed?

7. No feasible solution was found to preserve the archaeological remains in situ. The archaeological remains will be archaeologically excavated and recorded during the preliminary works phase and in advance of construction. As mentioned above, these measures are set out in the draft DAMS submitted at deadline 2, Appendix E, Site 16.2. The DAMS is being developed in consultation with Wiltshire Council Archaeology Service and the Heritage Monitoring Advisory Group prior to the end of the Examination and is secured by Requirement 5 of Schedule 2 of the draft Development Consent Order [APP-020].

Question CH.1.7

Para 6.6.62: Monument groups omitted from the assessment baseline

This appears to be on the grounds of lack of intervisibility, however the setting may be dependent on non-visible factors such as cultural or historic connections.

Has this point been considered?

Response

1. Yes, it has been considered in detail. The process of establishing the assessment baseline relied on both visible and non-visible factors such as cultural or historic connections.
2. The rationale for the selection of Asset Groups conveying Attributes of Outstanding Universal Value (OUV) is detailed in Environmental Statement Appendix 6.1 - Heritage Impact Assessment [APP-195], paragraphs 5.10.6 - 5.10.33, and relies both on visible and non-visible factors. The context of monument groups and relationships between them were identified via a range of studies including:
 - Environmental Statement Appendix 6.1 Annex 4 - Previous archaeological and antiquarian investigations within the Stonehenge part of the WHS [APP-199];
 - Environmental Statement Appendix 6.1 Annex 5 - Astronomy and Archeoastronomy [APP-200];
 - Environmental Statement Appendix 6.1 Annex 6 - Influences of the monuments and landscape of the Stonehenge part of the World Heritage Site on architects, historians and archaeologists [APP-201];
 - Environmental Statement Appendix 6.1 Annex 7 - Influences of the monuments and landscape of the Stonehenge part of the World Heritage Site on artists [APP-202];
 - Environmental Statement Appendix 6.1 Annex 8 - Influences of the monuments and landscape of the Stonehenge part of the World Heritage Site on literature and popular culture [APP-203]; and
 - Environmental Statement Appendix 6.9 - Cultural Heritage Setting Assessment [APP-218].
3. These studies sought to draw out non-visual contextual relationships: including cultural, artistic, astronomical, intellectual, spatial and functional relationships relevant to the significance of the assets and Asset Groups, which are set out in the Asset Group assessments in Section 6.9 of the HIA [APP-195]. These contextual and associative relationships are noted in the HIA [APP-195], irrespective of distance. However, they are not considered part of an asset's setting, and it is not considered that the Scheme would impact upon such associative relationships in relation to the Rox Hill Barrow Cemetery, Wilsford

Barrow Cemetery, Lake Down Barrow Cemetery and the Lake House Barrow Cemetery which were scoped out of the Heritage Impact Assessment.

4. The Setting of Heritage Assets Historic Environment Good Practice Advice in Planning: 3 (Historic England 2017) notes that "The extent and importance of setting is often expressed by reference to visual considerations. Although views of or from an asset will play an important part, the way in which we experience an asset in its setting is also influenced by other environmental factors such as noise, dust and vibration from other land uses in the vicinity, and by our understanding of the historic relationship between places. For example, buildings that are in close proximity but are not visible from each other may have a historic or aesthetic connection that amplifies the experience of the significance of each." This interplay between monument groups is particularly apparent in those with visual relationships; however, it is also relevant in the case of certain monuments with 'hidden' areas, such as the Greater Cursus. As indicated in the HIA [APP-195], paragraph 6.9.12, localised variations in topography, ridge-line views and inter-monumental views (and restricted views, such as the Cursus and Stonehenge Bottom) are key factors in understanding the distribution and grouping of monuments. In relation to the Rox Hill Barrow Cemetery, Wilsford Barrow Cemetery, Lake Down Barrow Cemetery and the Lake House Barrow Cemetery, how these Asset Groups are experienced within the southern part of the WHS landscape and their interplay with other Asset Groups and isolated monuments within the WHS will be unaffected by the Scheme.
5. The Setting Assessment [APP-218], paragraph 3.6.4, notes that "the assessment takes a deliberately cautious approach, recognising the fact that we know remarkably little about the way that this landscape was used and experienced during prehistory". Where intervening topography resulted in a lack of inter-visibility, consideration was given to including assets due to aspects such as spatial patterning, positioning in relation to earlier landscape features, chronological context and sequence, watercourses and watersheds, similarities in monument form and function, parallels in terms of cultural material and historical associations. With regards to the Rox Hill Barrow Cemetery, Wilsford Barrow Cemetery, Lake Down Barrow Cemetery and the Lake House Barrow Cemetery none of these factors would materially change with the construction of the Scheme and therefore they were scoped out of the Heritage Impact Assessment.

Question CH.1.8

Para 6.6.106

We are told that both Vespasian's Camp and Blick Mead fall within the Grade II* Amesbury Abbey Park (NHLE 1000469). There is a setting assessment in Appendix 6.9 for Vespasian's Camp (AG32) and separately for Amesbury Abbey Grade II* RPG (6053), but Blick Mead is included in neither, and no setting information for it appears elsewhere.

Because of the historical and cultural importance of Blick Mead, with its Mesolithic connections to the Stonehenge complex, and the fact that it would be overlooked by the Countess flyover, does not Blick Mead deserve a setting assessment?

Response

1. For the reasons set out below, the Applicant considers that Blick Mead has been adequately assessed as part of the assessment of Amesbury Abbey Park (within which Blick Mead is wholly contained) that is reported in the ES and summarised below, therefore that no further setting assessment is required. The conclusion of that assessment, as reported in the ES, is that the setting of Blick Mead will remain unchanged as a result of the Scheme.
2. Environmental Statement (ES) Appendix 6.9 - Cultural Heritage Setting Assessment (the Setting Assessment) notes that "The 2km study area contains a very large number of heritage assets, only a proportion of which are potentially affected by the Scheme" [APP-218, para 3.2.1]. Archaeological assets assessed in the Setting Assessment encompass "all high and very high value Asset Groups and discrete assets whose settings are potentially changed by the Scheme" [APP-218, para 3.3.1]. Although Blick Mead is noted as of high value in the ES, it is set wholly within the Grade II* Amesbury Abbey Park (NHLE 1000469) and is not in a prominent landscape position, unlike the earthworks that comprise Vespasian's Camp. It was therefore determined that the assessment of the setting of Amesbury Abbey Park would necessarily include the setting of Blick Mead and as such a separate setting assessment was not required for the Blick Mead asset. The remainder of this note sets out the reasons for this, including the context, experience and setting of the Blick Mead asset.
3. Land between the Scheme and Blick Mead is heavily wooded, which provides visual screening of the Blick Mead archaeological site. The road would be at grade as it passes the Blick Mead site to the north (as with the existing A303). Blick Mead's current setting, as it is experienced today, is characterised by the wooded parkland landscape of Amesbury Abbey, which restricts views in and out. This setting, and its relationship to the existing road, would not change through the construction of the Scheme. The flyover as it crosses over the current Countess Roundabout is located c.470m to the east-north-east and is visually screened from the site by woodland.
4. The ES Chapter 6 - Cultural Heritage notes that "Both Vespasian's Camp and Blick Mead fall within the Grade II* Amesbury Abbey Park (NHLE 1000469),

which occupies all of the land immediately south of the Scheme for the kilometre leading up to the existing Countess Roundabout" [APP-044, para. 6.6.106]. The 18th and 19th century Amesbury Abbey Park comprises the surroundings in which the Blick Mead archaeological site is experienced.

5. There is insufficient palaeoenvironmental evidence to inform a reconstruction of a point-in-time appearance of a past Mesolithic landscape, or to link such a model to any evidence for past landscape use, experience, continuity or revival. The current setting of the Blick Mead archaeological site, wholly within the 18th-19th century Grade II* Amesbury Abbey Park, is therefore the appropriate context for the setting of this archaeological site.
6. Consideration in the ES of the Current Blick Meads Site's Context, Experience, and Setting, including impact of the scheme on Blick Mead
7. While the ES does not consider the setting of Blick Mead alone, it does consider its context, experience, and the setting of the Amesbury Park within which it is contained. Importantly, it also considers the impacts of the Scheme on Blick Mead and concludes no change and a neutral effect. Further detail follows.

Context

8. The context of the Blick Mead site is its underlying topography and its relationship to the River Avon, within its setting of the Amesbury Park. It is part of a wider distribution of Mesolithic sites within the landscape, described in ES Appendix 6.2 Archaeology Baseline Report [APP-211]. This notes that "Several sites investigated within the WHS have illustrated the potential for Mesolithic remains, and land surfaces occupied during this period, to be obscured beneath later prehistoric alluvium and colluvium, particularly on the margins of the River Avon and on the lower parts of slopes and within dry valleys. Perhaps the primary example of this site type is the important Mesolithic site revealed by excavations undertaken since 2005 at Blick Mead (UID 4032), situated adjacent to a spring line overlooked by the Iron Age hillfort known as Vespasian's Camp (Jacques et al., 2014). The investigations have recovered large assemblages of lithic material (in excess of 30,000 pieces of struck flint, the majority of which was recovered from an area of 16m²), along with faunal remains (notably including an assemblage of aurochs bone, some of which exhibited signs of butchery) and sources of palaeoenvironmental data from within, and sealed by, sequences of water-lain clays and silts (Jacques et al., 2018). This has been interpreted as evidence for a sustained or repeated large-scale presence at the site for a span of almost 4000 years, from the 9th to 7th millennia BC, possibly continuing into the 5th millennium BC." [APP-211, para. 3.3.8].

Experience

9. In terms of experience of the asset (cultural associations, traditions and patterns of use), the annual winter solstice lantern parade which ends at Blick Mead is noted in the ES Appendix 6.1 - Heritage Impact Assessment [APP-195, 6.16.14]. The first lantern parade took place in 2011. The Heritage Impact Assessment [APP-195, para. 9.3.68] notes a Large Beneficial effect on AG27 the Avenue

(which the lantern parade broadly follows to King Barrow Ridge, then Stonehenge Road in to Amesbury, and on to the Blick Mead archaeological site within Amesbury Abbey Park).

The Scheme impacts on the Blick Mead archaeological site

10. The Scheme alignment has been optimised past the Blick Mead archaeological site, to avoid land-take and to keep the road at existing grade. Ground water modelling indicates no impact on Blick Mead (Abbey Pond) or the River Avon (see Blick Mead Tiered Assessment presented, ES Appendix 11.4 - Groundwater Risk Assessment, Annex 3 [APP-282]). The ES therefore reports No change and a Neutral Effect on the Blick Mead archaeological site (Appendix 6.8 - Cultural Heritage - Summary of non-significant effects [APP-217, page 5]).

Setting - The Grade II* Amesbury Abbey Park

11. The ES Appendix 6.9 - Cultural Heritage Setting Assessment [APP-218] sets out the setting assessment for the Grade II* Amesbury Abbey Park. This notes that "There would be an impact on the northern boundary and part of the eastern boundary of Amesbury Abbey RPG as a result of the Scheme. However, that impact would not extend far into the RPG due to screening provided by the dense vegetation that covers the majority of the northern part of the asset. The settings of the majority of assets (which would include the Blick Mead archaeological site) within the park would be unchanged as a result of the Scheme" [APP-218, para. 3.4.10]. "The Scheme would run from west to east to the north of the northern boundary of the park, taking much the same route as the current A303 apart from the approach to the eastern tunnel portal to the north of Vespasian's Camp in the north-west corner of the park. Here, the new road would run in cutting (Amesbury cutting), climbing gently to the east towards the proposed new grade separated Countess Junction in the location of the present Countess Roundabout. The junction would comprise a flyover (Countess Flyover) across the centre of the current roundabout with bridges over the carriageways of Countess Road and ramps (Countess eastern and western diverges) to the east and west. The flyover would be provided with acoustic fencing to both sides. The majority of the park (including the Blick Mead archaeological site) would be screened from the Scheme by the natural landform and the dense vegetation along the northern boundary of the park to the west of the proposed new grade separated Countess Junction." [APP-218, pp. 127-128].
12. As these quotations demonstrate, the setting of Blick Mead would be unchanged as a result of the Scheme and is, in any event, protected by the natural landform by substantial vegetative screening.
13. In conclusion, although Blick Mead is noted as of high value in the ES, it is set wholly within the Grade II* Amesbury Abbey Park. The setting assessment for the northern part of the Abbey grounds adjacent to the existing A303 as reported in the ES Appendix 6.9 - Cultural Heritage Setting Assessment [APP-218] is relevant to the current setting of the Blick Mead archaeological site. A separate

setting assessment was therefore not undertaken for this site, and in any event its setting will not change as a result of the construction of the Scheme.

Question CH.1.9

Para 6.7.2

It is noted that, for the purposes of the cultural heritage assessment, the construction phase is defined as the temporary activities involved in building the scheme and the subsequent permanent presence of the scheme once constructed [and] the operational phase comprises the situation when the scheme is being used by traffic. This is confusing. Surely the substantive division should be between the temporary effects experienced during construction and the permanent effects remaining after construction in the operational phase. This is the approach taken in the landscape and visual analysis.

Why has a different approach been taken in the cultural heritage assessment?

Response

1. The approach taken in Chapter 6: Cultural Heritage of the Environmental Statement, (as outlined in paragraph 6.7.2) [APP-044] to the assessment of the impacts of the scheme, its construction and operation, is in line with the methodology as set out in DMRB, Volume 11, Section 3, Part 2 (HA208/07) for the assessment of road schemes in relation to cultural heritage. This guidance is the industry standard methodology. As a professional industry standard, the relevant topic guidance for cultural heritage is therefore followed rather than that followed by the Landscape and Visual Impact Assessment.
2. The following text illustrates the assessment methodology as set out in HA208/07, which splits impacts into three types – temporary impacts from construction (which are reversible) (HA208/07, paragraphs 4.8), permanent impacts from construction (which generally cause direct irreversible permanent physical damage or change the setting of a heritage asset) (HA208/07, paragraphs 4.9-4.11) and operational impacts (which arise from the use of the road once built) (HA208/07, paragraph 4.12). Accordingly, this approach has been adopted in Environmental Statement Chapter 6, where the assessment has been split into Construction (temporary), Construction (permanent) and Operation. This approach allows for a thorough and detailed assessment of each constitutive element of the Scheme to be undertaken, acknowledging the temporal nature of reversible construction activities, permanent impacts as a result of the construction of the Scheme itself and the use of the Scheme once operational. The Applicant considers this approach to be appropriate and in line with the industry standard HA208/07.

Question CH.1.10

Para 6.8.5(c)(ii): Location of tunnel portals

This para tells us that the location of the western portal has been moved westwards to avoid impacting the scheduled Wilsford G1 barrow [and] the proposed additional length of canopy up to 200m long would reduce the visibility of the portal in views from monument groups such as Winterbourne Stoke Crossroads barrows, the Diamond group and Normanton Down barrows.

- i. Does the 200m addition reflect the westward LoD set out in the DCO?
- ii. How does it relate to the position of the portal and canopy presently shown on the drawings?
- iii. Is it the Applicant's intention to build this extension?
- iv. What would determine its precise length? (See also: Appendix 6.1: HIA paras 3.5.19(5) and 9.4.22)

Response

i. Does the 200m addition reflect the westward LoD set out in the DCO?

1. No. The 200m tunnel 'extension' referred to in Environmental Statement Chapter 6 - Cultural Heritage 6.8.5(c)(ii) [APP-044] is the proposed cut and cover length of tunnel (Work No.1E, draft Development Consent Order, Schedule 1, p50 [APP-020]) which represents an extension to the tunnel length put forward originally at the time of preferred route announcement. The westward Limits of Deviation (LoD) would allow a further 200m westward movement of the commencement point of the TBM bored tunnel (Work No.1F, draft Development Consent Order, Schedule 1, p50 [APP-020]). The 200m limit of deviation to the commencement point of Work No.1E (the cut and cover tunnel and associated works) is required to accommodate the 200m deviation of the commencement point of Work No.1F (the twin bored tunnel and associated works) should it be exercised. The Applicant's justification for the 200m limit of deviation for the commencement point of Work No.1F, and the consequent limits of deviation for neighbouring numbered works, is discussed further in response to question DCO.1.26.

ii. How does it relate to the position of the portal and canopy presently shown on the drawings?

2. The cut and cover length of tunnel (and therefore the portal and canopy) is located between Chainages 7+200 and 7+400 as shown on Sheet 6 of the Engineering Section Drawings (Plan and Profiles) [APP-010] and on Sheet 6 of the Works Plans [APP-008] as Work No.1E. The limits of deviation for these numbered works are set out in article 7 of the draft DCO [APP-020] and discussed further in response to question DCO.1.26.

iii. Is it the Applicant's intention to build this extension?

3. Yes, the canopy cut and cover length of tunnel (Work No.1E) will be constructed and shall extend westwards from the bored tunnel to at least chainage 7+200m in accordance with reference D-CH6 of the OEMP (secured by requirement 4), subject to the limits of deviation in article 7.
- iv. What would determine its precise length? (See also: Appendix 6.1: HIA paras 3.5.19(5) and 9.4.22)**
4. The precise length of the cut and cover tunnel extension – i.e. the extent to which the 200m westwards LoD is used - will be determined during detailed design. The cut and cover tunnel length provides a vertical transition zone which allows adequate ground cover for the Tunnel Boring Machine (TBM) at one end while minimising the depth of the open cut at the other end. Its length will be optimised to suit the vertical alignment of the realigned A303 (which in turn is also restricted by LoD) and will be dependent on the construction method for launching the tunnel boring machine, on peak ground water levels and on heritage and visual impact.

Question CH.1.11

Para 6.8.5(e): Lighting

Why has no outline operational lighting strategy been produced?

Response

1. It is considered there is not a need to produce an outline operational lighting strategy as the majority of the Scheme will not be lit. It is considered best practise not to provide linear street lighting in rural locations, except within settlements and at some junctions. In addition, a key objective of the Scheme is to 'help conserve and enhance the World Heritage Site (WHS)' and its dark skies. Therefore, to protect the WHS from obtrusive lighting, and the resultant visual impacts from lighting columns and to dark skies within the WHS and its surrounding rural environment, there will not be any road lighting along the open road inside or outside the WHS.
2. The new dual carriageway linking the existing unlit dual carriageways to the west of Winterbourne Stoke and the east of Amesbury will not have lighting along the new dual carriageway outside of the tunnel helping to enhance the dark sky environment. This will contribute towards the scheme's aim of minimising its impact on the surrounding environment. The deep cutting will also conceal the road and traffic from views across the WHS.
3. Road lighting is proposed at three locations only: in the tunnel; under Green Bridge No. 4 (day time only) and replacement of the existing lighting at Countess roundabout with directional LEDs to minimise light spill and sky glow. This lighting (and the principle of minimising light spill) is provided for in the Outline Environmental Management Plan (OEMP) [APP-187] (D-CH9 to D-CH12), and paragraph 4 of Schedule 2 of the draft DCO [APP-020] 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.
4. The lighting of the tunnel will be in compliance with BS5489-2: 2016 Code of practice for the design of road lighting Part 2: Lighting of tunnels (or any revisions at the time of final design). Lighting throughout the length of the tunnel shall support safe entry to, through and exit from the tunnel for users. The lighting will be automatically controlled and monitored (with a manual override capability); and automatically adjusted to the lighting levels based on and determined by external ambient natural light levels.

Question CH.1.12

Para 6.8.5(f): Road signage

The commitment to concealed, non-lit signs within the WHS noted.

- i. How is signage to be handled elsewhere within the Scheme?

Signage visible above skylines should be avoided (See VP8 Winter).

- ii. Please provide a list of all signage, its type and location.

Response

i. How is signage to be handled elsewhere within the Scheme?

1. The indicative road signage design for the scheme has been - and the detailed design will be - carried out based on guidance given in the following standards:
 - The Traffic Signs Regulations and General Directions (2016) (TSRGD)
 - Department for Transport's Traffic Signs Manuals (TSM)
 - Local Transport Note (LTN) 1/94 Design and Use of Directional Informatory Signs (1994)
 - BD78/99 Design of Road Tunnels,
2. and an outline review of the existing signage on the road network in the immediate vicinity of the scheme.
3. The highway alignment (Shown on 2.7 Engineering Section Drawings (Plan and Profiles) [APP-010]) and associated landscape mitigations proposals (Shown indicatively on 6.2 Environmental Statement Figure 2.5 A-S-Environmental Masterplan [APP-059]) have been selected to best integrate the scheme within the local landscape and topography, whilst minimising or removing any adverse impacts where possible, including from signage.
4. It is expected that signage would be located within cutting or bunded parts of the Scheme, with new planting to reduce the visual impact of the scheme and in so doing, reduce views of additional traffic signage from within the wider landscape. In addition, those signs to be illuminated during the hours of darkness would be limited to those required by DfT TSRGD Circular, May 2016, namely
 - Warning and regulatory signs at level crossings.
 - Headroom restrictions at low bridges or structures.
 - Warning of requirement to 'Stop' or 'Give Way' ahead (diagram 501).
 - Speed limit terminal signs on trunk or principal roads.
 - Regulatory terminal signs including give way, no entry, vehicle restrictions (including for low and narrow bridges) and banned manoeuvres.
 - Motorway entry, exit and gantry-mounted signs

ii. Please provide a list of all signage, its type and location.

5. The detail of the road signage for the Scheme will be determined by the detailed design of the scheme within the context of the guidance and legislation noted in the response to (i).
6. The commitments in the OEMP regarding signage in the WHS and the design of the scheme will ensure that unacceptable effects are avoided. Due to the extent of cutting or bunds outside of the WHS, signage would necessarily be positioned within these earthworks which would limit its visibility, as demonstrated by the photomontages within the Landscape and Visual Impact Assessment (APP-129 to APP-134).
7. VP08 (APP-131 and APP-132) is an exception, whereby the standards listed above, BD78, require gantry lane control signs and VMS on the approach to the River Till viaduct. To reduce the impact of the signage at this location, an MS4 sign is proposed, rather than a larger scale gantry across all lanes of the proposed A303. Additionally, new planting is also indicated on VP08, which by year 15 and secured pursuant to Requirement 8, has established to screen views of the sign.
- 8.

Question CH.1.13

Para 6.8.5(h): Decommissioned A303

- i. Please clarify the nature of the bound surface remaining. Would this be coloured tarmac?
- ii. Explain the discrepancies apparent between the appearance of the decommissioned A303 in Viewpoint CH13 (ES Appendix 6.9) and page 8 of the ES Non-technical Summary.

Response

- i. **Please clarify the nature of the bound surface remaining. Would this be coloured tarmac?**
 1. At this stage in the design of the scheme, the nature and colour of the bound surface are not decided.
 2. Within the World Heritage Site (WHS), commitments with regard to surfacing are set out at items D-CH2, D-CH3 and D-CH14 of the Outline Environmental Management Plan [APP-187] which provide for, respectively, the breaking up of the redundant A303 and A360 within the WHS, and that provision of surfacing within the WHS shall be developed in consultation with National Trust, Historic England, English Heritage and Wiltshire Council.
 3. Outside of the WHS, the surfacing of PRoWs will need to be considered in consultation with Wiltshire Council as they will ultimately be responsible for them once they are constructed. This matter is being discussed with Wiltshire Council.
 4. In conclusion therefore, the choice of the bound surface material and colour will be established through consultation between Highways England and the relevant Stakeholders.
- ii. **Explain the discrepancies apparent between the appearance of the decommissioned A303 in Viewpoint CH13 (ES Appendix 6.9) and page 8 of the ES Non-technical Summary.**
 5. The discrepancy is that Viewpoint CH13 in Environmental Statement Appendix 6.9 - Cultural Heritage Setting Assessment [APP-218] has included widths of both bound surface and soft chalk grassland for horse riders along the existing A303, as per the Scheme description in Environmental Statement Chapter 2 - The Proposed Scheme [APP-040] paragraph 2.3.56(d), whereas page 8 of the Environmental Statement Non-Technical Summary [APP-292] illustrates the existing A303 being returned to a soft landscape only, which is not correct as it omits the bound surface.
 6. However, page 2 of the Non-technical summary does include a correct image of the decommissioned A303 with the path network showing the existing A303 being converted to a restricted byway.

Question CH.1.14

Para 6.8.10: Heritage Management Plan prepared by the Main Contractor prior to the start of construction

The OEMP states that this should be prepared in consultation with the Heritage Monitoring and Advisory Group (HMAG) and Wiltshire Council Archaeological Services (WCAS). The ExA assumes the final version will be agreed with or approved by HMAG and WCAS. Please confirm.

Response

1. Highways England confirms that the Heritage Management Plan prepared by the Main Contractor prior to the start of construction will be prepared in consultation with the Heritage Monitoring and Advisory Group (HMAG) (comprising Historic England, Wiltshire Council, the National Trust and English Heritage Trust) and Wiltshire Council Archaeological Services, as set out in items PW-CH1 and MW-CH1 of the Outline Environmental Management Plan [APP-187]. The commitments given in the Outline Environmental Management Plan are secured by Requirement 4 of the draft Development Consent Order [APP-020].
2. As stated in the OEMP [APP-187, PW-CH1 and MW-CH1], HMAG and WCAS will be consulted on the HMP before Highways England as 'the Authority' approves it. The consultation provided for in the OEMP will ensure that the views of HMAG and WCAS are taken in to account in finalising the HMP, prior to Highways England's approval of the document. There is therefore no requirement for any external approval by HMAG or WCAS.

Question CH.1.15

Para 6.9.13: Construction

This para tells us that the principal temporary impacts of the Scheme would occur between the new Longbarrow Junction and the western portal, an active, dynamic construction site, heritage assets would experience views of, and noise from, the building of the new road and the cutting. Fig 2.7C (Illustrative construction layout including compounds and haul routes) gives little indication of the means necessary to service this area, with no haul routes shown apart from that on the line of the cutting.

- i. Is this a true representation?
- ii. How would the crawler cranes and moveable piling rigs gain access and working space to construct the cutting, the green bridge, the canopy, etc?
- iii. Beyond what is noted in paras 6.9.15/16, what are the implications for heritage assets including the linear earthworks, which is shown within the red line and very close to the working area for the green bridge?

Response

i. Is this a true representation?

1. The approach to construction described in Environmental Statement Chapter 2 - The Proposed Scheme [APP-040] is indicative, but it is representative of the likely approach to be adopted. Temporary impacts are controlled in the requirements at Schedule 2 of the draft Development Consent Order [APP-020] and the Outline Environmental Management Plan (OEMP) [APP-187] (PW-AIR1, MW-AIR1, PW-CH1, MW-CH1) [APP-187]. It is envisaged that the haul road within the western approach cutting would stick to within the construction footprint for the retained cutting which would be archaeologically excavated and recorded in advance of the construction of the haul route and the retained cutting during the preliminary works phase.

ii. How would the crawler cranes and moveable piling rigs gain access and working space to construct the cutting, the green bridge, the canopy, etc?

3. As stated above at point (i), the full width of the retained cutting would be archaeologically excavated and recorded in advance of the construction of the retained cutting during the preliminary works phase. The full construction footprint for the retained cutting would therefore be available for the movement of and working space for plant, crawler cranes and moveable piling rigs used to construct the cutting, Green Bridge 4 and the canopy over the western portal. It is envisaged that majority of the plant required to construct the cutting and bridge would access the main works compound via a temporary access road on the A360, north of the existing Longbarrow roundabout.
4. Access to the cutting and bridge works areas would then be from the main compound, through the new Longbarrow Junction, under temporary bridges constructed for the A303 and the A360 (to take them over the scheme) and along

the cutting to the western portal. Paragraphs 2.4.17 – 2.4.20 of the Environmental Statement Chapter 2 - The Proposed Scheme [APP-040] set out the Scheme's proposals for haul routes, and the routes are shown indicatively on Environmental Statement Figure 2.7 A-E. [APP-061]. Further information on haul routes is also set out in the Deadline 1 submission at REP1-005.

- iii. **Beyond what is noted in paras 66.9.15/16, what are the implications for heritage assets including the linear earthworks, which is shown within the red line and very close to the working area for the green bridge?**
5. According to Environmental Statement Appendix 6.1 - Heritage Impact Assessment (HIA) [APP-195, para. 6.8.17], the Western Portal and approach cutting pass through an area where previous surveys suggested there are limited archaeological remains within the footprint of the Scheme, although there are substantial groups of known monuments to the north-west, south-west, south, south-east and east. The Winterbourne Stoke Crossroads Barrows (Asset Group AG12) lie to the north-west of the approach cutting; to the east and south-east are the Normanton Down Barrows (AG19) (including the Wilsford G1 bowl barrow which lies approximately 25m east of the proposed western tunnel portal location); to the south-west lies a further group of monuments known as the Diamond Group (AG13), whilst a number of discrete monuments lie to the south including the Wilsford Shaft (NHLE 1010833). South of the proposed cutting is a scheduled late prehistoric linear boundary (NHLE1010837) – which will be protected and preserved in situ during construction.
 6. This linear boundary runs from the south-east of Winterbourne Stoke Roundabout to the southwest of the Diamond on Wilsford Down. It would be subject to views of construction, and also audible impacts, with a consequent temporary adverse change to their setting.
 7. As discussed in the response to question 1.16, a number of measures are set out in Environmental Statement Appendix 2.1 Outline Environmental Management Plan (OEMP) [APP-187] to ensure that archaeological assets are protected from haul routes and the temporary construction works. Heritage assets outside the construction footprint for the retained cutting in the western approaches would be protected in situ [APP-187, Annex A.2 - Table 2.2 and Figure 1B]. The implications of the temporary construction works for the heritage assets referred to in the question are as set out in the Environmental Statement Chapter 6 [APP-044], paragraphs 6.9.2-6.9.20 and in Table 6.10: Summary of significant effects – construction (temporary).

Question CH.1.16

Provide details of haul roads, lighting, signage and fencing to be used throughout the site during the construction period.

Response

1. Specific haul route detail cannot be provided at this stage other than the haul routes described within Figure 2.7 [APP-061] of the Environmental Statement. Final haul route detail is a matter for detailed design, once the full details of the construction phase are known. However, details of the Scheme's approach to ensuring the effects of haul routes are considered and assessed within the application is provided below.
2. The Scheme proposals for haul routes are described in paragraphs 2.4.17 to 2.4.20 of the Environmental Statement, Chapter 2 The Proposed Scheme [APP-040]. Indicative routes for the haul roads required during the construction phase of the Scheme are provided within Environmental Statement Figure 2.7 A-E [APP-061].
3. The general approach to haul roads is as follows:
 - a. Wherever possible, construction plant would travel along the alignment of the Scheme using the footprint of the proposed embankments and cuttings, for example from the main site compound to the western tunnel portal. This is secured through item MW-TRA7 of the OEMP [APP-187] which states that the use of haul routes should be maximised rather than using public roads. Compliance with this, is, in turn, secured through Requirement 4 of the draft DCO [APP-020].
 - b. No haul roads are proposed within the WHS, other than those within the footprint of the proposed new road alignment (refer ES Figure 2.7 [APP-061]).
 - c. To protect archaeology and prevent the deformation of topsoil and subsoil horizons, haul roads would be built under a 'no dig' solution, wherever possible. This is secured through item MW-CH5 of the OEMP [APP-187] In archaeologically sensitive areas, the approach would include a combination of appropriate protective barrier membrane, suitable fill material to bury archaeological remains and vehicle / plant control measures, as outlined within section 4.2.11 of the Detailed Archaeological Mitigation Strategy (DAMS) submitted at deadline 2. The DAMS would be secured by Requirement 5 of Schedule 2 of the draft Development Consent Order.
 - d. Operational impacts of the haul roads would be managed through the Heritage Management Plan developed by the Contractor on the basis of the DAMS and the imposition of speed limits to mitigate against dust impacts, as outlined within the Outline Environmental Management Plan (OEMP) (PW-AIR1, MW-AIR1, MW-AIR2, PW-CH1, MW-CH1) (Environmental Statement Appendix 2.2 [APP-187]).
 - e. Upon completion of construction of the Scheme, where land is not required as part of the Scheme, all haul routes would be removed upon completion of the

earthworks and the land reinstated pursuant to the provisions of the DCO and item COM-4 of the Outline Environmental Management Plan.

4. The appointed Contractor, during the detailed design stage, will define within their Construction Environmental Management Plan their approach to lighting, signage and fencing. Construction phase requirements and measures to reduce impacts would be managed through relevant specific measures. These would be secured through the OEMP [APP-187], for lighting (items MW-G29, PW-BIO7 and MW-BIO4) and signage and fencing (items PW-CH1, PW-CH4, PW-CH5, PW-LAN1, PW-BIO10, MW-G28, MW-CH1, MW-CH3, D-CH4, MW-WAT6, MW-COM3, MW-TRA1, MW-TRA2 and MW-TRA9). The measures apply equally to haul routes as they do to the rest of the construction of the Scheme as requirement 4 sets out that the authorised development must be carried out in accordance with the OEMP.

Question CH.1.17

Para 6.9.20: Construction at Countess roundabout

The ES states that the construction activity does not affect the setting of any heritage asset.

- i. Please justify this statement.
- ii. What are the implications for Blick Mead?

Response

i. Please justify this statement.

1. The question refers to paragraph 6.9.20 of Chapter 6 Cultural Heritage of the Environmental Statement (ES) [APP-044], and it is instructive to consider the full context of what is said in that paragraph. That paragraph provides as follows:

“While there would be considerable activity around Countess, both in terms of construction activity and traffic movement, relatively few heritage assets are present and the majority of these are within Amesbury Abbey Park and are well screened. The assets affected here are historic buildings located on the A345 immediately to the north and south of Countess Roundabout and the Amesbury Abbey RPG and Conservation Area at the point where they share a boundary to the south of the present A303 and the west of Countess Road. To the east of Countess, construction activity is largely confined to minor works within the existing carriageway and does not affect the setting of any heritage assets. The only newly-constructed element would be the link between Allington track and Amesbury Road, but the process of its creation is not considered to impact upon the setting of any element of the Earl's Farm Down/ New Barn Down Barrows (AG35).”

2. With respect to works to the east of Countess, the paragraph relates to the minor works to the existing road to tie it in to the Scheme. The statement “does not affect the setting of any heritage assets” is specifically related to these works east of Countess. Therefore, the ES does not state that construction activity does not affect the setting of any heritage asset with regards to construction at Countess Roundabout.
3. Further justification for this can be found in the Environmental Statement Appendix 6.9 - Cultural Heritage Setting Assessment [APP-218, pp. 127-128], which notes that:

“There would be an impact on the northern boundary and part of the eastern boundary of Amesbury Abbey RPG as a result of the Scheme. However, that impact would not extend far into the RPG due to screening provided by the dense vegetation that covers the majority of the northern part of the asset. The settings of the majority of assets within the park would be unchanged as a result of the Scheme” [APP-218, para. 3.4.10]. “The Scheme would run from west to east to the north of the northern boundary of the park, taking much the same route as the current A303 apart from the approach to the eastern tunnel portal to the north of

Vespasian's Camp in the north-west corner of the park. Here, the new road would run in cutting (Amesbury cutting), climbing gently to the east towards the proposed new grade separated Countess Junction in the location of the present Countess Roundabout. The junction would comprise a flyover (Countess Flyover) across the centre of the current roundabout with bridges over the carriageways of Countess Road and ramps (Countess eastern and western diverges) to the east and west. The flyover would be provided with acoustic fencing to both sides. The majority of the park [including the Blick Mead archaeological site] would be screened from the Scheme by the natural landform and the dense vegetation along the northern boundary of the park to the west of the proposed new grade separated Countess Junction. The flyover would be visible from locations along Countess Road within the setting of the park but this view would be blocked by the high ground to the east of Countess Road before the viewer reaches Kent House. There would be no visual impact on the most significant parts of the park at its centre with the grade I listed Amesbury Abbey [6054] and grade II listed Ornamental Vase [6058], or to the centre west on and adjacent to the River Avon where there are three grade II listed assets, Gay's Cave and Diamond [6055], the Chinese Temple [6056], and Baluster Bridge and Gate Piers [6057].*

There would be visual impact from the eastern portal, cutting and grade separated junction on the northern boundary of the park to the east of Countess Road. There would be visual impact from the grade separated junction on the northern boundary of the park to the west of Countess Road. That part of the park that covers Lord's Walk to the east of Countess Road would experience aural impacts to varying degrees dependant on the distance of the asset from the Scheme. There would also be visual impact from the grade separated junction on that part of the park either side of Countess Road to the south of Countess Roundabout. The effect of the Scheme would be Slight adverse (derived from a Minor impact upon a High value asset)" [APP-218, pp. 127-128].

ii. What are the implications for Blick Mead?

4. It is not considered that the Scheme would impact upon the setting of the Blick Mead archaeological site (please also see responses to ExAQ1 PINS Ref. CH.1.8 and CH.1.45). The Setting Assessment found that "There would be an impact on the northern boundary and part of the eastern boundary of Amesbury Abbey RPG as a result of the Scheme.
5. However, that impact would not extend far into the RPG due to screening provided by the dense vegetation that covers the majority of the northern part of the asset. The settings of the majority of assets [including the Blick Mead archaeological site] within the park would be unchanged as a result of the Scheme" [APP-218, para. 3.4.10]. The Setting Assessment further found that "The Scheme would run from west to east to the north of the northern boundary of the park, taking much the same route as the current A303 apart from the approach to the eastern tunnel portal to the north of Vespasian's Camp in the north-west corner of the park. Here, the new road would run in cutting (Amesbury cutting), climbing gently to the east towards the proposed new grade separated Countess Junction in the location of the present Countess Roundabout.

6. The junction would comprise a flyover (Countess Flyover) across the centre of the current roundabout with bridges over the carriageways of Countess Road and ramps (Countess eastern and western diverges) to the east and west. The flyover would be provided with acoustic fencing to both sides. The majority of the park [including the Blick Mead archaeological site] would be screened from the Scheme by the natural landform and the dense vegetation along the northern boundary of the park to the west of the proposed new grade separated Countess Junction." [APP-218, pp. 127-128].

Question CH.1.18

Table 6.11: Pits, Parsonage Down

Re: the ESSO pipeline diversion, please provide full details of works options and effects.

Response

1. Environmental Statement Chapter 2 - The Proposed Scheme [APP-040, para. 2.4.40], notes that the existing Esso oil pipeline which is crossed by the Scheme to the north west of Winterbourne Stoke will be diverted to the east of, and generally parallel to, the existing pipeline. A protective slab structure will be constructed above the diverted pipeline to protect it against construction activities. To ensure the long-term integrity of the new pipe, no planting of trees will be permitted above the pipeline. However, other habitat creation measures above the pipeline and surrounding area will be permitted.
2. Environmental Statement Chapter 2 – The Proposed Scheme [APP-040, para. 2.4.41] states that discussions have been ongoing with Esso regarding the pipeline diversion. The pipeline would be diverted within a corridor extending from approximately 50m west of its current alignment to the B3083, as shown on Environmental Statement Figure 2.7 A-E - Illustrative construction layout including compounds and haul routes [APP-061]. The final route of the pipeline within the corridor will be selected to avoid known archaeological assets and sensitive ecological receptors as far as reasonably practicable: Appendix E of the draft DAMS submitted at Deadline 2 addresses the archaeological mitigation of the selected route. The diverted pipeline would be 150mm in diameter and buried between 0.5m and 1m below existing ground level. The works will be subject to protective provisions forming part of the development consent order (if made), a draft of which is contained at Part 4 of Schedule 11. These are currently under negotiation.
3. An assessment has been made of the potential effects of the diversion of the Esso pipeline on cultural heritage, and measures to avoid or reduce such effects. The location of heritage assets within the Scheme boundary is shown on Environmental Statement Figure 6.8 A Archaeological Assets within 500m Study Area [APP-074 Figure 6.8A]. The selected route of the pipeline diversion lies within the corridor identified in the ES but would avoid the pits referred to in Table 6.11 of the ES, which lie to the east of the selected route. The proposed pipeline diversion would affect the following archaeological assets:
4. UID 1004.01 (including MWI7095 and MWI7130) - Field systems - Middle Bronze Age to Roman co-axial field system, as identified from aerial photographs: these features were confirmed in the archaeological evaluations as lynchets surviving as shallow sub-surface features. Finds were very rarely recovered from the plough-washed/colluvial fill of these features and provide a mixed chronology that likely indicates the long-lived occupation of this landscape.
5. As the field systems cover a large area, the construction of the diverted pipeline will not change the significance of effects as reported in relation to this asset (see

Environmental Statement Appendix 6.8 – Summary of non-significant effects [APP-217]; Table 1.2, assets 1004.01, 1004.02). The impacts will include truncating sections of the lynchets that form part of the field system, and these will be archaeologically recorded as mitigation. The impact is still assessed as a Minor Adverse impact overall to this heritage asset and the residual significance of effect as Slight Adverse. The draft DAMS submitted at Deadline 2 proposes suitable archaeological mitigation of these impacts, commensurate with the significance of the affected remains (see Appendix E of the draft DAMS).

Question CH.1.19

Para 6.9.32: Historic buildings

Why is the significant effect (moderate adverse) on Stables and Barn at Countess Farm noted in Table 6.11 not described?

Response

1. The significant effect (moderate adverse) on Stables and Barn at Countess Farm noted in Table 6.11 is not described in paragraph 6.9.32 because that paragraph is contained within the Non-significant effects part of the Construction effects section of the Environmental Statement Chapter 6 - Cultural Heritage [APP-044].
2. The effect on Stables and Barn at Countess Farm (UID 6068) is noted in paragraph 6.9.26 within the Significant effects part of Environmental Statement Chapter 6 - Cultural Heritage [APP-044] and described in Environmental Statement Appendix 6.9 - Cultural Heritage Setting Assessment [APP-218, p.137].

Question CH.1.20

Para 6.9.37: Operational effects on buildings

Adverse impacts are noted for the settings of several listed buildings, but these are not included in Table 6.12. Why not?

Response

1. Table 6.12 in Environmental Statement Chapter 6 - Cultural Heritage [APP-044] is a summary of significant effects during operation. While there are significant adverse effects on designated built heritage assets during construction, during the operation of the scheme none of the residual adverse effects on built heritage assets are considered to be significant.

Question CH.1.21

Paras 6.10.1/2: Monitoring

Mention is made of archaeological mitigation being carried out in compliance with the OEMP and OAMS during the preliminary works stages. However, according to Additional Submission 2, paras 1.2.4/5, the OAMS will be superseded by the DAMS by the end of the Examination, and Site Specific Written Schemes of Investigation (SSWSIs), Heritage Management Plans (HMP), and Method Statements will be developed prior to the relevant works starting.

This section should be clarified.

Response

1. The Outline Archaeological Mitigation Strategy (OAMS) (Environmental Statement Appendix 6.11 [APP-220]) provides for preparation of the Detailed Archaeological Mitigation Strategy (DAMS), Site Specific Written Schemes of Investigation (SSWSIs), Heritage Management Plans (HMPs) and Method Statements, as detailed within section 1.1.3 of the OAMS [APP-220]. The OAMS also makes provision for monitoring of the mitigation programme (refer to section 1.2.2 of the OAMS [APP-220]). The relationship between the OAMS and the DAMS and its components parts is set out at paragraph 1.3.3 of the Outline Environmental Management Plan (OEMP) (Environmental Statement Appendix 2.2 [APP-187]).
2. It is also noted that paragraph 6.10.1 of the Environmental Statement [APP-044] refers to the OAMS 'and any subsequent revisions', foreshadowing that the OAMS would develop into the DAMS.
3. The DAMS is currently being prepared, in consultation with the relevant stakeholders, and a draft is submitted at Deadline 2. At the end of the Examination, the DAMS would supersede and replace the OAMS as the Scheme's archaeological mitigation requirement for both the preliminary and main works. This would be secured through Requirement 5 of the Draft Development Consent Order [APP-020] and within items PW-CH2 and MW-CH2 of the OEMP [APP-220]. This is further explained in additional submission AS-10.

Question CH.1.22

Paras 6.10.1/2

- i. Does 'relevant works' refer to phasing?
- ii. Please supply an outline construction programme and phasing plan, together with phase by phase assumptions regarding haul routes.
- iii. Do preliminary works overlap with main works, either within phases or across the works as a whole?

Response

i. Does 'relevant works' refer to phasing?

1. The phrase 'relevant works' is not referenced within paragraphs 6.10.1 and 6.10.2 of the Environmental Statement (ES) or elsewhere in Chapter 6.

ii. Please supply an outline construction programme and phasing plan, together with phase by phase assumptions regarding haul routes.

2. Subject to securing a DCO and as noted in paragraph 1.2.5 of the Outline Environmental Management Plan (OEMP) [APP-187], preliminary works are planned to start in 2020 (in advance of the appointment of the main works contractor), with the main construction works following in 2021 and with the Scheme due to open to traffic in 2026.
3. The preliminary works would consist of archaeological and ecological mitigation works, remedial work in respect of any contamination or other adverse ground conditions, erection of temporary fencing, diversion and laying of underground apparatus, site clearance and the two sections of highways works outlined in paragraph 1.2.6 of the OEMP and as defined in Schedule 2 of the draft DCO [APP-020].
4. For the purposes of the EIA and the traffic assessment, two principal phases of the construction programme for the main works have been identified. These correspond to:
 - a. Phase 1, when Winterbourne Stoke bypass, Longbarrow Junction and Countess Roundabout flyover are under construction (likely 2021-2023); and
 - b. Phase 2, when the construction of the tunnel is the primary construction activity (2024 onwards). The Winterbourne Stoke bypass, Longbarrow Junction and Countess Roundabout flyover constructed in Phase 1 would be operational during Phase 2.
5. For the purposes of the EIA, it was assumed that haul routes would be operational throughout both phases of the construction programme. A more detailed construction plan will be developed by the Contractor, during the detailed design stage, as part of developing the Construction Environmental Management

Plan for each phase required by item MW-G5 of the OEMP [APP-187], compliance with which is secured by paragraph 4 of Schedule 2 to the draft DCO.

6. The response to question 1.16 highlights the other controls in the OEMP in relation to haul routes.
- iii. Do preliminary works overlap with main works, either within phases or across the works as a whole?**
7. As noted in paragraph 1.2.9 of the OEMP, some phases may overlap both in space and in time, for example, preliminary works could still be being undertaken by a preliminary works contractor in some locations, whilst site establishment for the main works construction is being progressed by a main works contractor in other locations. Similarly, there may be discrete locations where it would not be possible to complete preliminary works prior to the commencement of the main works, for example the diversion and laying of underground apparatus could, for some discrete diversions, depend on works being initiated by the main works contractor before such diversions can be undertaken.

Question CH.1.23

Tables 6.10-6.12

Given the number of significant effects reported, why are there so few references to combined effects with regard to cultural heritage in ES Chapter 15?

Response

1. The combinations of impacts which were considered likely to result in a new or different likely significant effect, or an effect of greater significance than any one of the impacts on its own, have been assessed in section 15.3 of Environmental Statement Chapter 15 - Assessment of Cumulative Effects [APP-053].
2. In respect of combinations of effect across environmental topics, the assessment of effects on cultural heritage and identification of appropriate mitigation measures was undertaken drawing on data from other topics including Air Quality, Landscape and Visual and Noise and Vibration (as confirmed at Environmental Statement Chapter 6 - Cultural Heritage, para 6.3.8 [APP-044], as well as at Chapter 15 – Assessment of Cumulative Effects, para 15.2.17). The construction phase of the Scheme was considered to have the greatest influence on impact interactions. It was considered that the combined construction phase visual, dust and noise impacts could interact to result in a greater significance of effect than each of the impacts acting in isolation. Visual, dust and noise effects on heritage receptors are considered within the assessment of construction and operational impacts and effects in Environmental Statement Chapter 6 - Cultural Heritage [APP-044], hence the reason that their combined effects are not dealt with in chapter 15.
3. The cultural heritage receptors were reviewed again for the purposes of the in-combination assessment and it was concluded that combined effects did not elevate the overall effects on cultural heritage receptors into the combined effect significance definitions in Table 15.1 of Environmental Statement Chapter 15 - Assessment of Cumulative Effects [APP-053].
4. Potential operational in-combination impacts were identified for visitors to the World Heritage Site (WHS) (human receptors). These in-combination impacts include visual impacts (moderate) cultural heritage impacts (improved public access to WHS), and noise impacts (major reduction in operational traffic noise at Stonehenge), which are assessed to result in a Large beneficial effect as shown in Table 15.4 of Environmental Statement Chapter 15 - Assessment of Cumulative Effects [APP-053].

Question CH.1.24

ES Chapter 2, para 2.4.19

- i. What are the cultural heritage implications of the temporary haul bridge over the River Till, and other temporary infrastructure?
- ii. What provisions are there for the reinstatement of affected land post-construction?

Response

- i. **What are the cultural heritage implications of the temporary haul bridge over the River Till, and other temporary infrastructure?**
 1. Environmental Statement Chapter 2 - The Proposed Scheme [APP-040] notes that "A temporary bridge would be required over the River Till SAC for this haul route. To minimise adverse impacts this bridge would be raised above the valley floor with supports located outside the designated area of the SAC and the River Till Floodplain." [APP-040, para. 2.4.19]. Indicative haul routes required for the construction of the Scheme are given in Environmental Statement Figure 2.7A. [APP-061].
 2. Environmental Statement Chapter 6 - Cultural Heritage, para 6.8.4c [APP-044] notes "[...] to avoid or minimise potential physical impacts arising from construction activities [...] Compounds, temporary road diversions and haul roads would be built under a 'no dig' solution, wherever possible, with topsoil retained in situ and geotextile laid before road stone and the temporary road surface". This aims to protect archaeology and existing soil structures from construction impacts including temporary infrastructure. Archaeological protection for the haul roads is set out in Environmental Statement Appendix 2.2 - Outline Environmental Management Plan (OEMP) [APP-187], item MW-CH5, which requires archaeological method statements to be produced to address how the main works contractor intends to preserve in situ sensitive archaeological remains and prevent deformation of topsoil / subsoil horizons (including no-dig solutions), such method statements to be developed in consultation with HMAG (in WHS) and WCAS (outside WHS). The implementation of the OEMP is secured by Requirement 4 of schedule 2 of the draft DCO.
 3. Management of the operational impacts of the haul roads will be secured by the Outline Environmental Management Plan [APP-187] (e.g. items PW-AIR1 and MW-AIR1 (which require speed limits to avoid dust impacts) and PW-CH1 and MW-CH1 (which require haul routes to be dealt with in Heritage Management Plans).
 4. The impact of haul roads, the temporary bridge and other temporary infrastructure has been assessed within relevant chapters of the Environmental Statement, including Chapter 6 - Cultural Heritage [APP-044]. As the haul roads are built with a no-dig solution and to preserve archaeological remains in situ, no significant effects are predicted for underlying archaeological remains. Haul roads

will be regularly checked and maintained to prevent rutting (OEMP [APP-187, items MW-CH1 and MW-AIR2]. Temporary visual and aural impacts on heritage assets and Asset Groups, including construction vehicles using haul roads, are as set out in Table 6.10: Summary of significant effects – construction (temporary) in Environmental Statement Chapter 6 [APP-044] and non-significant temporary effects in Table 1.1: Construction phase: temporary effects of Environmental Statement Appendix 6.8 - Cultural Heritage - Summary of non-significant effects [APP-217].

5. Archaeological baseline evidence and information was obtained for all of the indicative haul road routes. Para. 6.9.12 of Environmental Statement [APP-044] notes that "Construction noise associated with the embankment and viaduct across the River Till would be apparent from Asset Groups AG03 and AG04 (Winterbourne Stoke West and East barrow cemeteries) and Asset Group AG05 (Romano-British settlement). However, the fundamental aspects of their setting would remain unaffected – the function and landscape position of each remaining legible and with no key sightlines interrupted (above all the inter-visibility across the Till valley between AG03 and AG04). There would be no change to their significance and therefore a Neutral effect. Due to the intervening presence of the A303 and the screening provided by topography, no impact is predicted on the Winterbourne Stoke Conservation Area or its component elements."

ii. What provisions are there for the reinstatement of affected land post-construction?

1. Upon completion of construction, where land is not required as part of the Scheme, the haul roads would be returned to the existing land use, pursuant to the terms of the DCO.

Question CH.1.25

DCO Schedule 2: LoD

- i. What assumptions have been made in the ZTVs and photomontages with regard to LoDs?
- ii. How would they be affected by the use of the maximum deviations of 200m westwards and 30m eastwards of the tunnel and canopy works, and by other LoDs?

Response

i. What assumptions have been made in the ZTVs and photomontages with regard to LoDs?

1. The Zones of Theoretical Visibility (ZTV) have not included the Limits of Deviation (LoDs) as the ZTVs were undertaken at the initial stages of the design, during the Scoping Phase prior to the detailed assessment of the Scheme.

As set out in paragraph 7.5.3 of the Landscape and Visual Impact Assessment (LVIA) [APP-045], the study area extended 9km to the north of the Scheme, covering elevated land between Tilshead, Enford Down and Durrington; 6km to the east of Countess Roundabout, covering elevated landform across Beacon Hill; 7km to the south of the Scheme covering elevated land within the Cranborne Chase and West Wilshire AONB and 5km to the west of Yarnbury Camp, covering elevated land to the north of Codford St. Mary.

2. This is considered appropriate for the ZTVs which are a desk-based exercise used to inform the Landscape and Visual and the Cultural Heritage site visits and field work only.
3. As the Scheme design progressed and the LoD were included in the process, additional field work was undertaken which informed the final assessment which is based upon the DCO drawings, including for the consideration of the LoD, and is not based on the ZTVs. The ZTVs did not dictate the area ultimately assessed, as it was the field work which determined the receptors and then the impact was based on the DCO drawings including LoDs, effectively superseding the ZTVs which are a desk based initial exercise.
4. Similarly, the photomontages are based upon the indicative Scheme design in the Environmental Masterplan [APP-059] and therefore do not show the LoD. The photomontages do not form the basis of the assessment process, they are there to assist and by illustrating the Environmental Masterplan this is an appropriate response to linking that 2D graphic with a 3D representation.
5. The assumptions for the ZTVs are set out in the LVIA Area of Search, Environmental Statement Appendix 7.3 [APP-223].

ii. How would they be affected by the use of the maximum deviations of 200m westwards and 30m eastwards of the tunnel and canopy works, and by other LoDs?

6. As explained under (i) above, the ZTVs did not dictate the receptors ultimately assessed, which was based on the DCO drawings including LoDs, effectively superseding the desk based ZTVs.
7. However, had the ZTV modelling included the 200metre westwards and 30m eastwards maximum deviations of the tunnel and canopy works, then the theoretical visibility of vehicles on this section of the new A303 would have been reduced in relation to this specific part of the landscape modelling, as the vehicles would have been beneath a structure for a greater distance.
8. However, the change would have been very small in relation to the ZTV extent as the ZTV modelled other aspects of the Scheme as well, including the Slurry Treatment Plan (STP), at 20metres in height, rather than just the section on approach to the portals. The study area outlined above in (i) would have remained the same, and similarly as set out above, the field work 'on the ground' has determined the assessment process, not the ZTVs.
9. With respect to the other LoD stated in Table 2.1 of APP-040, neither the upwards, downwards, or centreline LoD would have altered the area of search.
10. This is because the ZTVs were based on taller features of the Scheme, for example the STP and main compounds, such that the maximum 1 metre upwards LoD of the road alignment was well within the ZTV parameters.
11. As explained under (i) above, the photomontages are based upon the indicative Scheme design in the Environmental Masterplan [APP-059] and therefore do not show the LoD.

Question CH.1.26

Provide details of fencing and drainage systems, including balancing ponds, together with their implications for cultural heritage.

Response

1. At this stage there are no plans available detailing construction phase fencing. This would be developed by the main works contractor during the detailed design stage. To ensure fencing has a minimal impact on the World Heritage Site (WHS), the main works contractor would consult with the Heritage Monitoring and Advisory Group (HMAG) to determine the type of construction boundary fencing to be used within the WHS, or within the setting of the WHS, to ensure that the type of fencing used would be sympathetic to the setting of the WHS. This would be secured through items MW-G28, MW-CH3 and D-CH14 of the Outline Environmental Management Plan (OEMP) (Environmental Statement Appendix 2.2 [APP-187]), which is, in turn, secured by Paragraph 4 of Schedule 2 of the Draft Development Consent Order [APP-020].
2. All heritage assets identified for protective fencing within the Detailed Archaeological Mitigation Strategy (DAMS), submitted at Deadline 2, would be securely fenced during the early stages of the preliminary works, as outlined within sections 5.8.2 and 5.8.3 of the DAMS. This would be secured by Paragraph 5 of Schedule 2 of the DCO. The Contractor would consult with the HMAG (for works inside the WHS) and Wiltshire Council Archaeology Services (WCAS) (for works outside of the WHS) to determine the type of fencing to be used. This would be secured through item PW-CH4 of the OEMP [APP-187] which is, in turn, secured by Paragraph 4 of Schedule 2 of the Draft Development Consent Order [APP-020].
3. Details of the Scheme's permanent fencing and gating strategy will follow at the detailed design stage. At this stage it is envisaged that fences along Public Rights of Ways (PRoWs) would be provided to prevent access onto private land, grazed grassland or the highway, or to provide a buffer zone to the retained cutting between Longbarrow Junction and the western tunnel portal. Where necessary for adjacent land use, appropriate stock-proof netting would be added to strained wire or other boundary treatment provided by way of accommodation works, as agreed between Highways England and the adjacent landowner. Indicative details are available in Series 3 of the Highway Construction Details, Manual of Contract Documents for Highway Works http://www.standardsforhighways.co.uk/ha/standards/mchw/vol3/section1/h_series.pdf. Please see also the PRoWs Design Document submitted to Examination at Deadline 2.
4. The details of the drainage system, including balancing ponds, are provided within the Environmental Statement Appendix 11.3 Road Drainage Strategy [APP-281]. Indicative locations of drainage areas are provided within Environmental Statement Figure 2.5 A-S - Environmental Masterplan [APP-059]. Paragraph 10 of Schedule 2 to the draft DCO [APP-020] requires Highways

England to submit written details of the drainage system based on the mitigation measures included in the Environmental Statement for approval of the Secretary of State prior to commencement of the construction of the part of the Scheme to which it relates.

5. Drainage areas have been located in areas so as to avoid impact on archaeological features and all areas have been included within the archaeological investigation works. Where appropriate, mitigation will be undertaken as part of the preliminary works to ensure cultural heritage assets are protected, as outlined within the Detailed Archaeological Mitigation Strategy (DAMS) submitted at Deadline 2. This is secured through items PW-CH2 and MW-CH2 of the OEMP [APP-187] which is, in turn, secured by Paragraph 4 of Schedule 2 of the Draft Development Consent Order [APP-020], and through Paragraph 5 of Schedule 2 of the draft Development Consent Order.
6. To ensure that cultural heritage assets are appropriately protected during the installation of fencing and drainage areas, the preliminary works contractors and main works contractor shall prepare Heritage Management Plans (HMPs), in consultation with HMAG (for areas within the WHS) and WCAS (for areas outside of the WHS), detailing how the historic environment is to be protected during all temporary and permanent works. Any associated archaeological mitigation requirements would be in accordance with the DAMS and shall be set out in a Site Specific Written Scheme of Investigation. These measures are secured through items PW-CH1, PW-CH2, MW-CH1, MW-CH2 and MW-CH3 of the OEMP [APP-187] which is, in turn, secured by Paragraph 4 of Schedule 2 of the Draft Development Consent Order [APP-020], and implementation of the DAMS (and the plans / strategies prepared pursuant to it) is secured by Paragraph 5 of Schedule 2 of the Draft Development Consent Order.

Question CH.1.27

- i. What restrictions on future archaeological research, above the tunnel route and elsewhere, are envisaged?
- ii. How are these justified?

Response

1. The proposed Scheme would provide powers to impose restrictions which may affect future archaeological research above the tunnel route, in order to protect the structural integrity of the tunnel. There are no restrictions intended to be placed on future archaeological research elsewhere. It is expected that the restrictions will vary along the length of the tunnel, depending upon the depth of the tunnel below the surface. The detail of the restriction is under discussion, but as currently drafted would restrict excavations relating to future archaeological research below 0.6m in areas where the tunnel is shallow, and below 1.2m in areas where the tunnel is deeper. The restriction would not prevent excavations from being undertaken below this depth but would require a promoter of future archaeological research to consult with Highways England in such cases in order to determine the extent to which that activity might have the potential to affect the structural integrity of the tunnel.
 - i. **What restrictions on future archaeological research, above the tunnel route and elsewhere, are envisaged?**
2. In response to (i), as set out in sections 5.3.6, 5.3.7 and Figure 1 of the Statement of Reasons [APP-023], Highways England seeks powers to acquire compulsorily subsoil for the bored tunnel, to the extent necessary to construct, operate and maintain the tunnel. Highways England therefore requires the subsoil within which the tunnel would lie, together with a 'layer' of additional subsoil around the tunnel itself; the additional layer, which would form a protective barrier around the tunnel, is referred to in the Statement of Reasons (see in particular Figure 1) as the 'exclusion zone'.
3. In addition, Highways England seeks powers to acquire compulsorily new rights over the subsoil above the tunnel (and its exclusion zone), up to and including the surface of the land above. The purposes for which such new rights are sought include enabling Highways England to impose restrictive covenants to secure protection of the tunnel from potentially conflicting future development and works that might jeopardise the structural integrity of the tunnel.
4. Highways England has been in discussions with the National Trust on the potential details of these restrictive covenants, given that the National Trust is the key landowner over whose land these restrictions would be imposed. The National Trust has raised concerns that the imposition of restrictive covenants could constrain future archaeological investigation work. Highways England and the National Trust have therefore consulted the Heritage Monitoring and Advisory Group (HMAG) on these proposals.

5. In response to the concerns raised by National Trust and HMAG that such restrictive covenants could impose an unacceptable restriction on future archaeological research, Highways England has identified that the level of restriction can be varied along the tunnel route based on the relative depth of the tunnel from ground surface. Where the tunnel is shallow (i.e. at the tunnel portals and at Stonehenge Bottom), any covenants imposed would need to involve a greater level of restriction, with a lighter restriction possible over the remainder of the route.
6. Attached at Appendix A is a longitudinal section showing the shallowest alignment of the tunnel permitted by the draft Development Consent Order [APP-020] (which reflects the greatest level of restriction over the surface). The section drawing locates the positions of these two types of restriction shown with shades of dark blue (for fuller restriction) and light blue for (lighter restriction).
7. The terms of the restriction are still under discussion with the landowners and heritage partners. The current proposal is that restrictive covenants will be required over land above and adjacent to the tunnel. These activities would include:
 - a. development which would require planning permission, deep foundations, piling or influence existing ground conditions.
 - b. changes in ground weight loading (either increasing or decreasing) such as:
 - i. any excavation (including boring and future archaeological research) below a depth of 1.2m in the area shown in light blue in Appendix A and below a depth of 0.6m in the area shown in dark blue in Appendix A;
 - ii. any additional loading as a result of building work or storage;
 - iii. use by any vehicles of greater weight than for standard road use vehicles; or
 - iv. any new tree planting or removal.
8. Where archaeological research is identified requiring activity restricted by the above proposed terms (such as by requiring excavations deeper than 0.6m or 1.2m, depending on the location), the restrictive covenants would require consultation with Highways England in order to analyse on a case by case basis and determine to what extent the proposed archaeological works may be permitted.

ii. How are these justified?

9. In response to (ii), this restriction is required in order to protect the Scheme from any activity that could risk the structural integrity of the tunnel. The use of the power to impose restrictive covenants would be exercised proportionately and in accordance with Government policy and guidance on compulsory acquisition.

Question CH.1.28

How will sub-surface archaeology within the areas HE intends to purchase be protected after construction activities?

Response

1. Land within the areas that Highways England intends to acquire permanently will be managed predominantly as chalk grassland following construction. The removal of land from cultivation will eliminate ongoing degradation and erosion of sub-surface archaeological remains and removal of surviving surface traces due to ploughing. The location of known heritage assets within areas permanently acquired and specific management requirements, or constraints, will be applied through the preparation of Handover Environmental Management Plans ('HEMPs') (see paragraphs 1.1.12, 3.1.3 and ref MW-G11 in Table 3.2b: REAC tables for the main works, in Appendix 2.2 OEMP [APP-187]). Cultural Heritage Asset Management Plans (CHAMPs) (see paragraph 6.8.14 of ES Chapter 6 Cultural Heritage [APP-044]) will be prepared every four years by Highways England (or the operating authority) in accordance with DMRB Vol 10 Section 6 Part 2 HA 117/08 (Highways Agency 2008) and as referred to in the Detailed Archaeological Mitigation Strategy secured by paragraph 5 of schedule 2 of the draft DCO [APP-020], to ensure that cultural heritage assets are protected during the course of highways operation and maintenance works.

Question CH.1.29

ES Appendix 2.2 OEMP

Historic England have concerns that Table 3.2a (Specific Measures to apply to preliminary works) contains insufficient detail given the very high sensitivity of the proposal.

Please provide details of additional specific measures which should be embedded in the OEMP and whether these could be contained in the DAMS.

Response

1. Highways England considers that the Outline Environment Management Plan (OEMP) [APP-187], including Table 3.2a, provides sufficient information for the decision-making process at this stage and to allow ongoing consultation and comment on the Scheme with the relevant bodies, including Historic England.
2. In terms of where additional details are provided, an Outline Archaeological Mitigation Strategy (OAMS) for the Scheme was submitted with the application and is set out in Appendix 6.11 to the Environmental Statement [APP-187]. The OAMS sets out a draft strategy as the basis for extensive consultation with members of the Heritage Monitoring Advisory Group (HMAG) (within the WHS) and Wiltshire Council Archaeology Service (WCAS) (outside the WHS) to develop a Detailed Archaeological Mitigation Strategy (DAMS) to be implemented as part of the OEMP (secured through paragraph 4 of Schedule 2 of the draft Development Consent Order [APP-020]) and as an independent certified document (secured by paragraph 5 of Schedule 2 of the draft DCO). PW-CH2 in Table 3.2a of the OEMP requires all works to be implemented in accordance with the DAMS.
3. The DAMS and accompanying Overarching Written Scheme of Investigation (OWSI) will set out the scope, guiding principles and methods for the planning and implementation of essential archaeological mitigation. A draft of the DAMS is submitted at Deadline 2. The DAMS will be developed further during Examination in consultation with HMAG/WCAS and the final DAMS will be a certified document, implementation of which will be secured as mentioned above by paragraph 5 of Schedule 2 to the DCO [APP-020].
4. The draft DAMS submitted at Deadline 2 contains additional detail on the scope of archaeological mitigation works and the process for the implementation of Site Specific Written Scheme of Investigations, Heritage Management Plans and Method Statements (see paragraphs 4.1.11-4.1.14, 4.2.2 and 5.1.6), required under the OAMS and OEMP to be prepared in consultation with HMAG/ WCAS prior to work commencing in that site or area of archaeological interest.
5. The draft DAMS details an archaeological research strategy underpinned by principles for archaeological mitigation. The strategy for archaeological mitigation specifies, in detail, the requirements for mitigation and the measures that they will entail. A comprehensive publication and dissemination programme will be

developed in parallel with a strategy for Public Archaeology and Community Engagement.

6. It is anticipated that the majority of the archaeological mitigation fieldwork will be undertaken during the Preliminary Works stage of the construction programme, as Advanced Archaeological Works. The archaeological mitigation programme is secured as part of the OEMP [APP-187, para. 1.2.6] which, in turn, is secured by Requirement 4 of the draft Development Consent Order [APP-020]. The contractors appointed to undertake the Preliminary Works and main construction works will produce Construction Environmental Management Plans (CEMPs) (based on and incorporating the requirements of the OEMP, as required by the OEMP itself) and Heritage Management Plans (required by the OEMP, PW-CH1 and MW-CH1) that set out how the requirements for archaeological mitigation at each stage will be implemented.
7. The OWSI (secured as part of the DAMS) will provide further detail on the approaches to be taken for archaeological mitigation, including detailed excavation, archaeological monitoring and recording, geo-archaeological investigation, archaeological topographic survey, preservation in situ, trial trench evaluation and ploughzone artefact collection. The OWSI will detail the programme for the archaeological mitigation, which will commence as part of the Preliminary Works and will be scheduled to be completed before the start of the main construction works, except for specific works that will necessarily only take place under the main construction works contract. The OWSI will also detail the requirements for monitoring, communications and the signing-off of archaeological works, the methodology for the reporting of archaeological investigation, proposals for publication and dissemination, and the preparation and deposition of archaeological archives.

Question CH.1.30

Paras 3.6.7-12: HMAG and the Scientific Committee

- i. Have HMAG's recommendations been incorporated in the Scheme?
- ii. Do HMAG have misgivings over any aspects of the Scheme?
- iii. Would HMAG and WCAS be able to contribute to the examination as groups, perhaps at hearings or preparing statements of common ground with the Applicant?

Response

i. Have HMAG's recommendations been incorporated in the Scheme?

1. Yes, the Heritage Monitoring Advisory Group's (HMAG) recommendations have been incorporated in the Scheme. To support the further development of the scheme proposals, Highways England engaged with statutory consultees including members of HMAG (Wiltshire Council, Historic England, the National Trust and English Heritage Trust) throughout the development of the preliminary design. As part of this engagement a weekly design development workshop was held to enable ongoing discussion with Heritage Partners (alongside other statutory and technical stakeholders) so specific questions and concerns related to aspects of the design could be considered in detail and potential solutions considered. More information on engagement with statutory bodies (including heritage partners) can be found in Table 7-1: Ongoing engagement with statutory environmental bodies in Chapter 7 of the Consultation Report [APP-026].
2. Recommendations received from HMAG members included; those on the lighting of the scheme, assumptions on signage and limiting land-take within the WHS, the positioning and width of Green Bridge 4, the positioning of the tunnel portals and the need for and length of the canopies. The Scientific Committee, which advises HMAG, was consulted regarding the design options for the road within the approach to the western portal. When asked to make a decision on this, their preference was for a steep-sided retained cut to reduce land-take. This was adopted into the Scheme's preliminary design.

ii. Do HMAG have misgivings over any aspects of the Scheme?

3. HMAG members to respond.

iii. Would HMAG and WCAS be able to contribute to the examination as groups, perhaps at hearings or preparing statements of common ground with the Applicant?

4. HMAG and WCAS to respond.

Question CH.1.31

Para 5.3.2(b): Field surveys, research excavations at Blick Mead

Have any modifications been made to the Scheme arising from consideration of the results of the Blick Mead excavations?

Response

1. Environmental Statement Appendix 6.1 - Heritage Impact Assessment [APP-195] notes that "The HIA considers the results of all archaeological fieldwork and recording undertaken since the publication of the 2015 WHS Management Plan, in particular [...] The published results of ongoing research excavations at Blick Mead spring, in the north-east of Vespasian's Camp, where possible Mesolithic settlement activity on the floor of the River Avon is being studied (Jacques et al. 2014; Jacques et al. 2018)." [APP-195, para 5.3.2b].
2. HIA para 8.2.6 notes that "The Scheme design has been developed to reduce the land-take within the WHS [...] Land-take at and around Blick Mead will be avoided, all Scheme elements (including temporary haul roads) avoiding the known extent of this asset." The route alignment has been optimised past Blick Mead, to avoid land-take and to keep the road at existing grade.
3. Groundwater modelling indicates no adverse significant effects on Blick Mead or the River Avon; this is presented in Environmental Statement Appendix 11.4 - Groundwater Risk Assessment, Annex 3, Blick Mead Tiered Assessment [APP-282].

Question CH.1.32

Para 5.3.16: CS Policy 59, Setting study of the WHS

When is this likely to be available?

Response

1. The Applicant is not responsible for producing the setting study; the Stonehenge and Avebury World Heritage Site (WHS) Coordination Unit is best able to advise regarding the timeline for the preparation of the WHS Setting Study.
2. Environmental Statement Appendix 6.1 - Heritage Impact Assessment [APP-195, para 5.3.16] indicates that the DCMS "2018 State of Conservation Report for the Stonehenge, Avebury and Associated Sites WHS report by the State Party notes that, 'A detailed draft brief [in relation to the setting study] has been developed and work will be commissioned in 2018–2019. The study is designed to provide guidance on the identification of the setting and the type of development that is likely to have an impact on it and the World Heritage and its OUV. It will also provide advice on the nature of evidence likely to be required from developers.'"
- 3.
- 4.

Question CH.1.33

Para 5.3.31: Bare earth baseline

This para tells us that the HIA excludes existing woodland cover in assessing scheme impacts on the attributes of the OUV.

Is this also true of the general scheme assessment set out in Chapter 6?

Response

1. Environmental Statement Appendix 6.1 - Heritage Impact Assessment (HIA) [APP-195, paras 5.3.30-31] assumes a 'bare earth' baseline derived from the digital terrain model to assess changes in the settings of heritage assets that contribute to Attributes of Outstanding Universal Value (OUV). This excludes both buildings and woodland cover, as many of these modern woodland areas impact adversely on the OUV of the World Heritage Site (WHS), and the Stonehenge and Avebury WHS Woodland Strategy [Chris Blandford Associates 2015, summarised in the 2015 WHS Management Plan, Simmonds & Thomas 2015, para. 7.2.10; 8.5.21 – 8.5.24] advocates a general presumption against new or replacement planting where these would cause a negative impact on the Attributes of OUV. The setting of the Neolithic and Bronze Age monuments which express Attributes of OUV, in particular intervisibility, is not enhanced by modern woodland plantations. On the advice of HMAG and the Stonehenge and Avebury WHS Coordination Unit, a bare earth model was adopted in assessing their setting. Accordingly, the HIA excludes existing woodland cover in assessing Scheme impacts on Attributes of OUV. The assessment of changes in the settings of heritage assets that contribute to Attributes of OUV, and changes in views between assets, assumes a long-term 'bare earth' baseline derived from the digital terrain model. There is insufficient chronological, palaeoenvironmental and archaeological data to enable us to return to 'an authentic prehistoric landscape' (2015 WHS Management Plan, para. 8.3.15).
2. Unlike the HIA, the Zone of Theoretical Visibility (ZTV) used in the cultural heritage assessment (Environmental Statement Chapter 6 - Cultural Heritage [APP-044, para 3.5.1-2]) takes into account landscape artefacts such as trees, woodland and buildings. In the ES, existing trees and buildings are treated as permanent landscape elements in both the cultural heritage chapter and Environmental Statement Chapter 7 - Landscape and Visual Effects [APP-045]. The Environmental Statement considers the setting of a wider range of heritage assets than the HIA, as it includes Middle Bronze Age and later archaeological remains and historic landscapes, and medieval and later built heritage assets, which do not express the Attributes of OUV [see APP-195, para. 5.10.29].
3. In the Environmental Statement, assets where the Scheme may have an impact upon setting have been identified based on the Scheme's ZTV modelling established by the Landscape and Visual Impact Assessment and site visits, and also considers physical and historical connectivity between heritage assets. In accordance with The Setting of Heritage Assets: Historic Environment Good

Practice Advice in Planning Note 3 (Second Edition) (Historic England 2017), attributes of their setting are considered to include their physical surroundings, such as green space, trees and vegetation. The winter season is taken as the baseline setting for the Environmental Statement, enabling the 'worst-case' scenario of limited woodland screening to be presented. This is detailed further in Environmental Statement Appendix 6.9 - Cultural Heritage Setting Assessment [APP-218].

4. In summary, a precautionary approach to the assessment has been taken in both the ES, which takes account of vegetation screening in its winter state, and in the HIA, which assumes a 'bare earth' baseline with no vegetation screening.

Question CH.1.34

Para 5.6.7: Life expectancy

This para anticipates that the 120 year life expectancy would be extended by the continual maintenance and replacement of components.

- i. Is there an operational maintenance plan consistent with this aim?
- ii. What are the implications for the renewal of, or the execution of major works on, particular elements?
- iii. How would full or partial decommissioning be carried out, and what are the implications for heritage assets?

Response

- i. **Is there an operational maintenance plan consistent with this aim?**
 1. A detailed operational maintenance plan will be produced as part of detailed design, after making of the DCO (if made). The Design and Build Contractor will be required to develop an inspection and maintenance plan during the detailed design phase that enables the asset to perform as specified in Highways England design standards.
 2. All structures will be subject to a regime of regular inspections, which Highways England will establish with the Design and Build Contractor within an inspection and maintenance plan during the detailed design stage. During detailed design of the structures, materials and structural form details will be favoured where they offer extended working life thus minimising future maintenance activities, the impact on the operation of the network, and the World Heritage Site (WHS). The scheme is being designed to minimise maintenance impacts or eliminate maintenance activities so far as is reasonably practicable in accordance with IAN 69/15 'Designing for Maintenance' and meet the requirements contained within Construction Design Management (CDM) 2015. In relation to the tunnel, maintenance activities will be in line with Volume 2, Section 2, Part 9: BD 78/99 Design of Road Tunnels and Volume 3, Section 2, Part 3: BA 72/03 Inspection and Maintenance of Road Tunnels.
 3. The scheme design is in accordance with the highest category within Highways England's Design Manual for Roads and Bridges BD 100/16 where the design working life of the bridges, tunnel portals, bored tunnels and the retaining walls is Category 5 (not less than 120 years).
 4. The Category 5 design working life is defined as the "assumed period for which a structure or part of it is to be used for its intended purpose with anticipated maintenance but without major repair being necessary". This however does not mean that the structure will cease to be serviceable after 120 years. It is a realistic expectation that major civil engineering structures that form part of important transport infrastructure would remain in use beyond their 'design working life'.

- ii. **What are the implications for the renewal of, or the execution of major works on, particular elements?**
5. Structural components that will require renewal during the design working life of the scheme typically include bridge bearings and movement joints. Other non-structural components include: parapets, waterproofing systems, road surfacing, road pavement, technology equipment and M&E equipment.
 6. The design working life of the bridges, tunnel and tunnel portals is Category 5 (>120 years), except for the elements below, in accordance with BD100/16 -The Use of Eurocodes for the Design of Highway Structure:
 - Expansion joints – Category 2 (up to 50 years)
 - Parapets – Category 2 (up to 50 years)
 - Waterproofing system – Category 2 (up to 50 years)
 7. Renewal works will typically be carried out under traffic management in lane closures or full carriageway closures with traffic in contraflow arrangement on opposite carriageway (Environmental Statement Chapter 2 - The Proposed Scheme [APP-040]). To maintain operation of the network, maintenance works that are not safety critical are carried out in off-peak hours where practicable and with minimum impact on the surrounding communities and environment. More extensive structural works that may require the full closure of the road are not anticipated during the design life of the structure.
 8. As new structures are required across the scheme, safe access arrangements and maintenance access for inspections and routine maintenance activities will be factored into their design. Material selection and structural form for key assets such as bridges will be influenced by their proven record of durability and those requiring no or minimal maintenance over the assets 120 years design life.
 9. Chapter 2 of the Environmental Statement (para 2.5) [APP-040] also refers to significant effects of maintenance on the WHS being unlikely. It states 'As required by the OEMP, industry standard control measures would be applied and encapsulated in the Handover Environmental Management Plan (HEMP). With the implementation of these measures no significant effects are considered likely'.
 10. The maintenance and renewal materials and design would be sympathetic to their WHS context. Traffic Management would look to limit traffic impacts around the WHS during the maintenance and renewal of components and materials. Works would be scheduled to avoid particularly busy times of the year, such as the solstices.

- iii. **How would full or partial decommissioning be carried out, and what are the implications for heritage assets?**
11. It is highly unlikely that the Scheme would be demolished after its design working life as the road would have become an integral part of nationally important infrastructure. Aspects of theoretical decommissioning are considered in Heritage Impact Assessment (HIA) (Environmental Statement Appendix 6.1 - Heritage Impact Assessment [APP-195]) Section 9.2, Impacts and effects of Scheme: overview: Theoretical decommissioning (paragraphs 9.2.14 to 9.2.25). Paragraph 9.2.16 explains how the tunnel and associated road infrastructure (both surface and underground components) may, theoretically, be decommissioned at some point in the future. During the detailed design stage, the Construction (Design and Management) (CDM) Regulations require the designer to consider decommissioning during the design of the scheme (CDM Regulation 9 (2) and Regulation 9 (3)). At present, there is insufficient information on the manner of any future decommissioning (given this is anticipated to be at least 120 years in the future), and both engineering and design technologies available and the regulatory environment will evolve over time. Paragraph 9.2.22 states that the hypothetical decommissioning of the Scheme might have a slight adverse short-term impact upon the Outstanding Universal Value (OUV) of the World Heritage Site (WHS). Paragraph 9.2.24 states that in the long term, it is not anticipated that hypothetical decommissioning of the Scheme would have any additional significant long-term adverse impact upon the OUV of the WHS.
12. Chapter 2 of the Environmental Statement (para 2.6) [APP-040] also refers to decommissioning of the scheme. It states that 'in the event of the Scheme needing to be demolished, this would conform to the statutory process at that time, including EIA as appropriate. Demolition of the Scheme is not therefore considered further in this ES. Consideration is however given, where relevant, to dismantling and replacing particular elements of the Scheme once they reach the end of their design life, if significant effects are likely'.

Question CH.1.35

Para 5.10.30: Assets scoped out due to intervening topography

Has consideration been given to including assets because of cultural or historical associations even though intervisibility may be absent?

Response

1. Where intervening topography resulted in a lack of inter-visibility, consideration was given to including assets due to aspects such as: spatial patterning; positioning in relation to earlier landscape features; chronological context and sequence; watercourses and watersheds; similarities in monument form and function; parallels in terms of cultural material; and, historical associations. However, as indicated in paragraph 6.9.12 of Environmental Statement Appendix 6.1 - Heritage Impact Assessment [APP-195], localised variations in topography, ridge-line views and inter-monumental views (and restricted views, such as some from the Stonehenge Cursus where it crosses Stonehenge Bottom) are the key factors in understanding the distribution and grouping of monuments. Please also see response to Question CH.1.7.

Question CH.1.36

Para 8.3.11: Archaeological mitigation documents

This para notes that these documents (DAMS, OWSI, SSWSI) would be agreed in consultation with HMAG/WCAS. Prior to the preliminary works starting on site.

- i. What would be the process of agreement?
- ii. How would the process be secured in the DCO?

Response

i. What would be the process of agreement?

1. The Outline Archaeological Mitigation Strategy (OAMS) (Environmental Statement Appendix 6.11 [APP-220]) provides for preparation of the Detailed Archaeological Mitigation Strategy (DAMS), Site Specific Written Schemes of Investigation (SSWSIs), Heritage Management Plans (HMPs) and Method Statements and makes provision for monitoring of the mitigation programme [APP-220, paras. 1.1.3 and 1.2.2]. The relationship between the OAMS and the DAMS and its component parts is set out at paragraph 1.3.3 of the Outline Environmental Management Plan (OEMP) (Environmental Statement Appendix 2.2 [APP-187]) and is further explained in additional submission AS-010.
2. The DAMS and the accompanying Overarching Written Scheme of Investigation (OWSI) are being developed during the course of the Examination through continuation of regular meetings with the Heritage Monitoring Advisory Group (HMAG), in order to produce a finalised DAMS prior to close of Examination. The HMAG meetings will be informed by further engagement with the Scientific Committee during this process.
3. The draft DAMS, submitted at Deadline 2, sets out the archaeological strategy and framework for the preparation of SSWSIs, HMPs and Method Statements, which will be prepared subsequent to the granting of the DCO. The SSWSIs, HMPs and Method Statements will be prepared in consultation with HMAG/WCAS, prior to any Preliminary Works or Main Works commencing for the Scheme; these processes are provided for in the draft DAMS (see paragraphs 4.1.11-4.1.14, 4.2.2 and 5.1.6) and the Outline Environmental Management Plan (OEMP) (Environmental Statement Appendix 2.2 [AAPP-187]) (HMP – PW-CH1 and MW-CH1, SSWSIs – PW-CH3 and Method Statements – PW-G5 and MW-G8).

ii. How would the process be secured in the DCO?

4. The DAMS will be a certified document and its implementation is secured by Paragraph 5 of Schedule 2 of the draft Development Consent Order [APP-020]. As noted above, the implementation of the DAMS includes the implementation of the OWSI which makes up part of the DAMS, as well as the preparation and implementation of SSWSIs, HMPs and Method Statements, and therefore the processes with respect to all those documents are also secured by Paragraph 5 of Schedule 2 of the DCO. The implementation of the OEMP is secured by Paragraph 4 of Schedule 2 of the draft DCO.

Question CH.1.37

Para 10.1.1 *et seq*: Cumulative impact

We are referred on to Chapter 15, which notes at para 15.3.4 that, due to the nature of the works, there are limited opportunities for mitigation measures during construction. Careful programming to minimise disturbance and to limit duration of disturbance is one form of mitigation.

Please provide evidence of phased programming designed to mitigate cumulative impact.

Response

1. To clarify and for the avoidance of doubt, Chapter 15 para 15.3.4 states that 'Due to the nature of the works, there are limited opportunities for mitigation measures to avoid these potentially significant adverse effects during construction'.
2. The ExA has introduced the suggestion that 'careful programming to minimise disturbance and to limit duration of disturbance is one form of mitigation' and has asked the applicant to provide evidence of phased programming. The identification of potential cumulative effects was based upon the scheme, as described in Chapter 2 - The Proposed Scheme of the Environmental Statement [APP-040], and has assumed a 'worst case' situation for the construction assessment whereupon all of the identified impacts are present at once and may be expected to combine to result in a greater overall impact (as stated at paragraph 15.3.5).
3. With regards to cultural heritage, careful phased programming is implicit in the development of the scheme's archaeological mitigation strategy, as set out within Section 6 of the draft Detailed Archaeological Mitigation Strategy, which is submitted at Deadline 2. Section 6 sets out site works which will take place over three phases spanning the preliminary works and main works stages. For example, measures including preserving archaeological remains in-situ and protecting them through the preliminary works and main works stages; undertaking the majority of archaeological mitigation during preliminary works; and limiting what remains in terms of archaeological mitigation works in the main works phase. The DAMS will be a certified document, and its implementation will be secured by requirement 5 of Schedule 2 to the draft DCO [APP-020].

Question CH.1.38

Para 3.2.2: Selection of assets for assessment - Criteria beyond visual impact

Non-visual impacts could also include historical or cultural association, the sequential effects of moving through the landscape on established routes, and cumulative effects.

Were these considered?

Response

1. Yes. Assets for assessment were selected having regards non-visual influences on a heritage asset's setting.
2. Please see response to ExAQ1 PINS No.CH.1.7 regarding non-visible factors related to setting, such as cultural or historic connections, as well as inter-visibility and 'hidden' linkages.
3. The Heritage Impact Assessment (HIA) notes with regard to sequential effects of moving through the landscape on established routes that "Site visits involved extensive walking through the landscape to experience changing views of Asset Groups when moving along permissive paths" (Environmental Statement Appendix 6.1 - Heritage Impact Assessment [APP-195, para. 5.3.12]). The authors of the Environmental Statement Chapter 6 - Cultural Heritage [APP-044] and the HIA experienced the sequential effects of moving through the landscape along established routes.
4. With further regard to sequential effects of moving through the landscape on established routes, the Setting Assessment (Environmental Statement Appendix 6.9 [APP-218]) and the HIA [APP-195] considered a number of previous inter-visibility studies, including *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]. The Asset Group analysis in section 6.9 of the HIA considers the speculations of Exon et al. on the experience of travelling through the landscape, and also specific studies of walking along the Greater Cursus (Pearson and Field 2011; Thomas in Parker Pearson 2012; Bowden et al. 2015).

5. Heritage assets were selected for assessment in consultation with other disciplines, for example Landscape and Visual Impact Assessment (with the production of Zones of Theoretical Visibility - ZTVs), Noise (through preliminary noise contour plots) and Air Quality (through discussion as to which assets would be affected by changes in air quality). In this way cumulative and in-combination effects could be considered on heritage assets. Cumulative impacts are set out in HIA Section 10, and further details on methodology and outcomes are set out in Environmental Statement Chapter 15, Assessment of Cumulative Effects [APP-053]. Please see also the response to Question CH.1.23 regarding combined effects and cultural heritage.

Question CH.1.39

Paras 3.4.4/16: Historic buildings scoped

What are the solitary buildings scoped into Section 1 and Section 5 – are they the milestones?

Response

1. Yes, the single historic buildings cited in paragraphs 3.4.4 and 3.4.16 of Environmental Statement Appendix 6.9 - Cultural Heritage Setting Assessment [APP-218] are milestones.
2. The milestone mentioned in paragraph 3.4.4 is located to the south-east of Yarnbury Castle (UID 6001; NHLE 1005621) in Section 1 of the Scheme. The milestone is set to the south of the A303 approximately 2.2 miles (3.5km) west of Winterbourne Stoke on the eastern side of what was the Stapleford Road, now a green lane. The milestone is in the form of a pillar 1m tall bearing the inscription 'IX Miles to SARUM XXVII Miles to BATH'. The asset has historic interest dating to 1750, over a decade earlier than the other milestones in the area. The asset's setting is the historic road beside which it stands.
3. The milestone mentioned in paragraph 3.4.16 is located approximately 120m south of junction with Bustard Road, B3086 (UID 6122, NHLE 1284782) in Section 5 of the Scheme (Rollestone Crossroads). The asset is an early 19th-century milestone in limestone with a cast iron plate bearing the raised lettering SALISBURY / 10/ DEVIZES / 13. The asset has historic interest for its commemoration of the Salisbury to Devizes turnpike of 1775. The asset's setting is the B3086, the road which it was erected to mark, and contributes to its significance.

Question CH.1.40

Para 3.4.9: Assets in West Amesbury

Reference is made to the River Till – should this be the River Avon?

Response

1. Yes – this is an error in paragraph 3.4.9 on Assets in West Amesbury in Environmental Statement Appendix 6.9 Cultural Heritage Setting Assessment [APP-218]. This should read instead as River Avon.

Question CH.1.41

AG03 and AG04: Winterbourne Stoke Barrows

Have the effects on users of the footpaths along the valley been taken into account in terms of serial progression northwards under the viaduct and over the land bridge before reaching the assets?

Response

1. The Environmental Statement has considered views from within the valley and in proximity to these assets (Environmental Statement Chapter 6 - Cultural Heritage, [APP-044]; Environmental Statement Chapter 7, Landscape and Visual Effects, [APP-045]; Environmental Statement Chapter 13, People and Communities, [APP-051]; and Environmental Statement Chapter 15, Assessment of Cumulative Effects, [APP-053]. The Environmental Statement Chapter 7, Landscape and Visual Effects [APP-045], also assesses the impacts from the Scheme, and any resultant significant effects, on users of footpaths throughout the Scheme.
2. With regards to the serial progression northwards under the viaduct and over the land bridge before reaching Asset Groups AG03 and AG04, this is not a fundamental element of the asset groups setting, as set out in the Environmental Statement Appendix 6.9 Cultural Heritage Setting Assessment [APP-218, pp. 25 and 26]. This document states that it is the visual connection between AG03 Winterbourne Stoke West Barrows and the Coniger Enclosure and AG04 Winterbourne Stoke East Barrows and Enclosure, east-west across the River Till Valley, that is the fundamental element to the understanding of their setting and their relationship to each other. The northern progression along the footpath does not contribute to the setting or the significance of either Asset Group.

Question CH.1.42

AG13: The Diamond Group

Would the linear earthwork feature be severed?

Response

1. A stretch of the non-designated linear boundary (in the form of a buried ditch with no surface trace) would be severed by the construction of the retained cut.
2. The linear feature is a Late Bronze Age boundary. Consequently, it does not convey the Attributes of Outstanding Universal Value (OUV), as the Statement of OUV (UNESCO 2013, 291–94) clearly sets out that those sites that contribute to OUV relate to monuments that were built c. 3700 to 1600 BC, i.e. the Early Neolithic to the Early Bronze Age (inclusive) (Environmental Statement Appendix 6.1 - Heritage Impact Assessment [APP-195, para. 5.10.29]). There is evidence for a diverse range of activities in the area around Stonehenge during the Later Bronze Age including formalised settlements and field systems in some areas of the Stonehenge landscape. Linear banks and ditches, such as those across Wilsford Down and Lake Down, formally divided up the landscape. Although they encroached as far as the Cursus, field systems are absent from the immediate area surrounding Stonehenge itself. The linear earthwork near the Diamond Group (AG13) contributes to the group only in the sense that it bisects the group and shows that in the Later Bronze Age the division of the land was more important than the barrows and their association with the pre-existing monumental Neolithic and Early Bronze Age landscape. The scheduled part of the land boundary (UID 2014.01, NHLE 1010837) is an upstanding earthwork which will not be directly physically impacted by construction.
3. A non-designated short section of this boundary (UID 2014.02, MWI6406), which does not survive as an upstanding earthwork, but as buried archaeological remains (a ditch) with no visible surface trace, will be truncated. It is visible as a cropmark on aerial photographs. A trench excavated through the feature in the early 2000s revealed a very large ditch aligned approximately north-west to south-east. The fills of the ditch produced animal bone, worked flint and burnt flint, and a single shard of Roman pottery from its upper fills (Wessex Archaeology 2002f). The ditch was subject to further excavation in January 2013 immediately to the south-west of the Winterbourne Stoke Crossroads. This established that the ditch was 4.6m wide and 1.5m deep. Although no artefacts were recovered to confirm the suspected Late Bronze Age date of the ditch, this was considered to be the most likely conclusion (Wessex Archaeology 2014b). This linear boundary continues for a significant distance across the landscape eventually reaching the River Till to the northwest.
4. As noted in Environmental Statement Appendix 6.8 - Cultural Heritage - Summary of non-significant effects [APP-217, Table 1.2], the proposed Scheme would impact upon the high value asset due to the realigned A360 North and the cutting approach to the Western Portal. Approximately 35m of the ditch would be

removed by the realigned A360, and a c. 25m length would be removed by the cutting approaching the Western Portal. Mitigation measures comprise archaeological investigation along the mainline cutting in advance of construction, and preservation in situ under compound areas. The impact magnitude following mitigation is assessed as Minor, resulting in a Slight Adverse permanent residual effect.

5.

Question CH.1.43

AG19: Normanton Down Barrows and Bowl barrow south of the A303 and north west of Normanton Gorse

- i. Taking into account the possibility of working to the maximum LoDs in close proximity to Normanton Down barrows, please summarise the measures to be taken to ensure the stability of the assets during tunnelling and other works.
- ii. Likewise, given the proximity of the Bowl barrow to the tunnel boring face, summarise the risks should the works proceed to the maximum LoDs latitudinally, longitudinally and vertically. This exercise should be carried out for all assets close to the works.

Response

- i. **Taking into account the possibility of working to the maximum LoDs in close proximity to Normanton Down barrows, please summarise the measures to be taken to ensure the stability of the assets during tunnelling and other works.**
 1. The tunnel will, at its closest point, be at a significant depth below existing ground levels even assuming that it is being carried out at the upper limit of deviation for the crown of the bored tunnel, shown on Bored Tunnel Limits of Deviation Plan [APP-019] and given effect through article 7(5) of the draft DCO [APP-020]. Laterally, the tunnel could deviate southwards, closer to the Normanton Down Barrows and Bowl, up to the Order limits in accordance with article 7(3), but would nonetheless be at the depths prescribed by that plan. It should be noted that the western portal LoDs mean that it can only move a nominal 1m to the east of the position of the "bow-tie" showing the commencement of Work No.1E on the Works Plans [APP-008] as set out in article 7(7) of the draft DCO. There will therefore be no direct physical impacts on the AG19 Normanton Down Barrows Asset Group.
 2. All heritage assets identified for preservation in situ within the Scheme boundary and suitable protective measures, including fencing and exclusion zones, are identified within the draft Detailed Archaeological Mitigation Strategy (DAMS), submitted at Deadline 2, as outlined within paragraphs 4.3.6-4.3.9 and 5.7.2-5.7.3 of the draft DAMS. These include heritage assets that are included within the AG19 Normanton Down Barrows. The final DAMS will be a certified document and its implementation is secured by Requirement 5 of Schedule 2 of the draft Development Consent Order [APP-020]. Fencing of heritage assets, identified in the DAMS for protective fencing, is also required by the Outline Environmental Management Plan (OEMP) [APP-187, PW-CH4]. The potential impacts from construction will be considered as part of the Scheme-wide Heritage Management Plan detailed in the OEMP [APP-187, PW-CH1, MW-CH1] which will indicate how the historic environment is to be protected in a consistent and integrated manner including from potential impacts of construction (for example, in relation to the Normanton Down Barrows - tunnel settlement and in-direct

impacts from ground vibration). Heritage assets that are at risk from ground vibration from the tunnel or from ground surface movement caused by settlement will be monitored during tunnelling operations with actions taken where necessary to control/mitigate impacts (see response to CH1.2). The implementation of the OEMP is secured by Requirement 4 of schedule 2 of the draft DCO.

3. The detailed design will set out the final design for the tunnel. It is intended that the primary means of mitigation will be through the design of the scheme to avoid potential impacts. In-direct impacts from ground vibration or settlement are not predicted. Significant effects from vibration and settlement are not anticipated. The construction of the scheme will be in accordance with the standard practice and standards of reasonable care and proficiency expected of any chosen Contractor, within the parameters as set out in the DCO, plans and the OEMP. This will ensure that there will be no stability risk to the AG19 Normanton Down Barrows.
- ii. **Likewise, given the proximity of the Bowl barrow to the tunnel boring face, summarise the risks should the works proceed to the maximum LoDs latitudinally, longitudinally and vertically. This exercise should be carried out for all assets close to the works.**
4. The tunnel will, at its shallowest permitted depth, be a minimum of 6.75m below existing ground levels in the vicinity of the Bowl barrow south of the A303 and north west of Normanton Gorse as set out in Application Document 2.16 Tunnel Limits of Deviation Plan [APP-019]. It should be noted that this barrow was fully archaeologically excavated in the 1960s. The western portal LoDs mean that its face can only move 1m to the east as discussed in (i) above. Laterally the bored tunnel could deviate up to the Order limits but in practice will need to align with the centrelines shown for Work No.1E, which themselves may only deviate laterally by up to 3 metres. Given the depths prescribed, there will therefore be no direct physical impacts on the Bowl barrow south of the A303 and north west of Normanton Gorse. The same procedures as set out in the draft DAMS and the OEMP for the preservation in situ of heritage assets, and the monitoring of those remains for ground vibration and ground surface movement (settlement), as set out in (i) above will apply to this asset.
 5. In-direct impacts from ground vibration or settlement are not predicted. Significant effects from vibration and settlement are not anticipated.
 6. The construction of the scheme will be in accordance with the standard practice and standards of reasonable care and proficiency expected of any chosen Contractor, within the parameters as set out in the DCO, plans and the OEMP. This will ensure that there will be no stability risk to the Bowl barrow south of the A303 and north west of Normanton Gorse.

Question CH.1.44

AG27: The Avenue

How is the Avenue to be treated as it crosses the old A303 and the road north of West Amesbury currently joining the A303?

Response

1. The location where the Avenue crosses Stonehenge Road north of West Amesbury is outside of the order limits (by approximately 90m) and will therefore be unaffected by the Scheme.
2. The Avenue would cross the redundant A303, east of Stonehenge Road, in a location where the existing highway would be converted to a Private Means of Access (PMA) which would only be required for occasional maintenance and agricultural access. As such the existing surface would be broken up and a grassed surface treatment provided to maintain landscape connectivity, as stated within the Environmental Statement Chapter 2: The Scheme, paragraph 2.3.56 [APP-040]. This would be secured by an amendment to the Outline Environmental Management Plan (OEMP) (Environmental Statement Appendix 2.2 [APP-187]), stating the requirement for the PMA east of Stonehenge Road to have a grassed surface to maintain landscape connectivity.
3. Where the Avenue would cross the redundant A303 (and is not required as a PMA) the A303 would be broken out and restored to species rich chalk grassland. This would be secured through items D-CH2 and MW-BIO2 of the OEMP [APP-187] which is, in turn, secured by Paragraph 4 of Schedule 2 of the draft Development Consent Order [APP-020].
4. In summary, the redundant A303 where it crosses the Avenue would have a grassed surface.

Question CH.1.45

AG32: Vespasian's Camp

See comments above on the setting of Blick Mead. Although no further land take is involved, the flyover may well affect Blick Mead visually.

Response

1. Regarding the setting of Blick Mead, please see response to Questions CH.1.8 and CH.1.17. Land between the Blick Mead site and the Scheme is heavily wooded which provides visual screening of Blick Mead. The road would be at grade as it passes the Blick Mead site to the north, as is the existing A303. Blick Mead's current setting, as it is experienced today, is characterised by the wooded parkland landscape of Amesbury which restricts views in and out. This setting, and its relationship to the existing road, would not change through the construction of the Scheme. The flyover as it crosses over the current Countess Roundabout is located c.470m to the east-north-east and is visually screened from the site by woodland.

Question CH.1.46

6061: Grey Bridge, grade II

Would the flyover be visible in winter, looking north?

Response

1. The flyover will be visible through the vegetation looking north from Grey Bridge during the winter months when the foliage is reduced. This is considered within the assessment of effects in Environmental Statement Appendix 6.9 - Cultural Heritage Setting Assessment [APP-218, page 130] and in Environmental Statement Appendix 6.8 - Cultural Heritage - Summary of non-significant effects [APP-217, page 10 and page 23].

Question CH.1.47

6067: Countess Farmhouse, grade II and associated buildings

The view of the roundabout to the south, including the new flyover, would be opened up because of the felling of mature trees to enable drainage works.

How effective as screening would be the current replanting proposals for a belt of trees within the Farmhouse land, how long would the trees take to achieve maturity, and what progress has been made towards agreement on a replanting scheme?

Response

1. The planting proposals are illustrated on the indicative cross sections attached, which show two lines of section from Countess farmhouse, each at Year 1 and Year 15 of operation.
2. The planting proposals would screen the lower parts of the Countess flyover retaining walls and slip-roads and soften views of the upper parts of the flyover at year 15 of operation, via the planting between the slip roads and flyover as indicatively set out on the Environmental Masterplan (Environmental Statement Figure 2.5 A-S [APP-059]).
3. The flyover would therefore remain visible and retain a significant visual effect at year 15 of operation as the viaduct and vehicles (including lorries) would be up to 11.5 metres above the grounds of Countess Farm.
4. The detailed design stage of the drainage works, in combination with a detailed tree survey, will establish the likely impact and exact extent of removal; such that it may be that the extent of tree loss could be reduced. The planting is secured under requirement 8 of Schedule 2 of the draft DCO [APP-020], pursuant to which Highways England will be required to submit a detailed landscaping scheme, which is required to be on the basis of the mitigation measures set out in the ES.
5. The time required for trees to reach maturity would depend on their species, however it is likely to take beyond 15 years to establish full screening of the flyover.
6. In terms of the progress being made to agree on a replanting scheme, discussions have been held with National Trust, the owners of the land. At meetings on the 15th February 2019 the National Trust stated that they are agreeable to replanting, subject to clarification of archaeological work and therefore the detail of any agreement is under discussion.

Question CH.1.48

Ratfyn Farmhouse, grade II

Since the flyover would be visible from the grounds above trees, is it appropriate to assess the effect of the scheme as neutral?

Response

1. Environmental Statement Appendix 6.9, Cultural Heritage Setting Assessment [APP-218] acknowledges that the flyover will be visible from the grounds of Ratfyn Farmhouse. This will result in a Negligible impact. In accordance with the methodology set out in the Environmental Statement Chapter 6: Cultural Heritage [APP-044], a Negligible impact acknowledges a change to historic building elements or setting, but that the change is slight and hardly affects the asset.
2. An analysis of the setting of the asset has been undertaken for Ratfyn Farmhouse [APP-218]. This identified the importance of the rural landscape to the way in which the asset is experienced, in accordance with the definition of heritage setting contained within the National Policy Statement for National Networks (DfT, 2014, footnote 96). Although the flyover will be visible, it will not affect the ability to appreciate the asset within its agricultural context, resulting in a negligible change which hardly affects the value of the asset. In accordance with the assessment criteria set out in Table 6.6 of the Environmental Statement [APP-044], the resulting effect upon a Medium value asset is Neutral. As stated in paragraph 6.3.23, where the Significance of Effects matrix presented in Table 6.6 allows for two levels of significance (i.e Neutral/Slight) professional judgement has been used to determine the appropriate level of significance.

Question CH.1.49

Para 1.2.3 (See also paras 1.2.5, 1.3.1, and 1.5.1)

This para tells us that the DAMS will be developed in consultation with the HMAG, comprising Historic England, WCAS, the National Trust, and English Heritage. Elsewhere in the ES (See OAMS para 1.2.7, etc.), it is noted that the development and operation of the DAMS and subsequent documents will be carried out in agreement with these parties.

The matter of agreement is a significant concern, which should be secured in the DCO.

Response

1. The Detailed Archaeological Mitigation Strategy (DAMS) and accompanying Overarching Written Scheme of Investigation (OWSI) will be developed during the course of the Examination through consultation via the continuation of regular Heritage Monitoring and Advisory Group (HMAG) meetings, with the intention of finalising the DAMS prior to the close of Examination. The HMAG meetings will be informed by further engagement with the Scientific Committee during this process.
2. The draft DAMS, submitted at Deadline 2, sets out the archaeological strategy and framework for the implementation of the DAMS and consultation with regard to subsequent documents (Site Specific Written Schemes of Investigation (SSWSIs), Heritage Management Plans (HMPs) and Method Statements). The SSWSIs, HMPs, and Method Statements will be prepared in consultation with HMAG and Wiltshire County Archaeological Service (WCAS), prior to any Preliminary Works or Main Works commencing for the Scheme; these processes are provided for in the draft DAMS (see paragraphs 4.1.11-4.1.14, 4.2.2 and 5.1.6) and the Outline Environmental Management Plan (OEMP) (Environmental Statement Appendix 2.2 [AAPP-187]) (HMP – PW-CH1 and MW-CH1, SSWSIs – PW-CH3 and Method Statements – PW-G5 and MW-G8).
3. The final DAMS submitted prior to the close of the Examination will be a certified document, and its implementation is secured by Paragraph 5 of Schedule 2 of the draft Development Consent Order [APP-020]. As noted above, the implementation of the DAMS includes the implementation of the OWSI which makes up part of the DAMS, as well as the preparation and implementation of SSWSIs, HMPs and Method Statements, and therefore the processes with respect to all those documents are also secured by Paragraph 5 of the DCO.
4. The implementation of the OEMP is secured by Paragraph 4 of Schedule 2 of the draft DCO. As a result, there is no requirement for the DCO to further secure consultation on or agreement of the DAMS or any subsequent documents.

Question CH.1.50

Method statements

Integration of method statements into the HMP for each phase of the works should be considered.

Response

1. The Detailed Archaeological Mitigation Strategy (DAMS) proposes strategies and approaches for the protection of archaeological remains to be retained *in situ* and for investigation, recording and analysis of archaeological remains to be removed prior to construction. A draft of the DAMS is submitted at Deadline 2. The following text is taken from the draft DAMS paragraphs 4.1.11- 4.1.14 and is set out below to clearly articulate the process for the production of Heritage Management Plans and Method Statements:
 2. *"4.1.11 During both the PW [preliminary works] stage and the MW [main works] stage, procedures will be adopted in the CEMPs [Construction Environmental Management Plans] to ensure that sites of archaeological interest are protected. Toolbox talks will be undertaken when necessary to inform construction supervision staff and site operatives of sensitive areas.*
 3. *4.1.12 HMPs will be prepared indicating how the historic environment is to be protected in a consistent and integrated manner, coordinated with all other relevant environmental topics. The requirements for what the HMPs would include are set out in the OEMP (APP-187; item PW-CH1 – See Appendix B.2) [Outline Environmental Management Plan Environmental Statement Appendix 2.2 (Application Document 6.3, Appendix 2.20 [APP-187]].*
 4. *4.1.13 In areas where archaeology or heritage assets are to be preserved in situ (protected by temporary perimeter fencing, or beneath fill materials), Method Statements (MSs) will be put in place at the start of the preliminary works and/ or construction works that describes specific protection measures to be applied to the site or area of interest, and following procedures outlined in the OEMP and the HMP. Method Statements will also be required in respect of temporary haul roads and temporary traffic management diversions where archaeological remains will be retained in situ.*
 5. *HMPs and MSs will be prepared by the PW [Preliminary Works] or MW [Main Works] contractor in consultation with HMAG [Heritage Monitoring and Advisory Group] (for sites within the WHS) and Wiltshire County Archaeological Service (WCAS) (for sites outside the WHS)."*
6. Integration of Method Statements into HMPs will be considered where relevant.

Question CH.1.51

Para 1.2.2: Signing off of sites to construction

Please confirm this is to happen only with the agreement of HMAGS/WCAS.

Response

1. The draft Detailed Archaeological Mitigation Strategy (DAMS), submitted at Deadline 2, sets out the archaeological strategy and framework for the implementation of the DAMS, the Site Specific Written Schemes of Investigation (SSWSIs), Heritage Management Plans (HMPs), and Method Statements, and sign-off of sites to construction. Sign-off of sites to construction will be undertaken in consultation with the Heritage Monitoring and Advisory Group (HMAG) and Wiltshire County Archaeological Services (WCAS) (see paragraphs 4.1.11-4.1.4, 4.2.2 and 5.1.6 of the draft DAMS submitted at Deadline 2).

Question CH.1.52

Unforeseen finds

- i. What would be the procedure followed to investigate and protect unforeseen cultural heritage finds made during the course of the works?
- ii. What would happen in the event of major finds fundamentally affecting the progress of the works?
- iii. Is this fully considered in the DAMS?

Response

- i. **What would be the procedure followed to investigate and protect unforeseen cultural heritage finds made during the course of the works?**
 1. The Detailed Archaeological Mitigation Strategy (DAMS) and accompanying Overarching Written Scheme of Investigation (OWSI) set out the scope, guiding principles and methods for the planning and implementation of essential archaeological mitigation, including the procedure to be followed to investigate and protect unforeseen cultural heritage finds made during the course of the works. A draft of the DAMS is submitted at Deadline 2. The DAMS will be developed further during Examination in consultation with the Heritage Monitoring and Advisory Group (HMAG) and Wiltshire County Archaeological Service (WCAS) with the intention of finalising the DAMS prior to close of Examination. The DAMS contains additional detail on the scope of archaeological mitigation works and the process for sign-off of documentation including Site Specific Written Schemes of Investigation, Heritage Management Plans and Method Statements. These are required under the Outline Archaeological Mitigation Strategy (OAMS) (Environmental Statement Appendix 6.11 [APP-220]) and the Outline Environmental Management Plan (OEMP) (Environmental Statement Appendix 2.2 [APP-187]) to be prepared in consultation with HMAG/ Wiltshire Council prior to work commencing in that site or area of archaeological interest.
 2. 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. In line with paragraph 5.1.10 of the draft DAMS, if unexpected finds (sites, artefacts, environmental remains or ecofacts, monuments or features) were made during the Preliminary Works or Main Works stages a site consultation meeting(s) would be convened between the Archaeological Contractor, HMAG / WCAS and the Technical Partners' Archaeologist to consider the significance of the finds. Depending on the outcome of the consultation meeting, an addendum to the Site Specific Written Scheme of Investigation or a new Site Specific Written Scheme of Investigation would be prepared by the Archaeological Contractor for approval by the Technical Partners' Archaeologist, in consultation with HMAG / WCAS.

ii. What would happen in the event of major finds fundamentally affecting the progress of the works?

2. An allowance for a minimum period of time to deal properly with any unexpected finds during the construction process would be agreed and recorded in the Construction Environmental Management Plan (CEMP) (as required by the OEMP –see paragraph 1.2.9 of the OAMS which is Annex A.2 of the OEMP [APP-187] (6.3 Environmental Statement Appendix 2.2 - Outline Environmental Management Plan)). The agreement of a minimum time period is also provided for in the DAMS; Paragraph 5.1.12 of the draft DAMS states:

"An allowance for a minimum period of time to deal properly with any unexpected finds during the construction process will be agreed with the Employer [Highways England] and recorded in the CEMP (as required by the OEMP)."

iii. Is this fully considered in the DAMS?

3. Yes; the DAMS notes that temporary fencing would be erected where appropriate and clear notices placed on site fences. Toolbox talks would be provided by the Archaeological Clerk of Works and / or the Archaeological Contractor when necessary to inform construction supervision staff and site operatives of sensitive areas or archaeological sites that must not be disturbed until investigation is completed and the site signed-off to construction, or where long-term protection is required. As mentioned in answer (ii), an allowance would be made for a minimum period of time to deal properly with any unexpected finds during the construction process, as agreed between the contractor and Highways England and recorded in the CEMP.

Question CH.1.53

Para 4.3.1: Post excavation assessment

It is noted that post excavation assessment will commence as soon as the archaeological mitigation fieldwork has been completed. However, para 3.1.5 emphasises that the majority of data, artefact and environmental sample processing would be undertaken whilst the investigation proceeds. This is important to allow investigation and mitigation to be suitably modified whilst in train. Please comment.

Response

1. This is catered for in the Detailed Archaeological Mitigation Strategy. The Outline Archaeological Mitigation Strategy (OAMS) (Environmental Statement Appendix 6.11 [APP-220]) provides for the preparation of the Detailed Archaeological Mitigation Strategy (DAMS), Site Specific Written Schemes of Information, Heritage Management Plans and Method Statements and makes provision for monitoring of the mitigation programme [APP-220, paras. 1.1.3 and 1.2.2]. The draft DAMS, submitted at Deadline 2, details an archaeological research strategy underpinned by principles for archaeological mitigation.
2. The strategy for archaeological mitigation details the requirements for mitigation and the measures that this would entail. These measures include provision for appropriate data, artefact and environmental sample processing to be undertaken whilst the investigation proceeds on site (including artefact spot-dating and preliminary assessment of environmental samples) to support continuous review of research objectives and excavation strategy at each site in order to support the outlined iterative approach to sample excavation. Decisions on further investigation at a given site, following review of the data, would be made as soon as sufficient information becomes available (see paragraph 5.2.7 of the draft DAMS submitted at Deadline 2).

Question CH.1.55

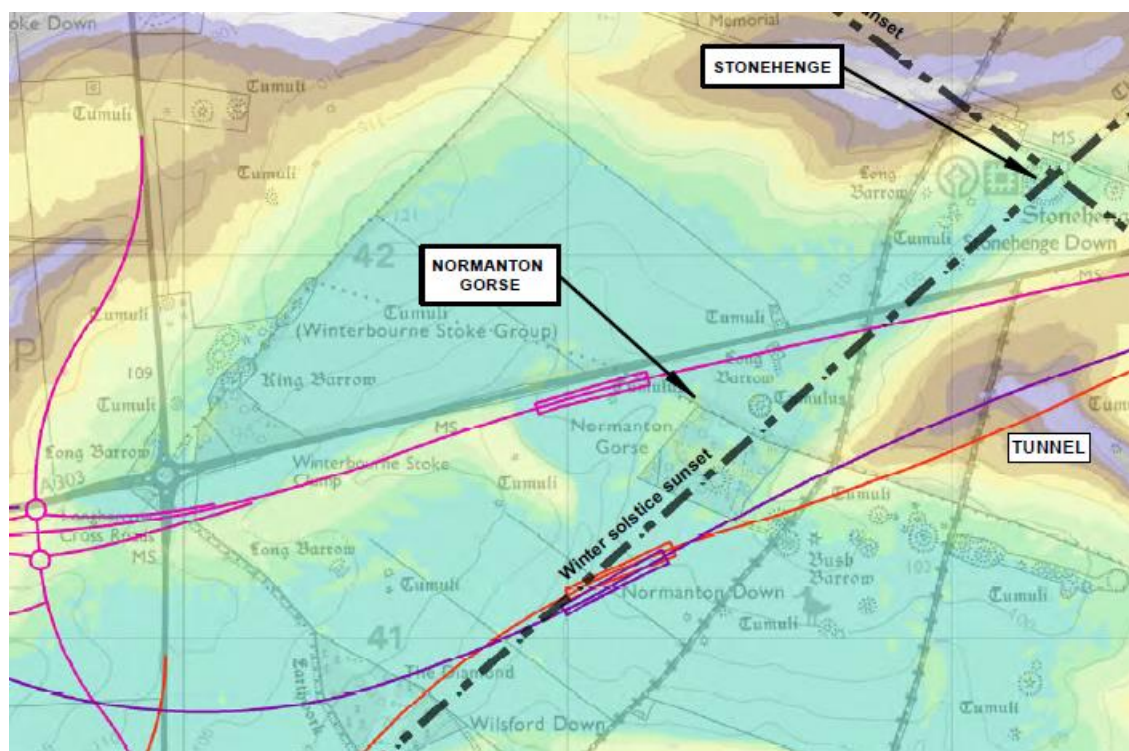
Stage 5

Route Option 1Nd (variation of D061) is said to avoid the winter solstice sunset alignment, to mitigate impacts on archaeology, and on the RSPB reserve at Normanton Down.

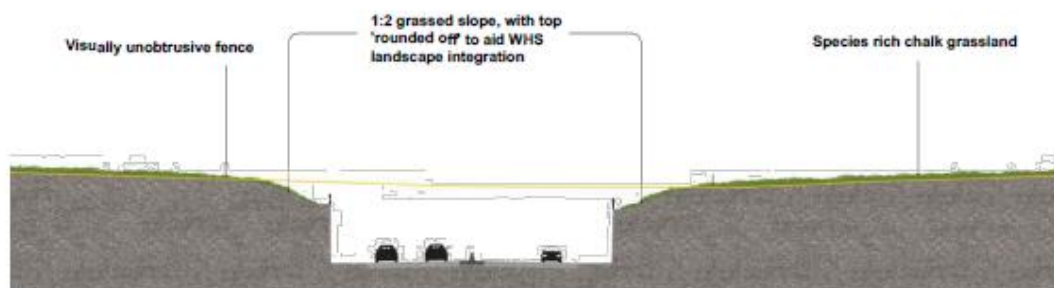
- i. Please provide illustrative evidence (visual modelling) of its relationship to the winter solstice alignment, together with evidence to show that headlights of cars in the cutting leading to the tunnel would not interfere with viewings of the sunset from the stones.
- ii. Also, illustrate how the Option would impact on visual relationships with Winterbourne Stoke Crossroads barrows, Normanton Down Barrows, the Diamond Group, and wider connections; and its relationship to the RSPB reserve (See also ES Chapter 6, Para 6.8.5(ii)).

Response

- i. **Please provide illustrative evidence (visual modelling) of its relationship to the winter solstice alignment, together with evidence to show that headlights of cars in the cutting leading to the tunnel would not interfere with viewings of the sunset from the stones.**
1. Figure 9 from the Scheme Assessment Report (Volume 7 Appendix E Historic Environment) [REP1-029] provides illustrative evidence of how Route Option 1Nd (route shown in pink) does not conflict with the Winter Solstice sunset alignment (black dot and dash line running in a north-east to south-west alignment from Stonehenge).



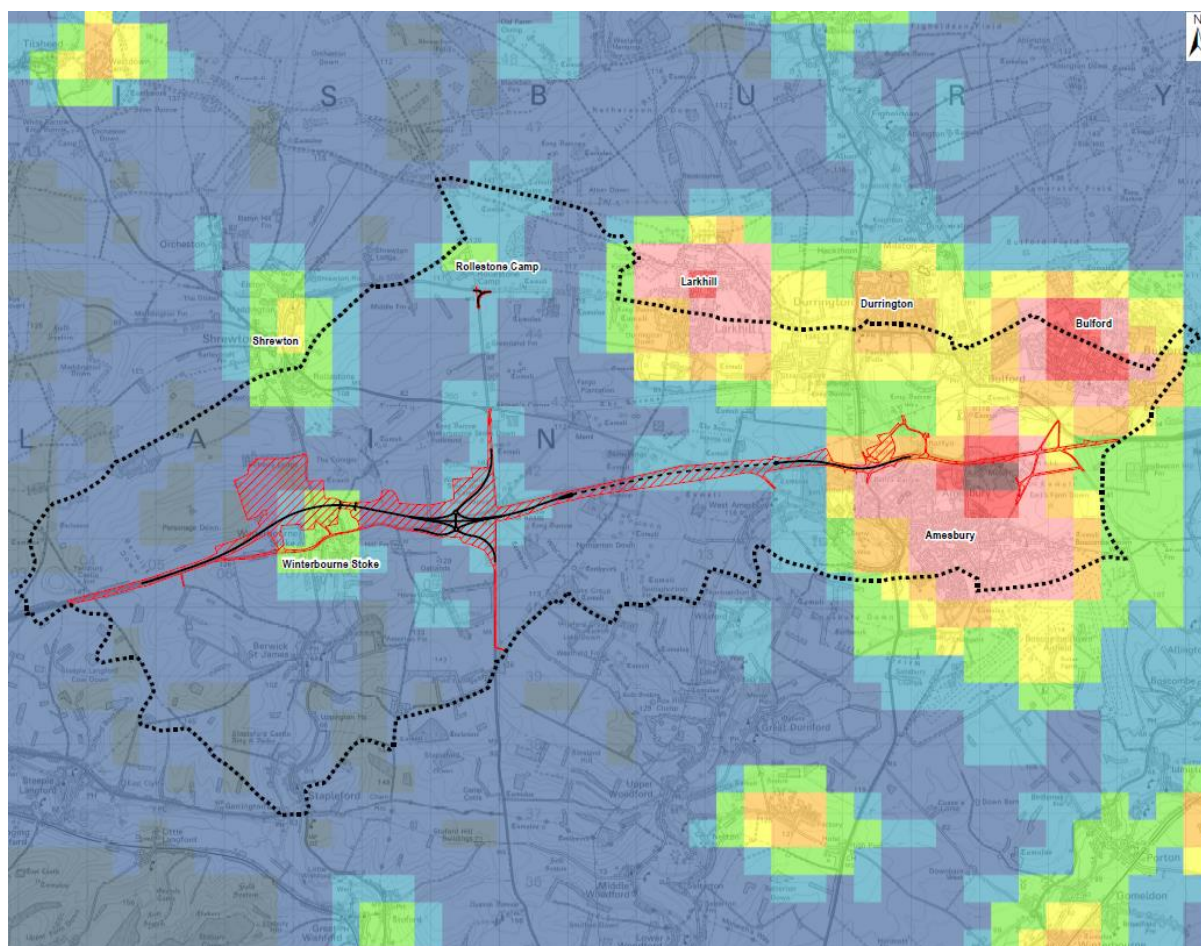
2. Figure G of the Environmental masterplan [APP-059] (extract below) indicates how vehicles would be situated in a retained cutting beneath existing ground levels, such that headlights of cars would not be visible from Stonehenge.



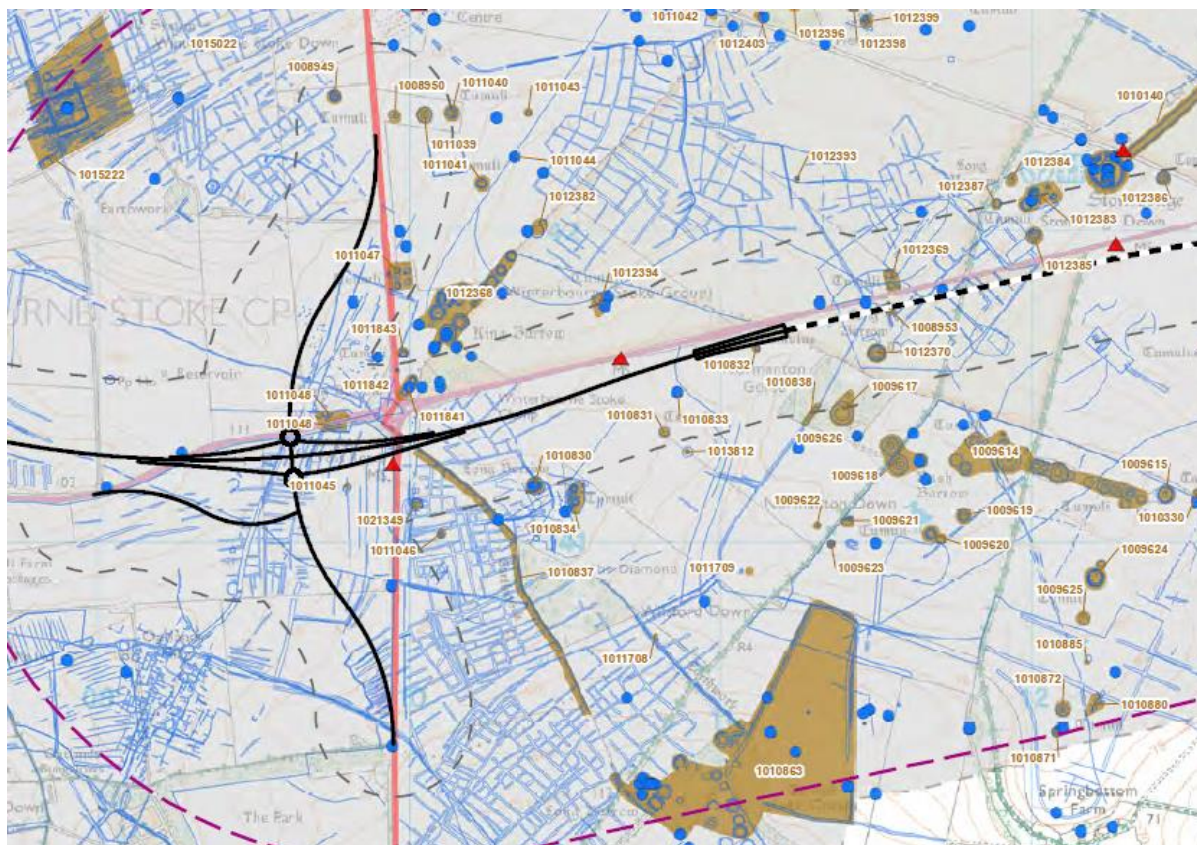
3. Environmental Statement Figure 7.30 – Representative Viewpoint 17 [APP-108], a view south-west from Byway AMES12 towards the Sun Barrow and Normanton Gorse – see image below) also demonstrates that from close to the Stones views of these vehicles would not be visible because of the intervening landform (on Normanton Down). It also clearly demonstrates that from close to Stonehenge you cannot see the western approach cutting or the western portal at all. You will therefore not be able to see car headlights intruding on the Winter Solstice sunset as viewed from Stonehenge.



4. Environmental Statement Figure 7.50 - LVIA Dark Skies [APP-128] (below) from the ES Chapter 7 Landscape and Visual Impact Assessment shows the level of radiance (night lights) shining up into the night sky. Light sources include lighting at the existing Longbarrow Roundabout. The Scheme will remove this lighting which, in combination with vehicles being in the tunnel and retained cutting, will improve the character of the night sky within the WHS as set out in paragraph 7.9.129 of APP-045.



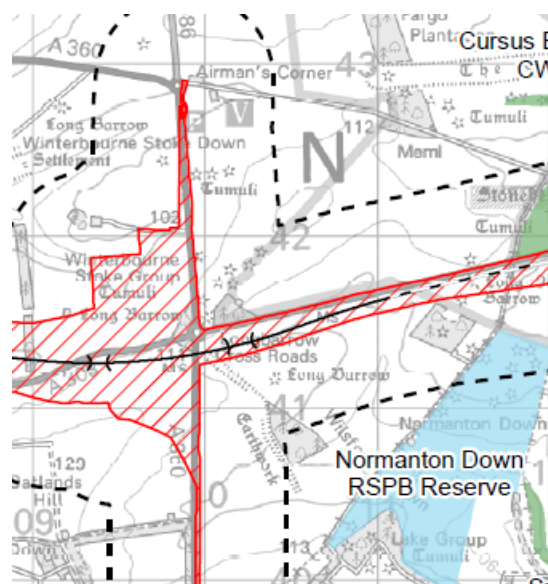
- ii. **Also, illustrate how the Option would impact on visual relationships with Winterbourne Stoke Crossroads barrows, Normanton Down Barrows, the Diamond Group, and wider connections; and its relationship to the RSPB reserve (See also ES Chapter 6, Para 6.8.5(ii)).**
5. Figure 7 (below) from the Scheme Assessment Report (Volume 7 Appendix E Historic Environment) [REP1-029] provides illustrative evidence of how Route Option 1Nd would impact on visual relationships with the AG12 Winterbourne Stoke Crossroads Barrows (to the northeast of the existing Longbarrow roundabout), AG19 the Normanton Down Barrows (in the vicinity of Normanton Gorse), and AG13 the Diamond Group (to the southeast of the existing Longbarrow roundabout), and wider connections. Further information regarding the impacts of Option 1Nd as reported at Preferred Route Announcement and explanation of the diagram below can be found in Deadline 1 Submission - Scheme Assessment Report - Volume 7 - Appendix E [REP1-029, Section 5.2] and also in Highways England's response to AL.1.16



6. With regards to how Option 1Nd would impact on visual relationships with the Winterbourne Stoke Crossroads Barrows, the Normanton Down Barrows and the Diamond Group, the option improves greatly on the existing surface A303 as it provides the opportunity to remove the sight and sound of traffic from most views from these three key Asset Groups in the western part of the WHS, excepting at the north end of the Normanton Down Barrows, by utilising a deep cutting. It also removes the sight and sound of traffic from the Lake Barrows and North Kite Enclosure to the southeast which form part of the wider connections by the use of the deep cutting.

7. Geophysical survey and archaeological trial trenching have also confirmed that within the footprint for Option 1Nd there is a sparsity of archaeological remains that contribute to the OUV of the WHS.

8. With reference to the RSPB nature reserve at Normanton Down, Route Option 1Nd follows the Scheme alignment and moves the route c.720m to the northwest of the nature reserve – see Figure 8.3 [APP-149] from the ES Chapter 8 Biodiversity (extract shown below). As a result the A303 would be in a deep cutting and hidden from view from the RSPB reserve.



Question CH.1.56

Table 3.3: Green bridge options

On both landscape/visual and cultural heritage, the tabulation favours option (a), location at the A360 alignment rather than option (b), 150m east of A360 alignment. However, the option of a widened bridge 150m east of the A360 has been adopted, which appears to contradict the outcome of the exercise.

Please explain why.

Response

1. Table 3.3, in 6.1 Environmental Statement Chapter 3 - Assessment of Alternatives [APP-041], describes a point-in-time optioneering process undertaken before public consultation in February-April 2018. The optioneering was undertaken to steer the design towards public consultation. At the time of this optioneering the location of Green Bridge 4 on the line of the existing A360 (Option A) was favoured, rather than 150m to the east (Option B), noting that both bridges were only 50m wide in design terms at this point. In landscape terms, Option A was favoured in order to maintain existing landscape form and the existing line and historic route of the A360. From a cultural heritage perspective, Option A would still maintain the physical connectivity and access between the monument groups (AG12 the Winterbourne Stoke Crossroads Barrows to the north and AG13 the Diamond Group to the south), would limit land take within the WHS and therefore limit the removal of archaeological remains within the WHS in comparison to Option B. Option B, in the design presented at optioneering would have additionally damaged the northern end of a scheduled boundary bank (NHLE 1010837). As both bridges were designed at 50m width Option B would not materially enhance the connectivity between the monument groups above and beyond Option A, hence there was little additional benefit to the OUV of the WHS in the Option B position.
2. At the time of the statutory consultation in February to April 2018, the Project Team received feedback from Heritage Partners (including Historic England and the National Trust) that Green Bridge 4 was not wide enough or in the right position. Taking on board this feedback, the bridge was widened to 150m and positioned to the east of the A360 alignment, as presented at supplementary consultation and in the current Scheme. Details of supplementary consultation are set out in the Consultation Report [APP-026], Chapter 6: Supplementary Consultation and summarised in the Assessment of Alternatives [APP-041], ES Chapter 3, section 3.3. The changed location and the increased width maximise the physical and landscape connectivity between the two upstanding long barrows in AG12 the Winterbourne Stoke Crossroads Barrows and AG13 the Diamond Group, and between the two Asset Groups north-south, to a much greater extent than either of the 50m options considered during the original optioneering. The greater physical and landscape connectivity of Green Bridge 4 and its positioning to maximise this between AG12 the Winterbourne Stoke Crossroads Barrows and AG13 the Diamond Group was recognised as being

more important than maintaining the line of the historic route (which does not contribute to the OUV of the WHS as it dates to the post-medieval period) and land form on the line of the WHS boundary and the current A360.

Question CH.1.57

The DCO indicates that the Limits of Deviation (LoD) for the tunnel canopy allow for a 200m extension westwards. This, with the 150m width of Green Bridge 4, would allow a significant part of the c1km cutting from the existing line of the A360 to the portal canopy to be concealed, benefitting landscape/visual and cultural heritage aspects of the Scheme.

- i. Is this alternative a serious consideration for the Applicant?
- ii. If not, why was this LoD included in the DCO?
- iii. Has the alternative of extending the canopy still further, thus going some way towards satisfying ICOMOS's criticisms, been considered in terms of cost-benefit analysis?

Response

i. Is this alternative a serious consideration for the Applicant?

1. Yes. This is not an alternative, it is part of the description of the scheme as applied for. The Limits of Deviation (LoD) with respect to the western portal and canopy have been included in the DCO in order to allow the requisite degree of flexibility to undertake these works. The Applicant has carefully considered the LoD for the western portal and canopy and, for the reasons set out in response to (ii) below, the full extent of the LoD is required and may be utilised.

ii. If not, why was this LoD included in the DCO?

2. The Tunnel Limits of Deviation (LOD) are considered necessary to facilitate the safe construction of the TBM bored tunnel by allowing some realignment of the location of the temporary drive and reception portals at the western and eastern end of the tunnel should this be necessary by the contractor.
3. The proposed means of tunnelling is based on the assembly and launch of the tunnel boring machine ("TBM") from the point of commencement of the tunnel, with the first tunnel drive west to east towards Amesbury. At the end of the first drive, the TBM will be received within the temporary portal where it will be turned around and re-launched to drive the second bore east to west. Therefore, the location of the drive and reception portals is a very important consideration as part of overall safe tunnel construction and operation of the TBM and flexibility is sought to facilitate this in tunnelling.
4. TBMs are large and complex machines; the cutting head and segment erector are contained within the shield and constitute the main components at the front of the TBM and are followed by a long train of supporting ancillary trailers supplying all the mechanical and electrical equipment, pre-cast segments and other materials in addition to the means of removing the excavated material. Making an adjustment to either the vertical or horizontal alignment of the tunnel can only be accommodated by a series of small incremental adjustments during the construction of each individual ring within the front shield. Therefore, any change in the alignment for a large diameter TBM can take between 200-300m to

accommodate during tunnelling. This is why the 200m westerly deviation is sought at the western portal.

5. The likely scenario under which such a deviation would be required is as a result of the further detailed design by the contractor as part of their risk management of the whole tunnelling operation. This would include: the identification and preservation of archaeology in the drive area; the development of a preferential approach to geological and hydrogeological conditions to commence tunnelling, and the identification of features in the ground that should be avoided as far as reasonably practicable to reduce risks during tunnelling. These changes to the alignment would be made during detailed design, hence the requirement to provide limits of deviation in the draft DCO.

iii. *Has the alternative of extending the canopy still further, thus going some way towards satisfying ICOMOS's criticisms, been considered in terms of cost-benefit analysis?*

6. The alternative of extending the western portal canopy further towards Green Bridge 4 has not been considered in terms of cost-benefit analysis, because this option is not a feasible or practicable option having regard to driver safety. In accordance with BD 78/99 Design of Road Tunnels CI 4.9 the gap between the tunnel and Green Bridge 4 (GB4) is at the minimum separation allowed without adversely impacting the Tunnel Approach Zone, i.e. the area in front of the tunnel portal. A further reduction in the separation of GB4 and the tunnel could create a hazard for drivers by reducing their visibility and generate confusion, and possible anxiety for some, on the approach to the tunnel. For driver safety reasons it is therefore not considered appropriate to increase the canopy further and reduce the gap between the tunnel and GB4.
7. In response to feedback from ICOMOS, the alternative option to consider extending the canopy towards the boundary of the World Heritage Site was considered. This is explained in the response to AL.1.29. The response to AL.1.29 explains why it was concluded that the cut and cover tunnel extension to the WHS boundary would have some, relatively minor, benefits to heritage, visual impact, biodiversity and amenity. These benefits are all associated with the extra connectivity that this option would provide over the vertical sided cut in the proposed scheme. However this option would not reduce the scheme footprint and therefore would not reduce the impact on archaeological assets and would not avoid all harm to the OUV of the WHS. In addition, it would raise new safety and operational risks during both the construction and operational phases of the longer tunnel. The conclusion was therefore that the overall benefits of extending the canopy towards the boundary are not of a scale to justify the significant cost, estimated at £264 million, over and above the cost of the current proposal.
8. A quantitative analysis of the benefits of a longer tunnel has not been carried out as it is clear – as summarised in chapter 3 of the ES - that the significant increased costs of the longer tunnel option considered (together with the subsidiary considerations of the traffic, operational, construction engineering, safety, mechanical and electrical issues that they would cause) are not justified

by the only minor relatively minor heritage and environmental benefits that they would deliver. More detail on these matters is included in Highways England's response to question AL.1.29.

Question CH.1.58

Table 3.7: Rollestone Corner junction options

It is noted that the WHS boundary in this area has been identified as a priority for amendment (extension) as part of a proposed boundary review.

How far has the review progressed and what are the options for extension with regard to the WHS as a whole? This point is very relevant to consideration of route options in general.

Response

1. Table 3.7 is correct when it notes that the WHS boundary in the Rollestone Corner Junction area has been identified as a priority for amendment (extension as part of a proposed WHS boundary review). The WHS boundary review is currently being progressed by the Stonehenge and Avebury WHS Coordination Unit and they should be consulted with regards to how far this has progressed. 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 shared their preliminary assessment of heritage assets and asset groups that may be included in a future boundary review, including monuments situated outside the WHS at Rollestone Corner (AG10 the Rollestone Barrows straddles the boundary, and the associated non-designated AG06 Net Down Barrows which lie on a ridge to the north-west and wholly outside the WHS boundary).
2. The following detail further elaborates what was undertaken as part of the Scheme's HIA and the reasons for including asset groups beyond the WHS boundary. As asset groups beyond the WHS boundary were considered as part of the assessment, and are considered to contribute to the OUV of the WHS, the proposed boundary review would not have an impact on the outcomes of the assessment and the consideration of the Rollestone Corner junction options.
3. With reference to how far the boundary review has progressed, the Department for Culture, Media and Sport (DCMS) State of Conservation Report 2019 [REP1-015] notes that a World Heritage Property Setting Study is currently being commissioned by the Stonehenge and Avebury WHS Coordination Unit. Work had not commenced by the time of the submission of the Scheme's HIA and so relevant information from it could not be included. After the World Heritage Property Setting Study has been completed, the boundary review at Stonehenge will be progressed.
4. The Stonehenge and Avebury World Heritage Site (WHS) Coordination Unit was consulted regarding potential Scheme impacts on assets outside the current WHS boundary mooted for inclusion in a boundary review. During scheme design development, it was assessed that both options for Rollestone Corner would fall within a redrawn wider boundary for the WHS in this area, which would include the outliers of the Rollestone Barrows beyond the WHS to the west (AG10), and the unscheduled Net Down Barrows (AG06) to the northwest. These Asset

Groups were included in the Stonehenge and Avebury WHS Coordination Unit's 2013 preliminary assessment study of heritage assets and Asset Groups that may be included in options for the extension of the boundary with regards to the Stonehenge part of the Stonehenge, Avebury and Associated Sites World Heritage Site. For this reason, the more compact junction design that is part of the scheme was assessed to be preferable as Asset Groups, partially outside and wholly outside the WHS at Rollestone Corner, would be included in any future boundary revision as they contribute to the OUV of the WHS.

5. Environmental Statement Appendix 6.1 - Heritage Impact Assessment [APP-195], paragraph 5.10.2 outlines the reasons for including heritage assets or asset groups beyond the WHS boundary: *"The HIA Assessment Area comprises the whole of the Stonehenge part of the Stonehenge, Avebury and Associated Sites WHS and its setting. The HIA acknowledges that the effects of the Scheme may extend beyond the boundaries of the Stonehenge part of the WHS, and therefore also considers [...] Impacts on assets outside the boundaries of the WHS that may contribute to one or more Attributes of OUV [...] Impacts on assets outside the WHS boundary which have relationships with assets within the WHS expressing OUV [and] Impacts upon the character of the setting of the WHS that would impact on Attributes of OUV within the WHS"*.
6. Regarding the boundary review process the HIA [APP-195] 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. Mooted changes include:
 - a. The removal of houses along Countess Road North (West) from within the boundary;
 - b. The extension of the boundary to the north and west of the existing WHS boundary, including:
 - i. Scheduled enclosures, round barrows, long barrows and causewayed enclosure associated with Robin Hood's Ball;
 - ii. Scheduled barrows and section of linear boundary earthwork on Winterbourne Stoke Down;
 - iii. Scheduled barrows at Rollestone;
 - iv. Scheduled barrows and enclosure at Longbarrow Crossroads;
 - v. Scheduled barrows north of the Packway;
 - vi. Scheduled Knighton long barrow;
 - vii. Scheduled long barrow in Larkhill Camp; and

viii. Unscheduled barrows of the Net Down group.”

7. Regarding which heritage assets and asset groups are included in the Scheme’s HIA [APP-195] in relation to the boundary, paragraph 5.10.5 states that the HIA *"considers impacts upon both sites located with the current WHS boundary, and physically related archaeological features that contribute to OUV located outside the current boundary."*
8. Identified Asset Groups that convey Attributes of the OUV of the WHS within the WHS boundary include AG10 – Rollestone Barrows, including outliers which extend beyond the present WHS boundary. Paragraph 5.10.25 of the HIA [APP-195] considers which asset groups outside the WHS boundary were considered by the HIA and states *"There are a range of potentially related Asset Groups that do not fall within the current boundaries of the WHS. Robin Hood’s Ball, Neolithic long barrows and Early Bronze Age round barrows are specifically noted in the nomination document (HBMCE 1985). All of these monuments were once situated within a more expansive and unified cultural landscape, only the core of which is encompassed by the formal boundary of the Stonehenge WHS [...] Assets groups of Neolithic and early to mid-Bronze Age date, which fall within the setting of the WHS, and whose significance is reinforced by relationships with assets conveying Attributes of OUV located within the WHS, have been assessed in this HIA. Such Asset Groups located outside the current WHS boundary comprise:*
 - AG06 – Net Down Barrow Cemetery
 - AG08 – Winterbourne Stoke Down Barrows
 - AG14 – Robin Hood’s Ball and Associated Sites
 - AG37 – Knighton Long Barrow
 - AG38 – Larkhill Camp Long Barrow
 - AG39 – Larkhill Causewayed Enclosure"
9. Regarding Rollestone Corner junction, the HIA [APP-195, paras. 6.8.31] notes that *"The archaeological evaluation for this small junction improvement has included land both within and outside the WHS boundary. The junction is situated amidst a relatively dense concentration of scheduled and non-designated Early Bronze Age round barrows including the Rollestone barrows to the south and the Net Down barrows to the north-west. The barrows are predominantly located along a ridge coinciding approximately with the line of the Packway, and are clustered together to form distinct groups, both within and beyond the WHS boundary."*
10. Thus the applicant has taken very seriously its duty to identify 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, including the options at Rollestone Corner, on the OUV of the WHS.

Question CH.1.59

Table 3.8: B3083 alignment options

- i. What knowledge do we have of archaeological remains which might be affected by Option 2 (realignment 50m west)?
- ii. Have geophysical surveys been carried out?

Response

i. What knowledge do we have of archaeological remains which might be affected by Option 2 (realignment 50m west)?

1. There are archaeological remains located on the line of the proposed realigned B3083 (Option 2). The proposed realignment intersects with the remnants of a 'Celtic field system' (UID 1004, MWI7095), known from aerial photographs and geophysical survey, and confirmed as the remnants of lynchets by trial trenching. The field system is likely to date from the Later Prehistoric and Roman periods.
2. Traces of an oval enclosure (UID 2036, MWI74874) were identified by geophysical survey in the field system at Parsonage Down, c.130m to the west of the proposed realignment of the B3083. Several pits recorded during trial trenching dated to the Neolithic period.
3. The draft Detailed Archaeological Mitigation Strategy (DAMS), submitted at deadline 2, includes proposals for archaeological mitigation in respect of these remains (Site 10.3, Appendix E of the DAMS).

ii. Have geophysical surveys been carried out?

4. Yes, extensive geophysical surveys were undertaken as part of the Scheme (Wessex Archaeology Phase 4 Geophysical Surveys 2018) covering a total of 192.4ha to the full extent of the red line boundary. These included the area of the B3038 realignment (Option 2).

Question CH.1.60

Table 3.13: Western portal location options

Deals with the heritage comparison between Option 2 (1km east of existing junction) and Option 3 (500m east of existing junction). Option 3 notes that the portal would be located between the Winterbourne Stoke barrow group and the Diamond Group adversely affecting the siting of monuments in relation to each other [and] the cutting emerging from the western portal would likely result in physical impact on a SM (prehistoric linear boundary). However, the road would take the same line in either option and so the cutting and Green Bridge 4 would remain interposed between the monuments in Option 3, affecting the siting of the monuments in relation to each other in a similar way. Also, the impact on the prehistoric linear boundary is determined by the landscape arrangement around Green Bridge 4, which would be the same in either option. The analysis also appears to conflict with ES Chapter 6, para 6.8.5(ii) which notes that the proposed additional length of canopy of up to 200m would reduce visibility of the portal in views from the monument groups.

Please explain.

Response

1. Table 3.13, in 6.1 Environmental Statement Chapter 3 - Assessment of Alternatives [APP-041] forms part of the section of Chapter 3 describing the design development options considered in the period since preferred route announcement in September 2017 (as set out in paragraphs 3.3.18-19 of Chapter 3). In the case of Table 3.13, it describes a point-in-time optioneering process undertaken before statutory consultation in February-April 2018.
2. Option 3 was located immediately south of the existing A303, approximately 500m east of the existing Longbarrow Junction. That option was considered less preferable, as although there would be less land-take from within the World Heritage Site (WHS) overall, a massive portal structure with a large cutting (much larger than the retained cutting in the Scheme) would have been located between the Winterbourne Stoke Crossroads Barrows and the Diamond Group, adversely affecting Attribute 5 that conveys the Outstanding Universal Value (OUV) of the WHS. It should be noted that, at the time there was no proposed land bridge or canopy and so the Winterbourne Stoke Crossroads Barrows and the Diamond Group would have been completely severed from each other by the option, with no physical or landscape connectivity between the two groups (see response to AL.1.25). The large portal structure would have resulted in a large piece of visible infrastructure being imposed between the two Asset Groups. The bored tunnel portal, in this location, would have had to exit at a depth of c.20m, due to the topography at this location, which would additionally have created a very large cut slope footprint for the portal structure itself. Additionally, the cutting for the large portal in Option 3 would have resulted in physical impacts on the northern end of the scheduled prehistoric linear boundary (NHLE 1010837) of late Bronze Age date on the western side of the WHS. This is why this option was not preferred.

3. Although the road would have followed the same alignment in all the options considered, the land bridge was not under consideration at this point during the optioneering. Therefore, the location of the land bridge was not relevant to the impact on the prehistoric linear boundary – it was the size and location of the western portal cut in Option 3 that resulted in the impacts on the prehistoric linear boundary.
4. The tabled Option 3 resulted in severance between the Winterbourne Stoke Crossroads Barrows and the Diamond Group, created by the large portal structure that was required which was super-imposed between the two Asset Groups. Option 2 offered a much narrower retained cut (the severance being partially mitigated at a later stage in the design, following statutory consultation, by the use of the 150m long land bridge (Green Bridge 4) allowing for the physical and landscape connectivity between the Winterbourne Stoke Crossroads Barrows and the Diamond Group to be maintained, and replicating the existing topography between the Winterbourne Stoke Crossroads Barrows and the Diamond Group across its 150m width). Similarly, the 200m canopy replicates the existing topography to the west of the scheduled Wilsford G1 barrow, reducing impacts on its setting, and offers physical and landscape connectivity over the top of the western portal in the Scheme, in the same way as Green Bridge 4.
5. Option 3 would have required the addition of a large canopy (longer than the 200m currently required at the Western Portal in the Scheme) in order to maintain the physical and landscape connection between the Winterbourne Stoke Crossroads Barrows and the Diamond Group. The land bridge subsequently included in the Scheme is placed to mitigate severance and maintain landscape and physical connectivity, replicating the existing topography between the Winterbourne Stoke Crossroads Barrows and the Diamond Group. The location of the land bridge was not relevant to the impact on the prehistoric linear boundary as the landbridge was not under consideration at this point in the optioneering. The land bridge and the 200m canopy referred to in Environmental Statement Chapter 6 - Cultural Heritage, para 6.8.5(i) [APP-044] were introduced in response to feedback from heritage partners, prior to statutory consultation in early 2018 for the canopy, and following statutory consultation for the land bridge and were not part of the consideration of alternatives referred to in Table 3.13.

Question CH.1.61

2018 response to ICOMOS 41COM7B.56

Regarding the F10 non-tunnel bypass, it is noted that the landscape to the south is itself a very rich archaeological landscape [and] professor Sir Barry Cunliffe said that, given the high archaeological potential of the land to the south, route F10 would likely impact more heavily on significant archaeology of the Neolithic and Bronze age periods, compared to the known, low potential for significant archaeology relevant to the period of OUV within the footprint of the currently proposed scheme within the WHS.

Please provide evidence to support this view.

Response

1. In the 2018 State of Conservation Report for the Stonehenge, Avebury and Associated Sites World Heritage Site submitted to the UNESCO World Heritage Centre by the Department for Digital, Culture, Media and Sport, Professor Sir Barry Cunliffe is quoted as saying that, given the high archaeological potential of the land to the south of the World Heritage property, route F010 would likely impact more heavily on significant archaeology of the Neolithic and Bronze Age periods, compared to the known, low potential for significant archaeology relevant to the period of Outstanding Universal Value (OUV) within the footprint of the currently proposed scheme within the Stonehenge part of the World Heritage property. He also referred to the boundary having been established over 30 years ago.
2. A surface route (F010) to the south of the World Heritage Site (WHS) was considered in detail as part of the route options assessment process and set out in the Deadline 1 Submission - Technical Appraisal Report - Volume 1 [REP-031]. This southern surface route would run to the south of Winterbourne Stoke and the WHS boundary but north of Upper Woodford before re-joining the existing A303. The archaeology to the south of the WHS is as yet known only from Wiltshire and Swindon Historic Environment Records (WSHER) data and the F010 route has not been subject to systematic archaeological evaluation. The southern surface route could have the potential to result in significant heritage impacts on previously unknown buried archaeological remains.
3. The extent of archaeological knowledge around the WHS is highly variable, as extensive archaeological investigations outside the WHS are typically linked to major projects such as large-scale housing developments, business and light industrial development, and infrastructure and utilities development such as pipelines. South of the WHS, major developments have occurred some 4km south of the southern surface route alignment at Bishopdown, Old Sarum, Longhedge and Fugglestone Red to the north of Salisbury. These large-scale developments have all found significant and extensive archaeological remains. Examples include:

- Camp Hill, Salisbury – significant Iron Age enclosed settlement site succeeded by high-status Roman occupation.
 - Longhedge, Salisbury – Iron Age enclosed settlement and Romano-British settlement.
 - Old Sarum, Salisbury – Bronze Age barrows and part of a Neolithic and Bronze Age long-distance land division.
 - Bishopdown, Salisbury – Neolithic pit alignment.
4. The proliferation of archaeological remains encountered in these developments , as well as significant archaeological remains dating to the Neolithic and Early Bronze Age at recent major developments just to the north and east of the WHS boundary at Larkhill (Larkhill Causewayed Enclosure) and Bulford (Bulford Henges), supports the statement by Professor Sir Barry Cunliffe that there is potential for significant archaeological discoveries in the landscape beyond the WHS boundary, including Neolithic and Bronze Age ceremonial, funerary and settlement remains.
 5. The Wiltshire and Swindon Historic Environment Record (WSHER) database also records a number of undated enclosures, settlements and associated field systems immediately to the south of the WHS, identified by aerial photographic assessment, that the southern surface route would directly physically impact. The extensive cropmark complexes through which the southern surface route alignment would pass underline the potential for new discoveries in this largely unsurveyed part of the landscape south of the WHS. The cropmarks include possible enclosed later prehistoric settlement sites set amongst extensive later prehistoric field systems and earlier prehistoric barrows. Route F010 lies in close proximity to the WHS, although wholly without it, passing within c. 300m to 500m of the WHS southern boundary for at least 3km of its length.
 6. The recent major development immediately to the north of the WHS at Larkhill, outside the current WHS boundary, unearthed a previously unknown Neolithic Causewayed enclosure (AG39 Larkhill Causewayed Enclosure) that was considered to contribute to the OUV of the WHS as part of the Heritage Impact Assessment (Environmental Statement Appendix 6.1 [APP-195]).
 7. Overall, the southern surface route would require much greater land-take (22km in length, the majority of which is greenfield) than the Scheme. It is therefore quite possible that F010 could contain significant amounts of previously unidentified archaeological remains, some of which may also contribute to the OUV of the WHS, in comparison to the well understood archaeology within the Scheme alignment.

Question CH.1.62

Also regarding the F10 non-tunnel bypass, the response notes that it is almost inevitable that the current surface of the A303 through the WHS would need to remain open to traffic to provide the required connectivity between local communities and alleviate pressure on the local roads around the boundary of the property.

Please provide evidence to support this view.

Response

1. At the time the tunnel options D061 and D062 were selected in preference to option F010 by Highways England, it was assumed that all the options included the removal of motorised vehicles from the route of the existing A303 through the WHS.
2. Highways England did raise concern that the longer F10 diversion route, and the associated increased local journey times and impacts on affected communities, may lead local communities to petition for the old A303 to be retained for local access. However, this was not a determining factor in the selection of the tunnelled options as the preferred options for consultation at that time. The comparison of route options provided for the removal of motorised vehicles from the existing A303.

Question CH.1.63

Again, regarding the F10 non-tunnel bypass, it is noted that the route would have an impact on the Rivers Avon and Till Special Area of Conservation.

Please provide evidence to support this view.

Response

1. Evaluation of the alternative options (incl. F010/ Option 1Sa) has been undertaken as part of the Scheme Assessment Report (SAR) [REP1-023 to 030] and Technical Appraisal Report (TAR) [REP1-031 to 038].
2. As detailed within paragraph 18.2.29 of the TAR [REP1-031] "Impacts on biodiversity were appraised following the methodology guidance presented in TAG Unit A3, Chapter 9. It followed guidance in DMRB Volume 11, Section 3, Part 4 (Ecology and Nature Conservation) and IAN 103/10. These guidelines set out a process of identifying the value of ecological resources and then characterising the impacts that are predicted".
3. The SAR and TAR detailed that the F010 (southern route) route was nearly twice the length of D061 and D062 (the northern routes) and would be completely above ground (paragraph 18.3.48, [REO1-031]. In addition, the northern routes were identified as having *"Lower risk of adverse effects to the River Avon SAC/River Till SSSI, and the aquatic ecology of the River Till, when compared with Option 1Sa which would cross the River Till at a location which is considered more likely to support the qualifying species for the River Avon SAC, as well as other protected and notable species."*
4. The assessment that there is greater potential for impacts on the River Avon SAC from the F010 route downstream of Winterbourne Stoke than from the northern route is supported by the evidence from the suite of ecological baseline surveys carried out upstream and downstream of both crossing locations. The surveys are included in the following Environmental Statement Appendices to Chapter 8 Biodiversity: for river habitat [APP-242], aquatic plants (macrophytes), [APP-244], fish [APP-252], aquatic macroinvertebrates [APP-247] and Desmoulin's whorl snail [APP-245]. Within these survey reports the location map for the survey sections is shown in Figure 1.1 of each report. The Scheme crosses the River Till at the upstream end of T2r. The section where F010 would cross the Till is at the upstream end of T5r. Note that the survey for Desmoulin's Whorl Snail was only in the river upstream of the A303 so did not include the F010 location.
5. As detailed in paragraph 8.9.17 of Environmental Statement Chapter 8 - Biodiversity [App-046], the location of where the Scheme crosses the River Till is very unlikely to affect the Annex II species that are a primary reason for selection of this site, such as salmon. This is because the spawning areas are located in the River Till downstream of the A303 (where F010 crosses the River Till), where the river is in flow during the autumn spawning season.

6. Salmon require gravel beds consisting of a mix of cobbled, pebbles and fine material for spawning.¹ The substrate within the River Till where the Scheme crosses the river is considered to be suboptimal for spawning, as the river channel forms part of the floodplain pasture for most of the year and the substrate was recorded as earth and was extensively trampled by livestock (ES Chapter 8 paragraph 4.1.6) [APP-046]. Suitable gravel habitat is recorded in reaches of the River Till from Winterbourne Stoke and downstream to the south (ES Chapter 8 paragraph 4.2.5) [APP-046], which would be crossed by F010, furthermore, the section crossed by F010 is typically flowing during the autumn spawning season for salmon and brown trout, whereas the Winterbourne section of the River Till crossed by the Scheme is not.
7. The northern sections of the River Till have almost no habitat suitable for Desmoulin's whorl snail *Vertigo moulinsiana* (an Annex II species, which is a primary reason for selection of this site) and none have been recorded there. The prolonged seasonal period of dry conditions in section T2r which is crossed by the Scheme makes this unfavourable (Appendix 8.8 Desmoulin's whorl snail survey report) [APP-245]. The section crossed by F010 is perennial and although it has not been surveyed for the snail, the habitat survey [APP-242] and macrophyte survey [APP-244] of this perennial section of the river indicate that some of the unshaded banks have slow flow, marginal vegetation and emergent reedbeds (including reed sweet-grass) and are therefore more likely to be suitable for Desmoulin's whorl snail than the seasonally dry pasture which is crossed by the Scheme.
8. The F010 route would require a wholly new crossing of the River Avon (River Avon System SSSI), part of the River Avon SAC, north of Upper Woodsford. The Scheme will cross the River Avon on the existing bridge east of Amesbury, which avoids the need for any new structures in or adjacent to the River Avon System SSSI. The Scheme requires one new crossing of the River Avon SAC. In contrast, F010 would require two new crossings on two different tributaries (the River Till and the River Avon), with both crossings on sections which are perennial and hence the Annex II fish species would be present during construction. Therefore, overall, more mitigation would be required for the construction of F010 crossings of the River Avon SAC than for the Scheme. That would include viaduct design which would need to mitigate for shading of aquatic vegetation by two viaducts, instead of one viaduct with the Scheme.

¹ Hendry K & Cragg-Hine D (2003). Ecology of the Atlantic Salmon. Conserving Natura 2000 Rivers Ecology Series No. 7. English Nature, Peterborough.

Question CH.1.64

Regarding longer tunnel options, the response notes that rising ground to the west of the property, known as Oatlands Hill, dictates that a tunnel continuing beyond the tunnel boundary would need to traverse the width of the hill before it could emerge where the ground begins to descend into the Till valley, east of Winterbourne Stoke. However, the existing route appears to pass north of Oatlands Hill allowing a tunnel to emerge in the dry valley north of Hill Farm.

Please explain, using map overlays if useful.

Response

1. The proposed tunnel length and length of any alternative tunnel design is dictated by selection of the optimum portal locations, ideally with the tunnel emerging on a downward facing slope to minimise length and depth of approach cutting. The location of the western portal in the proposed scheme is within the World Heritage Site (WHS) northwest of Normanton Gorse (Environmental Statement chapter 2 [APP-040] paragraph 2.3.15).
2. Any long tunnel option involving extension of the twin bores would have the western portal located at the first viable location outside the WHS. This would be where the proposed alignment cuts into the dry valley north of Oatlands Hill and immediately west of the current proposed location of Green Bridge Three, at about chainage 5+600.
3. Map overlay and Chainages are shown on the Engineering Section Drawings (Plan and Profiles) [APP-010]. It can be seen on the Longitudinal Section on sheet 5 of 24 that, at chainage 5+600, the existing ground level above the proposed alignment starts to fall. This natural slope provides a suitable location for the portal with reduced need for lengthy and deep approach cutting.
4. The Department for Digital, Culture, Media and Sport 2018 response to ICOMOS 41 COM7B.56 (the 2018 State of Conservation Report (SoCR)), in the section headed “Longer Tunnel Options”, starts by describing a route under Oatlands Hill, in error. This description relates to the “Northern Bypass” option as presented at consultation in January 2017. The remainder of the longer tunnel narrative in the 2018 SoCR correctly relates to a longer tunnel on the current proposed alignment. This alignment changed following the January 2017 consultation and the change in alignment results in the earliest point at which an extended tunnel would emerge being the dry valley north of Hill Farm, rather than the west side of Oatlands Hill. It refers to a bored tunnel extension of 1.8km, to a cost increase of £540m, to the impact on Longbarrow Junction and to heritage impacts at Winterbourne Stoke Barrow group all of which apply to the “Bored Tunnel Extension to beyond WHS Boundary” referred to in paragraph 3.3.61 of the Environmental Statement chapter 3 [APP-041] and described further in Highways England’s response to Question AL.1.29.

Appendix CH.1

Appendixes CH.1

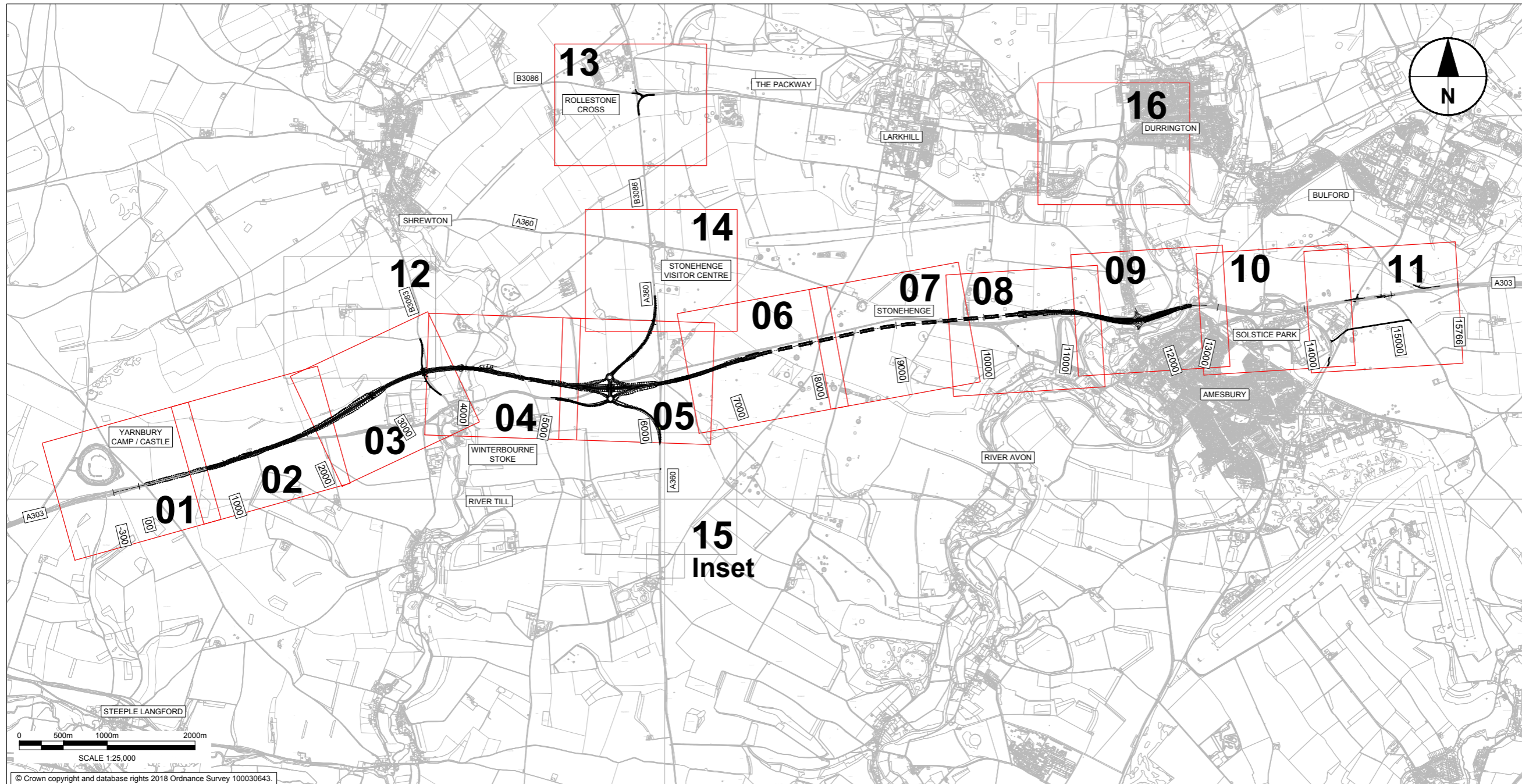
Question CH.1.12

Appendix associated with CH.1.12

Written Question CH.1.12 - Para 6.8.5(f): Road signage**Appendix**

Supporting evidence: Indicative traffic signs drawings illustrating potential layout and sizes for major signs.

Drawing Number	Title
HE551506-AMW-HSN-SW_GN_000_Z-DR-CH-1000 P04.1	Traffic Signs Layout, Preliminary, Sheet Arrangement Key Plan
HE551506-AMW-HSN-SW_GN_000_Z-DR-CH-1001 P04.1	Traffic Signs Layout, Preliminary, Sheet 01
HE551506-AMW-HSN-SW_GN_000_Z-DR-CH-1002 P04.1	Traffic Signs Layout, Preliminary, Sheet 02
HE551506-AMW-HSN-SW_GN_000_Z-DR-CH-1003 P04.1	Traffic Signs Layout, Preliminary, Sheet 03
HE551506-AMW-HSN-SW_GN_000_Z-DR-CH-1004 P04.1	Traffic Signs Layout, Preliminary, Sheet 04
HE551506-AMW-HSN-SW_GN_000_Z-DR-CH-1005 P04.1	Traffic Signs Layout, Preliminary, Sheet 05
HE551506-AMW-HSN-SW_GN_000_Z-DR-CH-1006 P04.1	Traffic Signs Layout, Preliminary, Sheet 06
HE551506-AMW-HSN-SW_GN_000_Z-DR-CH-1007 P04.1	Traffic Signs Layout, Preliminary, Sheet 07
HE551506-AMW-HSN-SW_GN_000_Z-DR-CH-1008 P04.1	Traffic Signs Layout, Preliminary, Sheet 08
HE551506-AMW-HSN-SW_GN_000_Z-DR-CH-1009 P04.1	Traffic Signs Layout, Preliminary, Sheet 09
HE551506-AMW-HSN-SW_GN_000_Z-DR-CH-1010 P04.1	Traffic Signs Layout, Preliminary, Sheet 10
HE551506-AMW-HSN-SW_GN_000_Z-DR-CH-1011 P03.1	Traffic Signs Layout, Preliminary, Sheet 11
HE551506-AMW-HSN-SW_GN_000_Z-DR-CH-1013 P03.1	Traffic Signs Layout, Preliminary, Sheet 13
HE551506-AMW-HSN-SW_GN_000_Z-DR-CH-1014 P03.1	Traffic Signs Layout, Preliminary, Sheet 14
HE551506-AMW-HSN-SW_GN_000_Z-DR-CH-1016 P03.1	Traffic Signs Layout, Preliminary, Sheet 16



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- LEGEND:**
- PROPOSED DESIGN
 - 05 SHEET USED AS PART OF THIS DRAWING SERIES.
 - 11 SHEET NOT USED AS PART OF THIS DRAWING SERIES.

FIRST ISSUE	CG	14/06/18	P01
IDR & SES COMMENTS ADDRESSED	HM	30/07/18	P02
FOR STAGE APPROVAL	HM	23/08/18	P03
FOR INFORMATION	LC	17/04/19	P04.1
Revision Details	By	Date	Suffix
Purpose of issue	Check		

Client

Project Title
**A303
 Amesbury to Berwick Down**

Drawing Title
**TRAFFIC SIGNS LAYOUT
 PRELIMINARY
 SHEET ARRANGEMENT
 KEY PLAN**

Designed	Drawn	Checked	Approved	Date
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Internal Project No.	Subsidiary			
60541439	S0			
Scale @ A1	Zone			
1:2500	Scheme Wide			

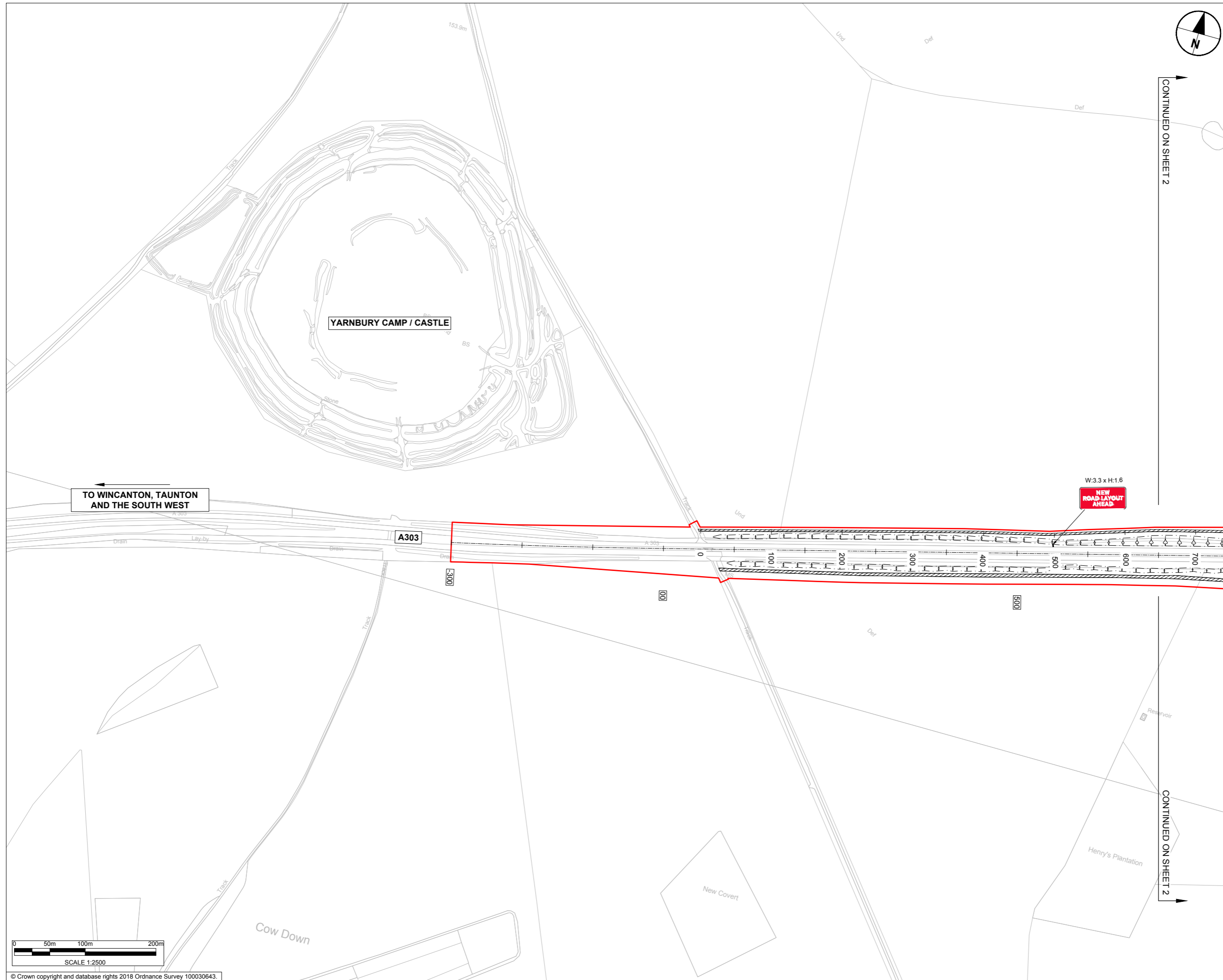
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Drawing Number	Highways England PIN	1 Originator	1 Volume	Rev
HE551506	-AMW	-HSN	-	P04.1
SW_GN_000_Z	-DR-CH-1000			
Location	Type	Role	Number	

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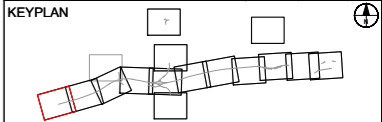
CONTINUED ON SHEET 2

CONTINUED ON SHEET 2

- NOTES:**
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 - ILLUSTRATIVE SCHEME LAYOUT
 - ORDER LIMIT
 - VARIABLE MESSAGE SIGN (VMS)

Revision Details	By	Check	Date	Suffix
FIRST ISSUE	CG	LC	16/05/18	P01
IDR & SES COMMENTS ADDRESSED	HM	LC	30/07/18	P02
FOR STAGE APPROVAL	HM	LC	23/08/18	P03
FOR INFORMATION			17/04/19	P04, 1



Purpose of issue



Project Title
**A303 Stonehenge
Amesbury to Berwick Down**

Drawing Title
**TRAFFIC SIGNS LAYOUT
PRELIMINARY
SHEET 01**

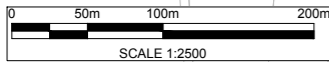
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Internal Project No. 60541439	Suitability S0
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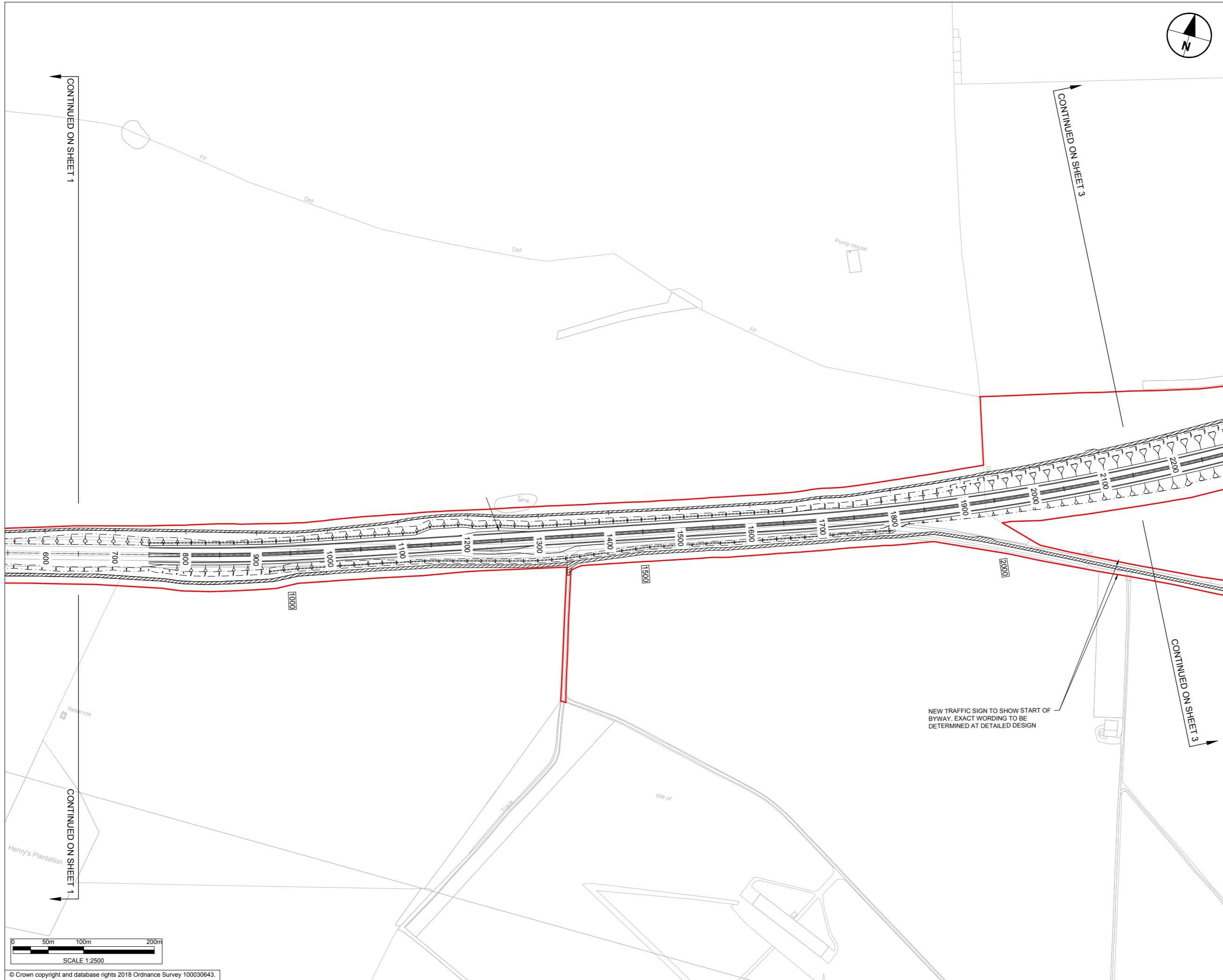
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2 The Square, Temple Quay
Bristol, BS1 6HA

Drawing Number HE551506 -AMW -HSN -	I Originator	I Volume	Rev
SW_GN_000_Z			P04.1
Location	I Type	I Role	I Number



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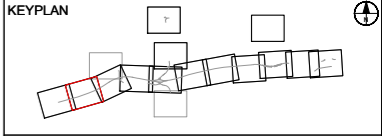
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Revision Details	By	Check	Date	Suffix
FIRST ISSUE	CG	LC	16/05/18	P01
IDR & SES COMMENTS ADDRESSED	HM	LC	30/07/18	P02
FOR STAGE APPROVAL	HM	LC	23/08/18	P03
FOR INFORMATION	---	---	17/04/19	P04, 1



Purpose of issue



Project Title

**A303 Stonehenge
Amesbury to Berwick Down**

Drawing Title

**TRAFFIC SIGNS LAYOUT
PRELIMINARY
SHEET 02**

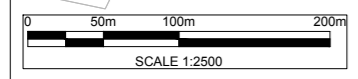
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Internal Project No.	Suitability
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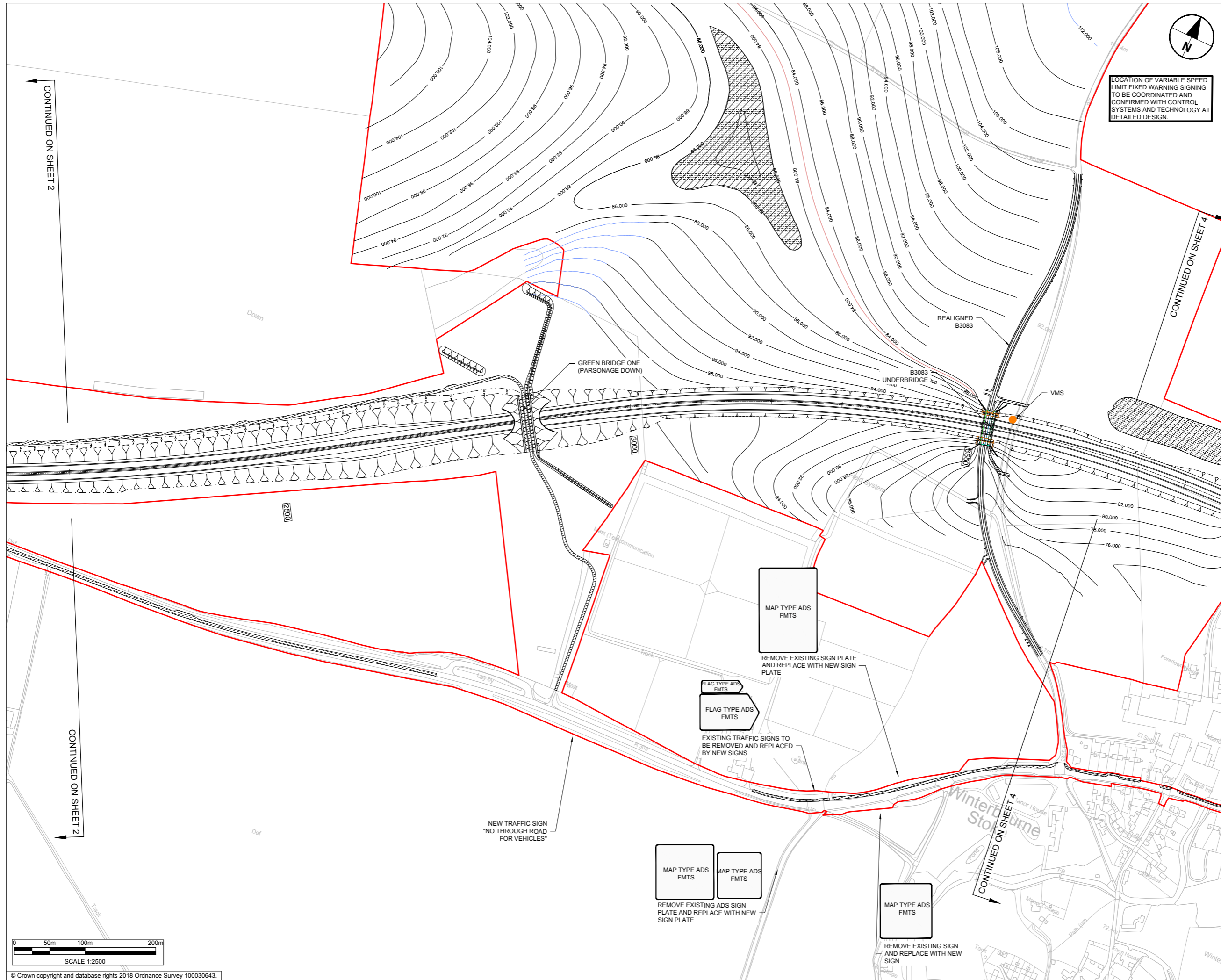
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Temple Quay House
2 The Square, Temple Quay
Bristol, BS1 6HA

Drawing Number	Highways England PIN	Originator	I Volume	Rev
HE551506	-AMW	-HSN	-	P04.1
SW_GN_000_Z		-DR-CH-1002		
Location	I Type	I Role	I Number	



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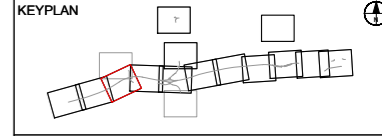
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Revision Details	By	Check	Date	Suffix
FIRST ISSUE	CG	LC	16/05/18	P01
IDR & SES COMMENTS ADDRESSED	HM	LC	30/07/18	P02
FOR STAGE APPROVAL	HM	LC	23/08/18	P03
FOR INFORMATION			17/04/19	P04.1



Purpose of issue



Project Title
A303 Stonehenge Amesbury to Berwick Down

Drawing Title
TRAFFIC SIGNS LAYOUT PRELIMINARY SHEET 03

Designed	Drawn	Checked	Approved	Date

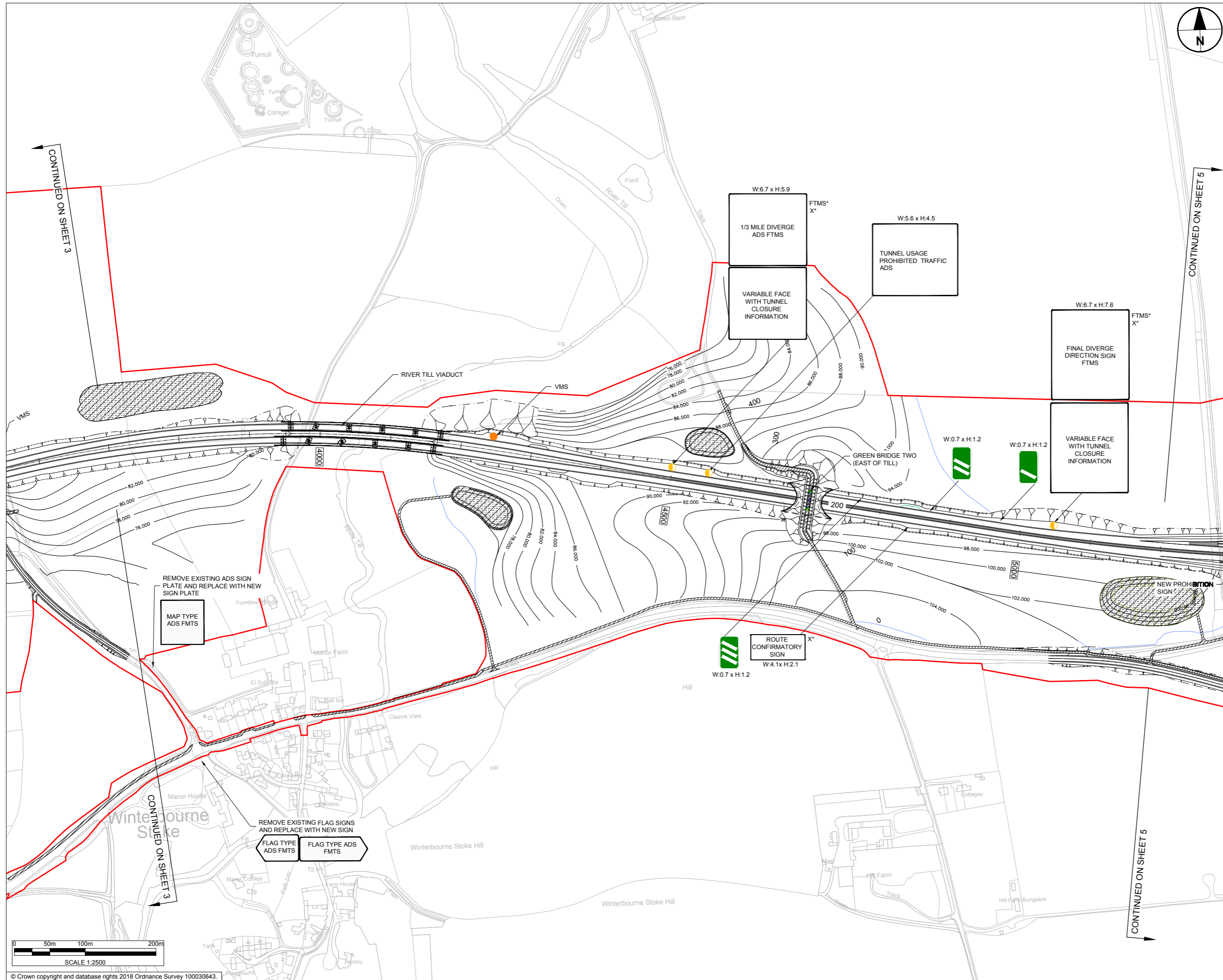
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Drawing Number	Highways England PIN	I Originator	I Volume	Rev
HE551506	-AMW	-HSN	-	P04.1
SW_GN_000_Z		-DR-CH-1003		
Location	I Type	I Role	I Number	

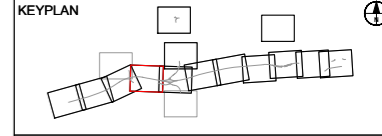
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Revision Details	By	Check	Date	Suffix
FIRST ISSUE	CG	LC	16/05/18	P01
IDR & SES COMMENTS ADDRESSED	HM	LC	30/07/18	P02
FOR STAGE APPROVAL	HM	LC	23/08/18	P03
FOR INFORMATION	---	---	17/04/19	P04,1



Purpose of issue



Project Title
**A303
 Amesbury to Berwick Down**

Drawing Title
**TRAFFIC SIGNS LAYOUT
 PRELIMINARY
 SHEET 04**

Designed	Drawn	Checked	Approved	Date
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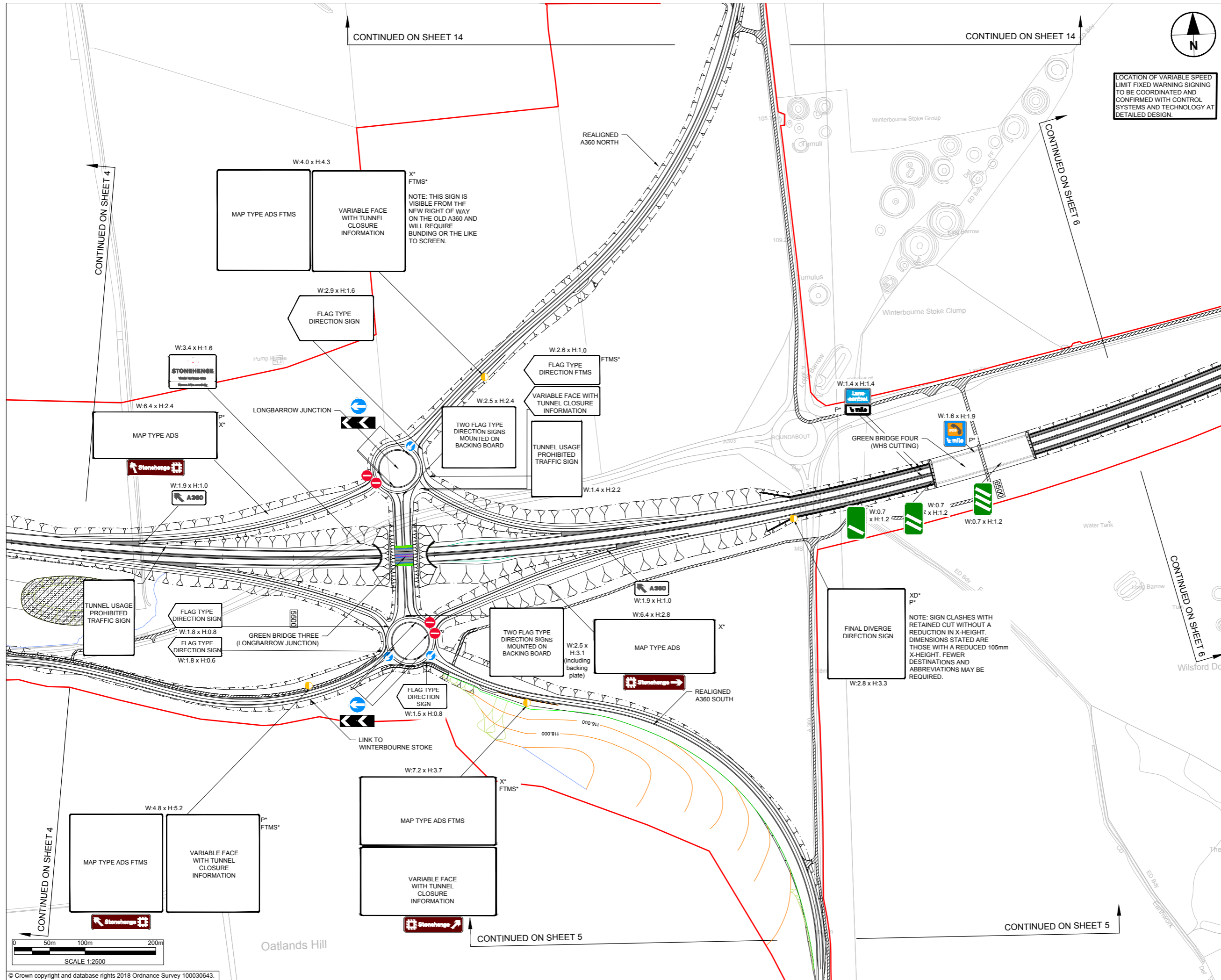
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Drawing Number	Highways England PIN	Originator	I Volume	Rev
HE551506	-AMW	-HSN	-	P04.1
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Location	I Type	I Role	I Number	

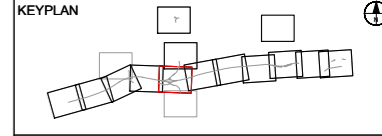
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Revision Details	By	Check	Date	Suffix
FIRST ISSUE	CG	LC	16/05/18	P01
IDR & SES COMMENTS ADDRESSED	HM	LC	30/07/18	P02
FOR STAGE APPROVAL	HM	LC	23/08/18	P03
FOR INFORMATION	---	---	17/04/19	P04,1



Purpose of issue
Client: **highways england**

Project Title
A303 Amesbury to Berwick Down

Drawing Title
TRAFFIC SIGNS LAYOUT PRELIMINARY SHEET 05

Designed	Drawn	Checked	Approved	Date
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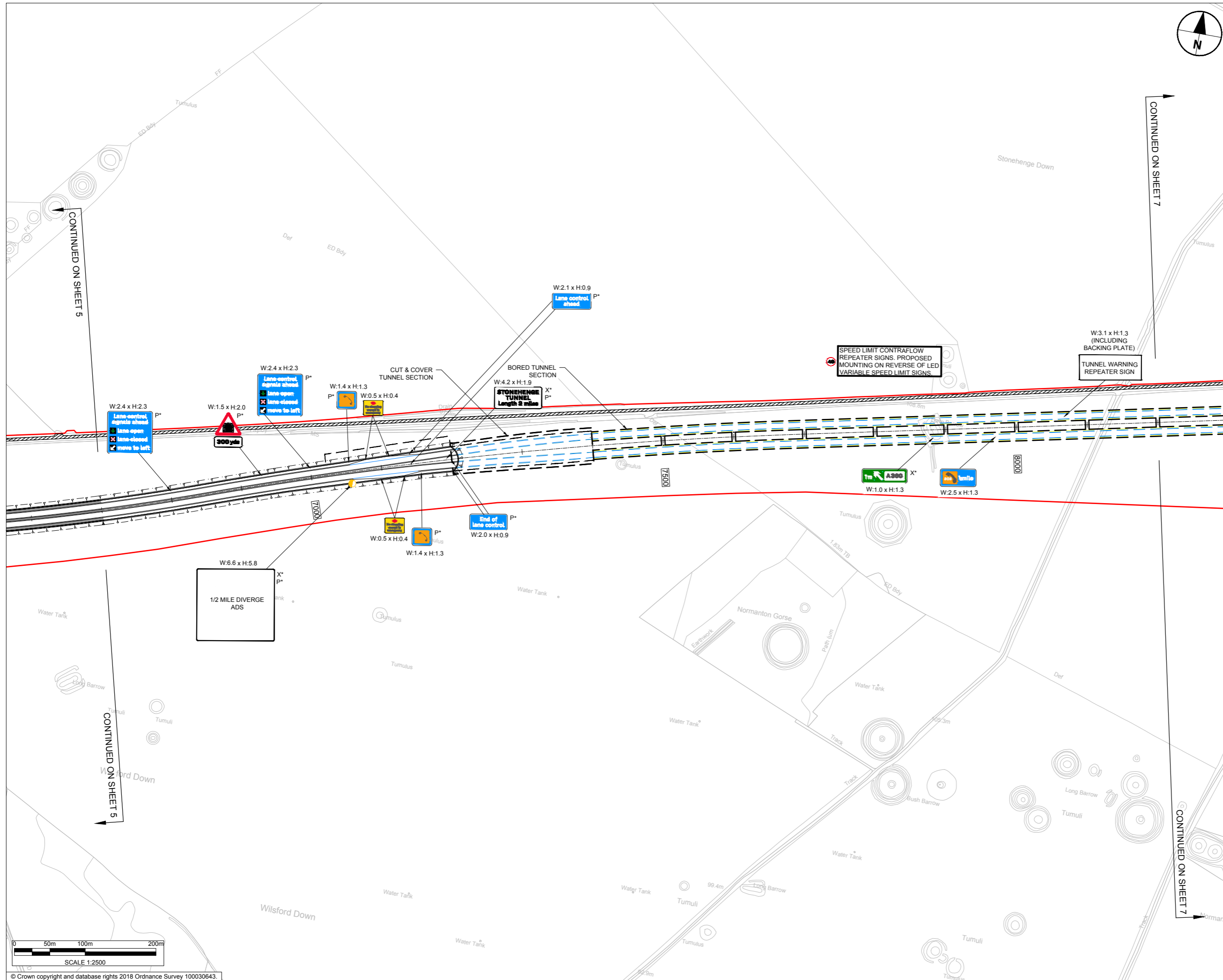
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Drawing Number	Highways England PIN	Originator	I Volume	Rev
HE551506 -AMW -HSN -SW_GN_000_Z	---	---	---	P04,1

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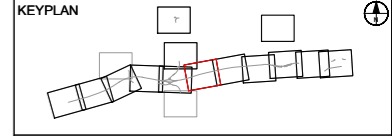
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Revision Details	By	Check	Date	Suffix
FIRST ISSUE	CG	LC	16/05/18	P01
IDR & SES COMMENTS ADDRESSED	HM	LC	30/07/18	P02
FOR STAGE APPROVAL	HM	LC	23/08/18	P03
FOR INFORMATION	---	---	17/04/19	P04.1



Purpose of issue



Project Title

**A303
Amesbury to Berwick Down**

Drawing Title

**TRAFFIC SIGNS LAYOUT
PRELIMINARY
SHEET 06**

Designed	Drawn	Checked	Approved	Date
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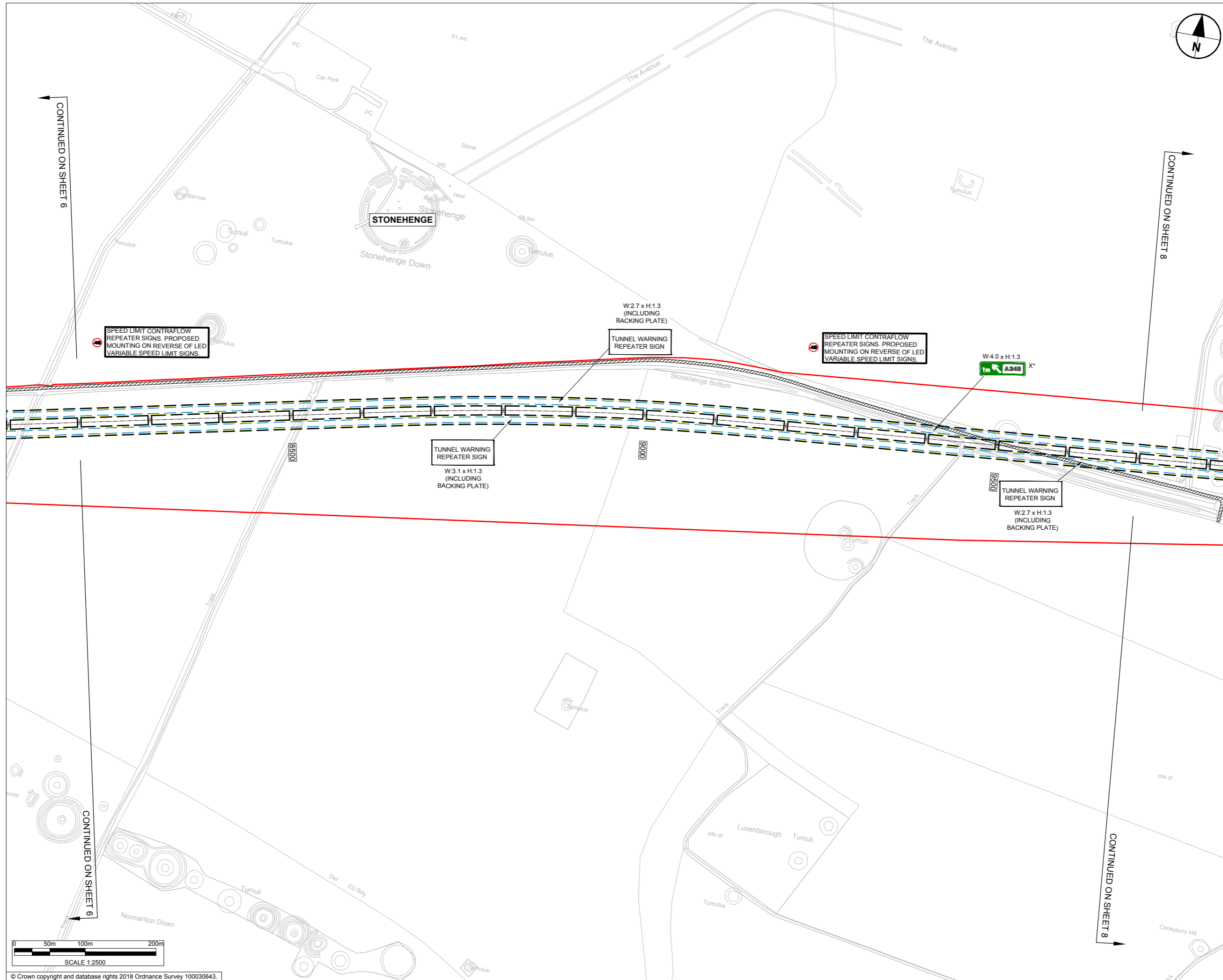
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Subsidiary S0
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Drawing Number	Highways England PIN	Originator	I Volume	Rev
HE551506	-AMW	-HSN	-	P04.1
SW_GN_000_Z		-DR-CH-1006		
Location	I Type	I Role	I Number	

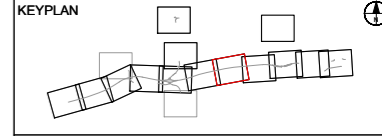
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Revision Details	By	Check	Date	Suffix
FIRST ISSUE	CG	LC	16/05/18	P01
IDR & SES COMMENTS ADDRESSED	HM	LC	30/07/18	P02
FOR STAGE APPROVAL	HM	LC	23/08/18	P03
FOR INFORMATION	---	---	17/04/19	P04, 1



Purpose of issue



Project Title
**A303 Stonehenge
 Amesbury to Berwick Down**

Drawing Title
**TRAFFIC SIGNS LAYOUT
 PRELIMINARY
 SHEET 07**

Designed	Drawn	Checked	Approved	Date
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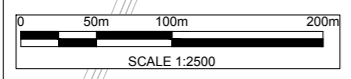
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 Zone Scheme Wide

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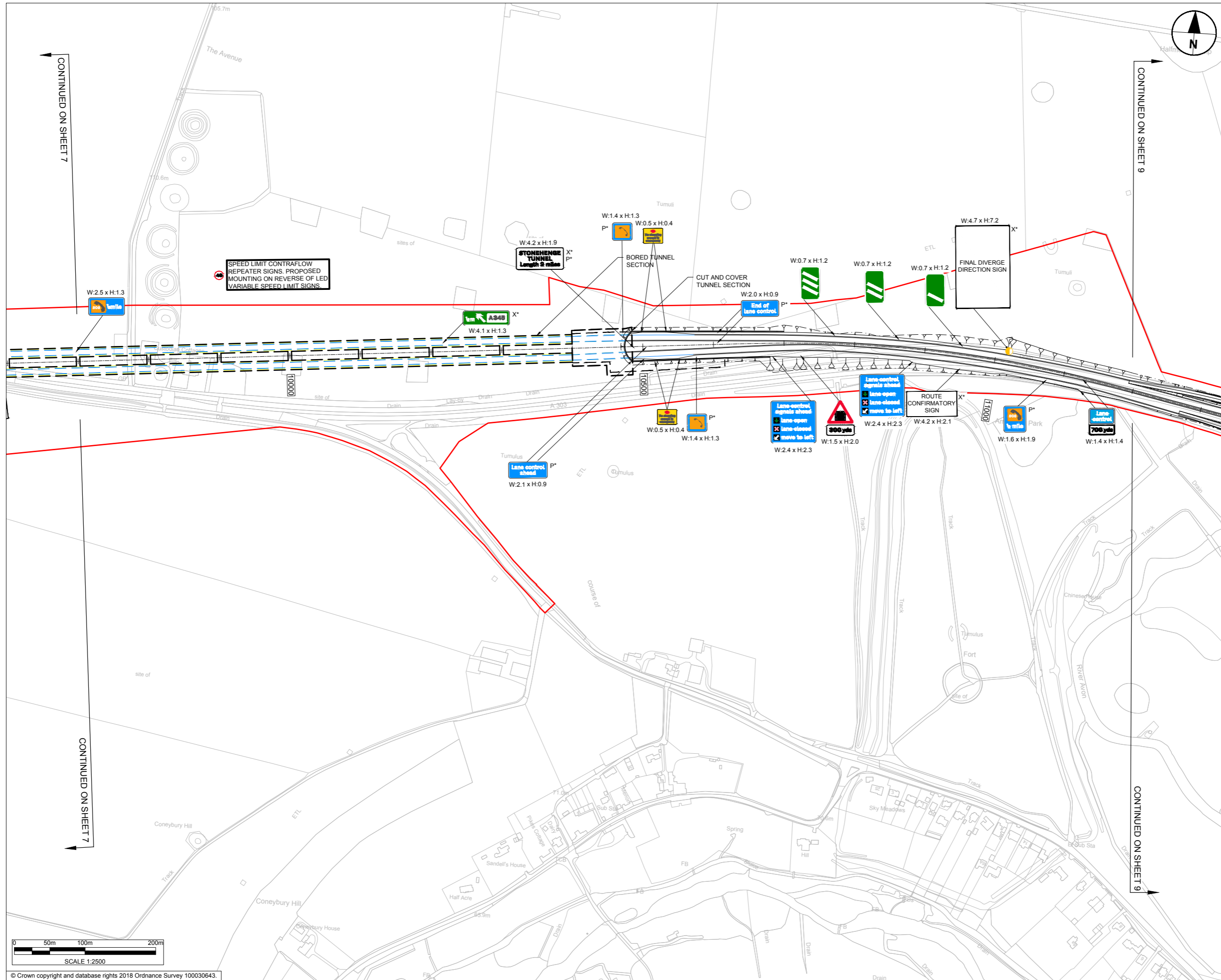
Highways England Project Office
 Temple Quay House
 2 The Square, Temple Quay
 Bristol, BS1 6HA

Drawing Number	Highways England PIN	Originator	I Volume	Rev
HE551506	-AMW	-HSN	-	P04.1
SW_GN_000_Z		-DR-CH-1007		
Location	I Type	I Role	I Number	

Plot Time: 10:00
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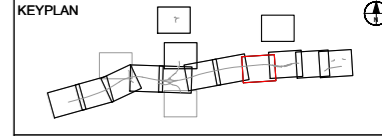
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 - XD* SIGN X-HEIGHT = BELOW MINIMUM (BELOW BRACKETED X-HEIGHT FOR SPEED OF ROAD)
 - L* SIGN EXTERNALLY ILLUMINATED
 - ILLUSTRATIVE SCHEME LAYOUT
 - ORDER LIMIT
 - VARIABLE MESSAGE SIGN (VMS)

Revision Details	By	Check	Date	Suffix
FOR INFORMATION			17/04/19	P04.1
FOR STAGE APPROVAL			23/08/18	P03
IDR & SES COMMENTS ADDRESSED			30/07/18	P02
FIRST ISSUE			16/05/18	P01



Purpose of issue



Project Title
**A303
 Amesbury to Berwick Down**

Drawing Title
**TRAFFIC SIGNS LAYOUT
 PRELIMINARY
 SHEET 08**

Designed	Drawn	Checked	Approved	Date

Internal Project No. 60541439
 Scale @ A1 1:2500
 Substation S0
 Zone Scheme Wide

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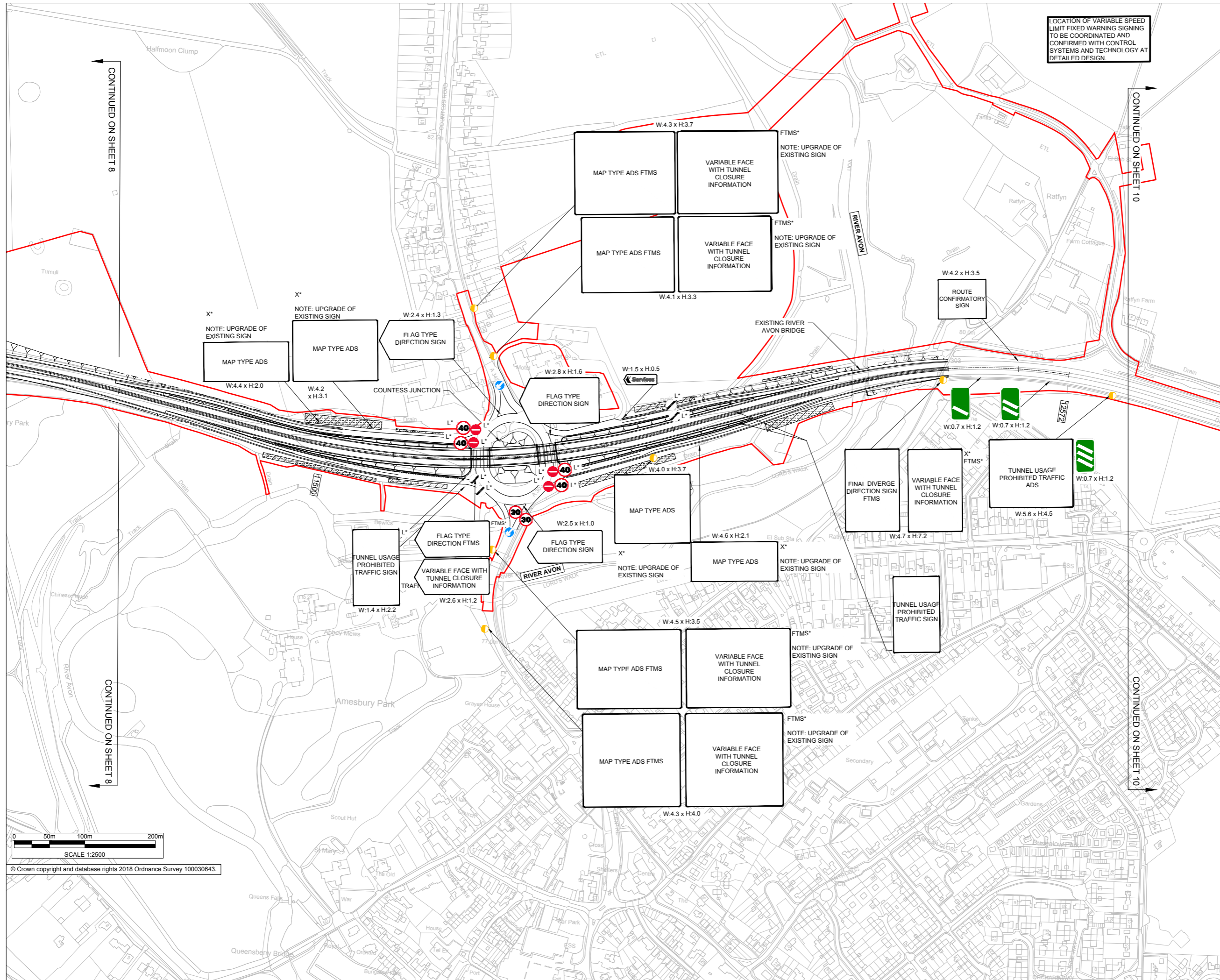
Highways England Project Office
 Temple Quay House
 2 The Square, Temple Quay
 Bristol, BS1 6HA

AmW
 AECOM + msa + WSP

Drawing Number HE551506 -AMW -HSN -SW_GN_000_Z
 Location I Type I Role I Number

Rev P04.1

Plot Time: 10:00
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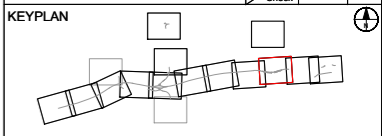


LOCATION OF VARIABLE SPEED LIMIT FIXED WARNING SIGNING TO BE COORDINATED AND CONFIRMED WITH CONTROL SYSTEMS AND TECHNOLOGY AT DETAILED DESIGN.

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Revision Details	By	Check	Date	Suffix
FIRST ISSUE	CG	LC	16/05/18	P01
IDR & SES COMMENTS ADDRESSED	HM	LC	30/07/18	P02
FOR STAGE APPROVAL	HM	LC	23/08/18	P03
FOR INFORMATION	---	---	17/04/19	P04,1



Purpose of issue



Project Title
**A303
 Amesbury to Berwick Down**

Drawing Title
**TRAFFIC SIGNS LAYOUT
 PRELIMINARY
 SHEET 09**

Designed	Drawn	Checked	Approved	Date
---	---	---	---	---

Internal Project No. 60541439
 Scale @ A1 1:2500
 Substation S0
 Zone Scheme Wide

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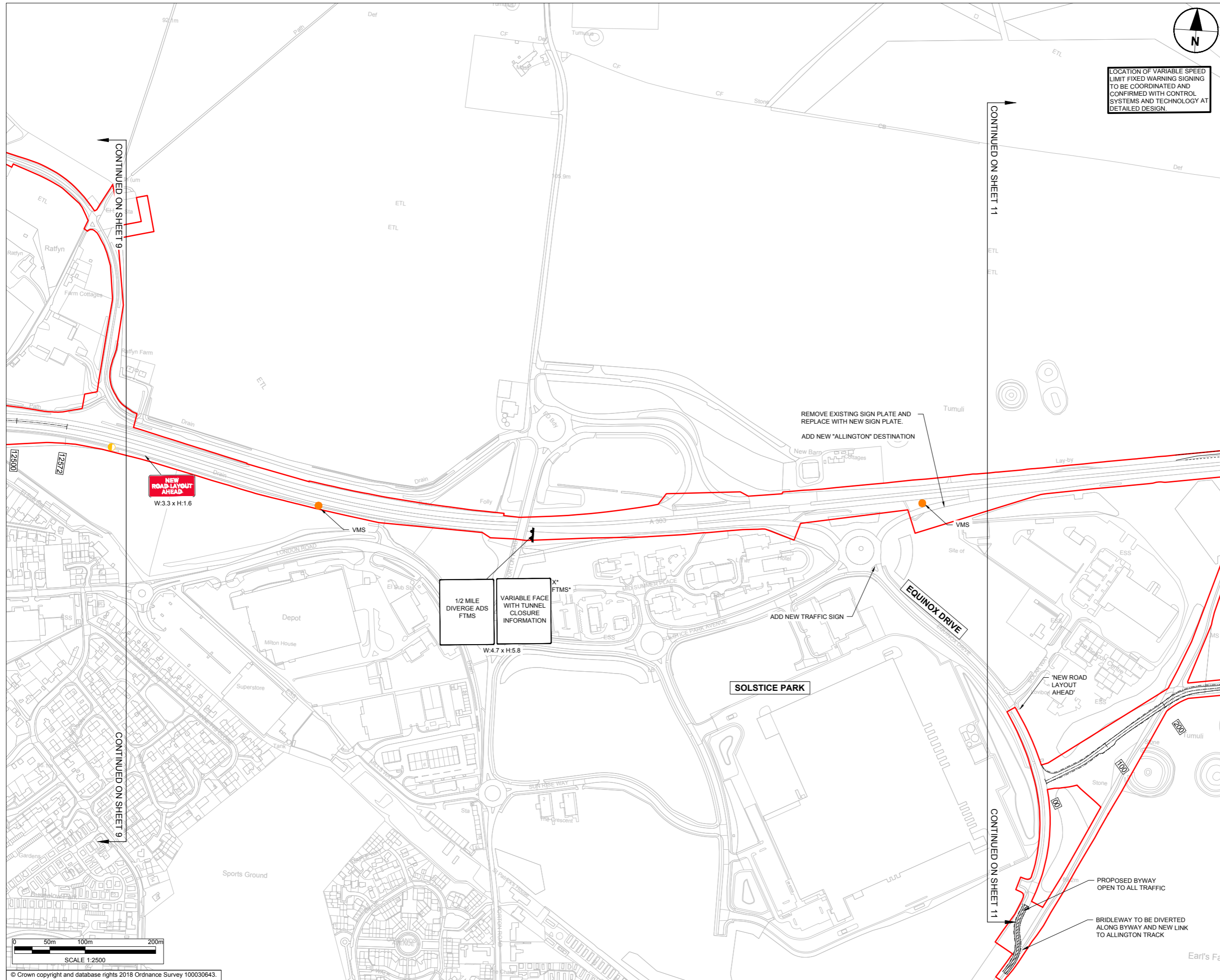
Highways England Project Office
 Temple Quay House
 2 The Square, Temple Quay
 Bristol, BS1 6HA

Drawing Number	Highways England PIN	Originator	I Volume	Rev
HE551506 -AMW -HSN -SW_GN_000_Z	---	---	---	P04,1

Location I Type I Rate I Number

Plot Time: 19/05/2019 13:33:52
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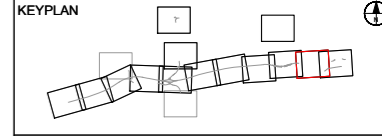
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 - ORDER LIMIT
 - VARIABLE MESSAGE SIGN (VMS)

FIRST ISSUE	CG	16/05/18	P01
IDR & SES COMMENTS ADDRESSED	HM	30/07/18	P02
FOR STAGE APPROVAL	HM	23/08/18	P03
FOR INFORMATION	---	17/04/19	P04, 1
Revision Details	By	Date	Suffix
	Check		



Purpose of issue



Project Title
A303 Amesbury to Berwick Down

Drawing Title
TRAFFIC SIGNS LAYOUT PRELIMINARY SHEET 10

Designed	Drawn	Checked	Approved	Date
Internal Project No.	Suitability			
60541439	S0			
Scale @ A1	Zone			
1:2500	Scheme Wide			

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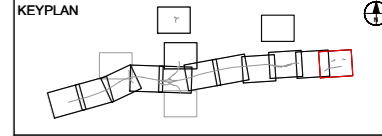
Drawing Number	Highways England PIN	1 Originator	1 Volume	Rev
HE551506 -AMW	-AMW	-HSN	-	P04.1
SW_GN_000_Z		-DR-CH-1010		
Location	1 Type	1 Role	1 Number	

Plot Time: 10:00
 File Name: C:\WORK\DRINKA\RECOM_EU\PROJECTS\A303\AMW\HSA\SW_GN_000_Z\DR-CH-1010

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Revision Details	By	Check	Date	Suffix
	WC	TE	10/08/18	P01
IDR AND HE COMMENTS ADDRESSED	WC	TE	23/08/18	P02
FOR INFORMATION			17/04/19	P03.1



Purpose of issue



Project Title
**A303
 Amesbury to Berwick Down**

Drawing Title
**TRAFFIC SIGNS LAYOUT
 PRELIMINARY
 SHEET 11**

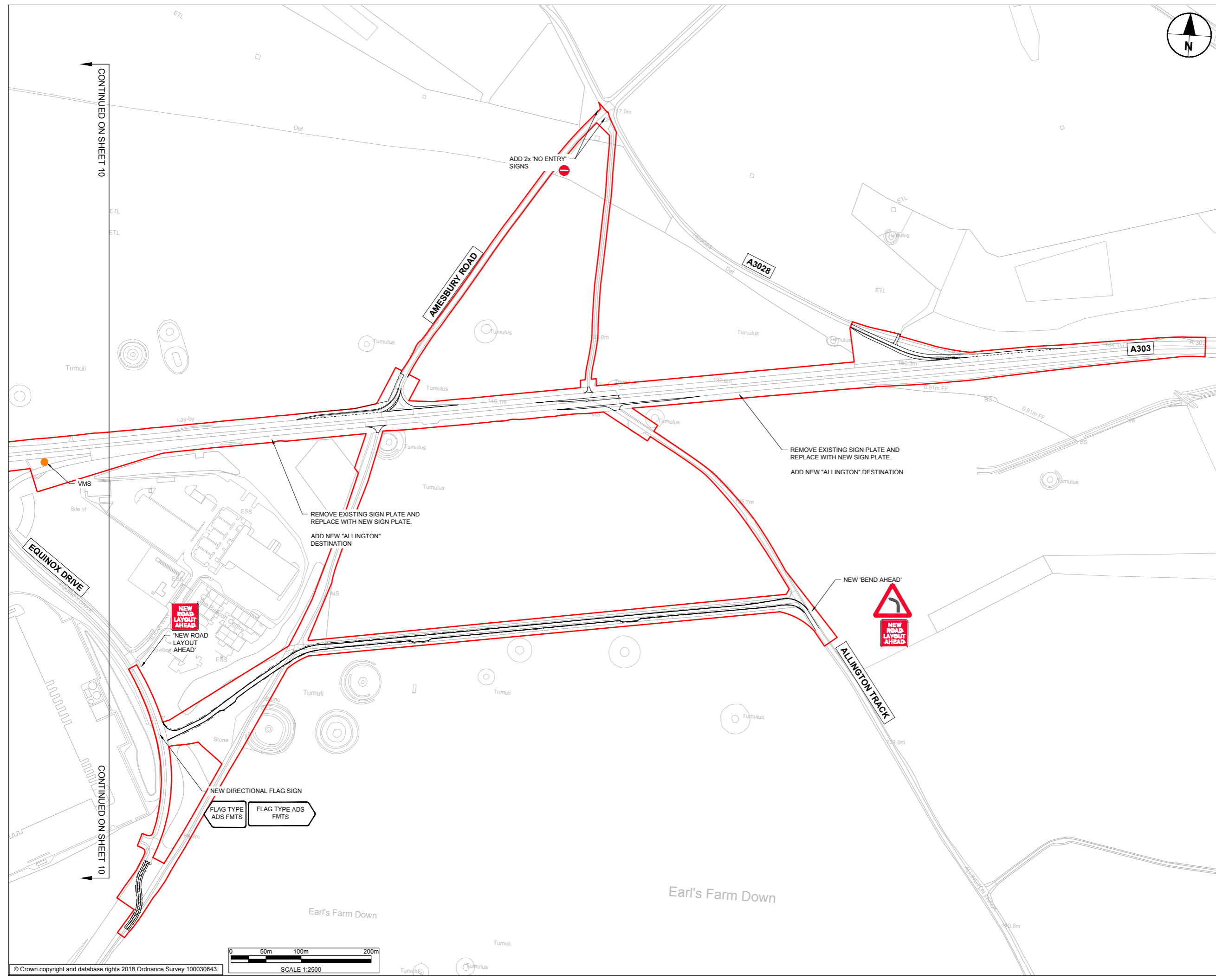
Designed	Drawn	Checked	Approved	Date
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Internal Project No. 60541439
 Scale @ A1 1:2500
 Subtality S0
 Zone Scheme Wide

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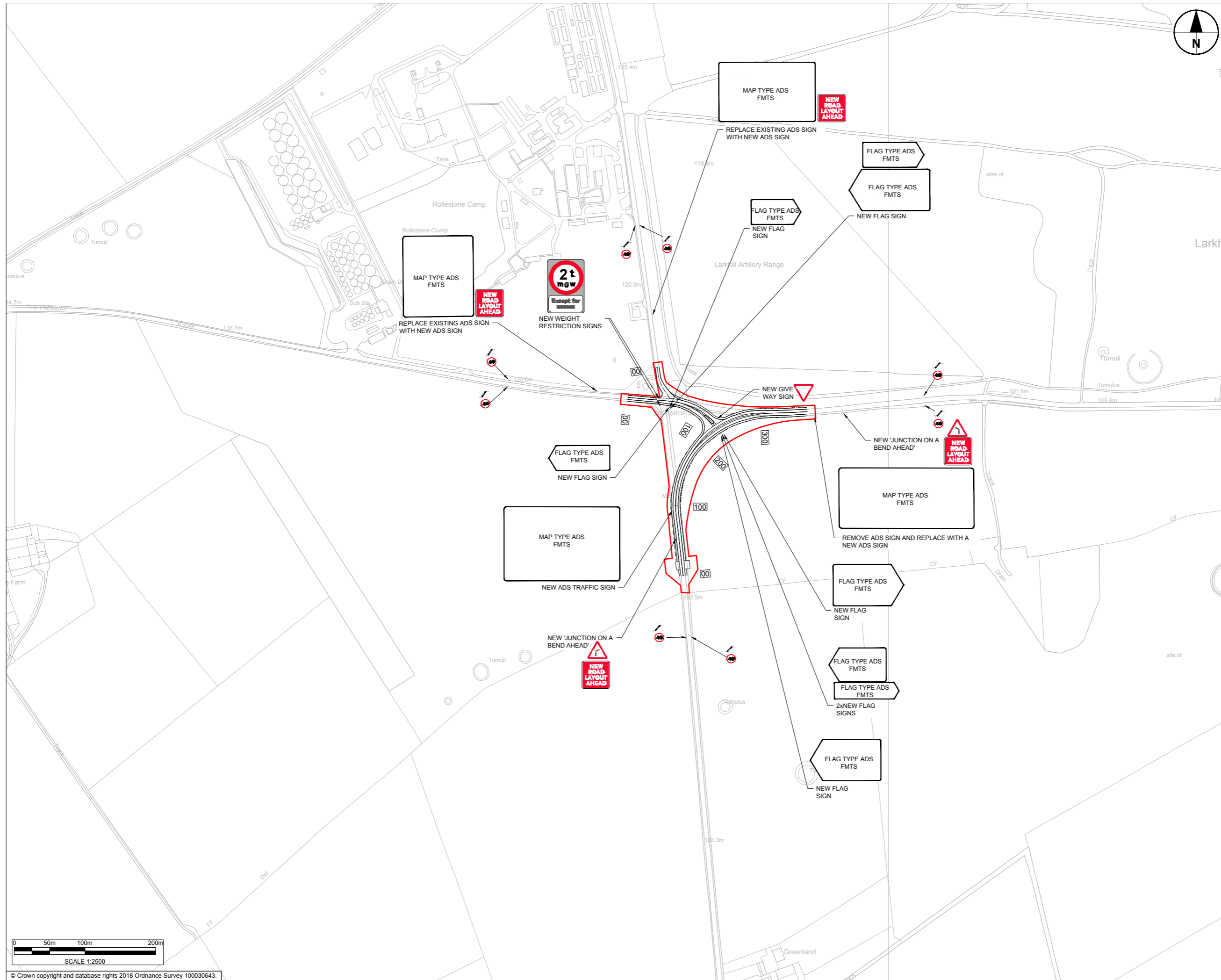
Highways England Project Office
 Temple Quay House
 2 The Square, Temple Quay
 Bristol, BS1 6HA

Drawing Number	Highways England PIN	Originator	I Volume	Rev
HE551506	-AMW	-HSN	-	P03.1
SW_GN_000_Z		-DR-CH-1011		
Location	I Type	I Role	I Number	



Plot Time: 10:00
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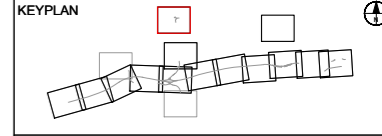
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 - ORDER LIMIT
 - VARIABLE MESSAGE SIGN (VMS)

Revision Details	By	Check	Date	Suffix



Purpose of issue



Project Title

**A303
Amesbury to Berwick Down**

Drawing Title

**TRAFFIC SIGNS LAYOUT
PRELIMINARY
SHEET 13**

Designed	Drawn	Checked	Approved	Date

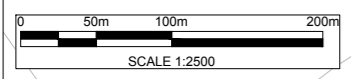
Internal Project No. 60541439
Scale @ A1 1:2500
Subsidiary S0
Zone Scheme Wide

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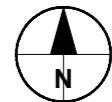
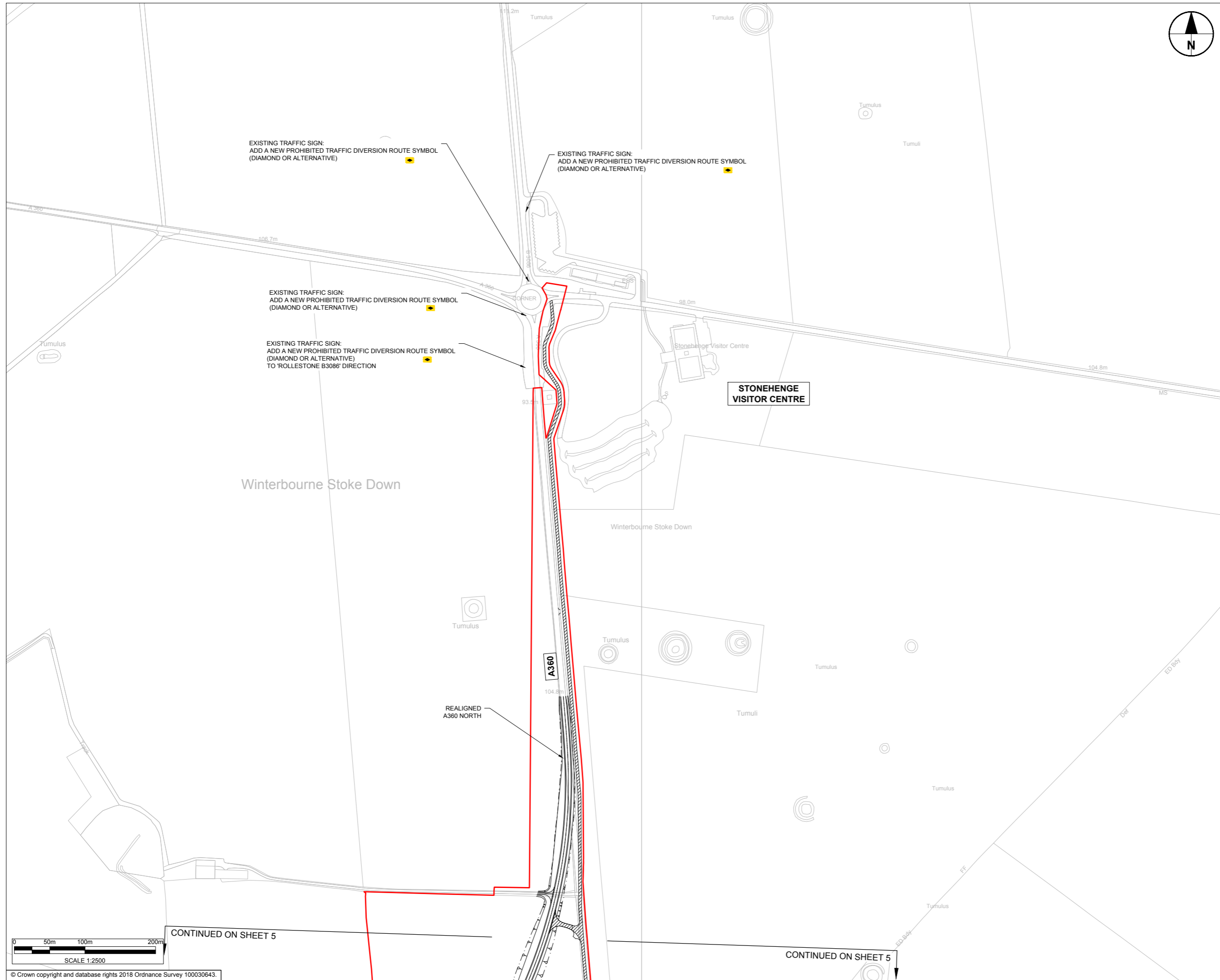
AmW
AECOM + mace + WSP

Drawing Number: HE551506 -AMW -HSN - SW_GN_000_Z
I Originator I Volume I Role I Number
P03.1



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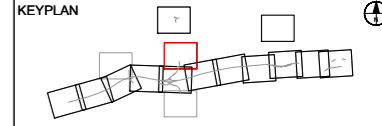
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Revision Details	By	Check	Date	Suffix
FOR STAGE APPROVAL	WC	TE	10/08/18	P01
FOR STAGE APPROVAL	WC	CG	23/08/18	P02
FOR INFORMATION			17/04/19	P03.1



Purpose of issue



Project Title
**A303
 Amesbury to Berwick Down**

Drawing Title
**TRAFFIC SIGNS LAYOUT
 PRELIMINARY
 SHEET 14**

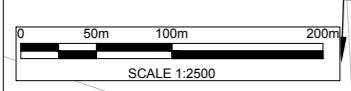
Designed	Drawn	Checked	Approved	Date
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Internal Project No.	Suitability			
60541439	S0			
Scale @ A1	Zone			
1:2500	Scheme Wide			

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Drawing Number	Originator	Volume	Rev
HE551506 -AMW -HSN -			
SW_GN_000_Z	-DR-CH-1014		P03.1
Location	Type	Role	Number

Plot Time: 10:00
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CONTINUED ON SHEET 5

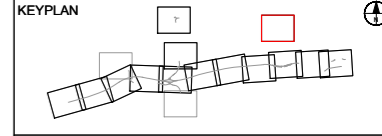
CONTINUED ON SHEET 5



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	WC	TE	10/08/18	P01
FOR STAGE APPROVAL	WC	CG	23/08/18	P02
FOR INFORMATION			17/04/19	P03,1
Revision Details	By	Check	Date	Suffix



Purpose of issue



Project Title

**A303
Amesbury to Berwick Down**

Drawing Title

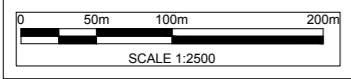
**TRAFFIC SIGNS LAYOUT
PRELIMINARY
SHEET 16**

Designed	Drawn	Checked	Approved	Date
Internal Project No.	Subsidiary			
60541439	S0			
Scale @ A1	Zone			
1:2500	Scheme Wide			

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Bristol, BS1 6HA

Drawing Number	Originator	Volume	Rev
HE551506 -AMW	-AMW	-HSN	P03,1
SW_GN_000_Z	-DR-CH-1016		
Location	I Type	I Role	I Number



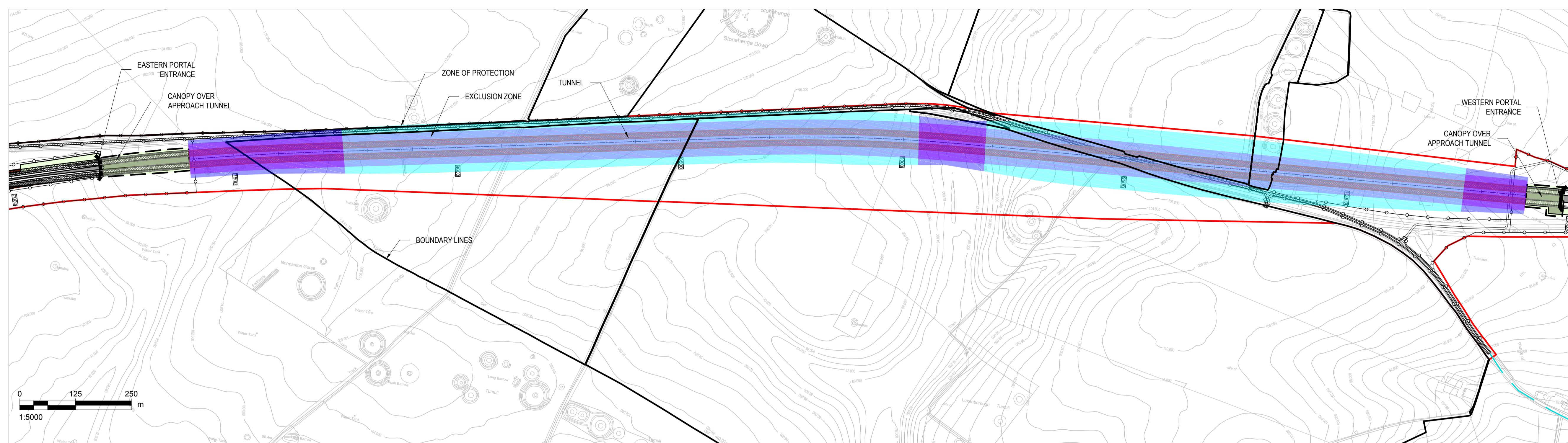
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Plot Time: 10:00
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Appendix CH.1

Question CH.1.27

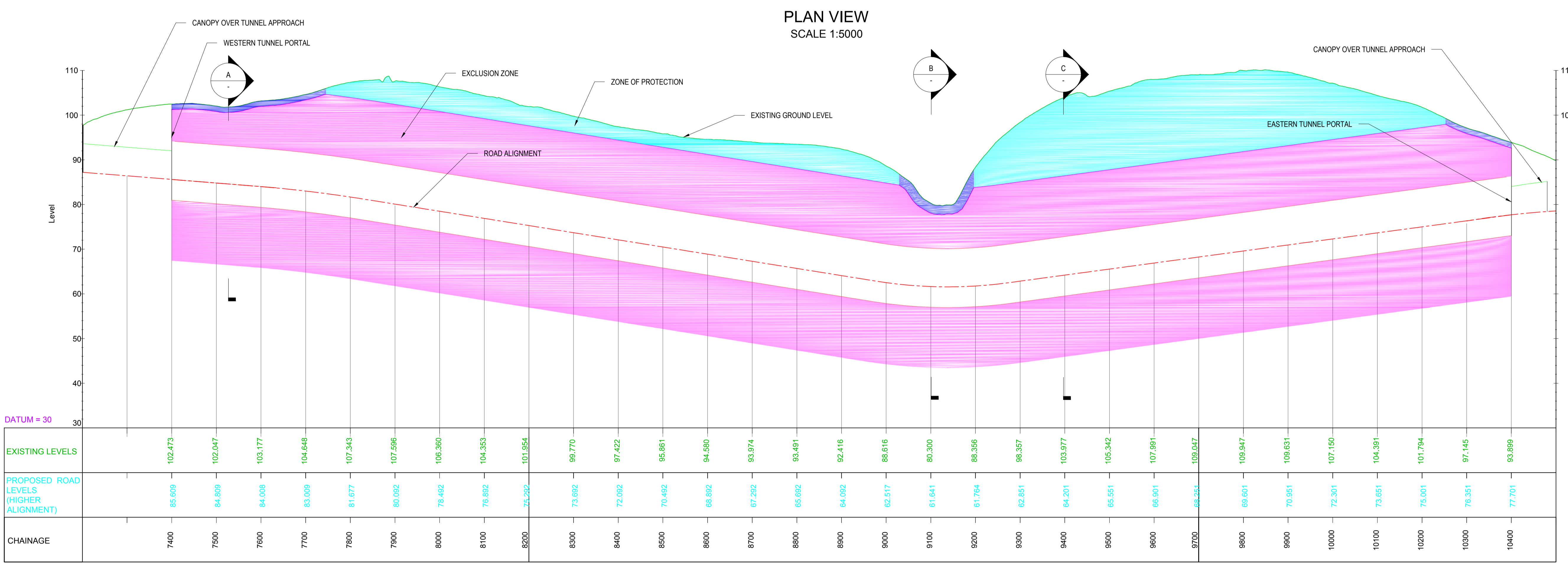
Proposed restriction - Tunnel long section



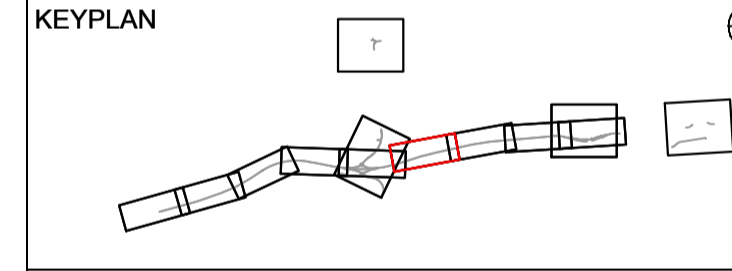
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- ALL DIMENSIONS IN MILLIMETRES, ALL CHAINAGES, LEVELS AND COORDINATES ARE IN METRES UNLESS DEFINED OTHERWISE.
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KEY:

- PERMANENT ACQUISITION
- RESTRICTION DARK BLUE AREA: 0.6M DEPTH
- RESTRICTION LIGHT BLUE AREA: 1.2M DEPTH



Revision Details	By	Check	Date	Suffix
LEVELS UPDATED TO REFLECT PROPOSED ROAD LEVELS	MA	MA	16/08/18	P01
LEVELS UPDATED TO REFLECT PROPOSED ROAD LEVELS	CN	MA	14/09/18	P02
LEVELS UPDATED TO REFLECT PROPOSED ROAD LEVELS	---	MA	14/09/18	P03,1



Purpose of issue



Project Title

**A303
Amesbury to Berwick Down**

Drawing Title
**ZONE 3 MAIN LINE TUNNELS
LONGITUDINAL SECTION
UPPER ALIGNMENT LAND
REQUIREMENTS -
FOR DISCUSSION**

Designed	Drawn	Checked	Approved	Date
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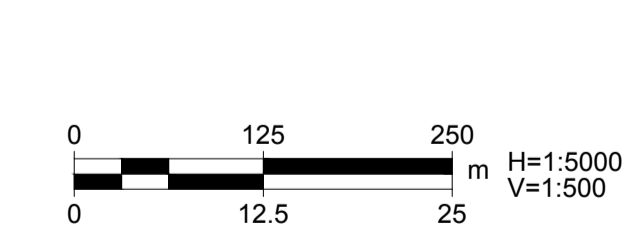
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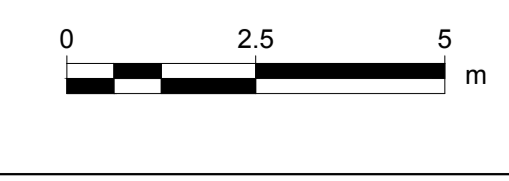
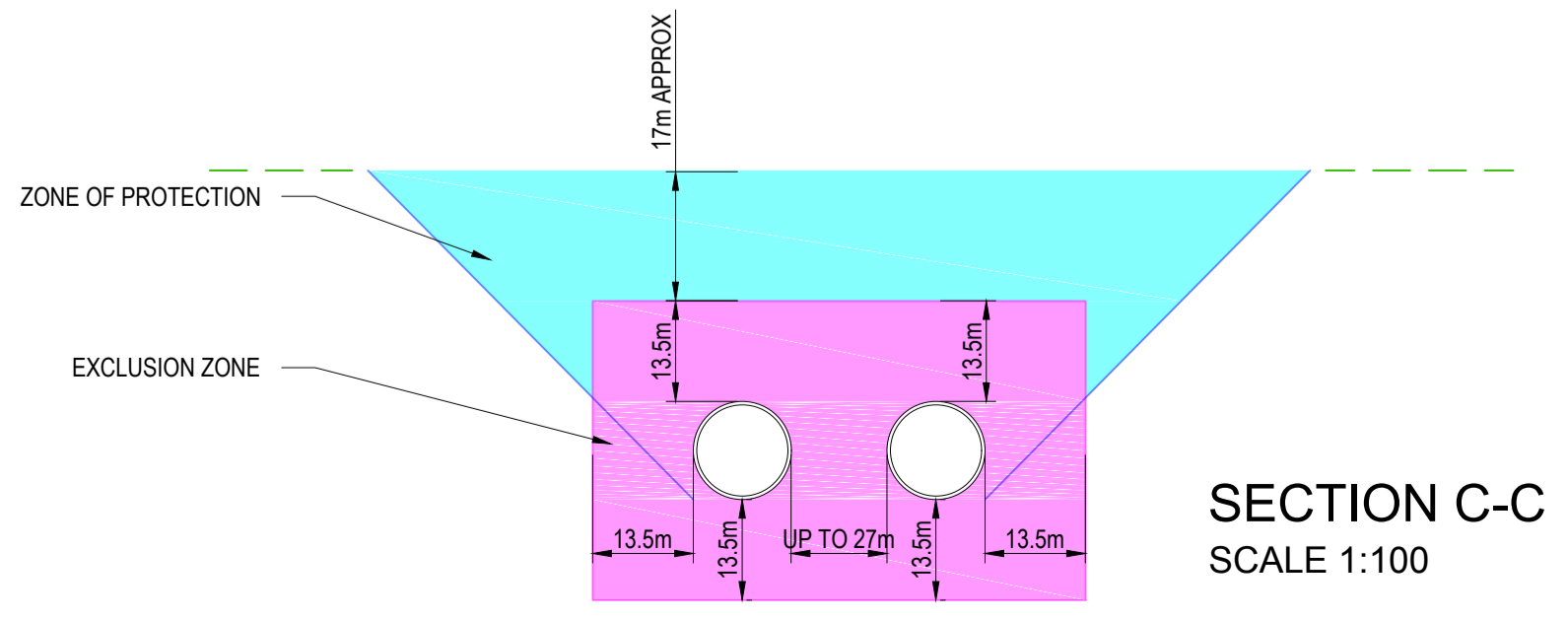
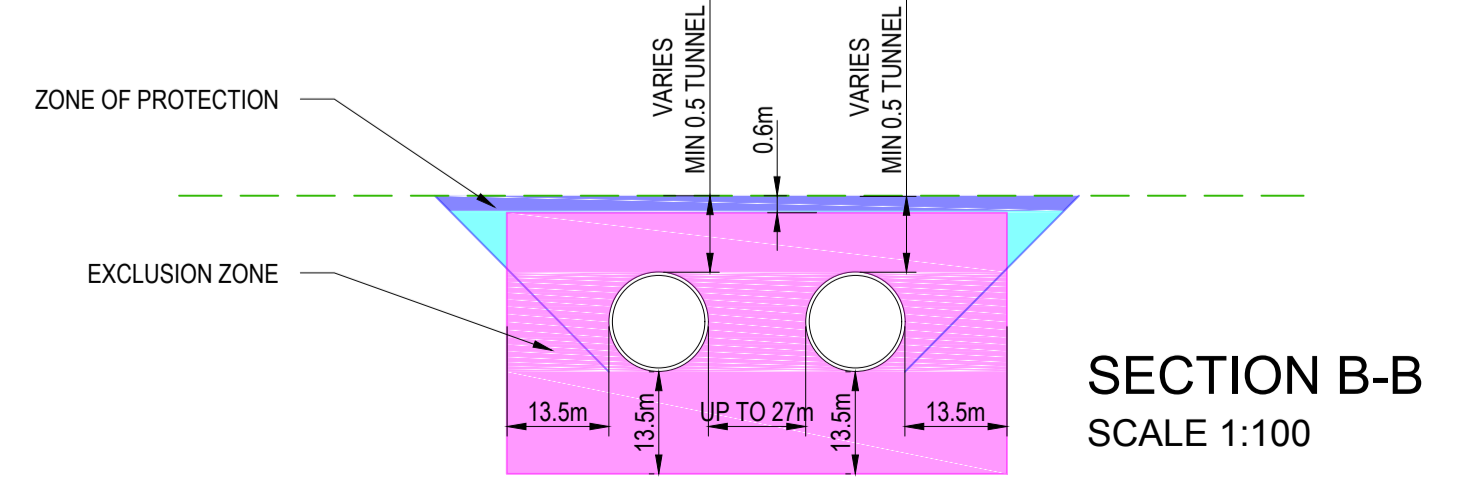
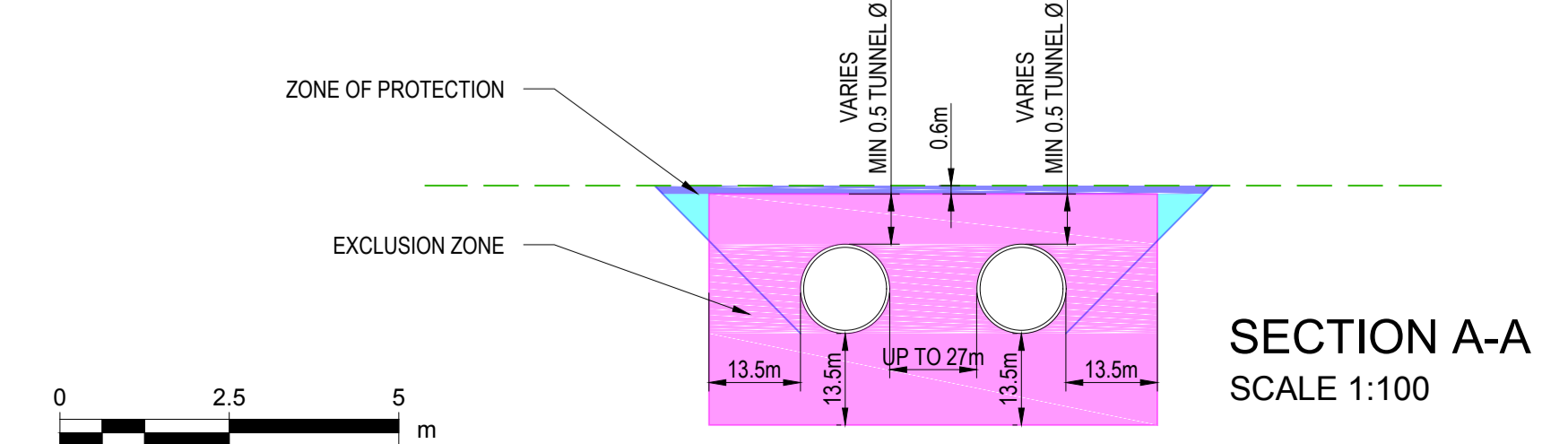
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2 The Square, Temple Quay
Bristol, BS1 6HA

AmW
AECOM + mace + WSP

Drawing Number HE551506 -AMW -STU - P03.1
Highways England PIN 1 Originator 1 Volume
Z3 ML_M00_Z -DR-CT-0080
Location 1 Type 1 Role 1 Number



LONGITUDINAL SECTION
SCALE Horiz: 1:5000 Vert: 1:500

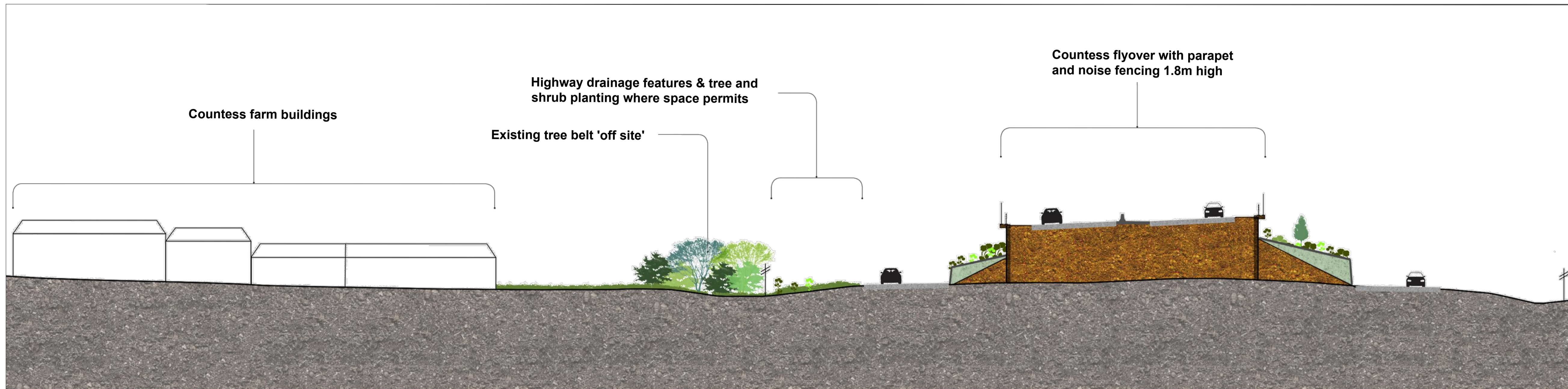


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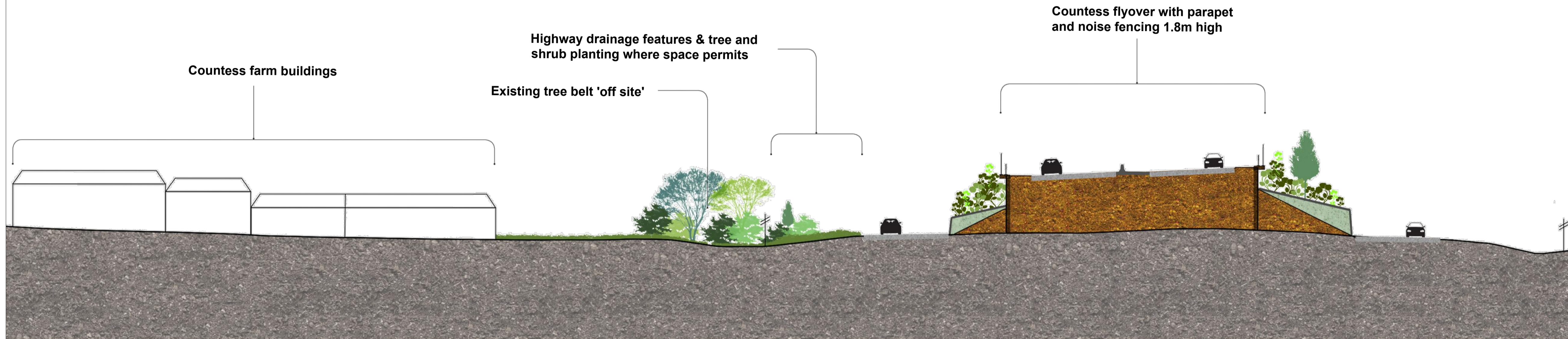
Appendixes CH.1

Question CH.1.47

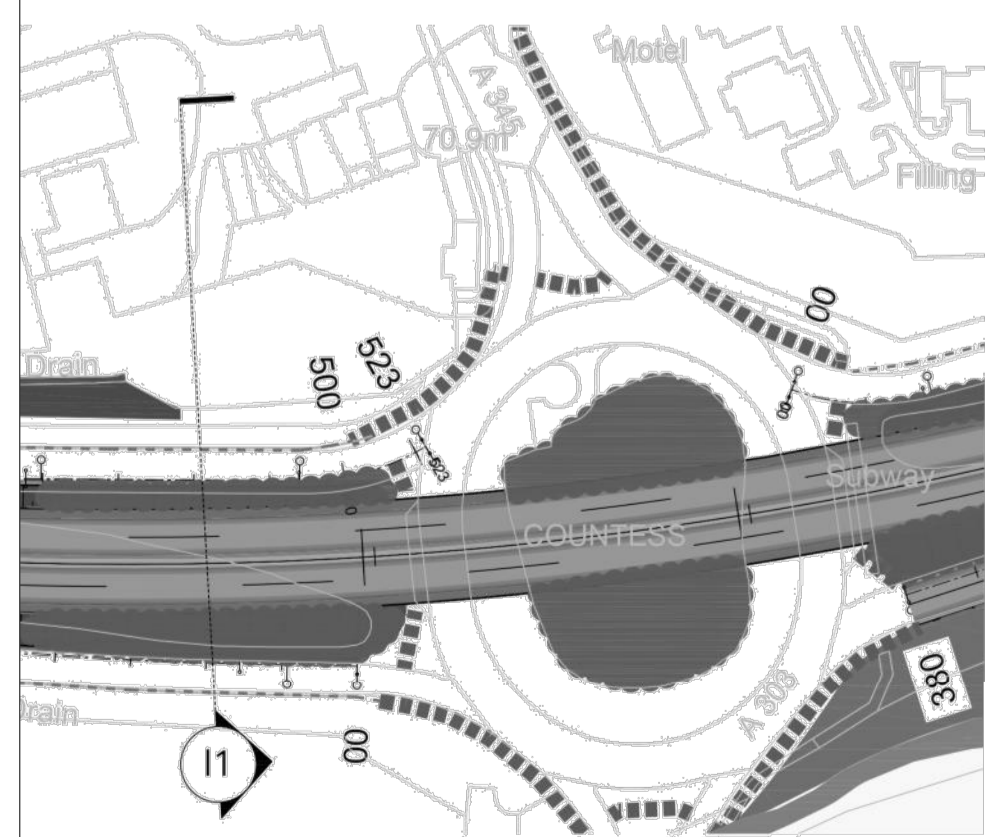
Appendix associated with CH.1.47



SECTION 11 (ONE YEAR AFTER ROAD OPENING)



SECTION 11 (15 YEAR AFTER ROAD OPENING)



LOCATION PLAN
SCALE 1:2000



SECTION SCALE 1:250

- NOTES:
1. ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.
 2. ALL MITIGATION PROPOSALS ARE BASED ON THE PRELIMINARY DESIGN PRESENTED ON DCO ENGINEERING SECTION DRAWINGS (PLAN AND PROFILES), AS SHOWN IN FIGURE 2.2A-X, IN THE ES. THE DESIGN AND LOCATION OF THE MITIGATION MEASURES ARE SHOWN HERE FOR ILLUSTRATIVE PURPOSES ONLY AND WILL BE SUBJECT TO DETAILED DESIGN DEVELOPMENT IN ACCORDANCE WITH THE PROVISIONS OF THE DEVELOPMENT CONSENT ORDER.

KEYPLAN

Purpose of issue
FOR STAGE APPROVAL



Project Title
**A303
Amesbury to Berwick Down**

Drawing Title
**ENVIRONMENT
MASTERPLAN
INDICATIVE CROSS
SECTIONS - FIGURE 2.5 T**

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Internal Project No. 60541439	Subsidiarity S4			
Scale @ A1 ---	Zone Scheme Wide			

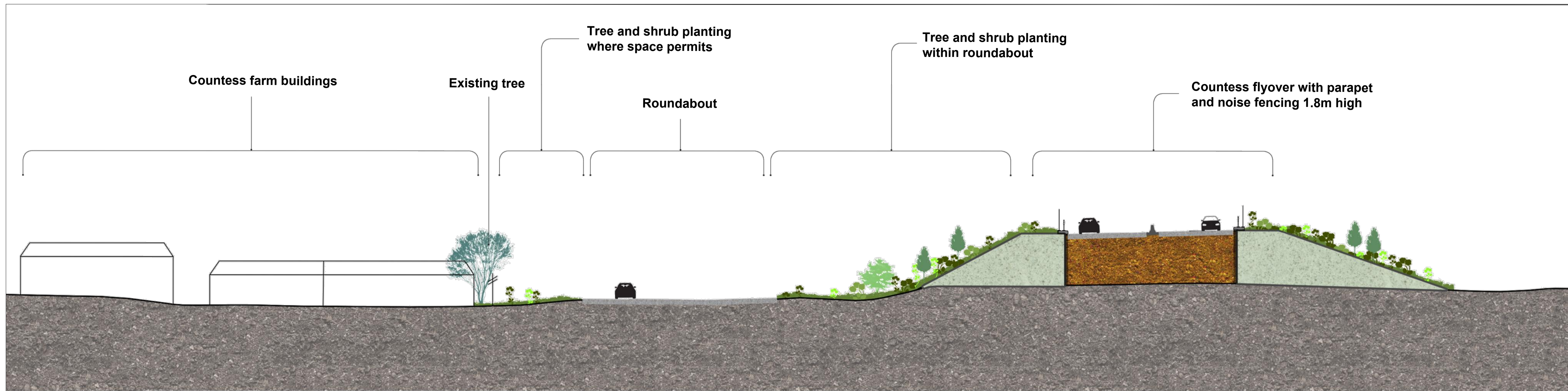
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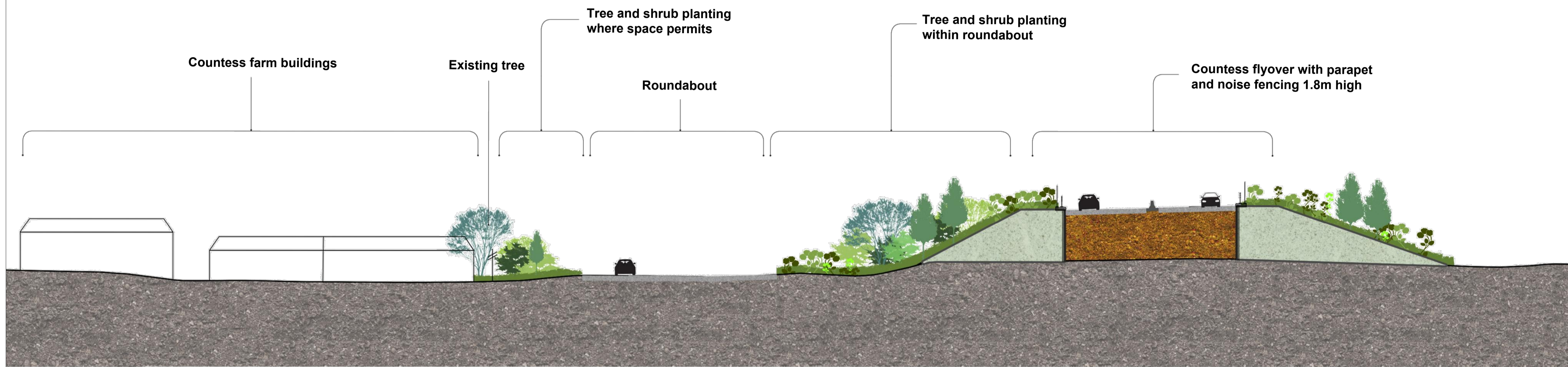
AECOM + mace + WSP

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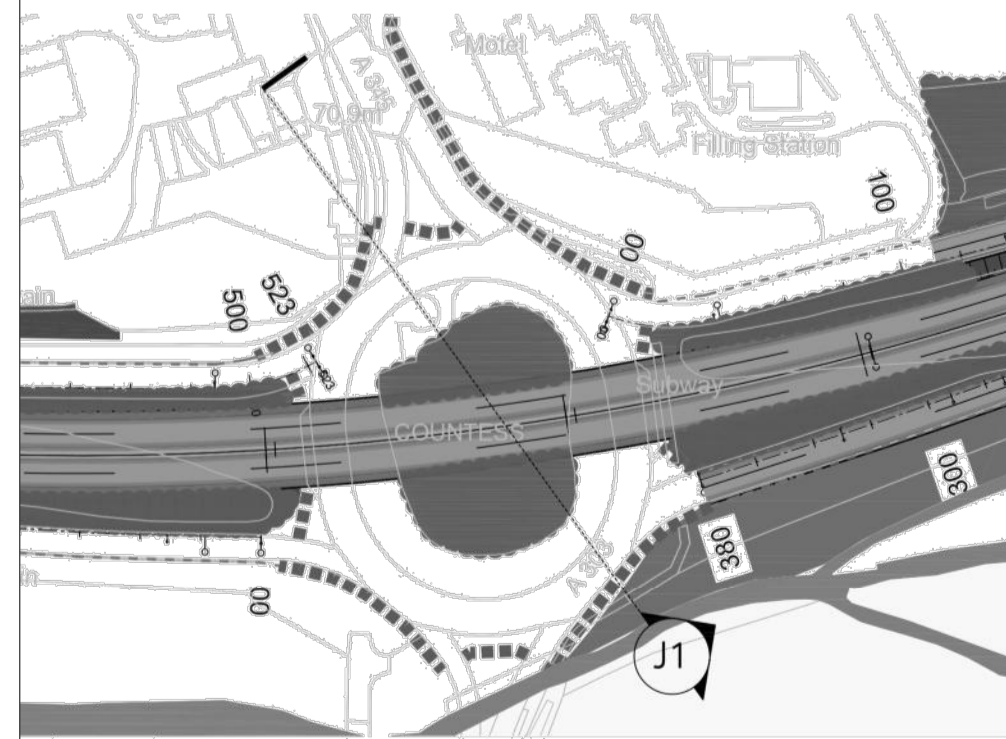
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SECTION J1 (ONE YEAR AFTER ROAD OPENING)



SECTION J1 (15 YEAR AFTER ROAD OPENING)



**LOCATION PLAN
SCALE 1:2000**



SECTION SCALE 1:250

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KEYPLAN

Purpose of issue
FOR STAGE APPROVAL



Project Title
**A303
Amesbury to Berwick Down**

Drawing Title
**ENVIRONMENT
MASTERPLAN
INDICATIVE CROSS
SECTION - FIGURE 2.5 U**

Designed MH	Drawn ---	Checked ---	Approved ---	Date ---
Internal Project No. 60541439	Suitability S4			
Scale @ A1 ---	Zone Scheme Wide			

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Drawing Number HE551506	Highways England PIN -AMW	Originator -ELLS	I Volume -1106	Rev P01.1
Location SW_GN_000_Z	I Type I Role I Number			

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