

**A303 Amesbury to Berwick Down  
(Stonehenge) Wiltshire  
TR010025**

**Wiltshire Council (A303-AFP022)  
Written Summaries of Oral Submissions  
put at the Issue Specific Hearings held in  
August 2019**

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## **I. Issue Specific Hearing 8 – Cultural Heritage, Landscape and Visual Effects and Design – 21<sup>st</sup> August 2019**

### **1.1 OEMP: Approvals, Agreements and Consultation**

1.1.1 The Council welcomed HE's amendments and confirmed that the Council was supportive of the Secretary of State's approval of the referenced plans. It was confirmed that it would approve the Heritage Management Plan, Site Specific Written Schemes of Investigation and Archaeological Method Statements, in consultation with Historic England.

1.1.2 Wiltshire Council noted the framework in which the HEMP would be produced and indicated that discussions were ongoing with HE to provide sufficient assurance that the Council's concerns could be addressed so that it was acceptable for the HEMP to be approved by HE. If agreement cannot be reached, the Council's position would remain that the HEMP should be subject to the approval of the Secretary of State as well. Discussions are ongoing, and provided sufficient comfort can be achieved, the Council considers that the proposal would be acceptable.

### **1.2 Design**

1.2.1 In relation to the design vision, Council officers attended a workshop recently to refine the wording of the design vision and principles. This remains under discussion between the parties. The Council's position is that the design should look at ways of reducing the environmental impact of the road through vegetation and the design and to soften the visual impact. Council officers are involved in the discussion on the development of the design principles and vision, but do support the landscape led approach to the design vision and principles.

1.2.2 The Council confirmed that the content of the design vision and principles is still under discussion and the Council did not have any specific points to raise at the present time.

1.2.3 With regard to the design principles, the Council reiterated that there had been helpful discussions with HE and that the principles themselves were essentially agreed. The discussions are continuing to nail down the precise language of the principles. The Council confirmed that it did not have any specific points to raise at the present time as the discussions were still ongoing.

1.2.4 The Council confirmed that there have been discussions on the design consultation mechanisms which are moving in the right direction. One particular issue relates to 4.5.13 and the dispute resolution mechanism, the Council received revised wording yesterday, which it is still reviewing. Therefore, the Council has no specific points to raise, other than the Council considers that the discussions are moving in the right direction but further discussion is required.

1.2.5 The Council confirmed that it was content with the proposed arrangement for the approval of detailed design. It considered that as the detailed design would be included within the CEMP, which would be approved by the Secretary of State, this provided the Council with sufficient comfort.

### **1.3 DAMS: Part 1**

1.3.1 With regard to the tunnel protection zones, the Council confirmed that this had been reflected in Wiltshire Council's Statement of Common Ground with HE. The Council's archaeologist has confirmed that she is happy with how the tunnel protection zones would work in practice, but the Council needs to check how the additional documents that this position has been based on has been reflected and captured within the latest draft of the DAMS and associated DCO documentation. The Council indicated that provided that it was satisfied that this had been sufficiently captured, the Council would be content.

### **1.4 DAMS: Part 2 – Overarching Written Scheme of Investigation (WSI)**

1.4.1 As set out in the Council's Deadline 7 response [REP7-044], the Council as lead curator considers that it ought to have the ability to require a cessation of works. It is considered insufficient to simply be consulted on. The Council must also be satisfied that a resumption of works would be in order. The Council considers this could be achieved through an alteration to the wording of paragraph 6.1.21 in the DAMS.

1.4.2 The Council indicated that it was expected that the Council would be given notice of the contractor finding something and sufficient time should be allowed for an enforcement officer to attend the site to make a decision. The Council would discuss with HE to suggest some suitably amended text for the relevant paragraph.

1.4.3 The Council recognised that this would require good communication between the parties, but considers that it would be no different to serving a stop notice under the Planning regime.

### **1.5 DAMS: Preservation by Record**

1.5.1 The Council indicated that it agreed with the Historic England statement and had nothing further to add.

### **1.6 DAMS: Communications**

1.6.1 The Council does not consider that the current arrangements are acceptable. Firstly, the Council has proposed revised wording for clause 8.5.1 within its Deadline 7 submission [REP7-044]. This would introduce a validation stage, so for when the Council is presented with a pack of information to discharge, it has the opportunity to consider whether there is adequate information to begin that process. The ExA will see that the Council put forward proposed wording within its representation.

1.6.2 Secondly, the Council does not wish for its comments to be limited to their previous comments. The Council considers that it should be able to comment on any amendments during the second review stage as there may be comments by other consultees which have either a direct or indirect bearing on matters that the Council are concerned with.

1.6.3 Finally, the Council would ask for 10 working days at that final stage to comment on the revised document rather than the 5 working days currently proposed.

## **1.7 DAMS: Part 3 – Tables, Figure and References**

- 1.7.1 The Council committed to providing a response within its written summaries to the ExA's questions in relation to Table 11-3. This is provided below.
- 1.7.2 The Council's archaeology team is still reviewing the details of the mitigation areas and actions (DAMS Appendix D and E). The Council has asked for additional areas to be covered and anticipates that these areas will be included by HE in the DAMS to be submitted at Deadline 8.
- 1.7.3 With relation to table 11-4, the Council indicated that this was a matter still under discussion and that it would update the Examination in due course.

### Post Hearing Note:

- 1.7.4 Wiltshire Council wishes to emphasise that although the DAMS is still in development and there is more work to be done by HE in relation to mitigation areas and techniques, and research questions, the Council does consider it a document that is comprehensive and fit for purpose.
- 1.7.5 The Council also wishes to add that in respect to mitigation of artefacts in the topsoil, there has been misunderstanding in relation to previous work in the WHS. The Council is not aware of any standard practice of curators insisting on 100% topsoil sieving of excavation sites within the WHS or elsewhere in the county. The Council has never requested this approach and is not aware that other curatorial bodies have either. A small number of academic led excavations have chosen to 100% sieve selected areas of their excavation sites for the retrieval of artefacts from the topsoil. This is a case by case decision and is not considered standard practice.
- 1.7.6 As far as the Council is concerned, the DAMS does adequately include a robust approach to mitigating topsoil archaeology.

## **1.8 Blick Mead Hydrology**

- 1.8.1 The Council confirmed that its position in this regard remains as set out in its written representations. The Council considers that it should be consulted on matters related to its functions and should not be limited to its role as lead local flood authority.
- 1.8.2 The Council's concern is essentially a mis-match to other parts of the OEMP, where the Council's functions are referred to as a whole, whereas here the Council's role is limited to its role as lead local flood authority, which is narrower than seen elsewhere in the document. The Council wants symmetry in the way in which the Council's role and functions are described. Therefore, the Council considers that it should be referred to in the wider sense of its functions.
- 1.8.3 The Council indicated that if a specific requirement were to be introduced for Blick Mead, the Council agrees that it would be appropriate for the Secretary of State to be the approving body, in consultation with Wiltshire Council in relation to any of the Council's functions. The Council confirmed that it did not have any specific wording for a requirement either, but that it would be very happy to review and consider any wording proposed by HE within their written summary and comment on that.

**1.9 Landscape Character**

1.9.1 The Council stated that HE's outline with respect of the Council's position on highways lighting was correct. The Council had originally suggested an additional requirement, but in its most recent submission, the Council indicated that it would be satisfactory to have a lighting strategy within the OEMP and proposed some wording to that effect. The Council is awaiting a response from HE as to the acceptability of that wording and discussions continue.

**1.10 Visual**

1.10.1 The Council indicated that it would be helpful if an additional visualisation could be prepared from the northern point of the Normanton Barrow group, just to the east of the western section of the Scheme. The Council's request for this additional viewpoint was based on the fact that a recent viewshed provided to the Council does show visual impact of the road on that part of the Normanton Barrow group.

1.10.2 The Council committed to providing a plan to show exactly which view point it was requesting within its written summary. However, subsequent to the hearing and following discussions with HE, the Council has now been provided with the view point requested.

## **II. Issue Specific Hearing 9 – Traffic and Transportation – 22<sup>nd</sup> August 2019**

### **2.1 NMC-01: Existing A303 Layby West of Winterbourne Stoke to be De-Trunked**

2.1.1 The Council confirmed that it supports the proposed change as it is in-line with representations made by the Council. The Council considers that the changes are important to reduce and minimise the risk of abuse by inappropriate activities of the area. The Council indicated that it was content for the area to be grassed and to remain as highway verge, and effectively a non-operational highway.

2.1.2 However, it was noted that de-trunking is a process; the Council considers that a decision can be taken on the detailed design and what is intended to go on the land under the provisions of detailed design. Any issues referred to Winterbourne Stoke Parish Council can be dealt with under the provisions of detailed design. The Council does not believe that this needs to affect the principle of de-trunking.

### **2.2 NMC-02: Countess Roundabout to be De-Trunked**

2.2.1 The Council confirmed that it supports proposed change NMC-02 in principle, however the precise boundary between the trunk road and local roads needs to be confirmed. The Council also indicated that there were points of detail on the plan legends which required resolution.

2.2.2 The Council was asked to include further detail to assist the ExA in its written summary. In the Council's response to HE's consultation on the proposed changes to the DCO application, the Council made the following points:

“Whilst the proposed change is in line with the general principle put forward by the Council, there is concern about the detail of the area shown hatched black, which excludes verge areas to the north and south sides of the junction, which are currently understood to be trunk road (maintained by HE, not Wiltshire Council), and which should be de-trunked to become verges to the A345 north-south route.

The highways records held by the Council show that there is significant verge area around all parts of the roundabout. The Council would wish to see the de-trunking hatch markings extend into the verge to the north side of the eastbound diverge and merge slips, and to the south of the westbound diverge and merge slip roads. The Council would be happy to agree the precise boundary between the strategic roads and the local roads with HE prior to their finalisation of the de-trunking alterations.

It is noted that the De-Trunking Plans Key Plan will need to be amended to accommodate a Sheet 03, but there is no need to show in the legend ‘Existing A303 to be de-trunked...’ because this detail will be shown on the individual drawing sheet. The change from before to after drawings for the Key Plan, removing the dashed line requires some explanation, but the Council raises no issue as to how the tunnel section of the Scheme is presented on a Key Plan.

The proposed change to the legend, as shown in the consultation document should be changed, for Sheet 03 only, to read ‘Existing A303 to be de-trunked (Area C)’ rather than the proposed ‘Existing A303 to be de-trunked (Area A to B and C)’. The rationale for this is because A to B will occur only on Sheets 01 and 02, and Area C will only be found on Sheet 03.”

2.2.3 The Council and HE committed to discussing these issues off-line in order to bring these issues to successful resolution.

**2.3 NMC-03: Declassification of Existing Between Winterbourne Stoke and Berwick Down**

2.3.1 The Council confirmed that this change had been at the request of the Council, and as such is fully supportive of it.

**2.4 NMC-04: Provision of Turning Head on Old Stonehenge Road**

2.4.1 Wiltshire Council confirmed that this change was put forward in line with Council suggestions and therefore the Council was fully supportive of it.

**2.5 NMC-06: Amendment to Public Right of Way (PRoW) to Stonehenge Visitor Centre**

2.5.1 The Council indicated that it was supportive on NMC-06 and that its preference was for Option B due to safety concerns. It was noted that the Option A route would have to be reduced in width to 1.5m in the vicinity of the dew pond. This restricted width is a cause of concern to the Local Highway Authority in road safety terms. The proposed route is intended to be a cycle track, and to accommodate both pedestrians and cyclists. It is likely that cyclists will be reluctant to dismount to allow any opposing pedestrian movement a right of way in this area, which could result in either being displaced onto the potentially wet verge and possibly the live carriageway of the A360. On this basis alone, Option A is not supported.

2.5.2 It was noted that a very detailed response for this proposal would be submitted as part of the Council's consultation response to HE on the proposed changes to the DCO application, which would be submitted shortly.

2.5.3 The Council will continue discussions with HE and other stakeholders with regard to this proposed change.

**2.6 Trail Riders Fellowship's Amendment 1**

2.6.1 The Council indicated that it does not support TRF's amendment 1 as the Council considers that it would increase the usage of all byways from motorised vehicles, which would be of detriment to the OUV of the WHS and non-motorised users. The Council also confirmed that it does not support the alternative proposals within amendment 1 as it would be difficult to control oversized vehicles.

2.6.2 The Council also requested clarity on how the proposal to restrict the width of the proposed byway would be managed, regardless of the status of what the proposed byway would be. The Council considers this to be a point of clarification as it found it difficult to visualise what the proposal would look like on the ground and how it would be managed.

**2.7 Trail Riders Fellowship's Amendment 2**

2.7.1 The Council confirmed that it had no comment to make to add to the discussion with relation to this proposed amendment.

## **2.8 Trail Riders Fellowship's Amendment 3**

2.8.1 The Council confirmed that it was opposed to amendment 3, as it considered that if the door was opened to allow usage by low capacity motorcycles, others would be encouraged to use the route and enforcement would be very difficult in practice given the nature of the route. The Council also indicated that its concerns regarding safe access remain; these are as detailed in the Council's previous submissions and not repeated.

## **2.9 Trail Riders Fellowship's Amendment 4**

2.9.1 The Council indicated that in addition to the effects of the proposal on OUV, the Council was concerned that if a full length strip of up to 8ft wide was left for use by motorcycles along the whole length of the former A303 which is currently proposed to be a restricted byway, this would narrow the width available for other users. This route is proposed to be shared with agricultural vehicles so the Council considers that these issues need to be taken into account.

2.9.2 The Council confirmed that it does have concerns on the effect of Byway 11 being becoming a cul-de-sac. The Council believes that some users will use this as a car park to access the rest of the rights of way network by other means i.e. on foot or to enable them to transport bikes to this area so that they can cycle from Byway 11. Additionally, the Council feels there is the potential to attract people to camp here, which could restrict the width available for car users to turn around. The Council considers that further discussion is required as to whether an engineered turning circle is required.

## **2.10 Evidence of Harm to Cultural Heritage, Landscape, Tranquillity and Other Potential Impacts Arising from Proposed Changes**

2.10.1 The Council had no comment to make with regard to this agenda item.

## **2.11 Evidence of Benefits / Need for the Highways England's Proposed Restricted Byway Along the Route of the A303 from Longbarrow to Stonehenge Road**

2.11.1 1:26:50 The Council indicated that the only present opportunity for non-motorised users to travel west to east and vice-versa through the centre of the WHS was to use the motorised traffic restricted C506 from the Stonehenge Visitor Centre to the junction with byway open to all traffic AMES 12, then to use the permissive path between AMES 12 and the existing A303 at Stonehenge Bottom, or alternatively to use the existing A303 itself. The Council considers both options to have disadvantages. The first route does not provide a public right of way over its whole length, as it involves the use of a permissive path, it is also shared with the shuttle buses and service vehicles between the Visitor Centre and AMES 12. The existing A303 itself is not considered to be a safe route for non-motorised users and is little used for that reason. Therefore, the proposed route has significant benefits in providing that east / west linkage.

2.11.2 The Council also considers that the provision of this new restricted byway would also meet Wiltshire Council's responsibility within its statutorily required Rights of Way Improvement Plan to consider the present and likely future needs of the public, including those with physical mobility impairments.

2.11.3 For these reasons, the Council supports this proposal and considers that it does carry benefits.



### **III. Issue Specific Hearing 10 – Flood Risk, Groundwater Protection, Geology and Land Contamination – 29<sup>th</sup> August 2019**

#### **3.1 Drainage Design and Climate Change Allowances**

- 3.1.1 The Council confirmed that the climate change allowances had now been agreed between HE, the Environment Agency and Wiltshire Council.
- 3.1.2 With regard to the Council's additional wording to MW-WAT14, the Council confirmed that it still considers that this additional wording is required as it specifies overarching design principles relating to return periods and climate change allowances for detailed design, that are not explicitly stated elsewhere in the Environmental Statement. These would be in-line with national standards.
- 3.1.3 The Council considers that this item links with agenda item 4.2 ii of Issue Specific Hearing 11, which deals with the provision of a specific design parameters document, which would be secured by an additional requirement and approved by the Secretary of State. The type of additional wording that the Council is proposing for this additional commitment in the OEMP, could fit well into such a document, if it were deemed to be required.
- 3.1.4 The Council indicated that this could either be secured by amendments to MW-WAT14 in the OEMP or in a specific design parameters document, if prepared. The Council agreed that ultimately it was not in the Council's gift to demand changes to the documents and were not in a position to force HE to incorporate them but the Council believes that this wording is required to be specified and secured somewhere either within the Order or within the tiers of documents beneath it. The Council considered that as the ExA rightly pointed out HE could not be forced to include these revisions, it may give further weight to why the preparation of a specific design parameters document was necessary.
- 3.1.5 The Council originally requested that this was included as an additional Requirement but as part of the development of the draft DCO it was decided that this could be captured within a lower-tier document, the OEMP. If it reverted to being included within the draft DCO, this would go back to the Council's original proposal.
- 3.1.6 The Council agreed with HE's statement that there was detail within the Flood Risk Assessment and the Road Drainage Strategy documents, but there isn't a document that states the overarching principles applied in the design development. The Council considers that this would be a very useful reference document to have for detailed design as it would be a single source of reference for the design approach. This approach has been used in other DCO's for example in the Sparkford to Ilchester DCO those types of design requirements are within DCO documents. The Council is not proposing that this must be in the draft DCO, the Council would be satisfied if it were to be within the OEMP.

#### **3.2 Road Drainage Strategy**

- 3.2.1 The Council indicated in relation to agenda item 3.2 i a and b, the Council is content and was happy to defer to the Environment Agency as to the reasons why.
- 3.2.2 The Council indicated that it broadly had nothing to add to what the Environment Agency had already said with regard to 3.2 i b, but considered that there was a link to the discussion on 3.2 i a in relation to the concern on additional requirements and whether it needed to be

made clear that the design may need to go beyond those standards already stipulated or not. The Council considers that there is a difference between something being a material consideration and a binding requirement. There should be something that will draw to the contractor's attention that they are not simply bound by the standards contained within the DMRB, or other appropriate standards, and that they may need to go beyond that. The Council queried to what extent HE had recognised that what is needed may go beyond the strict standards and whether there was a way to recognise those aspects already captured within the Statements of Common Ground, so that parties did not need to reinvent the wheel when it comes to applying these standards and search back through every document submitted during the course of the Examination. The Council considered this more to be a point of clarity as it felt that all parties wanted to make sure that this was adequate in terms of the management of pollution; it was a matter of how this was recorded as everybody at present seemed to recognise that it may be necessary to go above and beyond what's in the DMRB for example. The Council did not feel that it was necessary to state exactly what was required, instead the recognition should be captured that it may need to go beyond the specified standards. This would assist in alerting the minds of those making the application detail.

- 3.2.3 With regard to agenda item 3.2 ii, the Council confirmed that it was still its position that controls should be automated. The Council considers automated control to be the most robust form of control, which would limit the response time if a spill incident were to occur. It is also a standard form of control for this type of installation. The Council has had discussions with HE and the Environment Agency, and is in agreement with the Environment Agency when requesting automated controls as it does not rely on human intervention, it can be programmed and it also relates to the previously discussed issue on HD45 regarding the amount of spill volume to be accommodated within the tunnel drainage. The Council considers that there could be less volume of storage provided if the response time was potentially shorter.
- 3.2.4 The Council stated that at the moment there was not a DMRB standard for the control of tunnel drainage, so there is not a fall-back position on standards to refer to. This is why the Council considers that this design parameter should be fixed at this stage. It is also one of the design parameters that the Council proposed for inclusion at MW-WAT14 as outlined during the discussion on agenda item 3.1. The Council is trying to pin down those aspects which it considers is essential during this process, and in the Council's opinion it is inconceivable that there would be a manual mechanism which would be adequate. The Council considers that it would be sensible to make this clear from the outset.
- 3.2.5 The Council indicated that it considered this point was covered within its Statement of Common Ground (SoCG) with HE and that the automated operation of tunnel drainage was agreed. The Council believes that this links to the treatment and quality within the treatment areas and indicated that this had been agreed with HE in the SoCG but where HE did not wish to commit to as a design requirement within the Environmental Statement. The Council stated that if it were specified now, the parties would not need to go over it again at detailed design and potentially have abortive work undertaken at that time. There appears to be a mis-match between what is set out within the SoCG and that set out within the DCO documentation.
- 3.2.6 The Council confirmed that it now appeared to be clear that what was within the SoCG wasn't actually agreed. Whilst discussions would continue with HE on this matter, it may be that it remains unresolved and instead becomes an issue for the ExA to consider.

### **3.3 Field Drainage**

- 3.3.1 The Council indicated that this was not a particular concern to the Council, but having considered the wording MW-COM7 it appears adequate and the Council has nothing further to add.

### **3.4 Flood Risk Assessment**

- 3.4.1 The Council indicated that the peer review actions had now been agreed and the Council is largely satisfied in this regard. The outstanding issue is how this is to be reflected within the documentation as the Council considers that there should be one overarching document which details all the findings of the peer review process and believes that the sensible place to do this would be through an updated Flood Risk Assessment. This would incorporate all items which had been agreed throughout this process. The Council indicated that HE were so far resistant to undertaking this and did not agree that this was required.
- 3.4.2 The Council argued that the Flood Risk Assessment formed part of the Environmental Statement which is referenced in Requirement 10 of the draft DCO and that the drainage design needs to be carried out in accordance with the Environmental Statement and all the mitigation therein. Therefore, the Council considers the Flood Risk Assessment to be a key document that would form the foundation of any future design. The Council indicated that the risk of not capturing this information in an accessible place is that it would get lost. That information is currently contained within numerous submissions to the various deadlines throughout the Examination process and could be difficult to find for any future detailed designer. The Council believes that this should be as available and accessible as possible to avoid any abortive work in the future and to be clear from the outset what is expected.
- 3.4.3 The Council confirmed that it considers updating the Flood Risk Assessment was not necessarily absolutely essential as one could trawl through the various documents exchanged between the parties as part of the approvals process. However, HE have repeated indicated during this Examination there is a need to progress this Scheme in a timely manner. This would be in the public interest in terms of cost, but also to deliver the Scheme quickly. The Council considers that part of the process for obtaining approvals and discharges of requirements in a timely manner is minimising the scope for disagreement, and minimising parties starting from fundamentally different positions when approaching this process. The Council's position is that this would be a lot easier if all of the various submissions were drawn together into one document. The Flood Risk Assessment is part of the Environmental Statement and sets out mitigation measures and the Council considers this could be misleading if the requirements and conditions have been overtaken by discussions since its preparation. The Council indicated that this could be undertaken through either a revised Flood Risk Assessment or an addendum to the original document.
- 3.4.4 Wiltshire Council indicated that the mitigation referred to in the Flood Risk Assessment was the design mitigation that is referenced throughout the document. It explains what design mitigation has been applied for detailed design. The Council committed to providing full details of the design mitigation that had arisen from the peer review within its written summary, such as return periods, confirmation of climate change allowances, critical duration runs utilised in hydraulic modelling. This is all additional information that has been incorporated and demonstrates the design mitigation. The Council considers that this would be relevant to any future detailed designer.

- 3.4.5 The Council considers that the design mitigation details it seeks to be included is contained within the peer review actions. The relevant documents have been attached at Appendix A.
- 3.4.6 The Council confirmed that this was possible to be secured through the OEMP as an addendum as opposed to an addendum to the Flood Risk Assessment.
- 3.4.7 The Council indicated that it will continue discussions with HE once the Council has outlined the specific points in writing and will see whether agreement can be reached on how to address this matter.
- 3.4.8 With regard to agenda item 3.4 ii, the Council confirmed that since it had now agreed the peer review actions it was satisfied that the NPS NN meets the required policies and demonstrates that flood risk will not be increased elsewhere as a result of the Scheme.

### **3.5 Need for Additional Drainage Engineer Post for Wiltshire Council**

- 3.5.1 The Council indicated that there was a productive discussion taking place with HE in relation to the inclusion of this within the Side Agreement. The discussions are focusing on the precise wording and the extent of the provision, but at present the Council is content that this is being dealt with off-line.
- 3.5.2 The Council considers that the devil is in the detail but believes that the main hurdle has been overcome i.e. the principle of whether it is appropriate to provide some form of compensation. Discussions are ongoing as to the extent of this provision, but it is considered that agreement can be reached.
- 3.5.3 The Council recognised that time remaining within the Examination is quite short, and committed to updating the ExA as soon as possible with regard to this issue.

### **3.6 Contamination (Including Groundwater Contamination)**

- 3.6.1 The Council indicated that it was broadly satisfied that there were adequate controls in this regard through Requirement 7 in the draft DCO and PW-GEO1, PW-GEO2, MW-GEO6, MW-GEO7, MW-GEO8, MW-WAT6 and MW-WAT7 in the OEMP.
- 3.6.2 The Council confirmed that it was broadly supportive of the Environment Agency's comments in relation to a pre-commencement Requirement in addition and separate to Requirement 7. The Council considers that this is consistent with the general principles of land contamination investigation required for day-to-day planning applications received through the Council's Development Control Services.
- 3.6.3 The Council noted that HE have been undertaking "Phase 7" land contamination investigations. However, neither the Environment Agency nor Wiltshire Council have seen these reports and the Council indicated that it is keen to review them. The Council queried the status of these reports within the Scheme and associated DCO application.
- 3.6.4 With regard to the ExA's query on the adequacy of the OEMP in securing this pre-commencement survey work i.e. revisions to MW-GEO8, the Council can confirm following review subsequent to the hearing that it welcomes this amendment. However, the Council considers that this clause needs to be explicit that both Wiltshire Council and the Environment Agency are provided with the land contamination reports. This is because both agencies have

duties and responsibilities under the contaminated land regime contained in the Environmental Protection Act 1990 Part 2(A) and HE will need to ensure they discharge their liabilities and duties.

### **3.7 Private Water Supplies**

3.7.1 The Council indicated that it did not wish to comment on agenda item 5. i.

3.7.2 With regard to agenda items 5 ii and iii, the Council indicated that it welcomed the changes to MW-COM6. The Council has previously indicated that it would like to see this extended to preliminary works and asked for clarification from HE as to whether there would be any threat to private water supplies from the preliminary works.

3.7.3 The Council welcomed clarification from HE that that there would be no impact from the preliminary works and clarified that there were now no residual concerns. The Council also indicated that it was grateful to HE for their commitment to amend the way in which the Council was referred to in order to include its wider functions within the scope of consultation.

### **3.8 Tunnelling**

3.8.1 The Council indicated that it did not feel that there was disagreement between HE and Wiltshire Council on this matter. In the past the Council raised concerns before the commitment was made in D-CH32 to use the closed-face tunnelling technique, but this concern mainly was in relation to the two main bores. Since that commitment has been made, the Council has been broadly satisfied, particularly when coupled with the provisions contained in MW-WAT8 to minimise dewatering and obtain the necessary approvals for the discharge of pumped water.

3.8.2 The Council indicated that it had never specified its expectations in relation to the cross-passages, but confirmed that the Council hadn't previously expected that these were to be undertaken using a closed-face tunnelling technique. The Council indicated that upon initial review the presentation slides shown by HE, the technique appeared reasonable and if used, the Council considered the risks in terms of dewatering to be manageable. The Council queried what would happen if another technique was used and suggested that further conversations should take place with HE and the Environment Agency in order to specify the technique to be used. However, the Council's current position was that it would not insist that a closed-face tunnelling technique must be used for the cross-passages.

### **3.9 Requirements and OEMP**

3.9.1 The Council indicated that it had previously made a number of detail and in some cases minor, but important, points relating to changes sought to the OEMP. Some of those have been taken on board but others haven't and the Council wasn't entirely sure why some of the amendments hadn't been made. The changes requested were as follows.

3.9.2 The latest draft of MW-G7 now includes consultation with Wiltshire Council as requested but it states that consultation will only take place on material updates. The Council queried why the consultation was limited to material changes, as the Council considers that it should be consulted on all changes and it was for the Council to determine whether they were material or not.

- 3.9.3 In MW-WAT3 states that sufficient time will be made for the Environment Agency to issue permits in accordance with relevant legislation. The Council considers that the following text should be added, “and for applications pursuant to Wiltshire Council’s protective provisions in the DCO”. This is because surface water management is the Council’s remit. Additionally, within MW-WAT3, it states that water flows from sites will be limited during construction to existing run-off rates unless otherwise agreed with Wiltshire Council or the Environment Agency. The Council considers this should be “and the Environment Agency”. The Council indicated that whilst this was a minor point, it had a different meaning altogether. The Council is responsible for surface water flood risk management and the Environment Agency cannot speak on the Council’s behalf.
- 3.9.4 With regard to MW-WAT10, whilst recognised this was a minor point, it states that the groundwater level and water quality monitoring and reporting programme. The Council considers that the word “telemetry” should be included after “monitoring” for completeness and to reflect the discussions on telemetry to date.
- 3.9.5 The Council indicated that it was unclear whether this point had been covered at the hearings last week; it relates again to the scope of the consultation and the limitation to certain Council functions. The Council considers that it shouldn’t be limited to the Council in its role as Local Lead Flood Authority as it should extend to other Council functions i.e. public health. The Council wishes for the scope of consultation to be broadened to include other Council functions.
- 3.9.6 On MW-WAT12, it states pursuant to the Environment Agency’s protective provisions in the DCO. The Council considers that “pursuant to Wiltshire Council’s protective provisions in the DCO” should be added here. This would reflect the Council’s flood risk management functions.
- 3.9.7 On MW-WAT13, the Council indicated that this point would affect the Environment Agency as well. The Council is seeking an addition to this with the following wording, “following the post construction ground monitoring, Highways England will provide data collected and allow the Environment Agency or Wiltshire Council to adopt the boreholes to inform the groundwater flood warning service. Once further modelling work is completed by Highways England at detailed design stage, meeting the standards for flood map updates, the Environment Agency and Wiltshire Council can utilise this modelling work to update the fluvial, pluvial and groundwater flood map”. This is a requirement around warning and informing and was originally suggested as a requirement in the DCO but has now been suggested for inclusion in the OEMP. The Council indicated this this additional wording was sought as warning and informing was not currently captured within the commitment as it stands.
- 3.9.8 Finally, the Council is seeking a couple of changes on Annex A.3, which the Outline Soil Management Strategy. In 2.1.3, the soil resource plan should identify the drainage characteristics (permeability, conveyance etc.) of each soil horizon. 3.1.2 should include “for the avoidance of doubt, any activity associated with implementing the authorised development” to capture all activities. In 3.1.3, the soil handling strategy must also be informed by “the drainage characteristics of the soil both above and below ground”. In 3.1.4, the detailed method statements should also identify the methods to be used to maintain the existing drainage characteristics of each land parcel (infiltration, conveyance etc.) and manage the risk of compaction that may affect the drainage characteristics. Finally, in 3.1.9, it should also emphasize the scheme wide principle that water flows from the site will be limited during construction to existing runoff rates, unless otherwise agreed with Wiltshire Council and the

Environment Agency in accordance with relevant legislation. This would align with PW-WAT3 and MW-WAT3 within the OEMP.

- 3.9.9 The Council indicated that it was very grateful for the indication from HE that the majority of its requested changes would be taken on board and reflected in a revised OEMP. Once published, the Council will review to confirm that they are content with the changes made. In relation to Annex A.3, 3.1.2, the Council can understand why HE haven't agreed the Council's requested inclusion following what was said at the Hearing as the proposed amendment may be too broad. The Council is concerned that as drafted, 3.1.2 is a closed list, and there is potential for activities that can affect the soil which are not necessarily covered by the current list. The Council was looking for a catch-all to cover those activities which would not be included within the individual categories. The Council will reflect on this off-line with HE to see whether there is alternative drafting, for example by reference to excavation or compaction activity (including construction traffic), that could be agreed to address this point.
- 3.9.10 The Council confirmed that it was still seeking the additional Flood Risk Assessment requirement and had provided proposed wording in the past. The Council considered this would be covered in more detail at the DCO hearing.

#### **IV. Issue Specific Hearing 11 – Draft Development Consent Order – 30<sup>th</sup> August 2019**

##### **4.1 Article 2 – Interpretation**

4.1.1 The ExA indicated that they wished to consider the latest amendments to Article 2, specifically the addition of a “Cycleway” definition and additions to the definition of “maintain”. With regard to the definition of “Cycleway”, Wiltshire Council indicated that there had been concern that “Cycle track” was understood in highways legislation, but now understood having reviewed the proposed definition, that “cycleway” was not intended to have the same meaning as “cycle track” due to the inclusion of equestrian rights. The Council needs to satisfy itself that the correct wording is used at the right time as there are numerous references throughout the documentation to “cycle track”, “cycleway” and “cyclepath”. The Council considers this to be a terminology issue and not a matter of principle.

4.1.2 The Council confirmed that it was content with the revised definition of “maintain”.

4.1.3 With respect to the definition of “commence”, the Council acknowledged that certain aspects / activities should not be included within the definition of “commence” as they would not cause undue concern i.e. bringing materials onto site and the storage of those materials. However, the Council considers that the erection of construction plant and equipment should be as it would constitute development and should be subject to appropriate controls. The Council believes that the definition of “preliminary works” should include the erection of plant and equipment on site.

##### **4.2 Article 3 – Disapplication of Legislative Provisions**

4.2.1 The Council confirmed that protective provisions had now been agreed with HE. It was acknowledged that the ExA had not yet had sight of the agreed version, however it is understood that these will be incorporated into the latest version of the dDCO to be submitted at Deadline 8. Subject to the inclusion of the agreed protective provisions into the dDCO, the Council confirmed that they would now be satisfied.

##### **4.3 Article 7 – Limits of Deviation**

4.3.1 The Council indicated that they were broadly content. At Issue Specific Hearing 10 on 29<sup>th</sup> August, the Council referenced changes it was seeking to MW-WAT10 to capture the telemetry requirement within point c. It is understood that HE indicated that this would be taken on board and reflected in the next iteration of the OEMP. Subject to these amendments, the Council would be content.

##### **4.4 Article 13 – Discharge of Water**

4.4.1 The Council confirmed that it was no longer seeking the amendments to sub-paragraph (5) as outlined within its Deadline 7 response [REP7-043].

4.4.2 The Council was, however, still seeking amendments to sub-paragraph (6) to ensure that nothing in this clause overrides Wiltshire Council’s protective provisions, specifically the requirement for applications to be granted by the Council. The Council noted HE’s response and acknowledged that as a point of principle, it was not the intention for this clause to override or disapply the protective provisions. Therefore, the Council understood the need to



read the Order as a whole. However, there is specific provision within the clause for Regulation 12, therefore the Council considered that the protective provisions could equally be stated for clarity. The Council considers that this is a matter for the ExA as to whether the current drafting is sufficiently clear for Order to be read as a whole, but for the avoidance of doubt, the Council would prefer to the amendments sought are included. The Council considers this to be a drafting issue and not a principle disagreement between Wiltshire Council and HE.

#### **4.5 Article 22 – Compulsory Acquisition of Rights**

4.5.1 As indicated by the Council at Issue Specific Hearing 8 on Cultural Heritage, this matter has now been moved to “agreed” in Wiltshire Council’s Statement of Common Ground with HE. This was based on the Council’s review of supplementary documentation provided by HE, which provided greater clarity and comfort. However, it remains unclear where this additional information has been captured within the dDCO suite of documentation, which the Council considers is necessary. The Council indicated that this was another drafting matter and not a matter of principle.

#### **4.6 Requirement 1(1) – Interpretation**

4.6.1 The Council confirmed that its concerns in relation to the approval of the CEMPs and definitions have largely been overtaken by recent drafting amendments and acknowledged that there is now greater clarity with regard to the definitions. However, the Council considers that further clarity is required with regard to hierarchy. The Council understands that the HEMP would be in accordance with the CEMP which would be based on the OEMP, however the current drafting suggests that the HEMP is in accordance with the OEMP. The Council considers that this sequencing issue should be addressed, but subject to that, the Council confirmed that it was broadly satisfied.

4.6.2 Please see the Council’s view on the definition of “preliminary works” stated in paragraph 4.1.3 above.

#### **4.7 Requirement 3(1) and (2) – Preparation of Detailed Design etc.**

4.7.1 The Council confirmed that it was still its position that Requirement 3 should require the detailed design to be carried out so that it is “in accordance with” rather than “compatible with” the listed plans. The Council considers that “in accordance with” or “in strict accordance with” is well recognised and should be used. It is not clear what “compatible with” means and the Council considers this to be too wide and uncertain. The Council further confirmed that it was not the intention to preclude the use of the Limits of Deviation, and the wording previously proposed would allow for this. The Council indicated that it was willing to discuss further with HE if required, to agree an acceptable form of wording.

4.7.2 The Council welcomed HE’s commitment to amend the wording in the next iteration of the dDCO.

4.7.3 With regard to a separate design parameters document, the Council clarified that whilst it had previously indicated that it could see benefit in the production of this document, it was not essential. The OEMP has recently been significantly amended, and whilst further amendments are required following discussions between the Council, other heritage partners and HE, the Council considers that provided the OEMP contains all of the necessary detail, it would be

happy for it to be covered in this way. The Council recognised that the clock was ticking and that time remaining in the Examination was short, and endeavoured to do what it could to conclude discussions as soon as reasonably practicable.

- 4.7.4 The Council also reminded the ExA of the discussion at Issue Specific Hearing 10 on 29<sup>th</sup> August, specifically with regard to the need to modify MW-WAT14 to include minimum drainage design standards.
- 4.7.5 With respect to the illustrative design and the wording associated with that, the Council confirmed that it endorsed those comments made by Historic England and the National Trust in this regard and had nothing further to add.
- 4.7.6 The Council does not consider it necessary for the Secretary of State (SoS) to approve the detailed design, unless it is significantly outside of that provided for within the OEMP. This is because the OEMP is a certified document and approved by the SoS, furthermore the detailed design would be detailed within the CEMP which is also approved by the SoS. If the detailed design was not in compliance with the OEMP, the CEMP would not be approved without further action. The Council considers that this mechanism as set out above, is sufficient and ensures checks are in place to adequately control the preparation of the detailed design.
- 4.7.7 With regard to the timescales for consultation, the Council agreed that further amendments were required to include a verification mechanism for those documents that will be subject to Wiltshire Council approval. It welcomed HE's indication that further amendments would be put forward in the next iteration. Furthermore, whilst not specifically referenced at the Hearing, the Council wishes to remind the ExA of its concerns regarding the wider timescales for consultation as set out at the Issue Specific Hearing 8 on Cultural Heritage. Please see paragraphs 1.6.2 to 1.6.3 above for further detail.

#### **4.8 Requirement 4 – Outline Environmental Management Plan**

- 4.8.1 The Council welcomed the significant amendments and particularly the Secretary of State approval of the CEMP and associated management plans. The Council indicated that some fine tuning of points still of concern is required. Firstly, there appears to be two plans within the OEMP which are not specifically referenced within sub paragraph 11, being the Tunnel Ventilation Strategy and the Invasive Non-Native Species Management Plan. The Council requires clarity on what the approval arrangements for these two plans are and queries why for completeness and consistency they are also not included within sub paragraph 11.
- 4.8.2 The second area of concern is in relation to the HEMP. The Council acknowledges and understands HE's rationale that as the HEMP has to be in accordance with the CEMP, and therefore in accordance with the OEMP, it does not need to be approved by the SoS and could be retained by HE for approval. Whilst the Council is not emphatically opposed to the HEMP being dealt with in this way, further comfort is sought with regard to ongoing obligations for maintenance for those assets which would become the responsibility of the Council. It may be possible to address and alleviate the Council's concerns through the Side Agreement and discussions are continuing in an attempt to find a resolution. If the Council's concerns cannot be satisfactorily addressed in this manner, the Council would revert to its previous position whereby HE should not be the approving body of the HEMP, and that it should be the SoS.
- 4.8.3 The Council confirmed that it was content for the SoS to approve the DAMS, with the exception of the Heritage Management Plan, archaeological Method Statements and Site

Specific Written Schemes of Investigation which would be approved by Wiltshire Council. The Council indicated that whilst in its opinion it would be logical for the Council to approve the DAMS, given that it was a certified document, the Council accepted approval by the SoS.

- 4.8.4 The Council indicated that it had nothing further to add on point agenda item 4.3 iv that had not been said either earlier today or at the hearings held during week commencing 19<sup>th</sup> August 2019.
- 4.8.5 In response to a specific question from the ExA, the Council confirmed that it would withdraw its request for an additional Requirement related to the CEMP, provided that its concerns regarding the HEMP were satisfactorily addressed.
- 4.8.6 In respect of agenda item 4.3 vi, the Council confirmed that whilst the design principles and commitments and consultation mechanisms within the OEMP were still being discussed, it was confident that the detailed design for the public rights of way could be dealt with in this way rather than by way of a further specific Requirement. Whilst not specifically referenced at the hearing, the ExA should also be aware that further comfort for the Council in this regard is also provided through the Side Agreement, which is currently being negotiated / finalised.
- 4.8.7 With regard to agenda item 4.3 viii, the Council confirmed that whilst it did not have a vested interest in the lighting at the tunnel portals, it does need to be satisfied that the portal lighting was acceptable. The Council indicated in its Deadline 7 submission [REP7-043] that it would no longer seek an additional Requirement with respect to Highway Lighting provided its suggested amendments to the OEMP were incorporated. Whilst the Council was previously under the impression that HE required minor amendments to the proposed wording, following confirmation from HE at the hearing that the proposed wording was acceptable, the Council confirmed that subject to its inclusion with the next iteration of the OEMP, the Council would no longer seek an additional Requirement related to lighting.

#### **4.9 Requirement 5 – Archaeology**

- 4.9.1 The Council confirmed that the current wording was acceptable and that no extra provisions were required.

#### **4.10 Requirement 8 – Landscaping**

- 4.10.1 The Council confirmed that it was still of the view that reference should be made to 'normal' fences and walls within Requirement 8(3)(b). This is a sensitive area and the Council considers that there are potential implications for all walls and fences and therefore it should not be limited to noise fences and walls only.
- 4.10.2 The Council considers that this would be an appropriate place to deal with walls and fences, as it appears to exclude other types of fences and walls as currently drafted. This would normally be dealt with under a landscaping condition, therefore the Council considers that it would be appropriate to incorporate it here.
- 4.10.3 In response to a specific question from the ExA, the Council confirmed that as per its Deadline 7 response [REP7-043] the Council had withdrawn its request for its previously sought amendments to this Requirement.

#### 4.11 Requirement 10 – Drainage

4.11.1 Parties reminded the ExA of amendments to this Requirement sought at Issue Specific Hearing 10 held on 29<sup>th</sup> August. The Council welcomed HE’s commitment to amend this Requirement in the next iteration to include “flood risk” and to simplify the reference to Wiltshire Council so that it would now state “planning authority” rather than limit its involvement to specific functions.

#### 4.12 Requirement 11 – Details of Consultation

4.12.1 The Council confirmed that the drafting of the Requirement was acceptable.

#### 4.13 Whether any Additional Requirements are Necessary

4.13.1 The Council confirmed that following earlier agreement by HE to incorporate the Council’s proposed changes to the OEMP to address its concerns regarding Traffic Management during Tunnel Closures and Highway Lighting (please see paragraph 4.8.7 above), it would no longer seek these additional Requirements.

4.13.2 The Council had also sought an additional Requirement for Traffic Monitoring and Mitigation. Discussions are ongoing with HE which may enable the Council’s concerns to be addressed through the Side Agreement rather than as a standalone Requirement. The Council considers these discussions are progressing in a helpful regard and this matter should be capable of resolution in this manner.

4.13.3 The Council is still seeking the Flood Risk Assessment additional Requirement and maintains that there is a need for this separate Requirement. The Council considers that Requirement 10 as drafted is a pre-commencement condition, and the Council believes that a compliance requirement is necessary due to the flood risk sensitivity of the area. The Council considers this issue important enough to be elevated to the DCO as a Requirement as it is not expressly stated as far as the Council can see, that the Flood Risk Assessment must be complied with.

4.13.4 The Council erroneously indicated at the hearing that its suggested wording was provided within its Deadline 6 responses; the justification for the additional Requirements was stated within its response to DCO.2.66 [REP6-041] but the actual wording being sought was detailed within ‘Review of 3.1 Draft Development Consent Order dDCO (Rev 2)’ [REP4-039]. For ease the Council’s requested wording is replicated below:

***“Flood Risk Assessment***

***(1) Subject to sub-paragraph (2), the authorised development must be carried out in accordance with the flood risk assessment, including the mitigation measures detailed in it, so that no part of the authorised development is predicted to result in any exceedance of the flood levels to properties and land shown in the flood risk assessment.***

***(2) Sub-paragraph (1) does not apply in any circumstance where the undertaker proposes to carry out a part of the authorised development other than in accordance with the flood risk assessment and either demonstrates to Wiltshire Council’s and the Environment Agency’s satisfaction that the part of the authorised development concerned would not result in an exceedance of the flood levels shown in the flood risk assessment or demonstrates that all affected landowners accept the predicted exceedance of the flood levels shown in the flood risk assessment.”***

- 4.13.5 The Council thanked HE's for its comments, acknowledging that they were made on a without prejudice basis, and commitment to provide some alternative wording within their written submissions. The Council indicated that its specialist officers would review the proposed text to be put forward by HE, however initial thoughts were that this would go a long way to addressing the Council's concerns. The Council reiterated that it considered the Scheme area to have sensitivities that matched the A14 and hence the Council's reasons for asking this matter to be elevated to the DCO.
- 4.13.6 The Council agreed that there would be no need for any corresponding amendments to Part 2, Schedule 2 as this had been overtaken by recent events.
- 4.13.7 With regard to agenda item 4.9 v., the Council asked the ExA to refer to points made at the Issue Specific Hearing 10 held on 29<sup>th</sup> August, and specifically changes requested with respect to MW-G7, MW-WAT3, MW-WAT10, MW-WAT12, MW-WAT13 and Annex A.3 the Outline Soils Management Strategy (please see paragraphs 3.9.2 to 3.9.8 above). The Council notes that HE indicated agreement with the vast majority of these at ISH10 and asks the ExA to cross refer.

#### **4.14 Amendments to the Draft DCO Consequential to the Proposed Changes to the Application Sought by Various Parties**

- 4.14.1 Whilst not specifically mentioned at the hearing, the Council wishes the ExA to note that within its consultation response on HE's proposed changes to the DCO, the Council highlighted some inconsistencies with respect to the proposed drafting amendments associated with these changes.
- 4.14.2 With regard to NMC-06, the Council raised the following concern:

"The Council does not understand why the reference at dDCO Schedule 3 Part 1, Reference UA, has been deleted, and not replaced by alternative wording to indicate the proposal to construct a cycle track, partly on the verge of the A360 and partly on land to be acquired. The proposed cycle track link may not be able to sit within the confines of the highway verge along the A360, whose width is generally considered to be between 2.5 and 3m by the Council. The explanatory text in the proposed changes consultation document explains that the route will be provided with a 1m verge between cycle track and A360, the cycle track will be 2.5m wide, and there will be provision of a 0.5m margin between cycle track and field, or other, boundary fences; the total width of land required is therefore 4m (except past the dew pond, where a lesser width would be necessary for either Option A or B).

HE are requested to explain the rationale for not replacing Reference UA in the dDCO, to reflect the change in PRoW status."

- 4.14.3 Furthermore, whilst the Council's consultation response pressed for the inclusion of a "cycle track" definition, since the incorporation of a "cycleway" definition in the latest version of the dDCO, the Council queries which term will be used for NMC-06, if adopted. This is because the Council had understood that HE's intention was that part of the proposed route (Longbarrow to the Visitor Centre) would prohibit the use of equestrians who would be expected to use the A360 carriageway (subject to any future arrangements to be put forward by HE). Equestrian usage is permitted within the current drafting of "cycleway" as defined by HE, but the Council questions the appropriateness of mixing equestrians, cyclists and pedestrian traffic on a relatively narrow (2.5m) right of way. The Council will respond more

fully on this point when it has clarity on the NMC-06 proposals, following the submission of HE's follow-up report on consultation feedback.

## Appendix A – Peer Review Actions

- A1. Drainage Treatment Areas Technical Note
- A2. Peer Review Comments – Groundwater
- A3. Peer Review Comments – Pluvial
- A4. Peer Review Comments – Road Drainage Strategy

# Technical Note

<b>Project:</b>	<b>A303 Amesbury to Berwick Down</b>				
<b>Title:</b>	<b>Drainage Treatment Areas</b>				
<b>Doc ID:</b>	<b>HE551506-AMW-HDG-SW_GN_000_Z-TN-CH-0001</b>				
<b>Date:</b>	<b>3 July 2019</b>	Version:	<b>P01</b>	Status:	<b>S2</b>
<b>Doc Cat.</b>	<i>Unrestricted</i>	Author:	<b>Ted Evans</b>		

Revision	Date	Prepared by	Reviewed by	Approved by
P01	July 2019	T Evans	W Rogers	D MacKenzie

## 1 Introduction

- 1.1 The A303 Amesbury to Berwick Down scheme (“the Scheme”) forms part of a package of proposals for the A303/A30/A358 corridor, improving this vital connection between the South West and London and the South East and including the upgrade of remaining single carriageway sections on the route to dual carriageway. This investment is stated as a priority project in the National Infrastructure Plan and government’s commitment is confirmed in the Road Investment Strategy (2015-2020). Subject to achieving an approved Development Consent Order (DCO), enabling works are planned to start in early 2020 with the main construction works following in late 2021, and with the Scheme due to open to traffic in late 2026.
- 1.2 Objectives for the Scheme have been formulated both to address identified problems and to take advantage of the opportunities that new infrastructure would provide. The objectives would be achieved by providing a high quality dual two-lane all-purpose carriageway on the A303 trunk road between Amesbury and Berwick Down in Wiltshire. The Scheme would resolve traffic problems and, at the same time, protect and enhance the WHS.

## 2 Purpose of the Note.

- 2.1 AMW have produced an illustrative design for the highway drainage network for the Scheme which replaces the existing A303 trunk road, passing the Stonehenge monument. The surrounding area has many constraints in the form of monuments, Conservation areas, SSSI’s with a section of the Scheme passing through Stonehenge and Avebury World Heritage Site.
- 2.2 The aesthetics of the surrounding land is to be maintained, with any intrusive works not to be visible from the Stonehenge monument, thus preserving its natural beauty. Therefore, there is a need for natural and sustainable surface water drainage solutions throughout the Scheme.



2.3 As part of the DCO procedures, discussion with both the Environment Agency and Wiltshire Council on specific drainage issues have been undertaken. A meeting was held on the 20th June 2019 to review and progress the outstanding water and road drainage issues, attendees were:

- Environment Agency (EA) - Kath Burt, Carrie Whittaker, and Richard Coombes
- Wiltshire Council (WC) - Carli van Niekerk, Danny Everett
- Highways England (HE) - David Bullock, and Ken Marshall
- AmW - Steve Cook, Mark Davin, Ted Evans, Simon Buckley, and Travis Kelly

2.4 This Technical Note provides the technical/design details requested by EA and WC at this meeting to demonstrate the adequacy of the proposed drainage treatment areas.

### 3 Scope of the Note.

3.1 This Technical Note provides the following:

- A summary of the drainage design rationale to more than adequately meet the NPSNN and avoid any increase in flood risk.
- Define, if possible, the storm return period scenario that would result in highway runoff overtopping the drainage treatment areas (infiltration basins).
- Provide the exceedance route diagram for each of the drainage treatment areas.
- Description of the rationale and the clarifications of freeboard remaining in the 1 in 100year+40% scenario
- Provide sufficient information in principle to deem the road drainage climate change allowance to be adequate.

### 4 Standards Used.

4.1 The illustrative design has been carried out in accordance with the following:

- DMRB CD 526 – Spacing of Road Gullies Revision 1
- DMRB HD 33/16 – Design of Highway Drainage Systems
- DMRB HA 37/17 – Hydraulic Design of Road-edge Surface Water Channels
- DMRB HA 40/01 – Determination of Pipe and Bedding Combinations for Drainage Works
- DMRB HA 103/06 – Vegetated Drainage Systems for Highway Runoff
- DMRB HA 106/04 – Drainage of Runoff from Natural Catchments
- DMRB HA 107/04 – Design of Outfall and Culvert Details

- DMRB HA 219/09 - Determination of Pipe Roughness and Assessment of Sediment Deposition to Aid Pipeline Design
- Sewers for Adoption (SFA) 7<sup>th</sup> Edition
- The SuDs Manual 2015, CIRIA C753

## 5 Road Drainage and Climate Change allowances

5.1 The rationale used in the road drainage design is based on the following:

- The current guidance on climate change allowances for England is published by the Government at [www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances](http://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances). This states that for rainfall intensities, used in assessing surface water flood risk, both the central (20%) and upper end (40%) allowances should be assessed to understand the range of impact across the lifetime of scheme into the 2080s.
- It further states that to help to decide which allowances to use, consideration should be given to:
  - The likely speed, depth and extent of flooding for each allowance
  - the vulnerability of the receptors that could be flooded
  - Any built-in resilience measures; and
  - Any capacity in the development to include additional measures in the future.

5.2 The Road Drainage Strategy includes the following:

- An allowance of 1 in 100year+30% pluvial climate change in rainfall intensity within the preliminary design of the Drainage Treatment Area's (DTA's) within the Till catchment i.e. those that are designed as infiltration systems.
- Each drainage treatment area has a 300mm freeboard provision. Where an extreme event occurs and the freeboard is overtopped, exceedance routes have been identified to ensure excess water does not flow towards vulnerable properties.
- The basins are designed based on an infiltration rate one twentieth of the lowest rate corresponding to the soakaway test closest to the area.

## 6 Capacity sensitivity test

6.1 In addition, all the Drainage Treatment Areas have also been assessed on the following basis

### Climate Change

- 1 in 100 year plus 40% pluvial climate change allowance plus 300mm freeboard, having undertaken a 40% sensitivity test that showed no exceedance of drainage capacity

# Technical Note

**Table 1. Remaining freeboard when the 1 in 100 year plus 40% Climate change**

Drainage Treatment Area	Remaining Freeboard
1	251 mm
2	257 mm
4	387 mm
5	268 mm
6	260 mm

**Table 2. Climate change allowance to reduce freeboard to zero**

Drainage Treatment Area	Climate Change Allowance
1	68%
2	70%
4	84%
5	67%
6	66%

6.2 When assessed using this 1 in 100 year+40% allowance, the road drainage basins were found to contain the design storm without overtopping.

6.3 Although the capacity of the DTA's is not exceeded, (it has been ascertained that under a 1 in 100 year+40% scenario 250mm of freeboard on average remained in each of the DTA's), exceedance routes had been created within the landscaping that reflected existing topography to ensure surface flows would not be directed to any sensitive receptors.

**Details of the exceedance routes are shown on the following drawings, included in Appendix A.**

- HE551506-AMW-HDG-SW\_GN\_000\_Z-SK-CD-0019
- HE551506-AMW-HDG-SW\_GN\_000\_Z-SK-CD-0021
- HE551506-AMW-HDG-SW\_GN\_000\_Z-SK-CD-0022
- HE551506-AMW-HDG-SW\_GN\_000\_Z-SK-CD-0023
- HE551506-AMW-HDG-SW\_GN\_000\_Z-SK-CD-0024

## 7 Storm Return Period

7.1 The modelling software, Microdrainage, is limited to model up to a 1 in 1000 year return period storm which does not introduce any exceedance flows, therefore, it is not possible to define the equivalent return period for the climate changes listed

above. It is, however, possible to conclude that the return period will be greater than 1000 years.

## 8 Conclusions

8.1 The design rationale implemented is more than adequate to meet the NPSNN and avoid any increase in flood risk.

- The design is based on a 1 in 100 year+30% allowance for climate change with a 300mm freeboard being maintained.
- The drainage treatment areas capacity was tested against an upper end allowance of 40% for climate change, the remaining freeboard is more than 250mm at each drainage treatment area.
- To reduce the freeboard to zero the climate change allowance would have to be increased to between 66% and 84%, an increase of approximately 30% above the current upper end allowance of 40%.
- For the highway drainage to overtop the drainage treatment areas the design year return period would have to be greater than a 1 in 1000year return period storm.
- The exceedance routes had been created within the landscape that reflect existing topography to ensure surface flows would be directed to the current flow routes and would not be directed towards any sensitive receptors.

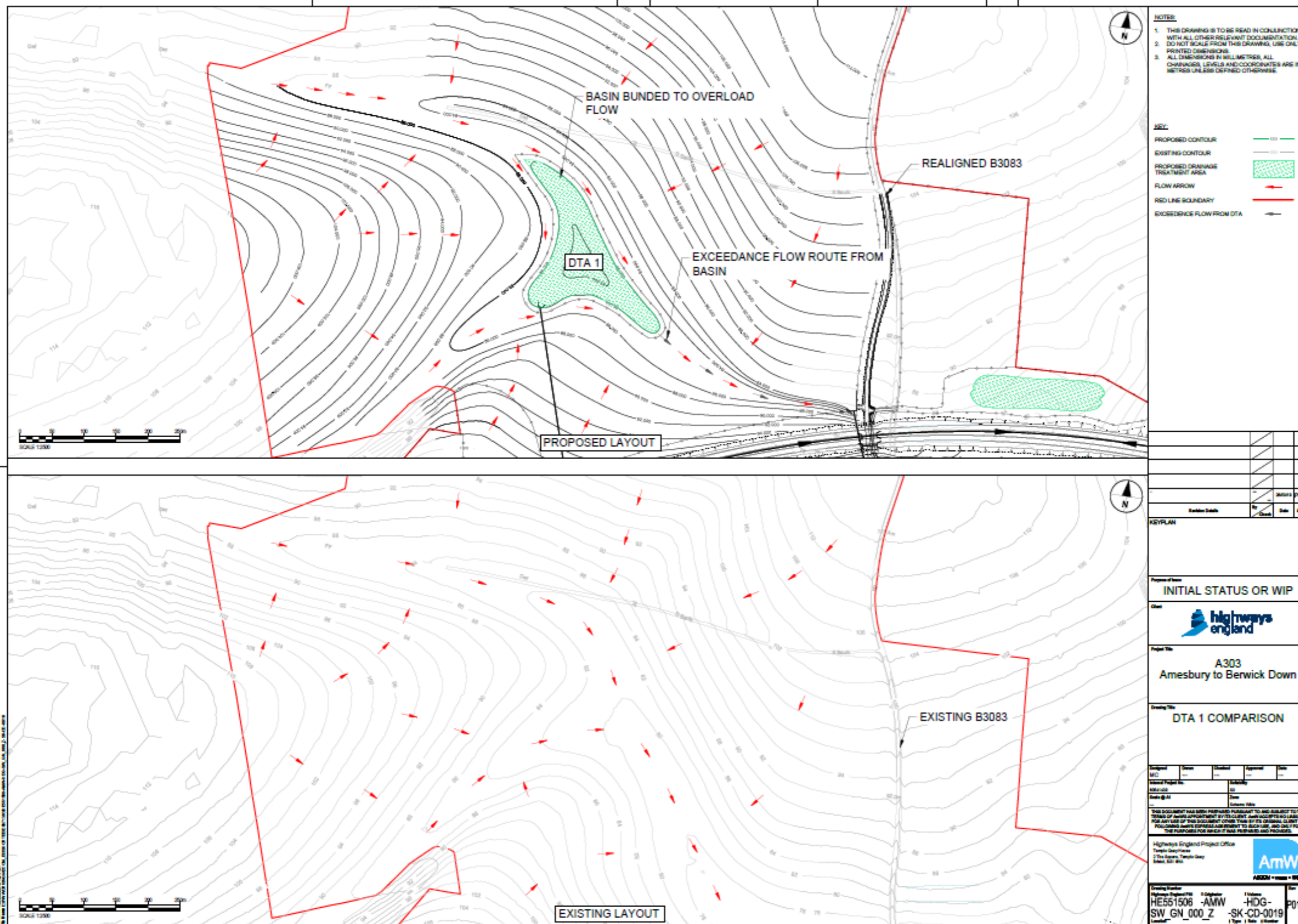
8.2 There is, therefore, enough capacity within the illustrative design of the road drainage treatment areas, to manage storm water runoff safely and the exceedance flow routes are not directed towards any sensitive receptors.

# Technical Note

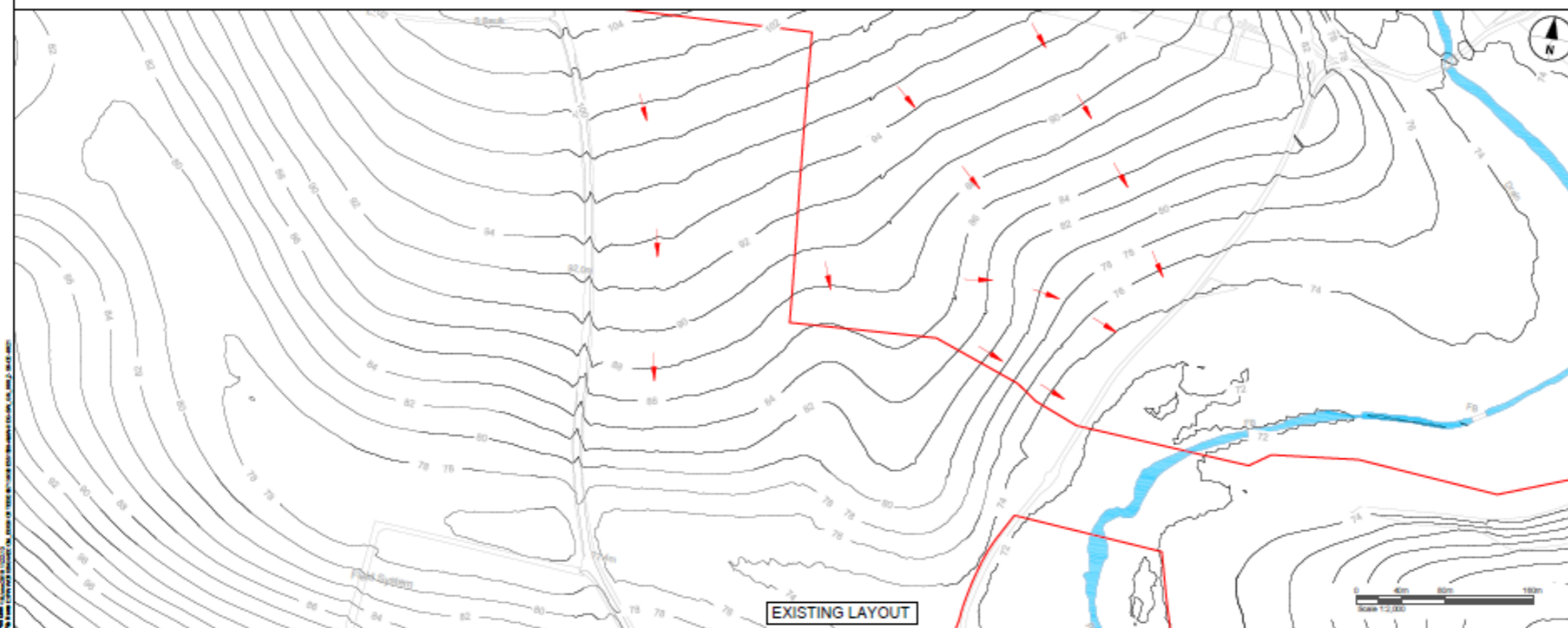
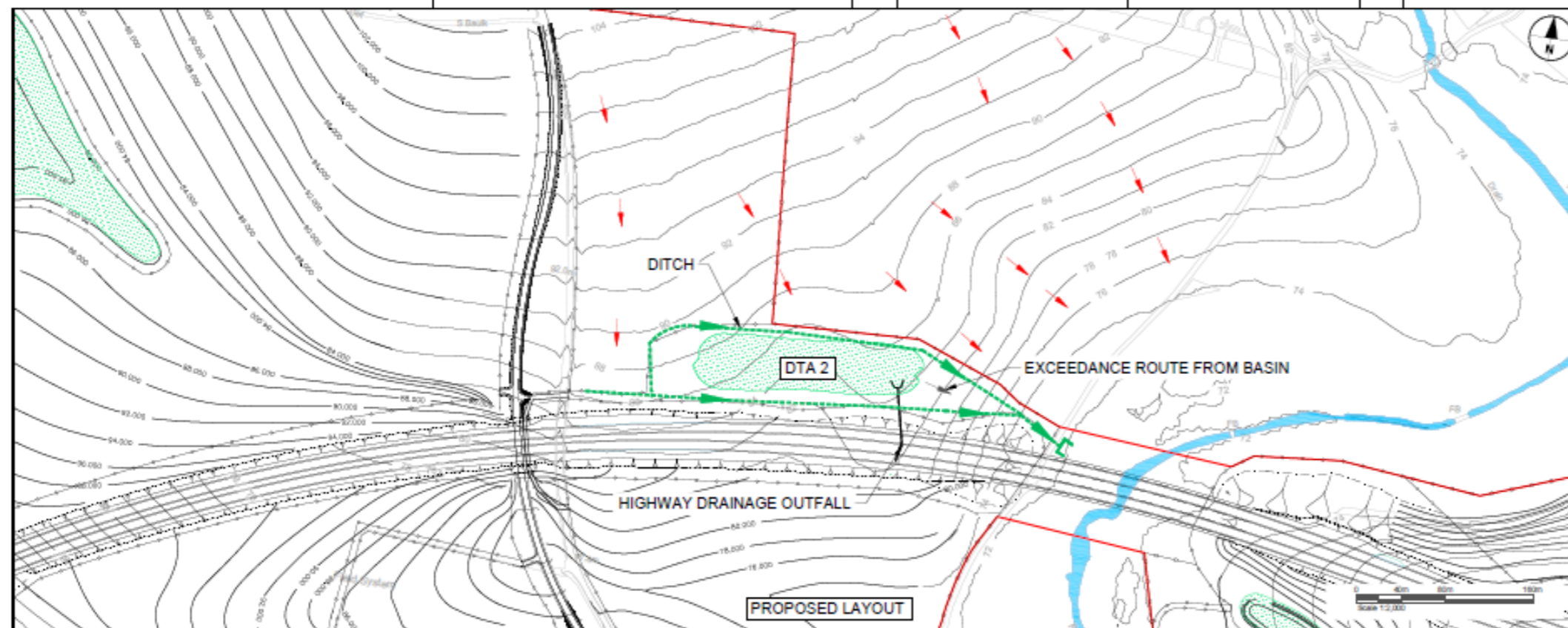
## Appendix A

### Drawings

# Technical Note



# Technical Note



**NOTES:**

- THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT DOCUMENTATION. DO NOT SCALE FROM THIS DRAWING. USE ONLY PRINTED DIMENSIONS.
- ALL DIMENSIONS IN MILLIMETRES. ALL CHANGERS, LEVELS AND COORDINATES ARE IN METRES UNLESS DEFINED OTHERWISE.

**KEY:**

- PROPOSED CONTOUR:
- EXISTING CONTOUR:
- PROPOSED DRAINAGE TREATMENT AREA:
- FLOW ARROW:
- RSD LINE BOUNDARY:
- EXCEEDANCE FLOW FROM DTA:
- LAND DRAINAGE DITCH:


**KEYPLAN**

Project Name: **INITIAL STATUS OR WIP**

Client:

Project Title: **A303 Stonehenge**

Drawing Title: **DTA 2 COMPARISON**

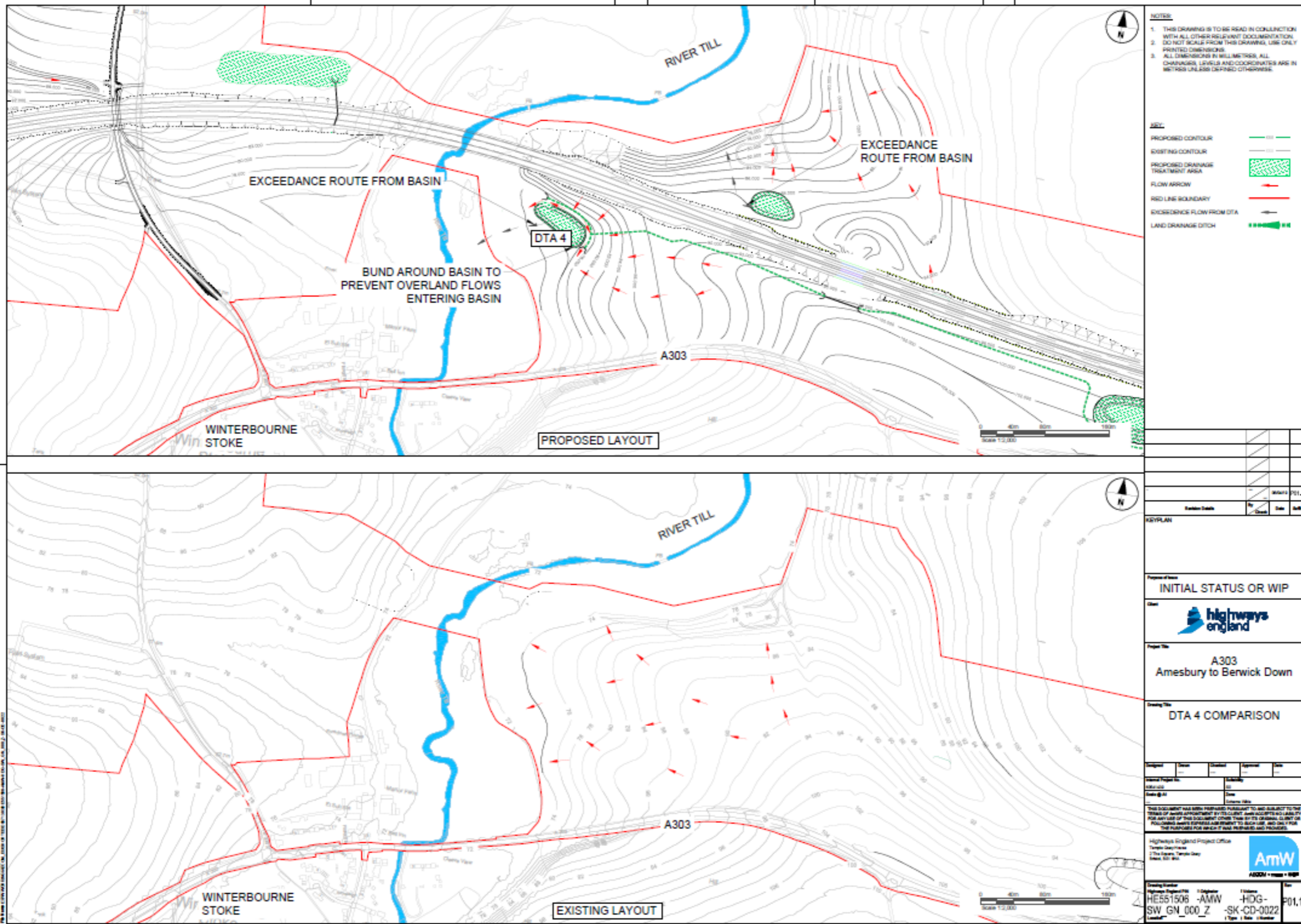
Project Name			
Project No.			

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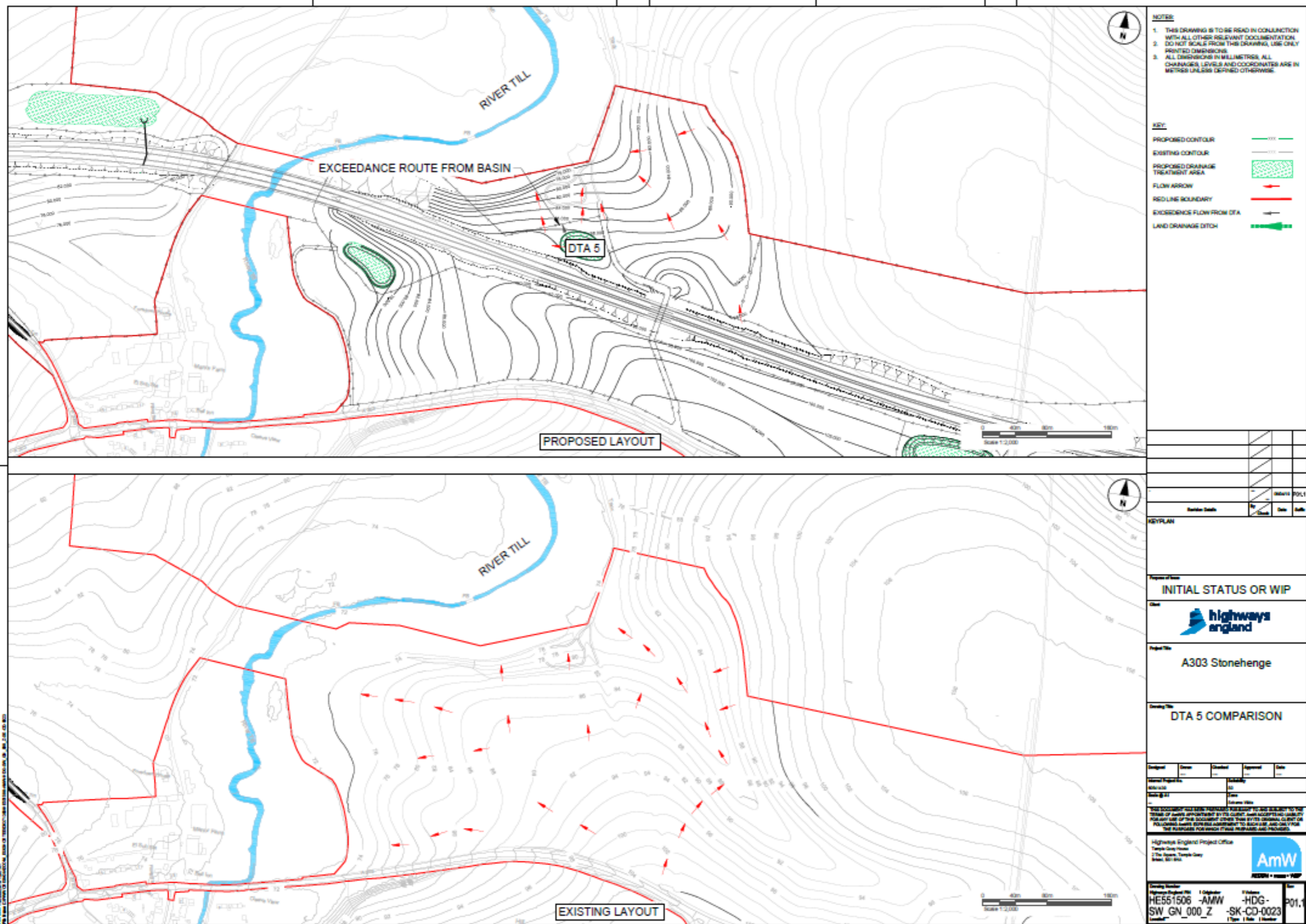
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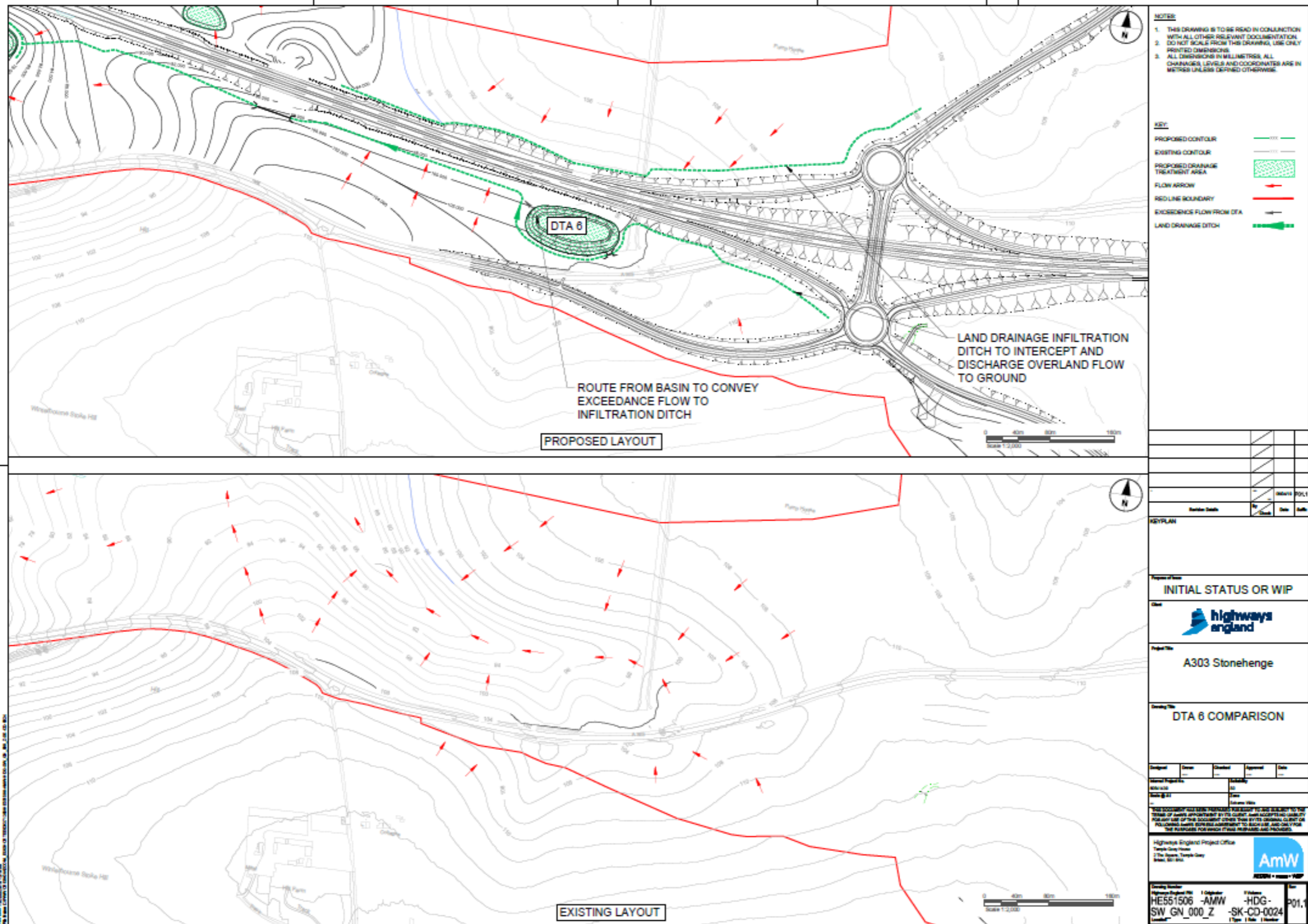




# Technical Note



# Technical Note

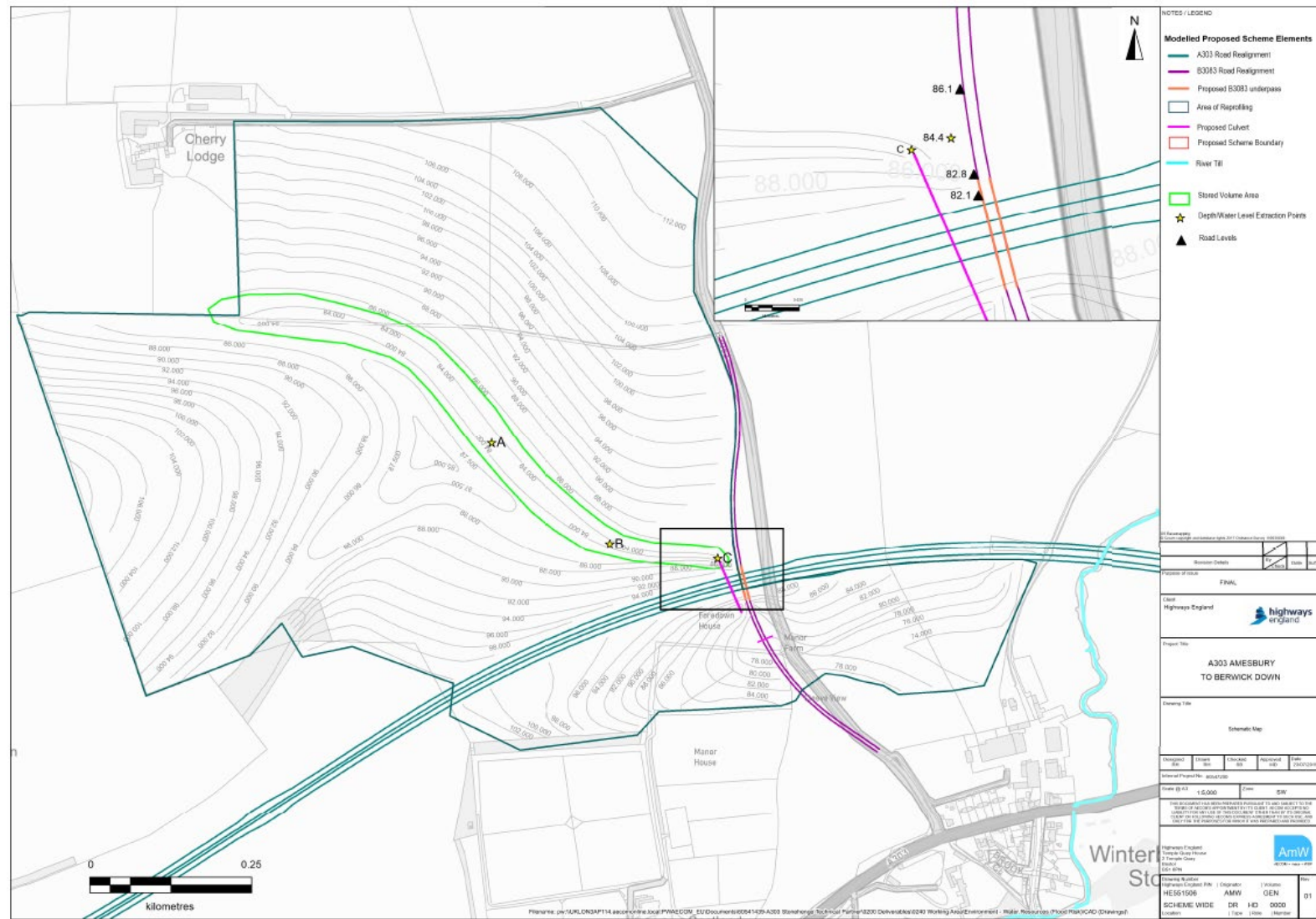


	Action addressed Requiring justification Needs to be addressed						
Findings / Recommendations	1st round of comments in Local Impact Report (Nov 2018)	2nd round of comments at Deadline 2a (10 May)	3rd round of comments at Deadline 4 (21 June)	HE response 28 June 2019	4th round of comments on 16 July 2019	HE Response Deadline 5	5th round of comments on 18 July 2019
Finding 1	The overall approach to groundwater risk assessment appears reasonable. The risk of the scheme inducing groundwater flooding, interfering with abstractions or impacting on flows to environmental receptors appears to be low (i.e. risks relating to quantity of groundwater flow and heads).	This point remains valid and the additional work has provided further assurance.					
Finding 2	The conceptual model of the groundwater system is presented clearly in Ref 1. Data collation has covered the usual expected data sources and reasonable interpretation and conclusions have been drawn.	The additional data collection and interpretation has enhanced the conceptual understanding.					
Finding 3	Use of the Wessex Basin model for quantitative risk assessment is a sensible approach; this is the best available tool and has stakeholder acceptance. Refinements to the hydraulic conductivity (K) in the model in the study area, in keeping with local pumping test results, appears appropriate. Nevertheless, the groundwater levels and flows presented do not show a clear improvement in model calibration.	Testing of alternative parameter distributions has provided reassurance in the model setup.					
Finding 4	It would be useful to see further interrogation of the model calibration, both original and refined versions, in the study area and checks on the impact of refinements to the model (both the K changes and using short model runs). This would provide additional confidence in the results and a fuller understanding of limitations.	This comparison has been provided for groundwater levels at a selection of monitoring boreholes and provides further confidence in the model. Ideally more long term groundwater level records (e.g. from EA monitoring boreholes) and flows in the rivers would have been included.	Not addressed in the documents provided	There are no additional longer duration boreholes or flow records in the catchment area of interest. The Groundwater Risk Assessment (APP-282) and the Deadline 3 Submission - 8.25 - Supplementary Groundwater Model Runs to Annex 1 Numerical Model Report (REP3-021) incorporate relevant data.	Calibration has been demonstrated for some locations in Figure B1 of document 8.24 - Groundwater Monitoring 2018-19 Conceptual Model Review. It would have been useful if similar plots were shown for other EA monitoring boreholes (eg Berwick Down OBH, Wiltshire Grain site, Manor Farm, Amesbury), historical onsite monitoring (eg P1 and P2), and the river gauge hydrographs. This would improve confidence in the calibration and in how the modelled levels should be applied but is not essential.	Data has been used where it is available. Not all of it has been presented in the published reports.	
Finding 5	A more comprehensive description of the refinements made should be given e.g. the extent of the changes in K and what starting heads have been used for each run. A table of model runs (stating period, property changes, starting heads etc) with reference codes, would be useful and each figure should state clearly which model run results are from.	For the supplementary runs the model refinements and starting heads have been clearly explained. In this document, as well as in the original modelling report, a table of model runs and use of reference codes would have been valuable. It is not always clear which run is being shown on a figure.	Not addressed in the documents provided	Run numbers are not reported; instead the runs are descriptive e.g. peak period, drought period, low storage model, YD model etc. as this caters to a wider readership.		Run numbers are not reported; instead the runs are descriptive e.g. peak period, drought period, low storage model, YD model etc. as this caters to a wider readership.	
Finding 6	The approach to modelling the tunnel structure below the water table by reducing K seems reasonable and assumptions appropriately conservative. Focusing presentation of results on changes in heads is correct; there would be more confidence in the model's ability to simulate changes in heads (and flows) than in modelling absolute levels.	No change has been made to the tunnel representation. New ground investigation results suggest the approach may be more conservative than anticipated.					
Finding 7	Where the assessment relies on the modelling of absolute levels (e.g. presentation of flood risk as modelled groundwater levels compared to ground level) additional caution in use of the results should be stated. In the area north of the tunnel where the most significant rises in groundwater levels are predicted any additional information on model calibration in this area would be helpful (point 4 above).	The calibration figure includes two monitoring boreholes north of the tunnel. At these, and most of the other boreholes shown, the model used for the risk assessment appears to slightly overestimate groundwater levels (this is tentative as the monitoring/modelling periods do not overlap), and therefore may be pessimistic in terms of predicted flood risk. Modelled changes in level, rather than absolute level should be used wherever possible. No comments on how the modelled groundwater levels should be used are included in the documents provided.	Not addressed in the documents provided	Agreed, the model is considered to be conservative. The environmental assessment compares the baseline with differences in levels and flow arising from the Scheme. It is therefore assessing changes wherever possible. Modelled groundwater levels were used by the flood and drainage teams to assess the effects of peak groundwater levels on drainage infrastructure and flood storage (see response to Finding 9).		Agreed, the model is considered to be conservative. The environmental assessment compares the baseline with differences in levels and flow arising from the Scheme. It is therefore assessing changes wherever possible. Modelled groundwater levels were used by the flood and drainage teams to assess the effects of peak groundwater levels on drainage infrastructure and flood storage (see response to Finding 9).	
Finding 8	Where specific previous groundwater flooding issues have been identified, or any other areas where flooding concerns are acute, it would be useful to clearly state the modelled impact from scheme on flood levels at these locations (even if zero).	Not addressed in the documents provided	Not addressed in the documents provided	There is a notable history of groundwater flooding within the study area as reported in the ES Chapter 11 (Paragraph 11.6.69, APP-049). Further details are provided in the Historic Flooding Events section (paragraph 11.6.70), the GRA (Appendix 11.4 (APP-282)) and in the FRA (Appendix 11.5 APP-283). The Groundwater Risk Assessment is clear where there is potential for a rise in groundwater levels (Figure 4.1 of Annex 1 to the Groundwater Risk Assessment (APP-282)). It is not necessary to state where changes are beyond the range of influence of the Scheme.		There is a notable history of groundwater flooding within the study area as reported in the ES Chapter 11 (Paragraph 11.6.69, APP-049). Further details are provided in the Historic Flooding Events section (paragraph 11.6.70), the GRA (Appendix 11.4 (APP-282)) and in the FRA (Appendix 11.5 APP-283). The Groundwater Risk Assessment is clear where there is potential for a rise in groundwater levels (Figure 4.1 of Annex 1 to the Groundwater Risk Assessment (APP-282)). It is not necessary to state where changes are beyond the range of influence of the Scheme.	
Finding 9	It is not evident whether any consideration been given to what the critical level is for groundwater interfering with drainage infrastructure or flood storage. A level of 2 m below ground has been used as an indication of risk but no explanation provided for what this is based upon. No information is given in these reports about how peak predicted groundwater levels from the modelling have been used in design of the scheme drainage infrastructure.	Not addressed in the documents provided	Not addressed in the documents provided	Modelled groundwater levels were used by the flood and drainage teams to assess the effects of peak groundwater levels on drainage infrastructure and flood storage. How groundwater level information was used is provided in the drainage and flood risk appendices. In both cases the peak modelled values were used. The Drainage Strategy (APP-281, Section 2.4) states that 'The preliminary design invert levels for infiltration systems have been specified at a minimum of 2m above the maximum recorded groundwater level in that locality, in line with best practice guidance (Ref 11.3.1 The SuDS Manual, CIRIA Report C753, Woods Ballard, B, Udale, Clarke, H, Ilman, S, Scott, T, Ashley, R, Kellagher, R 2015 ISBN: 978-0-86017-760-9)'. Modelled peak simulated groundwater levels have been provided to the drainage design team for the drainage strategy. This is described in the drainage strategy appendix (APP-283) Section 6.4. Although Figure 4.2 (APP-282) shows zones of peak groundwater levels within 2m of ground level, this is for illustrative purposes to demonstrate that in most areas, beyond the valleys groundwater levels are more than 2m below ground level and therefore the groundwater flood risk as a result of increases in predicted groundwater level of less than 1 m (Figure 4.1 APP-282) is not significant.	The response notes that 'Modelled peak simulated groundwater levels have been provided to the drainage design team for the drainage strategy' and that in the strategy 'The preliminary design invert levels for infiltration systems have been specified at a minimum of 2m above the maximum recorded groundwater level in that locality... Have the peak modelled groundwater levels been used rather than the maximum recorded groundwater levels?'	Modelled groundwater levels were used by the flood and drainage teams to assess the effects of peak groundwater levels on drainage infrastructure and flood storage. How groundwater level information was used is provided in the drainage and flood risk appendices. In both cases the peak modelled values were used. The Drainage Strategy (APP-281, Section 2.4) states that 'The preliminary design invert levels for infiltration systems have been specified at a minimum of 2m above the maximum recorded groundwater level in that locality, in line with best practice guidance (Ref 11.3.1 The SuDS Manual, CIRIA Report C753, Woods Ballard, B, Udale, Clarke, H, Ilman, S, Scott, T, Ashley, R, Kellagher, R 2015 ISBN: 978-0-86017-760-9)'. This is described in the drainage strategy appendix (APP-283) Section 6.4. It is confirmed that modelled peak simulated groundwater levels have been provided to the drainage design team for the drainage strategy and are sometimes referred to as 'maximum recorded' i.e. maximum recorded in the model output. This approach is precautionary because modelled peaks refer to the floods of 2014 which was not captured by all monitoring. Although Figure 4.2 (APP-282) shows zones of peak groundwater levels within 2m of ground level, this is for illustrative purposes to demonstrate that in most areas, beyond the valleys, groundwater levels are more than 2m below ground level and therefore the groundwater flood risk as a result of increases in predicted groundwater level of less than 1 m (Figure 4.1 APP-282) is not significant.	Wiltshire Council notes the precautionary approach taken in the preliminary design by using modelled peak levels, that are considerably higher than recorded peak levels. Ongoing groundwater monitoring and modelling should inform the detailed design and construction plan. This is secured through commitment MW-WAT10 (Groundwater Management Plan) in the Outline Environmental Management Plan (Environmental Statement Appendix 2.2), that allows for an update to the groundwater risk assessment for the final design and construction plan, and a programme of groundwater level monitoring.
Finding 10	The approach to considering climate change of increasing recharge by 20% (to consider peak groundwater levels) is very simple – no allowance is made for the effect of soil zone processes or changes in starting heads (it is assumed). Clarification of how this corresponds to the approach used in fluvial/pluvial flood risk assessment (where 30% and 40% increases appear to have been used) should be provided. A 20% increase in recharge will represent <20% increase in rainfall.	Not addressed in the documents provided	The additional information adequately addresses the review comments relating to the climate change groundwater analysis.				
Finding 11	The modelling results inevitably contain uncertainty and this should be reflected in presenting / describing results of quantitative risk assessment. Groundwater level monitoring of areas upgradient and downgradient of the tunnel will be important and as new data become available the modelling and risk assessment should be reviewed and updated.	Additional groundwater level monitoring data have been obtained but the records remain short. Monitoring should continue and the modelling and risk assessment be reviewed and updated.	Not addressed in the documents provided	The OEMP incorporates ongoing monitoring and risk assessment through MW-WAT10.		The OEMP incorporates ongoing monitoring and risk assessment through MW-WAT10.	
Finding 12	The qualitative risk assessment concludes that almost all groundwater risks are low or very low (following embedded mitigation). These mostly refer to the use of the Construction Environment Management Plan (CEMP). Construction and operation of a scheme on the unconfined Chalk aquifer, with elements at or below the water table, presents risks particularly to water quality and the underlying vulnerability should be kept in mind in later phases (e.g. detailed design, enforcement of the CEMP).	The additional investigations and modelling do not suggest changes to the risk assessment are required.					
Finding 13	It is not clear whether the potential risk that the tunnel surface acts as a preferential groundwater flow path and potential link between fissure zones has been considered.	Not addressed in the documents provided	Not addressed in the documents provided	Annex E of the Groundwater Risk Assessment (APP-282) provides a quantitative risk assessment of tunnelling. Further clarification was provided at Deadline 3 in response to the concern that grout migration from the TBM systems could lead to extensive permanent areas of Chalk with lowered permeability i.e. the opposite of Finding 13. As stated in the Deadline 3 response (REP3-013 paragraph, Deadline 3 Submission - 8.18 - Comments on Written Representations), grouting is undertaken in a controlled manner at the rear of the TBM Shield as the completed rings are built. The whole grouting process including material specification; use of setting accelerators; viscosity; injection pressures, and injection volume are all tightly controlled and monitored matters to ensure the void is completely filled without causing grout migration from the TBM system (paragraph 17.1.6). The small annular gap formed around the tunnel segments during excavation is necessary for the operation of the TBM and must be backfilled to provide support to the tunnel lining segments and limit settlement from ground closure around the lining. A backfill grouting system is therefore an integral part of TBM design and operation (paragraph 17.1.5).		Annex E of the Groundwater Risk Assessment (APP-282) provides a quantitative risk assessment of tunnelling. Further clarification was provided at Deadline 3 in response to the concern that grout migration from the TBM systems could lead to extensive permanent areas of Chalk with lowered permeability i.e. the opposite of Finding 13. As stated in the Deadline 3 response (REP3-013 paragraph, Deadline 3 Submission - 8.18 - Comments on Written Representations), grouting is undertaken in a controlled manner at the rear of the TBM Shield as the completed rings are built. The whole grouting process including material specification; use of setting accelerators; viscosity; injection pressures, and injection volume are all tightly controlled and monitored matters to ensure the void is completely filled without causing grout migration from the TBM system (paragraph 17.1.6). The small annular gap formed around the tunnel segments during excavation is necessary for the operation of the TBM and must be backfilled to provide support to the tunnel lining segments and limit settlement from ground closure around the lining. A backfill grouting system is therefore an integral part of TBM design and operation (paragraph 17.1.5).	
Recommendation 1	Specific recommended edits to the report text and figures are listed in detail in Sections 4 and 5. These would improve clarity of communication of the assessment	Not addressed in the documents provided	Not addressed in the documents provided	Noted but not material to the findings of the assessment.		Noted but not material to the findings of the assessment.	
Recommendation 2	The model would preferably be run for the full 1965-2016 run time for each of the revised baseline runs (the baseline run with revised calibration, the wet climate change run and the dry climate change run) and thorough comparisons made with the original Wessex basin model output and with observation/gauge data. The short period runs would be checked against these and output from the full runs used as starting heads for the short runs.	Although not all of these specific runs have been carried out, the supplementary model runs do test the revised model over the full run period and test the sensitivity to starting heads. The results provide confidence that the modelling approach is valid. Some additional comparison of model results with observation borehole data has been presented but, as noted above, should include more longer term groundwater level monitoring records and flows in the river.	Not addressed in the documents provided	It is noted that the peer review agrees that the results provide confidence that the modelling approach is valid. There are no additional longer duration boreholes or flow records in the catchment area of interest. The Groundwater Risk Assessment (APP-282) and the Deadline 3 Submission - 8.25 - Supplementary Groundwater Model Runs to Annex 1 Numerical Model Report (REP3-021) incorporate relevant data. Amesbury and South Newton are the only flow gauges in the study area and are shown in the reports. There is limited groundwater monitoring with no site having a record over decades, e.g. Berwick Down (2001-present), Wiltshire Grain Silo (1994-2005) and Stoford Cross (2005-present) which have been provided in the reports to support the text discussion and findings. The OEMP incorporates ongoing monitoring and risk assessment through MW-WAT10.		It is noted that the peer review agrees that the results provide confidence that the modelling approach is valid. There are no additional longer duration boreholes or flow records in the catchment area of interest. The Groundwater Risk Assessment (APP-282) and the Deadline 3 Submission - 8.25 - Supplementary Groundwater Model Runs to Annex 1 Numerical Model Report (REP3-021) incorporate relevant data. Amesbury and South Newton are the only flow gauges in the study area and are shown in the reports. There is limited groundwater monitoring with no site having a record over decades, e.g. Berwick Down (2001-present), Wiltshire Grain Silo (1994-2005) and Stoford Cross (2005-present) which have been provided in the reports to support the text discussion and findings. The OEMP incorporates ongoing monitoring and risk assessment through MW-WAT10.	
Recommendation 3	Provide an explicit list of the changes in the revised model compared to the original Wessex Basin model (e.g. as a table listing each model run).	Clearer descriptions of the aquifer property changes and starting heads have been provided					

Recommendation 4	<p>Provide graphs showing comparisons between:</p> <ul style="list-style-type: none"> <li>- the modelled groundwater heads from the short investigation runs</li> <li>- the long runs of the original Wessex basin model (and other long model runs if these are carried out)</li> <li>- observed data for all Environment Agency monitoring boreholes in the surrounding area and a good selection of site investigation boreholes covering the area of the scheme and areas to the north and south. This is a valuable check even where the time period of the short model does not overlap with the time period of the monitoring data.</li> </ul>	As noted above, this has been done for some observation boreholes but not for all locations with longer term records.	Not addressed in the documents provided	<p>As stated in response to Recommendation 2, there are no additional longer duration boreholes or flow records in the catchment area of interest. The supplementary model runs report [REP3-021] presented charts to demonstrate that the full length model run does not change the findings of the impact assessment.</p> <p>The groundwater monitoring review [REP3-020] considers the additional data to date compared to the model assumptions and calibration. This will continue in the future as more data is collected, through the OEMP requirement MWAT-10.</p>	As stated in response to Recommendation 2, there are no additional longer duration boreholes or flow records in the catchment area of interest. The supplementary model runs report [REP3-021] presented charts to demonstrate that the full length model run does not change the findings of the impact assessment. <p>The groundwater monitoring review [REP3-020] considers the additional data to date compared to the model assumptions and calibration. This will continue in the future as more data is collected, through the OEMP requirement MWAT-10.</p>
Recommendation 5	Check the sensitivity of the model with the tunnel included and the wet climate change model to use of higher starting heads.	This has been done and raised no concerns.			
Recommendation 6	Provide clarification of how the climate change approach is consistent with that used in other flood risk assessments (and ensure they are consistent).	Not addressed in the documents provided	The additional information adequately addresses the review comments relating to the climate change groundwater analysis.		
Recommendation 7	Use monitoring data comparisons to inform caveats to be applied to the use of absolute levels for flood levels or in scheme design. The model is likely to be more reliable for predicting changes in heads (and flows) rather than absolute levels. Modelling absolute levels in extreme events would particularly hold uncertainty. The predicted position of the water table in terms of depth below ground should be used with a degree of caution.	Not addressed in the documents provided	Not addressed in the documents provided	<p>As stated in the Deadline 3 response (paragraph 22.5.19 REP3-013) it is agreed that there is more confidence in a model's ability to simulate changes in heads (and flows) than in modelling absolute levels so changes have been used to assess impacts. With regard to flood levels, the existing and predicted modelled water levels below ground level are illustrated in Figure 3.10 of Appendix 11.4 [APP-282] and Figure 4.2 of Annex 1 [APP-282]. There is a predicted change in parts of Stonehenge Bottom valley, as shown in Figure 4.3 (Annex 1) which illustrates that the modelled change is in areas where there are no flooding concerns. Modelled peak simulated groundwater levels have been provided to the drainage design team for the drainage strategy. This is described in the drainage strategy appendix [APP-281]. Areas at risk of groundwater flooding have also been provided to flood modellers and geotechnical teams and used as described in the response to Finding 9.</p>	<p>As stated in the Deadline 3 response (paragraph 22.5.19 REP3-013) it is agreed that there is more confidence in a model's ability to simulate changes in heads (and flows) than in modelling absolute levels so changes have been used to assess impacts. With regard to flood levels, the existing and predicted modelled water levels below ground level are illustrated in Figure 3.10 of Appendix 11.4 [APP-282] and Figure 4.2 of Annex 1 [APP-282]. There is a predicted change in parts of Stonehenge Bottom valley, as shown in Figure 4.3 (Annex 1) which illustrates that the modelled change is in areas where there are no flooding concerns. Modelled peak simulated groundwater levels have been provided to the drainage design team for the drainage strategy. This is described in the drainage strategy appendix [APP-281]. Areas at risk of groundwater flooding have also been provided to flood modellers and geotechnical teams and used as described in the response to Finding 9.</p>



### Supporting Information #1- Schematic Map



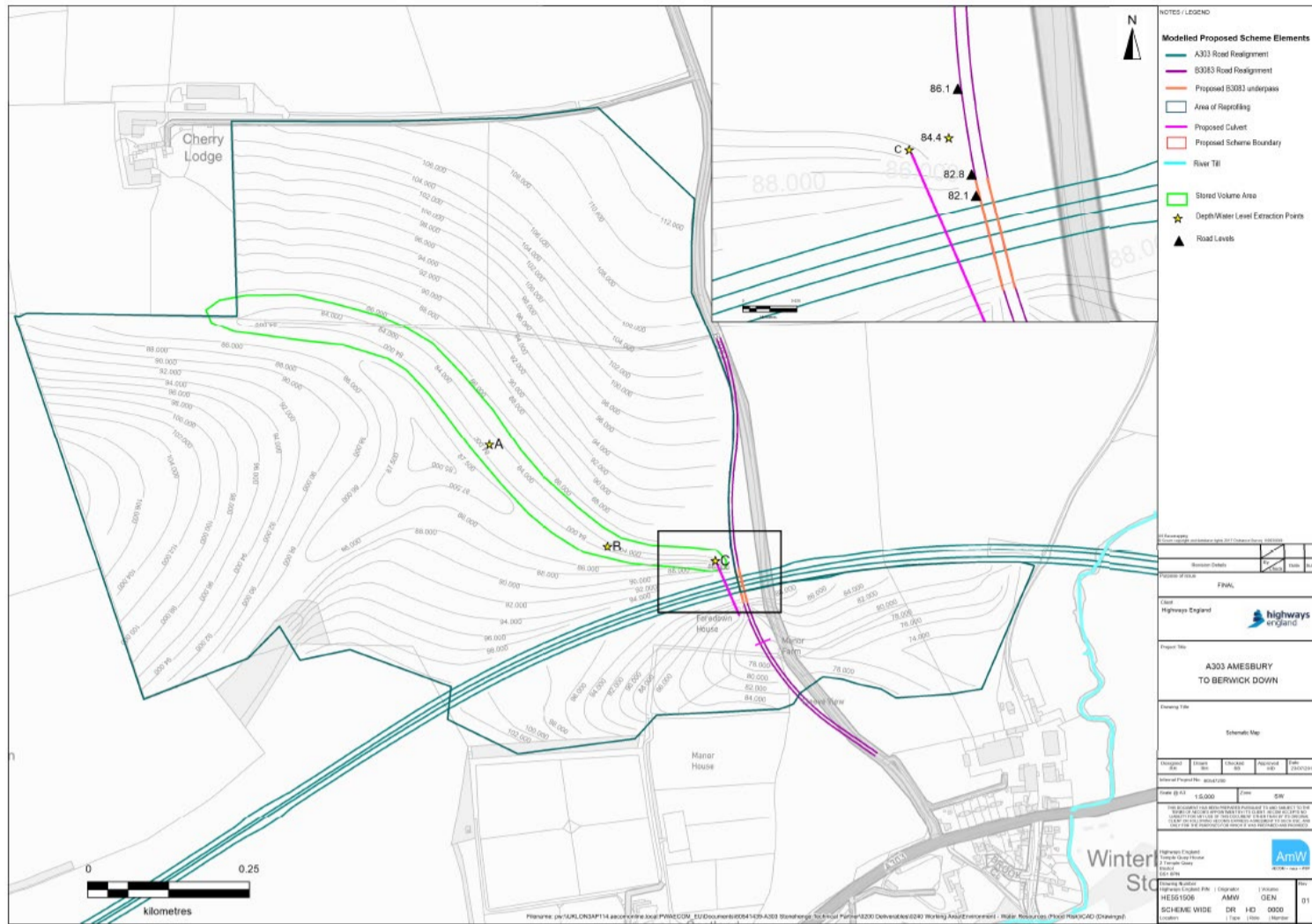
### Supporting Information #2- Maximum Flood Depths

Simulation	Depth (m)		
	A	B	C
1% AEP + CC 6hr	0.67	0.77	0.69
1% AEP + CC 12hr	0.68	0.78	0.71
1% AEP + CC 6hr-50% blockage	0.69	0.80	0.76
1% AEP + CC 12hr- 50% blockage	0.72	0.82	0.77
0.1% AEP 6hr	0.81	0.91	0.82
0.1% AEP 12hr	0.83	0.93	0.84

### Supporting Information #3- Maximum Water Levels

Simulation	Maximum water level (mAOD)		
	A	B	C
1% AEP + CC 6hr	84.44	84.43	84.35
1% AEP + CC 12hr	84.46	84.45	84.37
1% AEP + CC 6hr A303 50% blockage	84.47	84.46	84.42
1% AEP + CC 12hr A303 50% blockage	84.49	84.49	84.44
0.1% AEP 6hr	84.59	84.58	84.48
0.1% AEP 12hr	84.60	84.59	84.50

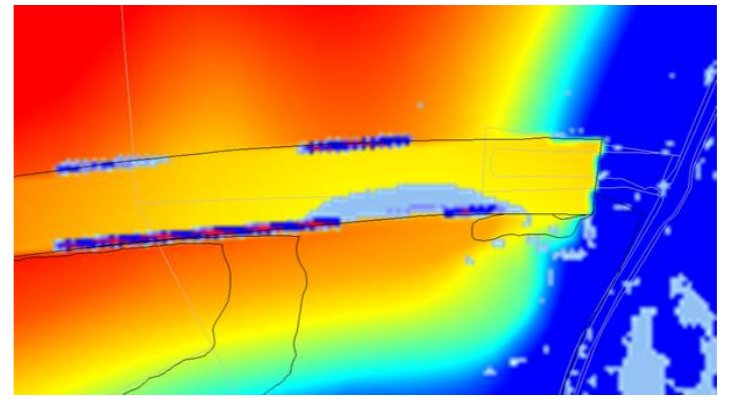
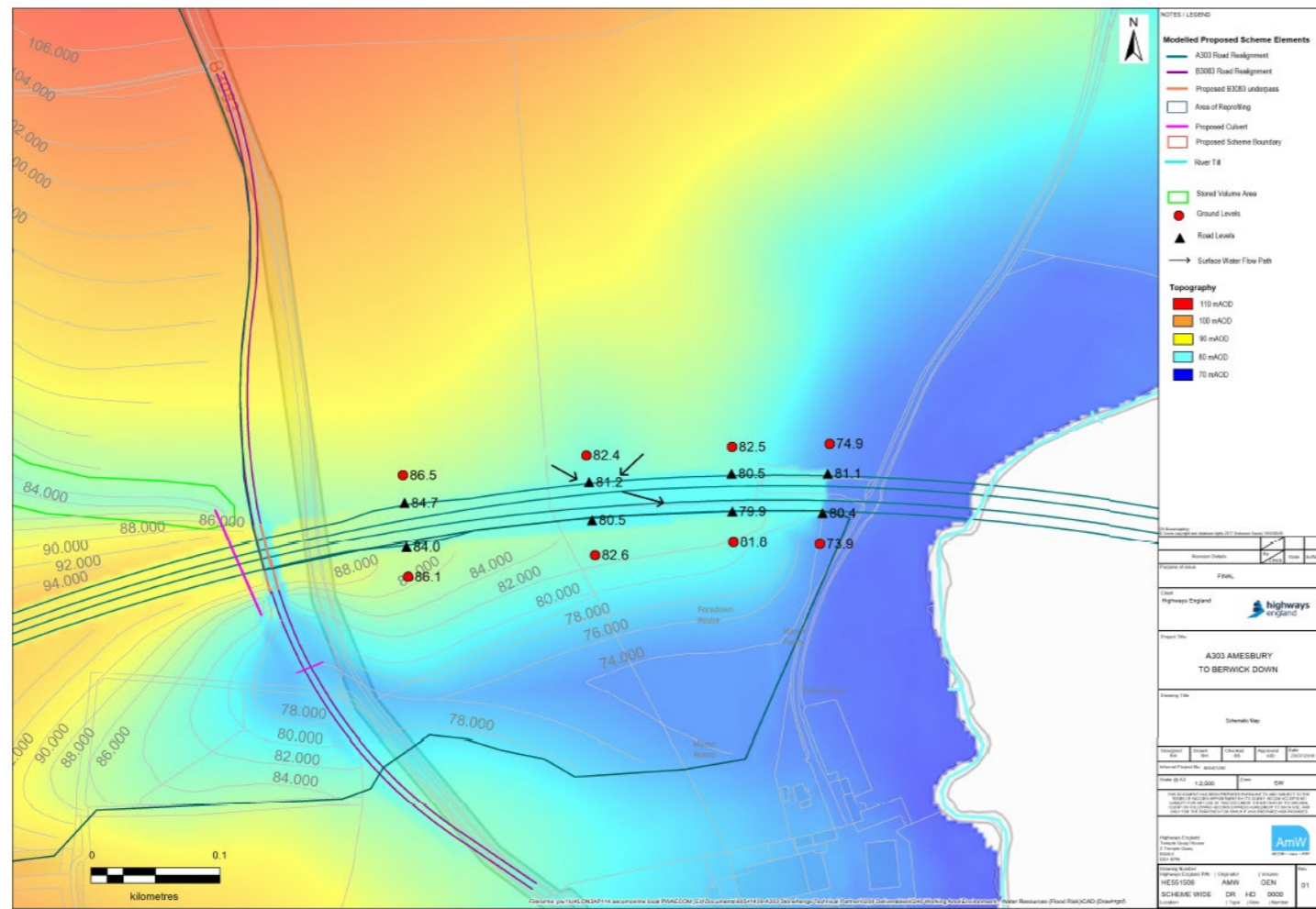
## Supporting Information #1- Schematic Map



## Supporting Information #2- Maximum Volumes in Parsonage Down

Simulation	Maximum volume (m <sup>3</sup> )
1% AEP + CC 6hr	13,681
1% AEP + CC 12hr	14,135
1% AEP + CC 6hr- 50% blockage	14,523
1% AEP + CC 12hr-50% blockage	15,261
0.1% AEP 6hr	18,467
0.1% AEP 12hr	19,014

Supporting Information #1- Annotated Model Setup





## Agreement of peer review actions for the Road Drainage Strategy

Paragraph/ Figure Number	Wiltshire Council Comment	Highways England Comment	Wiltshire Council Comment	Highways England Comment	Wiltshire Council Comment	Highways England Comment
Figure 2.1	Not clear in the report. Illegible	Pdf of drawing to be issued to WC	Not received	Sent via email 04/03/19		
Figure 2.2	Not clear in the report. Illegible	Pdf of drawing to be issued to WC	Received			
2.3.3 or 2.3.2	Separate carriageway and earthwork drainage systems are proposed. This follows best practice.	Noted.				
2.4.3	Infiltration design is based upon site soakaway tests. The design applies the lowest recorded infiltration rate at each test point to the drainage features in the vicinity of those tests. It is unclear as to where such soakaway tests were taken in spatial relation to the scheme. This needs to be clarified.	A copy of the report as referenced in the document will be forwarded to WC.	Received  The report is dated March 2006. Appendix 10.1 Preliminary Ground Investigation Report of the ES contains results of soil infiltration tests carried out in 2017. Have these latest tests been taken into account?	Yes. The 2017 tests indicate equal or increased rates of infiltration in the vicinity of the locations of the infiltration features, when compared to the values used within the preliminary design. The original, conservative values for infiltration have been retained within the design to ensure factor of safety within the design until full detailed design GDR is undertaken.		
2.4.3	All infiltration design is applied with 20x factor of safety. The is precautionary and should ensure a robust design.	Correct.				
2.4.4	It is proposed to set the drainage infiltration features a minimum of 1m above the highest recorded groundwater levels in the locality. However, it is unclear as to where such groundwater levels have	The data provided in the table has been extracted from the groundwater model which was calibrated against recorded groundwater data. A spatial plan of the levels and the basins will be provided to WC.				

Paragraph/ Figure Number	Wiltshire Council Comment	Highways England Comment	Wiltshire Council Comment	Highways England Comment	Wiltshire Council Comment	Highways England Comment
	been recorded in spatial relation to the scheme. This needs to be clarified.	It should be noted that all basin invert levels excluding DTA2 and DTA6 are set above existing ground level. The detailed design of the basins will be based on the information contained within the Geotechnical Design Report, DMRB HD 22/08 Management of Geotechnical Risk.				
Table 2.1	Indicates a minimum of 1.9m above the highest recorded groundwater levels (for drainage treatment area 4).	Noted.				
3.2.1	The western approaches are drained using traditional kerb and gully systems, with carrier pipes collecting runoff and conveying away from the road. The infiltration systems are to be designed for 100yrs + 30% climate change. It is not explained whether the surface water runoff can be suitably conveyed to the discharge points ie to what return period the sizing of carrier pipes will be made.	The carrier pipe systems will be designed in accordance with Design Manual for Roads and Bridges (DMRB) HD 33/16 Design of Highway Drainage Systems requirements.				
3.2.2	Infiltration ponds are proposed to receive the carriage runoff and take flow to ground. These are described as Drainage Treatment Areas (DTAs). The	The ponds have been located following liaison with the Landscaping team to minimise visual impact and become integrated as part of the landscape. The infiltration basins will be in HE ownership.	Awaiting information. Appendix 12.1 Tunnel Arisings Management Strategy of the ES says that the tunnel arisings (900,000 m <sup>3</sup> ) will be deposited in the area to the east of Parsonage	The post fill exceedance routes from the basin are shown on the GA's.	Exceedance routes provided in Technical Note – Drainage Treatment Areas (Doc ID HE551506-AMW-HDG-SW_GN_000_Z-TN-CH-0001).	

Paragraph/ Figure Number	Wiltshire Council Comment	Highways England Comment	Wiltshire Council Comment	Highways England Comment	Wiltshire Council Comment	Highways England Comment
	<p>ponds are located remote from the proposed highway alignment. It is unclear why the ponds are to be located so far from the road. Presumably this is driven by topography, but it will increase land-take for access and maintenance issues. There is no confirmation as to flood risk posed to the proposed DTAs. This should be checked for both impact on the scheme and impact on surrounding land etc. It is likely that detail design will impact on existing overland flow routes.</p>	<p>Further details on the flood risk at the DTA's will be provided to WC. Overland flood flow routes in the vicinity of the basins will be provided to WC demonstrating no impact to the basins.</p>	<p>Down ie. where DTA1 will be. We would want to see the exceedance routes post-fill.</p>			
3.2.3	<p>The ponds are intended to use a proprietary treatment system for treatment of water quality: it is unclear what systems might be employed here, where the full discharge is to ground. The details on how particulates (solids), hydrocarbons, and other chemical contaminants will be treated are not given. The proprietary treatment should attenuate all typical contaminants, giving sufficient residence time to achieve this. Specifically, the drainage strategy claims that the drainage scheme will enhance water quality though the specification of</p>	<p>The filtration treatment systems will provide treatment prior to infiltration to ground in accordance with the requirements of HD49/16, HD45/09 and advice within HA 103/06. The final choice of system will be determined during detailed design. The EA will be consulted through the detailed design process, the below is an extract from DMRB HA103</p> <p>4.15 (excerpt) Where proposed sites for drainage systems are situated above aquifers the vulnerability of the ground water should be</p>				

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	engineered infiltration systems. It is unclear how this will be implemented. It is unclear whether the proprietary treatment product will treat sediments, hydrocarbons, dissolved heavy metals, phosphates, or de-icing salts? Information on the maintenance proposals and residence time should be provided.	considered by reference to the groundwater vulnerability maps, information on abstraction source protection zones and by consultation with the EPAs.				
3.2.4	The proposed infiltration ponds are unlined except for small biodiversity areas by the piped outfall. These ponds infiltrate to ground. It is noted that the ponds are to be sized to hold runoff from the 1 in 100-year rainfall event, with a 30% allowance for climate change. Furthermore, a 300m freeboard is proposed. It is likely that such freeboard will accommodate a reasonable additional volume and it would be good to see this quantified. There is no specific attenuation proposed for the drainage with all runoff being drained to ground. It is unclear what happens when the pond base blinds with sediment and infiltration is restricted, or where the design event is exceeded. As no outfalls	General Arrangement Drawings illustrating the overflow routes from the basins will be provided to WC. The basins are subject to detailed design in accordance with HA 103/06. The preliminary basin sizes have been calculated based on a ground infiltration rate with a factor of safety of 20 applied. This conservative estimate will ensure that enough volume is provided over time with sediment build up limiting infiltration. The basins will also be subject to regular maintenance by HE.	Linked to 3.2.2. Awaiting exceedance routes.	Exceedance routes from basins shown on GA's	Exceedance routes provided in Technical Note – Drainage Treatment Areas (Doc ID HE551506-AMW-HDG-SW_GN_000_Z-TN-CH-0001).	

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	are proposed from the DTAs, ultimately these ponds may overtop: no evidence is provided to indicate where those flow might travel. However, the drainage strategy indicates that the predicted overland flow paths have been examined to minimise disruption. How that minimisation is effected is not described					
3.2.5	The capacity of the network storage for pollution spills is not described. Pollution control is proposed by valves on the outlet of the pipework system, before the infiltration ponds. This holds any contaminated water in the pipework. It is not clear whether the piped system would have sufficient capacity to accommodate a pollution event of say 1 or 2 tankers full (25m <sup>3</sup> to 50m <sup>3</sup> ), at the same time as a rainfall event with allowance for groundwater ingress. It is assumed from the design parameters that groundwater infiltration is not of concern for such storage capacity. However, it is unclear where any contaminated flows would arise or go if the pipe	Spillage control measures and storage volumes will be provided in accordance with the advice in DMRB HA 103/06. Further discussion with EA and HE ongoing.				

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	storage/capacity was exceeded. This needs to be explained.					
3.2.5	The proposed infiltration basins provide no containment for contamination to be held in the basins and subsequently removed. Some polluted runoff may well infiltrate to ground. It is recommended that the DTAs are designed with a receiving forebay to be capable of hold such contaminated discharges before entering the infiltration zone. This might already be intended although the concept design drawing does not show this.	See above.				
3.2.6	Runoff cannot be conveyed from the carriageway where it is placed in cutting (in the vertical cut). In these locations, the use of a buried crate system is proposed for infiltration, promoting infiltration below the scheme where is cannot be implemented in the natural topography. Such systems are not favoured by Wiltshire Council because of the maintenance liabilities and difficulties in accessing inside them. Wiltshire Council dissuade developers from using crate systems through their SuDS guide. Highways England	The section of the A303 in which the crate system concept is currently proposed is within HE ownership and maintenance responsibilities not WC. The unique constraints at this locality have led to this solution which has been endorsed by HE.				

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	should provide details of how such systems will be maintained, and make due consideration of risk to drainage whence they are not performing as per the design.					
3.2.7	Where there is a groundwater risk, a pumped system is to be installed to capture the groundwater and discharge it away from the site. This impacts mainly the tunnel.	Noted.				
3.2.8	Near the entrance to the tunnel, it is inferred that groundwater levels are closest to the carriageway and may not always allow sufficient infiltration. The risk is recognised and a pumped drainage system is proposed supplement the basic infiltration. This pump would discharge water to a more favourable location for infiltration, where groundwater levels are at less risk of impeding the drainage.	Noted.				
3.2.9	Land Drainage for the highway embankment and natural catchments drainage into cuttings are to be kept separate from the carriageway drainage. Ditches along the top of cuttings or at the toe of embankments will be included to capture the runoff from	Noted.				

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	those areas.					
3.2.11	These would be graded to flow the natural topography and discharge towards the River Till. It appears possible that and exceedance flows, and/or contaminated discharges, could be intercepted by those ditches and hence discharged into the river. Further evidence of how contamination and exceedance flows are dealt with is required.	Noted. Evidence to be provided to WC.	Linked to 3.2.2 & 3.2.4. Awaiting exceedance routes.	Exceedance routes from basins shown on GA's	Exceedance routes provided in Technical Note – Drainage Treatment Areas (Doc ID HE551506-AMW-HDG-SW_GN_000_Z-TN-CH-0001).	
3.2.12	The capacity of the land drainage system is not described in the road drainage strategy document. It may be covered in the FRA report as Appendix 11.5 of the ES.	In Appendix 11.5. Evidence to be provided to WC further to outfall option amendment.	I assume this is the modelling outputs demonstrating no detriment. If yes, we are awaiting those.	Yes. Will be included in flood information.		
3.2.14	Changes to the alignments of the local roads will apply similar drainage systems to those already in place. It is unclear what the specification of any engineered infiltration systems may be that provides enhancements to the water quality of their discharges.	The proposals include filter drain systems and on-line soakaways. These will be designed in accordance with best practice (DMRB). The existing highway drainage systems outfall the runoff directly to unlined ditches. The existing and proposed systems are different, with the proposed having treatment benefits.				
Figure 3.1	Not clear in the report. Illegible	Noted. Pdf of drawing to be sent to WC.	Received			
4.1.2	The tunnel drainage conveyed to a low point sump in the tunnel and then pumped to a tank at	The reports containing the details on the duty and standby pump arrangements along with	Received  Duty/assist/standby pumps provided so mechanical	Yes, the drainage systems are critical infrastructure in the tunnel.	The tunnel drainage strategy contains several valves. Tunnel drainage control strategy to be	Noted.



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	<p>high point in the alignment on the eastern approaches. From here it will either gravitate to the proposed highway network, or be retained for disposal by tanker as a contaminated waste. All wastewater from the impounding sump should be removed to an appropriate treatment works.</p> <p>The switch between discharge and retention is proposed to be automatically actuated automatically. Although the trigger mechanism is not described, it is understood to include operation of the fire-fighting system, incident signage, or maintenance switch.</p> <p>The capacity of low point sump or surface impounding tank is not known, although it is advised that the volume should be sufficient to contain all fire-fighting volumes and clean up. No resilience measures are described for the pumped system. Consideration should be made to the event of power or mechanical failure, as may be more so expected during extreme rainfall.</p>	<p>proposals for back up emergency power supply will be collated and forwarded to WC.</p>	<p>failure addressed. Power resilience in the form of diesel generator and UPS. "This will provide power to all essential items of plant such as Communications equipment and a portion of the Tunnel Emergency Lighting." Does that include drainage?</p>		<p>specified separately as this is not covered by DMRB standards. We would require automated control.</p>	
4.1.3	<p>Groundwater seepages into the tunnel will be intercepted by the</p>	<p>The system either diverts the water to the impounding sump which is</p>				

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	<p>drainage and pumped to the surface drainage system towards the east. It is not known whether there is any need for drainage to control groundwater levels around tunnel as dewatering, as opposed to seepage. It is not specified whether there are any interceptors included in the tunnel drainage system. As such it is likely that some contaminants are pumped and conveyed to Countess roundabout before being discharged</p>	<p>contained or to a ditch which conveys the water towards Countess roundabout. By discharging to a ditch we will be discharging to a SuDS system and therefore the requirement for an interceptor is negated. The new version of HA 103 will include ditches as a vegetative treatment system for highway runoff.</p>				
5.2.1	<p>The eastern approaches are drained using road-edge channels on the new road, with kerb drains on the slip roads and flyover. The existing drainage system will be retained on the Countess roundabout.</p>	<p>Noted.</p>				
5.2.2	<p>These channels and kerb drains discharge into a carrier pipe system but is not described here where that outfalls.</p>	<p>The channels and combined kerb drains will outfall to the linear ponds adjacent to the slip roads. Which attenuate and treat the runoff prior to discharging to the existing ditches feeding to the Avon.</p>				
5.2.3	<p>The strategy includes for eight new DTAs. These are located alongside the road. It is not clear why these are, yet those in the western approaches are remote from the road. The ponds (DTAs) are proposed to be lined and</p>	<p>The ponds are located close to the highway because of specific local constraints. The lands to the south are bounded by the Avon and the lands to the north are owned by National Trust. The attenuation features in this</p>				

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	<p>planted, to contain a permanent body of water for water treatment and biodiversity. It is not immediately obvious why these are lined and planted, yet those in the western approaches are not. It is likely that a permanent dilution volume is being retained in these systems as they receive pumped water from within the tunnel – although this is not described in the report. The ponds are also proposed to attenuate discharges to provide a 20% betterment on the existing discharge rates. It is not clear why the ponds are attenuating flows yet those in the western approaches are not, although the report indicates that the ponds drain to the River Avon. It is also suggested that the change in discharge be compared to greenfield runoff rates should the existing highway be causing detriment compared to the greenfield condition. The size of the ponds is not reported – neither as a volume nor as return period capacity. Consideration should be made of the retained volume and</p>	<p>area were required to sit within the existing highway boundary. The reason for providing different attenuation features to the west of the tunnel and the east of the tunnel are because of their setting, with the preferred option chosen to match the characteristics of the surrounding area. To the west of the tunnel the lands are predominantly chalk grasslands with no permanent water present, even the Till is winterbourne along part of its length. Therefore a grassed basin will be the most appropriate feature to blend holistically into the existing landscape. The impermeable areas in the basins will act similarly to “dew ponds” thus recreating a feature common in agricultural areas. At Countess the major feature is the river Avon, a permanent water body. By lining the ponds we will be providing similar features to the adjacent area. Full infiltration of the runoff is not possible because of the land constraints and lining will prevent the features drying out during the summer months. Pumped water from the tunnel does not enter the DTA's but utilises the</p>				

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	<p>any obligations under the Reservoirs Act. The ponds are designed to not be inundated by the River Avon during its 1 in 100-year flood, with an allowance for climate change. The allowance applied is not described.</p>	<p>existing culvert at Countess Roundabout to discharge the flows and utilises a ditch to provide treatment upstream of the culvert. It should be noted that the pumped flows from the tunnel to the ditch will be negligible. The only waters pumped to the ditch will be from infiltration through the tunnel lining and water carried in by vehicles. The Tunnel Design Authority Report states that the channel in the service gallery under the road through the tunnel will collect groundwater seepage. There are weep holes in the tunnel walls to allow seepage when groundwater rises above the tunnel level in winter. The low point sump will be sized @ 125m<sup>3</sup> for emergencies and further consideration will be given to the pump sizing for normal operations and groundwater infiltration during detail design. This suggests that the pumped flows may not be negligible in winter. Have you assessed how much this flow will be and whether the low point sumps will provide sufficient storage? The tunnel low point sump has been sized for the firefighting system and spillage and is therefore</p>				

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		<p>designed to hold and then pump very high flows. The flows through the tunnel lining will be minimal, the preliminary design calculation indicate a flow of 0.2l/s based on 0.1 litre/m<sup>2</sup>/day (BTS Spec. 3<sup>rd</sup> Edition Class 3). High flow operations (tunnel sprinkler, wall washing) are pumped to the impounding sump. All ponds are designed in accordance with HA 103/06 and retain the 1 in 100 year event + 30% climate change. None of the attenuation features contain a volume which would require invoking the Reservoir Act.</p>				
5.2.4	<p>Runoff cannot be conveyed from the carriageway where it is in cutting at the eastern portal. The use of a buried crate system is proposed for infiltration, promoting infiltration below the scheme. Such systems are not favoured by Wiltshire Council because of the maintenance liabilities and difficulties in accessing inside them. Wiltshire Council dissuade developers from using crate systems through their SuDS guide. Highways England should provide details of how such</p>	<p>The section of the A303 in which the crate system concept is currently proposed is within HE ownership and maintenance responsibilities not WC. The unique constraints at this locality have led to this solution which has been endorsed by HE.</p>				

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	<p>systems will be maintained and make due consideration of risk to drainage whence they are not performing as per the design. In this location the groundwater levels are reported as being 2m below the invert of the proposed infiltration crates. To remain precautionary at this stage, the preliminary design proposals include for a pumped system.</p>					
5.2.5	<p>The catchment adjacent to Blick Mead is reported to see an increase in runoff from 292l/s to 328l/s. The associated outfall is not attenuated via one of the DTAs. Whilst it is understood that the archaeology local to this catchment requires the ground to be saturated, there is no consideration in the strategy for any impact this increase in peak flow will cause on the River Avon. It is also reported that the ditch conveying runoff to the outfall will be lined with a filtration treatment system, and goes on to indicate that the ditches will infiltrate to ground. It is thus unclear whether this runoff is intended to outfall into the River Avon or discharge to ground. Any proprietary treatment</p>	<p>The peak flow increase from this outfall will be compensated by the betterment provided from the other highway outfalls in close vicinity to this outfall. As per the existing arrangement, in high frequency/low intensity events a significant proportion of the runoff will infiltrate to ground along the length of the ditch. In less frequent/high intensity storms less runoff will have a chance to infiltrate and hence runoff will convey to the outfall.</p>				

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	should attenuate typical contaminants, promoting sufficient residence time.					
5.2.6	Any spillage/contamination is intended to be contained within the pipe system, upstream of the linear lined ponds. It is not clear whether the piped system would have sufficient capacity to accommodate a pollution event of say 1 or 2 tankers full (25m3 to 50m3) , at the same time as a rainfall event with allowance for groundwater ingress.	Spillage control measures will be designed in accordance with DMRB HA 103/06.				
5.2.7	The capacity of the land drainage system is not described. This should not be less than the carriageway drainage to prevent flooding.	The land drainage system will be designed in accordance with HA 106/04 and sized accordingly.				
5.2.9	With the carriageway being lowered in cut, the natural valley feature currently accommodated though an agricultural underpass will be intercepted by a ditch on the north side of the road. The drainage strategy suggests that this ditch will convey flow westwards towards the tunnel before draining into ditch which outfalls into a culvert to the west of Countess roundabout. Figure 5.2 does not indicate this flow route,	Drainage General Arrangement drawings showing this information will be issued to WC.  Please note that this strategy is an Appendix to the Water chapter of the ES which supports the DCO application for the scheme. The level of detail shown on the DCO submission is not commensurate with the request to append detailed drainage GA's to this appendix.	Received			

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	and the outfall from this former overland flow route is unclear. A full set of drainage plans is required as an appendix to this drainage strategy.					
Figure 5.2	Not clear in the report. Illegible	Pdf of drawing to be issued to WC.	Received			