Great Yarmouth Third River Crossing

Application for Development Consent Order

Document 7.4c: Design Report: Appendix C – RSA Stage 1 Report

Planning Act 2008

The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 (as amended) ("APFP")

APFP regulation Number: 5(2)(q)

Planning Inspectorate Reference Number: TR010043

Author: Norfolk County Council

Document Reference: 7.4c

Version Number: 0 – Revision for Submission

Date: 30 April 2019

GREAT YARMOUTH: THIRD RIVER CROSSING

STAGE 1 SAFETY AUDIT

REPORT REF: GEN/259
March 2019

Report Prepared for: **Infrastructure Delivery**
Norfolk County Council

Report Author: Kevin Allen BEng (Hons) IEng MICHT MSoRSA

Report Status:

Issue	Status	Purpose	Name/Signature	Date
1	Stage 1 Safety Audit Report	Client Issue	Kevin Allen [redacted]	25 March 2019
2	Designer's Response	Designer response to Safety Issues raised	Anthony Groom [redacted]	03April 2019
3	NM Decision	Implementation of Safety Audit recommendations	Kevin Allen [redacted]	4 April 2019

INTRODUCTION

This report contains the results of a Stage 1 Safety Audit carried out on the above scheme. The Audit was carried out at the request of Norfolk County Council Major Projects.

The Audit Team membership was as follows:-

Kevin Allen BEng (Hons), I Eng, MCIHT, MSoRSA (Audit Team Leader)	Project Engineer Network Safety + Sustainability Norfolk County Council
Julian Fonseka BSc(Hons) EngTech, MCIHT, MSoRSA (Audit Team Member)	Engineer Network Safety + Sustainability Norfolk County Council

Specialist Advisors:-

Richard Wiseman	Area Road Safety Officer Norfolk County Council
Graham Samways	Electrical Services Manager Norfolk County Council

The Audit took place at County Hall on 20 March 2019. The audit comprised an examination of the supplied documentation (see Appendix A) and a site inspection by the Audit Team Leader on 22 March 2019 at 09:30 which lasted around 60 minutes. During the site visit the weather was overcast and the road surface dry. Traffic flows were moderate and observed speeds were generally in line with the posted speed limit of 30mph. The Audit submission provided all necessary supporting information.

The terms of reference are as described in Community and Environmental Services Highways Service Manual Procedure SP03-07-P01. The Auditors have examined and reported only on the road safety implications of the scheme within the main report.

The audited scheme involves the provision of a new multi-lane bridge over the River Yare in Great Yarmouth, linking William Adams Way to South Denes Road. The scheme also includes

a new 5 arm roundabout on William Adams Way and a signalised junction at South Denes Road/Sutton Road.

The auditors have reviewed the three year accident record for the location. There have been 2 recorded (slight) personal injury accidents during this time. Both accidents occurred on William Adams Way, one a single vehicle loss of control and the other a car pulling out in to the path of a cyclist. The proposed roundabout at this location will fundamentally change the road layout where these accidents occurred.

A comments section has been included in Appendix B. The issues noted are not necessarily safety issues. They relate either to wider network implications, safety issues identified outside the scope of the audited scheme or suitability of a particular design choice.

ITEMS RAISED AT PREVIOUS AUDIT

All issues raised at the previous stage 1 safety audit (8 August 2018) have been resolved.

ITEMS RAISED AT THIS STAGE 1 AUDIT

1.0 General

1.1 Problem – Collisions with maintenance vehicles

Location – East side of William Adams Way roundabout

The shared use cycleway arrangements on the east side of the roundabout have been altered since the previous Stage 1 audit to accommodate the Mind: Community Roots site. This has resulted in the loss of a maintenance bay, presumably associated with the nearby toucan crossings. The loss of the maintenance bay will require any maintenance workers to park elsewhere without a dedicated facility. This could lead to potential health and safety issues for maintenance workers or a collision hazard for motorists.

Recommendation -

It is recommended that a dedicated maintenance bay is provided nearby to the toucan crossings on William Adams Way and the overbridge.

Designer's Response:

It is noted that there are a number of lightly-trafficked side roads immediately adjacent to the new roundabout which may provide a suitable location for maintenance operatives to park. The feasibility of maintenance operatives parking in these side roads will be discussed with maintenance organisations early in the detailed design stage. If this is not regarded as feasible, subject to further investigations as part of detailed design, a maintenance hardstanding could be incorporated at one or more of the following locations: William Adams Way East; Westbound direction south of roundabout; Suffolk Road, close to Labyrinth site or integrated into the low-level footways at the MIND site.

Network Management Decision:

Response accepted, however, existing side roads are not appropriate for maintenance parking at new signalised facilities. Dedicated maintenance bays to be provided at detailed design stage in close proximity to the traffic signals controllers.

2.0 Alignment

2.1 Problem – increased risk of failure to stop or tail-end collision

Location – proposed link road

Both the signalised junction at the eastern end of the link, and the roundabout at the western end, are approached on a significant down grade. This will exacerbate the need for braking on approach to these junctions (and any queues), with increased potential for vehicles failing to stop resulting in junction overshoot or tail-end collision.

Recommendation -

At a previous Stage 1 Audit (22 February 2017) it was agreed that the full length of 5% down grade would be surfaced with a high psv aggregate to reduce the risk of tail end collision when queuing occurs. For this more recent audit submission the length has been reduced to the immediate 50m approaches to the traffic signals at South Denes Road and the toucan crossing near William Adams Way. It is recommended that the previous longer length of high psv surfacing is reinstated on the overbridge.

Designer's Response:

Recommendation accepted.

Network Management Decision:

Response accepted.

3.0 Junctions

3.1 No comment

4.0 Non-motorised Users

4.1 Problem – Pedestrian collision hazard

Location – Footways/cycleways either side of bridge deck

It is noted that the bridge parapet has been located between the carriageway and the footway/cycleway. It is understood that part of the reason for this is to protect pedestrians in the event of a terrorism related car 'ramming' incident. The parapet specification is shown as having N1 containment which has a working width of up to W4 (up to 1.3m). This level of deformation will encroach well in to the footway/cycleway, increasing the risk of pedestrian or cyclist injury.

Recommendation -

It is recommended that a parapet is provided with a higher level of containment, to reduce working width and hence reduce the likelihood of injury to pedestrians and cyclists in the event of a vehicle strike.

Designer's Response:

The vehicle parapet was not switched from the edge of the bridge to the edge of the road to provide protection to pedestrians on the footway / shared surfaces. The bridge deck superstructure, as currently designed, would not be able to support / anchor a heavy containment vehicle restraint system, such as H4A, that would be required to provide additional protection to pedestrians. It is noted that the original specimen design offered the same, if not less, protection to pedestrians.

Network Management Decision:

Response accepted on the basis that the parapet is not provided for the specific purpose of pedestrian protection and a heavy containment vehicle restraint is not practically viable on the bridge structure.

4.2 Problem – Head on collision between cyclists

Location – Cycleway on east side of Southtown Road

The cycleway scales at only 1.5m wide. It is not clear whether this cycling facility is intended to have single or two-way flow. 1.5m is insufficient width for 2-way cycle use and would introduce a risk of cyclist head on collisions.

Recommendation -

It is recommended that the cycleway is either widened or explicitly signed for one way use only.

Designer's Response:

Signs will be provided to clarify that the cycleway on the east side of Southtown Road is for one-way (southbound) use only.

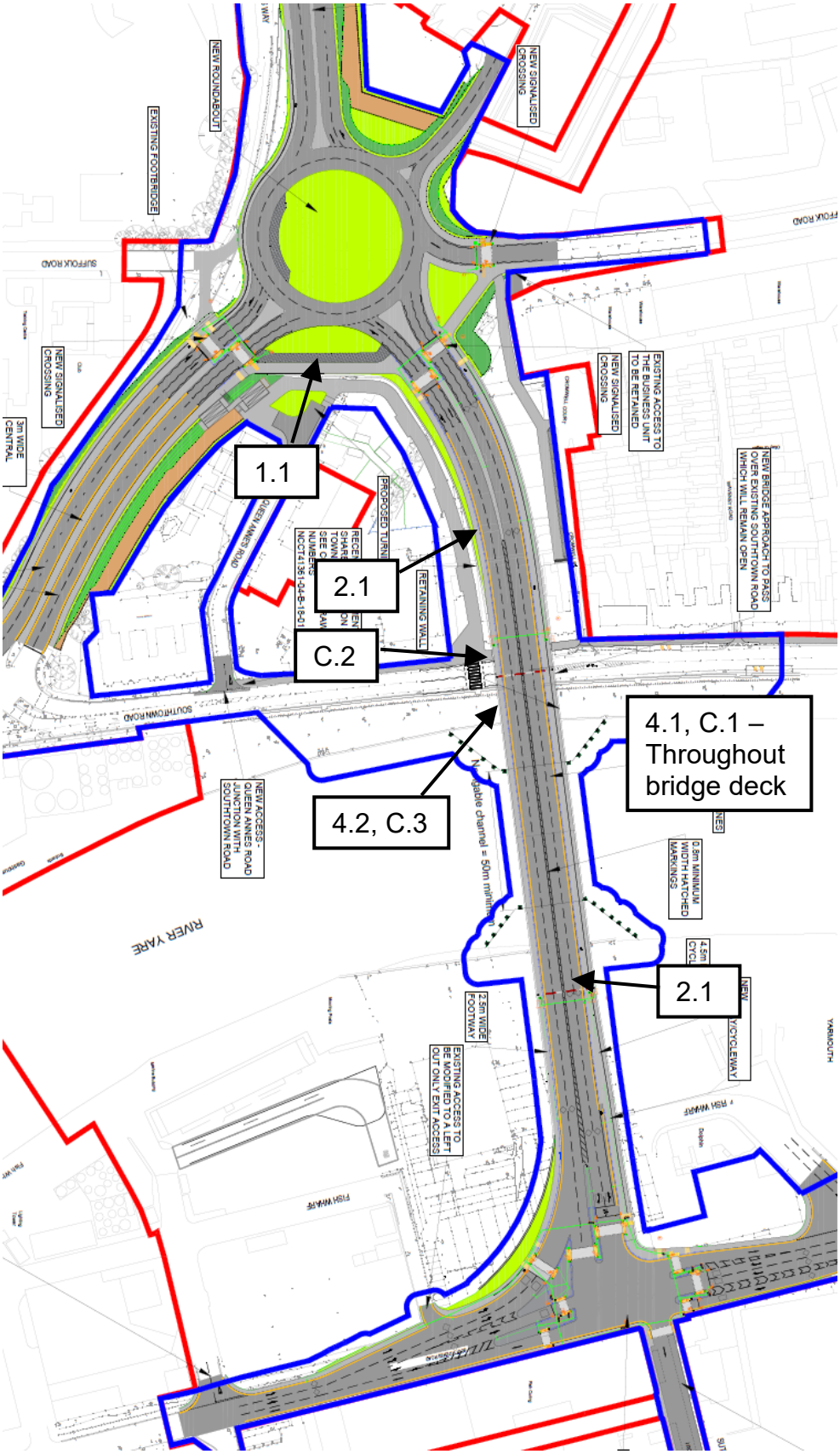
Network Management Decision:

Response accepted.

5.0 Signs, Lighting and Markings

5.1 No comment

6.0 Problem Location Plan



AUDIT TEAM STATEMENT

We certify that this audit has been carried out in accordance with Norfolk County Council Community and Environmental Procedure SP03-07-P01

Signed (ATL) [redacted] Kevin Allen

Dated 25 March 2019

Signed [redacted] Julian Fonseka

Dated 25/03/2019

APPENDIX A: Audit Brief

The following documents were submitted for this Road Safety Audit:

Document Ref.	Scale (if applicable)	Title
N/A	*N/A*	*Safety Audit Submission*
2.4 P01.3	*N/A*	*Application for Development Consent Order*
70041951-WSP-HGN-GYTRC-DR-D-001 P07,2	*1:1250@A1*	*Proposed Highway General Arrangement*
GYTRC-ROD-SBR-S01-DR-CB-1004	*Various*	*Bascule Bridge Superstructure Sheet 4*
GYTRC-ROD-SBR-S03-DR-CB-3004	*Various*	*Western Approach Retaining Structures Sheet 4*
GYTRC-ROD-SBR-S03-DR-CB-3005	*Various*	*Western Approach Retaining Structures Sheet 5*
GYTRC-ROD-SBR-S03-DR-CB-4003	*Various*	*Eastern Approach Retaining Structures Sheet 3*
GYTRC-ROD-SBR-S03-DR-CB-4004	*Various*	*Eastern Approach Retaining Structures Sheet 4*
GYTRC-ROD-SBR-S03-DR-CB-0001	*Various*	*Road Alignment and Site Extent*
PKA018-MP-91 to 94	*1:500@A1*	*Minimum Polished Stone Value*
GYTRC-WSP-XXX-XX-DR-XX-XXXX	*1:1250@A1*	*Traffic Regulation Measures Plan (Sheet 1 of 2)*
GYTRC-WSP-XXX-XX-DR-XX-XXXX	*1:1250@A1*	*Traffic Regulation Measures Plan (Sheet 2 of 2)*
XX	*N/A*	*Departure from Standards Report*

APPENDIX B: Comments

C.1 Bridge deck adjacent to parapets – The kerb height for the cycleway/footway has not been specified on the design drawings. It should be noted that TD27/05 specifies a maximum kerb height of 75mm (although can be increased to 100mm with justification) to avoid vehicle take-off. It is therefore recommended that these parameters are adhered to in detailed design.

Designer's Response:

Recommendation accepted.

C.2 Southtown Road – At present, a long length of on-street parking commences immediately north of the proposed zebra crossing. The interaction between the on-street parking and zebra crossing zig zags is not shown on the submitted plans as it is beneath the bridge deck. At Stage 2 audit this detail will need to be assessed to ensure any on-street parking does not mask pedestrians wishing to cross from west to east.

Designer's Response:

Recommendation accepted.

C.3 Southtown Road – Considerable landscaping and level changes are taking place on the east side of Southtown Road in the area under the bridge deck. At Stage 2 audit the choice of materials/tactile paving will need to be carefully considered to ensure adequate tonal contrast is provided at changes of level to assist partially sighted users

Designer's Response:

Recommendation accepted.

GREAT YARMOUTH: THIRD RIVER CROSSING - ADDENDUM - DEPARTURES FROM STANDARD

STAGE 1 SAFETY AUDIT

REPORT REF: GEN/259
April 2019

Report Prepared for: **Major Projects**
Norfolk County Council

Report Author: Julian Fonseka BSc(Hons) EngTech, MCIHT, MSoRSA

Report Status:

Issue	Status	Purpose	Name/Signature	Date
1	Stage 1 Safety Audit Report	Client Issue	Julian Fonseka [redacted]	24/04/2019
2	Designer's Response	Designer response to Safety Issues raised	Maamle Okutu, WSP	25 April 2019
3	NM Decision	Implementation of Safety Audit recommendations	Julian Fonseka [redacted]	26/04/2019

INTRODUCTION

This report contains the results of a Stage 1 Safety Audit carried out on the above scheme. The Audit was carried out at the request of Norfolk County Council Major Projects.

The Audit Team membership was as follows:-

Julian Fonseka BSc(Hons) EngTech, MCIHT, MSoRSA (Audit Team Leader)	Engineer Network Safety + Sustainability Norfolk County Council
Kevin Allen BEng(Hons), I Eng, MCIHT, MSoRSA (Audit Team Member)	Project Engineer Network Safety + Sustainability Norfolk County Council

The Audit took place at County Hall on 23 April 2019. The audit comprised an examination of the supplied documentation in the form of a departure from standard report which is included as Appendix A. No site inspection was undertaken due to the supplementary nature of this Audit and the fact that the site was visited by the Audit Team Leader as part of the recently completed Stage 1 Safety Audit.

The terms of reference are as described in Community and Environmental Services Highways Service Manual Procedure SP03-07-P01. The Auditors have examined and reported only on the road safety implications of the scheme within the main report.

The audited scheme involves the provision of a new multi-lane bridge over the River Yare in Great Yarmouth, linking William Adams Way to South Denes Road. The scheme also includes a new 5 arm roundabout on William Adams Way and a signalised junction at South Denes Road/Sutton Road. The site is urban with predominantly industrial use and located midway between Great Yarmouth and Gorleston, and subject to a 30mph speed limit. The exception is the A47 Harfreys roundabout (which junctions with Williams Adams Way) which is part of the Gt Yarmouth western bypass and is subject to a 50mph speed limit.

BACKGROUND / PREVIOUS AUDIT

All issues raised at the previous audit (20 March 2019) have been resolved. This report serves as an addendum to this report and explicitly considers departures from standard which were not actively considered previously.

Three departures from standard have submitted:

- Discontinuous parapet / barrier provision where *TD19/06 – Requirement for Road Restraint Systems* would mandate linking two adjacent systems with less than 50m between them. This results from the need to provide stepped pedestrian access to a viewing platform on the northwest corner of the bridge. Notwithstanding this requirement, the break in the parapet is coincident with a proposed Class N1 containment Vehicle Restraint System (VRS), separating the eastbound bridge carriageway from the proposed shared pedestrian / cycle facility. Hence, the proposed VRS would prevent an errant vehicle from reaching the gap in the bridge parapet wall.
- Substandard median separation between opposing carriageways of 0.8m where *TD27/05 - Cross-Sections and Headrooms* would mandate 1.8m. The new bridge will be subject to a 30mph speed limit and adjoins constrained, entirely urban highway environments. The geometry of the link has been designed in accordance with TD9/93 and the risk of cross over collisions is considered low.
- Substandard entry path radius where the scheme ties into the existing A47 / William Adams Way. Existing entry path radius is more than three times the 100m maximum mandated in *TD16/07 - Geometric Design of Roundabouts*. The proposed scheme improves this somewhat, but the value is still more than double the mandated value.

ITEMS RAISED AT THIS STAGE 1 AUDIT

1.0 General

1.1 No comment

2.0 Alignment

2.1 No comment

3.0 Junctions

3.1 Problem – failure to give way / tail end / loss of control collisions

Location – east arm of existing A47 / William Adams Way roundabout

Whilst the scheme improves the existing entry path radius at this arm, the resultant value is approximately 250m, compared with the absolute maximum of 100m from *TD16/07*.

Entry path radius is the most important determinant of safety at a roundabout and an excessive figure allows vehicles to enter the roundabout and circulate at higher than desirable speeds. This increases the risk of failure to give way, tail end, or circulatory carriageway loss of control type collisions due to the higher approach speeds engendered by the geometry. Consideration of the six year (to end January 2019) accident records for this junction shows six collisions of this type occurring on this east arm. The provision of the third river crossing will increase traffic flow at this roundabout and it may therefore be anticipated that an increased number of collisions will occur.

Recommendation – a subsidiary deflection island should be provided between the nearside and central lanes. See *TD51/17 – Segregated Left Turn Lanes and Subsidiary Deflection Islands at Roundabouts*.

Designer's Response:

Preliminary investigations into the provision of a TD 51/17 compliant subsidiary deflection island and associated hatched markings, between the nearside and straight-ahead lanes, have been carried out and these are summarised on the attached sketch. The sketch is based on the provision of a physical subsidiary deflection island, as opposed to a non-physical subsidiary deflection island, as the latter are subject to abuse by drivers crossing the hatched road markings and therefore are less effective than physical islands. The key findings from this exercise, detailing why the recommendation is not accepted, are as follows:

- In addition to providing appropriate lane widths, the subsidiary deflection island cannot be accommodated within the proposed carriageway width without widening the carriageway on the nearside over the length of the

hatching shown. Lane widths (bold lines on sketch) of 3m have been used to develop the indicative layout shown on the sketch and this would require nearside carriageway widening of up to approximately 1.3m, however, the extent of widening required would increase to approximately 3.25m if 3.65m wide lanes were required on this section of William Adams Way. The nature of the site constraints at this location, which include the adjacent Southtown Common, are such that it is not feasible to consider carriageway widening of this magnitude.

- There is concern that the proposed start of the hatching for the subsidiary deflection island is located too close to the exit from the new roundabout on William Adams Way which would preclude the provision/siting of lane directional signs in advance of the start of the hatching. As a result, there is concern that introducing hatching at this location means drivers would have to make a decision on which lane to take resulting in driver hesitation with some drivers braking suddenly and could result in lane change and rear shunt collisions in the vicinity of the westbound exit from the roundabout.

To mitigate the safety concerns raised, in particular those regarding high entry speeds due to non-compliant entry path radius, it is proposed to provide appropriate visibility screening in the central reserve on the approach to Harfrey's roundabout to as described in TD 16/07 paragraph 8.8. Further details of the type of screening proposed would form part of the Stage 2 RSA submission.

It is also considered that the location of the new roundabout on William Adams Way, relative to the westbound entry onto Harfrey's roundabout, will limit westbound approach speeds to Harfrey's roundabout.

Network Management Decision: Accepted on the basis that land required for additional widening on the south side of William Adams Way is not available. The suggestion of installation of vegetation screening to reduce likely roundabout entry speed is accepted and will be considered in detail at Stage 2 Audit. [redacted]

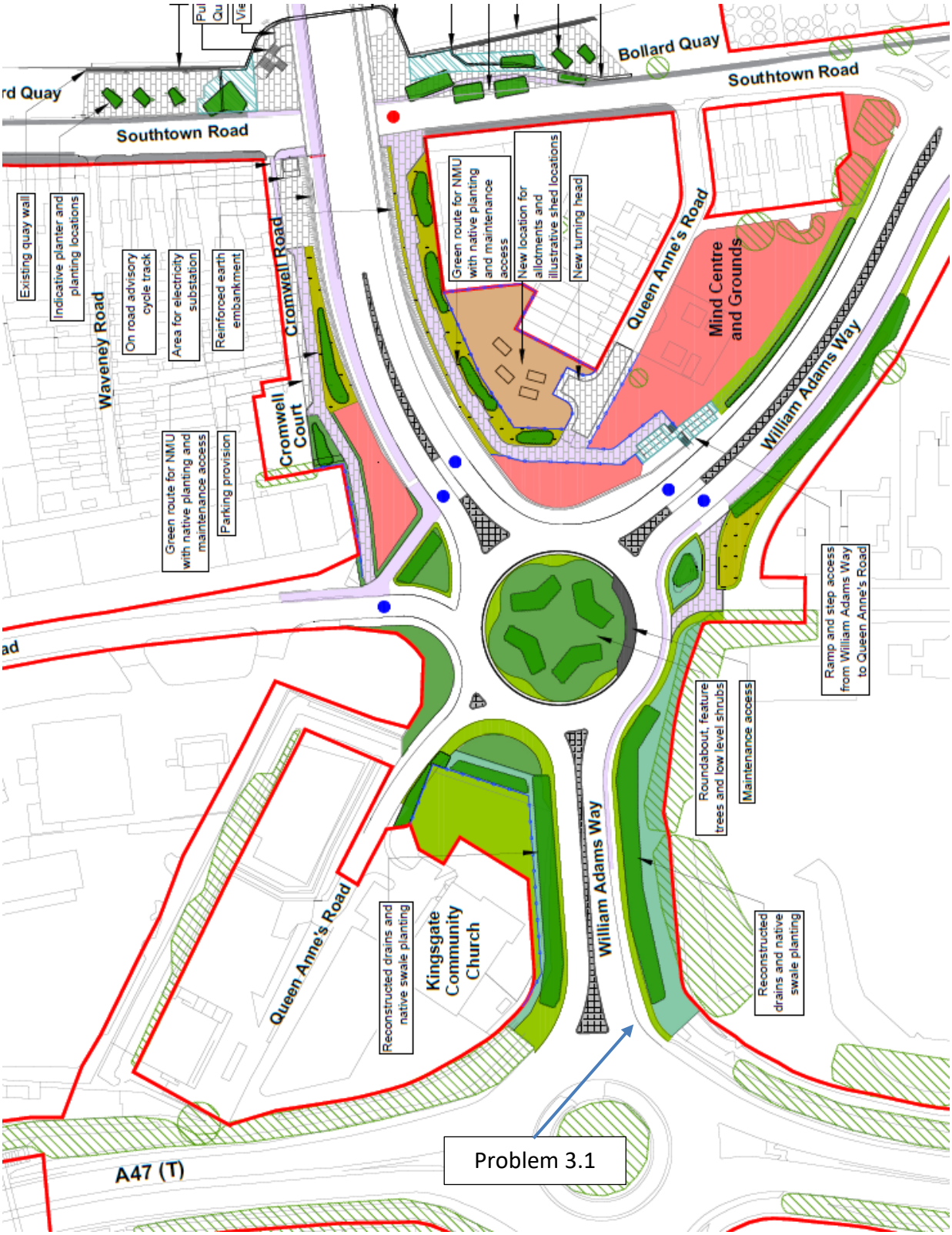
4.0 Non-motorised Users

4.1 No comment

5.0 Signs, Lighting and Markings

5.1 No comment

6.0 Problem Location Plan



AUDIT TEAM STATEMENT

We certify that this audit has been carried out in accordance with Norfolk County Council Community and Environmental Procedure SP03-07-P01

Signed (ATL) [redacted] Julian Fonseka
Dated 26/04/2019

Signed [redacted] Kevin Allen
Dated 25 April 2019

APPENDIX A:

Great Yarmouth Third River Crossing

Application for Development Consent Order

Document 7.4c: Design Report: Appendix B - Departure from Standards Report

Planning Act 2008

The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 (as amended) ("APFP")

APFP regulation Number:

Planning Inspectorate Reference Number: TR010043

Author: Norfolk County Council

Document Reference: 7.4c

Version Number: P00

Date: 8th April 2019

Quality Control

Issue/Revision	First Issue	Revision 1	Revision 2	Revision 3
Remarks	P00			
Date	08/04/2019			
Prepared by	James Cove			
Signature				
Checked by	Maamle Okutu			
Signature				
Authorised by				
Signature				
Project number				
Report number				
File reference				

Foreword

This document accompanies an application ('the Application') submitted by Norfolk County Council ('the Council' / 'the Applicant') to the Secretary of State for a Development Consent Order ('DCO') under the Planning Act 2008.

If made by the Secretary of State, the DCO would grant development consent for construction, operation and maintenance of a new bascule bridge highway crossing of the River Yare in Great Yarmouth, and which is referred to in the Application as the Great Yarmouth Third River Crossing (or 'the Scheme').

The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 (as amended) require that an application for a DCO be accompanied by the documents specified at Regulation 5(2)(a) to (r). This is one of those documents and is specified at Regulation 5(2)[state which of (a) to (r) applies].

CONTENTS

PAGE No.

Tables

Figures

1 Departures from Standard

1.1 Introduction

1.1.1 The Great Yarmouth Third River Crossing (GYTRC) scheme has been designed using current standards contained in the Design Manual for Roads and Bridges (DMRB). The DMRB sets a standard of good practice that has been developed principally for Trunk Roads and motorways. It is for the local highway authority to decide on the extent to which the documents in the manual are appropriate when used for local road schemes. Departures from Standard occur when it is not possible to comply with the standards set out in the DMRB.

1.1.2 Departures from Standard are not uncommon and are part of the design hierarchy used in circumstances where desirable minimum standards cannot be achieved. There may be situations where features on site, innovation of design, construction methods or materials may make it advantageous to depart from standards. Where a Departure from standard is proposed, it should ensure safety, value for money and maintainability despite not following the requirements from the design manual.

1.1.3 Where it has not been possible to comply with the DMRB on the GYTRC scheme, the departures have been considered through the road safety audit process. This is to ensure that consideration has been given to the safety implication of the departures on all road users and the resulting design is safe.

1.1.4 This report provides information on the highway geometric departures.

1.2 Summary of Highway Geometric Departures

1.2.1 Table 1.1 provides a summary of the highway geometric departures identified as part of the reference design. Detailed design will be completed following the grant of development consent.

*Table **Error! No text of specified style in document.**.1: Summary of Highway Geometric Departures*

Reference	Location	Description	Standard	Required Standard	Proposed Standard	Comments
DEP 1	William Adams Way	Discontinuous provision of parapets at access steps.	TD19	Chapter 3: 3.15 Where practicable, gaps between two safety barrier installations must be closed.	Break/gap in vehicle parapet to provide access via steps	The departure to provide a gap in vehicles parapet is required at this location to provide steps to the viewing platform on the bridge.

Reference	Location	Description	Standard	Required Standard	Proposed Standard	Comments
DEP 2	River Yare Bridge	Sub-standard provision of central reserve width.	TD27	Chapter 4: 4.6.2 Figure 4-4a 1.8m wide central reserve width	0.8m wide central reserve width	Provision of a 1.8m minimum central reserve width in accordance with Figure 4-4a of TD 27 would require additional land take resulting in additional costs and environmental impact.
DEP 3	William Adams Way approach to A47 roundabout	Roundabout entry path radius	TD16	Chapter 7 Para 7.56 - Entry path radius must not exceed 100m	253m	There is an existing departure relating to a sub-standard entry path radius on the westbound approach to the existing Harfrey's Roundabout from William Adam's Way. The existing entry path radius is approximately 326m. The reference design proposes an entry path radius of approximately 253m. Designing out the existing departure would require additional land take resulting in additional costs.

1.3 Location of Highway Geometric Departures

1.3.1 Figures 1.1 shows the locations of highway geometric departures on the scheme. The location of departures is based on the reference design. The detailed design will be completed following the grant of development consent.

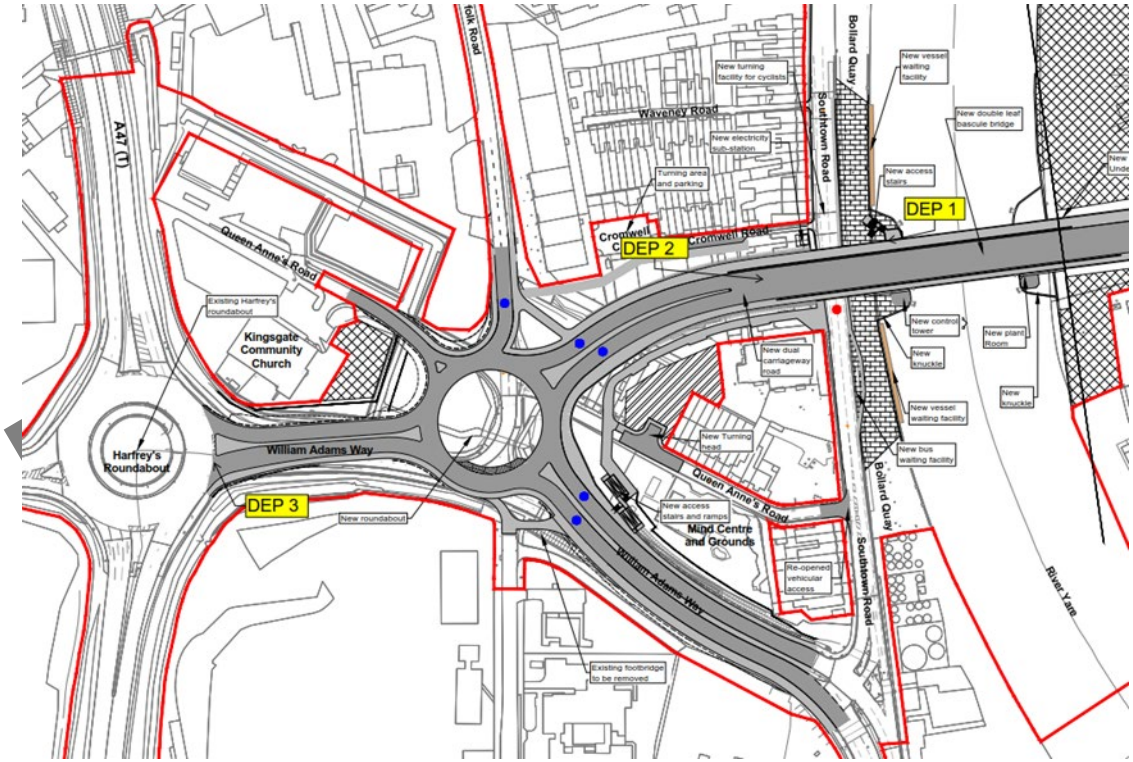


Figure 1.1 – Location of Highway Geometric Departures