

# A303 Sparkford to Ilchester Dualling Scheme TR010036

## 7.7 Road Safety Audit

APFP Regulation 5(2)(q)

Planning Act 2008

Infrastructure Planning (Applications: Prescribed  
Forms and Procedure) Regulations 2009

July 2018



Infrastructure Planning

Planning Act 2008

**The Infrastructure Planning  
(Applications: Prescribed Forms  
and Procedure) Regulations  
2009**

**A303 Sparkford to Ilchester Dualling  
Scheme**  
Development Consent Order 201[x]

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**ROAD SAFETY AUDIT**

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<b>Planning Inspectorate Scheme Reference</b>	TR010036
<b>Application Document Reference</b>	7.7
<b>Author:</b>	A303 Sparkford to Ilchester Dualling Scheme, Project Team, Highways England

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# **1 Introduction**

## **1.1 Purpose of this report**

- 1.1.1 This Road Safety Audit Response report relates to the Stage 1 Road Safety Audit report for the A303 Sparkford to Ilchester Dualling scheme. The Stage 1 Road Safety Audit Brief comprised of a set of drawings assembled by the Design Team for the scheme and sent by the Overseeing Organisation Project Manager (Tom Roberts) to the Road Safety Audit Team for examination. The Road Safety Audit Report was prepared and issued by the Road Safety Audit Team Leader, Barry Pledge, of Mott MacDonald.

## **2 Existing Route**

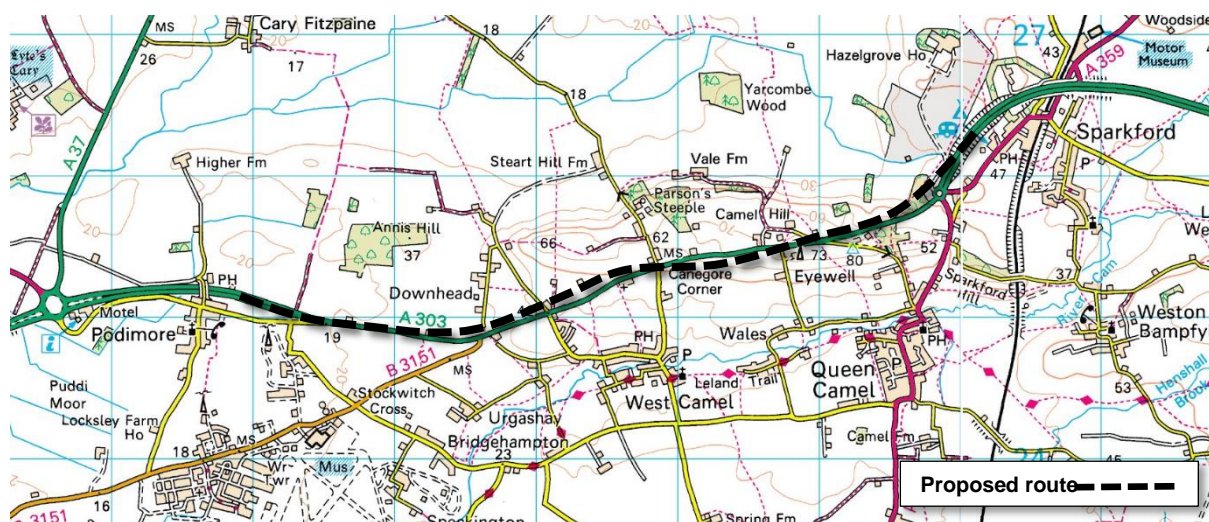
### **2.1 Existing route corridor**

- 2.1.1 The A303 forms part of the strategic road network and a strategic link between the south-west peninsula and the rest of the south, south-east and London. The route is comprised of multiple road standards including dual carriageway, single carriageway and single carriageway sections with overtaking lanes. Speed limits also vary between 40mph and 70mph depending on the character of the road and its surroundings.

### **2.2 Existing project road**

- 2.2.1 The section of the A303 that is being upgraded as part of this project, commences at the eastern limits of the existing dual carriageway at Podimore Bypass. Travelling east, the route reaches the junction with the B3151 before bearing north east and rising upwards through Canegore Corner to reach the crest of Camel Hill at Eyewell. This section of the route is characterised by a single lane road, with double white lines negating overtaking and subject to a 50mph speed limit. There are several priority junctions along the route giving access to the settlements of Queen Camel and West Camel to the south and Downhead to the north, as well as several farm accesses and parking laybys.
- 2.2.2 From the crest of Camel Hill, the route descends to meet the roundabout at the western limit of the dual carriageway Sparkford Bypass (Hazlegrove Roundabout). This section comprises two lanes in the westbound direction, one lane in the eastbound direction and is also subject to a 50mph speed limit. Hazlegrove Roundabout forms a junction between the A303 and the A359, which runs south through Queen Camel and north-east through Sparkford. The roundabout also provides access to a service station, and to a school at Hazlegrove House.
- 2.2.3 The section of the A303 that is to be upgraded is approximately 5.6kilometres long.
- 2.2.4 The extents of the scheme are illustrated in Figure 2.1. This figure also illustrates the line of the proposed route.
- ### **2.3 Scheme proposals**
- 2.3.1 The proposed scheme is to provide a continuous dual carriageway on the A303 linking the Podimore Bypass and the Sparkford Bypass. The scheme will involve the removal of at-grade junctions and direct accesses. Any new junctions will be constructed to grade separated standards, or to compact grade separated standards depending upon anticipated traffic flows.

Figure 2.1 Scheme Extents



### **3 Scheme description**

#### **3.1 Description of the existing route corridor**

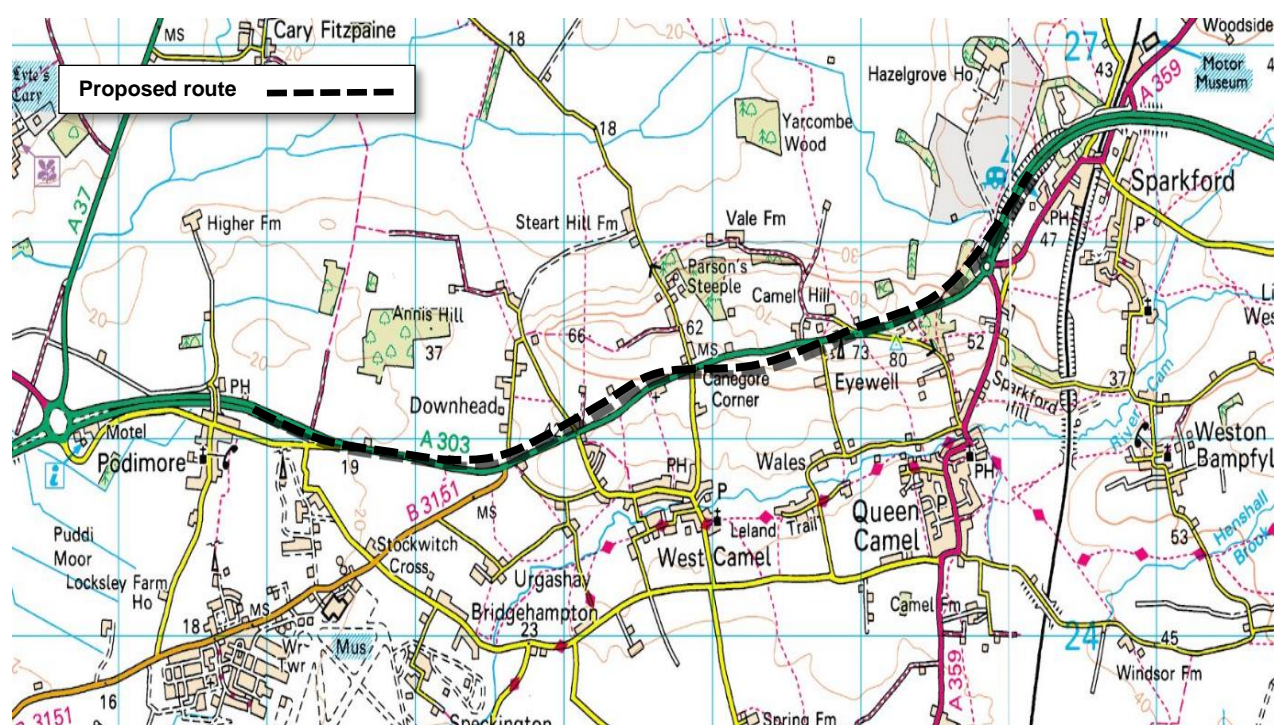
- 3.1.1 The A303 forms part of the strategic road network and a strategic link between the south-west peninsula and the rest of the south, south-east and London. The route is comprised of multiple road standards including dual carriageway, single carriageway, and single carriageway sections with overtaking lanes. Speed limits also vary between 40mph and 70mph depending on the character of the road and its surroundings.

#### **3.2 Existing project road**

- 3.2.1 The section of the A303 that is being upgraded as part of this project commences at the eastern limits of the existing dual carriageway Podimore Bypass. Travelling east, the route reaches the junction with the B3151 before bearing north east and rising upwards through Canegore Corner to reach the crest of Camel Hill at Eyewell. This section of the route is characterised by a single lane road, with double white lines prohibiting overtaking and subject to a 50mph speed limit. There are several priority junctions along the route giving access to the settlements of Queen Camel and West Camel to the south and Downhead to the north, as well as several farm accesses and parking laybys.
- 3.2.2 From the crest of Camel Hill, the route descends to meet the roundabout at the western limit of the dual carriageway at Sparkford Bypass ('Hazlegrove Roundabout'). This section comprises two lanes in the westbound direction, one lane in the eastbound direction and is also subject to a 50mph speed limit. Hazlegrove Roundabout forms a junction between the A303 and the A359 which runs south through Queen Camel and north-east through Sparkford. The roundabout also provides access to a service station, and to a school at Hazlegrove House.
- 3.2.3 The section of the A303 that is to be upgraded is almost 3.5 miles, or approximately 5.6 kilometres in length.
- 3.2.4 The extents of the Scheme are illustrated in Figure 3.1. This figure also illustrates the line of the proposed route.



Figure 3.1 Scheme extents





## **4 Items raised at the stage 1 road safety audit**

4.1.1 This section describes road safety related issues identified by the Audit Team that are associated with proposed A303 Sparkford to Ilchester Dualling scheme, along with the Design Team's response. A Reference Key Plan highlighting the location of each problem (extracted from the Audit Report) is shown in appendix A. Updated layout drawings are included in appendix B.

### **4.2 Problem 001**

- Location: Throughout scheme, at various locations.
- Summary: Presence of vehicles on roads adjacent to the A303.

4.2.1 There are a number of proposed local access roads (LARs) that will run adjacent to the new A303.

4.2.2 During the hours of darkness and / or in poor weather conditions, the headlights of vehicles travelling on adjacent LARs may impact on motorists travelling on the A303.

4.2.3 This has the propensity to confuse motorists, as these vehicles (at a distance) may appear to be travelling towards them in the same carriageway, which could increase the risk of collisions resulting from sudden braking and / or late lane changing.

4.2.4 The Audit Team have identified the following locations where this issue may be pertinent:

- North of A303, at Field Access road (approx. Chainage 900m – 1,950m);
- South of A303, at Field Access road (approx. Chainage 750m – 1,000m);
- South of A303, existing (retained) A303 LAR (approx. Chainage 3,000m – 3,250m);
- North of A303, Steart Hill South LAR (approx. Chainage 3,300m – 3,650m);
- North of A303, Access to Pepper Hill Cottage (approx. Chainage 4,350m – 4,450m).

### **Recommendation**

4.2.5 It is recommended that, where practicable, the alignment of adjacent LARs in close proximity to the A303 main carriageway, are reviewed and altered to reduce the risk of headlight glare.

- 4.2.6 Where this cannot be achieved it may be possible to provide a barrier, such as earth bunds or fencing, to prevent headlights being seen from the A303.

**Design Team Response: Accept the problem and recommendation made.**

4.2.7 An assessment of the locations identified in para 5.2.4 has deemed that vehicles on roads adjacent to the A303 could affect mainline traffic therefore, anti-dazzle fencing in accordance with TA57/87 Ch.5 is provided at the following locations;

- South of A303, existing (retained) A303 LAR (approx. Chainage 3,110m – 3,270m)
- North of A303, Steart Hill South LAR (approx. Chainage 3,310m – 3,400m);
- North of A303, Access to Pepper Hill Cottage (approx. Chainage 4,300m – 4,370m).

4.2.8 It should be noted that access tracks will be very lightly trafficked, particularly at night therefore, it is deemed that presence of vehicles on the below identified field access roads adjacent to the A303 would have a negligible effect on mainline traffic. Therefore, no provision of anti-dazzle fencing (or similar) has been made in the following locations;

- North of A303, at Field Access road (approx. Chainage 900m – 1,950m).
- South of A303, at Field Access road (approx. Chainage 750m – 1,000m).

**4.3 Problem 002**

- Location: A303 new carriageway, at various locations (listed).
- Summary: Sections of the new A303 alignment where stopping sight distance has not been achieved.

4.3.1 The Audit Team have been made aware (by information provided in the RSA Brief) that there are several sections of the new A303 route where sufficient Stopping Sight Distance (SSD) may not be provided, due to the topography and land constraints. These have been listed at:

- Between chainage 3,570m – 3,675m (westbound);
- Between chainage 4,395m – 4,615m (westbound);
- Between chainage 3,475m – 3,630m (eastbound).

4.3.2 Failure to provide alignments with sufficient SSD may increase the risk of collisions with objects in the carriageway, or with other stationary vehicles (such as a traffic queue).

## Recommendation

- 4.3.3 It is recommended that where appropriate SSD cannot be achieved, the Design Team undertake a safety risk assessment to quantify / qualify the level of risk to users.
- 4.3.4 The outcomes of the risk assessment should be referred to the Project Sponsor for their consideration.

### Design Team Response: Accept the problem and recommendation made.

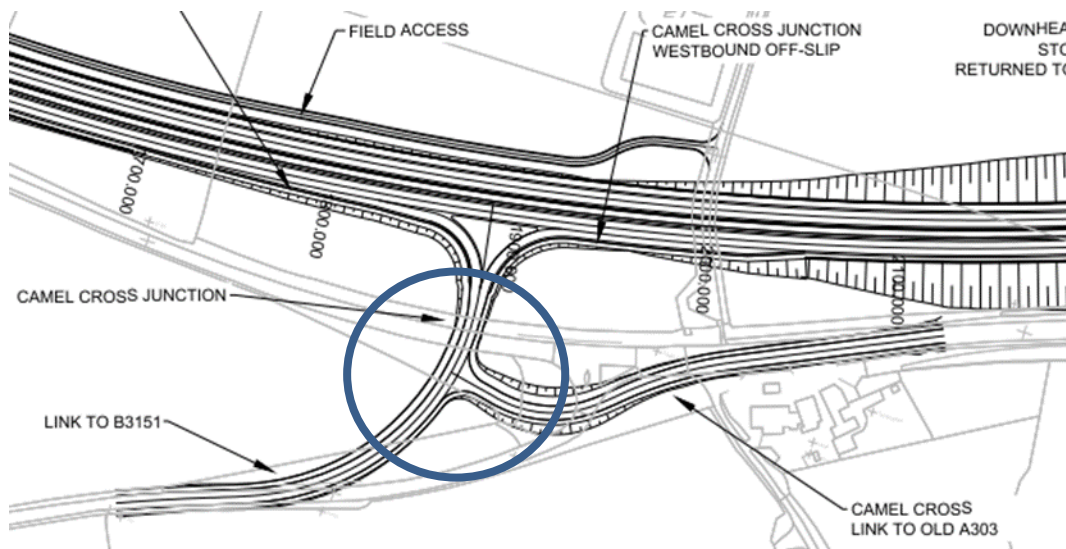
- 4.3.5 The layout design has been updated to improve visibility to meet the appropriate SSD (either desirable minimum or one step below, as part of a permitted relaxation), is provided.

## 4.4 Problem 003

- Location: B3151 at its junction with Camel Cross Link.
- Summary: Potential collision risk due to reduced visibility to vehicles manoeuvring at the junction.

- 4.4.1 The proposed dualling of the A303 is to be constructed off-line and the Camel Cross Junction will be relocated, maintaining direct access to / from the B3151.
- 4.4.2 There will be a new (realigned) junction on the B3151 with Camel Cross Link. This will be a new priority junction located approximately 50m south of the A303. It is understood that the design speed of this link road is 70kph.

Figure 4.1 : Proposed Camel Cross Link junction with the Link to B3151



Source: Mott MacDonald. Based on Drawing No.: HE551507-MMSJV-HGN-000-DR-CH-0103\_P05 (NOT TO SCALE)

- 4.4.3 The Audit Team is concerned that the proximity of the B3151 / Camel Cross Link junction to the A303 westbound exit (to the north) will make it difficult for vehicles to turn in / out safely. Furthermore, SSD to the junction for traffic travelling eastbound on the B3151 may also be reduced because of the highway alignment on approach (a left-hand bend).
- 4.4.4 This could result in an increased risk of collisions between right-turning in / out traffic at the junction for Camel Cross Link.

### **Recommendation**

- 4.4.5 It is recommended that the junction at B3151 / Camel Cross Link is relocated further south-west so as to provide improved visibility / SSD to the junction, in both directions. Typically, the desirable minimum SSD requirement is 120m for a design speed of 70kph (as specified in DMRB, TD9/93, Table 3).

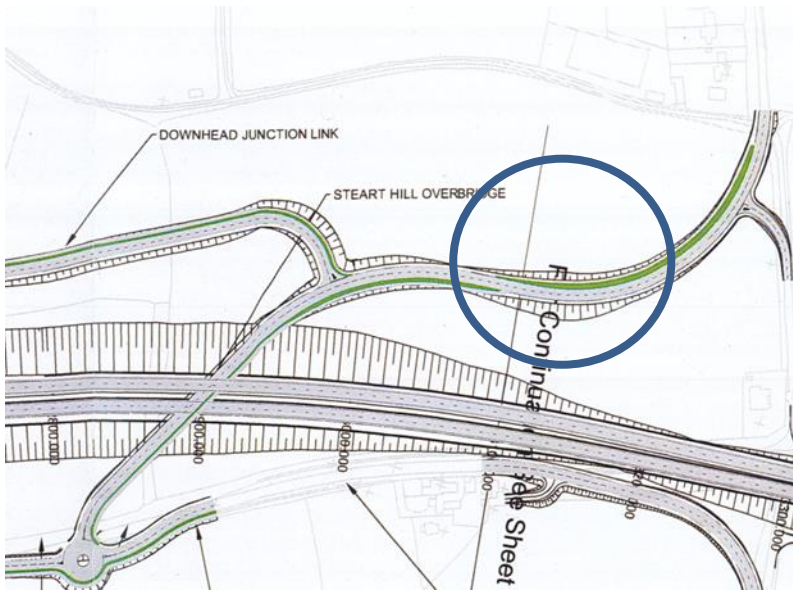
### **Design Team response: Accept the problem and suggest alternative recommendation.**

- 4.4.6 The junction has been moved approximately 50m further south.
- 4.4.7 In addition, the layout design has been changed from a T Junction with priority given to traffic leaving / entering the A303, to a T Junction with priority given to B3151. The change in junction form is considered to change driver behaviour as they would be expecting to slow as they approach the give way line to the B3151 junction from the A303. Appropriate forward visibility is provided with verges widened at the junction to provide full visibility at the junction. Queuing off the A303 is not considered to be an issue due to the relatively low traffic flows.

## **4.5 Problem 004**

- Location: Downhead Junction Link.
  - Summary: Lack of continuous NMU connectivity.
- 4.5.1 Downhead Junction will be constructed as a grade-separated junction. Access to / from the A303 eastbound carriageway is provided by a new link road. This connects with Steart Hill as a new priority junction with access to the old A303 carriageway, via a new overbridge and roundabout to the south.
- 4.5.2 On Downhead Junction Link a new footway route is proposed on the northern and western side. At the junction with Steart Hill, pedestrians will be expected to cross as no connecting footway will be provided on the northern side.

Figure 4.2 Showing discontinued footway on the northern side of Steart Hill.



Source: Mott MacDonald. Based on Drawing No.: HE551507-MMSJV-HGN-000-DR-CH-0103\_P05 (NOT TO SCALE)

4.5.3 The Audit Team is concerned that this gap in footway provision on the northern side of Steart Hill will result in pedestrians walking in the verge or on the carriageway, increasing the risk of collisions with passing vehicles.

### Recommendation

4.5.4 It is recommended that a continuous footway is provided between the Downhead Junction Link and Steart Hill, on the northern side.

### Design Team Response: Accept the problem and recommendation made.

4.5.5 The layout design has been updated to provide a continuous NMU route on Downhead Lane, Downhead junction Link and Steart Hill Link.

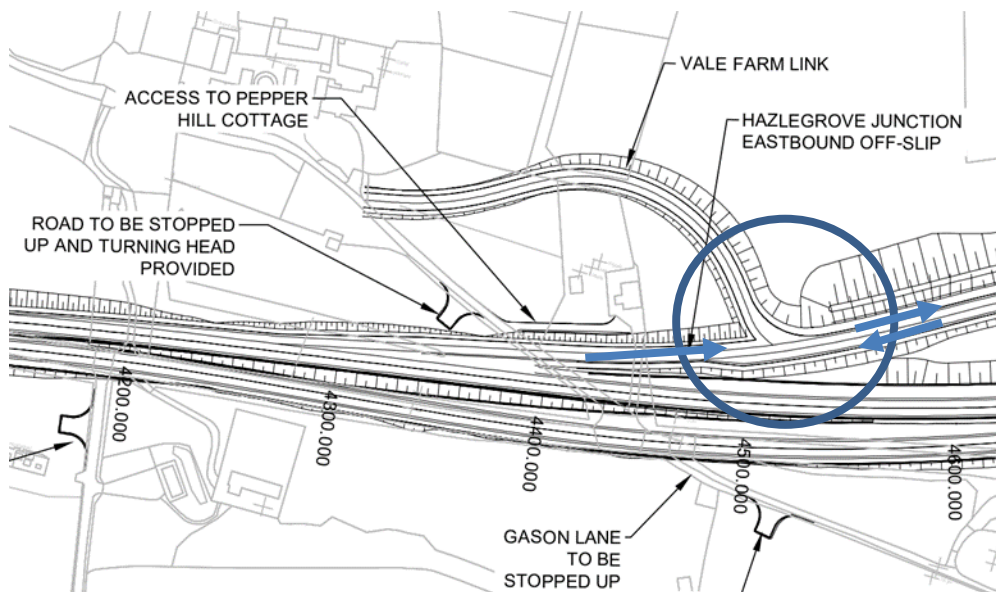
## 4.6 Problem 005

- Location: Camel Hill Link, at junction with Vale Farm Link.
- Summary: Appropriateness of junction type at end of slip-road.

4.6.1 At the end of the diverge from the new A303 eastbound carriageway a priority junction is proposed which provides access to Vale Farm. To the west of this junction, two-way traffic will be permitted on the Camel Hill Link.



Figure 4.3 Showing Camel Hill Link at junction with Vale Farm Link.



Source: Mott MacDonald. Based on Drawing No.: HE551507-MMSJV-HGN-000-DR-CH-0104\_P07 (NOT TO SCALE)

#### 4.6.2 The proposed priority junction at this location may result in the following road safety issues:

- Motorists approaching the junction from the A303 eastbound, may do so at high speeds, due to the long and straight alignment of the off-slip road. This has the potential to increase the risk of collisions, particularly at the new priority junction where slower vehicles may be turning into Vale Farm Link.
- It is unclear if left-turn manoeuvres into Vale Farm Link will be permitted. The Audit Team is concerned that if no deceleration lane is provided then vehicles slowing to carry out a left turn manoeuvre will be at risk of rear end shunt-type collisions with (potentially faster) traffic following behind.
- Motorists travelling westbound on Camel Hill Link (a two-way road) may not fully appreciate that access is prohibited beyond the Vale Farm Junction. Due to the alignment, there is a concern that vehicles will be able to join the A303 eastbound off slip, in the wrong direction, which is likely to result in head-on collisions.
- Drivers on the A303 eastbound off-slip may not anticipate oncoming (westbound) vehicles on Camel Hill Link, to the west of the Vale Farm Junction, particularly at night when only headlights can be seen at distance. This could result in sudden lane changing or braking manoeuvres increasing the late braking and / or loss of control collisions on the A303 eastbound off slip.

### Recommendation

#### 4.6.3 It is recommended that the form and function of the junction at Camel Hill Link / Vale Farm is reviewed.

4.6.4 The Audit Team is of the opinion that a roundabout may better serve traffic movements at this location and could address many of the issues highlighted (including the potential for high eastbound approach speeds and conflicts from turning movements).

4.6.5 Care should be taken to ensure that the length of the diverge is not affected by any new proposals at this junction.

**Design Team Response: Accept the problem and recommendation made**

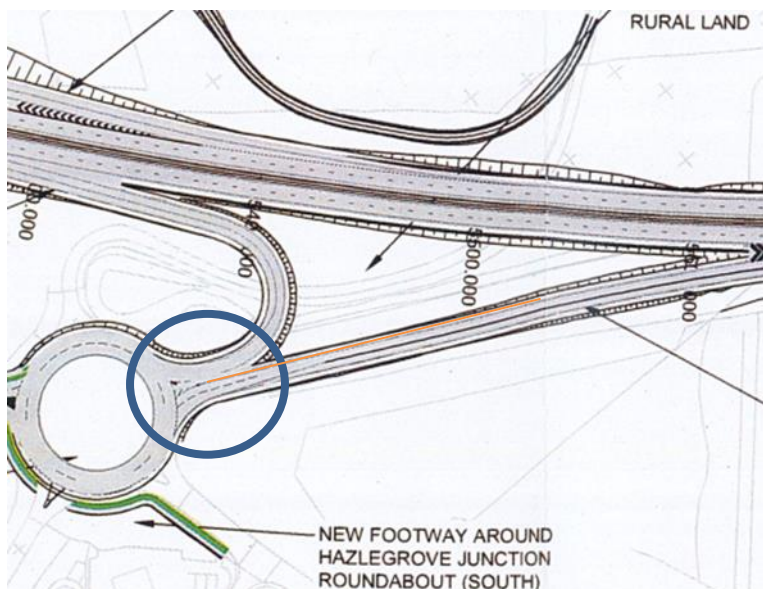
4.6.6 The layout design has been changed from a T Junction to a roundabout (see updated drawings in appendix B).

**4.7 Problem 006**

- Location: Hazlegrove Junction Roundabout, northern arm.
- Summary: Lack of segregation between traffic streams entering / exiting the roundabout.

4.7.1 The proposals indicate there will be a short two-way section on the northern arm of the roundabout, serving traffic from the westbound off-slip of the A303 arm toward the roundabout and traffic to the westbound A303 on-slip away from the roundabout. It is not clear if / how the opposing traffic streams will be segregated.

Figure 4.4 Showing proposed (unsegregated) two-way section on the northern arm.



Source: Mott MacDonald. Based on Drawing No.: HE551507-MMSJV-HGN-000-DR-CH-0105\_P06 (NOT TO SCALE)

4.7.2 This two-way arrangement could manifest in collisions due to:

- Vehicles entering the wrong side of the carriageway after exiting the roundabout, and / or;

- Increased risk of vehicles entering the A303 off-slip road in the wrong direction and potentially joining the A303 in the wrong direction.
- Furthermore, failure to provide appropriate segregation between the traffic streams (such as a constructed median / safety fence) may allow vehicles to carry out u-turning at this location, increasing the risk of collisions.

### Recommendation

4.7.3 It is recommended that suitable segregation between the traffic streams is provided at this location. This may include realigning the carriageway(s) to increase segregation.

### Design Team Response: Accept the problem and recommendation made

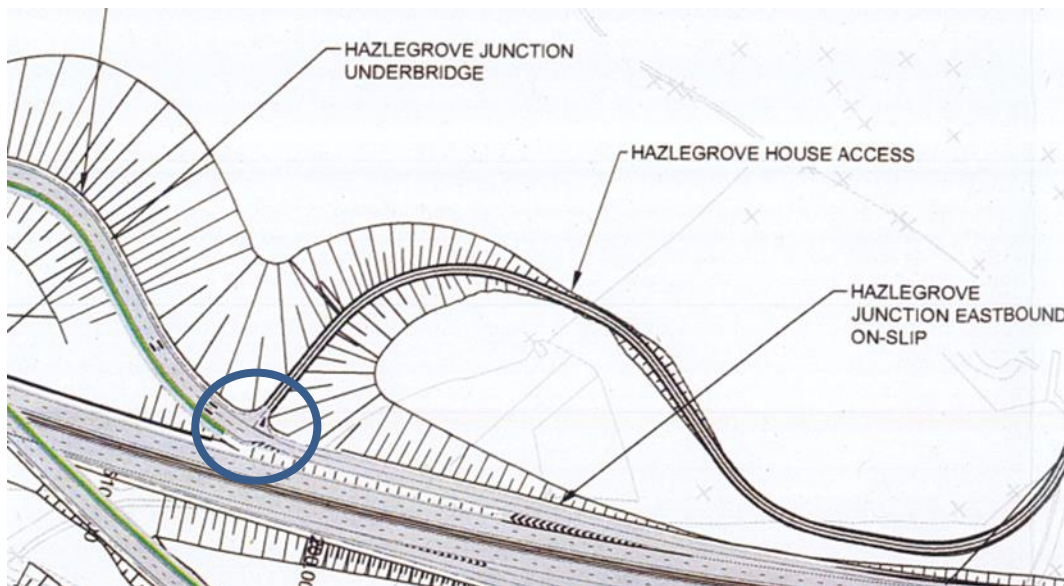
4.7.4 The layout design will include a kerbed splitter island.

## 4.8 Problem 007

- Location: Hazlegrove Link at its junction the Hazlegrove House Access.
- Summary: Inter-visibility at the junction.

4.8.1 On Hazlegrove Link, at its junction the Hazlegrove House Access, the alignment of the eastbound approach is such that it may impact on inter-visibility between vehicles manoeuvring at the junction.

Figure 4.5 Junction arrangement at Hazlegrove Link / Hazlegrove House Access



Source: Mott MacDonald. Based on Drawing No.: HE551507-MMSJV-HGN-000-DR-CH-0105\_P06 (NOT TO SCALE)

4.8.2 This could lead to an increased risk of collisions, particularly as there may be a tendency for higher eastbound traffic speeds, accelerating to join the A303 eastbound.

### **Recommendation**

4.8.3 It is recommended that the visibility splay between vehicles on Hazlegrove Link (eastbound) and those waiting / attempting to turn right (westbound) from the access road at the junction are calculated and provided.

4.8.4 This includes providing sufficient SSD on approach to the junction.

### **Design Team Response: Accept the problem but suggest alternative recommendation.**

4.8.5 Access to Hazlegrove House has been removed from Hazlegrove Junction eastbound on-slip layout design. An alternative private means of access to Hazlegrove House has been provided between the roundabout located to the western extent of the 690m long Camel Hill Link and Hazlegrove Junction eastbound on-slip. Desirable minimum sight stopping distance is for achieved for both junctions. Through this provision, both Hazlegrove House access and Hazlegrove eastbound on-slip have dedicated junctions/access located 150m apart. This has deconflicted local traffic wishing to access/egress Hazlegrove House with that of vehicles wishing to join/re-join the eastbound A303.

### **4.9 Problem 008**

- Location: Camel Hill Link, at its junctions with Hazlegrove Link and Ridge Copse Link.
- Summary: Risk of collisions resulting from turning manoeuvres.

4.9.1 On Camel Hill Link road there are two priority junctions proposed, at Hazlegrove Link (on the north-west side of the A303) and Ridge Copse Link on the south-east side.

4.9.2 It is unclear what SSD will be provided to the back of stationary vehicles, waiting to turn at these junctions. At the junction with Hazlegrove Link, there may be reduced visibility due to the presence of Hazlegrove Junction Underbridge (the A303 main carriageway).

4.9.3 The proposals indicate that there will be no right-turn facilities at these junctions (such as a right-turn pocket with ghost island). Without adequate provision for right-turning there may be an increased risk of shunt type collisions on Camel Hill Link at Hazlegrove Link (north-westbound) and Ridge Copse Link (south-eastbound).

4.9.4 The Audit Team is of the opinion that right-turning manoeuvres may be more prevalent at Camel Hill Link / Hazlegrove Link junction, by motorists seeking the A303 eastbound from the Service Area.

## **Recommendation**

- 4.9.5 It is recommended that sufficient SSD is provided to stationary vehicles that may be waiting to turn right – especially at Hazlegrove Link (north-westbound), where the bridge may impact on forward visibility.
- 4.9.6 Furthermore, the requirement for right-turn facilities at these junctions are investigated and included in the design, where appropriate.

### **Design Team Response: Accept the problem and recommendation made**

- 4.9.7 The required forward visibility to waiting vehicles has been provided. The junction gaining access to Ridge Corpse Link from Camel Hill Link has been removed with access now gained directly from Hazlegrove Roundabout.
- 4.9.8 Access to Hazlegrove House has been removed from Hazlegrove Junction eastbound on-slip. An alternative private means of access to Hazlegrove House has been provided between the compact roundabout located to the western extent of Camel Hill Link and Hazlegrove Junction eastbound on-slip.
- 4.9.9 Provision of right turn facilities has been investigated but are not considered necessary due to the relatively low flows associated with traffic travelling westbound on Camel Hill Link. The majority of traffic will be turning right onto the Hazlegrove Junction eastbound on-Slip from Camel Hill Link and therefore slowing.

## **Appendix A Road Safety Audit**



# **A303 Sparkford to Ilchester Dualling**

## **Stage 1 Road Safety Audit**

**March 2018**  
**264223ON-TPN-ITD-387-B**

# A303 Sparkford to Ilchester Dualling

## Stage 1 Road Safety Audit

March 2018

264223ON-TPN-ITD-387-B

### Revision Record

Revision No	Date	Originator	Checker	Approver	Description
A	08/03/2018	M S Ring	B A Pledge	S A Finney	First Issue
B	19/03/2018	M S Ring	B A Pledge	S A Finney	Second Issue

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# 1 Introduction

This report describes a Stage 1 Road Safety Audit (RSA) carried out on the A303 Sparkford to Ilchester Dualling scheme, in Somerset (Highways England Pin No. HE551507). The proposed scheme is to replace the existing single carriageway section and connect to the existing dual carriageway sections to the east and west.

The purpose of the scheme is to provide a high quality dual two lane all-purpose carriageway on the A303 trunk road linking existing dual carriageway sections and it includes grade separated interchanges and removal of direct access junctions to support the free flow movement of traffic.

The scheme is located within Highways England Area 2 and the Maintaining Agent is Skanska.

The Audit was carried out at the request of Mott MacDonald Sweco Joint Venture (MMSJV) on behalf of their client, Highways England (Project Sponsor). The RSA Brief was approved by Mr Tom Roberts, Highways England, on 07/02/2018.

The Audit Team consisted of:

**B A Pledge** MCIHT MSoRSA (Team Leader)

Mott MacDonald, Integrated Transport Division

**M S Ring** BSc Hons MCIHT MSoRSA (Team Member)

Mott MacDonald, Integrated Transport Division

It is confirmed that this is a Stage 1 RSA and that the audit has been undertaken upon completion of the preliminary design at 'Design Fix 3' and in accordance with the Highways England Departmental Standard DMRB HD19/15.

The audit took place at the Southampton office of Mott MacDonald and consisted of a detailed examination of the submitted documentation and drawings listed in **Appendix A**.

The Audit Team visited the site of the proposed scheme on Tuesday 20<sup>th</sup> February 2018 between 11:30hrs and 15:00hrs. During the visit, the weather conditions were clear and the road surface was dry. Traffic conditions were generally moderate but free flowing. The Audit Team were accompanied on-site by Mr Paul De-Maria, a Senior Road Safety Auditor from Somerset County Council.

The terms of reference for RSA are described in DMRB HD 19/15. The Audit Team has examined and reported only on the road safety implications of the scheme as presented, and has not examined or verified the compliance of the designs to any other criteria.

The comments and recommendations for road safety improvements made in this report seek to address matters that might have an adverse effect on road safety in the context of the chosen design. No attempt has been made to comment on the justification of the scheme and the auditors accept no responsibility for the design or construction of the scheme.

All the issues raised in this report are considered to be required for action. The comments contained in the report are based on safety related concerns and as such the Design Engineer will need to consider carefully how to respond to each of the issues. All responses should be provided to the Project Sponsor within a Road Safety Audit Response Report and kept on file for future reference. Refer to DMRB HD19/15 Chapter 3 'Subsequent Actions'.

Identified road safety problems are referenced to the drawings provided, and the locations have been indicated on the Reference Key Plans at **Appendix C**.

## **Scheme Description**

The scheme is proposing to replace the existing single carriageway section of the A303 between Sparkford and Ilchester with an all-purpose dual two-lane carriageway.

The scheme objectives are to relieve congestion, smooth traffic flow, improve journey times and reliability, maintain a safe and serviceable network for all road users and support the economic health of the region and nation.

A detailed scheme description has been taken from the RSA Brief:

*The proposed scheme is to provide a dual carriageway on the A303 between Sparkford and Ilchester in Somerset. This will replace the existing single carriageway section and connect the existing dual carriageway sections to the east and west.*

*The scheme will involve the replacement of existing at-grade junctions and direct accesses with three new junctions. A junction at Hazlegrove will include slip road connections between both carriageways and the local road network. A junction at Downhead will provide a connection between the eastbound carriageway and the local road network. A junction at Camel Cross will provide a connection between the westbound carriageway and the local road network.*

*Two bridges will provide local road crossings of the proposed dual carriageway. An underbridge will provide a crossing as part of the Hazlegrove Junction and an overbridge will provide a crossing as part of the Downhead and Camel Cross junctions.*

*NMU provision includes diversion of existing NMU routes where these are affected by the dualling scheme, two new crossings making use of proposed local road crossings and a cycle diversion strategy that will utilise existing local roads located to the south of the scheme.*

## Road Safety Audit Brief

A Stage 1 RSA Brief for the A303 Sparkford to Ilchester dualling scheme was provided by the MMSJV Design Manager, Mr Chris Setters on 12/02/2018 (Document reference: HE551507-MMSJV-HGN-000-RP-CH-0039).

## Details of Departures and Relaxations

A number of departures and relaxations from standards have been identified by the Design Team. These were provided to the Audit Team within Section 5.1 of the RSA Brief.

Taken from the Audit Brief:

*The design of the dual carriageway currently includes three combination departures as listed in the Table below.*

3570 – 3675 Westbound	$K=100$ , $SSD=209$	Combination departure
4395 – 4615 Westbound	$K=100$ , $SSD=203$	Combination departure
3475 – 3630 Eastbound	$K=100$ , $SSD=225$	Combination departure

*A formal application for these departures has not yet been made.*

*The reason for the proposed departures is to facilitate construction through this section where the proposed dual carriageway crosses the existing carriageway. At this location, the topography comprises a summit and available space either side of the road corridor is restricted by adjacent land constraints, including the scheduled monument at Camel Hill Farm and the MOD signal station. A buildability review is currently being undertaken, and if this confirms that this departure would facilitate safer construction then a formal application for departures will be made. Otherwise, the design will be amended to remove these sub-standard elements.*

*In previous stages, a potential weaving departure between the Hazlegrove Junction and the next junction on the eastbound carriageway (A359, Camelot) was identified in the 'Departures from Standards Checklist'. However, this has now been designed out.*

*No Design Strategy Records have been produced for this scheme at this stage. However, the 'Geometric Design Input' working note (document HE551507-MMSJV-HGN-000-RP-CH-0006) provides details of the main input parameters for the layout of the scheme.*



## Factors Affecting Road Safety

One potential factor that may impact on road safety has been brought to the attention of to the Audit Team in the RSA Brief:

*It has been identified that the scheme is likely to lead to increased local traffic flows, compared to the 'do minimum' scenario, through the nearby villages of Sparkford and West Camel. This is detailed in the document "Provisional Local Traffic Information" which is provided with this brief.*

## 3 Items raised at this Stage 1 Audit

This section describes road safety related issues identified by the Audit Team that are associated with proposed A303 Sparkford to Ilchester dualling scheme. A Reference Key Plan is shown at **Appendix C**.

### 3.1 Problem 001

*Location:* Throughout scheme, at various locations.

*Summary:* Presence of vehicles on roads adjacent to the A303.

There are a number of proposed local access roads (LARs) that will run adjacent to the new A303.

During the hours of darkness and / or in poor weather conditions, the headlights of vehicles travelling on adjacent LARs may impact on motorists travelling on the A303.

This has the propensity to confuse motorists, as these vehicles (at a distance) may appear to be travelling towards them in the same carriageway, which could increase the risk of collisions resulting from sudden braking and / or late lane changing.

The Audit Team have identified the following locations where this issue may be pertinent:

- North of A303, at Field Access road (approx. Chainage 900 – 1950);
- South of A303, at Field Access road (approx. Chainage 750 – 1000);
- South of A303, existing (retained) A303 LAR (approx. Chainage 3000 – 3250);
- North of A303, Blue Haze Access LAR (approx. Chainage 3300 – 3650);
- North of A303, Access to Pepper Hill Cottage (approx. Chainage 4350 – 4450).

### Recommendation

It is recommended that, where practicable, the alignment of adjacent LARs in close proximity to the A303 main carriageway, are reviewed and altered to reduce the risk of headlight glare.

Where this cannot be achieved it may be possible to provide a barrier, such as earth bunds or fencing, to prevent headlights being seen from the A303.

## 3.2 Problem 002

*Location: A303 new carriageway, at various locations (listed).*

*Summary: Sections of the new A303 alignment where Stopping Sight Distance has not been achieved.*

The Audit Team have been made aware (by information provided in the RSA Brief) that there are several sections of the new A303 route where sufficient Stopping Sight Distance (SSD) may not be provided, due to the topography and land constraints. These have been listed at:

- Between chainage 3570 – 3675 (westbound);
- Between chainage 4395 – 4615 (westbound);
- Between chainage 3475 – 3630 (eastbound).

Failure to provide alignments with sufficient SSD may increase the risk of collisions with objects in the carriageway, or with other stationary vehicles (such as a traffic queue).

### Recommendation

It is recommended that where appropriate SSD cannot be achieved, the Design Team undertake a safety risk assessment to quantify / qualify the level of risk to users.

The outcomes of the risk assessment should be referred to the Project Sponsor for their consideration.

### 3.3 Problem 003

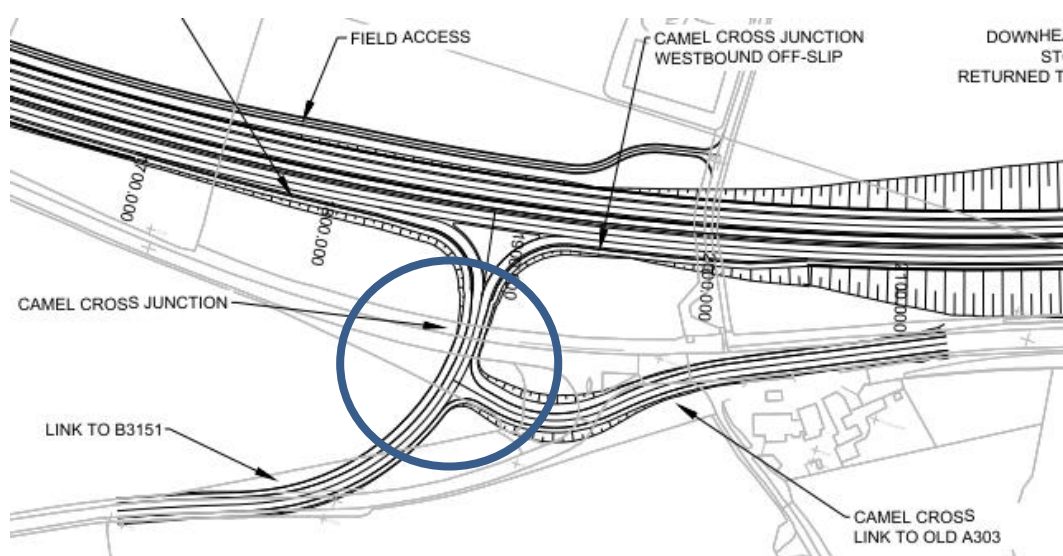
*Location:* B3151 at its junction with Camel Cross Link.

*Summary:* Potential collision risk due to reduced visibility to vehicles manoeuvring at the junction.

The proposed dualling of the A303 is to be constructed off-line and the Camel Cross Junction will be relocated, maintaining direct access to / from the B3151.

There will be a new (realigned) junction on the B3151 with Camel Cross Link. This will be a new priority junction located approximately 50m south of the A303. It is understood that the design speed of this link road is 70kph.

**Figure 1:** Proposed Camel Cross Link junction with the Link to B3151



Source: Mott MacDonald. Based on Drawing No.: HE551507-MMSJV-HGN-000-DR-CH-0103\_P05 (NOT TO SCALE)

The Audit Team is concerned that the proximity of the B3151 / Camel Cross Link junction to the A303 westbound exit (to the north) will make it difficult for vehicles to turn in / out safely. Furthermore, SSD to the junction for traffic travelling eastbound on the B3151 may also be reduced because of the highway alignment on approach (a left-hand bend).

This could result in an increased risk of collisions between right-turning in / out traffic at the junction for Camel Cross Link.

### Recommendation

It is recommended that the junction at B3151 / Camel Cross Link is relocated further south-west so as to provide improved visibility / SSD to the junction, in both directions. Typically, the desirable minimum SSD requirement is 120m for a design speed of 70kph (as specified in DMRB TD9/93 Table 3).

### 3.4 Problem 004

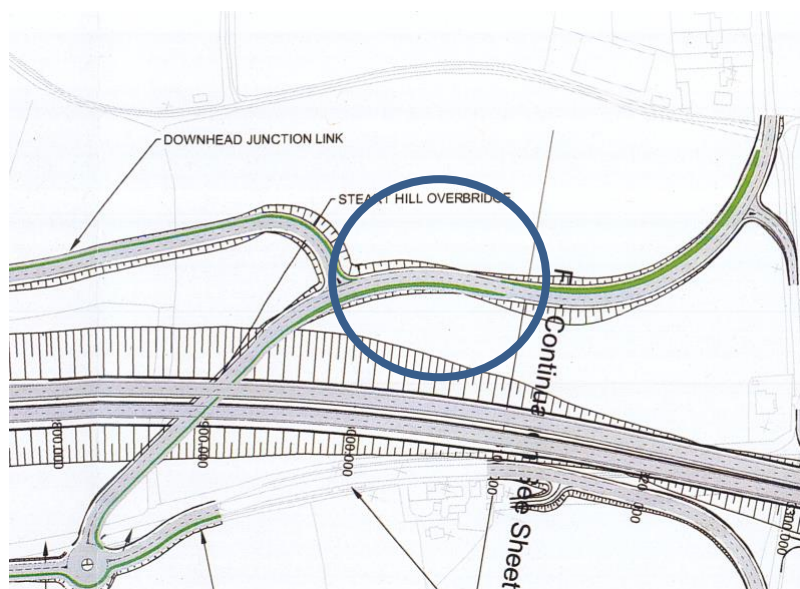
*Location: Downhead Junction Link.*

*Summary: Lack of continuous NMU connectivity.*

Downhead Junction will be constructed as a grade-separated junction. Access to / from the A303 eastbound carriageway is provided by a new link road. This connects with Steart Hill as a new priority junction with access to the old A303 carriageway, via a new overbridge and roundabout to the south.

On Downhead Junction Link a new footway route is proposed on the northern and western side. At the junction with Steart Hill pedestrians will be expected to cross, as no connecting footway will be provided on the northern side.

**Figure 2:** Showing discontinued footway on the northern side of Steart Hill.



Source: Mott MacDonald. Based on Drawing No.: HE551507-MMSJV-HGN-000-DR-CH-0103\_P05 (NOT TO SCALE)

The Audit Team is concerned that this gap in footway provision on the northern side of Steart Hill will result in pedestrians walking in the verge or on the carriageway, increasing the risk of collisions with passing vehicles.

### Recommendation

It is recommended that a continuous footway is provided between the Downhead Junction Link and Steart Hill, on the northern side.

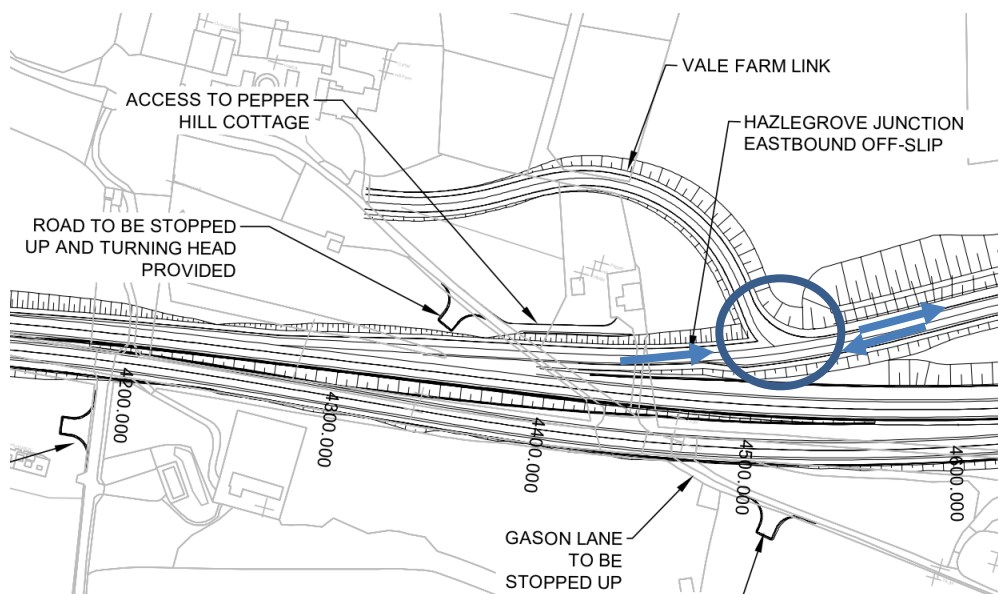
### 3.5 Problem 005

*Location:* Camel Hill Link, at junction with Vale Farm Link.

*Summary:* Appropriateness of junction type at end of slip-road.

At the end of the diverge from the new A303 eastbound carriageway a priority junction is proposed, which provides access to Vale Farm. To the west of this junction, two-way traffic will be permitted on the Camel Hill Link.

**Figure 3:** Showing Camel Hill Link at junction with Vale Farm Link.



Source: Mott MacDonald. Based on Drawing No.: HE551507-MMSJV-HGN-000-DR-CH-0104\_P07 (NOT TO SCALE)

The proposed priority junction at this location may result in the following road safety issues:

- Motorists approaching the junction from the A303 eastbound, may do so at high speeds, due to the long and straight alignment of the off-slip road. This has the potential to increase the risk of collisions, particularly at the new priority junction where slower vehicles may be turning into Vale Farm Link.
- It is unclear if left-turn manoeuvres into Vale Farm Link will be permitted. The Audit Team is concerned that if no deceleration lane is provided then vehicles slowing to carry out a left turn manoeuvre will be at risk of rear end shunt-type collisions with (potentially faster) traffic following behind.
- Motorists travelling westbound on Camel Hill Link (a two-way road) may not fully appreciate that access is prohibited beyond the Vale Farm Junction. Due to the alignment, there is a concern that vehicles will be able to join the A303 eastbound off slip, in the wrong direction, which is likely to result in head-on collisions.



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- Drivers on the A303 eastbound off-slip may not anticipate oncoming (westbound) vehicles on Camel Hill Link, to the west of the Vale Farm Junction, particularly at night when only headlights can be seen at distance. This could result in sudden lane changing or braking manoeuvres increasing the late braking and / or loss of control collisions on the A303 eastbound off slip.

### **Recommendation**

It is recommended that the form and function of the junction at Camel Hill Link / Vale Farm is reviewed.

The Audit Team is of the opinion that a roundabout may better serve traffic movements at this location and could address many of the issues highlighted (including the potential for high eastbound approach speeds and conflicts from turning movements).

Care should be taken to ensure that the length of the diverge is not affected by any new proposals at this junction.

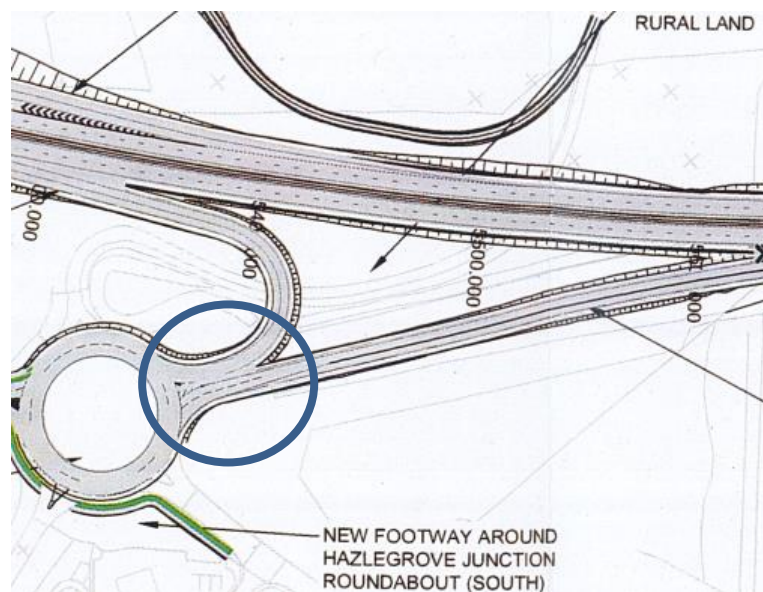
### 3.6 Problem 006

*Location: Hazlegrove Junction Roundabout, northern arm.*

*Summary: Lack of segregation between traffic streams entering / exiting the roundabout.*

The proposals indicate there will be a short two-way section on the northern arm of the roundabout, serving traffic from the westbound off-slip of the A303 arm toward the roundabout and traffic to the westbound A303 on-slip away from the roundabout. It is not clear if / how the opposing traffic streams will be segregated.

**Figure 4:** Showing proposed (unsegregated) two-way section on the northern arm.



Source: Mott MacDonald. Based on Drawing No.: HE551507-MMSJV-HGN-000-DR-CH-0105\_P06 (NOT TO SCALE)

This two-way arrangement could manifest in collisions due to:

- Vehicles entering the wrong side of the carriageway after exiting the roundabout, and / or;
- Increased risk of vehicles entering the A303 off-slip road in the wrong direction and potentially joining the A303 in the wrong direction.

Furthermore, failure to provide appropriate segregation between the traffic streams (such as a constructed median / safety fence) may allow vehicles to carry out u-turning at this location, increasing the risk of collisions.

### Recommendation

It is recommended that suitable segregation between the traffic streams is provided at this location. This may include realigning the carriageway(s) to increase segregation.

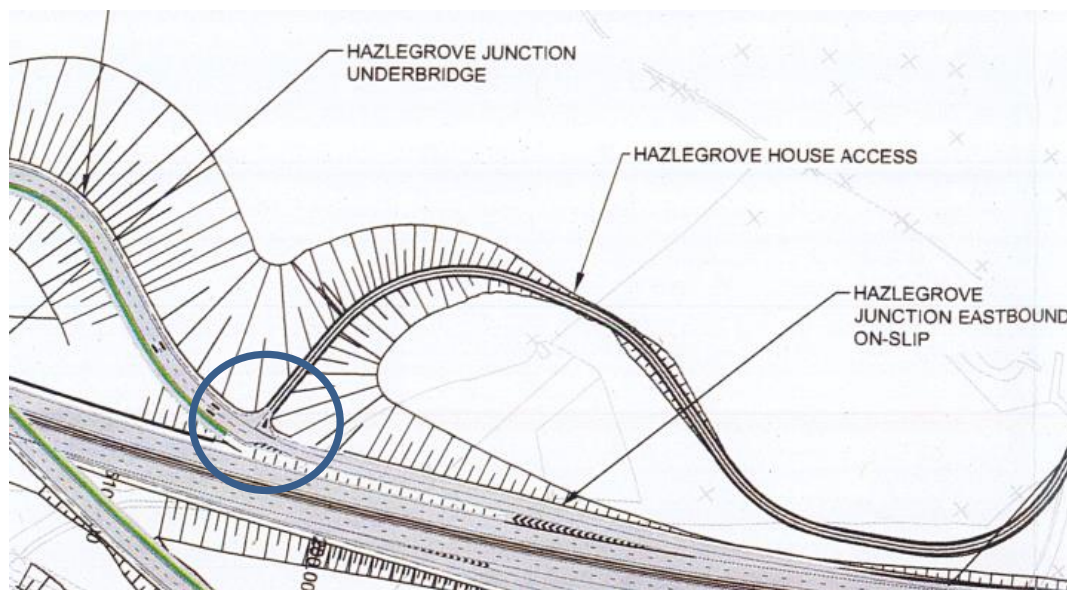
### 3.7 Problem 007

*Location: Hazlegrove Link at its junction the Hazlegrove House Access.*

*Summary: Inter-visibility at the junction.*

On Hazlegrove Link, at its junction the Hazlegrove House Access, the alignment of the eastbound approach is such that it may impact on inter-visibility between vehicles manoeuvring at the junction.

**Figure 5:** Junction arrangement at Hazelgrove Link / Hazelgrove House Access



Source: Mott MacDonald. Based on Drawing No.: HE551507-MMSJV-HGN-000-DR-CH-0105\_P06 (NOT TO SCALE)

This could lead to an increased risk of collisions, particularly as there may be a tendency for higher eastbound traffic speeds, accelerating to join the A303 eastbound.

### Recommendation

It is recommended that the visibility splay between vehicles on Hazlegrove Link (eastbound) and those waiting / attempting to turn right (westbound) from the access road at the junction are calculated and provided.

This includes providing sufficient SSD on approach to the junction.

### **3.8 Problem 008**

*Location: Camel Hill Link, at its junctions with Hazlegrove Link and Ridge Copse Link.*

*Summary: Risk of collisions resulting from turning manoeuvres.*

On Camel Hill Link road there are two priority junctions proposed, at Hazlegrove Link (on the north-west side of the A303) and Ridge Copse Link on the south-east side.

It is unclear what SSD will be provided to the back of stationary vehicles, waiting to turn at these junctions. At the junction with Hazlegrove Link, there may be reduced visibility due to the presence of Hazelgrove Junction Underbridge (the A303 main carriageway).

The proposals indicate that there will be no right-turn facilities at these junctions (such as a right-turn pocket with ghost island). Without adequate provision for right-turning there may be an increased risk of shunt type collisions on Camel Hill Link at Hazlegrove Link (north-westbound) and Ridge Copse Link (south-eastbound).

The Audit Team is of the opinion that right-turning manoeuvres may be more prevalent at Camel Hill Link / Hazlegrove Link junction, by motorists seeking the A303 eastbound from the Service Area.

### **Recommendation**

It is recommended that sufficient SSD is provided to stationary vehicles that may be waiting to turn right – especially at Hazlegrove Link (north-westbound), where the bridge may impact on forward visibility.

Furthermore, the requirement for right-turn facilities at these junctions are investigated and included in the design, where appropriate.

## 4 Audit Team Statement

We certify that this audit has been carried out in accordance with the Highways England Departmental Standard for Road Safety Audit, DMRB HD 19/15.

### Road Safety Audit Team Leader

**B A Pledge MCIHT, MSoRSA**

*Holder of a Certificate of Competency in Road Safety Audit, Sep 2012*

Senior Road Safety Engineer

Signed:

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Date: 19<sup>th</sup> March 2018

### Road Safety Audit Team Member

**M S Ring BSc (Hons), MCIHT, MSoRSA**

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Principal Traffic Engineer

Signed

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Date: 19<sup>th</sup> March 2018

### Others Involved (e.g. Observers, Police, Network Management, specialist advisor)

**Paul De-Maria BSc (Hons) MIHE EngTech**

*Holder of a Certificate of Competency in Road Safety Audit, Nov 2012*

Senior Road Safety Auditor, Somerset County Council.

## Appendix A Drawings and Documents

**Table A-1** and **Table A-2** list the drawings and documents provided for this Road Safety Audit.

**Table A-1: Documents**

Document Ref	Document Title	Rev
Client Scheme Requirements.pdf	Client Scheme Requirements	A
HE551507-MMSJV-GEN-000-RP-UU-0003	Scheme Assessment Report	P03
363903-09-010-RE-005	NMU Audit Report	P01
-	Provisional Local Traffic Information	-
HE551507-MMSJV-HGN-000-RP-CH-0006	Geometric Design Input Working Note	-

**Table A-2: Drawings**

Drawing Ref	Drawing Title	Rev
HE551507-MMSJV-LSI-000-DR-UU-2011	Location Plan	P01
-	Environmental Constraints Plan	-
HE551507-MMSJV-HGN-000-DR-CH-0101	Plan Option 1	P05
HE551507-MMSJV-HGN-000-DR-CH-0005	Cross Section Type – D2AP Balanced and super elevated	P01
HE551507-MMSJV-HGN-000-DR-CH-0006	Cross Section Type – S2 Series	P01
HE551507-MMSJV-HGN-000-DR-CH-0007	Cross Section Type – Slip Roads and Interchange Links	P01
HE551507-MMSJV-HGN-000-DR-CH-0008	Cross Section Type – Compact Connectors	P01
HE551507-MMSJV-HGN-000-DR-CH-0009	Cross Section Type – Access and Rights of Ways	P01
HE551507-MMSJV-HGN-000-DR-CH-0102	Plan and profile. Sheet 1 of 4.	P05
HE551507-MMSJV-HGN-000-DR-CH-0103	Plan and profile. Sheet 2 of 4.	P05
HE551507-MMSJV-HGN-000-DR-CH-0104	Plan and profile. Sheet 3 of 4.	P07
HE551507-MMSJV-HGN-000-DR-CH-0105	Plan and profile. Sheet 4 of 4.	P04
HE551507-MMSJV-HSR-000-DR-CH-0001	Side / Slip Road Layout - Sheet 1	P03



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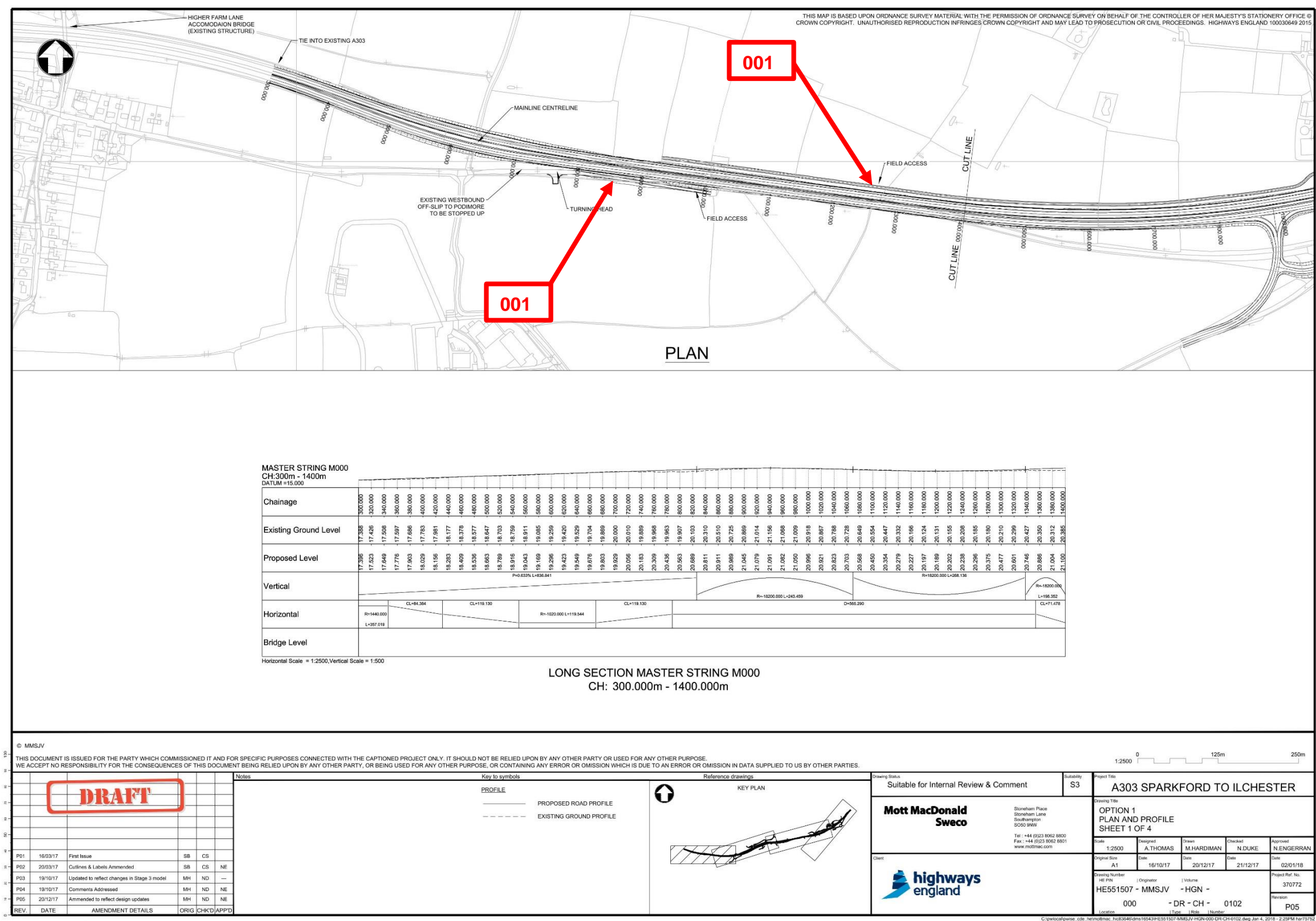
HE551507-MMSJV-HSR-000-DR-CH-0002	Side / Slip Road Layout - Sheet 2	P04
HE551507-MMSJV-HSR-000-DR-CH-0003	Engineering Sections - Sheet 1	P03
HE551507-MMSJV-HSR-000-DR-CH-0004	Engineering Sections - Sheet 2	P03
HE551507-MMSJV-HSR-000-DR-CH-0005	Engineering Sections - Sheet 3	P02
HE551507-MMSJV-HDG-000-DR-CD-0101	Proposed Highway Drainage Plan Layout. Sheet 1	P01
HE551507-MMSJV-HDG-000-DR-CD-0102	Proposed Highway Drainage Plan Layout. Sheet 2	P01
HE551507-MMSJV-HDG-000-DR-CD-0103	Proposed Highway Drainage Plan Layout. Sheet 3	P01
HE551507-MMSJV-HDG-000-DR-CD-0104	Proposed Highway Drainage Plan Layout. Sheet 4	P01
HE551507-MMSJV-HGN-000-DR-CH-0208	Rights of Way and Access. Sheet 1 of 4.	P02
HE551507-MMSJV-HGN-000-DR-CH-0209	Rights of Way and Access. Sheet 2 of 4.	P02
HE551507-MMSJV-HGN-000-DR-CH-0210	Rights of Way and Access. Sheet 3 of 4.	P05
HE551507-MMSJV-HGN-000-DR-CH-0211	Rights of Way and Access. Sheet 4 of 4.	P05
HE551507-MMSJV-HGN-000-DR-CH-0206	Tourist Signage Strategy.	P04
HE551507-MMSJV-HGN-000-DR-CH-0207	Cycle Signage Strategy.	P03
HE551507-MMSJV-HGN-000-DR-CH-0212	Primary Route Signage Strategy	P01
HE551507-MMSJV-HGN-000-DR-CH-0213	Non-Primary Route Signage Strategy	P01
HE551507-MMSJV-HGN-000-DR-CH-0214	Local Destination Signage Strategy	P01
HE551507-MMSJV-MTR-000-DR-TR-0017	Annual Average Daily Traffic – Option 1	-



## **Appendix B      Reference Key Plans**

Figure C-1: Keyplan – Option 1 Plan and Profile (Sheet 1 of 4)	19
Figure C-2: Keyplan – Option 1 Plan and Profile (Sheet 2 of 4)	21
Figure C-3: Keyplan – Option 1 Plan and Profile (Sheet 3 of 4)	23
Figure C-4: Keyplan – Option 1 Plan and Profile (Sheet 4 of 4)	25

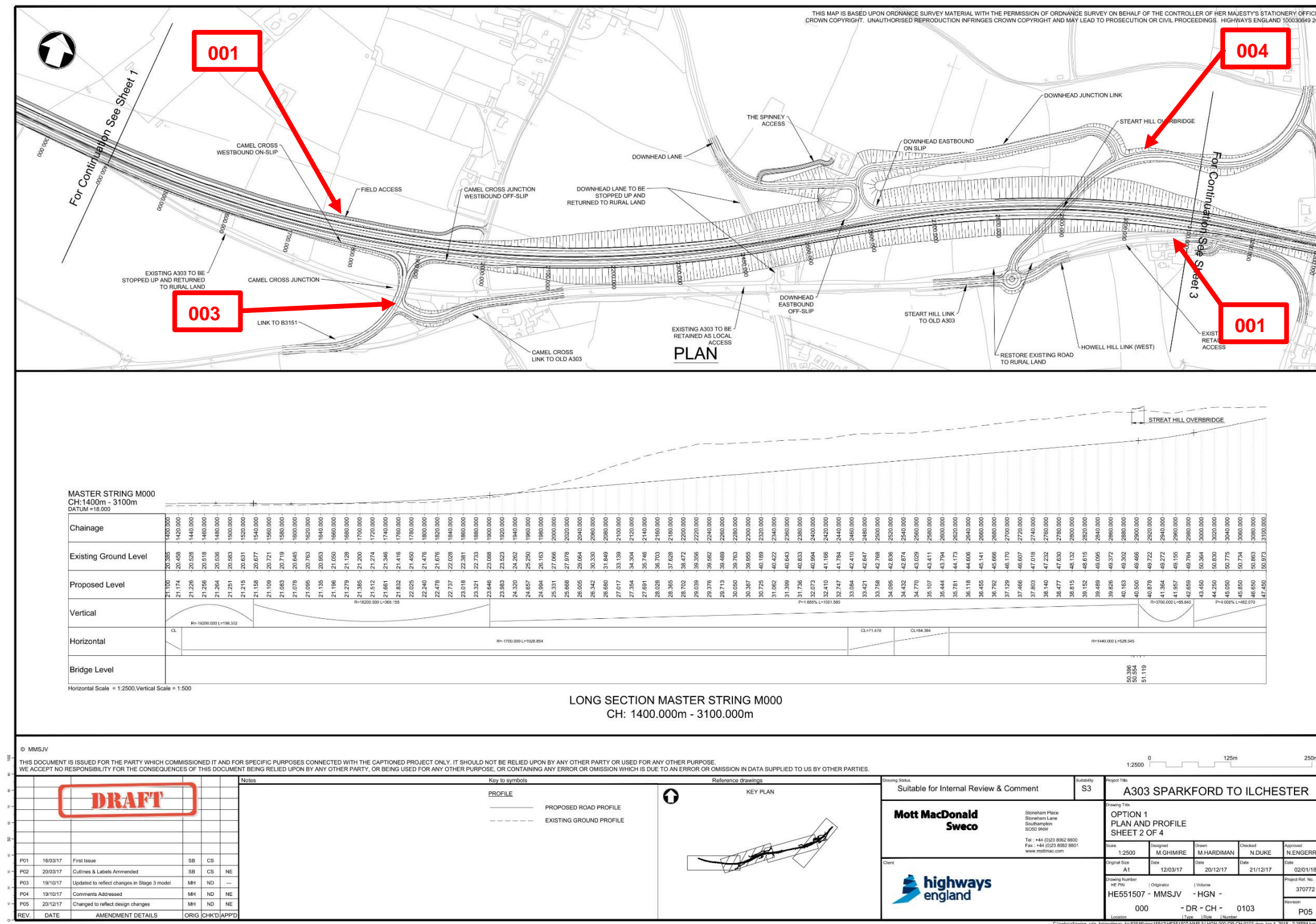
Figure C-1: Keyplan – Option 1 Plan and Profile (Sheet 1 of 4). Numbers refer to Problems in report.



Source: Mott MacDonald, based on Drawing No.: HE551507-MMSJV-HGN-000-DR-CH-0102 P05 (Not to scale)

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**Figure C-2: Keyplan – Option 1 Plan and Profile (Sheet 2 of 4). Numbers refer to Problems in report.**



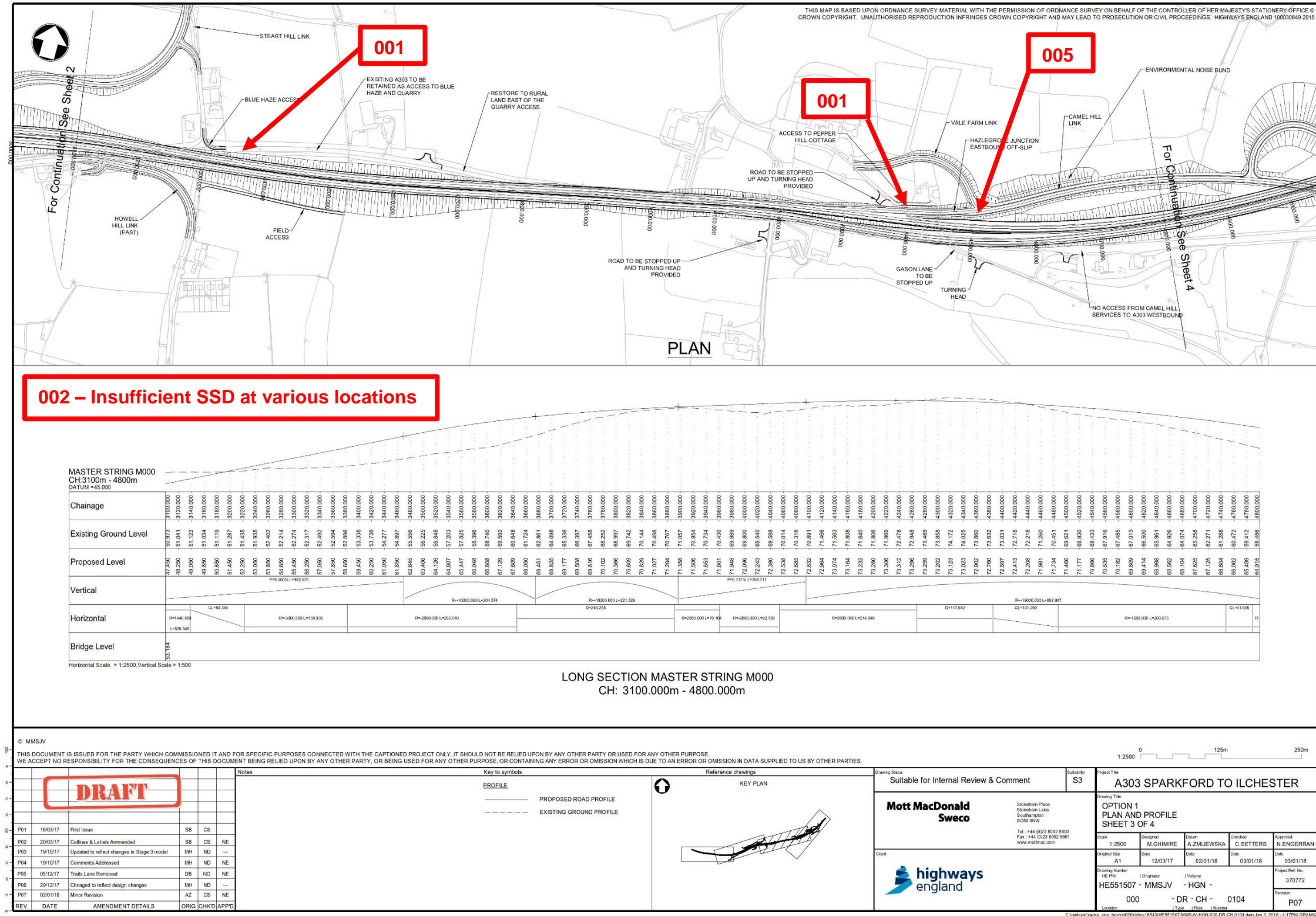
**Source:** Mott MacDonald, based on based on Drawing No.: HE551507-MMSJV-HGN-000-DR-CH-0103 P05 (Not to scale)

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**Figure C-3: Keyplan – Option 1 Plan and Profile (Sheet 3 of 4). Numbers refer to Problems in report.**



Source: Mott MacDonald, based on Drawing No.: HE551507-MMSJV-HGN-000-DR-CH-0104 P07 (Not to scale)

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Figure C-4: Keyplan – Option 1 Plan and Profile (Sheet 4 of 4). Numbers refer to Problems in report.

