Appendix I – Road Safety Audit Designer's Responses

Adastral Park, Ipswich : Traffic Signals Access off the A12 Dual Carriageway
Technical Note : Designer's Response to Road Safety Audits at Stage 1

14th June 2017

1 Introduction

Brookbanks Consulting Limited (BCL) is commissioned by Commercial Estates Group (CEG) Ltd to provide technical advice on viability and delivery on a proposed mixed use development at Adastral Park, Martlesham Heath, Suffolk. A Transport Assessment has been produced that has assessed the potential implications. A range of highway interventions has been subsequently identified.

For the Outline Planning Application, the following access strategy was offered:

- Traffic Signals Access off the A12 Dual Carriageway;
- Two simple priority junction accesses off Ipswich Road;
- Simple priority junction access off Gloster Road through the North-west Quadrant.

The Transport Assessment also identified that off-site highway mitigation measures were necessary at the following locations:

- A14 / A12 / A1156 Interchange;
- A12 / Newbourne Rd / Foxhall Road Roundabout;
- A12 / Barrack Square / Eagle Way Roundabout and Gloster Road / Barrack Square Priority Junction;
- A12 / Anson Road / Eagle Way Roundabout;
- A12 / A1214 Roundabout;
- A1189 Heath Road / Foxhall Road Roundabout;
- A1189 Bixley Road / A1156 Felixstowe Road Bixley Roundabout;
- A1214 / A1189 Gyratory Junction.

All design options, at the request of Suffolk County Council, have been subject to a Stage 1 Road Safety Audit. This note sets out the findings of the audit for the traffic signals access off the A12 Dual Carriageway together with a designers response.

2 Designer's Response

The Designers Response should be read in conjunction with the Road Safety Audit (ref SESL1714) as attached in Appendix A and revised Drawing No: 10391-HL-02C as attached in Appendix B.

Problem 1

Location: A12 Ring Road
Summary: Likely excessive speed on approach to signals which can result in a number of accident types. The proposed 50mph speed limit is positioned too close to the signals to reduce speeds effectively and the proposed national speed limit signs are positioned just beyond the signals meaning that the signs will be visible to drivers at the signals, encouraging them to speed up through the junction. The southbound signs in particular are positioned adjacent to a warning sign for the subsequent roundabout which tells drivers to "Reduce Speed Now" so drivers are being given a number of mixed messages.
Recommendation: To encourage the required speed on the approach to the signals a 50mph speed limit should be applied on the A12 between the Barrack Square roundabout to the north and Foxhall Road roundabout to the south.
BCL Comment: *The Stopping Sight Distance for the signalised crossing will achieve the required distances as specified in TD 9/93 Table 3. A Traffic Regulation Order is currently being discussed with the local authority that will reduce the speed limit to 50 mph*

between the Martlesham and Foxhall Roundabouts. However, advance warning sign provision to further enhance this will be discussed at detailed design stage.

Problem 2

Location: A12 / Adastral Park Road
Summary: Risk of shunts/lane change accidents. It is not clear if there is sufficient room to accommodate right turners into Adastral Park Road. On this dual carriageway, drivers in the offside lane may be obstructed by right turning vehicles, which could result in shunts, or lane change accidents for drivers moving into the nearside to avoid the queuing vehicles, or vehicles slowing down to manoeuvre.
Recommendation: Provide an additional lane for right turning vehicles, or at detailed signal design ensure that all arms run separately.
BCL Comment: *There is not sufficient space for an additional right-turning lane. However, at in terms of the signal phasing all arms shall run in separate stages, hence without having to Give Way to one another. This shall also apply to right-turning traffic from the A12 into Adastral Park Road.*

Problem 3

Location: Adastral Park Road
Summary: Risk of kerb strikes. The tie in at the exit from the signals is acute and could result in vehicles hitting the nearside kerb.
Recommendation: Provide a smoother transition.
BCL Comment: *The transition has now been amended to provide a smoother transition on exit from the junction.*

Problem 4

Location: Adastral Park Road
Summary: Risk of horses being spooked. The current crossing point for horses looks unused, which is probably due to the very busy A12. However, the proposed formal crossing may encourage use of this route. It is convoluted and involves 4 stops for a horse and rider adjacent to this very busy road.
Recommendation: Provide a straight-across crossing point. This could be separate from the pedestrian/cycle crossing point to reduce any potential capacity issues.
BCL Response: *This is no longer applicable as a Pegasus crossing is no longer being provided.*

Problem 5

Location: A12, Pegasus crossing
Summary: Horses may become spooked. The stagger for the crossing is the wrong way round which means that the horses and riders will be approaching the crossing with their back to traffic. This may frighten the horses if they are not expecting vehicles to pass them at speed from behind.
Recommendation: Amend the stagger on the crossing so that the riders and horses are facing oncoming traffic. This should also reduce the distance that horses are adjacent to the carriageway on the western side of the A12.
BCL Response: *This is no longer applicable as a Pegasus crossing is no longer being provided. However, this recommendation has been carried through for the adjacent pedestrian and cycle crossing.*

Problem 6

Location: A12, Pegasus crossing
Summary: Insufficient space for horses which may result in the horses waiting too close to the traffic or unable to manoeuvre properly, both of which may spook them. The segregated area for horses in the central island does not appear wide enough for a horse to turn, (particularly as the traffic signal pole will have to be in this area), or provide enough space for them to wait. There are also no holding areas for horses either side of the A12.

Recommendation: Extend the island to provide sufficient holding space and extend it to ensure that the signal equipment is outside of this area for horses, to reduce the chances of them being spooked. Provide holding areas in all places where the horses are expected to wait. Holding areas should be 10m x 5m.

BCL Response: *This is no longer applicable as a Pegasus crossing is no longer being provided.*

Problem 7

Location: A12, Pegasus crossing

Summary: Horses may become spooked. The path to and from the crossing on the west side of the A12 is adjacent to the carriageway. As much segregation from the traffic as possible should be provided.

Recommendation: Realign the path so that it follows the back of highway.

BCL Response: *This is no longer applicable as a Pegasus crossing is no longer being provided.*

3 Limitations

Third party information has been used in the preparation of this report, which Brookbanks Consulting Ltd, by necessity assumes is correct at the time of writing. While all reasonable checks have been made on data sources and the accuracy of data, Brookbanks Consulting Ltd accepts no liability for same.

The benefits of this report are provided to Carlyle Land Ltd and Commercial Estates Group for the proposed development on Land at Adastral Park.

Brookbanks Consulting Ltd excludes third party rights for the information contained in the report.

Appendix A: Road Safety Auditor's Report

Safety Engineering Services Ltd

Land South and East of Adastral Park, Ipswich

Proposed Western Signalised Access
A12 Dual Carriageway

Stage 1 Road Safety Audit

Stage 1 Road Safety Audit

CONTENTS

Report Number	Client Reference	Report Status
SESL1714	10391	FINAL

1 INTRODUCTION

This report presents the findings of a Road Safety Audit carried out on off-site highway mitigation works proposed to enable site access to land to the south and east of Adastral Park, Ipswich, at the request of Brookbanks Consulting Ltd. The development will consist of up to 2000 dwellings, local centres, with facilities to serve recreation and education.

The audit was carried out by the following:

S Hancock	Road Safety Audit Team Leader Safety Engineering Services Ltd
D Ramsden Certificate of Competency gained in June 2015	Road Safety Audit Team Member Safety Engineering Services Ltd

The audit took place on Saturday 27 May 2017 and comprised a desktop study of the plans provided and a drive and walk through of the site by both team members. During the site visit, the weather was sunny and fine and the road surfaces were dry. Traffic at the time of the audit was moderate.

A list of drawings and documents provided for the purpose of audit is in Appendix A. The locations of any problems have been identified on an annotated drawing in Appendix B.

The main terms of reference of the audit are as described in HD19/15. 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 designs to any other criteria.

There are eleven junctions in total requiring offsite highway mitigation works associated with this development. This Road Safety Audit focuses on the proposed signalised junction on the A12, which incorporates an equestrian crossing.

2 ROAD SAFETY AUDIT FINDINGS

2.1 PROBLEM

Location: A12 Ring Road

Summary: Likely excessive speed on approach to signals which can result in a number of accident types.

The proposed 50mph speed limit is positioned too close to the signals to reduce speeds effectively and the proposed national speed limit signs are positioned just beyond the signals meaning that the signs will be visible to drivers at the signals, encouraging them to speed up through the junction. The southbound signs in particular are positioned adjacent to a warning sign for the subsequent roundabout which tells drivers to "Reduce Speed Now" so drivers are being given a number of mixed messages.

RECOMMENDATION

To encourage the required speed on the approach to the signals a 50mph speed limit should be applied on the A12 between the Barrack Square roundabout to the north and Foxhall Road roundabout to the south.

2.2 PROBLEM

Location: A12 / Adastral Park Road

Summary: Risk of shunts/lane change accidents.

It is not clear if there is sufficient room to accommodate right turners into Adastral Park Road. On this dual carriageway, drivers in the offside lane may be obstructed by right turning vehicles, which could result in shunts, or lane change accidents for drivers moving into the nearside to avoid the queuing vehicles, or vehicles slowing down to manoeuvre.

RECOMMENDATION

Provide an additional lane for right turning vehicles, or at detailed signal design ensure that all arms run separately.

2.3 PROBLEM

Location: Adastral Park Road

Summary: Risk of kerb strikes.

The tie in at the exit from the signals is acute and could result in vehicles hitting the nearside kerb.

RECOMMENDATION

Provide a smoother transition.

2.4 PROBLEM

Location: Adastral Park Road

Summary: Risk of horses being spooked.

The current crossing point for horses looks unused, which is probably due to the very busy A12. However, the proposed formal crossing may encourage use of this route. It is convoluted and involves 4 stops for a horse and rider adjacent to this very busy road.

RECOMMENDATION

Provide a straight-across crossing point. This could be separate from the pedestrian/cycle crossing point to reduce any potential capacity issues.

2.5 PROBLEM

Location: A12, Pegasus crossing

Summary: Horses may become spooked.

The stagger for the crossing is the wrong way round which means that the horses and riders will be approaching the crossing with their back to traffic. This may frighten the horses if they are not expecting vehicles to pass them at speed from behind.

RECOMMENDATION

Amend the stagger on the crossing so that the riders and horses are facing oncoming traffic. This should also reduce the distance that horses are adjacent to the carriageway on the western side of the A12.

2.6 PROBLEM

Location: A12, Pegasus crossing

Summary: Insufficient space for horses which may result in the horses waiting too close to the traffic or unable to manoeuvre properly, both of which may spook them.

The segregated area for horses in the central island does not appear wide enough for a horse to turn, (particularly as the traffic signal pole will have to be in this area), or provide enough space for them to wait. There are also no holding areas for horses either side of the A12.

RECOMMENDATION

Extend the island to provide sufficient holding space and extend it to ensure that the signal equipment is outside of this area for horses, to reduce the chances of them being spooked. Provide holding areas in all places where the horses are expected to wait. Holding areas should be 10m x 5m.

2.7 PROBLEM

Location: A12, Pegasus crossing

Summary: Horses may become spooked.

The path to and from the crossing on the west side of the A12 is adjacent to the carriageway. As much segregation from the traffic as possible should be provided.

RECOMMENDATION

Realign the path so that it follows the back of highway.

3 AUDIT STATEMENT

We certify that this audit has been carried out in accordance with HD 19/15.

Signed:

S Hancock
Audit Team Leader
Safety Engineering Services Ltd

Date 28 May 2017

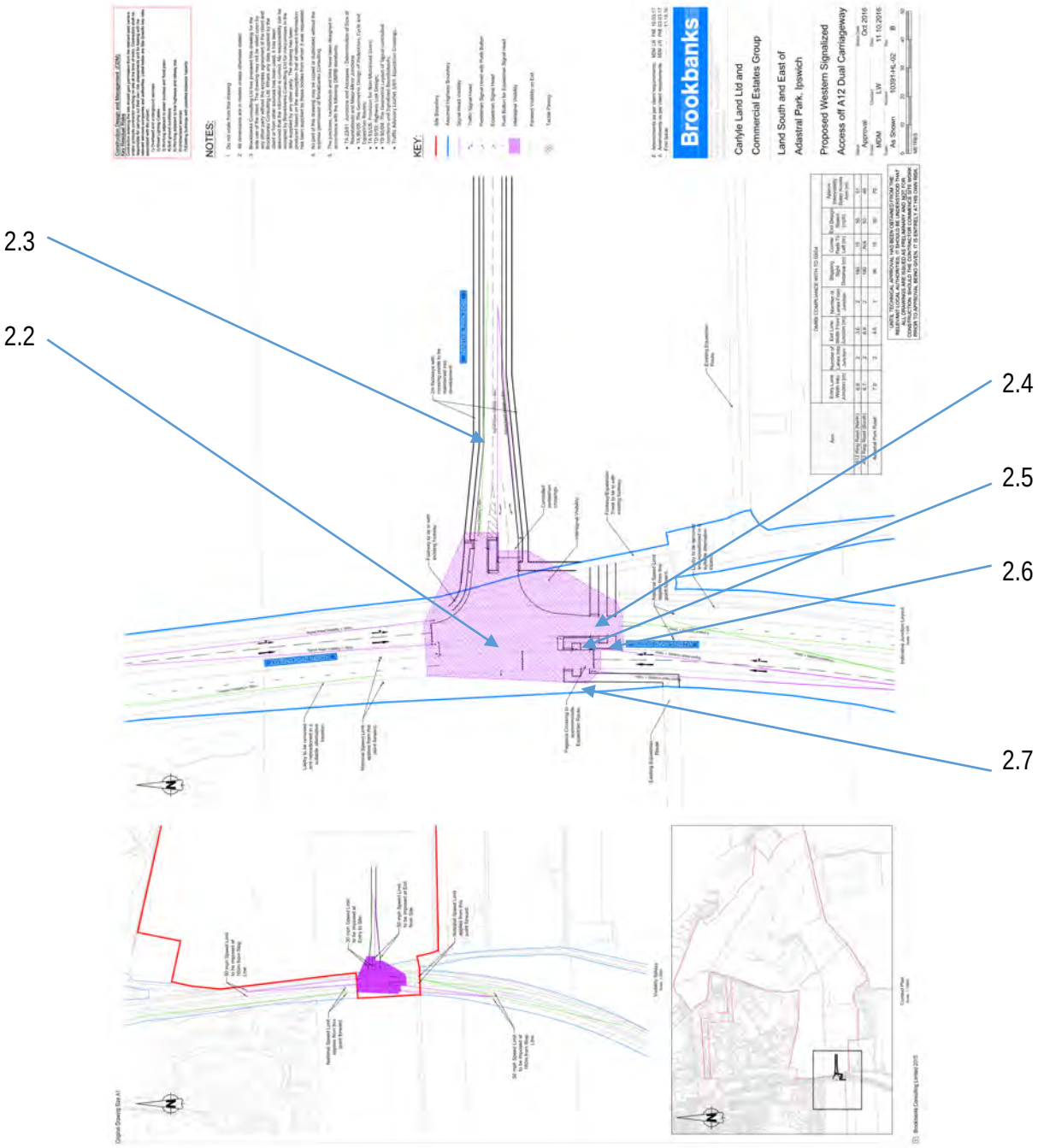
Signed:

D Ramsden
Audit Team Member
Safety Engineering Services Ltd

Date: 30 May 2017

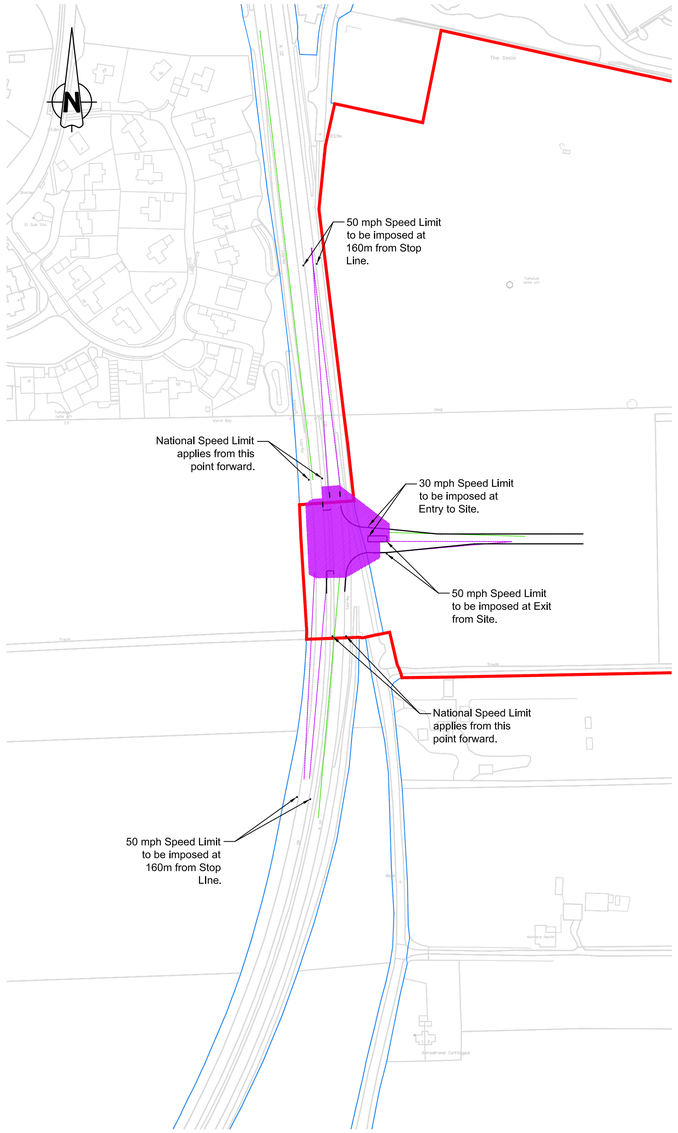
DRAWINGS AND DOCUMENTS PROVIDED FOR AUDIT

10391-H-02 Rev B	Proposed Western Signalised Access off A12 Dual Carriageway
10391TA01Rv2	Land South and East of Adastral Park - Transport Assessment

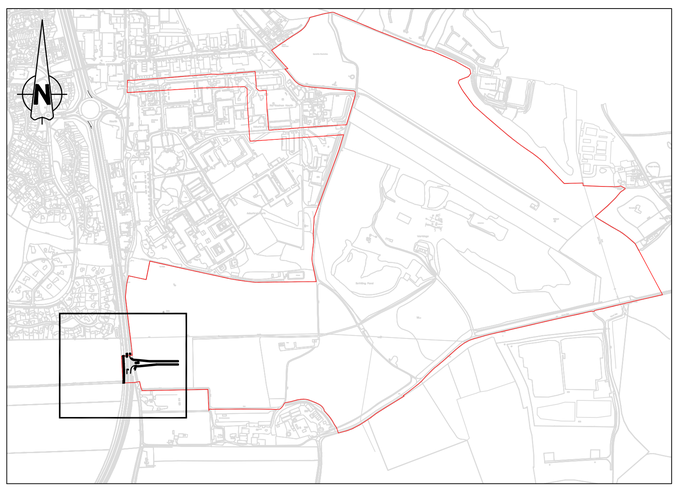

2.3
2.2
2.4
2.5
2.6
2.7
NOTES:
KEY:
Brookbanks
Carlyle Land Ltd and
Commercial Estates Group
Land South and East of
Adastral Park, Ipswich
Proposed Western Signalized
Access off A12 Dual Carriageway

Appendix B: Updated Design Drawing

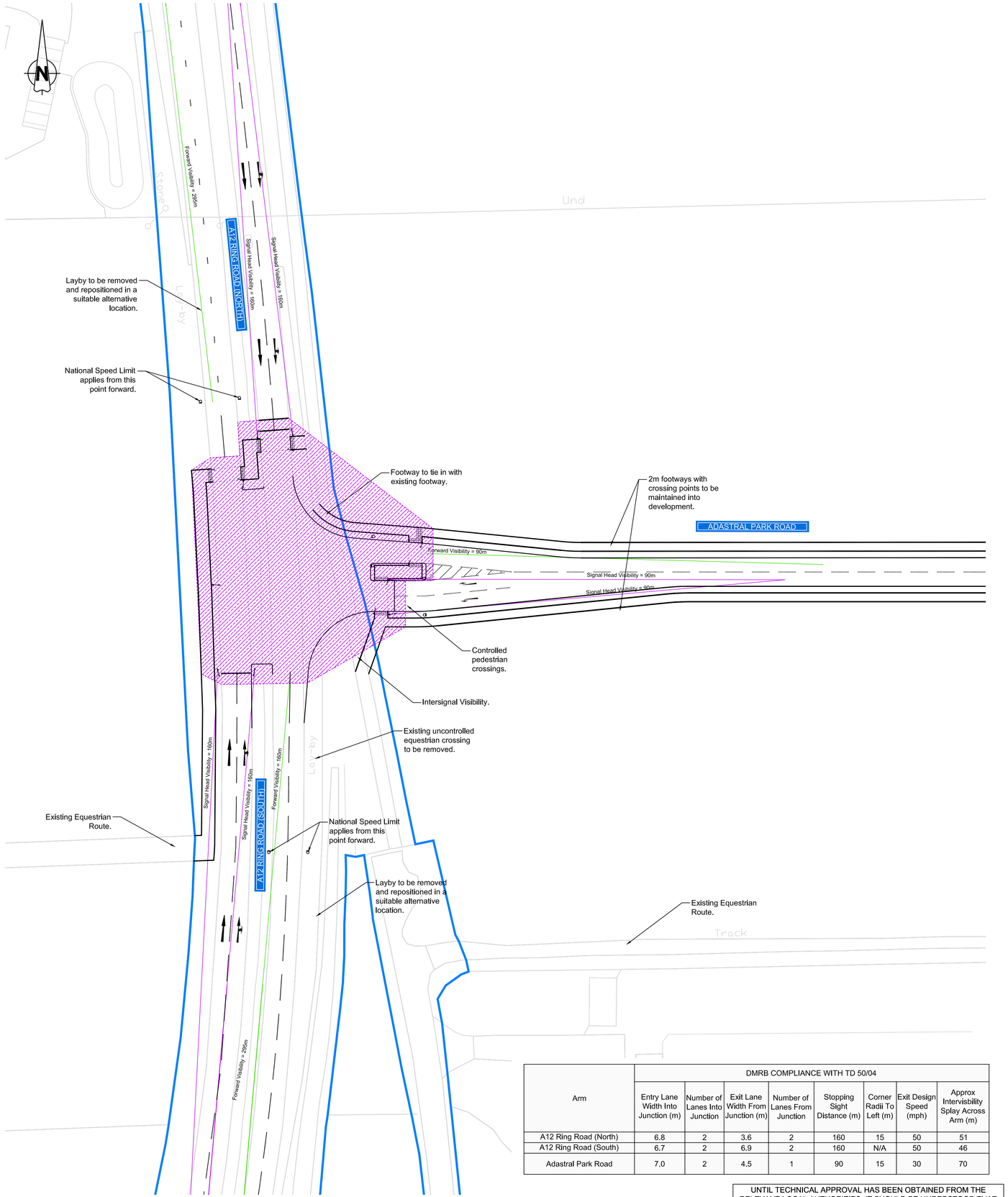
Original Drawing Size A1



Visibility Splays
Scale: 1:2000



Context Plan
Scale: 1:10000



Indicative Junction Layout
Scale: 1:500

Arm	DMRB COMPLIANCE WITH TD 50/04							
	Entry Lane Width Into Junction (m)	Number of Lanes Into Junction	Exit Lane Width From Junction (m)	Number of Lanes From Junction	Stopping Sight Distance (m)	Corner Radii To Left (m)	Exit Design Speed (mph)	Approx Intervisibility Splay Across Arm (m)
A12 Ring Road (North)	6.8	2	3.6	2	160	15	50	51
A12 Ring Road (South)	6.7	2	6.9	2	160	N/A	50	46
Adastral Park Road	7.0	2	4.5	1	90	15	30	70

UNTIL TECHNICAL APPROVAL HAS BEEN OBTAINED FROM THE RELEVANT LOCAL AUTHORITIES, IT SHOULD BE UNDERSTOOD THAT ALL DRAWINGS ARE ISSUED AS PRELIMINARY AND NOT FOR CONSTRUCTION. SHOULD THE CONTRACTOR COMMENCE SITE WORK PRIOR TO APPROVAL BEING GIVEN, IT IS ENTIRELY AT HIS OWN RISK.

Construction Design and Management (CDM)
Key Residual Risks

Contractors entering the site should gain permission from the relevant land owners and/or principle contractor working on site at the time of entry. Contractors shall be responsible for carrying out their own risk assessments and for liaising with the relevant services companies and authorities. Listed below are Site Specific key risks associated with the project.

1) Overhead and underground services
2) Street Lighting Cables
3) Working adjacent to water courses and flood plain
4) Soft ground conditions
5) Working adjacent to live highways and railway line
6) Unchartered services
7) Existing buildings with potential asbestos hazards

NOTES:

1. Do not scale from this drawing
2. All dimensions are in metres unless otherwise stated.
3. Brookbanks Consulting Ltd has prepared this drawing for the sole use of the client. The drawing may not be relied upon by any other party without the express agreement of the client and Brookbanks Consulting Ltd. Where any data supplied by the client or from other sources has been used, it has been assumed that the information is correct. No responsibility can be accepted by Brookbanks Consulting Ltd for inaccuracies in the data supplied by any other party. The drawing has been produced based on the assumption that all relevant information has been supplied by those bodies from whom it was requested.
4. No part of this drawing may be copied or duplicated without the express permission of Brookbanks Consulting.
5. The junctions, roundabouts and links have been designed in accordance with the following DMRB standards:
   - TA 23/81: Junctions and Accesses - Determination of Size of Roundabouts and Major-Minor Junctions
   - TA 90/05: The Geometric Design of Pedestrian, Cycle and Equestrian Routes;
   - TA 91/05: Provision for Non-Motorised Users;
   - TD 9/93: Highway Link Design;
   - TD 50/04: The Geometric Layout of Signal-controlled Junctions and Signalized Roundabouts;
   - Traffic Advisory Leaflet 3/03: Equestrian Crossings.

KEY:

- Site Boundary
- Assumed Highway Boundary
- Signal Head Visibility
- Traffic Signal Head
- Pedestrian Signal Head with Push Button
- Equestrian Signal Head
- Push Button for Equestrian Signal Head
- Intersignal Visibility
- Forward Visibility on Exit
- Tactile Paving

C	Improvements to crossing design.	MDM	LW	PAB 14.06.17
B	Amendments as per client requirements.	MDM	LW	PAB 10.03.17
A	Amendments as per client requirements.	MDM	LW	PAB 03.03.17
-	First Issue	-	-	- 11.10.16

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Carlyle Land Ltd and
Commercial Estates Group

Land South and East of
Adastral Park, Ipswich

Proposed Western Signalized
Access off A12 Dual Carriageway

Status: Approval			Status Date: Oct 2016
Drawn: MDM	Checked: LW		Date: 11.10.2016
Scale: As Shown	Number: 10391-HL-02		Rev: C

0 10 20 30 40 50
METRES

Adastral Park, Ipswich : Eastern Priority Junction Access off Ipswich Road
Technical Note : Designer's Response to Road Safety Audits at Stage 1

13th June 2017

1 Introduction

Brookbanks Consulting Limited (BCL) is commissioned by Commercial Estates Group (CEG) Ltd to provide technical advice on viability and delivery on a proposed mixed use development at Adastral Park, Martlesham Heath, Suffolk. A Transport Assessment has been produced that has assessed the potential implications. A range of highway interventions has been subsequently identified.

For the Outline Planning Application, the following access strategy was offered:

- Traffic Signals Access off the A12 Dual Carriageway;
- Two simple priority junction accesses off Ipswich Road;
- Simple priority junction access off Gloster Road through the North-west Quadrant.

The Transport Assessment also identified that off-site highway mitigation measures were necessary at the following locations:

- A14 / A12 / A1156 Interchange;
- A12 / Newbourne Rd / Foxhall Road Roundabout;
- A12 / Barrack Square / Eagle Way Roundabout and Gloster Road / Barrack Square Priority Junction;
- A12 / Anson Road / Eagle Way Roundabout;
- A12 / A1214 Roundabout;
- A1189 Heath Road / Foxhall Road Roundabout;
- A1189 Bixley Road / A1156 Felixstowe Road Bixley Roundabout;
- A1214 / A1189 Gyratory Junction.

All design options, at the request of Suffolk County Council, have been subject to a Stage 1 Road Safety Audit. This note sets out the findings of the audits for the Eastern Priority Junction Access off Ipswich Road together with a designers response.

2 Designer's Response

The Designers Response should be read in conjunction with the Road Safety Audit (ref SESL1715) as attached in Appendix A.

Problem 1

Location: Ipswich Road / eastern access
Summary: Junction form may not be adequate. Traffic flows were not available for this junction. As this access serves a significant size site it may require a ghost island.
Recommendation: Assess the projected flows and provide a ghost island if the numbers merit it.
BCL Response: *It has been demonstrated through Paramics modelling that the proposed junction will work adequately with respect to traffic flows, as there is minimal queuing from Ipswich Road to the east wishing to turn into the site. This is attributable to the road being lightly trafficked and not serving a substantial area.*

3 Limitations

Third party information has been used in the preparation of this report, which Brookbanks Consulting Ltd, by necessity assumes is correct at the time of writing. While all reasonable checks have been made on data sources and the accuracy of data, Brookbanks Consulting Ltd accepts no liability for same.

The benefits of this report are provided to Carlyle Land Ltd and Commercial Estates Group for the proposed development on Land at Adastral Park.

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Appendix A: Road Safety Auditor's Report

Safety Engineering Services Ltd

Land South and East of Adastral Park, Ipswich

Proposed Priority Junction
Eastern Access off Ipswich Road

Stage 1 Road Safety Audit

Stage 1 Road Safety Audit

CONTENTS

Report Number	Client Reference	Report Status
SESL1715	10391	FINAL

1 INTRODUCTION

This report presents the findings of a Road Safety Audit carried out on off-site highway mitigation works proposed to enable site access to land to the south and east of Adastral Park, Ipswich, at the request of Brookbanks Consulting Ltd. The development will consist of up to 2000 dwellings, local centres, with facilities to serve recreation and education.

The audit was carried out by the following:

S Hancock	Road Safety Audit Team Leader Safety Engineering Services Ltd
D Ramsden Certificate of Competency gained in June 2015	Road Safety Audit Team Member Safety Engineering Services Ltd

The audit took place on Saturday 27 May 2017 and comprised a desktop study of the plans provided and a drive and walk through of the site by both team members. During the site visit, the weather was sunny and fine and the road surfaces were dry. Traffic at the time of the audit was very light.

A list of drawings and documents provided for the purpose of audit is in Appendix A. The locations of any problems have been identified on an annotated drawing in Appendix B.

The main terms of reference of the audit are as described in HD19/15. 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 designs to any other criteria.

There are eleven junctions in total requiring offsite highway mitigation works associated with this development. This Road Safety Audit focuses on the proposed priority junction of Adastral Park Road with Ipswich Road.

2 ROAD SAFETY AUDIT FINDINGS

2.1 PROBLEM

Location: Ipswich Road / eastern access

Summary: Junction form may not be adequate.

Traffic flows were not available for this junction. As this access serves a significant size site it may require a ghost island.

RECOMMENDATION

Assess the projected flows and provide a ghost island if the numbers merit it.

3 AUDIT STATEMENT

We certify that this audit has been carried out in accordance with HD 19/15.

Signed:

S Hancock
Audit Team Leader
Safety Engineering Services Ltd

Date 28 May 2017

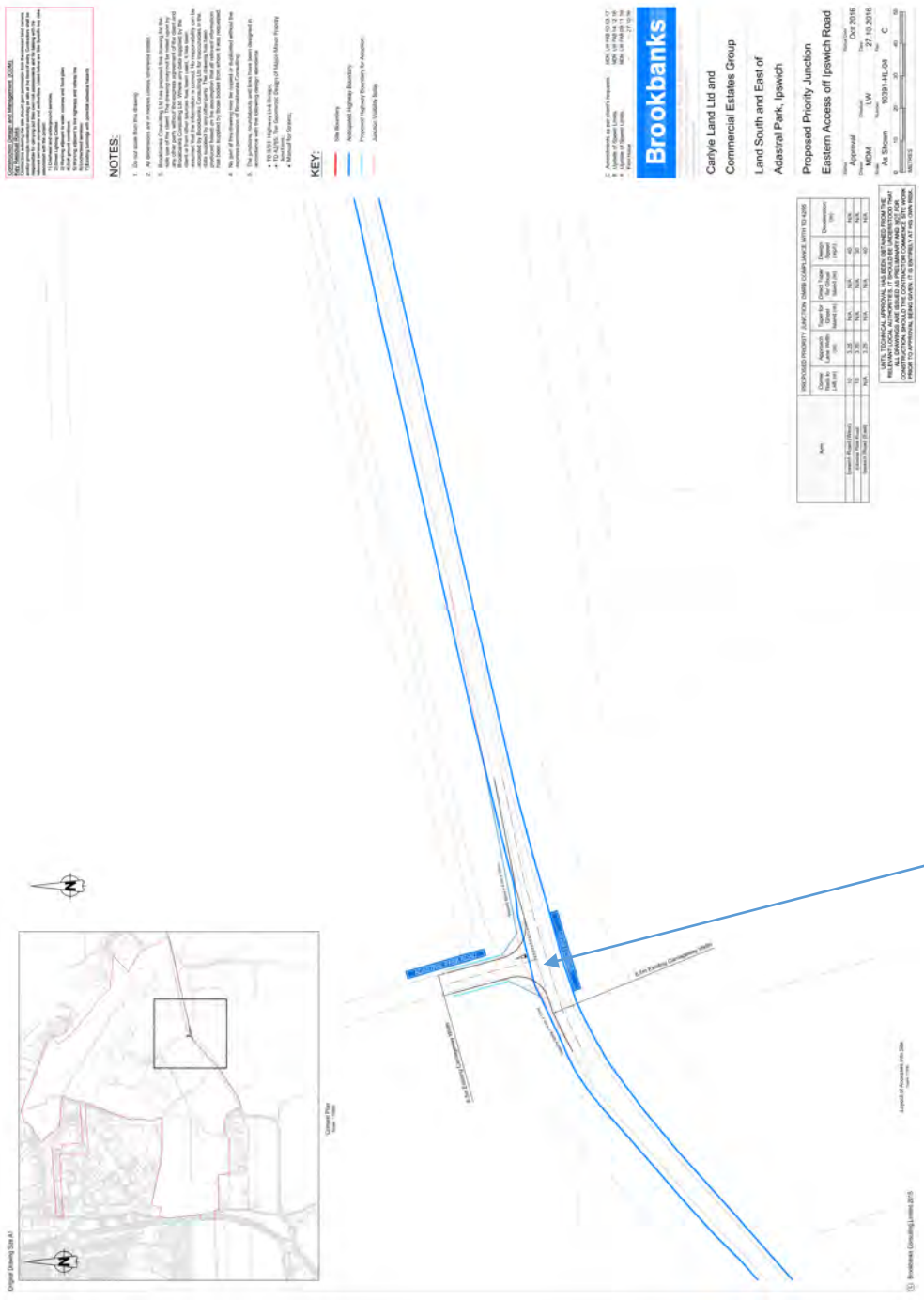
Signed:

D Ramsden
Audit Team Member
Safety Engineering Services Ltd

Date: 30 May 2017

DRAWINGS AND DOCUMENTS PROVIDED FOR AUDIT

10391-H-04 Rev C	Proposed Priority Junction - Eastern Access off Ipswich Road
10391TA01Rv2	Land South and East of Adastral Park - Transport Assessment


NOTES.
KEY:
Brookbanks
Carlyle Land Ltd and
Commercial Estates Group
Land South and East of
Adastral Park, Ipswich
Proposed Priority Junction
Eastern Access off Ipswich Road
Approval
MDM
LW
27.10.2016
As Shown
16397-HL-04
C
Oct 2016
Ipswich Road
Eastern Access
Cycle Track Access
Eastern Access Carriageway Width
Ipswich Road Carriageway Width
Original Drawing Size A1

2.1

Adastral Park, Ipswich : Western Priority Junction Access off Ipswich Road
Technical Note : Designer's Response to Road Safety Audits at Stage 1

13th June 2017

1 Introduction

Brookbanks Consulting Limited (BCL) is commissioned by Commercial Estates Group (CEG) Ltd to provide technical advice on viability and delivery on a proposed mixed use development at Adastral Park, Martlesham Heath, Suffolk. A Transport Assessment has been produced that has assessed the potential implications. A range of highway interventions has been subsequently identified.

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The Transport Assessment also identified that off-site highway mitigation measures were necessary at the following locations:

- A14 / A12 / A1156 Interchange;
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- A12 / Barrack Square / Eagle Way Roundabout and Gloster Road / Barrack Square Priority Junction;
- A12 / Anson Road / Eagle Way Roundabout;
- A12 / A1214 Roundabout;
- A1189 Heath Road / Foxhall Road Roundabout;
- A1189 Bixley Road / A1156 Felixstowe Road Bixley Roundabout;
- A1214 / A1189 Gyratory Junction.

All design options, at the request of Suffolk County Council, have been subject to a Stage 1 Road Safety Audit. This note sets out the findings of the audits for the Western Priority Junction Access off Ipswich Road together with a designers response.

2 Designer's Response

The Designers Response should be read in conjunction with the Road Safety Audit (ref SESL1716) as attached in Appendix A.

Problem 1

Location: Ipswich Road / proposed western access

Summary: Visibility is obstructed. There are a large number of significant sized trees in the vicinity of this junction which may obstruct visibility.

Recommendation: Measure the visibility at a setback of 2.4 metres and specify the removal of any trees which fall within this.

BCL Response: *The vegetation clearance including trees has been specified for this site through an arboricultural survey. This has resolved that any trees blocking the visibility splay are not protected and therefore can be removed.*

Problem 2

Location: Ipswich Road / western access

Summary: Junction form may not be adequate. Traffic flows were not available for this junction. As this access serves a significant size site it may require a ghost island.

Recommendation: Assess the projected flows and provide a ghost island if the numbers merit it.

BCL Response: *It has been demonstrated through Paramics modelling that the proposed junction will work adequately with respect to traffic flows, as there is minimal queuing from Ipswich Road to the east wishing to turn into the site. This is attributable to the road being lightly trafficked and not serving a substantial area.*

3 Limitations

Third party information has been used in the preparation of this report, which Brookbanks Consulting Ltd, by necessity assumes is correct at the time of writing. While all reasonable checks have been made on data sources and the accuracy of data, Brookbanks Consulting Ltd accepts no liability for same.

The benefits of this report are provided to Carlyle Land Ltd and Commercial Estates Group for the proposed development on Land at Adastral Park.

Brookbanks Consulting Ltd excludes third party rights for the information contained in the report.

Appendix A: Road Safety Auditor's Report

Safety Engineering Services Ltd

Land South and East of Adastral Park, Ipswich

Proposed Priority Junction
Western Access

Stage 1 Road Safety Audit

Stage 1 Road Safety Audit

CONTENTS

Report Number	Client Reference	Report Status
SESL1716	10391	FINAL

1 INTRODUCTION

This report presents the findings of a Road Safety Audit carried out on off-site highway mitigation works proposed to enable site access to land to the south and east of Adastral Park, Ipswich, at the request of Brookbanks Consulting Ltd. The development will consist of up to 2000 dwellings, local centres, with facilities to serve recreation and education.

The audit was carried out by the following:

S Hancock	Road Safety Audit Team Leader Safety Engineering Services Ltd
D Ramsden Certificate of Competency gained in June 2015	Road Safety Audit Team Member Safety Engineering Services Ltd

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A list of drawings and documents provided for the purpose of audit is in Appendix A. The locations of any problems have been identified on an annotated drawing in Appendix B.

The main terms of reference of the audit are as described in HD19/15. 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 designs to any other criteria.

There are eleven junctions in total requiring offsite highway mitigation works associated with this development. This Road Safety Audit focuses on the proposed westernmost simple priority junction.

2 ROAD SAFETY AUDIT FINDINGS

2.1 PROBLEM

Location: Ipswich Road / proposed western access

Summary: Visibility is obstructed

There are a large number of significant sized trees in the vicinity of this junction which may obstruct visibility.

RECOMMENDATION

Measure the visibility at a setback of 2.4 metres and specify the removal of any trees which fall within this.

2.2 PROBLEM

Location: Ipswich Road / eastern access

Summary: Junction form may not be adequate.

Traffic flows were not available for this junction. As this access serves a significant size site it may require a ghost island.

RECOMMENDATION

Assess the projected flows and provide a ghost island if the numbers merit it.

3 AUDIT STATEMENT

We certify that this audit has been carried out in accordance with HD 19/15.

Signed:

S Hancock
Audit Team Leader
Safety Engineering Services Ltd

Date 28 May 2017

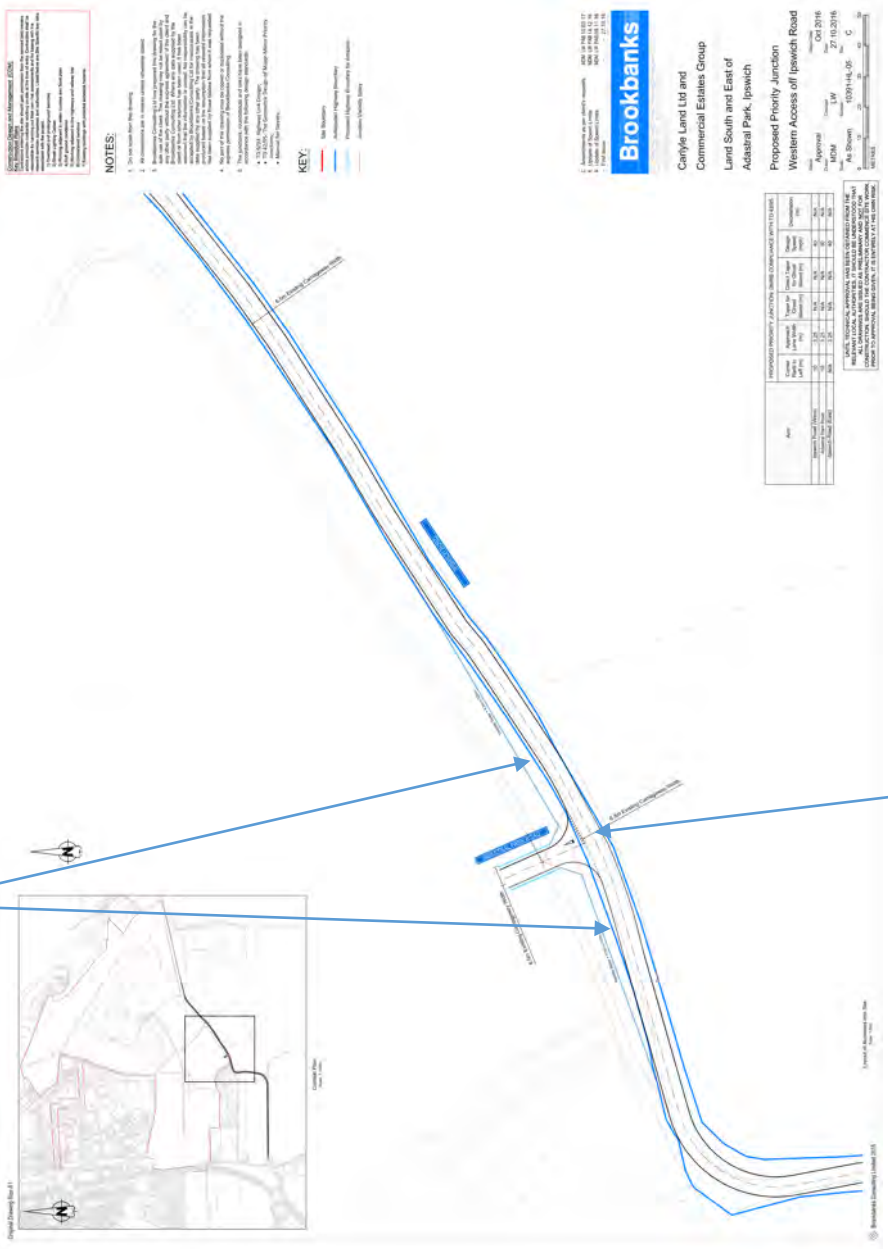
Signed:

D Ramsden
Audit Team Member
Safety Engineering Services Ltd

Date: 30 May 2017

DRAWINGS AND DOCUMENTS PROVIDED FOR AUDIT

10391-H-05 Rev C	Proposed Priority Junction - Western Access
10391TA01Rv2	Land South and East of Adastral Park - Transport Assessment


NOTES:
KEY:
Brookbanks
Carlyle Land Ltd and
Commercial Estates Group
Land South and East of
Adastral Park, Ipswich
Proposed Priority Junction
Western Access off Ipswich Road
Oct 2016
27.10.2016
As Shown
2.1
2.2

Adastral Park, Ipswich : North-west Quadrant Access off Gloster Road
Technical Note : Designer's Response to Road Safety Audits at Stage 1

13th June 2017

1 Introduction

Brookbanks Consulting Limited (BCL) is commissioned by Commercial Estates Group (CEG) Ltd to provide technical advice on viability and delivery on a proposed mixed use development at Adastral Park, Martlesham Heath, Suffolk. A Transport Assessment has been produced that has assessed the potential implications. A range of highway interventions has been subsequently identified.

For the Outline Planning Application, the following access strategy was offered:

- Traffic Signals Access off the A12 Dual Carriageway;
- Two simple priority junction accesses off Ipswich Road;
- Simple priority junction access off Gloster Road through the North-west Quadrant.

The Transport Assessment also identified that off-site highway mitigation measures were necessary at the following locations:

- A14 / A12 / A1156 Interchange;
- A12 / Newbourne Rd / Foxhall Road Roundabout;
- A12 / Barrack Square / Eagle Way Roundabout and Gloster Road / Barrack Square Priority Junction;
- A12 / Anson Road / Eagle Way Roundabout;
- A12 / A1214 Roundabout;
- A1189 Heath Road / Foxhall Road Roundabout;
- A1189 Bixley Road / A1156 Felixstowe Road Bixley Roundabout;
- A1214 / A1189 Gyratory Junction.

All design options, at the request of Suffolk County Council, have been subject to a Stage 1 Road Safety Audit. This note sets out the findings of the audit for the North-west Quadrant Access together with a designers response.

2 Designer's Response

The Designers Response should be read in conjunction with the Road Safety Audit (ref SESL1718) as attached in Appendix A.

Problem 1

Location: Quadrant Access Road/ Gloster Road
Summary: Risk of loss of control/sideswipes on the bends. The bends in the road are designed in accordance with the Manual for Streets, but the approaches are straight and will not encourage the requisite speeds to travel around them. This could lead to losses of control and/or poor lane discipline due to speed. It is recognised that the red line boundary is a constraint and it may not be possible to realign the road.
Recommendation: Provide traffic calming / speed management measures to reduce speeds on the straight sections.
BCL Response: *The potential provision of traffic calming measures will be discussed at detailed design stage.*

3 Limitations

Third party information has been used in the preparation of this report, which Brookbanks Consulting Ltd, by necessity assumes is correct at the time of writing. While all reasonable checks have been made on data sources and the accuracy of data, Brookbanks Consulting Ltd accepts no liability for same.

The benefits of this report are provided to Carlyle Land Ltd and Commercial Estates Group for the proposed development on Land at Adastral Park.

Brookbanks Consulting Ltd excludes third party rights for the information contained in the report.

Appendix A: Road Safety Auditor's Report

Safety Engineering Services Ltd

Land South and East of Adastral Park, Ipswich

Proposed Priority Junction
North-west Quadrant Access

Stage 1 Road Safety Audit

Stage 1 Road Safety Audit

CONTENTS

Report Number	Client Reference	Report Status
SESL1718	10391	FINAL

1 INTRODUCTION

This report presents the findings of a Road Safety Audit carried out on off-site highway mitigation works proposed to enable site access to land to the south and east of Adastral Park, Ipswich, at the request of Brookbanks Consulting Ltd. The development will consist of up to 2000 dwellings, local centres, with facilities to serve recreation and education.

The audit was carried out by the following:

S Hancock	Road Safety Audit Team Leader Safety Engineering Services Ltd
D Ramsden Certificate of Competency gained in June 2015	Road Safety Audit Team Member Safety Engineering Services Ltd

The audit took place on Saturday 27 May 2017 and comprised a desktop study of the plans provided and a drive and walk through of the site by both team members. During the site visit, the weather was sunny and fine and the road surfaces were dry. Traffic at the time of the audit was moderate.

A list of drawings and documents provided for the purpose of audit is in Appendix A. The locations of any problems have been identified on an annotated drawing in Appendix B.

The main terms of reference of the audit are as described in HD19/15. 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 designs to any other criteria.

There are eleven junctions in total requiring offsite highway mitigation works associated with this development. This Road Safety Audit focuses on the proposed priority junction with Gloster Road and the access road.

2 ROAD SAFETY AUDIT FINDINGS

2.1 PROBLEM

Location: Quadrant Access Road/ Gloster Road

Summary: Risk of loss of control/sideswipes on the bends.

The bends in the road are designed in accordance with the Manual for Streets, but the approaches are straight and will not encourage the requisite speeds to travel around them. This could lead to losses of control and/or poor lane discipline due to speed. It is recognised that the red line boundary is a constraint and it may not be possible to realign the road.

RECOMMENDATION

Provide traffic calming / speed management measures to reduce speeds on the straight sections.

3 AUDIT STATEMENT

We certify that this audit has been carried out in accordance with HD 19/15.

Signed:

S Hancock
Audit Team Leader
Safety Engineering Services Ltd

Date 28 May 2017

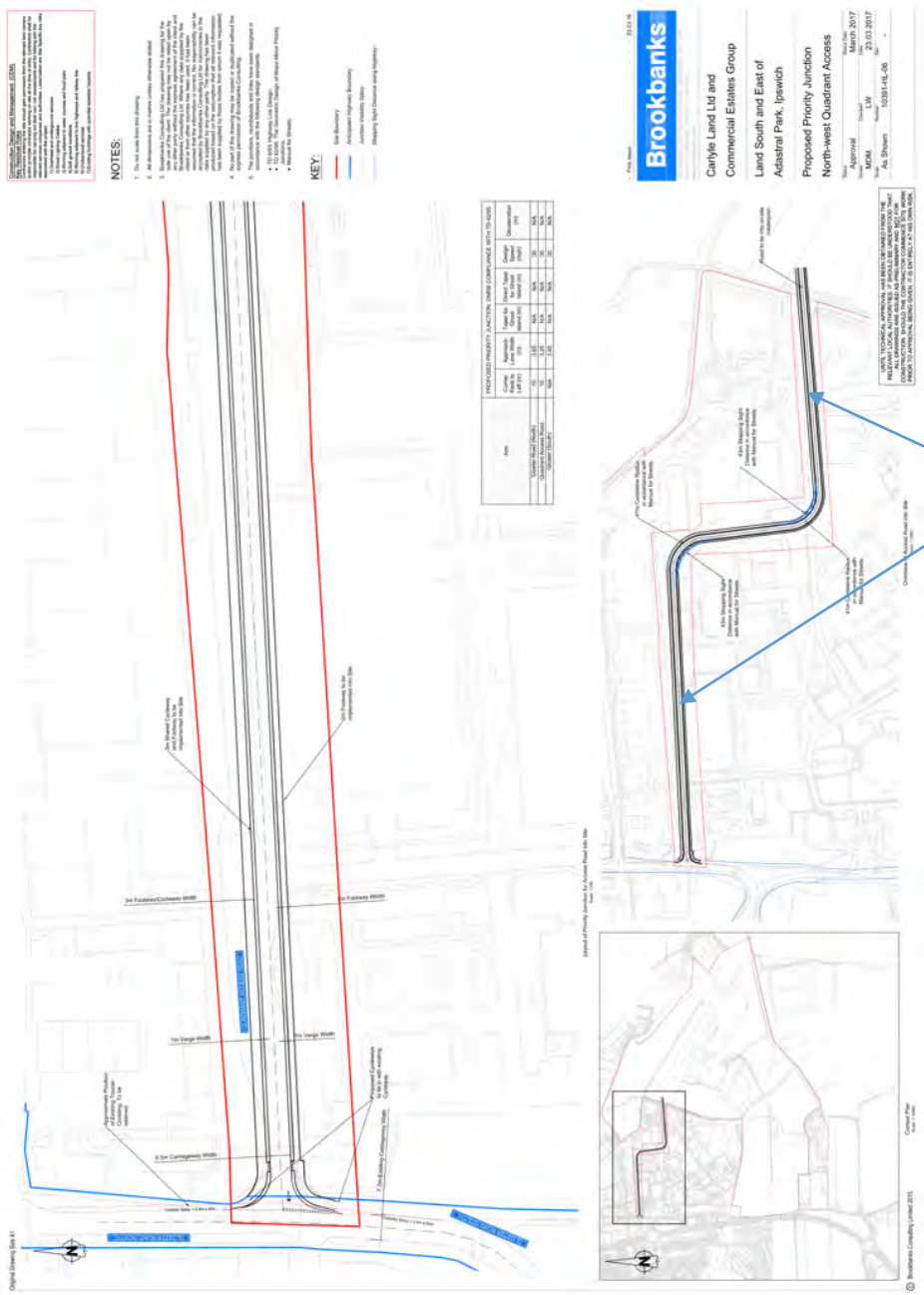
Signed:

D Ramsden
Audit Team Member
Safety Engineering Services Ltd

Date: 30 May 2017

DRAWINGS AND DOCUMENTS PROVIDED FOR AUDIT

10391-H-06	Proposed Priority Junction - North-west Quadrant Access
10391TA01Rv2	Land South and East of Adastral Park - Transport Assessment


NOTES:
KEY:
Brookbanks
Carlyle Land Ltd and
Commercial Estates Group
Land South and East of
Adastral Park, Ipswich
Proposed Priority Junction
North-west Quadrant Access
Approval
MDM
As Shown
March 2017
23.03.2017
2.1

Adastral Park, Ipswich : Off-site Highway Mitigation to A14/A1156 Felixtowe Road / A12 Ring Road / Bucklesham Lane Roundabout
Technical Note : Designer's Response to Road Safety Audits at Stage 1

13th June 2017

1 Introduction

Brookbanks Consulting Limited (BCL) is commissioned by Commercial Estates Group (CEG) Ltd to provide technical advice on viability and delivery on a proposed mixed use development at Adastral Park, Martlesham Heath, Suffolk. A Transport Assessment has been produced that has assessed the potential implications. A range of highway interventions has been subsequently identified.

For the Outline Planning Application, the following access strategy was offered:

- Traffic Signals Access off the A12 Dual Carriageway;
- Two simple priority junction accesses off Ipswich Road;
- Simple priority junction access off Gloster Road through the North-west Quadrant.

The Transport Assessment also identified that off-site highway mitigation measures were necessary at the following locations:

- A14 / A12 / A1156 Interchange;
- A12 / Newbourne Rd / Foxhall Road Roundabout;
- A12 / Barrack Square / Eagle Way Roundabout and Gloster Road / Barrack Square Priority Junction;
- A12 / Anson Road / Eagle Way Roundabout;
- A12 / A1214 Roundabout;
- A1189 Heath Road / Foxhall Road Roundabout;
- A1189 Bixley Road / A1156 Felixstowe Road Bixley Roundabout;
- A1214 / A1189 Gyratory Junction.

All design options, at the request of Suffolk County Council, have been subject to a Stage 1 Road Safety Audit. This note sets out the findings of the audit for the A14 / A12 / A1156 Interchange together with a designers response.

2 Designer's Response

The Designers Response should be read in conjunction with the Road Safety Audit (ref SESL1718) as attached in Appendix A and revised Drawing No: 10391-HL-11C as attached in Appendix B.

Problem 1

Location: Circulatory carriageway / A14 westbound exit slip
Summary: Likelihood of shunt accidents or failure to comply with signals. The visibility of the offside signals for drivers in the offside lane by the bridge parapet and as there is a significant risk of the nearside signal being obstructed by high sided vehicles, drivers in the offside may not appreciate the presence of the signals in time.
Recommendation: Provide a signal layout which ensures that drivers in the offside lane will have a view of at least one signal head at the requisite distance. One solution would be the provision of a mast arm.
BCL Response: *High-mast traffic signals have now been provided on the A14 Westbound Off-slip approach as advised.*

Problem 2

Location: All approaches to signals.
Summary: Mature trees (and other vegetation) obstruct visibility. There are a significant number of large trees (and other vegetation) which obstruct the various visibility splays required. These splays need to be cleared and kept clear for the life of the signals.
Recommendation: Apply for the removal of the trees to ensure the requisite splays can be achieved for signalisation.
BCL Response: *All trees and other vegetation that hinder visibility to traffic signal heads are recommended to be cropped back and maintained on a regular basis.*

Problem 3

Location: Dedicated left-turn lane, A14 to A1156
Summary: Risk of vehicles striking kerb or signal head. With kerbed dedicated lanes, vehicles are known to strike the kerb which can result in loss of control or overturning for high sided vehicles. This hatching means that vehicles approach in the straightest line possible and then drive directly adjacent to the kerb following the tightest radius around this bend. They are also running directly next to the nearside signal head, which is sited on this relatively narrow feature.
Recommendation: Swap the start of the nearside hatching to the offside of this lane which will also achieve better segregation between this and the adjacent signalised ahead lane. Continue the hatching around on the kerbed side, increasing the distance between the running area and the kerbs and signal head. The hatching should be then provided on both sides to create the largest radius path around this bend. At detailed design, reflective features should be provided along the length of the kerbed island to minimise the chance of it being struck by vehicles, both turning left and exiting the circulatory.
BCL Response: *In TD 51/17 for the design of Segregated Left turn Lanes and Subsidiary Deflection Islands at Roundabouts, hatching is advised to be on the nearside of the curve in Paragraph 2.5.10. In addition, placing the hatching on the off-side would reduce forward visibility for vehicles travelling along this lane outside of the hatched area. Reflective features will be discussed at detailed design stage.*

Problem 4

Location: Circulatory carriageway / A12 ring road.
Summary: Risk of sideswipes and shunts (and non-compliance with stopline). The circulatory carriageway is reduced down to one lane on approach to the signals with the A12 entry. The hatching appears to create a pinch point for the two exit lanes to the A12 Ring Road which could lead to sideswipes. It also reduces stacking capacity at the signals which could result in queuing back into the offside exit lane, which if not anticipated could result in high speed shunts. (The layout also appears to show the stopline not extending from kerb to kerb, which means vehicles can legally cross the hatching against a red light).
Recommendation: Provide two lanes on this approach, removing the hatching.
BCL Response: *This has now been amended to reflect this observation.*

3 Limitations

Third party information has been used in the preparation of this report, which Brookbanks Consulting Ltd, by necessity assumes is correct at the time of writing. While all reasonable checks have been made on data sources and the accuracy of data, Brookbanks Consulting Ltd accepts no liability for same.

The benefits of this report are provided to Carlyle Land Ltd and Commercial Estates Group for the proposed development on Land at Adastral Park.

Brookbanks Consulting Ltd excludes third party rights for the information contained in the report.

Appendix A: Road Safety Auditor's Report

Safety Engineering Services Ltd

Land South and East of Adastral Park, Ipswich

A14 Roundabout Signalisation

Stage 1 Road Safety Audit

Stage 1 Road Safety Audit

CONTENTS

Report Number	Client Reference	Report Status
SESL1718	10391	FINAL

1 INTRODUCTION

This report presents the findings of a Road Safety Audit carried out on off-site highway mitigation works proposed to enable site access to land to the south and east of Adastral Park, Ipswich, at the request of Brookbanks Consulting Ltd. The development will consist of up to 2000 dwellings, local centres, with facilities to serve recreation and education.

The audit was carried out by the following:

S Hancock	Road Safety Audit Team Leader Safety Engineering Services Ltd
D Ramsden Certificate of Competency gained in June 2015	Road Safety Audit Team Member Safety Engineering Services Ltd

The audit took place on Saturday 27 May 2017 and comprised a desktop study of the plans provided and a drive and walk through of the site by both team members. During the site visit, the weather was sunny and fine and the road surfaces were dry. Traffic at the time of the audit was moderate.

A list of drawings and documents provided for the purpose of audit is in Appendix A. The locations of any problems have been identified on an annotated drawing in Appendix B.

The main terms of reference of the audit are as described in HD19/15. 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 designs to any other criteria.

There are eleven junctions in total requiring offsite highway mitigation works associated with this development. This Road Safety Audit focuses on the proposals to signalise 3 of the 5 arms of the A14/A1156 Felixtowe Road/A12 Ring Road/Bucklesham Lane roundabout.

2 ROAD SAFETY AUDIT FINDINGS

2.1 PROBLEM

Location: Circulatory carriageway / A14 westbound exit slip

Summary: Likelihood of shunt accidents or failure to comply with signals.

The visibility of the offside signals for drivers in the offside lane by the bridge parapet and as there is a significant risk of the nearside signal being obstructed by high sided vehicles, drivers in the offside may not appreciate the presence of the signals in time.

RECOMMENDATION

Provide a signal layout which ensures that drivers in the offside lane will have a view of at least one signal head at the requisite distance. One solution would be the provision of a mast arm.

2.2 PROBLEM

Location: All approaches to signals.

Summary: Mature trees (and other vegetation) obstruct visiblity.

There are a significant number of large trees (and other vegetation) which obstruct the various visibility splays required. These splays need to be cleared and kept clear for the life of the signals.

RECOMMENDATION

Apply for the removal of the trees to ensure the requisite splays can be achieved for signalisation.

2.3 PROBLEM

Location: Dedicated left-turn lane, A14 to A1156

Summary: Risk of vehicles striking kerb or signal head.

With kerbed dedicated lanes, vehicles are known to strike the kerb which can result in loss of control or overturning for high sided vehicles. This hatching means that vehicles approach in the straightest line possible and then drive directly adjacent to the kerb following the tightest radius around this bend. They are also running directly next to the nearside signal head, which is sited on this relatively narrow feature.

RECOMMENDATION

Swap the start of the nearside hatching to the offside of this lane which will also achieve better segregation between this and the adjacent signalised ahead lane. Continue the hatching around on the kerbed side, increasing the distance between the running area and the kerbs and signal head. The hatching should be then provided on both sides to create the largest radius path around this bend. At detailed design, reflective features should be provided along the length of the kerbed island to minimise the chance of it being struck by vehicles, both turning left and exiting the circulatory.

2.4 PROBLEM

Location: Circulatory carriageway / A12 ring road.

Summary: Risk of sideswipes and shunts (and non-compliance with stopline).

The circulatory carriageway is reduced down to one lane on approach to the signals with the A12 entry. The hatching appears to create a pinch point for the two exit lanes to the A12 Ring Road which could lead to sideswipes. It also reduces stacking capacity at the signals which could result in queuing back into the offside exit lane, which if not anticipated could result in high speed shunts. (The layout also appears to show the stopline not extending from kerb to kerb, which means vehicles can legally cross the hatching against a red light.)

RECOMMENDATION

Provide two lanes on this approach, removing the hatching.

3 AUDIT STATEMENT

We certify that this audit has been carried out in accordance with HD 19/15.

Signed:

S Hancock
Audit Team Leader
Safety Engineering Services Ltd

Date 28 May 2017

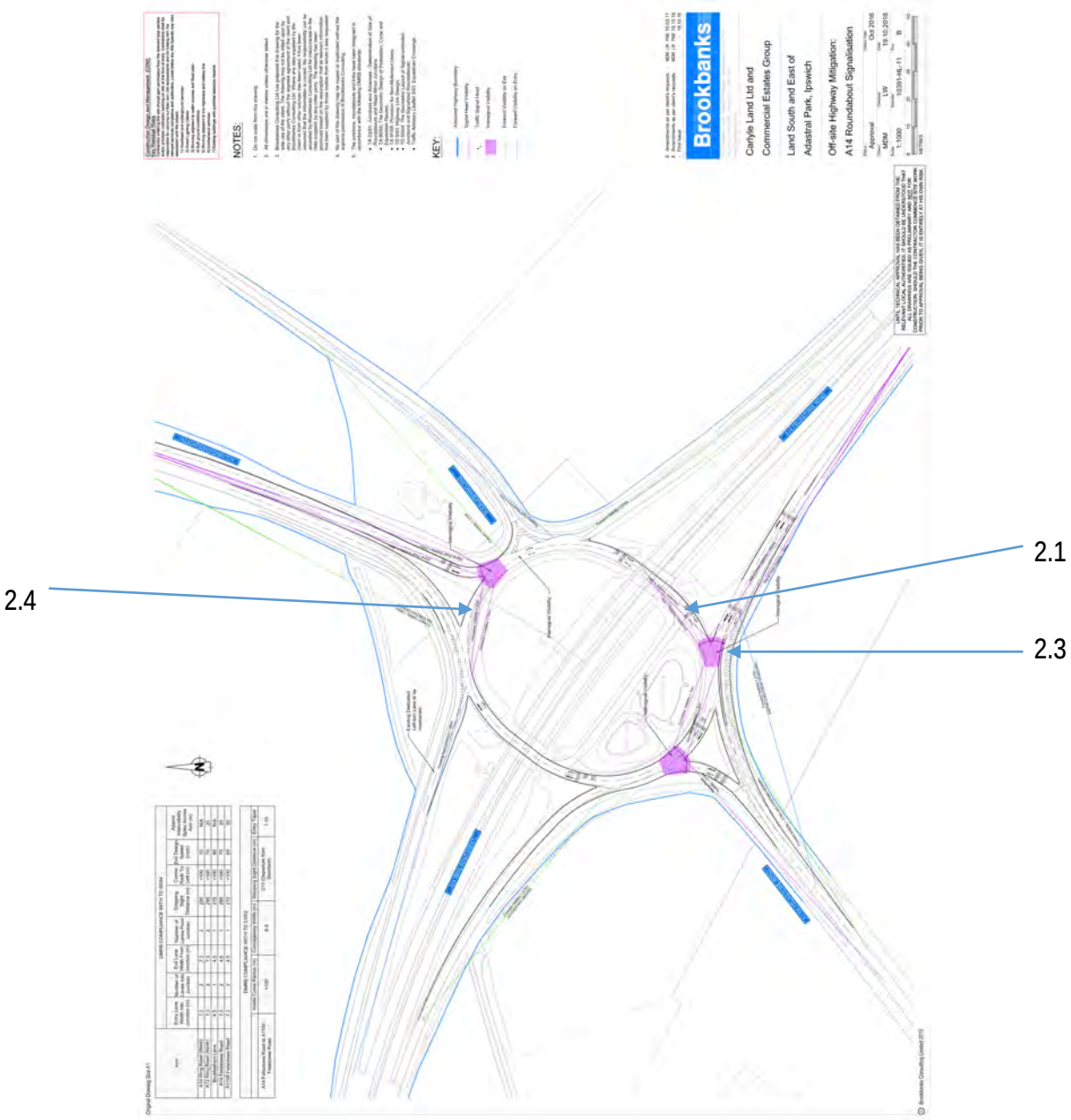
Signed:

D Ramsden
Audit Team Member
Safety Engineering Services Ltd

Date: 30 May 2017

DRAWINGS AND DOCUMENTS PROVIDED FOR AUDIT

10391-H-11 Rev B	Offsite Highway Mitigation - A14 Roundabout Signalisation
10391TA01Rv2	Land South and East of Adastral Park - Transport Assessment

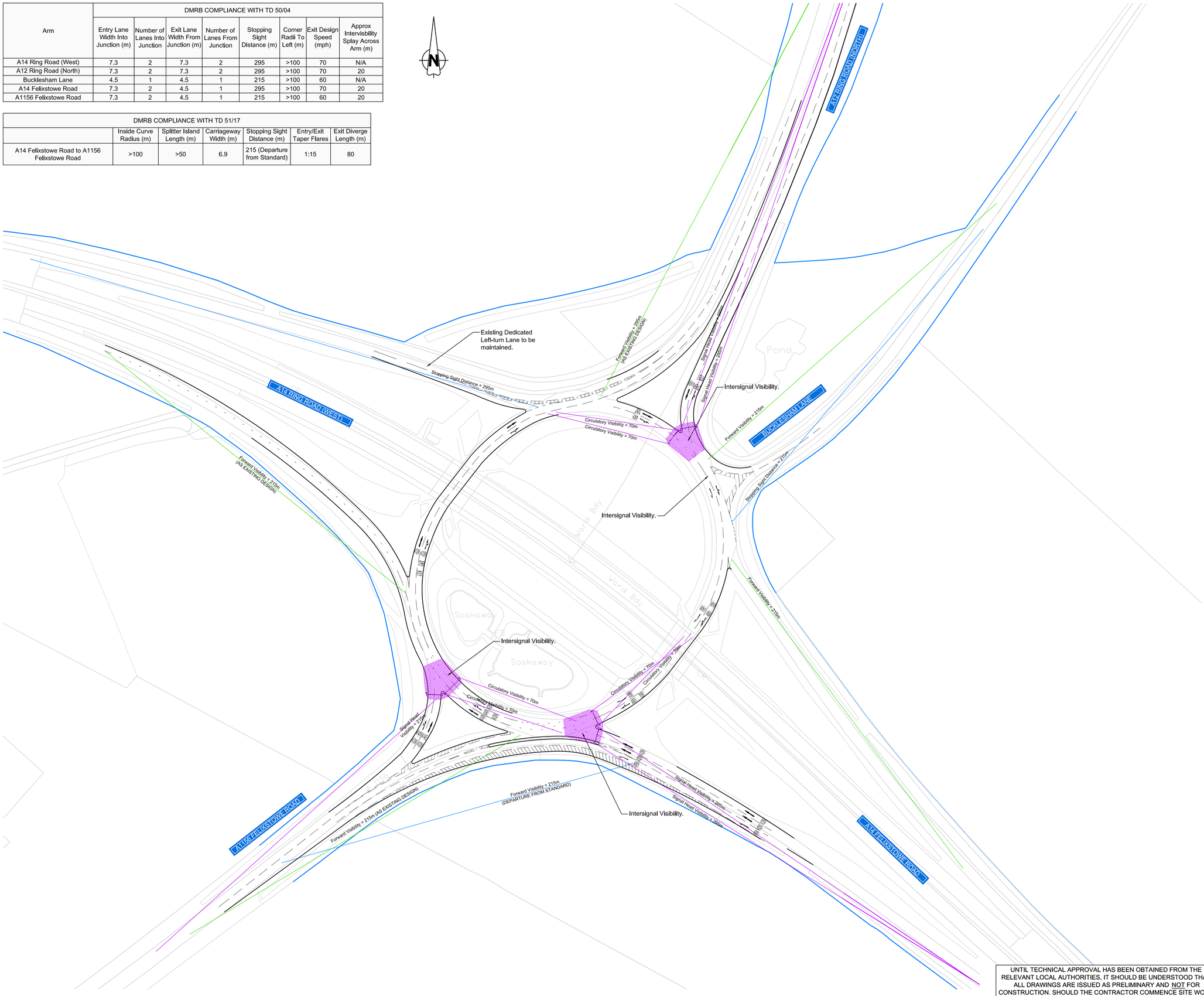

2.1
2.3
2.4

Appendix B: Updated Design Drawing

Original Drawing Size A1

Arm	DMRB COMPLIANCE WITH TD 50/04							
	Entry Lane Width Into Junction (m)	Number of Lanes Into Junction	Exit Lane Width From Junction (m)	Number of Lanes From Junction	Stopping Sight Distance (m)	Corner Radii To Left (m)	Exit Design Speed (mph)	Approx Intervisibility Splay Across Arm (m)
A14 Ring Road (West)	7.3	2	7.3	2	295	>100	70	N/A
A12 Ring Road (North)	7.3	2	7.3	2	295	>100	70	20
Bucklesham Lane	4.5	1	4.5	1	215	>100	60	N/A
A14 Felixstowe Road	7.3	2	4.5	1	295	>100	70	20
A1156 Felixstowe Road	7.3	2	4.5	1	215	>100	60	20

	DMRB COMPLIANCE WITH TD 51/17					
	Inside Curve Radius (m)	Splitter Island Length (m)	Carriageway Width (m)	Stopping Sight Distance (m)	Entry/Exit Taper Flares	Exit Diverge Length (m)
A14 Felixstowe Road to A1156 Felixstowe Road	>100	>50	6.9	215 (Departure from Standard)	1:15	80



Construction Design and Management (CDM)
Key Residual Risks

Contractors entering the site should gain permission from the relevant land owners and/or principle contractor working on site at the time of entry. Contractors shall be responsible for carrying out their own risk assessments and for liaising with the relevant services companies and authorities. Listed below are Site Specific key risks associated with the project.

1) Overhead and underground services
2) Street Lighting Cables
3) Working adjacent to water courses and flood plain
4) Soft ground conditions
5) Working adjacent to live highways and railway line
6) Unchartered services
7) Existing buildings with potential asbestos hazards

NOTES:

1. Do not scale from this drawing
2. All dimensions are in metres unless otherwise stated.
3. Brookbanks Consulting Ltd has prepared this drawing for the sole use of the client. The drawing may not be relied upon by any other party without the express agreement of the client and Brookbanks Consulting Ltd. Where any data supplied by the client or from other sources has been used, it has been assumed that the information is correct. No responsibility can be accepted by Brookbanks Consulting Ltd for inaccuracies in the data supplied by any other party. The drawing has been produced based on the assumption that all relevant information has been supplied by those bodies from whom it was requested.
4. No part of this drawing may be copied or duplicated without the express permission of Brookbanks Consulting.
5. The junctions, roundabouts and links have been designed in accordance with the following DMRB standards:
   - TA 23/81: Junctions and Accesses - Determination of Size of Roundabouts and Major-Minor Junctions
   - TA 90/05: The Geometric Design of Pedestrian, Cycle and Equestrian Routes;
   - TA 91/05: Provision for Non-Motorised Users;
   - TD 9/93: Highway Link Design;
   - TD 50/04: The Geometric Layout of Signal-controlled Junctions and Signalized Roundabouts;
   - Traffic Advisory Leaflet 3/03: Equestrian Crossings.

KEY:

- Assumed Highway Boundary
- Signal Head Visibility
- Traffic Signal Head
- High-mast Traffic Signal Head
- Intersignal Visibility
- Forward Visibility on Exit
- Forward Visibility on Entry

B	Amendments as per Road Safety Audit.	MDM	LW	PAB 12.06.17
B	Amendments as per client's requests.	MDM	LW	PAB 10.03.17
A	Amendments as per client's requests.	MDM	LW	PAB 19.10.16
-	First Issue	-	-	- 19.10.16

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Tel (0121) 329 4330 Fax (0121) 329 4331
www.brookbanks.com

Carlyle Land Ltd and Commercial Estates Group

Land South and East of Adastral Park, Ipswich

Off-site Highway Mitigation: A14 Roundabout Signalisation

Status	Status Date
Approval	Oct 2016
Drawn / Checked / Date	
MDM / LW / 19.10.2016	
Scale / Number / Rev	
1:1000 / 10391-HL-11 / C	

0 10 20 30 40 50
METRES

UNTIL TECHNICAL APPROVAL HAS BEEN OBTAINED FROM THE RELEVANT LOCAL AUTHORITIES, IT SHOULD BE UNDERSTOOD THAT ALL DRAWINGS ARE ISSUED AS PRELIMINARY AND NOT FOR CONSTRUCTION. SHOULD THE CONTRACTOR COMMENCE SITE WORK PRIOR TO APPROVAL BEING GIVEN, IT IS ENTIRELY AT HIS OWN RISK.

Adastral Park, Ipswich : Off-site Highway Mitigation to Foxhall Roundabout
Technical Note : Designer's Response to Road Safety Audits at Stage 1

14th June 2017

1 Introduction

Brookbanks Consulting Limited (BCL) is commissioned by Commercial Estates Group (CEG) Ltd to provide technical advice on viability and delivery on a proposed mixed use development at Adastral Park, Martlesham Heath, Suffolk. A Transport Assessment has been produced that has assessed the potential implications. A range of highway interventions has been subsequently identified.

For the Outline Planning Application, the following access strategy was offered:

- Traffic Signals Access off the A12 Dual Carriageway;
- Two simple priority junction accesses off Ipswich Road;
- Simple priority junction access off Gloster Road through the North-west Quadrant.

The Transport Assessment also identified that off-site highway mitigation measures were necessary at the following locations:

- A14 / A12 / A1156 Interchange;
- A12 / Newbourne Rd / Foxhall Road Roundabout;
- A12 / Barrack Square / Eagle Way Roundabout and Gloster Road / Barrack Square Priority Junction;
- A12 / Anson Road / Eagle Way Roundabout;
- A12 / A1214 Roundabout;
- A1189 Heath Road / Foxhall Road Roundabout;
- A1189 Bixley Road / A1156 Felixstowe Road Bixley Roundabout;
- A1214 / A1189 Gyratory Junction.

All design options, at the request of Suffolk County Council, have been subject to a Stage 1 Road Safety Audit. This note sets out the findings of the audit for the A12 / Newbourne Rd / Foxhall Road Roundabout together with a designers response.

2 Designer's Response

The Designers Response should be read in conjunction with the Road Safety Audit (ref SESL1719) as attached in Appendix A and revised Drawing No: 10391-HL-22C as attached in Appendix B.

Problem 1

Location: A12 north and southbound approaches.
Summary: Lack of deflection could result in high entry speeds with associated loss of control or entry/circulating accidents. It appears that suitable entry path curvature is not achieved on both of these approaches. Insufficient entry path curvature has a significant effect on the safety of roundabouts.
Recommendation: If entry path curvature cannot be achieved due to the widening, alternative measures should be considered to increase capacity.
BCL Response: *The approach entry kerb radii on all approaches have been narrowed to the minimum advised value of 20m as per Paragraph 7.49 in DMRB standard TD 16/07 Geometric Design of Roundabouts. However, for the A12 Ring Road (North) deflection cannot be achieved. Therefore a physical island to assist with achieving deflection has been devised. This will require additional land for construction, however 1m working width has been left to assist with achieving the mandatory requirement in Paragraph 1.18,*

TD 16/07. The revised design will now achieve deflection on the approaching arms and therefore satisfy the mandatory requirements of Paragraph 7.56 in TD 16/07.

Problem 2

Location: A12 north and southbound approaches and Foxhall Road.
Summary: Lack of, or unsuitable direction signing may result in a number of collision types at roundabout. The proposed widening on the above approaches reduces the highway in places to a width which does not appear suitable to accommodate direction signing. Suitably placed advance direction signing is an important factor on approach to roundabout junctions so that drivers are not confused and approach in the correct lane, which is especially important with a multi-lane approach such as that proposed.
Recommendation: Plot the required advance direction signing according to the parameters set out within Appendix A of LTN 1/94 and submit this for further audit to ensure that a suitable signing strategy can be achieved.
BCL response: *The required advance directional signing has been plotted on the revised drawing and there is space available for it to be suitably implemented.*

Problem 3

Location: A12 Ring Road (South)
Summary: Risk of goods vehicles rollover accidents/powered 2-wheeler loss of control and sideswipes. Curves to the right and then to the left on approach can create problems for goods vehicles and powered 2-wheelers and in this instance could also result in poor lane disciple on approach when less busy, which is likely to result in markings being worn off which can increase the risk of poor lane discipline risking sideswipes.
Recommendation: Relax the curves as much as possible.
BCL Response: *All curves across the alignment have been relaxed where there is reverse curvature to remove any sudden changes in alignment.*

Problem 4

Location: Newbourne Road
Summary: Transition between existing and proposed alignment is sharp and may result in poor lane discipline or loss of control. The small-scale drawing showing the extent of works indicates a sudden change of alignment on this approach.
Recommendation: Extend the extent of works to allow a smoother transition.
BCL Response: *The alignment of Newbourne Road cannot be extended any further to the south as there is a protected tree in the way. However, the transition alignment has been revised as much as possible to avoid any sudden changes in directional alignment of the kerbs.*

Problem 5

Location: All arms
Summary: Lane markings may result in conflict and lane change accidents. There are a number of conflicts in the lane destination arrows and lane alignments.
Recommendation: At detailed design, ensure that there are no conflicts and that markings to Diagram 1010 are used to guide drivers to the appropriate lanes.
BCL Response: *The lanes have been fully revised to ensure that there are minimum conflicts. The use of line type 1010 on approaches to guide drivers to the correct lanes will be discussed at detailed design stage.*

3 Limitations

Third party information has been used in the preparation of this report, which Brookbanks Consulting Ltd, by necessity assumes is correct at the time of writing. While all reasonable checks have been made on data sources and the accuracy of data, Brookbanks Consulting Ltd accepts no liability for same.

The benefits of this report are provided to Carlyle Land Ltd and Commercial Estates Group for the proposed development on Land at Adastral Park.

Brookbanks Consulting Ltd excludes third party rights for the information contained in the report.

Appendix A: Road Safety Auditor's Report

Safety Engineering Services Ltd

Land South and East of Adastral Park, Ipswich

Foxhall Roundabout Mitigation

Stage 1 Road Safety Audit

Stage 1 Road Safety Audit

CONTENTS

Report Number	Client Reference	Report Status
SESL1719	10391	FINAL

1 INTRODUCTION

This report presents the findings of a Road Safety Audit carried out on off-site highway mitigation works proposed to enable site access to land to the south and east of Adastral Park, Ipswich, at the request of Brookbanks Consulting Ltd. The development will consist of up to 2000 dwellings, local centres, with facilities to serve recreation and education.

The audit was carried out by the following:

S Hancock	Road Safety Audit Team Leader Safety Engineering Services Ltd
D Ramsden Certificate of Competency gained in June 2015	Road Safety Audit Team Member Safety Engineering Services Ltd

The audit took place on Saturday 27 May 2017 and comprised a desktop study of the plans provided and a drive and walk through of the site by both team members. During the site visit, the weather was sunny and fine and the road surfaces were dry. Traffic at the time of the audit was moderate.

A list of drawings and documents provided for the purpose of audit is in Appendix A. The locations of any problems have been identified on an annotated drawing in Appendix B.

The main terms of reference of the audit are as described in HD19/15. 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 designs to any other criteria.

There are eleven junctions in total requiring offsite highway mitigation works associated with this development. This Road Safety Audit focuses on the amendments to the Foxhall Roundabout, which increases the number of entry lanes to improve capacity.

The drawing supplied does not identify the tie in points and accordingly these have not been audited.

2 ROAD SAFETY AUDIT FINDINGS

2.1 PROBLEM

Location: A12 north and southbound approaches.

Summary: Lack of deflection could result in high entry speeds with associated loss of control or entry/circulating accidents.

It appears that suitable entry path curvature is not achieved on both of these approaches. Insufficient entry path curvature has a significant effect on the safety of roundabouts.

RECOMMENDATION

If entry path curvature cannot be achieved due to the widening, alternative measures should be considered to increase capacity.

2.2 PROBLEM

Location: A12 north and southbound approaches and Foxhall Road.

Summary: Lack of, or unsuitable direction signing may result in a number of collision types at roundabout.

The proposed widening on the above approaches reduces the highway in places to a width which does not appear suitable to accommodate direction signing. Suitably placed advance direction signing is an important factor on approach to roundabout junctions so that drivers are not confused and approach in the correct lane, which is especially important with a multi-lane approach such as that proposed.

RECOMMENDATION

Plot the required advance direction signing according to the parameters set out within Appendix A of LTN 1/94 and submit this for further audit to ensure that a suitable signing strategy can be achieved.

2.3 PROBLEM

Location: A12 Ring Road (South)

Summary: Risk of goods vehicles rollover accidents/powered 2-wheeler loss of control and sideswipes.

Curves to the right and then to the left on approach can create problems for goods vehicles and powered 2-wheelers and in this instance could also result in poor lane disciple on approach when less busy, which is likely to result in markings being worn off which can increase the risk of poor lane discipline risking sideswipes.

RECOMMENDATION

Relax the curves as much as possible.

2.4 PROBLEM

Location: Newbourne Road

Summary: Transition between existing and proposed alignment is sharp and may result in poor lane discipline or loss of control.

The small-scale drawing showing the extent of works indicates a sudden change of alignment on this approach.

RECOMMENDATION

Extend the extent of works to allow a smoother transition.

2.5 PROBLEM

Location: All arms

Summary: Lane markings may result in conflict and lane change accidents.

There are a number of conflicts in the lane destination arrows and lane alignments.

RECOMMENDATION

At detailed design, ensure that there are no conflicts and that markings to Diagram 1010 are used to guide drivers to the appropriate lanes.

3 AUDIT STATEMENT

We certify that this audit has been carried out in accordance with HD 19/15.

Signed:

S Hancock
Audit Team Leader
Safety Engineering Services Ltd

Date 28 May 2017

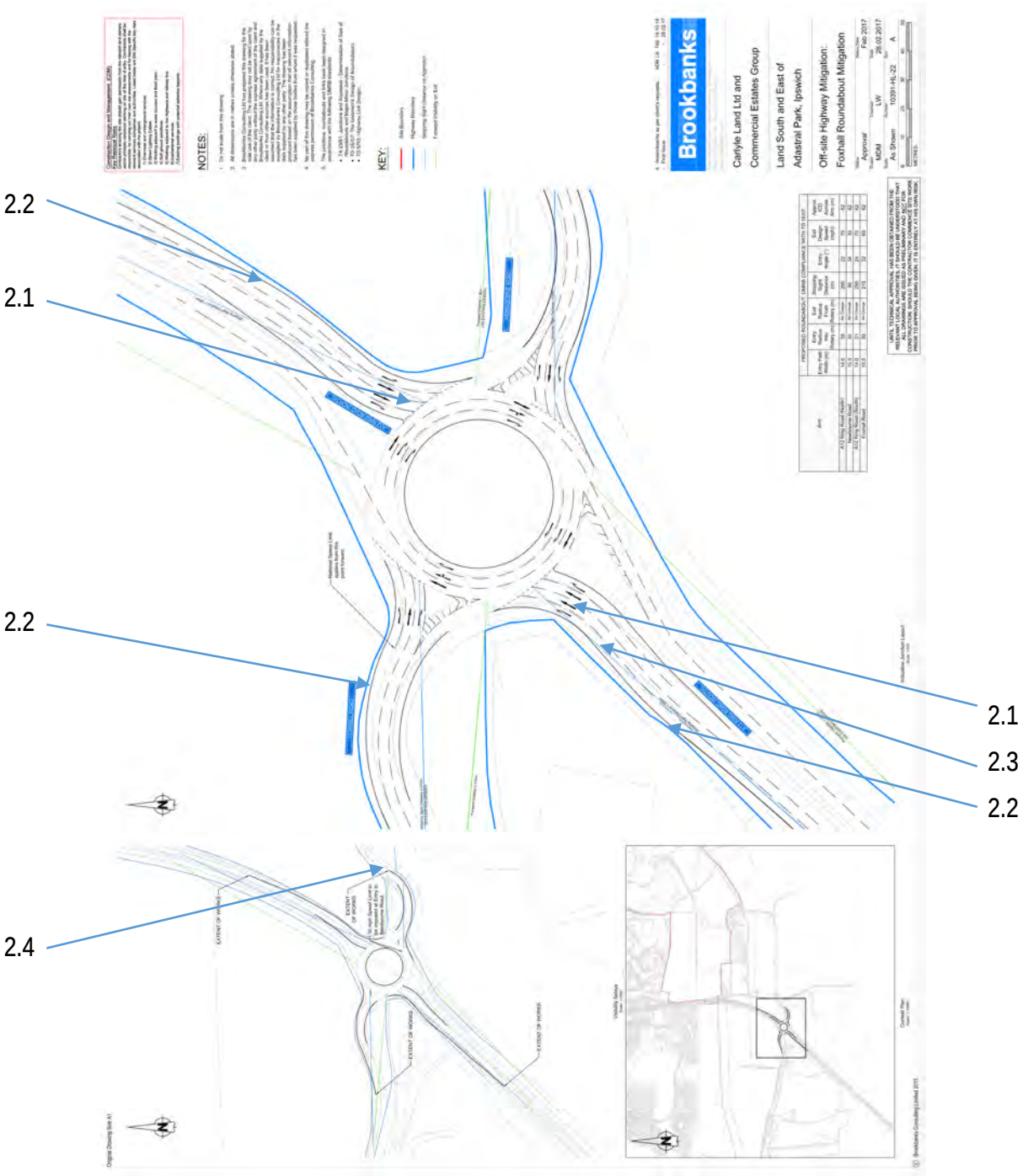
Signed:

D Ramsden
Audit Team Member
Safety Engineering Services Ltd

Date: 30 May 2017

DRAWINGS AND DOCUMENTS PROVIDED FOR AUDIT

10391-H-22 Rev A	Offsite Highway Mitigation - A14 Roundabout Signalisation
10391TA01Rv2	Land South and East of Adastral Park - Transport Assessment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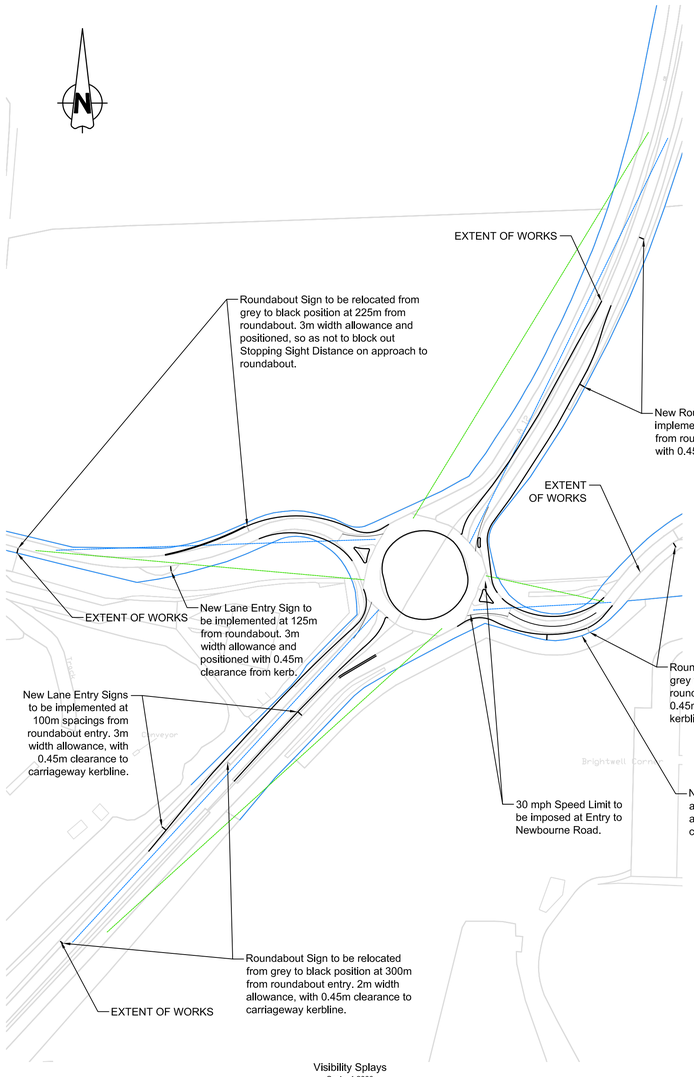
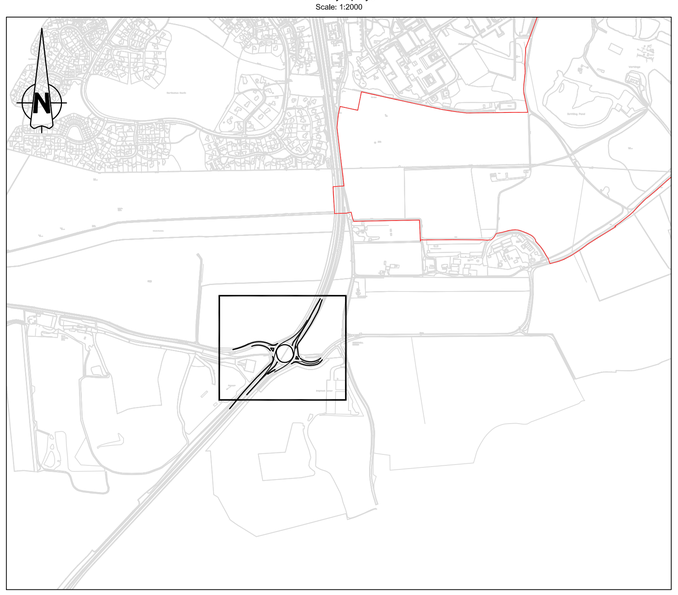
2.1
2.3
2.2
2.4
NOTES:
KEY:
Brookbanks
Carlyle Land Ltd and
Commercial Estates Group
Land South and East of
Adastral Park, Ipswich
Off-site Highway Mitigation:
Foxhall Roundabout Mitigation
As Shown
1039-HL-22
A
Feb 2017
28.02.2017

Appendix B: Updated Design Drawing

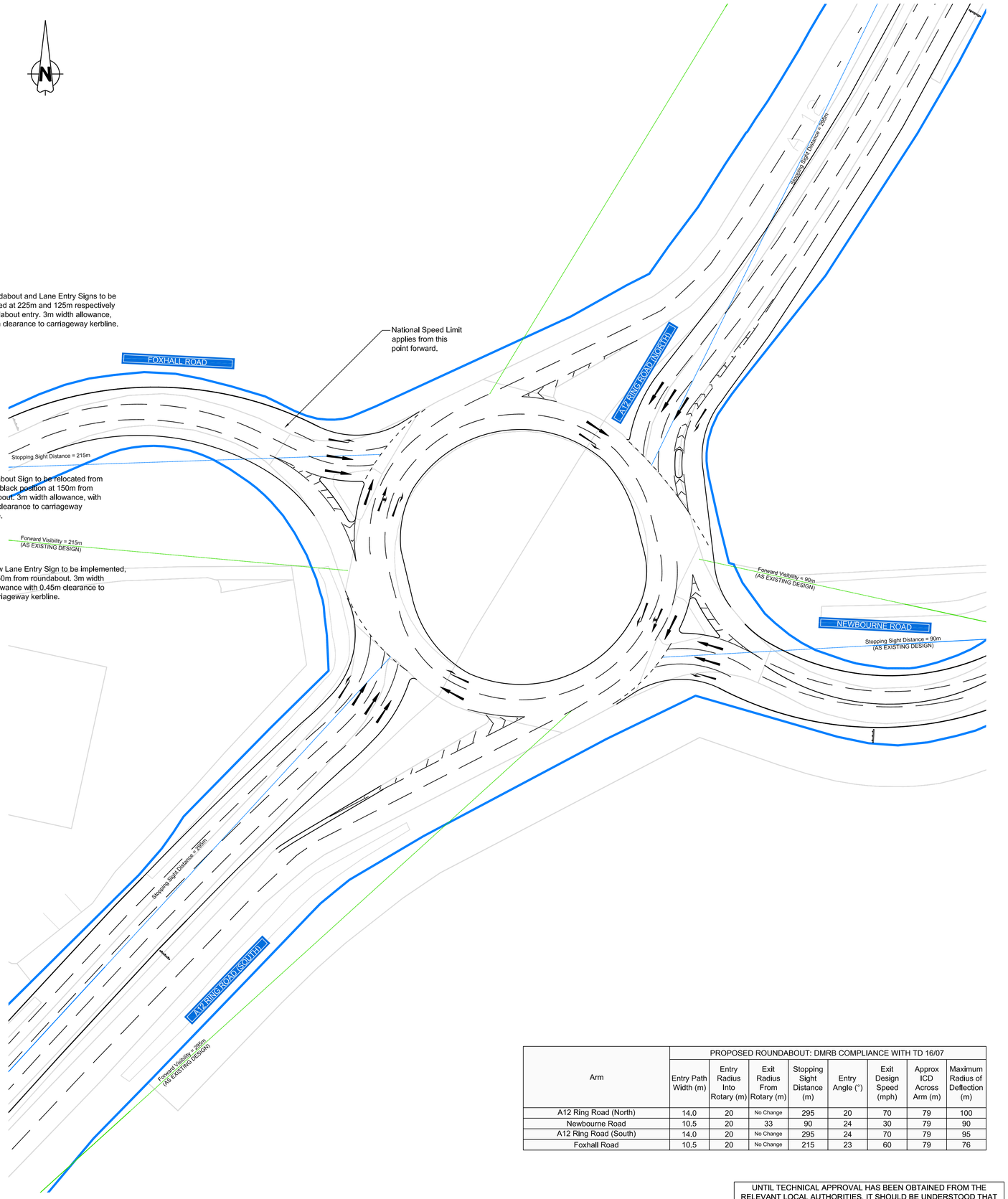
Original Drawing Size A1



Visibility Splays
Scale: 1:2000



Context Plan
Scale: 1:10000



Indicative Junction Layout
Scale: 1:500

Arm	PROPOSED ROUNDABOUT: DMRB COMPLIANCE WITH TD 16/07							
	Entry Path Width (m)	Entry Radius Into Rotary (m)	Exit Radius From Rotary (m)	Stopping Sight Distance (m)	Entry Angle (°)	Exit Design Speed (mph)	Approx ICD Across Arm (m)	Maximum Radius of Deflection (m)
A12 Ring Road (North)	14.0	20	No Change	295	20	70	79	100
Newbourne Road	10.5	20	33	90	24	30	79	90
A12 Ring Road (South)	14.0	20	No Change	295	24	70	79	95
Foxhall Road	10.5	20	No Change	215	23	60	79	76

UNTIL TECHNICAL APPROVAL HAS BEEN OBTAINED FROM THE RELEVANT LOCAL AUTHORITIES, IT SHOULD BE UNDERSTOOD THAT ALL DRAWINGS ARE ISSUED AS PRELIMINARY AND NOT FOR CONSTRUCTION. SHOULD THE CONTRACTOR COMMENCE SITE WORK PRIOR TO APPROVAL BEING GIVEN, IT IS ENTIRELY AT HIS OWN RISK.

Construction Design and Management (CDM)
Key Residual Risks

Contractors entering the site should gain permission from the relevant land owners and/or principle contractor working on site at the time of entry. Contractors shall be responsible for carrying out their own risk assessments and for liaising with the relevant services companies and authorities. Listed below are Site Specific key risks associated with the project.

1) Overhead and underground services
2) Street Lighting Cables
3) Working adjacent to water courses and flood plain
4) Soft ground conditions
5) Working adjacent to live highways and railway line
6) Unchartered services
7) Existing buildings with potential asbestos hazards

NOTES:

1. Do not scale from this drawing
2. All dimensions are in metres unless otherwise stated.
3. Brookbanks Consulting Ltd has prepared this drawing for the sole use of the client. The drawing may not be relied upon by any other party without the express agreement of the client and Brookbanks Consulting Ltd. Where any data supplied by the client or from other sources has been used, it has been assumed that the information is correct. No responsibility can be accepted by Brookbanks Consulting Ltd for inaccuracies in the data supplied by any other party. The drawing has been produced based on the assumption that all relevant information has been supplied by those bodies from whom it was requested.
4. No part of this drawing may be copied or duplicated without the express permission of Brookbanks Consulting.
5. The junctions, roundabouts and links have been designed in accordance with the following DMRB standards:
   - TA 23/81: Junctions and Accesses - Determination of Size of Roundabouts and Major-Minor Junctions
   - TD 16/07: The Geometric Design of Roundabouts.
   - TD 9/93: Highway Link Design;

KEY:

- Site Boundary
- Highway Boundary
- Stopping Sight Distance on Approach
- Forward Visibility on Exit

B	Amendments for Road Safety Audit.	MDM	DN	PAB 14.06.17
A	Amendments as per client's requests.	MDM	LW	PAB 03.03.17
-	First Issue	-	-	- 28.02.17

Brookbanks
6150 Knights Court Solihull Parkway Birmingham B37 7WY
Tel (0121) 329 4330 Fax (0121) 329 4331
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Carlyle Land Ltd and
Commercial Estates Group

Land South and East of
Adastral Park, Ipswich

Off-site Highway Mitigation:
Foxhall Roundabout Mitigation

Status	Status Date
Approval	Feb 2017
Drawn: MDM	Checked: LW	Date: 28.02.2017
Scale: As Shown	Number: 10391-HL-22	Rev: B

0 10 20 30 40 50
METRES

Adastral Park, Ipswich : Offsite Highway Mitigation to A12 / Barrack Square / Eagle Way Roundabout and Gloster Road / Barrack Square Priority Junction
Technical Note : Designer's Response to Road Safety Audits at Stage 1

15th June 2017

1 Introduction

Brookbanks Consulting Limited (BCL) is commissioned by Commercial Estates Group (CEG) Ltd to provide technical advice on viability and delivery on a proposed mixed use development at Adastral Park, Martlesham Heath, Suffolk. A Transport Assessment has been produced that has assessed the potential implications. A range of highway interventions has been subsequently identified.

For the Outline Planning Application, the following access strategy was offered:

- Traffic Signals Access off the A12 Dual Carriageway;
- Two simple priority junction accesses off Ipswich Road;
- Simple priority junction access off Gloster Road through the North-west Quadrant.

The Transport Assessment also identified that off-site highway mitigation measures were necessary at the following locations:

- A14 / A12 / A1156 Interchange;
- A12 / Newbourne Rd / Foxhall Road Roundabout;
- A12 / Barrack Square / Eagle Way Roundabout and Gloster Road / Barrack Square Priority Junction;
- A12 / Anson Road / Eagle Way Roundabout;
- A12 / A1214 Roundabout;
- A1189 Heath Road / Foxhall Road Roundabout;
- A1189 Bixley Road / A1156 Felixstowe Road Bixley Roundabout;
- A1214 / A1189 Gyratory Junction.

All design options, at the request of Suffolk County Council, have been subject to a Stage 1 Road Safety Audit. This note sets out the findings of the audit for the A12 / Barrack Square / Eagle Way Roundabout and Gloster Road / Barrack Square Priority Junction together with a designers response.

2 Designer's Response

The Designers Response should be read in conjunction with the Road Safety Audit (ref SESL1720) as attached in Appendix A and revised Drawing No: 10391-HL-23B as attached in Appendix B.

Problem 1

Location: A12 north and southbound approaches.
Summary: Lack of deflection could result in high entry speeds with associated loss of control or entry/circulating accidents. It appears that suitable entry path curvature may not be achieved on both of these approaches. Insufficient entry path curvature has a significant effect on the safety of roundabouts.
Recommendation: If suitable entry path curvature cannot be achieved due to the widening, alternative measures should be considered to increase capacity.

BCL Response: *The approach entry kerb radii have been narrowed to the minimum advised value of 20m as per Paragraph 7.49 in DMRB standard TD 16/07 Geometric Design of Roundabouts. This will now achieve deflection on the approaching arm and therefore satisfy the mandatory requirements of Paragraph 7.56 in TD 16/07.*

Problem 2

Location: Barrack Square / Gloster Road

Summary: Misuse of junction could lead to conflict. It is likely that the ahead and/or right lanes at the Barrack Square arm of the roundabout could become blocked in the event of a very short queue. Drivers may deliberately drive over the ghost island to access either of these lanes, which could create conflict with those using the lanes correctly. There is also a possibility that drivers could mistake the ghost island as the start of the lanes for the roundabout and misuse it unintentionally.

Recommendation: Provide traffic islands in the hatching at each end of the ghost island to clarify the layout and prevent deliberate misuse.

BCL Response: *Traffic islands have been provided to emphasize the layout of the two separate junctions and regulate traffic flow.*

Problem 3

Location: Barrack Square exit arm

Summary: Risk of lane change accidents. There are two lanes on this exit, with a very short length for unfamiliar drivers to ascertain the correct lane to be in. This can lead to conflicts if drivers need to change lanes with a very short length to do so.

Recommendation: Provide a single lane on exit, developing the left turn lane immediately afterwards.

BCL Response: *The lane has now been amended to provide a hatched single lane on exit with an immediate flare into the nearside diverging taper.*

3 Limitations

Third party information has been used in the preparation of this report, which Brookbanks Consulting Ltd, by necessity assumes is correct at the time of writing. While all reasonable checks have been made on data sources and the accuracy of data, Brookbanks Consulting Ltd accepts no liability for same.

The benefits of this report are provided to Carlyle Land Ltd and Commercial Estates Group for the proposed development on Land at Adastral Park.

Brookbanks Consulting Ltd excludes third party rights for the information contained in the report.

Appendix A: Road Safety Auditor's Report

Safety Engineering Services Ltd

Land South and East of Adastral Park, Ipswich

Adastral Park Roundabout and Gloster Road Mitigation

Stage 1 Road Safety Audit

Stage 1 Road Safety Audit

CONTENTS

Report Number	Client Reference	Report Status
SESL1720	10391	FINAL

1 INTRODUCTION

This report presents the findings of a Road Safety Audit carried out on off-site highway mitigation works proposed to enable site access to land to the south and east of Adastral Park, Ipswich, at the request of Brookbanks Consulting Ltd. The development will consist of up to 2000 dwellings, local centres, with facilities to serve recreation and education.

The audit was carried out by the following:

S Hancock	Road Safety Audit Team Leader Safety Engineering Services Ltd
D Ramsden Certificate of Competency gained in June 2015	Road Safety Audit Team Member Safety Engineering Services Ltd

The audit took place on Saturday 27 May 2017 and comprised a desktop study of the plans provided and a drive and walk through of the site by both team members. During the site visit, the weather was fine and sunny and the road surfaces were dry. Traffic at the time of the audit was moderate.

A list of drawings and documents provided for the purpose of audit is in Appendix A. The locations of any problems have been identified on an annotated drawing in Appendix B.

The main terms of reference of the audit are as described in HD19/15. 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 designs to any other criteria.

There are eleven junctions in total requiring offsite highway mitigation works associated with this development. This Road Safety Audit focuses on the proposed lane increases at the Adastral Park Roundabout to increase capacity and amendments to the adjacent priority junction with Gloster Road.

2 ROAD SAFETY AUDIT FINDINGS

2.1 PROBLEM

Location: A12 north and southbound approaches.

Summary: Lack of deflection could result in high entry speeds with associated loss of control or entry/circulating accidents.

It appears that suitable entry path curvature may not be achieved on both of these approaches. Insufficient entry path curvature has a significant effect on the safety of roundabouts.

RECOMMENDATION

If suitable entry path curvature cannot be achieved due to the widening, alternative measures should be considered to increase capacity.

2.2 PROBLEM

Location: Barrack Square / Gloster Road

Summary: Misuse of junction could lead to conflict.

It is likely that the ahead and/or right lanes at the Barrack Square arm of the roundabout could become blocked in the event of a very short queue. Drivers may deliberately drive over the ghost island to access either of these lanes, which could create conflict with those using the lanes correctly. There is also a possibility that drivers could mistake the ghost island as the start of the lanes for the roundabout and misuse it unintentionally.

RECOMMENDATION

Provide traffic islands in the hatching at each end of the ghost island to clarify the layout and prevent deliberate misuse.

2.3 PROBLEM

Location: Barrack Square exit arm

Summary: Risk of lane change accidents

There are two lanes on this exit, with a very short length for unfamiliar drivers to ascertain the correct lane to be in. This can lead to conflicts if drivers need to change lanes with a very short length to do so.

RECOMMENDATION

Provide a single lane on exit, developing the left turn lane immediately afterwards.

3 AUDIT STATEMENT

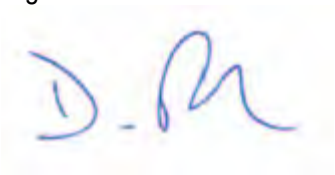
We certify that this audit has been carried out in accordance with HD 19/15.

Signed:

S Hancock
Audit Team Leader
Safety Engineering Services Ltd

Date 28 May 2017

Signed:

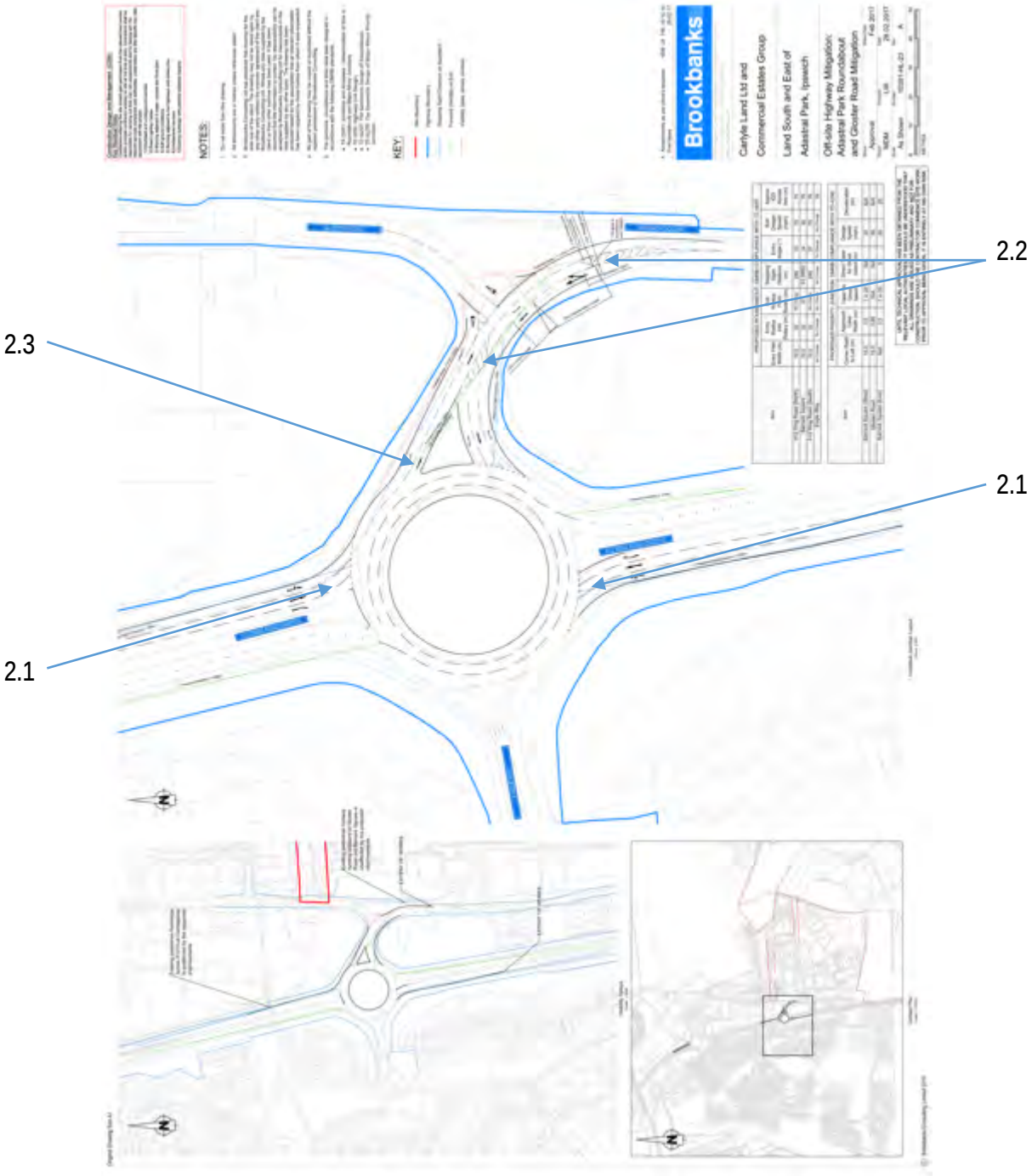


D Ramsden
Audit Team Member
Safety Engineering Services Ltd

Date: 30 May 2017

DRAWINGS AND DOCUMENTS PROVIDED FOR AUDIT

10391-H-23 Rev A	Offsite Highway Mitigation - Adastral Park Roundabout and Gloster Road Mitigation
10391TA01Rv2	Land South and East of Adastral Park - Transport Assessment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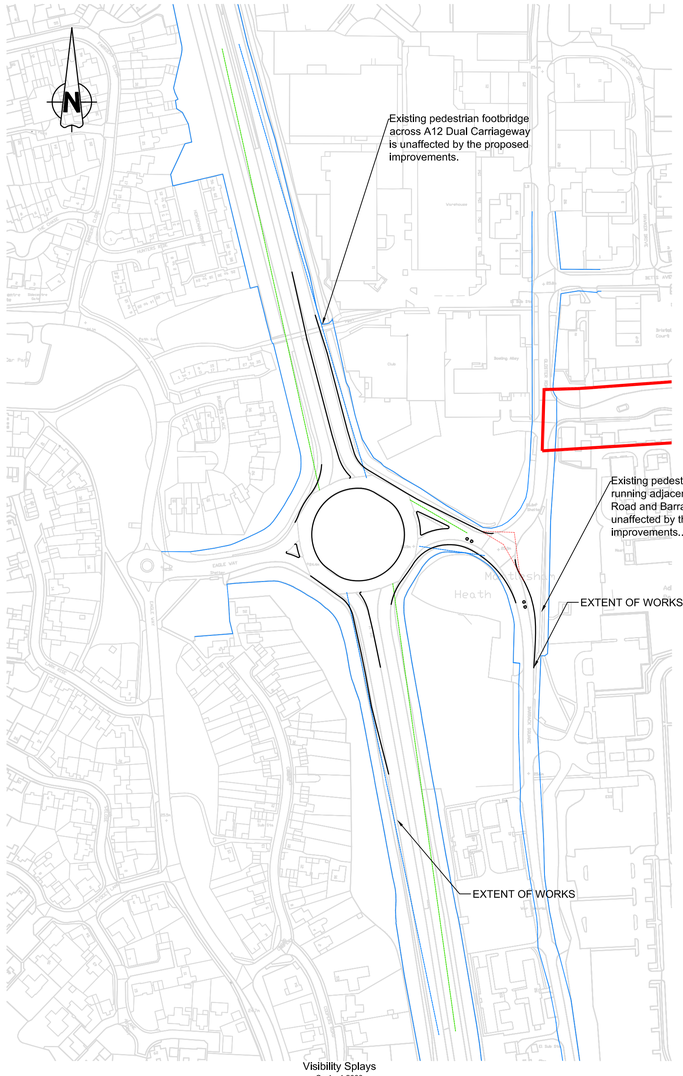
Appendix B: Updated Design Drawing

Original Drawing Size A1



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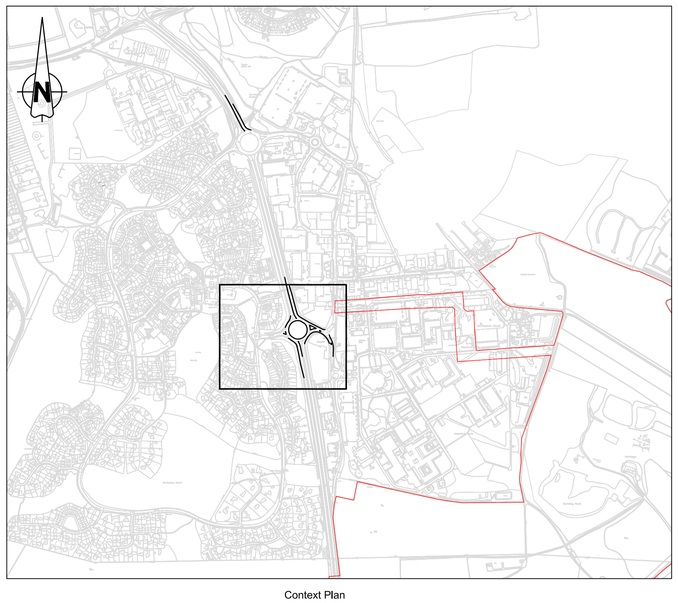
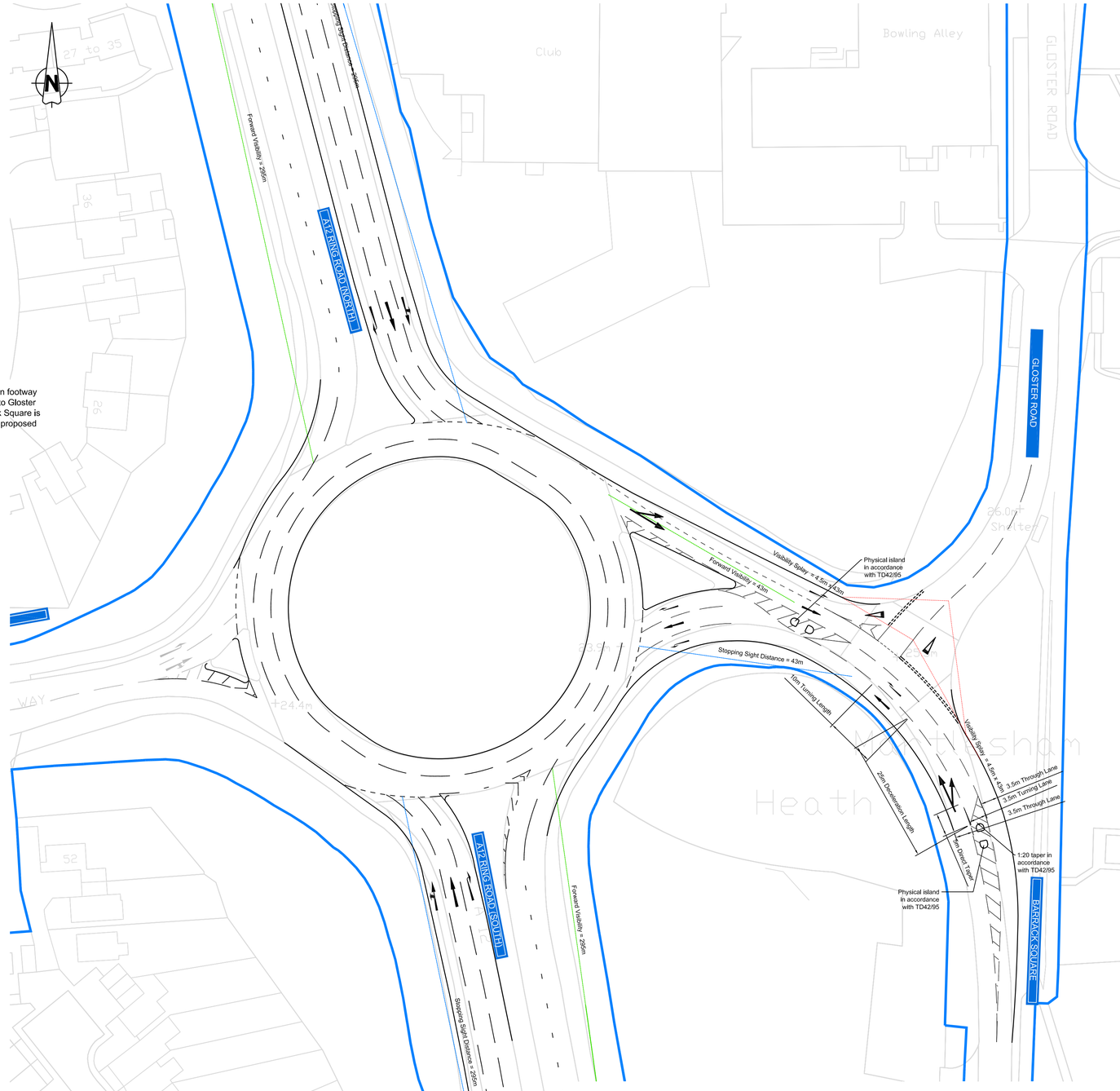


Context Plan
Scale: 1:10000



Indicative Junction Layout
Scale: 1:500

Arm	PROPOSED ROUNDABOUT: DMRB COMPLIANCE WITH TD 16/07							
	Entry Path Width (m)	Entry Radius Into Rotary (m)	Exit Radius From Rotary (m)	Stopping Sight Distance (m)	Entry Angle (°)	Exit Design Speed (mph)	Approx ICD Across Arm (m)	Maximum Radius of Deflection (m)
A12 Ring Road (North)	10.5	20	No Change	295	24	70	81.5	55
Barrack Square	10.5	27	39	43 (MfS)	36	30	81.5	39
A12 Ring Road (South)	10.5	20	No Change	295	23	70	81.5	87
Eagle Way	No Change	No Change	No Change	No Change	No Change	No Change	81.5	59

Arm	PROPOSED PRIORITY JUNCTION: DMRB COMPLIANCE WITH TD 42/95					
	Corner Radii to Left (m)	Approach Lane Width (m)	Taper for Ghost Island	Direct Taper for Ghost Island (m)	Design Speed (mph)	Deceleration (m)
Barrack Square (West)	15.0	3.5	1 in 20	N/A	30	N/A
Gloster Road	15.0	3.65	N/A	N/A	30	N/A
Barrack Square (East)	N/A	3.5	1 in 20	5	30	25

UNTIL TECHNICAL APPROVAL HAS BEEN OBTAINED FROM THE RELEVANT LOCAL AUTHORITIES, IT SHOULD BE UNDERSTOOD THAT ALL DRAWINGS ARE ISSUED AS PRELIMINARY AND NOT FOR CONSTRUCTION. SHOULD THE CONTRACTOR COMMENCE SITE WORK PRIOR TO APPROVAL BEING GIVEN, IT IS ENTIRELY AT HIS OWN RISK.

Construction Design and Management (CDM)
Key Residual Risks
Contractors entering the site should gain permission from the relevant land owners and/or principle contractor working on site at the time of entry. Contractors shall be responsible for carrying out their own risk assessments and for liaising with the relevant services companies and authorities. Listed below are Site Specific key risks associated with the project.

1) Overhead and underground services
2) Street Lighting Cables
3) Working adjacent to water courses and flood plain
4) Soft ground conditions
5) Working adjacent to live highways and railway line
6) Unchartered services
7) Existing buildings with potential asbestos hazards

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   - TA 23/81: Junctions and Accesses - Determination of Size of Roundabouts and Major-Minor Junctions
   - TD 9/93: Highway Link Design;
   - TD 16/07: The Geometric Design of Roundabouts.
   - TD 42/95: The Geometric Design of Major-Minor Priority Junctions.

KEY:

- Site Boundary
- Highway Boundary
- Stopping Sight Distance on Approach
- Forward Visibility on Exit
- Visibility Splay across Junction

B	Further amendments for deflection.	MDM DN PAB	15.06.17
A	Amendments as per client's requests.	MDM LW PAB	03.03.17
-	First Issue	- - -	28.02.17

Brookbanks
6150 Knights Court Solihull Parkway Birmingham B37 7WY
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www.brookbanks.com

Carlyle Land Ltd and Commercial Estates Group

Land South and East of Adastral Park, Ipswich

Off-site Highway Mitigation: Adastral Park Roundabout and Gloster Road Mitigation

Status		Status Date
Approval		Feb 2017
Drawn	Checked	Date
MDM	LW	28.02.2017
Scale	Number	Rev
As Shown	10391-HL-23	B

0 10 20 30 40 50
METRES

Adastral Park, Ipswich : Offsite Highway Mitigation to A12 / Anson Road / Eagle Way Roundabout

Technical Note : Designer's Response to Road Safety Audits at Stage 1

13th June 2017

1 Introduction

Brookbanks Consulting Limited (BCL) is commissioned by Commercial Estates Group (CEG) Ltd to provide technical advice on viability and delivery on a proposed mixed use development at Adastral Park, Martlesham Heath, Suffolk. A Transport Assessment has been produced that has assessed the potential implications. A range of highway interventions has been subsequently identified.

For the Outline Planning Application, the following access strategy was offered:

- Traffic Signals Access off the A12 Dual Carriageway;
- Two simple priority junction accesses off Ipswich Road;
- Simple priority junction access off Gloster Road through the North-west Quadrant.

The Transport Assessment also identified that off-site highway mitigation measures were necessary at the following locations:

- A14 / A12 / A1156 Interchange;
- A12 / Newbourne Rd / Foxhall Road Roundabout;
- A12 / Barrack Square / Eagle Way Roundabout and Gloster Road / Barrack Square Priority Junction;
- A12 / Anson Road / Eagle Way Roundabout;
- A12 / A1214 Roundabout (Signal Timing Modification only);
- A1189 Heath Road / Foxhall Road Roundabout;
- A1189 Bixley Road / A1156 Felixstowe Road Bixley Roundabout;
- A1214 / A1189 Gyratory Junction.

All design options, at the request of Suffolk County Council, have been subject to a Stage 1 Road Safety Audit. This note sets out the findings of the audit for the A12 / Anson Road / Eagle Way Roundabout together with a designers response.

2 Designer's Response

The Designers Response should be read in conjunction with the Road Safety Audit (ref SESL1721) as attached in Appendix A and revised Drawing No: 10391-HL-24B as attached in Appendix B.

Problem 1

Location: A12 southbound approach.
Summary: Lack of deflection could result in high entry speeds with associated loss of control or entry/circulating accidents. It appears that suitable entry path curvature is not achieved as a result of the widening. Insufficient entry path curvature has a significant effect on the safety of roundabouts.
Recommendation: If entry path curvature cannot be achieved due to the widening, alternative measures should be considered to increase capacity.

BCL Response: *The approach entry kerb radius has been narrowed to the minimum advised value of 20m as per Paragraph 7.49 in DMRB standard TD 16/07 Geometric Design of Roundabouts. This will now achieve deflection on the approaching arm and therefore satisfy the mandatory requirements of Paragraph 7.56 in TD 16/07.*

3 Limitations

Third party information has been used in the preparation of this report, which Brookbanks Consulting Ltd, by necessity assumes is correct at the time of writing. While all reasonable checks have been made on data sources and the accuracy of data, Brookbanks Consulting Ltd accepts no liability for same.

The benefits of this report are provided to Carlyle Land Ltd and Commercial Estates Group for the proposed development on Land at Adastral Park.

Brookbanks Consulting Ltd excludes third party rights for the information contained in the report.

Appendix A: Road Safety Auditor's Report

Safety Engineering Services Ltd

Land South and East of Adastral Park, Ipswich

Martlesham Roundabout

Stage 1 Road Safety Audit

Stage 1 Road Safety Audit

CONTENTS

Report Number	Client Reference	Report Status
SESL1721	10391	FINAL

1 INTRODUCTION

This report presents the findings of a Road Safety Audit carried out on off-site highway mitigation works proposed to enable site access to land to the south and east of Adastral Park, Ipswich, at the request of Brookbanks Consulting Ltd. The development will consist of up to 2000 dwellings, local centres, with facilities to serve recreation and education.

The audit was carried out by the following:

S Hancock	Road Safety Audit Team Leader Safety Engineering Services Ltd
D Ramsden Certificate of Competency gained in June 2015	Road Safety Audit Team Member Safety Engineering Services Ltd

The audit took place on Saturday 27 May 2017 and comprised a desktop study of the plans provided and a drive and walk through of the site by both team members. During the site visit, the weather was sunny and fine and the road surfaces were dry. Traffic at the time of the audit was moderate.

A list of drawings and documents provided for the purpose of audit is in Appendix A. The locations of any problems have been identified on an annotated drawing in Appendix B.

The main terms of reference of the audit are as described in HD19/15. 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 designs to any other criteria.

There are eleven junctions in total requiring offsite highway mitigation works associated with this development. This Road Safety Audit focuses on the proposed amendments to the A12 Ring Road/Eagle Way/Anson Road roundabout, comprising a lane increase to the northern entry arm.

2 ROAD SAFETY AUDIT FINDINGS

2.1 PROBLEM

Location: A12 southbound approach.

Summary: Lack of deflection could result in high entry speeds with associated loss of control or entry/circulating accidents.

It appears that suitable entry path curvature is not achieved as a result of the widening. Insufficient entry path curvature has a significant effect on the safety of roundabouts.

RECOMMENDATION

If entry path curvature cannot be achieved due to the widening, alternative measures should be considered to increase capacity.

3 AUDIT STATEMENT

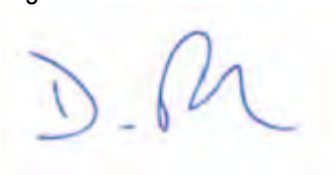
We certify that this audit has been carried out in accordance with HD 19/15.

Signed:

S Hancock
Audit Team Leader
Safety Engineering Services Ltd

Date 28 May 2017

Signed:



D Ramsden
Audit Team Member
Safety Engineering Services Ltd

Date: 30 May 2017

DRAWINGS AND DOCUMENTS PROVIDED FOR AUDIT

10391-H-24 Rev A	Offsite Highway Mitigation - Martlesham Road Roundabout Mitigation
10391TA01Rv2	Land South and East of Adastral Park - Transport Assessment

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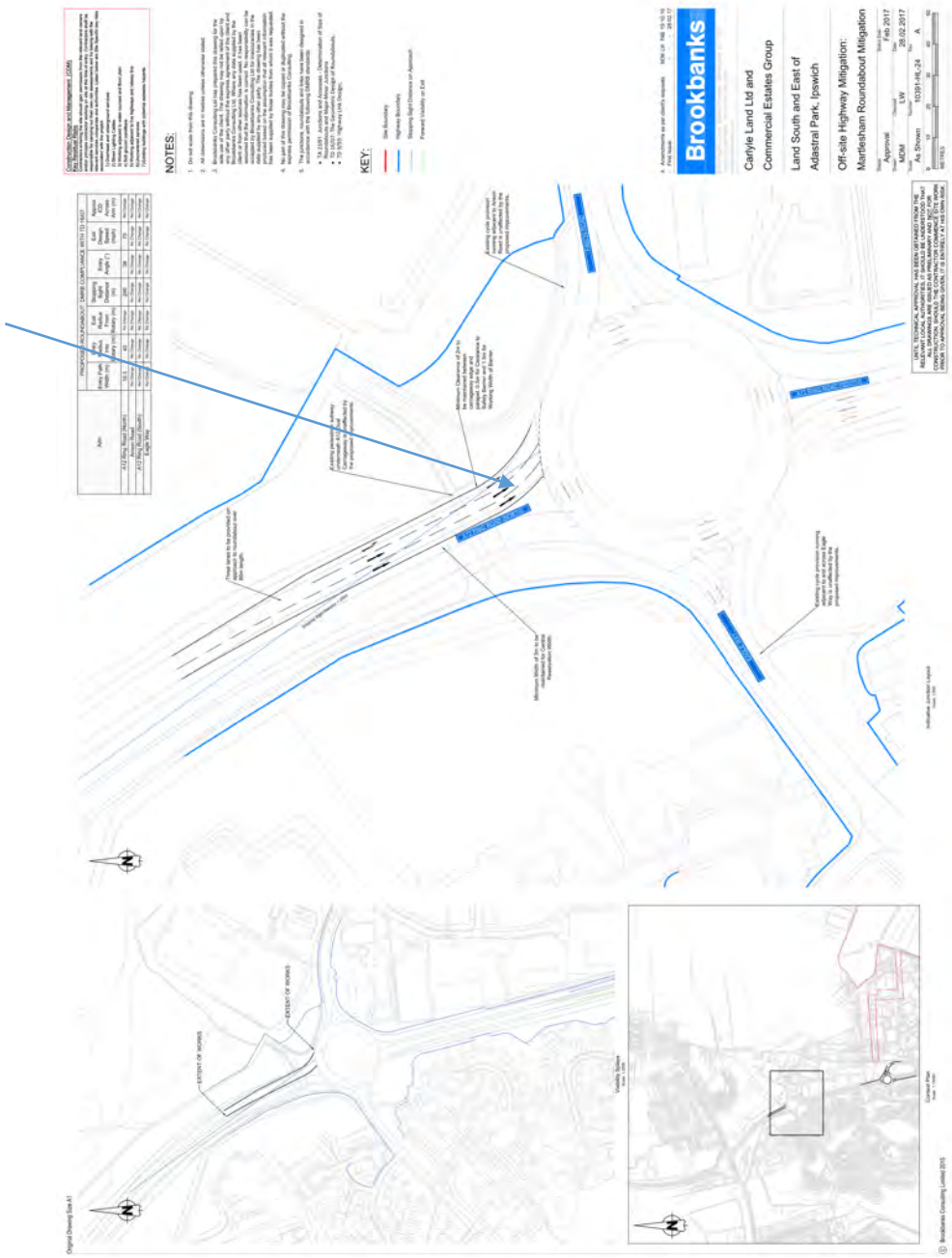
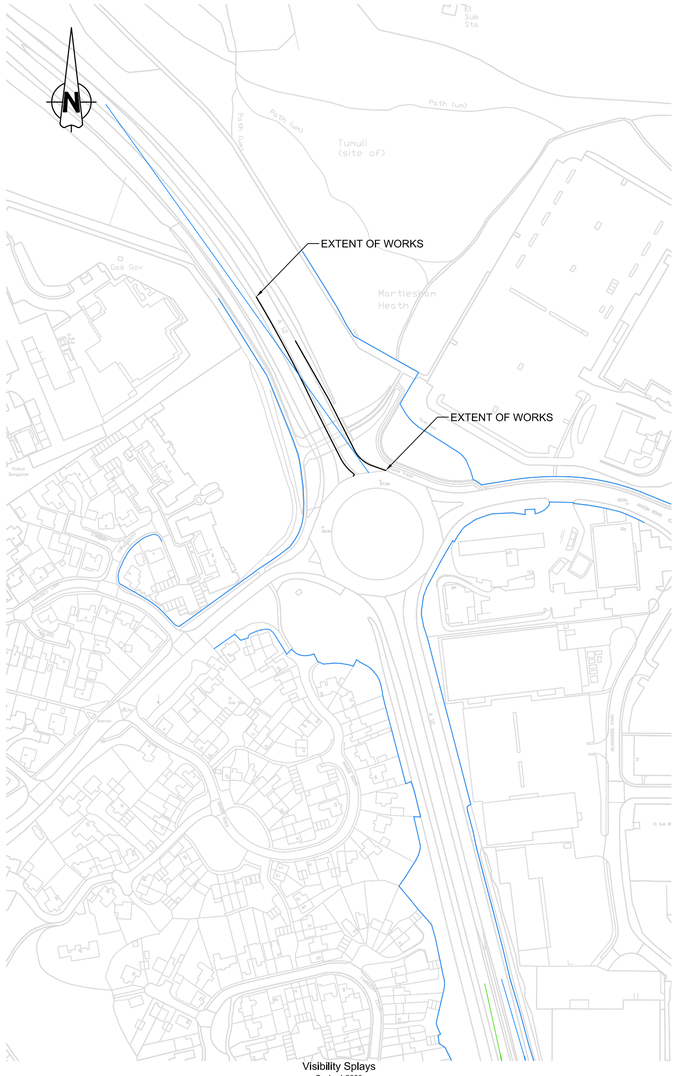
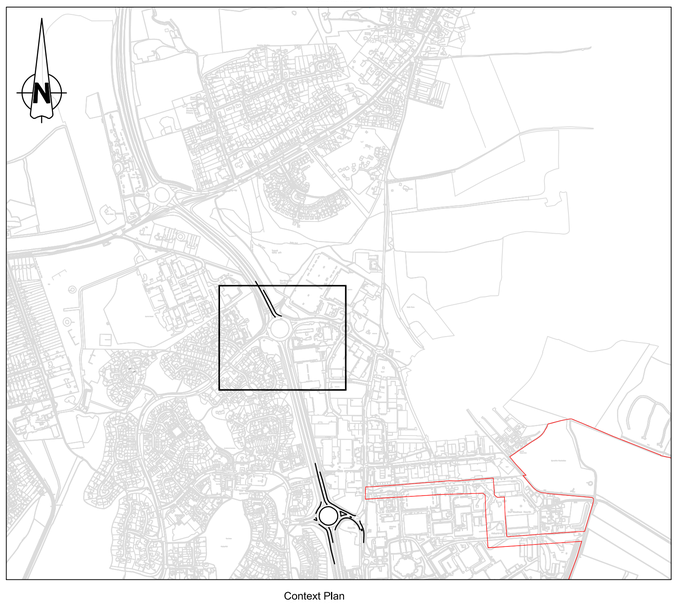

NOTES:
KEY:
Brookbanks
Carlyle Land Ltd and
Commercial Estates Group
Land South and East of
Adastral Park, Ipswich
Off-site Highway Mitigation:
Martlesham Roundabout Mitigation
EXTENT OF WORKS
EXTENT OF WORKS

Appendix B: Updated Design Drawing

Original Drawing Size A1

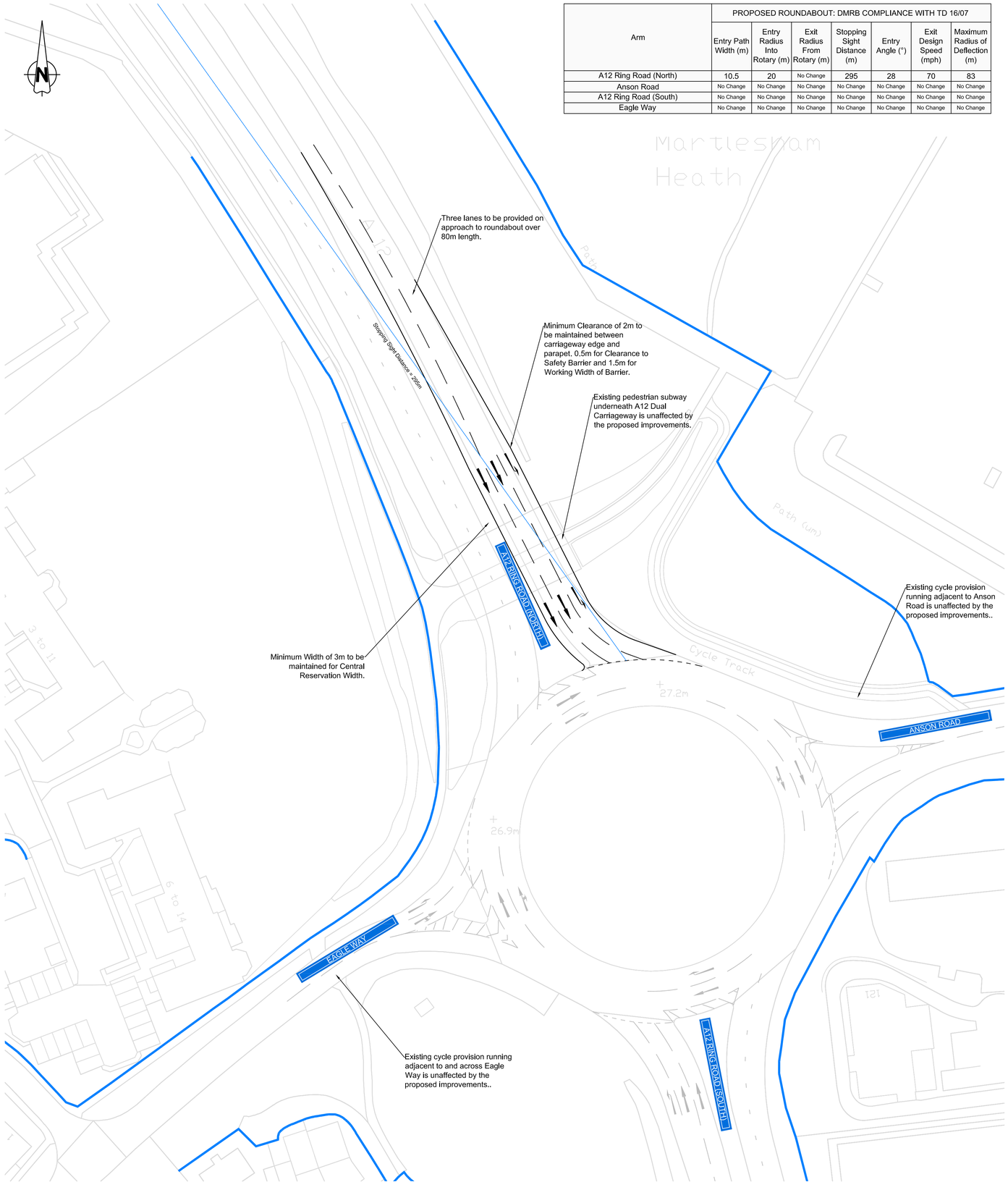


Visibility Splays
Scale: 1:2000



Context Plan
Scale: 1:10000

Arm	PROPOSED ROUNDABOUT: DMRB COMPLIANCE WITH TD 16/07						
	Entry Path Width (m)	Entry Radius Into Rotary (m)	Exit Radius From Rotary (m)	Stopping Sight Distance (m)	Entry Angle (°)	Exit Design Speed (mph)	Maximum Radius of Deflection (m)
A12 Ring Road (North)	10.5	20	No Change	295	28	70	83
Anson Road	No Change	No Change	No Change	No Change	No Change	No Change	No Change
A12 Ring Road (South)	No Change	No Change	No Change	No Change	No Change	No Change	No Change
Eagle Way	No Change	No Change	No Change	No Change	No Change	No Change	No Change



Indicative Junction Layout
Scale: 1:500

Construction Design and Management (CDM)
Key Residual Risks
Contractors entering the site should gain permission from the relevant land owners and/or principle contractor working on site at the time of entry. Contractors shall be responsible for carrying out their own risk assessments and for liaising with the relevant services companies and authorities. Listed below are Site Specific key risks associated with the project.

1) Overhead and underground services
2) Street Lighting Cables
3) Working adjacent to water courses and flood plain
4) Soft ground conditions
5) Working adjacent to live highways and railway line
6) Unchartered services
7) Existing buildings with potential asbestos hazards

NOTES:

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4. No part of this drawing may be copied or duplicated without the express permission of Brookbanks Consulting.
5. The junctions, roundabouts and links have been designed in accordance with the following DMRB standards:
   - TA 23/81: Junctions and Accesses - Determination of Size of Roundabouts and Major-Minor Junctions
   - TD 16/07: The Geometric Design of Roundabouts.
   - TD 9/93: Highway Link Design;

KEY:

- Site Boundary
- Highway Boundary
- Stopping Sight Distance on Approach
- Forward Visibility on Exit

B	Further amendments for deflection,	MDM DN	PAB 14.06.17
A	Amendments as per client's requests.	MDM LW	PAB 03.03.17
-	First Issue	- -	- 28.02.17

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Carlyle Land Ltd and
Commercial Estates Group

Land South and East of
Adastral Park, Ipswich

Off-site Highway Mitigation:
Martlesham Roundabout Mitigation

Status		Status Date
Approval		Feb 2017
Drawn	Checked	Date
MDM	LW	28.02.2017
Scale	Number	Rev
As Shown	10391-HL-24	B

0 10 20 30 40 50
METRES

UNTIL TECHNICAL APPROVAL HAS BEEN OBTAINED FROM THE RELEVANT LOCAL AUTHORITIES, IT SHOULD BE UNDERSTOOD THAT ALL DRAWINGS ARE ISSUED AS PRELIMINARY AND NOT FOR CONSTRUCTION. SHOULD THE CONTRACTOR COMMENCE SITE WORK PRIOR TO APPROVAL BEING GIVEN, IT IS ENTIRELY AT HIS OWN RISK.

Adastral Park, Ipswich : Offsite Highway Mitigation to A1189 Heath Road / Foxhall Road Roundabout

Technical Note : Designer's Response to Road Safety Audits at Stage 1

13th June 2017

1 Introduction

Brookbanks Consulting Limited (BCL) is commissioned by Commercial Estates Group (CEG) Ltd to provide technical advice on viability and delivery on a proposed mixed use development at Adastral Park, Martlesham Heath, Suffolk. A Transport Assessment has been produced that has assessed the potential implications. A range of highway interventions has been subsequently identified.

For the Outline Planning Application, the following access strategy was offered:

- Traffic Signals Access off the A12 Dual Carriageway;
- Two simple priority junction accesses off Ipswich Road;
- Simple priority junction access off Gloster Road through the North-west Quadrant.

The Transport Assessment also identified that off-site highway mitigation measures were necessary at the following locations:

- A14 / A12 / A1156 Interchange;
- A12 / Newbourne Rd / Foxhall Road Roundabout;
- A12 / Barrack Square / Eagle Way Roundabout and Gloster Road / Barrack Square Priority Junction;
- A12 / Anson Road / Eagle Way Roundabout;
- A12 / A1214 Roundabout (Signal Timing Modification only);
- A1189 Heath Road / Foxhall Road Roundabout;
- A1189 Bixley Road / A1156 Felixstowe Road Bixley Roundabout;
- A1214 / A1189 Gyratory Junction.

All design options, at the request of Suffolk County Council, have been subject to a Stage 1 Road Safety Audit. This note sets out the findings of the audit for the A1189 Heath Road / Foxhall Road Roundabout together with a designers response.

2 Designer's Response: Roundabout

The Designers Response should be read in conjunction with the Road Safety Audit (ref SESL1722) as attached in Appendix A.

Problem 1

Location: Foxhall Road (east) arm
Summary: Risk of vehicles striking direction sign. The widening on this arm is achieved by narrowing the existing splitter island and in doing so it appears that clearance to the existing sign will be reduced. This could lead to vehicles hitting it.
Recommendation: Ensure that the sign is realigned or replaced at detailed design.
BCL Response: *It is recommended that the sign is relocated to the south side of the carriageway as this will ensure that vehicles do not clip the sign when the central island is narrowed. However the elevation of the sign should be maintained to ensure visibility behind vehicles waiting on entry to the roundabout. It will also improve visibility for drivers of any pedestrians waiting on the splitter island to cross the carriageway.*

3 Limitations

Third party information has been used in the preparation of this report, which Brookbanks Consulting Ltd, by necessity assumes is correct at the time of writing. While all reasonable checks have been made on data sources and the accuracy of data, Brookbanks Consulting Ltd accepts no liability for same.

The benefits of this report are provided to Carlyle Land Ltd and Commercial Estates Group for the proposed development on Land at Adastral Park.

Brookbanks Consulting Ltd excludes third party rights for the information contained in the report.

Appendix A: Road Safety Auditor's Report

Safety Engineering Services Ltd

Land South and East of Adastral Park, Ipswich

A1189 Bixley Road/Foxhall Road Roundabout Mitigation

Stage 1 Road Safety Audit

Stage 1 Road Safety Audit

CONTENTS

Report Number	Client Reference	Report Status
SESL1722	10391	FINAL

1 INTRODUCTION

This report presents the findings of a Road Safety Audit carried out on off-site highway mitigation works proposed to enable site access to land to the south and east of Adastral Park, Ipswich, at the request of Brookbanks Consulting Ltd. The development will consist of up to 2000 dwellings, local centres, with facilities to serve recreation and education.

The audit was carried out by the following:

S Hancock	Road Safety Audit Team Leader Safety Engineering Services Ltd
D Ramsden Certificate of Competency gained in June 2015	Road Safety Audit Team Member Safety Engineering Services Ltd

The audit took place on Saturday 27 May 2017 and comprised a desktop study of the plans provided and a drive and walk through of the site by both team members. During the site visit, the weather was sunny and fine and the road surfaces were dry. Traffic at the time of the audit was moderate.

A list of drawings and documents provided for the purpose of audit is in Appendix A. The locations of any problems have been identified on an annotated drawing in Appendix B.

The main terms of reference of the audit are as described in HD19/15. 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 designs to any other criteria.

There are eleven junctions in total requiring offsite highway mitigation works associated with this development. This Road Safety Audit focuses on the proposed minor widening works on the Foxhall Road to achieve improvements to capacity.

2 ROAD SAFETY AUDIT FINDINGS

2.1 PROBLEM

Location: Foxhall Road (east) arm

Summary: Risk of vehicles striking direction sign.

The widening on this arm is achieved by narrowing the existing splitter island and in doing so it appears that clearance to the existing sign will be reduced. This could lead to vehicles hitting it.

RECOMMENDATION

Ensure that the sign is realigned or replaced at detailed design.

3 AUDIT STATEMENT

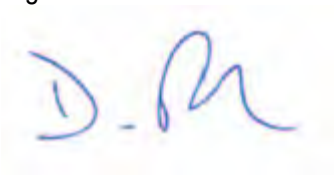
We certify that this audit has been carried out in accordance with HD 19/15.

Signed:

S Hancock
Audit Team Leader
Safety Engineering Services Ltd

Date 28 May 2017

Signed:



D Ramsden
Audit Team Member
Safety Engineering Services Ltd

Date: 30 May 2017

DRAWINGS AND DOCUMENTS PROVIDED FOR AUDIT

10391-H-25 Rev A	Offsite Highway Mitigation - Offsite Highway Mitigation - A1189 Bixley Road / Foxhall Road Roundabout Mitigation
10391TA01Rv2	Land South and East of Adastral Park - Transport Assessment

2.1


NOTES:
KEY:
Brookbanks
Carlyle Land Ltd and
Commercial Estates Group
Land South and East of
Adastral Park, Ipswich
Off-site Highway Mitigation:
A1189 Bixley Road / Foxhall
Road Roundabout Mitigation
IPSWICH

Adastral Park, Ipswich : Offsite Highway Mitigation to A1189 Bixley Road / A1156 Felixstowe Road Roundabout

Technical Note : Designer's Response to Road Safety Audits at Stage 1

13th June 2017

1 Introduction

Brookbanks Consulting Limited (BCL) is commissioned by Commercial Estates Group (CEG) Ltd to provide technical advice on viability and delivery on a proposed mixed use development at Adastral Park, Martlesham Heath, Suffolk. A Transport Assessment has been produced that has assessed the potential implications. A range of highway interventions has been subsequently identified.

For the Outline Planning Application, the following access strategy was offered:

- Traffic Signals Access off the A12 Dual Carriageway;
- Two simple priority junction accesses off Ipswich Road;
- Simple priority junction access off Gloster Road through the North-west Quadrant.

The Transport Assessment also identified that off-site highway mitigation measures were necessary at the following locations:

- A14 / A12 / A1156 Interchange;
- A12 / Newbourne Rd / Foxhall Road Roundabout;
- A12 / Barrack Square / Eagle Way Roundabout and Gloster Road / Barrack Square Priority Junction;
- A12 / Anson Road / Eagle Way Roundabout;
- A12 / A1214 Roundabout (Signal Timing Modification only);
- A1189 Heath Road / Foxhall Road Roundabout;
- A1189 Bixley Road / A1156 Felixstowe Road Roundabout;
- A1214 / A1189 Gyratory Junction.

All design options, at the request of Suffolk County Council, have been subject to a Stage 1 Road Safety Audit. This note sets out the findings of the audit for the A1189 Bixley Road / A1156 Felixstowe Road Roundabout together with a designers response.

2 Designer's Response

The Designers Response should be read in conjunction with the Road Safety Audit (ref SESL1723) as attached in Appendix A and revised Drawing No: 10391-HL-26B as attached in Appendix B.

Problem 1

Location: A1189 Bixley Road arm
Summary: Possibility of kerb strikes. The lanes are aligned so that the nearside ahead lane directs traffic towards the splitter island on Bucklesham Road.
Recommendation: Realign the lanes so they are directed away from the kerbed islands.
BCL Response: *The splitter island on the Bucklesham Road arm has been slightly reduced in size to provide a smoother alignment for ahead traffic across the roundabout from the A1189 Bixley Road arm. If this compromises the clearance to the sign post in the middle of the splitter arm, then this should also be moved backwards to suit (there is sufficient space for this so as not to block the crossing point.*

3 Limitations

Third party information has been used in the preparation of this report, which Brookbanks Consulting Ltd, by necessity assumes is correct at the time of writing. While all reasonable checks have been made on data sources and the accuracy of data, Brookbanks Consulting Ltd accepts no liability for same.

The benefits of this report are provided to Carlyle Land Ltd and Commercial Estates Group for the proposed development on Land at Adastral Park.

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Appendix A: Road Safety Auditor's Report

Safety Engineering Services Ltd

Land South and East of Adastral Park, Ipswich

A1189 Bixley Road/A1156 Felixtowe Road Roundabout Mitigation

Stage 1 Road Safety Audit

Stage 1 Road Safety Audit

CONTENTS

Report Number	Client Reference	Report Status
SESL1723	10391	FINAL

1 INTRODUCTION

This report presents the findings of a Road Safety Audit carried out on off-site highway mitigation works proposed to enable site access to land to the south and east of Adastral Park, Ipswich, at the request of Brookbanks Consulting Ltd. The development will consist of up to 2000 dwellings, local centres, with facilities to serve recreation and education.

The audit was carried out by the following:

S Hancock	Road Safety Audit Team Leader Safety Engineering Services Ltd
D Ramsden Certificate of Competency gained in June 2015	Road Safety Audit Team Member Safety Engineering Services Ltd

The audit took place on Saturday 27 May 2017 and comprised a desktop study of the plans provided and a drive and walk through of the site by both team members. During the site visit, the weather was sunny and fines and the road surfaces were dry. Traffic at the time of the audit was moderate.

A list of drawings and documents provided for the purpose of audit is in Appendix A. The locations of any problems have been identified on an annotated drawing in Appendix B.

The main terms of reference of the audit are as described in HD19/15. 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 designs to any other criteria.

There are eleven junctions in total requiring offsite highway mitigation works associated with this development. This Road Safety Audit focuses on the proposed widening on the A1189 Bixley Road to achieve an additional lane for capacity purposes.

2 ROAD SAFETY AUDIT FINDINGS

2.1 PROBLEM

Location: A1189 Bixley Road arm

Summary: Possibility of kerb strikes.

The lanes are aligned so that the nearside ahead lane directs traffic towards the splitter island on Bucklesham Road.

RECOMMENDATION

Realign the lanes so they are directed away from the kerbed islands.

3 AUDIT STATEMENT

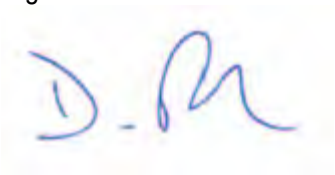
We certify that this audit has been carried out in accordance with HD 19/15.

Signed:

S Hancock
Audit Team Leader
Safety Engineering Services Ltd

Date 28 May 2017

Signed:



D Ramsden
Audit Team Member
Safety Engineering Services Ltd

Date: 30 May 2017

DRAWINGS AND DOCUMENTS PROVIDED FOR AUDIT

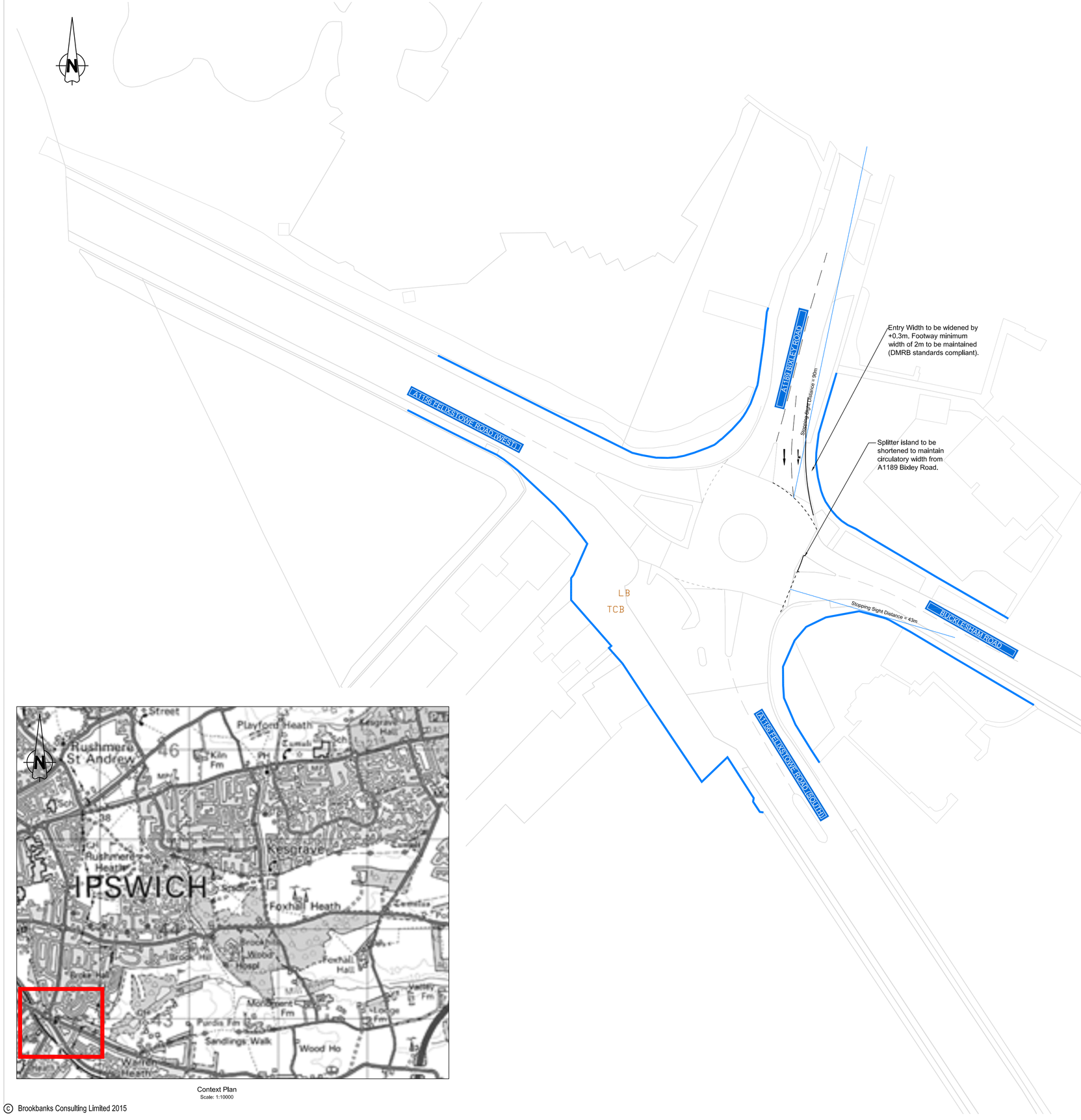
10391-H-26 Rev A	Offsite Highway Mitigation - A1189 Bixley Road / A1156 Felixtowe Road Roundabout Mitigation
10391TA01Rv2	Land South and East of Adastral Park - Transport Assessment

2.1


NOTES:
KEY:
Brookbanks
Carlyle Land Ltd and
Commercial Estates Group
Land South and East of
Adastral Park, Ipswich
Off-site Highway Mitigation: A1189
Bixley Road / A1156 Felixstowe
Road Roundabout Mitigation
IPSWICH

Appendix B: Updated Design Drawing

Original Drawing Size A1



Context Plan
Scale: 1:10000

Construction Design and Management (CDM)
Key Residual Risks

Contractors entering the site should gain permission from the relevant land owners and/or principle contractor working on site at the time of entry. Contractors shall be responsible for carrying out their own risk assessments and for liaising with the relevant services companies and authorities. Listed below are Site Specific key risks associated with the project.

1) Overhead and underground services
2) Street Lighting Cables
3) Working adjacent to water courses and flood plain
4) Soft ground conditions
5) Working adjacent to live highways and railway line
6) Unchartered services
7) Existing buildings with potential asbestos hazards

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   - TA 23/81: Junctions and Accesses - Determination of Size of Roundabouts and Major-Minor Junctions
   - TD 16/07: The Geometric Design of Roundabouts.
   - TD 9/93: Highway Link Design;

KEY:

Anticipated Highway Boundary

Stopping Sight Distance on Approach

B	Amendments as per Road Safety Audit.	MDM LW PAB	12.06.17
A	Amendments as per client's requests.	MDM LW PAB	25.03.17
-	First Issue	- - -	03.03.17

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Carlyle Land Ltd and
Commercial Estates Group

Land South and East of
Adastral Park, Ipswich

Off-site Highway Mitigation: A1189 Bixley Road / A1156 Felixstowe Road Roundabout Mitigation

Status		Status Date
Approval		Mar 2017
Drawn	Checked	Date
MDM	LW	03.03.17
Scale	Number	Rev
As Shown	10391-HL-26	B

0 10 20 30 40 50
METRES

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Adastral Park, Ipswich : Offsite Highway Mitigation to A1214 / A1189 Gyratory Junction

Technical Note : Designer's Response to Road Safety Audits at Stage 1

13th June 2017

1 Introduction

Brookbanks Consulting Limited (BCL) is commissioned by Commercial Estates Group (CEG) Ltd to provide technical advice on viability and delivery on a proposed mixed use development at Adastral Park, Martlesham Heath, Suffolk. A Transport Assessment has been produced that has assessed the potential implications. A range of highway interventions has been subsequently identified.

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- Simple priority junction access off Gloster Road through the North-west Quadrant.

The Transport Assessment also identified that off-site highway mitigation measures were necessary at the following locations:

- A14 / A12 / A1156 Interchange;
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- A12 / Anson Road / Eagle Way Roundabout;
- A12 / A1214 Roundabout (Signal Timing Modification only);
- A1189 Heath Road / Foxhall Road Roundabout;
- A1189 Bixley Road / A1156 Felixstowe Road Roundabout;
- A1214 / A1189 Gyratory Junction.

All design options, at the request of Suffolk County Council, have been subject to a Stage 1 Road Safety Audit. This note sets out the findings of the audit for the A1214 / A1189 Gyratory Junction together with a designers response.

2 Designer's Response

The Designers Response should be read in conjunction with the Road Safety Audit (ref SESL1724) as attached in Appendix A and revised Drawing No: 10391-HL-27B as attached in Appendix B.

Problem 1

Location: Colchester Road/Woodbridge Road

Summary: Visibility to left obstructed, risking failure to give way collisions. The proposal attempts to recreate the circulatory carriageway of a roundabout but requires vehicles to give way to those travelling westbound on Woodbridge Road. The existing approach layout of Woodbridge Road means that visibility for drivers in the right lane will be obstructed twofold; by them having to look behind them through their vehicle and by other vehicles at the give way line in the left lane.

Recommendation: Rather than recreating the circular nature of a roundabout, create a priority junction layout, more perpendicular to Woodbridge Road. This will mean drivers will not be looking through their vehicles and will reduce the obstruction by vehicles in

the left lane. It will require measures at detailed design to ensure that drivers do not get confused and attempt to turn left. If this is not possible, then alternative measures to increase capacity should be looked at, such as signalisation.

BCL Response: *It is not a DMRB requirement to provide visibility to the left on approach to the roundabout as this may encourage higher approach speeds into the roundabout. With respect to the A1189 Heath Road, unobstructed visibility to the right can be achieved for the whole roundabout on entry as well as from 15m behind the stop line, which achieves the requirements of TD 16/07 Paragraphs 8.5 and 8.6. A priority junction will not offer the same level of capacity as a roundabout.*

Problem 2

Location: Colchester Road/Woodbridge Road

Summary: Risk of shunt/lane change accidents due to buses stopping unexpectedly/overhanging into carriageway. The current layout supports eastbound buses entering the bus gate with subsequent access to all routes. It was observed on site that the bus stop in the central island was used as a terminus point with a bus parked for some time. In the new layout, eastbound buses and any vehicles wishing to turn right to access the hospital will be in the offside lane to turn right, but may be obstructed from doing so by vehicles queuing towards the give way line resulting in following vehicles stopping suddenly or changing lanes unexpectedly. It is also likely that buses wishing to enter the existing (extended) layby will not be able to do so without the back of the bus overhanging into the nearside ahead lane, which can also result in lane change accidents/shunts. If an overhanging bus is waiting for some time, this increases the likelihood of conflict.

Recommendation: The right turn from Woodbridge Road should be banned by Traffic Regulation Order and kerb alignment alterations to discourage the manoeuvre. Alternatively, the recommendation to provide signalisation in Problem 1 could overcome this.

BCL Response: *The design proposes that the bus gate in the middle of the roundabout is removed and the bus stop on the south side of the gyratory is extended to accommodate an additional bus waiting area to compensate for this. Bus services that currently use this gate for dropping off and picking up would be advised to access the bus stops on the south side of the gyratory by circulating the eastern roundabout and then via the westbound A1214 approach. Therefore this would reduce the likelihood of conflict from overhanging buses in the new Give Way area.*

Problem 3

Location: Heath Road/Woodbridge Road

Summary: Risk of left turning vehicles conflicting with ahead vehicles. The proposed left turn lane on Heath Road forms a shallow entry angle with the roundabout, which encourages drivers to not give way.

Recommendation: Remove the hatching between this lane and the adjacent right turn lane, replacing it adjacent to the kerb, to provide a better entry angle.

BCL Response: *The kerb on approach has been realigned to provide a sharper angle to the roundabout gyratory. This will also provide scope to widen the footway and thus improve safety for pedestrians.*

Problem 4

Location: Heath Road/Woodbridge Road

Summary: Risk of sideswipe accidents. The southernmost section of circulatory carriageway is narrower than the entry width from Woodbridge Road, which could result in collisions between two adjacent ahead vehicles.

Recommendation: Ensure this section of carriageway is 1 to 1.2 times the entry width as a minimum.

BCL Response: *The central island has been relocated northwards to ensure that the circulatory width on the westbound entry from A1214 Woodbridge Road is equal to the entry width of A1214 Woodbridge Road. Deflection has also been checked and achieves the requirements of TD 16/07 Paragraph 7.56.*

Problem 5

Location: Heath Road/Woodbridge Road

Summary: Risk of conflict for drivers accessing number 48 Woodbridge Road. The proposed layout conflicts with the current access arrangements for 48 Woodbridge Road. Both of these existing access points are compromised by the proposals, and could result in drivers carrying out unexpected and unsafe manoeuvres whilst attempting to access and egress the property.

Recommendation: Provision should be made to ensure the safe access and egress for this property, which may entail accommodation works.

BCL Response: *Access to this property will not be compromised as the works now involve widening the footway. The existing access to the property is already directly from the roundabout. However a note shall be added to the drawing alert the detailed design team to this at detailed design stage.*

3 Limitations

Third party information has been used in the preparation of this report, which Brookbanks Consulting Ltd, by necessity assumes is correct at the time of writing. While all reasonable checks have been made on data sources and the accuracy of data, Brookbanks Consulting Ltd accepts no liability for same.

The benefits of this report are provided to Carlyle Land Ltd and Commercial Estates Group for the proposed development on Land at Adastral Park.

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Appendix A: Road Safety Auditor's Report

Safety Engineering Services Ltd

Land South and East of Adastral Park, Ipswich

A1214 / A1189 Gyratory Junction Mitigation

Stage 1 Road Safety Audit

Stage 1 Road Safety Audit

CONTENTS

Report Number	Client Reference	Report Status
SESL1724	10391	FINAL

1 INTRODUCTION

This report presents the findings of a Road Safety Audit carried out on off-site highway mitigation works proposed to enable site access to land to the south and east of Adastral Park, Ipswich, at the request of Brookbanks Consulting Ltd. The development will consist of up to 2000 dwellings, local centres, with facilities to serve recreation and education.

The audit was carried out by the following:

S Hancock	Road Safety Audit Team Leader Safety Engineering Services Ltd
D Ramsden Certificate of Competency gained in June 2015	Road Safety Audit Team Member Safety Engineering Services Ltd

The audit took place on Saturday 27 May 2017 and comprised a desktop study of the plans provided and a drive and walk through of the site by both team members. During the site visit, the weather was sunny and fine and the road surfaces were dry. Traffic at the time of the audit was moderate.

A list of drawings and documents provided for the purpose of audit is in Appendix A. The locations of any problems have been identified on an annotated drawing in Appendix B.

The main terms of reference of the audit are as described in HD19/15. 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 designs to any other criteria.

There are eleven junctions in total requiring offsite highway mitigation works associated with this development. This Road Safety Audit focuses on the proposed amendments to the gyratory which forms the gyratory junction with the A1214 Colchester Road/A1071 Woodbridge Road/A1189 Heath Road/Ipswich Hospital Access. The amendments include the removal of a bus gate/stop to enable provision of a circulatory section at western end.

2 ROAD SAFETY AUDIT FINDINGS

2.1 PROBLEM

Location: Colchester Road/Woodbridge Road

Summary: Visibility to left obstructed, risking failure to give way collisions.

The proposal attempts to recreate the circulatory carriageway of a roundabout but requires vehicles to give way to those travelling westbound on Woodbridge Road. The existing approach layout of Woodbridge Road means that visibility for drivers in the right lane will be obstructed twofold; by them having to look behind them through their vehicle and by other vehicles at the give way line in the left lane.

RECOMMENDATION

Rather than recreating the circular nature of a roundabout, create a priority junction layout, more perpendicular to Woodbridge Road. This will mean drivers will not be looking through their vehicles and will reduce the obstruction by vehicles in the left lane. It will require measures at detailed design to ensure that drivers do not get confused and attempt to turn left. If this is not possible, then alternative measures to increase capacity should be looked at, such as signalisation.

2.2 PROBLEM

Location: Colchester Road/Woodbridge Road

Summary: Risk of shunt/lane change accidents due to buses stopping unexpectedly/overhanging into carriageway.

The current layout supports eastbound buses entering the bus gate with subsequent access to all routes. It was observed on site that the bus stop in the central island was used as a terminus point with a bus parked for some time. In the new layout, eastbound buses and any vehicles wishing to turn right to access the hospital will be in the offside lane to turn right, but may be obstructed from doing so by vehicles queuing towards the give way line resulting in following vehicles stopping suddenly or changing lanes unexpectedly. It is also likely that buses wishing to enter the existing (extended) layby will not be able to do so without the back of the bus overhanging into the nearside ahead lane, which can also result in lane change accidents/shunts. If an overhanging bus is waiting for some time, this increases the likelihood of conflict.

RECOMMENDATION

The right turn from Woodbridge Road should be banned by Traffic Regulation Order and kerb alignment alterations to discourage the manoeuvre. Alternatively, the recommendation to provide signalisation in Problem 2.1 could overcome this.

2.3 PROBLEM

Location: Heath Road/Woodbridge Road

Summary: Risk of left turning vehicles conflicting with ahead vehicles.

The proposed left turn lane on Heath Road forms a shallow entry angle with the roundabout, which encourages drivers to not give way.

RECOMMENDATION

Remove the hatching between this lane and the adjacent right turn lane, replacing it adjacent to the kerb, to provide a better entry angle.

2.4 PROBLEM

Location: Heath Road/Woodbridge Road

Summary: Risk of sideswipe accidents.

The southernmost section of circulatory carriageway is narrower than the entry width from Woodbridge Road, which could result in collisions between two adjacent ahead vehicles.

RECOMMENDATION

Ensure this section of carriageway is 1 to 1.2 times the entry width as a minimum.

2.5 PROBLEM

Location: Heath Road/Woodbridge Road

Summary: Risk of conflict for drivers accessing number 48 Woodbridge Road.

The proposed layout conflicts with the current access arrangements for 48 Woodbridge Road. Both of these existing access points are compromised by the proposals, and could result in drivers carrying out unexpected and unsafe manoeuvres whilst attempting to access and egress the property.

RECOMMENDATION

Provision should be made to ensure the safe access and egress for this property, which may entail accommodation works.

3 AUDIT STATEMENT

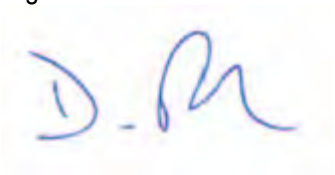
We certify that this audit has been carried out in accordance with HD 19/15.

Signed:

S Hancock
Audit Team Leader
Safety Engineering Services Ltd

Date 28 May 2017

Signed:

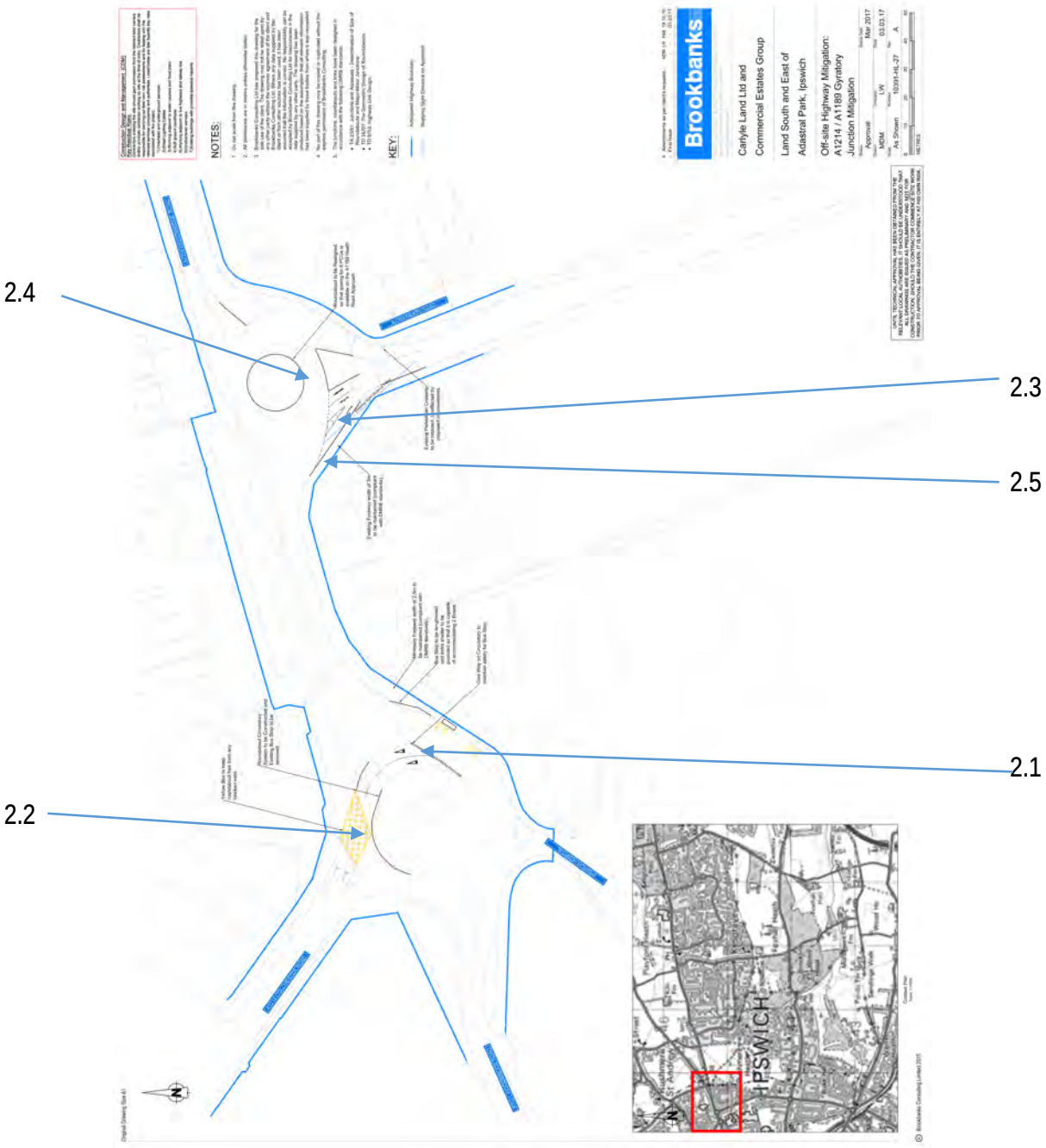


D Ramsden
Audit Team Member
Safety Engineering Services Ltd

Date: 30 May 2017

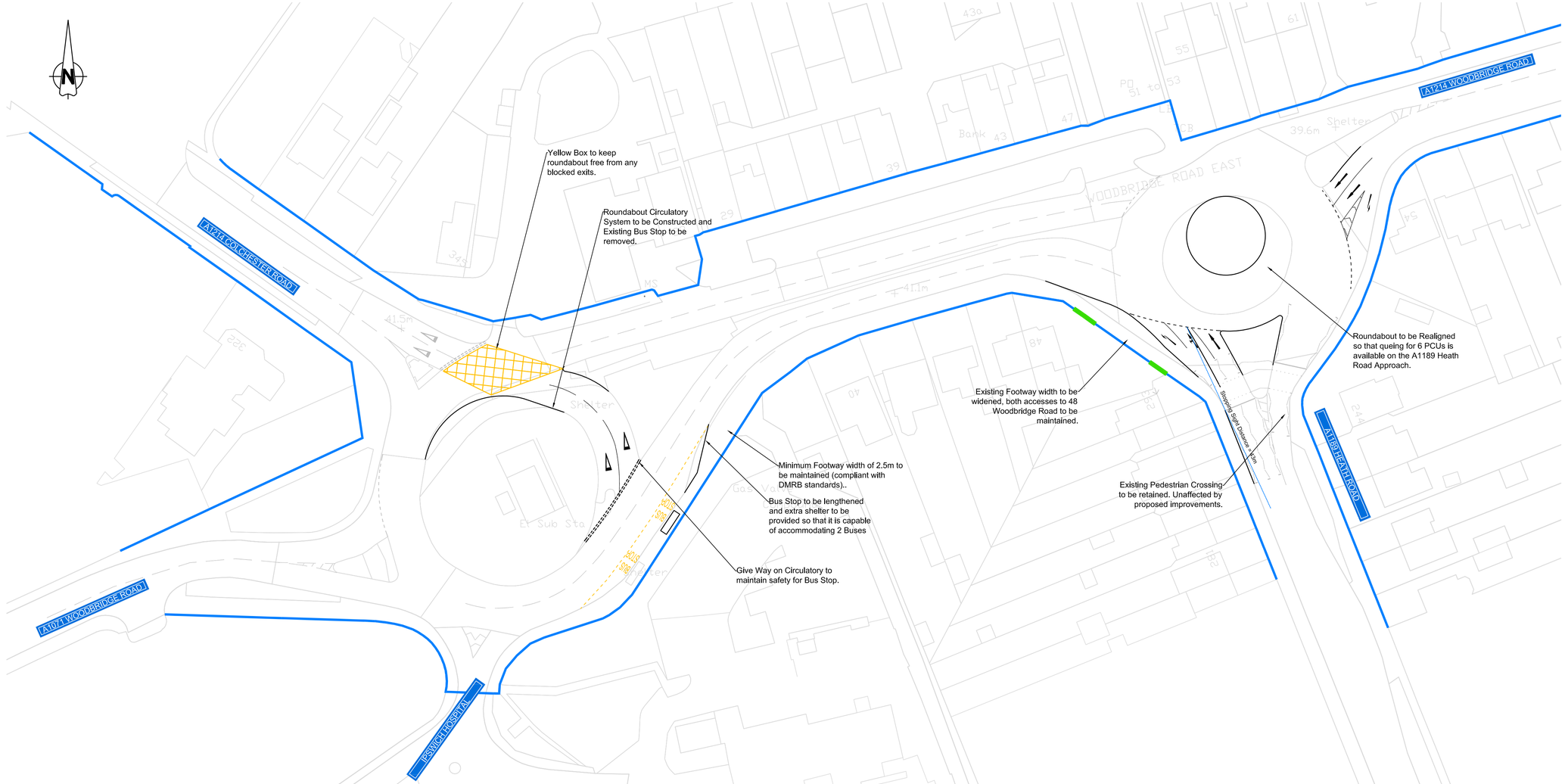
DRAWINGS AND DOCUMENTS PROVIDED FOR AUDIT

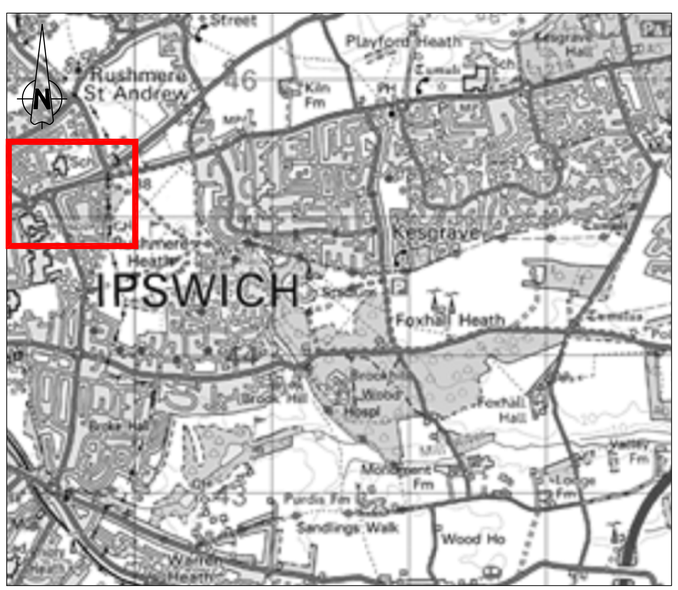
10391-H-27 Rev A	Offsite Highway Mitigation - A1214/A1189 Gyratory Junction Mitigation
10391TA01Rv2	Land South and East of Adastral Park - Transport Assessment


2.4
2.3
2.5
2.1
2.2
NOTES:
KEY:
Brookbanks
Carlyle Land Ltd and Commercial Estates Group
Land South and East of Adastral Park, Ipswich
Off-site Highway Mitigation: A1214 / A1189 Gyratory Junction Mitigation
IPSWICH

Appendix B: Updated Design Drawing

Original Drawing Size A1





Context Plan
Scale: 1:10000

Construction Design and Management (CDM)
Key Residual Risks

Contractors entering the site should gain permission from the relevant land owners and/or principle contractor working on site at the time of entry. Contractors shall be responsible for carrying out their own risk assessments and for liaising with the relevant services companies and authorities. Listed below are Site Specific key risks associated with the project.

1) Overhead and underground services
2) Street Lighting Cables
3) Working adjacent to water courses and flood plain
4) Soft ground conditions
5) Working adjacent to live highways and railway line
6) Unchartered services
7) Existing buildings with potential asbestos hazards

NOTES:

1. Do not scale from this drawing
2. All dimensions are in metres unless otherwise stated.
3. Brookbanks Consulting Ltd has prepared this drawing for the sole use of the client. The drawing may not be relied upon by any other party without the express agreement of the client and Brookbanks Consulting Ltd. Where any data supplied by the client or from other sources has been used, it has been assumed that the information is correct. No responsibility can be accepted by Brookbanks Consulting Ltd for inaccuracies in the data supplied by any other party. The drawing has been produced based on the assumption that all relevant information has been supplied by those bodies from whom it was requested.
4. No part of this drawing may be copied or duplicated without the express permission of Brookbanks Consulting.
5. The junctions, roundabouts and links have been designed in accordance with the following DMRB standards:
   - TA 23/81: Junctions and Accesses - Determination of Size of Roundabouts and Major-Minor Junctions
   - TD 16/07: The Geometric Design of Roundabouts.
   - TD 9/93: Highway Link Design;

KEY:

- Anticipated Highway Boundary
- Stopping Sight Distance on Approach
- Access to frontage to be maintained

B	Amendments as per Road Safety Audit.	MDM	LW	PAB 12.06.17
A	Amendments as per client's requests.	MDM	LW	PAB 25.03.17
-	First Issue	-	-	- 03.03.17

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Carlyle Land Ltd and
Commercial Estates Group

Land South and East of
Adastral Park, Ipswich

Off-site Highway Mitigation:
A1214 / A1189 Gyratory
Junction Mitigation

Status	Status Date
Approval	Mar 2017
Drawn / Checked / Date	
MDM / LW / 03.03.17	
Scale / Number / Rev	
As Shown / 10391-HL-27 / B	

0 10 20 30 40 50
METRES

UNTIL TECHNICAL APPROVAL HAS BEEN OBTAINED FROM THE RELEVANT LOCAL AUTHORITIES, IT SHOULD BE UNDERSTOOD THAT ALL DRAWINGS ARE ISSUED AS PRELIMINARY AND NOT FOR CONSTRUCTION. SHOULD THE CONTRACTOR COMMENCE SITE WORK PRIOR TO APPROVAL BEING GIVEN, IT IS ENTIRELY AT HIS OWN RISK.