

Upton McGougan

Lyons Haulage Site
Worthing Road, Littlehampton

RIGHT TURN LANE ACCESS DESIGN CHECK REPORT

for

Stuart Lyons (Haulage) Ltd

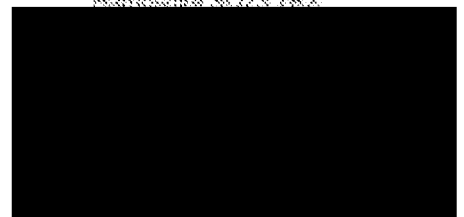
December 2009

Project No. 022.1832/RW/90619b



Upton McGougan

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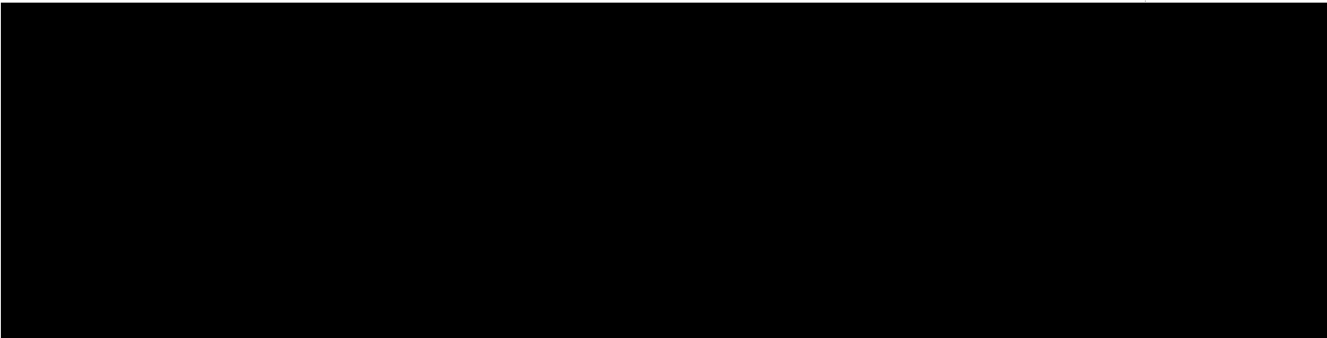
Revision History

Rev	Date	Purpose/Status	Document Ref.	Comments
-	28.08.09	Draft	022.1832/PB/90619	
A	28.09.09	Final	022.1832/PB/90619a	
B	16.12.09	Revised	022.1832/RW/90619b	Revised as per WSCC Comments

Prepared by:

Reviewed by:

Approved by:



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1.0 SUBMITTED INFORMATION

The following information has been submitted within the appendices of this design check report to allow a complete design check on the proposed access arrangement to be completed:

Drawing No. 022.1832.202.P6	Junction Access Option 5 including Visibility Splay
Drawing No. 022.1832.204.P3	Refuse Vehicle Swept Path (Large 3-Axle Vehicle)
Document Ref. 022.1832/PB/80871b	Trip Rate Impact Assessment Including TRICS data and PICADY Analysis

Highway Ownership Records

Minutes of Pre-Application Discussion Meeting

2.0 DESCRIPTION OF HIGHWAY WORKS

Right turn lane on the A259 (Worthing Road) and associated carriageway realignment to improve an existing access to accommodate predicted traffic levels associated with a c.100 residential unit redevelopment of the existing haulage depot premises.

These improvement works should be considered in relation to the 'Development-Related Infrastructure' works on the A259 in the immediate vicinity of the proposed site access, as approved and implemented to West Sussex County Council (WSCC) Highways requirements in association with the Toddington Lane residential development.

Traffic Speed/Flow Information

Extensive traffic surveys and future year growth models were undertaken with the application for the neighbouring Toddington Lane scheme (application number LU/45/06), including Future Year 2015 'with development' traffic flows. It should be noted that the supporting assessment incorporated development traffic for 150 residential units being developed on the Lyons Haulage site, however not via the existing access on the A259. The assessment considered closure of the existing Lyons Haulage accesses and development traffic accessing the local road network through the neighbouring site. These traffic flows are considered within the attached Trip Rate Impact Assessment.

The speed limit on this section of the A259 is 40mph.

Accident History

A full accident data review has not been completed at this stage. The reason for this is simply that significant improvement works have been implemented on the A259 in the vicinity of the proposed site access within the last 12 months, which were subject to a full Section 278 design check and safety audit process. Limited accident data would be available since the implementation of these works, and accidents caused by highway design concerns that were recorded prior to these highway improvements may have now been resolved.

3.0 DESIGN FEATURES

Horizontal Alignment

The right turning lane is designed in accordance with **DMRB TD42/95** – Geometric Design of Major/Minor Priority Junctions and **TD9/93** – Highway Link Design.

The right turn lane is designed to **TD42/95** criteria for a ghost-island right turn lane. The geometric design for the right turning lane is influenced by the 40mph speed limit of Worthing Road (A259), the proximity to the Watersmead Roundabout and the predicted trip levels generated from residential redevelopment of the site.

The width of the right turn lane of 3.0m is identified as a permissible relaxation from **TD42/95** 3.5m standard. This is highlighted subsequently within the departure from standards section of this design check, and has been discussed with WSCC Highway Officers. The through lanes are 3.0m.

The turning length of the right turn lane is determined by the peak traffic demand generated by the size and type of redevelopment, which we have calculated using the TRICS (2009b) database. Whilst further details can be found within the accompanying Trip Rate Impact Assessment (document ref: 022.1632/PB/898715), the highest proportion of right turn manoeuvres into the site is 20 vehicles during the PM peak (1 vehicle every 3 minutes), with which the PICADY junction model highlights a minimal queue (as identified within the Trip Rate Impact Assessment). The turning length is however determined by referring to **TD42/95** paragraph 7.32 and 7.33 that specifies a minimum turning length of 10m to allow long vehicles to position themselves correctly before undertaking right turn manoeuvres.

The deceleration length for the right turning lane is designed based on the speed of Worthing Road (A259), which is a 40mph road. Based on **TD42/95** - Table 7/5a which sets out the deceleration length for Ghost Island and single lane dualing, the deceleration length is determined as 25m based on the design speed of 60kmph. The location of the Watersmead Roundabout (approximately 120m to the east of the site access) acts to keep speeds low, and so the 60kmph (~37.5mph) design speed should be considered appropriate. A 5m direct taper is required for the design speed of 60kmph. The taper of the approach and tail hatching for the Ghost Island is designed at 1:20 symmetrically around the centreline of the major road as per **TD42/95** standards.

The footway and cycleway is extended across one of the site access to connect with the junction bell mouth and across the splitter island to provide crossing points for both pedestrian and cyclists.

The access improvements include the closure of the existing eastern site access and the existing 3.0m shared footway/cycleway extended across the site frontage to connect with the relocated site access and splitter island, with additional drop kerbs and tactile paving to be implemented in accordance with *DfT Guidance on the use of Tactile Paving Surfaces*.

The geometric design for the site access is based on **TD42/95**, BS standard for kerbing radii and Manual for Streets. The lane width of 5.5m for the site access is determined using MIS with allowance for 2 HGVs to pass, which is widened to 6.0m for the first 23m to accommodate the swept paths of larger vehicles. The site access would provide a left out arrangement to prevent vehicles from turning right across the right turn lane to travel westbound along Worthing Road. With Watersmead Roundabout located approximately 120m to the east, it is our professional

view that by restricting right turn movements out of the site, a significant improvement would be achieved over and above the current arrangement which sees large HGVs undertaking this manoeuvre. A PICADY assessment of this arrangement has been conducted and is incorporated into the accompanying Trip Rate Impact Assessment.

The kerb radii of 15m are based on the vehicle swept paths and manufacturer specification as per British Standards, as well as TD42/95 guidance on radii at Ghost Island junctions.

Vertical Alignment

The vertical alignment of the carriageway would remain as existing.

Drainage Proposals

The proposals would include the relocation of any existing gullies that may be directly impacted upon by the access improvements. Drainage relocation would be fully assessed at any future Section 278 stage, and we would envisage working closely with WSCC through the detailed stage to ensure this is achieved.

Street Lighting

The proposals would include the relocation of two street lighting columns to the rear of the proposed footway on the southern side of the carriageway (approximately 2.0m south of their current locations). Street lighting works would be fully assessed at any future Section 278 stage and we would envisage working closely with WSCC to ensure this is achieved.

Traffic Signals

N/A. There would be no impact on the signal pedestrian crossing approximately 80m east of the proposed access location.

Road Markings and Signage

It is intended that additional signage would be required at the site access to prohibit right turning manoeuvres (DIA 612) and highlight no entry into the exit lane of the site access (DIA 616).

Signage and street furniture currently located within the southern footway would be relocated within the proposed alignment for the southern footway.

All road markings and signing would be provided in accordance with TSRGD 2002 & Highway Authorities requirements. A road marking and signing schedule would be provided to support the S278 Detail Design stage submission.

Signage is indicatively demonstrated on attached drawing no 022.1832.202.P6.

Pavement Design

The proposed realigned footway would be constructed to meet WSCC requirements and specific construction specifications agreed at any future Section 278 stage.

Structures

N/A

Visibility

Visibility in the primary direction of 4.5m x 120m is achievable in accordance with DMRB requirements for a 40mph road.

Visibility in the secondary direction of 4.5m x 120m is achievable to the Watersmead Roundabout exit lane, with overtaking at this location prohibited by the splitter island of the roundabout. This is therefore in accordance with DMRB TD42/95 visibility splay requirements.

These visibility splays are demonstrated on drawing no 022.1832.202.P6.

Pedestrian and Cycle Facilities

Pedestrian and cycle facilities on the northern side of the A259 would be improved through the stopping up of the existing eastern access point to the Lyons Haulage site, and improve the western access with left only splitter island with dropped kerbs and tactile paving at the bellmouths. These works are demonstrated on the attached drawing no 022.1832.202.P6.

Public Transport Facilities

N/A

Road Safety Audit

As established with WSCC Highways Officers during pre-application discussions (minutes attached), this design check report will precede a full RSA of the proposed access arrangement, and we look forward to receiving these comments in due course.

Arboriculture

N/A

Standard Details

At the detail design check stage a list of WSCC Standard Details including Revision suffix, which are relevant to the works, will be provided.

Departures from Standard

TD42/95 seeks a standard 3.5m width for right turn-lane ghost island design, but accepts 3.0m as a permissible relaxation. This design incorporates a 3.0m width, and the suitability of which has been discussed with WSCC Highways Officers.

4.0 CONCLUSION

Upton McGougan have been commissioned to assist in the development of an access strategy to the allocated land at Windroos Nursery for residential development. Due to third party land restrictions, the access option available to bring forward this site for development is directly via the A259 (Worthing Road).

Following pre-application discussions with WSCC Highways, this Design Check Report has been prepared, in conjunction with a Trip Rate Impact Assessment, to allow WSCC to fully appraise the design suitability of the proposed access arrangement.

In accordance with the pre-application discussions, a full Stage 1 Road Safety Audit would be undertaken following comments on the design by WSCC.

Appendix E
WSCC Design Check

PRE-APP ENQUIRY Design Checklist
S2/WS2/Single carriageway UAP Roads
Simple and Ghost Island Major/ Minor Priority Junction – checklist

Project	Lyons Haulage Site
Road	Worthing Road, Littlehampton
Junction type	Ghost Island Major/Minor Priority Junction
Checker	David Lambert
Date	12/01/10
Version	1.0 - 40mph design speed (70 kph)

1. Documents submitted:

1.1	Design Statement Version	022.1832/RW/90619b
1.2	St 1 Safety Audit (if available) version	Not available
1.3	Prelim Design drawing Number(s)	022.1832.202 Rev P6 022.1832.204 Rev P3
1.4	Trip Rate Impact Assessment	022.1832/PB/89871b
1.5	Report on junction choice TA 30/82	Not supplied

2. Supporting information (for use in determining design criteria)

2.1	Speed data provided	Yes
2.2	Turning Count Data provided	Yes
2.3	Development traffic flows provided	Yes

3. Currency of design standards used herein

Standard	Version	Up to date?
TA 79/99	printed 02/10/08	Yes
TD 9/93	printed 05/09/08	Yes
TD 42/95	printed 08/09/08	Yes
TA 30/82	printed 15/01/10	yes

4. Junction Choice

Junction choice checked against TA30/82? No

Junction choice valid? No

6. TD9-93 Link design

6.1 Changes to curvature on major road and SSD check.

6.1.1	Speed Limit	60mph	50mph	40mph	30mph
6.1.2	Road Type	URBAN / ~~RURAL~~ / Primary distributor			

Eastbound Approach

6.1.3 s	Design Speed/kph	100 A/B	85 A/B	70 A/B	60B
6.1.4 s	SSD _{req} /m	215	160	120	90
6.1.5 s	1 step below SSD _{req} /m	160	120	90	70
6.1.6 s	SSD Achieved	120m		Min	
				Min / 1 step below / fail	
6.1.7 s	Is 1.5 x SSD _{req} achieved on approach to junctions			YES / NO	

6.1.9	Ownership/status of land within visibility envelopes shown	YES / NO	All reported to be either in applicants control or Highway Land
6.1.10	Effect on roadside features shown	YES / NO	

6.2 Horizontal Curvature

No non-complaint curvature introduced

6.3 Vertical Curvature

N/A ~ substantially flat

7. TD42/95 & TD41/95 Design of Major/Minor Junctions/accesses

7.1 Checks standard for all junctions

7.1.1	Speed Limit	40mph		
	Design Speed	Speed data not supplied		
7.1.2a	Minor Road Traffic Flow	$Q_m = 120 \times 5.096 = 611$ AADT (Design year + Development flows)		
7.1.2b	Major Road traffic flow	$= (1600+1507) \times 9.6 = 29827$ AADT		
7.1.2c	Do flows accord with TD42/95 figure 2/2	No ~ Major road traffic flows outside of that for which ghost island junctions are deemed to be acceptable according to figure 2/2		
7.1.3	Visibility criteria	If speed limit is <30mph use MfS, else use DMRB. If using DMRB and $Q_m < 500$ AADT use TD 41/95, otherwise use TD 42/95		
	Standard applied	MfS / TD/41/95 / TD 42/95		
7.1.4	'X' distance	Required	9m	Departure From standard
		Achieved	4.5m	
		Management of vegetation overgrowth into vis splays	Hedgerow fronting vis splay retained ~ no measures to prevent overgrowth indicated	Design to include measures to prevent overgrowth of vegetation
7.1.5	'Y' distance	Required	120m	Achieved
		Achieved	120m facing west 120m facing east	
7.1.6	Visibility of junction layout as per TD42/95 7.6a	Minor road approach SSD_{min} achieved	shown:	YES / NO
			checked:	To be considered as part of reserved matters
7.1.7	Visibility of junction layout as per TD42/95 7.6b	15m to tangent points	included:	YES / NO
			checked:	YES / NO Achieved ~ (Note that adequate tapers have not been provided).
7.1.8	Statement that junction is operating within capacity...	Included:	YES / NO	
		Checked:	YES / NO RFCs acceptable	

7.1.9	Level section of minor road before give way line	Conforms to Para 3.7 1/150 max for 15m		To be considered as part of reserved matters		
		Is a residential estate road and conforms to WSCC standard 1/30 max for 10m		To be considered as part of reserved matters		
7.1.10	Visibility for other junctions	Cornfield Close	Visibility splay to be assessed and shown on drawings			
7.1.11	Corner Radii check against TD42/95 7.17 part: ~~a, b, c, d, e~~ (Delete as applicable)		Radius	Taper	Departure from Standard	
		Proposed	15m	Nil		
		Required	15m	1 in 6 over 30m		
7.1.12	Diverging Tapers and Lanes. TD42/95 paras 7.52 – 7.54	7.53 Speed less than 85kph, therefore not required				
7.1.12	Appropriate track swept paths and justification of vehicle type(s) supplied?	Swept path for refuse vehicle seems unreasonably tight. – High likelihood that kerbs will be overrun. Due to presence of traffic island it will be necessary to consider swept paths for occasional use by pantechnicons and HGVs.				
7.1.13	Angle of intersection of junction	Required: 70° to 110° Achieved: 45°		Departure from Standards		

7.2 For ghost island layouts only:

7.2.1	Lane widths check against TD42/95	Westbound Ref 7.20	3.0m	This is the minimum allowed in the standards. It is suggested that due to high flows and mixed vehicles types that 3.65m be provided as there is sufficient space to do so.
		Eastbound Ref 7.20	3.0m	
		Turning lane Ref 7.35	3.0m	Relaxation is sought – It is suggested that due to high flows at least 3.5m should be provided – There appears to be sufficient space to do so
7.2.2	Check taper for ghost island T7/3	Eastern: Provided: Required:	36m 30m	Departure from Standards – Western taper length not achieved. Note: No gradient was highlighted by the designer.
		Western: Provided: Required:	25m 30m	

7.2.3	Check direct taper for turning lane Table 7/4	Provided:	5m	Departure from standards (It should be noted that design speed is selected by speed limit in urban areas, not by vehicle speeds)
7.2.4	Check length of turning lane (7.40) (from start of taper to junction centreline) Table 7/5a refers	Required:	15m	
		Provided:	35m	
		Required:	10m	
7.2.5	Smoothness of kerb and centreline alignment. (Qualitative visual check)	Turning:	Nil	Tapers non-compliant with standards
		Queueing:	40m	
		Decelerating:	50m	
		Total		

7.3 Pedestrian refuges/ splitter islands / channelling islands

Need for refuge/splitter islands to be determined through safety audit process.

7.3.1	Island kerb offset to markings See TSM Ch5 para 4.23	Required: Provided:	N/A	N/A
7.3.2	Major Road lane widths at Island to be greater than 4m or less than 3.2m. (wacc policy)	Provided:	N/A	N/A
7.3.3	Channelising island in accordance with TD42/95 annex 2			No - Departure from standards

4. General Comments

4.1	Bilster pattern tactile paving should be aligned with back of footway. Other tactile paving and markings will be required where cycle route intersects with footways - review as part of detailed design.
4.2	Angle of intersection with carriageway may possibly cause visibility problems for drivers of vehicles without back windows, such as vans and also elderly people who would not be supple enough to turn their heads to get adequate visibility.
4.3	It is suggested that a facility for left turning cyclists (both in and out from site) be provided to enable them to access cycle path. Furthermore, it is suggested that design could be amended so that "End of cycle route" signs can be omitted. - i.e clearly lead cyclists safely onto the site access road.
4.4	Dropped kerbs and tactile paving to be provided for the full width of the footway/cycleway at the road crossing points.
4.5	LO to confirm that Worthing Road capacity and that of nearby junctions have been considered and are satisfactory.
4.6	Southern kerbline of triangular island (i.e the bit that runs parallel to the A259) to be offset 0.5m away from the carriageway.
4.7	Visibility splays for cyclists waiting to cross side road to be included on plans
4.8	Note the presence of a possible improvement line to the A259 - maintainable highway plan in Design Check Report is out of date.

Appendix F

Stage 1 Road Safety Audit and Speed Survey

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Moorside Road
Winchester
SO23 7RX

ROAD SAFETY AUDIT - STAGE 1

LYONS HAULAGE SITE
WORTHING ROAD
LITTLEHAMPTON

JUNCTION ACCESS OPTION 5

FEBRUARY 2010

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HAMPSHIRE
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Road Safety Audit - Stage 1
Lyons Haulage Site, Worthing Road, Littlehampton - Junction Access Option 5

Page 1

Revision Status	Prepared by: (Name)	Checked by: (Name)	Approved by: (Signature)	Date Approved:
Original	Stefan Lötter	Mark Barrett		15 February 2010
Designer's Response				
Authority's Response				
Audit Response				

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Engineer:

CRASHNOT SOLUTIONS LLP
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Date: 15 February 2010

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APPENDIX A Designers Response

APPENDIX B Key Plans

1.0 INTRODUCTION

- 1.1 CRASHNOT SOLUTIONS LLP have been commissioned by Upton McGougan to prepare a Stage 1 Road Safety Audit in response to the construction of a right turn lane and associated carriageway realignment towards the south, on Worthing Road (A259) in Littlehampton. This is to improve the existing access to Lyons Haulage premises to accommodate predicted traffic levels associated with a 100 residential unit redevelopment of these premises.
- 1.2 The Audit Team is established from the CRASHNOT SOLUTIONS LLP, which is independent of the project design team. They have had no involvement with the design of the proposed works.
- 1.3 The report has been prepared with reference to the Design Manual for Roads and Bridges (DMRB) Highways Directive (HD) 19/03.
- 1.4 Whilst reference is made to certain design standards, where safety may be compromised by a reduction in standard, this report is not intended to provide a design check. The Audit Team has only reported on 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 or the appropriateness of the design. Consequently, the Auditors accept no responsibility for the design or construction of the scheme.
- 1.5 The recommendations in this report refer to a means of overcoming a safety problem or comment. There are likely to be various similar solutions that the designer should consider. In providing the Designers Response, discussion on possible solutions is expected. The recommendations contained herein do not absolve the Designer of his/her responsibilities.
- 1.6 The LHA response to the RSA should be formally recorded and reported to the designer and the RSA team so that a record of the Audit process is contained in the *As Built* design pack to be provided and retained by the LHA on final completion.

2.0 METHODOLOGY

2.1 The Road Safety Audit team was established as follows:

Audit Team Leader: Stefan Lötter BEng MSc MIMT MScRSA

Audit Team Member: Mark Barrett MIMT

2.2 The Audit was undertaken after detailed examination of the submitted documents and a visit to the site on Monday 8th February 2010 between 13.00 and 14.00. The weather was overcast with light drizzle at the time of the site visit and the road surface was wet.

2.3 Road Safety Audit was undertaken on the scheme detailed in the following documentation:

Drawing no.	Rev	Title
O22.1832.202	P6	Junction Access Options 5
O22.1832.204	P3	Junction Access Options 5 – Refuse Vehicle Tracking

2.4 The Audit Team was also provided with the:

- 'Right Turn Lane Access Design Check Report' (dated December 2009, Project No. 022.1832/RW/90619b) which highlights various departures from standard
- 'Trip Rate Impact Assessment' (dated August 2009, Project No. 022.1832/PB/89871b)
- Pre-App Enquiry Design Checklist (dated 12 January 2010, Version: 1.0 - 40mph design speed (70 kph))
- IA Appendix A - Operator's Licence and Clients summary
- IA Appendix B - Lyons Private Houses (South England Sites)
- IA Appendix Ci - Lyons Haulage AM Peak + Development Report
- IA Appendix Cii - Lyons Haulage PM Peak + Development Report
- Highway Ownership Records

2.5 The Audit Team undertook speed surveys on the main approaches to the proposed development access (on Worthing Road) approximately 50 m either side of the access. The results indicate that speeds in the eastbound and westbound directions are 40.3 mph and 34.5 mph respectively. The speed limit along Worthing Road is 40 mph.

2.6 No collision data was provided to the Audit Team.

3.0 ITEMS RAISED AT THIS STAGE 1 AUDIT

(Refer to Key Plans in Appendix B)

3.1 Problem

LOCATION: Access to development

The 3 metre wide shared footway/cycleway across the development frontage and access, links up with the 2 metre wide footways either side of the access road that leads into the development. The 'end of route' sign on the western side of the access has been provided three metres beyond the start of the footway, effectively resulting in a localised narrow section of shared footway/cycleway. As a result there is an increased risk of conflict between cyclists (who may still not have dismounted at this stage) and pedestrians, and an increased risk of cyclists and pedestrians being forced into the live carriageway during busy periods.

The 'end of route' sign on the eastern side of the access may mask the 'no entry' sign behind it. This may result in drivers turning into the exit lane if the other sign is damaged or vandalised, increasing the risk of head-on collisions with vehicles/riders leaving the development.

RECOMMENDATION

Relocate the 'end of route' sign on the western side of the access closer to the start of the footway.

Relocate either the 'end of route' sign or the 'no-entry' sign (or both) to prevent any of the signs being masked.

3.2 Problem

LOCATION: Access to development

Visually impaired pedestrians leaving the development along the 2 metre wide footway may not realise that they are entering an area shared with cyclists, increasing the risk of conflict.

RECOMMENDATION

Make visually impaired pedestrians aware that they are entering a shared area, by providing corduroy paving (in accordance with *Guidance on the use of tactile paving surfaces, Department for Transport, 2005*) to coincide with the 'end of route' signs. (Also refer to the recommendation for Problem 3.1)

3.3 Problem

LOCATION: Southern side of Worthing Road

There are a number of lighting columns, cabinets and road signs located adjacent to the existing footway. It is unclear if these are to be relocated or removed altogether. If they are to remain, they will reduce the effective width of

the footway and may increase the risk of pedestrians stepping into the live carriageway to pass each other. They are also a hazard for visually impaired pedestrians. Pedestrians are also at risk of striking their heads on the bottom or side of the sign.

RECOMMENDATION

Reduce the risk of injury to pedestrians using the new footway along the southern side of Worthing Road by removing or relocating all road side furniture off the footway (i.e. south of the footway). Ensure all this furniture has adequate vertical and horizontal clearance for pedestrians.

3.4 Problem

LOCATION: Access to development

The hatching to the west of the splitter/traffic island is almost 400mm wide. Pedestrians may be inclined to wait in this area, increasing the risk of being struck by turning vehicles, in particular the rear sections of large right turning vehicles.

RECOMMENDATION

Reduce the risk of pedestrians waiting in the hatch area being struck by vehicles by reducing the width of the hatching or increasing the width of the island.

3.5 Problem

LOCATION: Worthing Road to the west of the access

The provision of the right turn lane effectively removes the last overtaking opportunity along this section of Worthing Road. There is an increased risk that drivers may still try and overtake just prior to the hatching markings either side of the right turn lane, particularly in the eastbound direction, increasing the risk of collisions with vehicles waiting to turn right.

RECOMMENDATION

Provide protection for right turning vehicles by providing a traffic island with appropriate keep left signage and bollards within the hatching markings to the west of the right turn lane.

Alternatively, link this hatched markings area with the hatched markings further to the west.

3.6 Problem

LOCATION: Worthing Road to the east of the access

The widening of the carriageway to the south and introduction of the right turn lane has effectively introduced a relatively sharp 'kink' in the offside of the

westbound lane just prior to the start of the hatching east of the right turn lane. As a result there is an increased risk of vehicles that are leaving the roundabout, overrunning the opposing carriageway, increasing the risk of head-on collisions.

RECOMMENDATION

Keep opposing vehicles apart by joining up the hatched markings to the east of the right turn lane and the hatched markings on the roundabout splitter island.

4.0 AUDIT TEAM STATEMENT

- 4.1 We certify that this Audit has been carried out in accordance with HD 19/03 and that we have inspected the proposed scheme with the sole purpose of identifying features of the design that could be added to, removed or modified to enhance the safety of the proposed works. Those problems and comments identified in the report together with associated suggestions, which we recommend, should be considered before construction proceeds.

AUDIT TEAM LEADER

Stefan Lötter BEng MSc MHT MScRSA
CRASHNOT SOLUTIONS LLP
30 Silchester Place
Hyde
Winchester
SO23 7FT

Signed:

Date: 15 February 2010

AUDIT TEAM MEMBER

Mark Barrett MSc

APPENDIX A: DESIGNERS RESPONSE

Auditors: Stefan Lötter (Team Leader) and Mark Barrett (Team Member)

Scheme: Lyons Haulage Site, Worthing Road, Littlehampton -- Junction Access Option 5

Date Audit Completed: 15 February 2010

This response is to a Stage 1 Road Safety Audit to the design standard detailed within HD19/03 of Volume 5, Section 2, Part 2, of the Design Manual for Roads and Bridges, as detailed by the Highways Agency.

Problem no. in safety audit report	Problem accepted (yes/no)	Recommended measure accepted (yes/no)	Alternative measure (detail description)
3.1			
3.2			
3.3			
3.4			
3.5			
3.6			

Principal Engineer's Statement

Road Safety Audit for Lyons Haulage Site, Worthing Road, Littlehampton – Junction Access Option 5

I certify that I have considered the items that have arisen in the Stage 1 Road Safety Audit Report and I am content to accept all of its recommendations except for the ones listed above. I have stated my reasons for not accepting them and I seek the Chief Engineer's endorsement of my proposals.

..... Date

Principal Engineer

Chief Engineer's Decision

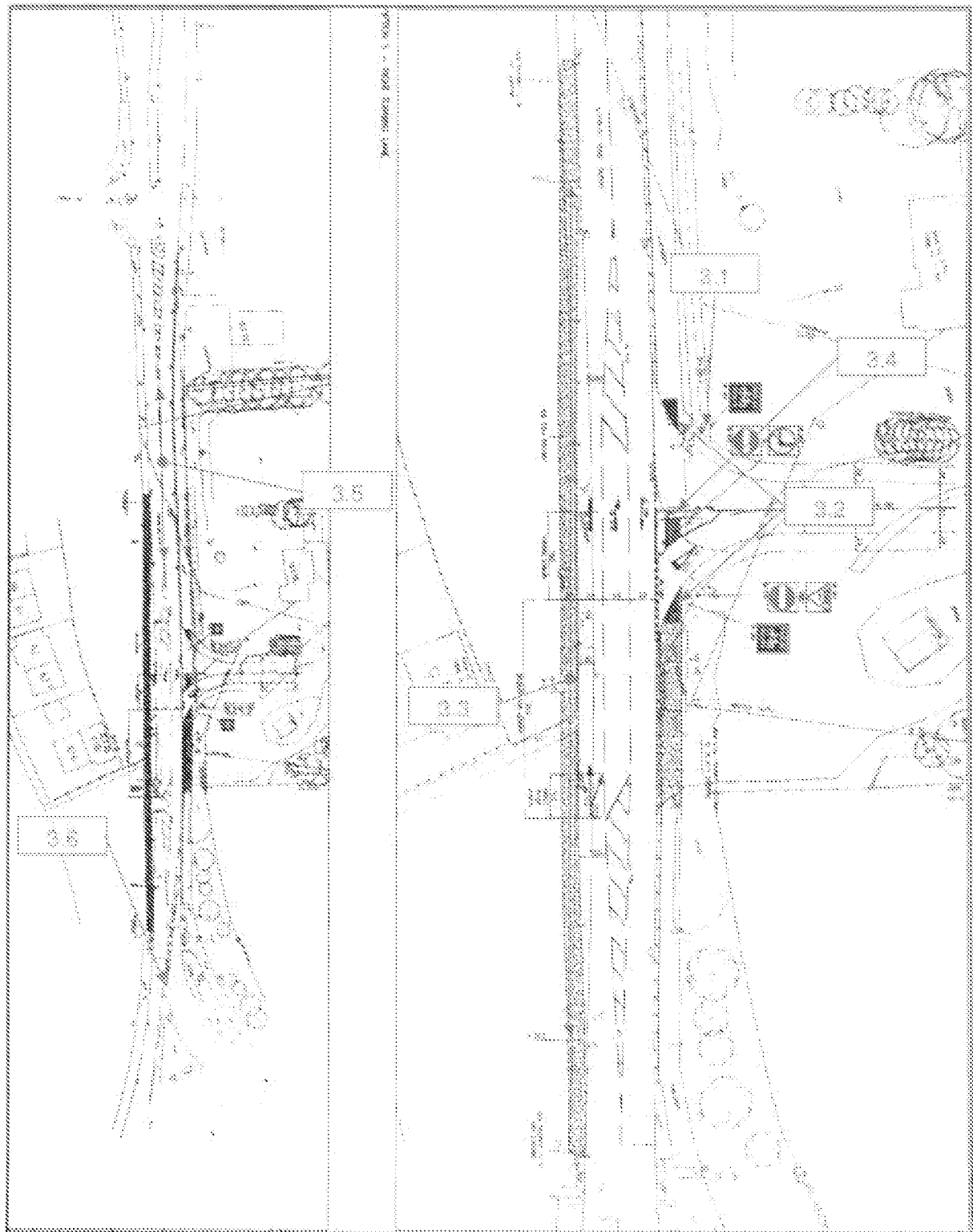
I accept these proposals by the Principal Engineer.

..... Date

Chief Engineer

APPENDIX B: KEY PLANS

(Numbers in red refers to problems in Section 3)





CRASHNOT SOLUTIONS LTD

SPEED SURVEY

A259 Worthing Rd, Littlehampton
(approaches to Lyons Haulage Access)



REF: 2010 / 020

08 February 2010

SPEED SURVEY

A259 Worthing Rd, Littlehampton
(approaches to Lyons Haulage Access)

BRIEF:

CRASHNOT SOLUTIONS LLP HAS BEEN COMMISSIONED BY UPTON MCGOUGAN TO UNDERTAKE A SPEED SURVEY ON THE A259 WORTHING ROAD, LITTLEHAMPTON ON THE APPROACHES TO THE ACCESS SERVING LYONS HAULAGE.

SURVEY:

THE SURVEYS WERE UNDERTAKEN ON 9TH FEBRUARY 2010 IN ACCORDANCE WITH THE SURVEY BRIEF PREPARED BY ROB WILSON (UPTON MCGOUGAN).

SURVEY EXTENT:

THE SPEED SURVEY WAS UNDERTAKEN IN ACCORDANCE WITH TA21/81 (VEHICLE SPEED MEASUREMENT ON ALL PURPOSE ROADS). A SAMPLE OF 200 SPEED RECORDINGS OF ALL FREE FLOWING VEHICLES (EXCLUDING MOTOR CYCLES) WAS RECORDED AT THE LOCATION INDICATED ON THE SITE MAP PROVIDED.

ROAD WORKS:

THERE WERE ROAD WORKS ON THE A259 WORTHING ROAD AT THE TIME OF THE SPEED SURVEYS, APPROXIMATELY 750 WEST OF THE ACCESS SERVING LYON'S HAULAGE.

WEATHER:

THE WEATHER THROUGHOUT ALL SURVEY PERIODS WAS COLD, OVERCAST WITH LIGHT DRIZZLE.

WESTSOUND

CLIENT:	Upper Midway
DAY:	MONDAY
LOCATION:	A230 Worthing Rd, Littlehampton - approximately 50 m east of access to Lyn's house

IDS NO:	2010/23
DATE:	26 February 2011
WEATHER:	OBSOLETE AND LIGHT CRUISE
POSTED SPEED LIMIT:	40
NO OF READINGS, N:	100
STANDARD DEVIATION:	3.55

SPEED (MPH)	NO. OF READINGS	SUM OF SPEEDS	SUM OF V ²
10	0	0	0
11	0	0	0
12	0	0	0
13	0	0	0
14	0	0	0
15	0	0	0
16	0	0	0
17	0	0	0
18	0	0	0
19	0	0	0
20	0	0	0
21	0	0	0
22	22	484	484
23	0	0	0
24	0	0	0
25	0	0	0
26	0	0	0
27	115	3135	3135
28	167	4736	4736
29	435	12615	12615
30	300	8400	8400
31	372	11532	11532
32	416	13312	13312
33	353	11649	11649
34	174	5916	5916
35	180	6300	6300
36	72	2592	2592
37	148	5472	5472
38	18	648	648
39	29	1041	1041
40	40	1600	1600
41	0	0	0
42	0	0	0
43	0	0	0
44	0	0	0
45	0	0	0
46	0	0	0
47	0	0	0
48	0	0	0
49	0	0	0
SUB TOTAL		5143	99707

$$SY = 3143$$

$$SD^2 = 99707$$

SPEED (MPH)	NO. OF READINGS	SUM OF SPEEDS	SUM OF V ²
50	0	0	0
51	0	0	0
52	0	0	0
53	0	0	0
54	0	0	0
55	0	0	0
56	0	0	0
57	0	0	0
58	0	0	0
59	0	0	0
60	0	0	0
61	0	0	0
62	0	0	0
63	0	0	0
64	0	0	0
65	0	0	0
66	0	0	0
67	0	0	0
68	0	0	0
69	0	0	0
70	0	0	0
71	0	0	0
72	0	0	0
73	0	0	0
74	0	0	0
75	0	0	0
76	0	0	0
77	0	0	0
78	0	0	0
79	0	0	0
80	0	0	0
81	0	0	0
82	0	0	0
83	0	0	0
84	0	0	0
85	0	0	0
86	0	0	0
87	0	0	0
88	0	0	0
89	0	0	0
SUB TOTAL		0	0

ALL READINGS ARE IN MPH

EASTBOUND

CLIENT	Upton McLaughlin
DAY	Monday
LOCATION	A359 Worthing Rd. Littlehampton - approximately 30 m west of access to Lynn's Hardware
DATE	10/02/20
TIME	10:00
NO. OF READINGS	100
STANDARD DEVIATION	3.04

NO. NO.	2510/20
DATE	10/02/20
WEATHER	OVERCAST WITH LIGHT DRIZZLE
POSTED SPEED LIMIT	40
NO. OF READINGS, N	100
STANDARD DEVIATION	3.04

SPEED (MPH)	NO. OF READINGS	SUM OF SPEEDS	SUM OF V ²
0	0	0	0
1	0	0	0
2	0	0	0
3	0	0	0
4	0	0	0
5	0	0	0
6	0	0	0
7	0	0	0
8	0	0	0
9	0	0	0
10	0	0	0
11	0	0	0
12	0	0	0
13	0	0	0
14	0	0	0
15	0	0	0
16	0	0	0
17	0	0	0
18	0	0	0
19	0	0	0
20	0	0	0
21	0	0	0
22	0	0	0
23	0	0	0
24	0	0	0
25	0	0	0
26	0	0	0
27	0	0	0
28	0	0	0
29	0	0	0
30	0	0	0
31	0	0	0
32	0	0	0
33	0	0	0
34	0	0	0
35	0	0	0
36	0	0	0
37	0	0	0
38	0	0	0
39	0	0	0
40	0	0	0
41	0	0	0
42	0	0	0
43	0	0	0
44	0	0	0
45	0	0	0
46	0	0	0
47	0	0	0
48	0	0	0
49	0	0	0
SUB TOTAL		3724	130504

$$\Sigma V = 3724$$

$$\Sigma V^2 = 130504$$

SPEED (MPH)	NO. OF READINGS	SUM OF SPEEDS	SUM OF V ²
50	0	0	0
51	0	0	0
52	0	0	0
53	0	0	0
54	0	0	0
55	0	0	0
56	0	0	0
57	0	0	0
58	0	0	0
59	0	0	0
60	0	0	0
61	0	0	0
62	0	0	0
63	0	0	0
64	0	0	0
65	0	0	0
66	0	0	0
67	0	0	0
68	0	0	0
69	0	0	0
70	0	0	0
71	0	0	0
72	0	0	0
73	0	0	0
74	0	0	0
75	0	0	0
76	0	0	0
77	0	0	0
78	0	0	0
79	0	0	0
80	0	0	0
81	0	0	0
82	0	0	0
83	0	0	0
84	0	0	0
85	0	0	0
86	0	0	0
87	0	0	0
88	0	0	0
89	0	0	0
SUB TOTAL		0	0

$$\Sigma V = 0$$

Appendix G

Road Safety Audit Designer's Response

Upton McGougan

Lyons Haulage Site
Worthing Road, Littlehampton

ROAD SAFETY AUDIT DESIGNER'S RESPONSE

for

Stuart Lyons (Haulage) Ltd

July 2010

Project No. 022.1832/GB/92001A



Upton McGougan

IAC House
Moorside Road
Winchester
Hampshire SO23 7RX

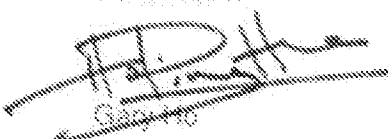
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Revision History

Rev	Date	Purpose/Status	Document Ref.	Comments
-	18.04.10		022.1832/GB/92001	
A	13.07.10	Submission	022.1832/GB/92001A	

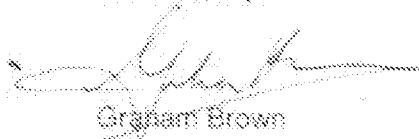
Prepared by:



Gary Ho

Engineer

Reviewed by:



Graham Brown

Associate

Approved by:



Rob Wilson

Director

1.0 INTRODUCTION

- 1.1 Upton McGougan Ltd have been commissioned to provide engineering services to the proposed development at Lyons Haulage.
- 1.2 This report provides a designer's response to the Road Safety Audit (RSA) – Stage 1 report for proposed off-site highway improvements for adoption under Section 278 of the Highways Act 1980 for the residential development.
- 1.3 Crashnot Solutions LLP, an independent Road Safety Auditor, undertook the RSA and revised the RSA in February 2010 based on additional information being supplied.
- 1.4 This designer's response firstly examines each of the audit findings and responds to the recommendations made.

2.0 AUDIT FINDINGS & RECOMMENDATIONS

Problem no. in safety audit report	Problem accepted (yes/no)	Recommended measure accepted (yes/no)	Alternative measure (detail description)	Audit Team Response
3.1	Yes	Yes	'End of route' sign has been relocated closer to the start of the footway as demonstrated in drawing no. 022.1832.202.P7	Agreed with relocation of 'End of route' sign on western side of access. Widen the shared footway/cycleway to 3m right up to the corduroy paving. 'End of route' sign on the eastern side of the access is positioned behind the corduroy paving, effectively extending the shared footway/cycleway through a localised narrowed section. This may increase the risk of conflict with pedestrians, particularly with the abundant vegetation adjacent to the shared footway/cycleway restricting forward visibility. Move sign post (combination) in adjacent to or in advance of (i.e. south of) the corduroy paving. Remove vegetation in the visibility splays for approaching cyclists and drivers. Widen the shared footway/cycleway to 3m right up to the corduroy paving.
3.2	Yes	Yes	Corduroy paving has been added at the start of the footway as per 'Guidance on the use of tactile paving surfaces, DfT 2005'. This is demonstrated in drawing no. 022.1832.202.P7	Agreed

UPTON MCGOUGAN Ltd

3.3	Yes	Yes	All services and road side furniture will be relocated to the back of the footway and to be addressed at detailed design stage.	Agreed
3.4	Yes	Yes	The splitter island has been repositioned and hatching width reduced to prevent pedestrian waiting in the hatched area as demonstrated in drawing no. 022.1832.202.P7	Agreed
3.5	No	No	The proposed right turning lane will have an identical right turning layout as per other right turning facilities on Worthing Road. The only single lane dualing is on Toddington Lane to stop rat running and this is not applicable to this site.	The risk of overtaking along this section still remains. Provide protection for right turning vehicles by providing a small traffic island with appropriate keep left signage and bollards within the hatching markings to the west of the right turn lane (west of the junction). Alternatively, link this hatched area with the existing hatched area just to the west (for example with a 800mm wide hatched strip).
3.6	No	No	Proposed road marking will tie into the existing signalised pedestrian crossing as demonstrated in drawing no. 022.1832.202.P7	Agreed. The general alignment of exit from the roundabout is much improved and the 'kink' in the offside of the westbound lane effectively removed.

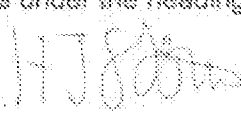
3.0 CONCLUSION

- 3.1 I certify that I have considered the items raised in the Stage 1 Road Safety Audit Report and I am content to accept all of its recommendations except for the ones listed above. I have stated my reasons for not accepting them and I seek the Chief Engineer's endorsement of my proposals.

Principal Engineer.....

Date.....

- 3.2 I certify that I have considered the responses from the design team and have included my comments under the heading of "Audit Team Response".

Audit Team Leader..... 

Date 16 July 2010

- 3.3 I accept these proposals by the Principal Engineer.

Chief Engineer.....

Date.....

Appendix H

Right Turn Lane Design Check Response