

The Lake Lothing (Lowestoft) Third Crossing Order 201[*]



Lake Lothing
**THIRD
CROSSING**

**Document 7.5:
Design Report**

Appendix 8



REPORT 1069948-WSP-HAC-LL-RP-ZS-0002

**LAKE LOTHING THIRD
CROSSING, LOWESTOFT**
ROAD SAFETY AUDIT STAGE 1

FINAL ISSUE
OCTOBER 2017



LAKE LOTHING THIRD CROSSING, LOWESTOFT ROAD SAFETY AUDIT STAGE 1

FINAL ISSUE REPORT
PROJECT NO: 1069948-WSP-HAC-LL-RP-ZS-0002

Date: October 2017

WSP

Exchange Station
Tithebarn Street
Liverpool
L2 2QP

Tel: +0 (44) 7778 676 500

www.wsp.com



PRODUCTION TEAM

CLIENT

Suffolk County Council

Jon Barnard

WSP

Road Safety Auditor

D Robinson

Road Safety Auditor

N Jones

Report Authoriser

K Chesworth

LIMITATIONS

This report is presented to Suffolk County Council and may not be used or relied on by any other person. It may not be used by Suffolk County Council in relation to any other matters not covered specifically by the agreed scope of this Report.

Notwithstanding anything to the contrary contained in the report, WSP is obliged to exercise reasonable skill, care and diligence in the performance of the services and shall not be liable except to the extent that it has failed to exercise reasonable skill, care and diligence, and this report shall be read and construed accordingly.

This report has been prepared by WSP. No individual is personally liable in connection with the preparation of this report. By receiving this report and acting on it, the client or any other person accepts that no individual is personally liable whether in contract, tort, for breach of statutory duty or otherwise

TABLE OF CONTENTS

1	LAKE LOTHING THIRD CROSSING, LOWESTOFT	1
	LAKE LOTHING THIRD CROSSING, LOWESTOFT	1
1.1	ROAD SAFETY AUDIT STAGE 1.....	1
1.2	INTRODUCTION	1
1.3	SCHEME DETAILS	1
1.4	DEPARTURE FROM STANDARD.....	1
1.5	THE ROAD SAFETY AUDIT	2
1.6	THE AUDIT REPORT.....	2
1.7	AUDIT TEAM.....	2
1.8	ADMINISTRATION.....	2
2	ITEMS RAISED AT THIS STAGE 1 ROAD SAFETY AUDIT	4
2.1	GENERAL – BASIC DESIGN PRINCIPLES	4
2.2	PROBLEM 1	4
2.3	PROBLEM 2.....	4
2.4	PROBLEM 3.....	5
2.5	JUNCTIONS – LAYOUT	5
2.6	PROBLEM 4.....	5
2.7	PROBLEM 5.....	5
2.8	NON-MOTORISED USERS	6
2.9	PROBLEM 6.....	6
2.10	PROBLEM 7.....	7
2.11	PROBLEM 8.....	7
2.12	PROBLEM 9.....	7
2.13	PROBLEM 10.....	8

3	AUDIT TEAM STATEMENT	9
4	DOCUMENTS SUPPLIED FOR THE AUDIT.....	10
5	HAZARD LOCATION PLANS	11
5.1	SOUTHERN ROUNDABOUT.....	11
5.2	NORTHERN ROUNDABOUT	12
6	CLIENT RESPONSE FORM.....	13

LAKE LOTHING THIRD CROSSING, LOWESTOFT

1.1 ROAD SAFETY AUDIT STAGE 1

1.2 INTRODUCTION

This Road Safety Audit Report results from a Stage 1 Road Safety Audit carried out on the proposed Lake Lothing third crossing, Lowestoft, Suffolk. The works include the construction of a new bascule bridge positioned centrally over the navigational channel of Lake Lothing. The bridge, and connecting roads, will link Waveney Drive on the southern side of Lake Lothing to Denmark Road/Peto Way on the northern side. This Road Safety Audit Report has been produced as part of the Road Safety Audit procedure during the scheme design process and the terms of reference for this report are described in DMRB HD19/15

1.3 SCHEME DETAILS

The southern side of the scheme included the construction of a new three-arm roundabout (southern roundabout) on Waveney Drive where an existing four-arm traffic signalised junction serves the present road layout. The new roundabout will not be serving Durban Road which will become a cul-de-sac. The proposed link road from the roundabout to the bascule bridge will provide a rising gradient along the alignment of the existing Riverside Road alignment. To compensate for the loss of Riverside Road at this location a new ghost- island junction will be created on Waveney Drive west of the proposed roundabout junction. Riverside Road will be re-routed to this junction to maintain access for the existing commercial businesses.

On the northern side of Lake Lothing the road link from the bascule bridge will pass over the railway line descending on a sharp left-hand curve to a three-arm roundabout (southern roundabout) with Peto Way and Denmark Road. The existing roundabout three-arm roundabout on Denmark Road will be reduced to a mini-roundabout layout.

This scheme provides a new road layout and any existing recorded road collision occurrences have not been considered in preparing this Road Safety Audit.

1.4 DEPARTURE FROM STANDARD

There are four departures from the relevant design standard as follows:

Northern Roundabout

1. Exit from roundabout onto Peto Way – Visibility;
2. Entry Path Curvature from Peto Way onto roundabout; and
3. Combination of visibility and curvature on northern approach

Southern Roundabout

1. Entry Path deflection from Crossing onto Roundabout.

1.5 THE ROAD SAFETY AUDIT

This Stage 1 Road Safety Audit comprised an examination of the scheme documents provided by the Design Project Manager and a site inspection. The Audit Team have been notified of the relevant Departures from Design Standards, refer the Section 1.4 above.

The Stage 1 Road Safety Audit was undertaken in accordance with DMRB Design Standard HD19, the scheme brief and the general layout drawings made available to the audit team prior the date of the inspection. The scheme involves a considerable amount of walking and cycling facilities, both new, and links with the existing infrastructure. However there is no evidence of an assessment in accordance with HD42, in its previous or present format, having been identified in the audit briefing document.

This audit comprised an examination of design drawings which took place at the Hull University on Wednesday 18th October 2017 and a site visit during daylight hours the following day. The documents viewed for this audit are listed in Section 3. The weather during the site visit was sunny and dry with the traffic flowing freely.

1.6 THE AUDIT REPORT

The terms of reference are as described in the Design Manual for Roads and Bridges (DMRB) HD 19/15 'Road Safety Audit'. The audit team has examined and reported only on the road safety implications of the scheme as presented and has not examined or verified the compliance of the designs to any other criteria. This scheme has not been subjected to a previous Road Safety Audit.

To clearly explain a safety problem or the recommendation to resolve a problem the audit team may, on occasion, have referred to a design standard without touching on technical audit. Unless general to the scheme, each problem location has been described with reference to road/ street name (if appropriate) as well as being marked or listed on the drawing(s) provided as part of the audit brief.

1.7 AUDIT TEAM

The Audit Team members approved by the scheme Project Manager for this audit are:

Team Leader	D Robinson I Eng. MICE, MCIHT, MSoRSA Competency Certificate February 2012 Principal Engineer, WSP (Liverpool)
Team Member	N Jones BA (hons) Dip. MSoRSA, MCIHT (Certificate of Competence December 2013) ITS Senior Consultant, WSP, Sutton Coldfield

1.8 ADMINISTRATION

It is the audit Project Manager's responsibility to advise the audit team leader if any problem or recommendation is not accepted. A copy of every signed exception report is required by

the audit team leader from the scheme Project Manager for attachment to the master copy of the “Final” audit report.

The Hazard Location Plan is at Section 5 and a “Client feedback report” form is located in Section 6 of this document. Where the client agrees/disagrees with the recommendations of the Road Safety Audit Team, this form should be completed and signed by the designated signatory.

Safety issues identified during the audit and site inspection, which the terms of reference exclude from this report but which the audit team wishes to draw to the attention of the scheme Project Manager, will be set out in a separate letter. These issues could include, for example, maintenance items and operational issues.

2

ITEMS RAISED AT THIS STAGE 1 ROAD SAFETY AUDIT

2.1 GENERAL – BASIC DESIGN PRINCIPLES

2.2 PROBLEM 1

Location: A – Waveney Drive / Riverside Road ghost-Island junction

Summary: The proposed priority ghost-island junction layout between Waveney Drive and Riverside Road will replace a controlled junction layout serving a major employment areas. Providing a priority junction layout could create long delays for drivers on Riverside Road resulting them becoming frustrated and impatient leading to risk taking at the junction area with collisions occurring.

The proposed priority ghost-island junction layout between the realigned Riverside Road and Riverside Road serves a major employment, commercial and retail area. This generates a large amount of peak-time traffic flow in and out of the Riverside Road area. Providing a priority junction may not be appropriate to accommodate the demand. This could result in drivers becoming irritated and frustrated with the length of delay being experienced on Riverside Road with the lack of suitable gap in the Waveney Drive traffic flow. This could result in drivers taking risks entering Waveney Drive resulting in side-impact / nose-to-tail collisions at the junction.

Recommendation: It is recommended that the junction layout should be capable of accommodating the expected and future traffic flow without creating excessive delay to traffic on the minor arm (Riverside Road).

2.3 PROBLEM 2

Location: B – northbound approach to the Northern Roundabout.

Summary: The northbound approach of the link road to the Northern Roundabout consists of a small horizontal radius combined with a rapid descent to the roundabout potentially resulting in loss of control collision occurrences.

The combination of the horizontal and vertical alignment of the new link road approach to the northern roundabout may result in drivers losing control of their vehicle with head-on collisions occurring.

Recommendation: It is recommended that mitigation measures are incorporated into the scheme design to encourage drivers to negotiate the approach to the roundabout at the appropriate speed for the geometry provided.

2.4 PROBLEM 3

Location: C – Access to Motorlings from Waveney Drive.

Summary: The proposed access to the Motorlings area is unlikely to accommodate a car-transported vehicle when delivering / collecting cars from the Motorlings premises. This will result in a large vehicle creating a hazard on Waveney Drive on the immediate exit from the proposed roundabout leading to likelihood of collisions occurring.

The existing access to the Motorlings site is being removed as a result of the new link road for the river crossing. The proposed geometry of the new access road serving Motorlings, off Waveney Drive, may not accommodate an articulated car-transport vehicle. The direct consequence of this situation may be that the transporter vehicle stops on Waveney Drive a short distance from the roundabout exit. This will create a hazard to traffic exiting the roundabout with nose-to-tail / side impact collision occurrences.

Recommendation: It is recommended that the design incorporates provision for expected vehicle types and movements that do not create a hazard to Waveney Drive traffic.

2.5 JUNCTIONS – LAYOUT

2.6 PROBLEM 4

Location: D – Layout of side road junction with Waveney Drive.

Summary: The proposed vehicle access, adjacent to that provided for Motorlings area, is unlikely to accommodate the geometry to accommodate a turning vehicle to accomplish the left-turn on the Waveney Drive. This may result in a vehicle over-running the shared-use footway conflicting with footway users.

The proposed layout of the side road that joins the Motorlings access road does not have the geometry to support a vehicle turning left onto Waveney Drive without crossing the shared-use footway. This will create a conflict between a vehicle and users of the shared-use footway.

Recommendation: It is recommended that the design of the side road junction should provide the appropriate geometry to permit vehicle turning left on to Waveney Drive without conflicting with footway users.

2.7 PROBLEM 5

Location: E – Peto Way.

Summary: The proposed eastbound traffic lane on Peto Way, bypassing the proposed roundabout, may encourage drivers not to stop at the junction with the short link road between the roundabouts, resulting in collisions occurring.

Maintaining the eastbound traffic lane on Peto Way enabling drivers to bypass the proposed Northern Roundabout may facilitate drivers to enter the junction at an inappropriate speed and fail to give-way to approaching traffic. This could result collisions occurring as a result of harsh braking and failure to stop / give-way incidents.

Recommendation: It is recommended that all Peto Way eastbound traffic enters the Northern Roundabout.

2.8 NON-MOTORISED USERS

2.9 PROBLEM 6

Location F – Southern Roundabout

Summary: The existing four arm traffic signalised junction at Waveney Drive provides a pedestrian controlled crossing facility on all four arms. The proposed roundabout indicates that uncontrolled crossings will be provided. There is a high risk of a pedestrian being in collision with a vehicle at the proposed uncontrolled crossing points when attempting to cross the road.

The proposed layout of the southern roundabout will provide uncontrolled pedestrian crossings at Waveney Drive and the new link. The existing A12 Roundabout does not provide any pedestrian crossing points over Waveney Drive nor is there any being provided between the proposed and existing roundabout. The desire line for pedestrians is to cross the Waveney Drive using a controlled crossing point when travelling from the residential area on the southern side of Waveney Drive to access the retail outlets on the northern side of the road, refer to Photograph No.1. Not providing a controlled crossing point will increase the risk of a collision between a vehicle and a pedestrian using an uncontrolled crossing facility over Waveney Drive on the pedestrian / cyclist desire line between the residential area and the retail outlets



Recommendation: Maintain a controlled crossing point aligned with the pedestrian / cyclists desire line to cross Waveney Drive in close proximity of the proposed roundabout.

2.10 PROBLEM 7

Location G – Shared-use route on northern side of Waveney Drive.

Summary: The existing shared-use route for pedestrians and cyclists is indicated to be used for carriageway access. This may create a conflict between vehicles and pedestrians / cyclists.

The shared-use route on the northern side of Waveney Drive between the existing Riverside Road signalised crossroads junction and roundabout has established a significant desire line for pedestrians and cyclists to access the ASDA supermarket and other retail outlets. The proposals indicate that this shared-use route will be used as a carriageway with the shared-use route relocated adjacent the carriageway. This change in layout may be confusing for all footway users and create conflict with vehicle activity.

Recommendation: It is recommended that the pedestrian / cyclist facilities on the northern side of Waveney Drive between the proposed and existing roundabouts should not have the potential conflict with vehicle movements.

2.11 PROBLEM 8

Location H – Southern Roundabout

Summary: The proposed shared-use route on the western side of the new link road from the southern roundabout does not provide connectivity for cyclists linking to the realigned Riverside Road. Cyclists will use the Waveney Drive northern footway which is not designated for shared-use, creating conflict with pedestrians.

The propose shared-use facility on the western side of the new link road over Lake Lothing does not provide a dedicated link to the proposed Riverside Road facilities. It is essential that the new shared-use network has connectivity throughout ensuring cyclists do not have to enter the carriageway avoiding a potential conflict with vehicles.

Recommendation: It is recommended that connectivity is provided for cyclists between Riverside Road and the new shared-use facility provided on the link road.

2.12 PROBLEM 9

Location I – Northern Roundabout - Segregated pedestrian and cyclist route under Railway Bridge.

Summary: The proposed route of the segregated shared-use facility that passes under the railway bridge should provide a safe and secure environment for all users.

The route of the shared-use footpath that is intended to pass under the proposed railway bridge should provide an environment that does not encourage any anti-social behaviour. The route should have appropriate levels of illumination and open aspects. The alternative route using the proposed footway on the eastern side of the link road may be preferred by cyclists because it appears to be of a shorter travel distance and avoids any potential undesirable experience using the route under the railway bridge.

Recommendation: It is recommended that the proposed shared-use route under the railway bridge provides a safe route for all users.

2.13 PROBLEM 10

Location J – Northern and Southern Roundabouts.

Summary: The road marking indicate that on one arm three traffic lanes are being provided whilst the proposed layout indicates that there is a maximum of two exit lanes which could result in side impact collisions.

The northbound entry into the northern roundabout and the southbound entry into the southern roundabout indicate three traffic lanes. At each roundabout a maximum of two exit lanes are provided this may result in conflicting movements on the circulatory carriageway resulting in side impact collision occurrences.

Recommendation: It is recommended that the layout of the entry arms correctly depicts the relevant destination removing the potential conflicting maneuverers.


End of list of Problems Identified and Recommendations offered in this Stage 1 Audit Report

3 AUDIT TEAM STATEMENT

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

AUDIT TEAM LEADER:

Name: D Robinson
Position: Principal Engineer
Organisation: WSP,
Address: 1st Floor Exchange Station,
Tithebarn Street,
Liverpool.
L2 2QP

Signed: 
Date: 31st October 2017

AUDIT TEAM MEMBER:

Name: Neil Jones
Position: ITS Senior Consultant
Organisation: WSP,
Address: Knights House,
2 Parade.
Sutton Coldfield
B72 1PH

Signed: 
Date: 31st October 2017

4

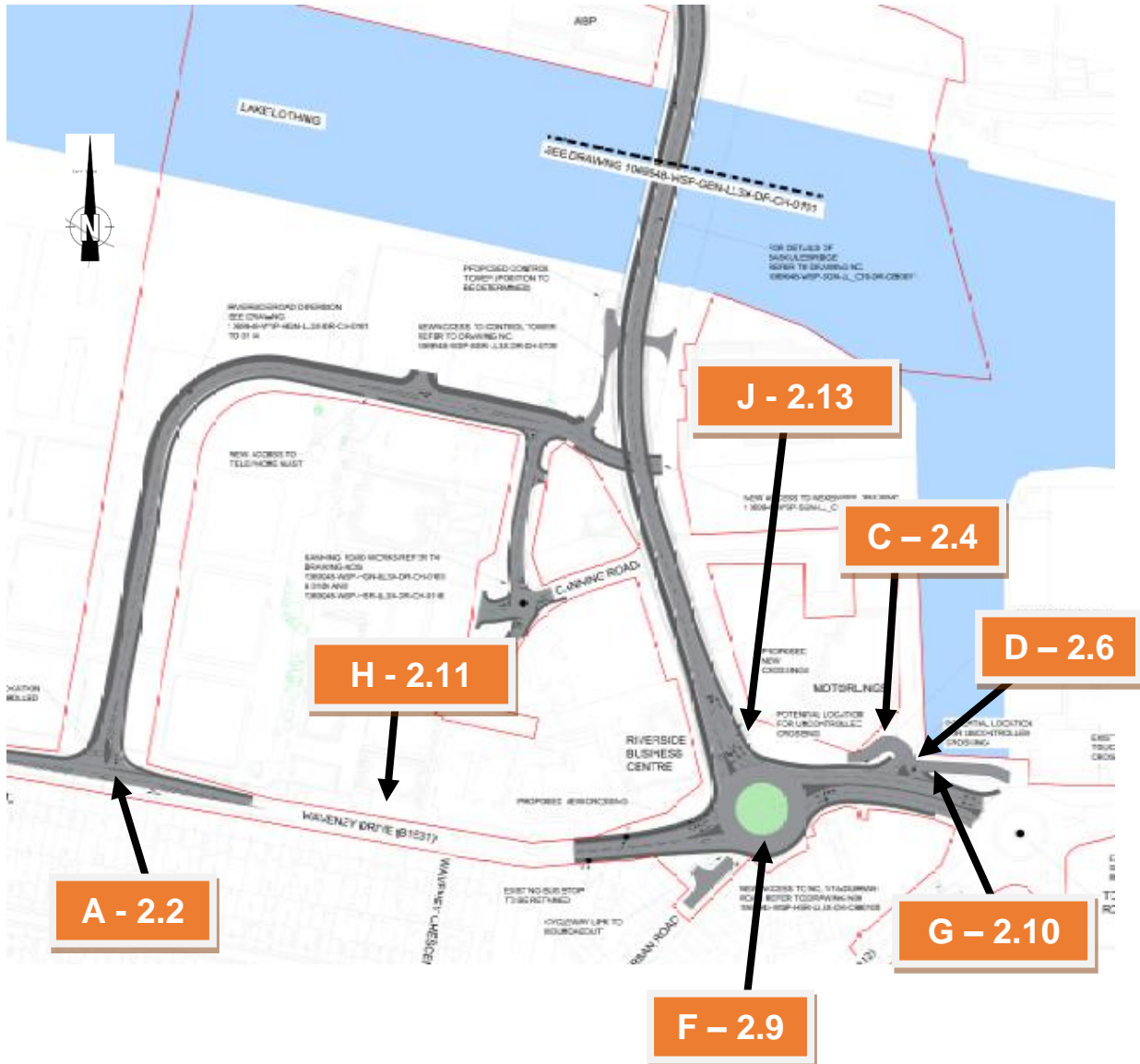
DOCUMENTS SUPPLIED FOR THE AUDIT

Drawings - Lake Lothing Third Crossing, Lowestoft	
Drawing No.	Drawing Title
1069948-WSP-LSI-LL-DR-GI-0001	General Arrangement
1069948-WSP-GEN-LL3X-DR-CH-0101 & 0102	General Arrangement Sheets 1 of 2 and 2 of 2
1069948-WSP-SGN-LL_C19-DR-CB-0011	LI3X approach spans and bascule bridge plan and elevation
1069948-WSP-SGN-LL_C19-DR-CB-0013	General Arrangement Riverside Road access portal frame

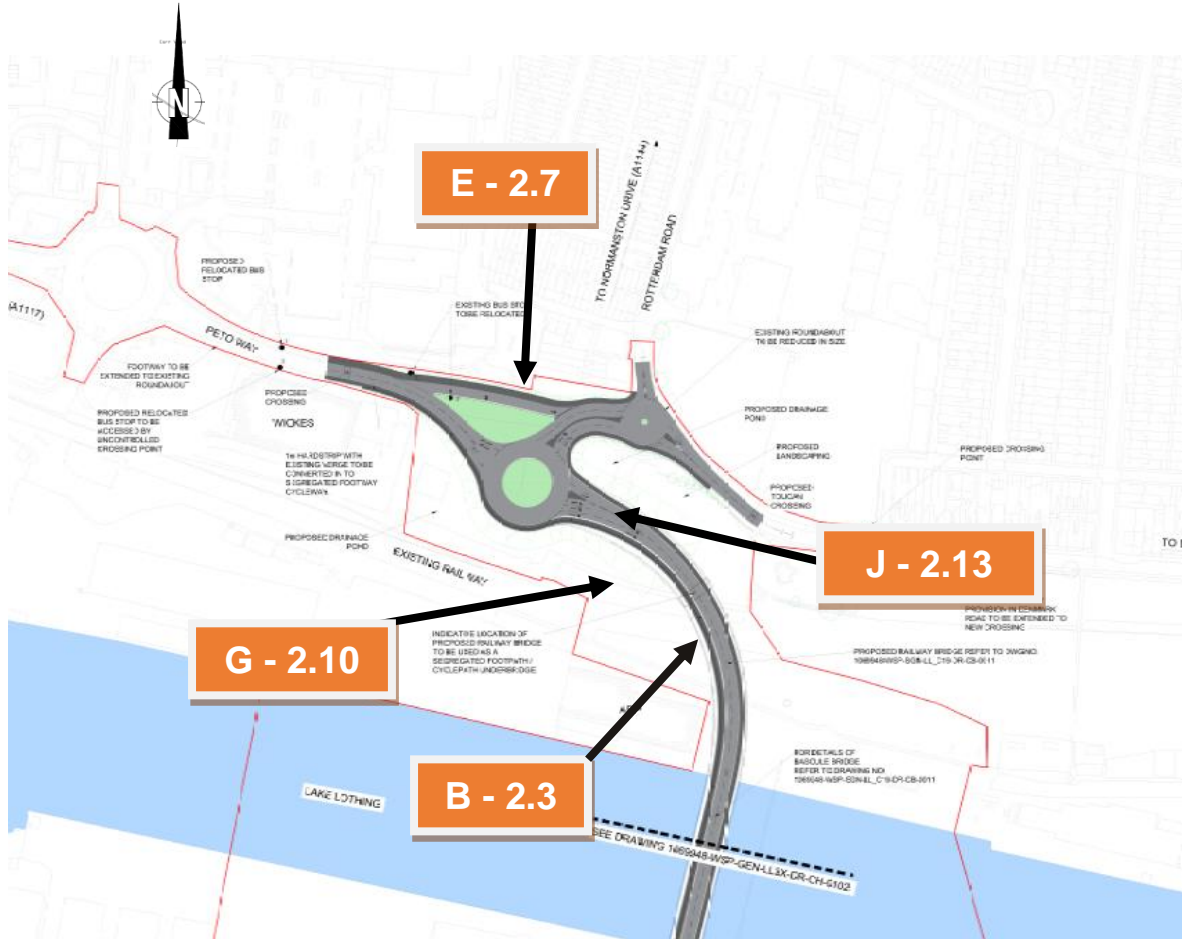
Documents - Lake Lothing Third Crossing, Lowestoft	
Document No.	Document Title
Reference 01	Road Safety Audit Brief

5 HAZARD LOCATION PLANS

5.1 SOUTHERN ROUNDABOUT



5.2 NORTHERN ROUNDABOUT



6 CLIENT RESPONSE FORM

Scheme: Lake Lothing Third Crossing, Lowestoft

Audit stage 1

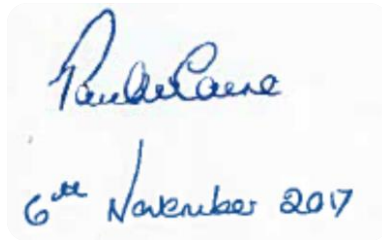
Date Audit Completed: 30th October 2017

Road Safety Audit Item Reference	Problem Accepted by Client /Designer (yes/no)	Recommended measure accepted by Client/Designer (yes/no)	Client/Designer Comments/Alternative measures (describe)	Alternative Measures accepted by Auditors (yes/no)
2.2	Yes	Yes	The design life of the junction is currently not known. The whole of the adjacent site is the subject of a future development containing a mixture of residential and industrial development. The current junction is the preferred layout, as a signalised junction would result in private residences being 'caught in between' the signal heads, with a potential safety issue for turning vehicles into and out of private property. Provision of a roundabout is considered to be premature in light of the future development	Yes
2.3	Yes	Yes	The design speed is 30mph and on a down grade approach to the northern roundabout. The issue can be picked up as part of the detailed design, but the initial response would be to consider a higher PSV for the surfacing material and enhanced signage about queuing.	Yes
2.4	Yes	Yes	The car transporter shall pull off Waveney Drive onto the hard standing between Waveney Drive and Kirkley Ham in a westerly direction. It shall then access the Tom Crisp Way roundabout through the existing Asda delivery yard entrance. The proposed island at the entrance to Motorlings shall comprise a 'solid white' painted island that can be overrun by vehicles particularly	Yes

Road Safety Audit Item Reference	Problem Accepted by Client /Designer (yes/no)	Recommended measure accepted by Client/Designer (yes/no)	Client/Designer Comments/Alternative measures (describe)	Alternative Measures accepted by Auditors (yes/no)
			the car Transporter. Pedestrian and cyclists facilities shall have an informal crossing of the access and a dedicated facility provided to tie into the existing facilities adjacent to Tom Crisp Way, between the 'pull-in' for the Transporter and the existing Waveney Drive.	
2.6	Yes	Yes	The proposed access to Motorlings has been tracked for a car and small van entering and exiting and does not overrun the footway.	Yes
2.7	Yes	Yes	Vehicles travelling eastbound will have to slow down to enter the dedicated left lane to Rotterdam Road. Speeds will be low and appropriate signage will be provided as part of the detailed design to advise drivers of the second roundabout and the need to 'give way' as part of the detailed design.	Yes
2.9	Yes	Yes	Discussions on the type and location of crossings at Waveney Drive will be held as part of the detailed design process.	Yes
2.10	Yes	Yes	An access to Motorlings has to be provided as part of the works. This location is perceived as the best location. Conflicts with pedestrians and cyclists are to be kept to a minimum and appropriate signing and markings will be provided as part of the detailed design.	Yes
2.11	Yes	Yes	Links from the bridge to Riverside Road for cyclists and pedestrians are currently being investigated and will become part of the detailed design. The current preferred solution is to provide a	Yes

Road Safety Audit Item Reference	Problem Accepted by Client /Designer (yes/no)	Recommended measure accepted by Client/Designer (yes/no)	Client/Designer Comments/Alternative measures (describe)	Alternative Measures accepted by Auditors (yes/no)
			ramp from Canning Road up to the crossing	
2.12	Yes	Yes	The proposed cycleway below the railway bridge is part of the proposed urban park where amenity lighting will be provided as part of the detailed design.	Yes
2.13	Yes	Yes	The road markings shall be reviewed as part of the detailed design.	Yes

Signed:



Design Team Leader

Date:

6th November 2017

Signed:



Audit Team Leader

Date: 6th November 2017