Project details

Report Title	M5 Junction 14 and A38 / B4509 Signalised Junction Stage 1 Road Safety Audit Response Report
Date	2nd September 2020
Document reference and revision	39209_5570_TN002
Prepared by	Stantec
On behalf of	Highways England and South Gloucestershire Council

Authorisation sheet

Project	Land West of Park Farm, Thornbury
Report title	M5 Junction 14 and A38 / B4509 Signalised Junction Stage 1 Road Safety Audit Response Report
Prepared by:	
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Position	Associate
Signed	[redacted]
Organisation	Stantec
Date	02.09.2020

Approved by:	
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Position	SPATIAL PLANNING TEAM LEADER
Signed	[redacted]
Organisation	Highways England
Date	17.09.2020

Approved by:	
Name	Myles Kidd
Position	Transport Development Control Manager
Signed	
Organisation	South Gloucestershire Council
Date	Thursday 3rd September 2020

TECHNICAL NOTE

Job Name: West of Park Farm, Thornbury

Job No: 39209

Note No: 5570_TN002

Date: 2 September 2020

Prepared By: K. Stock

Subject: **Road Safety Audit Response Report – M5 Junction 14 and A38/B4509 Signalised Junction**

1. Introduction

1.1. Stantec has been commissioned by Barwood Development Securities Ltd & North West Thornbury Landowner Consortium (Client) to provide transport advice in support of the proposed mixed-use development at West of Park Farm, Thornbury.

1.2. An updated outline planning application (application reference PT18/6450/O) was submitted to South Gloucestershire Council (SGC) in January 2020 for up to 595 dwellings and land for a primary school.

1.3. As part of the proposals, mitigation is proposed at the northbound off-slip of M5 Junction 14 and the junction between the A38 and B4509. The scheme consists of the extension of the two-lane approaches on the northbound off slip and the northbound approach on the A38.

1.4. A Stage 1 Road Safety Audit (RSA) was requested by Highways England (HE) and South Gloucestershire Council (SGC) to assess the proposals.

Stage 1 Road Safety Audit

1.5. TMS Consultancy (TMS) were commissioned by Stantec on behalf of our Client to undertake a RSA of the proposed mitigation scheme at M5 Junction 14 and the A38/B4509 junction.

1.6. A RSA brief was submitted to TMS to inform the RSA. The brief was agreed by HE and SGC prior to the RSA being undertaken.

1.7. As the audit has been carried out during the COVID-19 pandemic, a site visit has not been carried out. SGC and HE issued guidance in April and May 2020 respectively whereby a relaxation to the RSA Standard (GG119) was given, allowing audit teams to use online mapping in lieu of a site visit. The audit was carried out on 9th June 2020.

1.8. A copy of the RSA is provided in **Appendix A**.

Problems and Improvements Raised in the RSA

1.9. The RSA identifies a number of problems and recommendations which the audit team consider require action in order to improve the safety of the scheme and minimise collision occurrence. A scheme drawing showing the location of the specific problems is included in Appendix B of the RSA.

1.10. Following completion of the RSA, a GG104 Risk Assessment was also requested by Highways England for the M5 Junction 14 scheme. A copy of the Risk Assessment is enclosed at **Appendix B**.

2. Key Personnel

2.1. The overseeing organisations are Highways England and South Gloucestershire Council.

2.2. The RSA team were from TMS Consultancy and were as follows:

- Lee Williams – BSc (Hons), MIHE
  Highways England Approved RSA Certificate of Competency
  Principal Engineer, TMS Consultancy
- Richard Marriot – CertEd, MCIHT, MSoRSA
  Highways England Approved RSA Certificate of Competency
  Road Safety Engineer, TMS Consultancy

2.3. The design organisation is Stantec.

3. Road Safety Audit Decision Log

3.1. **Table 3.1** sets out the RSA decision log.

Table 3.1 – Road Safety Audit Decision Log

Ref	Overseeing Organisation	RSA Problem	RSA Recommendation	Design Organisation Response	Overseeing Organisation Response	Agreed RSA Action
2.1	**HE**	**Location** – M5 Junction 14 off slip **Summary**: Speed related collisions on slip lane With the proposed two-lane extension for the motorway off slip, this will create a longer potentially at grade section of slip lane, where at quieter times of the day, vehicles might be able to carry more speed when heading off the motorway, with little deflection. This could increase the risk of speed related collisions such as shunt collisions and overshoots at the give way priority junction with the B4509.	Deflection measures should be introduced such as a ghost island diverge layout. The ramp gradient on the off-slip lane extension should also be reviewed at the detailed design stage and altered accordingly.	A ghost island diverge layout is not considered necessary and the design standard for a 'Two lane auxillary diverge' specifically allows the layout proposed for amendments to existing junctions (DMRB CD122 Layout B option 2). The mainline and connector road stopping sight distance visibility is considered appropriate. However, the principle of reviewing the ramp gradient at detailed design stage is agreed.	Accepted. A GG104 safety risk assessment has been undertaken by the Design Organisation regarding the need for a ghost island diverge. The GG104 assessment concludes the diverge is not required. HE agrees that the GG104 assessment provides an adequate assessment of the risks associated with the proposals and the conclusions of the assessment are accepted.	Agreed - No changes required.
2.2	**HE**	**Location** – M5 Junction 14 off slip **Summary**: Lane swapping side swipes at diverge The existing priority junction layout, where the off slip joins the B4509 is proposed to be retained, where the two lanes on the off slip are for left or right turners only, meaning that drivers will have to ensure they get into the correct lane early at the diverge point. With the extended two-lane layout and not knowing any detailed dimensions at this stage, the diverge taper might not be insufficient, reducing the window for drivers to react and this could increase the risk of late braking and side swipe collisions.	At detailed design stage the diverge taper length and nosing should be reviewed, ensuring they allow sufficient driver reaction time to manoeuvre into the correct lane, where a ghost island diverge lane layout should also be installed to assist drivers to enter the correct lane with greater time to react.	A ghost island diverge layout is not considered necessary and the design standard for a 'Two lane auxillary diverge' specifically allows the layout proposed for amendments to existing junctions (DMRB CD122 Layout B option 2). Signage/road marking directions can be reviewed at the detailed design stage avoid propensity for weaving, such as left and right turn lane markings are provided at the start of the two lanes to continue for the length of the slip road at intervals to be agreed. Signage on the approach could also be provided; the exact locations TBC through the detailed design.	Accepted. A GG104 safety risk assessment has been undertaken by the Design Organisation regarding the need for a ghost island diverge. The GG104 assessment concludes the diverge is not required. HE agrees that the GG104 assessment provides an adequate assessment of the risks associated with the proposals and the conclusions of the assessment are accepted.	Agreed - No changes required.
2.3	**HE**	**Location** – M5 Junction 14 off slip **Summary**: Lane swapping side swipes on the off-slip lane From Google street view there is currently no signing to tell drivers which lane they should be in at the B4509 junction, other than arrow markings indicating left or right only close to the junction, where they have little time to react, which could result in side swipe collisions. With the longer off slip lanes proposed there might also be more temptation to swap lanes (not knowing the status of the lanes) and then trying to cut in late near to the junction, increasing the risk of shunt collisions with following traffic.	A ghost island diverge layout should be installed, with clear advance signing to indicate the two separated lanes for the B4509 East and B4509 West.	As for Problem 2.2	Accepted. A GG104 safety risk assessment has been undertaken by the Design Organisation regarding the need for a ghost island diverge. The GG104 assessment concludes the diverge is not required. HE agrees that the GG104 assessment provides an adequate assessment of the risks associated with the proposals and the conclusions of the assessment are accepted.	Agreed - No changes required.
2.4	**HE**	**Location** – M5 Junction 14 off slip **Summary**: Strike hazard with trees at diverge Several trees are currently located at the new proposed diverge taper, where the risk of collision could be higher at this point with lane changing/ weaving vehicles. If an errant vehicle does leave the carriageway following a collision or a late manoeuvre, they could be a at increased risk of a high-speed impacts with the trees.	The Armco VRS should be extended to cover the diverge taper and surrounding area.	Agreed in principle, subject to detailed design	Accepted.	Agreed - No changes required.

Ref	Overseeing Organisation	RSA Problem	RSA Recommendation	Design Organisation Response	Overseeing Organisation Response	Agreed RSA Action
2.5	**SGC**	**Location** – A38 on-carriageway bus stop **Summary**: Lane swapping collisions With the bus stop layby proposed to be removed and for buses to stop on the main carriageway instead, when a bus is stopped to pick up or drop off passengers it will block the straight ahead lane, where vehicles will then have to overtake in the right turn lane only, This could increase the risk of side swipe collisions and late manoeuvres close to the junction when they realise they are in the incorrect lane.	The bus stop should be relocated, or a new layby created if land is available.	The bus stop will provided off-carriageway within a lay-by	Designers response agreed.	Agreed. Updated scheme drawing (39209/5501/SK37 -B) enclosed at **Appendix C**.
2.6	**SGC**	**Location** – Sundayshill Lane junction with the A38 **Summary**: Pull out collisions at side road The point at where the northbound single lane starts to filter into two lanes for straight ahead and right turn only is very close to the junction of Sundayshill Lane, where northbound vehicles may start to filter early at the junction. For drivers turning out of the junction they might not see other vehicle commencing overtakes to head into the right filter lane, where they could be masked by vehicles in the 'straight ahead' lane and pull out in front of them, increasing the risk of collisions occurring.	The filter lane commencement should be start further north away from Sundayshill Lane junction.	The existing Sundayshill Lane give-way line will be retained, maintaining a single lane on the A38 through the junction. The diverge to the ahead lane flare will then start after the junction, addressing the problem identified.	Designers response agreed.	Agreed. Updated scheme drawing (39209/5501/SK37 -B) enclosed at **Appendix C**.
2.7	**SGC**	**Location** – A38 pedestrian refuge crossing point **Summary**: Collisions with pedestrians at uncontrolled crossing point At this uncontrolled crossing point, on the west side pedestrians will now have to cross two lanes of traffic instead of one and this is close to the point where the A38 will filter into two lanes. There will be an increased distance to cross, with potentially unpredictable lane changing traffic, which could increase the risk of pedestrian collisions with oncoming vehicles.	The crossing point should be upgraded to a controlled crossing or the crossing point should be relocated.	The uncontrolled crossing point shall be removed and relocated south of the junction with Sundayshill Lane where the existing crossing will be upgraded to include tactile paving. Removal of the crossing points allows for the bus stop layby to be provided in this location (As Problem 2.5).	Designers response agreed.	Agreed. Updated scheme drawing (39209/5501/SK37 -B) enclosed at **Appendix C**.
2.8	**SGC**	**Location** – Mill Lane junction with A38 **Summary**: Turning collisions with oncoming vehicles With the potential increase traffic flows and additional right turners on the A38 at the junction with Mill Lane, this could make it difficult for drivers wanting to turn right out of Mill Lane; where there is potentially two lanes of queuing traffic to negotiate. Drivers might choose to creep out and block the southbound lane on the A38, increasing the risk of collision with oncoming traffic.	'Keep Clear' road markings should be installed on the two northbound lanes to allow for the passage of right tuners from Mill Lane.	Agreed.	Agreed.	Agreed. Updated scheme drawing (39209/5501/SK37 -B) enclosed at **Appendix C**.

TECHNICAL NOTE

4. Design Organisation and Overseeing Organisation Statements

Design Organisation Statement

On behalf of the Design Organisation I certify that: The RSA actions identified in response to the road safety audit problems in this road safety audit have been discussed and agreed with the Overseeing Organisation	
Name	K. Stock
Signed	
Position	Associate
Organisation	Stantec
Date	2nd September 2020

Overseeing Organisation Statement – Highways England

On behalf of the Overseeing Organisation I certify that: 1) The RSA actions identified in response to the road safety audit problems in this road safety audit have been discussed and agreed with the Design Organisation; and 2) The agreed RSA actions will be progressed.	
Name	RACHEL SANDY
Signed	R Sandy
Position	SPATIAL PLANNING TEAM LEADER
Organisation	Highways England
Date	17.09.2020

TECHNICAL NOTE

Overseeing Organisation Statement – South Gloucestershire Council

On behalf of the Overseeing Organisation I certify that: 1) The RSA actions identified in response to the road safety audit problems in this road safety audit have been discussed and agreed with the Design Organisation; and 2) The agreed RSA actions will be progressed.	
Name	Myles Kidd
Signed	
Position	Transport Development Control Manager
Organisation	South Gloucestershire Council
Date	Thursday 3rd September 2020

DOCUMENT ISSUE RECORD

Technical Note No	Rev	Date	Prepared	Checked	Reviewed (Discipline Lead)	Approved (Project Director)
39209/5570/TN002	-	02.09.20	KS	NT	KS	NT

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TECHNICAL NOTE

APPENDIX A

safer roads for everyone

West of Park Farm, Thornbury, South Gloucestershire

M5 Junction 14 and A38/B4509 Signalised Junction

Road Safety Audit Stage 1

on behalf of Highways England

Client - Stantec

TMS reference no: 15667

Date: 23rd June 2020

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West of Park Farm, Thornbury, South Gloucestershire

M5 Junction 14 and A38 / B4509 Signalised Junction

Road Safety Audit Stage 1

1. Introduction

1.1 This report describes a Stage 1 Road Safety Audit carried out for M5 Junction 14 and A38/ B4509 Signalised Junction, on behalf of Highways England. The audit was carried out on 9th June 2020 in the offices of TMS Consultancy.

1.2 The audit team members were approved by Rachel Sandy (Highways England) and Myles Kidd (South Gloucestershire Council) and are as follows:

Audit Team Leader

Lee Williams – BSc (Hons), MIHE
Highways England Approved RSA Certificate of Competency
Principal Engineer, TMS Consultancy

Audit Team Member

Richard Marriott – CertEd, MCIHT, MSoRSA
Highways England Approved RSA Certificate of Competency
Road Safety Engineer, TMS Consultancy

1.3 The audit comprised an examination of the documents listed in **Appendix A**. The Road Safety Audit was undertaken in accordance with the Audit Brief provided by Neil Thorne (Stantec). The audit brief was approved by Rachel Sandy (Highways England) and Myles Kidd (South Gloucestershire Council).

1.4 As this audit has been carried out during the COVID-19 pandemic, a site visit has not been carried out. Highways England issued guidance on 27th March 2020 whereby a relaxation to the Road Safety Audit Standard (GG119) was given, allowing audit teams to use online mapping in lieu of a site visit.

1.5 The terms of reference of the Road Safety Audit are as described in GG 119 (GG 119 superseded HD 19/15 in November 2018). The 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 design to any other criteria.

1.6 All of the problems described in this report are considered by the audit team to require action in order to improve the safety of the scheme and minimise collision occurrence.

1.7 A scheme drawing is included in **Appendix B**, where the locations of specific problems are referenced. A location plan of the scheme is also included in this Appendix.

1.8 The scheme consists of extension of the M5 Junction 14 northbound off slip by 350m, creating a longer extent of two lanes on the off slip, and lengthening of A38 northbound lanes so they extend from the existing stop line to the Sundayshill Lane junction. Both junctions are located between Bristol, to the south, and Gloucester to the north. Improvements to the junctions are required to support a planning application for up to 595 dwellings and an onsite primary school, located approximately 4.6 miles to the west of the junction, within Thornbury.

1.9 **Road Safety Audit Response Report**

Following the completion of the road safety audit, the design team should prepare a road safety audit response report in collaboration with the Overseeing Organisation.

The response report should incorporate the following:

- **Decision Log** spreadsheet, where each Problem and Recommendation in the Safety Audit report is reiterated
- In the Decision Log, a response should be provided by the Design Team and Overseeing Organisation for each problem raised in the RSA report, together with an agreed action

Further information is provided in **GG 119 Sections 4.11 to 4.19** and **Appendix F** (where a road safety audit response report template is available).

The response report should be produced and finalised within *one month* of the issue of the RSA report. A copy of the response report should be issued to the Safety Audit Team for information.

2. Items resulting from this Stage 1 Audit

The safety problems have been grouped together for each junction:

PROBLEMS - M5

2.1 PROBLEM

Location – M5 Junction 14 off slip

Summary: Speed related collisions on slip lane

With the proposed two-lane extension for the motorway off slip, this will create a longer potentially at grade section of slip lane, where at quieter times of the day, vehicles might be able to carry more speed when heading off the motorway, with little deflection. This could increase the risk of speed related collisions such as shunt collisions and overshoots at the give way priority junction with the B4509.

RECOMMENDATION

Deflection measures should be introduced such as a ghost island diverge layout. The ramp gradient on the off-slip lane extension should also be reviewed at the detailed design stage and altered accordingly.

2.2 PROBLEM

Location – M5 Junction 14 off slip

Summary: Lane swapping side swipes at diverge

The existing priority junction layout, where the off slip joins the B4509 is proposed to be retained, where the two lanes on the off slip are for left or right turners only, meaning that drivers will have to ensure they get into the correct lane early at the diverge point. With the extended two-lane layout and not knowing any detailed dimensions at this stage, the diverge taper might not be insufficient, reducing the window for drivers to react and this could increase the risk of late braking and side swipe collisions.

RECOMMENDATION

At detailed design stage the diverge taper length and nosing should be reviewed, ensuring they allow sufficient driver reaction time to manoeuvre into the correct lane, where a ghost island diverge lane layout should also be installed to assist drivers to enter the correct lane with greater time to react.

2.3 PROBLEM

Location – M5 Junction 14 off slip

Summary: Lane swapping side swipes on the off-slip lane

From Google street view there is currently no signing to tell drivers which lane they should be in at the B4509 junction, other than arrow markings indicating left or right only close to the junction, where they have little time to react, which could result in side swipe collisions. With the longer off slip lanes proposed there might also be more temptation to swap lanes (not knowing the status of the lanes) and then trying to cut in late near to the junction, increasing the risk of shunt collisions with following traffic.

RECOMMENDATION

A ghost island diverge layout should be installed, with clear advance signing to indicate the two separated lanes for the B4509 East and B4509 West.

2.4 PROBLEM

Location – M5 Junction 14 off slip

Summary: Strike hazard with trees at diverge

Several trees are currently located at the new proposed diverge taper, where the risk of collision could be higher at this point with lane changing/ weaving vehicles. If an errant vehicle does leave the carriageway following a collision or a late manoeuvre, they could be a at increased risk of a high-speed impacts with the trees.

RECOMMENDATION

The Armco VRS should be extended to cover the diverge taper and surrounding area.

PROBLEMS – A38

2.5 PROBLEM

Location –A38 on-carriageway bus stop

Summary: Lane swapping collisions

With the bus stop layby proposed to be removed and for busses to stop on the main carriageway instead, when a bus is stopped to pick up or drop off passengers it will block the straight ahead lane, where vehicles will then have to overtake in the right turn lane only, This could increase the risk of side swipe collisions and late manoeuvres close to the junction when they realise they are in the incorrect lane.

RECOMMENDATION

The bus stop should be relocated, or a new layby created if land is available.

2.6 PROBLEM

Location – Sundayshill Lane junction with the A38

Summary: Pull out collisions at side road

The point at where the northbound single lane starts to filter into two lanes for straight ahead and right turn only is very close to the junction of Sundayshill Lane, where northbound vehicles may start to filter early at the junction. For drivers turning out of the junction they might not see other vehicle commencing overtakes to head into the right filter lane, where they could be masked by vehicles in the ‘straight ahead’ lane and pull out in front of them, increasing the risk of collisions occurring.

RECOMMENDATION

The filter lane commencement should be start further north away from Sundayshill Lane junction.

2.7 PROBLEM

Location – A38 pedestrian refuge crossing point

Summary: Collisions with pedestrians at uncontrolled crossing point

At this uncontrolled crossing point, on the west side pedestrians will now have to cross two lanes of traffic instead of one and this is close to the point where the A38 will filter into two lanes. There will be an increased distance to cross, with potentially unpredictable lane changing traffic, which could increase the risk of pedestrian collisions with oncoming vehicles.

RECOMMENDATION

The crossing point should be upgraded to a controlled crossing or the crossing point should be relocated.

2.8 PROBLEM

Location – Mill Lane junction with A38

Summary: Turning collisions with oncoming vehicles

With the potential increase traffic flows and additional right turners on the A38 at the junction with Mill Lane, this could make it difficult for drivers wanting to turn right out of Mill Lane; where there is potentially two lanes of queuing traffic to negotiate. Drivers might choose to creep out and block the southbound lane on the A38, increasing the risk of collision with oncoming traffic.

RECOMMENDATION

‘Keep Clear’ road markings should be installed on the two northbound lanes to allow for the passage of right tuners from Mill Lane.

3. Audit Team Statement

We certify that the terms of reference of the road safety audit are as described in GG 119, with the exception of a site visit, due to a relaxation of the standard issued by Highways England on 27th March 2020 during the COVID-19 pandemic (also in accordance with the guidance note issued by South Gloucestershire Council in April 2020).

Audit Team Leader

Lee Williams – BSc (Hons), MIHE
Highways England Approved RSA Certificate of Competency
Principal Engineer, TMS Consultancy

Signed 

Date 23rd June 2020

Audit Team Member

Richard Marriott – CertEd, MCIHT, MSoRSA
Highways England Approved RSA Certificate of Competency
Road Safety Engineer, TMS Consultancy

Signed 

Date 23rd June 2020

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Appendix A

Documents Examined:

Appendix A - CVs

39209_West of Park Farm_Thornbury_TN005 Road Safety Audit Brief_M5 J14 A38_FINAL_010620

39209-5501-SK31 350 M5 J14 NB Offslip [DRAFT]

39209-5501-SK37 A A38_B4509 Junction Mitigation

Appendix B_Site location

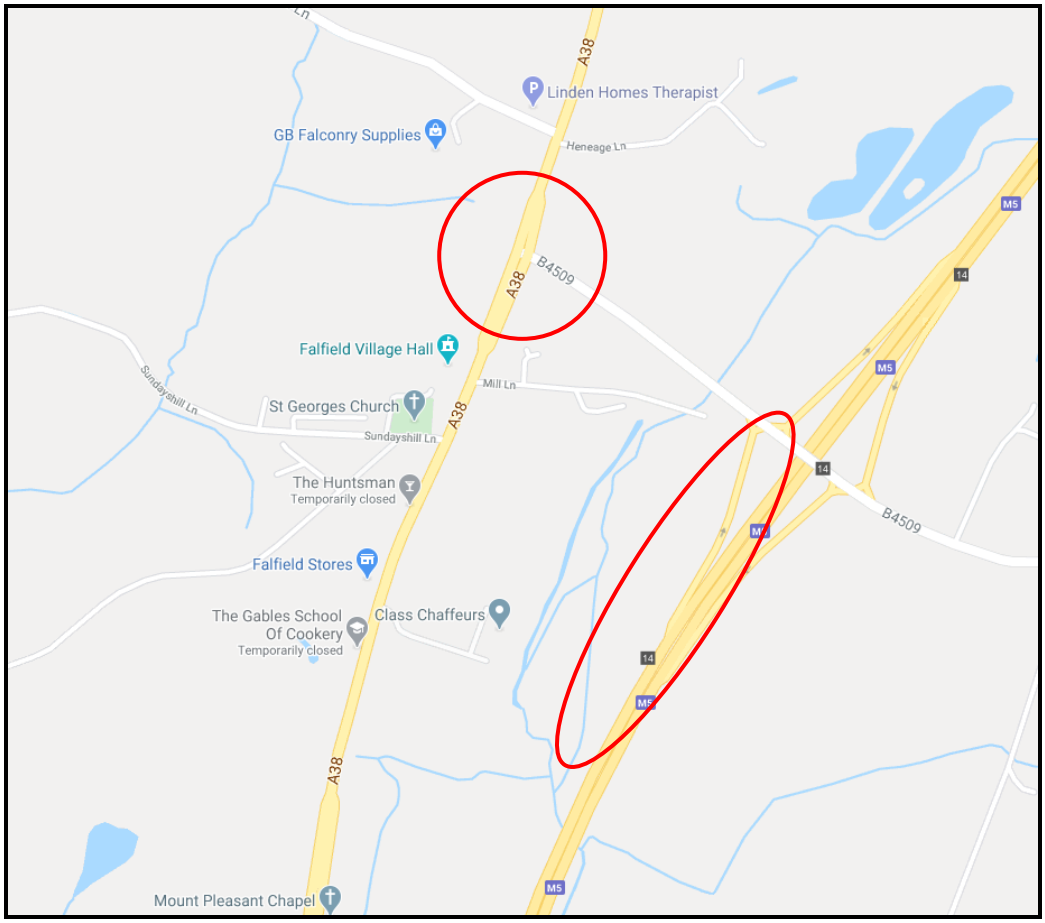
Appendix C

Appendix D_EDR072 M5 J14 PLOT

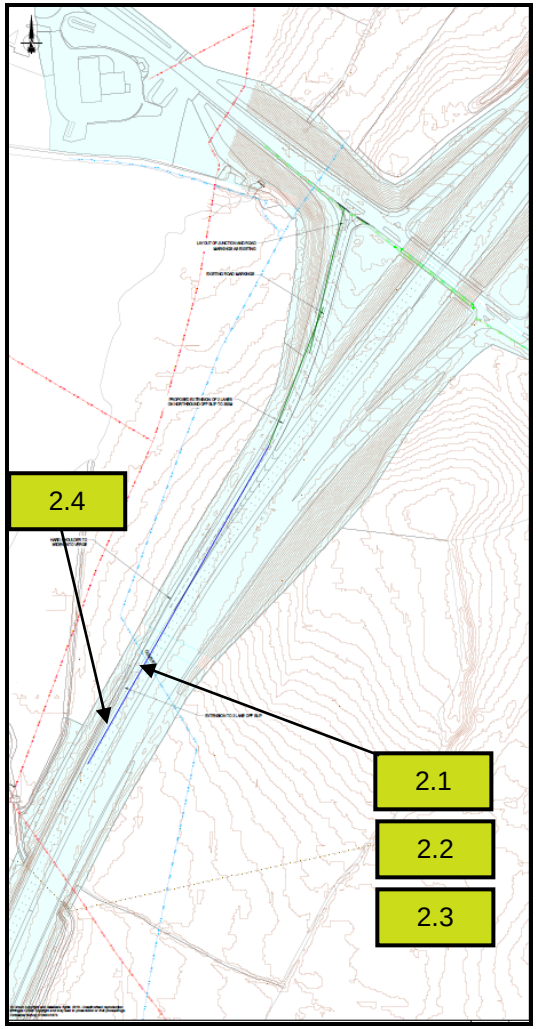
Appendix B

Please refer to the following page for a plan illustrating the locations of the problems identified as part of this audit (location numbers refer to paragraph numbers in the report).

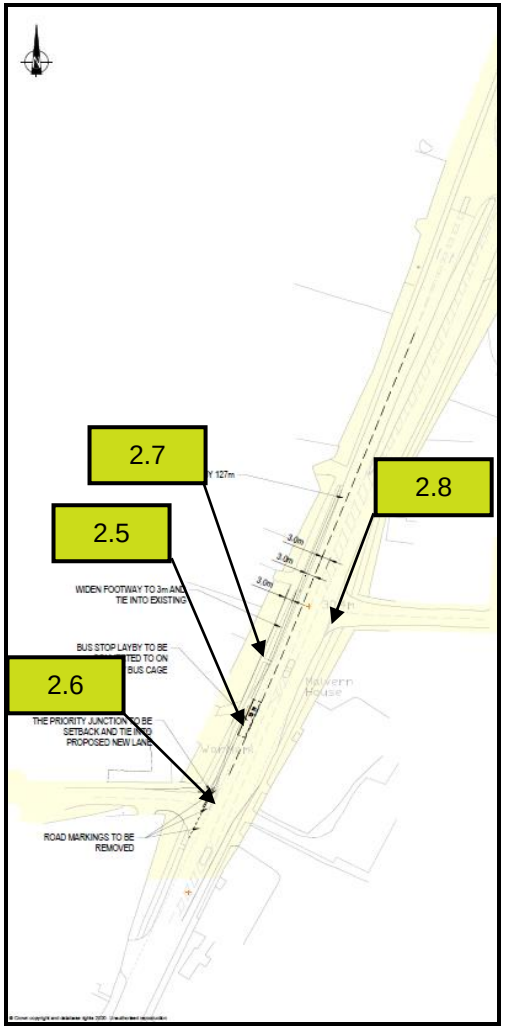
The location of the scheme is shown below:



M5 Junction 14



A38/ B4509



TECHNICAL NOTE

APPENDIX B

TECHNICAL NOTE

Job Name: Land West of Park Farm, Thornbury

Job No: 39209

Note No: 5578/TN008

Date: 10 August 2020

Prepared By: K. Stock

Subject: **GG104 Risk Assessment – M5 Junction 14**

1. Introduction

1.1. Stantec has been commissioned by Barwood Development Securities Ltd & North West Thornbury Landowner Consortium (the Developer) to provide highway and transport advice in support of a mixed use residential-led development on Land West of Park Farm, Thornbury.

1.2. An updated outline planning application (application reference PT18/6450/O) was submitted to South Gloucestershire Council (SGC) in January 2020.

1.3. M5 Junction 14 is located seven kilometres to the northeast of the application site.

1.4. Discussions have been ongoing with Highways England (HE) following submission of the planning application.

1.5. Whilst it has been demonstrated that the net impact of the development is immaterial and therefore that there is no severe impact on the operation of the strategic road network (SRN) in this location, HE confirmed that existing queuing at M5 Junction 14 extents back on to the mainline during the AM peak.

1.6. The application has therefore proposed a mitigation scheme in this location. The results of microsimulation modelling demonstrate that the mitigation scheme, which includes the lengthening of the M5 J14 northbound two lane off-slip section to a total of 350m, more than mitigates the forecast queues associated with the development at the application site, and reduces existing queuing, particularly in the AM peak.

1.7. This risk assessment follows the requirements of Highways England standard GG104 Requirements for Safety Risk Assessment.

2. Scheme Description and Background

Site Description

2.1. M5 Junction 14 features a grade separated junction, with signalised T-junctions on the off slips with the B4509, including the movements from the B4509 on to both the M5 on-slip roads north and south bound. The signals are only in operation during the PM peak hour.

2.2. The right turn movements on to the on-slips from the B4509 both have dedicated lanes, of approximately 40m length.

2.3. The existing northbound off-slip has a marked section of two lanes measuring around 150 metres in length, however the carriageway width is wide enough to allow two vehicles along the slip road.

2.4. HE have confirmed that queuing on the northbound off slip extends back on to the mainline carriageway during the AM peak. This was confirmed by microsimulation modelling undertaken by Stantec as part of the planning application and documented in Stantec Technical Note 39209/TN006 v.1 "M5 Junction 14 VISSIM Forecast Modelling Note – Update".

Risk Assessment Study Area

2.5. The study area comprises the northbound off slip at M5 Junction 14 only.

Proposed Highways Scheme

2.6. It is proposed to lengthen the two lanes on the off-slip to a total of 350m, as per DMRB CD122 Layout B option 2. A drawing of the scheme is provided within **Appendix A**.

2.7. The Option 2 layout, rather than a ghost island layout was selected for a number of reasons:

1) The design standard for a 'Two lane auxillary diverge' specifically allows the layout proposed for amendments to existing junctions (DMRB CD122 Layout B option 2). The mainline and connector road stopping sight distance visibility is considered appropriate. A ghost island diverge layout is therefore not considered necessary.

2) Implementation of the ghost island diverge requires further widening of the motorway corridor and greater impact on adjacent land. The land immediately adjacent to the highway corridor along the length of the diverge is not land within the applicant's ownership, nor maintained by HE. There is also an existing bridge structure (Gambril Lane) 670 metres to the south of the off-slip that restricts further widening past this point.

2.8. HE previously confirmed on 6th May 2020 that, in terms of design, the mitigation scheme is believed to be suitable in principle, subject to a Stage 1 Road Safety Audit (RSA). A Stage 1 RSA was undertaken by TMS Consultancy in June 2020.

Personal Injury Collision Data

2.9. Personal Injury Collision (PIC) data was obtained from SGC for M5 Junction 14 for the five-year period between 30th April 2013 and 1st May 2018. The full PIC data reports can be found in **Appendix B.**

2.10. The PIC data assessment provides an overview of the number and severity of collisions and a summary of the vulnerable road users casualties involved. The assessment also defines the likely causes of the collisions, considering any trends in the incidents recorded or collisions caused as a result of the existing highway layout.

2.11. Eight collisions were recorded in the vicinity of this motorway junction within the five-year period. All collisions were recorded as slight in severity and one involved a vulnerable road user. Vulnerable road users are classed as pedestrians, cyclists and powered two wheeled vehicles (P2W).

2.12. The incident involving the vulnerable road user occurred on the B4509 when a motorcyclist collided with a vehicle stopped to allow for a right turning vehicle to manoeuvre.

2.13. Three of the collisions involved vehicles rear-ending the car in front whilst they were approaching stationary traffic or preparing to make a turn. Two of these collisions took place on the M5 mainline, and one on the B4059, approximately 300m east of Junction 14.

2.14. Two of the collisions involved vehicles attempting to change lane or driving at excess speed on the M5 mainline.

2.15. One of the collisions involved a vehicle who had pulled into the hard shoulder being hit (glancing blow) by a passing heavy goods vehicle.

2.16. The final collision involved a vehicle failing to give-way at one of the M5 slips roads and pulling out of the junction and colliding with a car travelling along B4509.

2.17. Overall at this location, there does not appear to be a pattern in collisions which is the result of a prevailing highway safety issue. The majority of collisions appear to be the result of driver error, reckless driving and failing to slow down when approaching stationary traffic.

Stage 1 Road Safety Audit

2.18. The problems stated in the RSA that are considered to be relevant to this risk assessment relate to:

1. (Problem 2.1) Vehicle speeds when leaving the motorway.
2. (Problem 2.2) Risk of vehicles changing lanes late.
3. (Problem 2.3) Risk of late braking and side swipe collisions.
4. (Problem 2.4) Strike hazard with trees at diverge taper.

2.19. The other problems raised do not affect the SRN.

Walking, Cycling and Horse Riding Assessment and Review (WCHAR)

2.20. HE confirmed that the scheme is exempt from a Walking Cycling and Horse Riding Assessment and Review (WCHAR). An exemption certificate was issued on 30th March 2020.

3. Safety Risk Assessment Planning

3.1. The safety question to be addressed is:

"Is there is a need for a ghost island diverge layout as part of the improvement scheme for the northbound off-slip?"

Options Considered

3.2. The option considered is as shown on drawing Stantec drawing 39209-5501-SK31, included at **Appendix A.**

4. Categorisation of the Activity Type

4.1. GG104 Requirements for Safety Risk Assessment states that "*the scope and complexity of the safety risk assessment shall be determined by categorisation of the activity type in category A, B or C in accordance with table 2.6*".

4.2. The selection criteria types have been assessed in accordance with Table 2.6 of GG104, as shown in **Table 4.1** below.

Table 4.1 – Categorisation of Activity Type

Feature	Selection Criteria Type	Rationale
Extent of prior experience of activity	A	There is significant experience within Highways England. Activity features are codified in a standard or formal procedure
Statutory and formal processes and procedures (including standards and legislation)	A	The activity is entirely within the scope of existing standards, guidance, formal processes or procedures and applicable legislation. The activity requires no safety related departures from standard or safety related changes to formal processes or procedures (including any legislation).
Impact on the organisation	A	The activity has no impact on Highways England processes, procedures, structure, roles or responsibilities, competencies, policies or strategy.
Activity scale	A	The impact of the activity is limited in nature and scale.
Technical	A	Design in accordance with DMRB. Processes, techniques, methodologies and/or technologies involved are currently in widespread use.
Stakeholder impact and interest	A	The proposed scheme is entirely within the SRN. The activity has a low number of stakeholders and number of safety issues involved is limited.

4.3. In accordance with GG104 Requirements for Safety Risk Assessment, Table 2.7N, the activity type category is A because all activity features are categorised as type A.

4.4. Appendix C of GG104 confirms that "*Type A activities require no more than a business as usual approach, consequently type A approvals will not require any additional effort beyond those required by the governance process of the business area".*

5. Identification of Affected Populations

5.1. The identified affected populations are set out in **Table 5.1**.

Table 5.1 – Affected Populations

Population	Classification
People directly employed by Highways England and who work on the motorway and all-purpose trunk roads either permanently e.g. traffic officers, or periodically e.g. those undertaking site visits; AND People in a contractual relationship with Highways England, including their national vehicle recovery contract operatives, all workers engaged in traffic management activities and incident support services, and any other activities where traffic is present, such as persons carrying out survey and inspection work.	Workers
All road users, including the police and emergency services, as well as those others, who are at work but are not in a contractual relationship with Highways England such as privately contracted vehicle recovery and vehicle repair providers.	Users

6. Safety Risk Assessment Scope

Defining the Scope of the Activity

6.1. The activity scope is the potential lifecycle of the proposed extension of the two lane northbound off-slip with respect only to its impact on the SRN and the associated populations defined in **section 5**, including modifications to the SRN in the proposed design.

6.2. The potential lifecycle activities include planning, design, construction, operation, maintenance and decommissioning.

Defining the Scope of the Safety Risk Assessment

6.3. The risk assessment study area is as defined in **paragraph 2.5**.

6.4. The information taken into account in the risk assessment includes:

a) DMRB CD122 Geometric Design of Grade Separated Junctions.

b) The modifications to the SRN shown on Stantec drawing 39209-5501-SK31.

c) Road Safety Audit Stage 1, dated June 2020.

d) Stantec Technical Note 39209/TN006 v.1 “M5 Junction 14 VISSIM Forecast Modelling Note – Update”.

e) Any other information included within this risk assessment report.

6.5. The risk assessment report excludes:

i) Risks that experienced designers and contractors would reasonably be expected to manage during the design and construction phases in accordance with The Construction (Design and Management) Regulations 2015.

ii) Risks that are not foreseeable at the planning stage.

7. Safety Baseline and Safety Objective

Safety Baseline

7.1. The safety baseline has been defined with reference to Table D.1 of GG104 and is set out in **Table 7.1.**

Table 7.1: Safety Baseline

Populations: Workers / Users / Other Parties (L= Likelihood, S= Severity, R= Risk Value)				
Ref	**Hazard / Risk Description**	**L**	**S**	**R**
1	**Workers**			
1.1	Construction and Maintenance Risk	2	3	6
2	**Users**			
2.1	Vehicle speeds when leaving the motorway	4	2	8
2.2	Risk of vehicles changing lanes late	4	2	8
2.3	Risk of late braking and side swipe collisions	4	2	8
2.4	Strike hazard with trees at diverge taper	1	2	2
2.5	Risk of collisions as result of queuing on the mainline	4	4	16

Notes

1) Refer to Table d.1 of GG104 for definitions of likelihood, severity and risk value
2) Safety baseline and likelihoods based on recorded PIC data. The severity has been set at "Moderate harm: Slight injury or illness, moderate damage or loss" because all of the collisions in the collision data resulted in slight injury.
3) Collective risk is used to represent the statistical risk to a group of people, or a population, associated with a particular activity.

Safety Objective

7.2. The safety objective for this risk assessment at the planning stage is:

To demonstrate that there would not be an adverse impact on the safety of the strategic road network as a result of implementing the proposed highway design shown on Stantec drawing 39209-5501-SK31 in **Appendix A**.

7.3. It is noted that the safety objectives for road workers shall always be to manage risk as low as is reasonably practicable (ALARP).

8. Safety Risk Assessment

Hazard Identification

8.1. Hazards have been identified from the Stage 1 Road Safety Audit and documents comprising the scope of the risk assessment in **section 6.4**.

8.2. As the scheme was confirmed as being exempt from a WCHAR, NMUs are not given further consideration in this risk assessment.

8.3. The identified hazards are shown in the second column in **Table 8.1**. They have been categorised under the 'hazard / risk description' categories used to determine the safety baseline to enable comparison between the baseline and the hazard risk analysis.

8.4. The hazard analysis and analysis of safety risk is also shown in **Table 8.1**. It uses, "*GG104 Table D.1 Risk value, likelihood and severity of outcomes that may be assigned to qualitative data for the purpose of assessment*".

8.5. The hazard analysis and analysis of safety risks relate to collective risk metrics in line with the safety baseline.

Table 8.1 Hazard identification and analysis of safety risk, risk values and safety risk mitigations

Ref	Hazard / Risk Description	L	S	R	Response / Control Measure	L	S	R	Details / assumptions / monitoring
1	**Workers**								
1.1	Construction and maintenance of works	2	4	8	Construction work is to be designed and constructed in accordance with the CDM 2015 Regulations. This includes managing foreseeable risks during the design phase using the, eliminate, reduce, isolate, control (ERIC) hierarchy and residual risks are to be communicated to the Principal Contractor. A Health & Safety Plan is to be produced before work starts and a Health & Safety File is to be available for subsequent maintenance, improvement and decommissioning activities. Any further control measures deemed necessary by the Contractor to be implemented.	2	3	6	
2	**Users**								
2.1	According to the Road Safety Audit, there is the possibility that vehicles might be able to carry more speed when leaving the motorway, with little deflection. It goes on to say that this would increase the risk of speed related collisions such as shunt collisions and overshoots at the give way priority junction with the B4509.	4	2	8	There is no evidence of existing collisions of this nature.	4	2	8	Junction with B4509 is unchanged within proposed highway scheme. Ramp gradient to be developed at detailed design stage. No change from safety baseline.

Ref	Hazard / Risk Description	L	S	R	Response / Control Measure	L	S	R	Details / assumptions / monitoring
	The RSA recommendation suggests that deflection measures should be introduced such as a ghost island diverge layout. The ramp gradient on the off-slip lane extension should also be reviewed at the detailed design stage and altered accordingly				A ghost island diverge layout is not considered necessary and the design standard for a 'Two lane auxillary diverge' specifically allows the layout proposed for amendments to existing junctions (DMRB CD122 Layout B option 2). The mainline and connector road stopping sight distance visibility is considered appropriate, reducing the risk of shunt collisions and overshoots at the give way line. The ramp gradient on the off-slip lane extension will be reviewed at the detailed design stage and altered accordingly.				
2.2	According to the Road Safety Audit, there is a risk that drivers will have to ensure they get into the correct lane early at the diverge point due to the two lanes on the off slip are for left or right turners only. It also states that with the extended two-lane layout, the diverge taper might be insufficient, reducing the window for drivers to react and this could increase the risk of late braking and side swipe collisions.	4	2	8	A ghost island diverge layout is not considered necessary for the reasons set out above. Signage/road marking directions can be reviewed at the detailed design stage to avoid propensity for weaving, such as left and right turn lane markings provided at the start of the two lanes to continue for the length of the slip road at intervals to be agreed.	3	2	6	Signage design strategy to be developed at detailed design stage.

Ref	Hazard / Risk Description	L	S	R	Response / Control Measure	L	S	R	Details / assumptions / monitoring
	The RSA recommendation suggests that at detailed design stage the diverge taper length and nosing will be reviewed, ensuring they allow sufficient driver reaction time to manoeuvre into the correct lane, where a ghost island diverge lane layout should also be installed to assist drivers to enter the correct lane with greater time to react.				Signage on the approach could also be provided; the exact locations are to be confirmed through the detailed design.				
2.3	According to the Road Safety Audit, there is a risk that lane swapping will result in side swipes on the off-slip lane. It goes on to states that there is currently no signing to tell drivers which lane they should be in at the B4509 junction, other than arrow markings indicating left or right only close to the junction, where they have little time to react. The RSA suggests that there may be more temptation to swap lanes and trying to cut in late near to the junction, increasing the risk of shunt collisions, and recommends a ghost island diverge layout should be installed, with clear advance signing to indicate the two separated lanes for the B4509 East and B4509 West.	4	2	8	A ghost island diverge layout is not considered necessary for the reasons set out above. Clear advance signing will be installed to indicate the two separated lanes for the B4509 East and B4509 West.	3	2	6	
2.4	According to the RSA there is a risk of collisions at the proposed diverge taper with lane changing / weaving vehicles, and an increased risk of high-speed impact with trees.	2	4	8	The Armco VRS will be extended to cover the diverge taper and surrounding area.	2	2	4	

Ref	Hazard / Risk Description	L	S	R	Response / Control Measure	L	S	R	Details / assumptions / monitoring
2.5	There is a risk of collisions at the northbound off slip as a result of queuing on the M5 mainline	2	4	8	The proposed highway scheme will extend the length of two lanes on the off slip thereby enabling additional vehicles to queue off the mainline. Modelling indicates that an additional 345 metres of queue can be accommodated on the off slip as a result of the proposals.	2	4	8	Modelling results set out in Stantec Technical Note 39209/TN006 v.1 “M5 Junction 14 VISSIM Forecast Modelling Note – Update”. Proposed development does not add additional traffic on to the northbound off slip in the AM peak hour.

Evaluation of Safety Risks

8.6. **Table 8.1** demonstrates that the residual risk values are lower than or equal to the safety baseline. The proposed highway scheme will significantly reduce the length of mainline queuing, providing a safety benefit over the existing situation. It is therefore concluded that the safety objective is being achieved.

8.7. On the basis of the qualitative assessment of the alternative options (ghost island diverge) and measures for mitigating risks to users during normal operation of the highway in **Table 8.1,** it is considered that the proposed mitigation measures include all measures that are reasonably required.

8.8. On the basis of the qualitative assessment of the measures for mitigating risks to users outside of normal operation of the highway (i.e. when there are no roadworks of temporary traffic management), workers and other parties in **Table 8.1**, it is considered that the proposed mitigation measures are as low as reasonably practicable (ALARP).

Safety Risk Mitigations

8.9. The control measures to be implemented and the assumptions to be verified are included in **Table 8.1**.

8.10. On the basis that the control measures in **Table 8.1** are implemented, there is no need for further mitigation measures at this stage.

9. Documenting and Maintaining the Safety Risk Assessment

9.1. The entire safety risk assessment shall be reviewed and updated during the detailed design stage and at subsequent stages of the scheme development, the timings of which are to be agreed between the Project Manager, Developer and Highways England.

9.2. Assumptions made in relation to the safety risk assessment shall be validated as part of the reviews.

DOCUMENT ISSUE RECORD

Technical Note No	Rev	Date	Prepared	Checked	Reviewed (Discipline Lead)	Approved (Project Director)
39209/5578/TN008	-	10.08.20	KS	NT	KS	NT

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APPENDIX A

LAYOUT OF JUNCTION AND ROAD MARKINGS AS EXISTING

EXISTING ROAD MARKINGS

PROPOSED EXTENSION OF 2 LANES ON NORTHBOUND OFF SLIP TO 350M

HARD SHOULDER TO WIDEN INTO VERGE

EXTENSION TO 2 LANE OFF SLIP

NOTES:

1. THE LAYOUT IS SUBJECT TO DETAILED DESIGN, CAPACITY TESTING, GROUND INVESTIGATIONS RESULTS & EARTHWORKS MODELLING, UTILITIES & SERVICES AND CONFIRMATION OF LAND OWNERSHIP;
2. THE DETAILED DESIGN LAYOUT WILL BE DESIGNED IN ACCORDANCE WITH ALL RELEVANT DESIGN GUIDANCE AND STANDARDS;
3. THE LAYOUT HAS BEEN BASED ON THE APPROPRIATE DESIGN SPEED FOR OUR CURRENT PROPOSALS;
4. THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH ALL RELEVANT ASSOCIATED DOCUMENTS; AND
5. THE USE OF THE DRAWING DOES NOT ABSOLVE THE CLIENT FROM THEIR RESPONSIBILITIES IN REGARDS TO HEALTH & SAFETY AND CDM REGULATIONS.
6. FOR FULL DETAIL ON THE UTILITIES REFER TO PBA DRAWINGS 39209/2514/001 - 003

HIGHWAYS ENGLAND LAND OWNERSHIP TAKEN FROM DATA.GOV.UK, DERIVED FROM LAND RESISTER CADASTRAL PARCEL, LAST UPDATED AUGUST 2019

0.5M CONTOURS DERIVED FROM LiDAR INFORMATION TAKEN FROM ESRI DATABASE OCTOBER 2019

Mark	Revision	Date	Drawn	Chkd	Appd

SCALING NOTE: Do not scale from this drawing. If in doubt, ask.

UTILITIES NOTE: The position of any existing public or private sewers, utility services, plant or apparatus shown on this drawing is believed to be correct, but no warranty to this is expressed or implied. Other such plant or apparatus may also be present but not shown. The Contractor is therefore advised to undertake their own investigation where the presence of any existing sewers, services, plant or apparatus may affect their operations.

Drawing Issue Status

FOR INFORMATION

LAND TO THE WEST OF PARK FARM THORNBURY
M5 JUNCTION 14 MITIGATION SCHEME
350m 2 LANE N/B OFFSLIP

Client

BARWOOD DEVELOPMENT SECURITIES

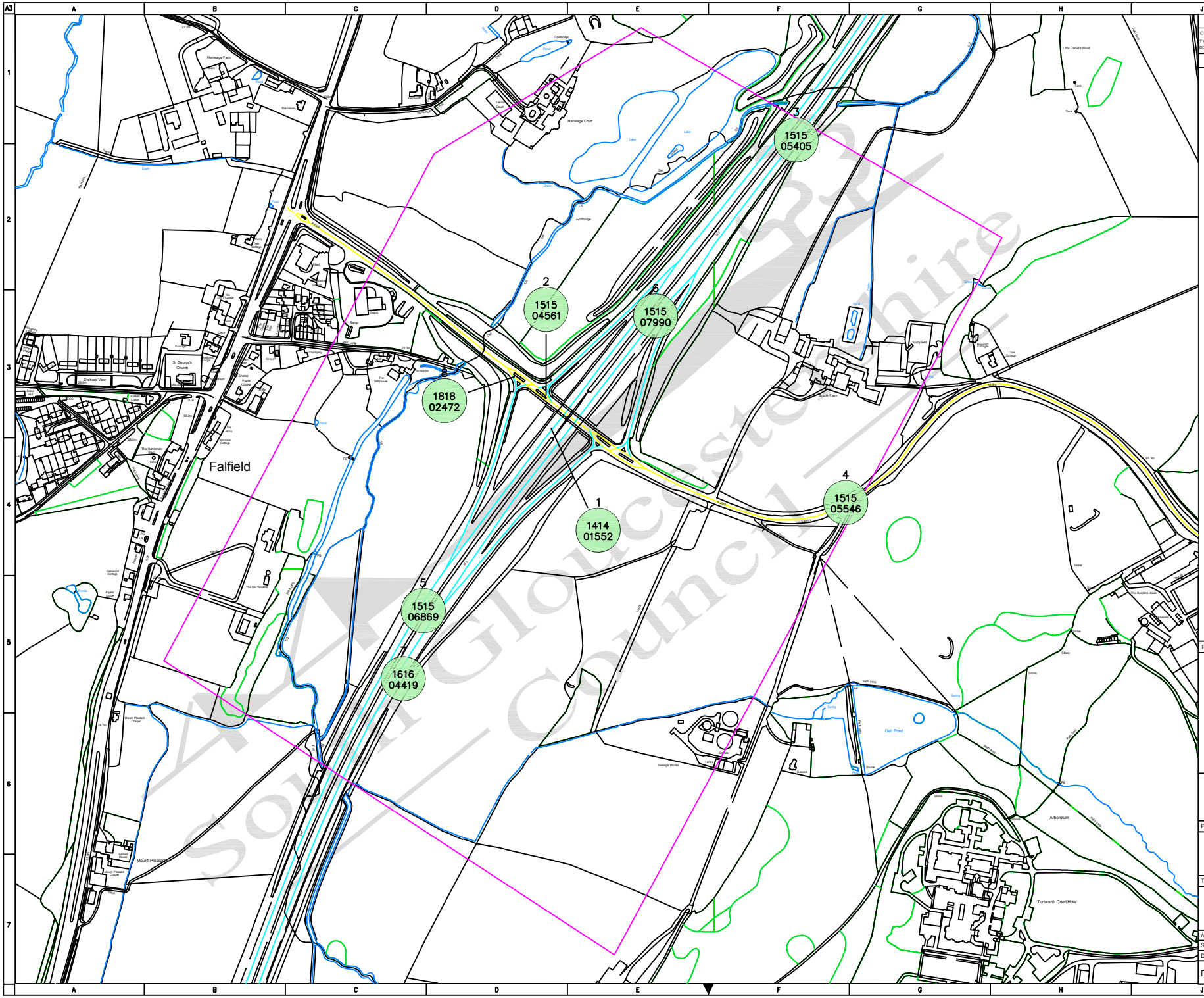
Date of 1st Issue	Designed	Drawn
08.11.19	JHo	JHo
A1 Scale	Checked	Approved
1:500	-	-

Drawing Number	Revision
39209/5501/SK31	-

pba peterbrett
now part of Stantec
peterbrett.com

BRISTOL
Tel: 01173 327 840

APPENDIX B



ORDNANCE SURVEY

NOTES

1. All dimensions are in metres unless noted otherwise.
2. This drawing should not be scaled and only written dimensions should be used. Any discrepancies should be brought to the attention of this department immediately.

Rev.	Description	Drawn	App'd	Date

South Gloucestershire Council

DEPARTMENT OF ENVIRONMENT AND COMMUNITY SERVICES

DIRECTOR
Steve Evans

STREETCARE TRANSPORT & WASTE
PO Box 299, Civic Centre, High Street,
Bristol. BS15 0DR
Telephone: 01454 868 000
Email: TransportServices@southglos.gov.uk

Project

Down Road, Winterbourne
STation Road to Quarry Lane

Title

Personal injury accident
30/04/2013 to 01/05/2018*
(*provisional)

Acad Ref	I:\Road Safety Engineering\Acc Stats\Bylts\Data Req\R4-2 External\External Data Req\		
Scale @ A3	NTS	Drawn	DS
Date	Jul18	Approved	
Dwg No.	Parish –	Scheme –	Number Rev.

Acad Ref I:\Road Safety Engineering\Acc Stats\Bylts\Data Req\R4-2 External\External Data Req\Plotted by:dS on Jul 17, 2018 - 11:34am

141401552 SLIGHT 368780/193190 20/02/2014 15:30

LOCATION M5 Junction J14

DESCRIPTION VEHS TRAV N/B ON THE M5 WHEN AS THEY PASSED J14 THERE WAS BUILT UP TRAFFIC. D2 SLOWED AND STOPPED FOR STAT TRAFFIC AHEAD, BUT D1 FTS AND V1 HIT R/O V2.

VEHICLES		DRIVER		CASUALTIES			VEH	SEX	AGE
1	Car	Female	Unk	1	Passenger	SLIGHT	2	Female	Unk
2	Car	Male	30	2	Passenger	SLIGHT	2	Male	1

151504561 SLIGHT 368773/193235 24/06/2015 08:19

LOCATION B4509 Junction with M5 Junction 14, Failfield

DESCRIPTION V1 (M/C)TRAVELLING E/B ON B4509 FROM THE A38 BEHIND A TRACTOR WHEN THE TRACTOR STOPPED TO ALLOW O/C V2 TO T/RIGHT ONTO THE M5 SLIP ROAD. R1 U/TOOK THE TRACTOR AND COLLIDED WITH V2.

VEHICLES		DRIVER		CASUALTIES			VEH	SEX	AGE
1	M/cycle 125 - 500cc	Male	30	1	Driver/Rider	SLIGHT	1	Male	30
2	Car	Female	33	2	Passenger	SLIGHT	2	Female	9

151505405 SLIGHT 369111/193580 17/07/2015 10:55

LOCATION M5 J14-15 (Exact location unknown)

DESCRIPTION IT WAS APPEAR THAT THE VEHS WERE TRAV S/B ON THE M5 BETWEEN J14 AND J15 IN TRAFFIC. WHEN V1 HIT THE R/O V2. A CONVERSATION TOOK PLACE WHERE D1 TRIED TO OFFER D2 £20 FOR DAMAGE, BUT THEN DROVE OFF WITHOUT LEAVING CORRECT DETAILS.

VEHICLES		DRIVER		CASUALTIES			VEH	SEX	AGE
1	Van/Goods < 3.5t	Male	Unk	1	Driver/Rider	SLIGHT	2	Male	32
2	Car	Male	32						

151505546 SLIGHT 369178/193090 07/06/2015 12:02

LOCATION B4509 Tortworth j/w Unnamed Rd, Falfield

DESCRIPTION V2 STAT WAITNG TO T/RT ONTO A SIDE RD FROM B4509. V1 TRAV E/B AROUND A L/H/B HIT R/O V2 CAUSING IT TO BE PUSHED ACROSS RD ONTO GRASS VERGE.

VEHICLES		DRIVER		CASUALTIES			VEH	SEX	AGE
1	Car	Female	40	1	Driver/Rider	SLIGHT	2	Male	32
2	Car	Male	32						

151506869 SLIGHT 368607/192944 28/08/2015 22:08

LOCATION M5 J15-14

DESCRIPTION V1 AND V2 TRAVELLING N/B ON THE M5. V1 WAS IN L2 AND V2 IN L3 OVERTAKING VEHICLES WHEN V1 MOVED INTO L3 AND COLLIDED WITH V2 AND LOST CONTROL.

VEHICLES		DRIVER		CASUALTIES			VEH	SEX	AGE
1	Car	Male	46	1	Driver/Rider	SLIGHT	1	Male	46
2	Car	Male	25						

151507990 SLIGHT 368921/193342 19/06/2015 19:45

LOCATION M5 J14 (M/P 118/7)

DESCRIPTION V1 WAS TRAVELLING S/B IN LANE 3 AT EXCESS SPEED, WHEN D1 LOST CONTROL AND SWERVED FROM LANE 3 TO LANE 1 WHERE IT HIT V2. V2 LEFT THE C/W ON THE N/S, WENT UP A BANK AND FLIPPED ONTO ITS ROOF. V1 WENT ONTO VERGE AND STOPPED.

VEHICLES		DRIVER		CASUALTIES			VEH	SEX	AGE
1	Car	Female	49	1	Passenger	SLIGHT	2	Female	4
2	Car	Male	47						

161604419 SLIGHT 368580/192852 09/05/2016 14:52

LOCATION M5 J14, Falfield

DESCRIPTION V2 PULLED ONTO HARD SHOULDER WHILE TRAV S/B ON THE M5 & STOPPED DUE TO A PROBLEM WITH THE WINDSCREEN WIPERS DURING HEAVY RAIN. PASSING V1 COLLIDED (GLANCING BLOW) WITH OFFSIDE OF V2

VEHICLES		DRIVER		CASUALTIES			VEH	SEX	AGE
1	Goods > 7.5t	Male	42	1	Driver/Rider	SLIGHT	2	Male	54
2	Goods 3.5 - 7.5t	Male	54	2	Passenger	SLIGHT	2	Male	24

181802472 SLIGHT 368730/193260 28/03/2018 08:12

LOCATION M5 J14 at Junction with B4509

DESCRIPTION V1 WAS LEAVING THE M5 ONTO THE B4509 AT J14. V1 FAILED TO GIVE WAY AT THE JUNCTION AND PULLED OUT. V2 WHICH WAS TRAVELLING W/B TOWARDS FALFIELD ON THE B4509 COULD NOT AVOID COLLISION AND HIT THE O/S OF V1.

VEHICLES		DRIVER		CASUALTIES			VEH	SEX	AGE
1	Car	Male	38	1	Driver/Rider	SLIGHT	1	Male	38
2	Car	Male	46	2	Passenger	SLIGHT	2	Female	40

TECHNICAL NOTE

APPENDIX C

NOTES:

1. THE LAYOUT IS SUBJECT TO DETAILED DESIGN, CAPACITY TESTING, GROUND INVESTIGATIONS RESULTS & EARTHWORKS MODELLING, UTILITIES & SERVICES AND CONFIRMATION OF LAND OWNERSHIP;
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KEY:

HIGHWAY BOUNDARY INFORMATION RECEIVED FROM SGC 22.09.2015 AND INTERPRETED BY STANTEC

EXISTING SIGNALISED JUNCTION OF A38/B4509

EXTEND AHEAD FLARE BY 121m

EXISTING PRIVATE ACCESS MAINTAINED

RELOCATED BUS STOP LAYBY AND SHELTER TO ACCOMMODATE THE EXTENSION OF FLARE TO THE JUNCTION OF A38/B4509

PROVIDE 3M FOOTWAY ALONG REALIGNED CARRIAGEWAY AND TIE INTO EXISTING

START OF AHEAD LANE FLARE, NORTH OF A38/SUNDAYSHILL LANE JUNCTION

THE POSITION OF THE SUNDAYSHILL LANE GIVE-WAY LINE RETAINED WITH REVISED TIE-IN, TO ACCOMMODATE THE EXTENSION OF FLARE TO THE A38/B4509 JUNCTION

'KEEP CLEAR' ROAD MARKINGS ON NORTHBOUND LANES TO ALLOW FOR THE PASSAGE OF RIGHT TUNERS FROM MILL LANE

EXISTING INFORMAL CROSSING TO BE REMOVED

UPGRADE OF EXISTING PEDESTRIAN CROSSING TO INCLUDE TACTILE PAVING

Mark	Revision	Date	Drawn	Chkd	Appd
B	CHANGES IN LINE WITH SGC DECISION LOG COMMENTS (25.08.20)	01.09.20	PC	KS	NT
A	UPDATED FOR HIGHWAY AUTHORITY COMMENTS	01.06.20	SL	NT	NT

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Drawing Issue Status

CONCEPT

WEST OF PARK FARM, THORNBURY

A38 B4509 JUNCTION MITIGATION EXTENDED N/B FLARE BY 121m

Client

BARWOOD DEVELOPMENT SECURITIES LTD

Date of 1st Issue	Designed	Drawn
19.03.2020	JHo	JHo
A3 Scale	Checked	Approved
1:1000	KS	-
Drawing Number		Revision
39209/5501/SK37		B

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