Norwich Western Link

Design and Access Statement – Appendix A

Author: Norfolk County Council

Document Reference: NCC/1.02.01

Version Number: 01

Date: November 2023

Contents

1 Introduction

1.1.1 The below document is the A10 West Winch Housing Access Road Stage 1 Safety Audit.

1.1.2 We have included a summary of key information shown in this document in an accessible format. However, some users may not be able to access all technical details. If you require this document in a more accessible format please contact norwichwesternlink@norfolk.gov.uk

A10 WEST WINCH HOUSING ACCESS ROAD

STAGE 1 SAFETY AUDIT

REPORT REF: A10/015
November 2023

Report Prepared for: Norfolk County Council and National Highways

Project Details:

Report Title	A10/A47(T) West Winch Housing Access Road RSA1
Date	November 2023
Doc Ref	A10/015 RSA1
Prepared By	Norfolk County Council (NCC)/WSP
On behalf of	Norfolk County Council and National Highways
Report author	Kevin Allen BEng (Hons) IEng MCIHT MSoRSA

Report Status:

Issue	Status	Purpose	Name/Signature	Date
1	Stage 1 Safety Audit Report	Client Issue	Kevin Allen [redacted]	19 December 2023

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/WSP and also on behalf of National Highways.

The Audit Team is independent of the project design team and has had no involvement with the project. 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
Steve Johnson BEng(Hons), MCIHT, MSoRSA NH Cert Comp (Audit Team Observer)	Principal Engineer Planning and Development National Highways

The Audit took place via online conferencing on 10 November 2023. The audit comprised an examination of the supplied documentation (see Appendix A) and a site inspection by all members of the Audit Team on 20 November 2023 at 10:00 which lasted around 2hrs. During the site visit the weather was cloudy and the road surface dry. Traffic flows were moderately heavy but free flowing on A10 and A47. However, at the time of the site visit a road accident had occurred at the Hardwick interchange overbridge and police had closed the northwest quadrant of the roundabout. This led to extensive queuing on the roundabout.

The terms of reference are as described in GG 119 *Road Safety Audit*. The Auditors have examined and reported only on the road safety implications of the scheme as presented and has not examined or verified the compliance of the design to any other criteria.

The audited scheme involves a new housing access link which will also become the re-routed A10. The new link road meets the A47 trunk road at a new signalised roundabout with segregated left turn lane. The new link road is categorised as single carriageway with 1m hard

strips and has several roundabout junctions to serve new housing. Shared use cycling/walking facilities are provided throughout along the link road. A new overbridge for the link is to be provided at Rectory Road and an at grade signalised crossing at the severed Chequers Lane. A 70kph (40mph) design speed has been adopted for the new housing access road. The submission did not contain details of any proposed lighting changes or roundabout geometry. It has therefore not been possible to comment in detail on these aspects of the scheme design.

The auditors have reviewed the latest 3-year accident record at the interfaces of the new road with A47, A10 south of West Winch, Rectory Road and Chequers Lane. During this time there have been 4 recorded personal injury accidents (1 fatal, 2 serious, 1 slight). The slight accident occurred at the A10 interface, the other three at the A47 interface. The accident at A10 was serious and involved a tail end collision between two cars. The fatality at A47 involved an eastbound overtake/head on collision. The A47 serious accident involved an eastbound single vehicle loss of control, the slight accident a tail end collision in icy conditions. None involved non-motorised users. The new scheme provides a dual carriageway with central reserve on this section of A47 which would remove the risk of overtake/head on collision.

ITEMS RAISED AT PREVIOUS AUDIT

The auditors are unaware of any previous road safety audit being carried out.

ITEMS RAISED AT THIS STAGE 2 AUDIT

1.0 General

1.1 Problem – speed related collisions on housing access road

Location – throughout access road but primarily between Hopkins roundabout and southern A10 roundabout.

It is understood that a 70kph (40mph) design speed and speed limit have been adopted for the link road. The link road has predominantly straight alignment, albeit broken up by several roundabouts. Furthermore the highway cross section is wide – 7.3m carriageway, 1m hard strips, 5.0m wide swale and 4.0m shared use. With no obvious developed frontage, the audit team is concerned that speed limit compliance will be poor. There may also be marked speed differential between compliant and non-speed limit compliant drivers. Hence, there is an increased risk of speed related collisions (e.g. overtake, tail end collision). Of particular concern are the long uninterrupted lengths of link road south of the Hopkins roundabout.

Recommendation – it is recommended that the highway cross section is reduced to a lower standard more in line with a 70kph design speed and/or speed management measures introduced.

1.2 Problem – collisions with Vehicle Restraint Systems (VRS)

Location – throughout access road.

VRS is proposed extensively throughout the access road to protect roadside hazards. In several instances, this appears appropriate (e.g. at bridge piers), however, there are also situations where VRS is used at point hazards (e.g. speed limit repeater signs, advance directions signs). Whilst roadside hazards should be mitigated, VRS represents a collision hazard in itself and may not be the best solution for all point hazards. Long lengths of VRS also gives an over-engineered appearance at odds with a 40mph design speed (see also 1.1).

Recommendation – Where possible, it is recommended that single point hazards (e.g. traffic sign posts) are specified as passively safe as an alternative to long lengths of VRS.

1.3 Problem – collisions with roadside trees

Location – throughout access road.

Landscaping plans indicate new tree planting in areas where vehicles carry a risk of leaving the carriageway. Vehicle collisions with mature trees carry a high risk of serious or fatal injury for vehicle occupants. Of particular concern are roundabout central islands, the segregated left turn island at A47, and trees at roundabout exits.

Recommendation – It is recommended that any trees which have the potential for a trunk girth greater than 250mm are not planted in the above high risk areas. Roadside trees on links to be set back at least 4.5m from the carriageway edge.

2.0 Alignment

2.1 Problem – Loss of control at segregated left turn lane

Location – Housing Access Road/A47 roundabout

No dimensions have been provided for the segregated left turn lane (SLT) and it has therefore not been possible to check these in detail. Nevertheless, the SLT features a relatively long straight section as it leaves the mainline, which may encourage acceleration, followed by a marked left hand bend. Guidance prescribed within *CD116 Geometric Design of Roundabouts* states that SLTs should not be designed to induce high vehicle speeds. The audit team is therefore concerned that the proposed layout may give rise to loss of control at the left hand bend.

Recommendation – to discourage high speed on approach to the left hand bend it is recommended that the SLT feeder lane is reduced in length (see also 2.2).

2.2 Problem – Tail end collision/side swipes

Location – Housing Access Road at start of SLT (CH30)

The diverge for the SLT at the A47 roundabout commences only 20m north of the Hopkins roundabout. These leaves little time for unfamiliar drivers to absorb traffic

sign information when exiting the roundabout and make the decision to enter the SLT. Hurried decision making may lead to late braking and abrupt lane changes in order for a driver to enter the SLT. This carries a risk of tail end collision or sideswipe conflicts.

Recommendation – It is recommended that the diverge for the SLT commences further north, to allow drivers more time to make a decision to enter the SLT (see also 2.1).

2.3 Problem – Nearside kerb strikes

Location – Transition between A10 existing/proposed alignment (CH200)

Travelling north, at the point where the existing A10 meets the housing access road, the highway curves to the east. The topography appears relatively flat and the audit team is concerned that drivers may still receive visual clues relating to the historic A10 horizontal alignment (e.g. tree lines, lighting columns etc.) This carries a risk of nearside kerb strikes, particularly in dark conditions.

Recommendation – It is recommended that measures are introduced to screen the historic A10 alignment and promote the new right hand bend.

2.4 Problem - Collisions at new roundabouts

Location – All new link housing access road roundabouts

No details have been provided regarding detailed roundabout geometry. Of particular concern is lack of detail for entry path curvature which is a key determinant of roundabout safety as it directly affects the entry and circulatory speed for a roundabout. However, other geometric features such as entry and exit kerb radii, circulatory width and landscaping can also influence the safe operation of a roundabout.

Recommendation – It is recommended that roundabout geometry is subject to safety audit prior to detailed design.

3.0 Junctions

3.1 Problem – inappropriate use of farm access

Location – Housing Access Link Road CH600

A nearby farm is proposed to have a direct vehicular access with the housing access road, albeit limited to left in – left out movement. The access has a conventional junction appearance with give way markings and regular kerb radii. The audit team is concerned that, given the conventional appearance, drivers may mistakenly use the access believing it is an all traffic route. A further turning manoeuvre will then be required to rejoin the link road, risking a failure to give way conflict.

Recommendation – It is recommended that measures are provided to give the farm access the appearance of a lower status private access. Possible options include a coloured surface treatment and dropped kerb edging at the channel line.

3.2 Problem – inappropriate use of maintenance track access

Location – Southern A10 roundabout, east arm CH020

A maintenance access directly abuts the east arm of the southern roundabout. The audit team is concerned that, given the conventional appearance, drivers may mistakenly use the access believing it is an all traffic route. This will result in unnecessary U turns and turning movements at the roundabout which risk conflict with other road users.

Recommendation – It is recommended that measures are provided to give the maintenance access the appearance of a lower status private access. Possible options include a coloured surface treatment and dropped kerb edging at the channel line.

4.0 Non-motorised Users

4.1 Problem – collisions with pedestrians at uncontrolled crossing points

Location – Metacre, Hopkins and Zurich roundabouts

Uncontrolled crossing points appear to be provided for the western arms of the above roundabouts which serve residential housing. The crossing points are at the

roundabout splitter islands and appear to be demarcated by pedestrian crossing studs. Pedestrian crossing studs should only be provided at controlled crossings (e.g. zebra, toucan). Hence, the use of studs is potentially confusing to all road users, increasing the risk of conflict between crossing pedestrians and motor vehicles.

Recommendation – It is recommended that the pedestrian crossing studs are omitted.

4.2 Problem – Cyclist loss of control

Location – Metacre, Hopkins and Zurich roundabouts

Shared use cycle/footways are to be provided on the west side of A10, which then leads west at the above roundabouts to serve the residential housing. The shared use appears to narrow to footway only behind grass verges to the west of the roundabouts. There is no obvious dropped kerb for a cyclist to leave/join the carriageway. Hence, a cyclist will need to negotiate a full height kerb, risking loss of control.

Recommendation – Provide dropped kerbs so that cyclists may easily leave/join the shared use facility.

4.3 Problem – Confusing guidance for visually impaired pedestrians

Location – Southern A10 roundabout

An uncontrolled crossing point is provided on the west arm of the southern A10 roundabout. However, 'L' shaped tactile paving has been provided which usually denotes a controlled crossing such as a zebra. This may mistakenly lead a visually impaired pedestrian to believe they have priority over traffic and step out in to the path of a motor vehicle.

Recommendation – It is presumed to be a drafting error, however, the 'L' shaped paving should be amended to a rectangular two rows of buff coloured paving.

4.4 Problem – Conflict between pedestrians and live A10 traffic

Location – Between the historic A10 alignment and southern A10 roundabout

At CH200, travelling north, the existing A10 meets the housing access road at the start of a right hand bend. Northbound pedestrians wishing to access West Winch will need to walk up to the southern roundabout and then turn left. This is a longer route than existing and leaves pedestrians at potential risk of conflict with live A10 traffic.

Recommendation – It is recommended that the redundant section of A10 is converted to a pedestrian/cyclists link between the historic alignment and Gravelhill Lane.

4.5 Problem – Equestrian fall hazard

Location – Rectory Lane overbridge

No details have been provided for the parapet height at the Rectory Lane overbridge. It is noted that a bridleway passes over the south side of the bridge deck. Bridleways require a higher parapet to mitigate the risk of equestrians falls.

Recommendation – It is recommended that a 1.8m high parapet is provided for the southern bridge deck.

4.6 Problem – Inaccessible bridge

Location – Rectory Lane overbridge

It is noted that ramps either side of the bridge deck have gradients in the order of 5%. This is at gradient considered a ramp and less mobile pedestrians will require additional measures to ensure the bridge is accessible.

Recommendation – It is recommended that level resting platforms and hand rails are provided in line with guidance prescribed within *Inclusive Mobility*.

4.7 Problem – Collisions with pedestrians/cyclists at controlled crossing point

Location – New controlled crossing point CH650

An elongated traffic island has been provided immediately south of the controlled crossing to prevent right turns in or out of a farm access. To the north, hatching guides traffic around the elongated island. The signal staging for the crossing is not known. However, even if this is a one stage pedestrian crossing, a pedestrian or cyclist crossing late has the potential to be 'stranded' at the half way point between the traffic island and hatching. A pedestrian or cyclist waiting at this location will be vulnerable to vehicle strikes given the relatively narrow 1.5m island width and only hatching for protection to the north.

Recommendation – It is recommended that the traffic island is widened to 3.0m at the controlled crossing and also extends north of the crossing width. 'Keep left' signing should be provided to guide drivers past the nearside of the island. Alternatively

relocate the farm access such that hatching is not required at the controlled crossing point.

5.0 Signs, Lighting and Markings

5.1 Problem – Collision with traffic island in dark conditions

Location – A47 roundabout, SLT.

No details have been provided for whether all or part of the link road and its various junctions are to be street lit. Whilst there are several non-lit roundabouts in Norfolk the proposed A47 roundabout is complex with traffic signals and a SLT. This increases the risk of a driver misjudging the correct vehicle path through the junction in dark conditions, resulting in kerb strikes. It is notable that *CD116 Geometric Design of Roundabouts* prescribes that '*…physical segregated left turn lanes shall only be provided at street lit junctions*.'

Recommendation – It is recommended that the northern A47 roundabout is street lit. Given the close proximity of the Hopkins roundabout, this may also require illumination.

5.2 Problem – Sideswipe collisions

Location – All roundabouts on link road.

Concentric markings have been provided on roundabouts to aid lane discipline for circulating traffic. However, being fully concentric, the markings tend to aid right turning traffic over straight ahead movements. It is anticipated that the majority of movements will be north-south on the A10 and therefore an alternative road marking arrangement may be more appropriate to reduce the risk of sideswipe collisions at mainline exits.

Recommendation – It is recommended that an alternative road markings arrangement is provided for the circulatory carriageway. Partial concentric or concentric spiral markings are likely to be preferable to reduce the potential for conflict at the A10 exits.

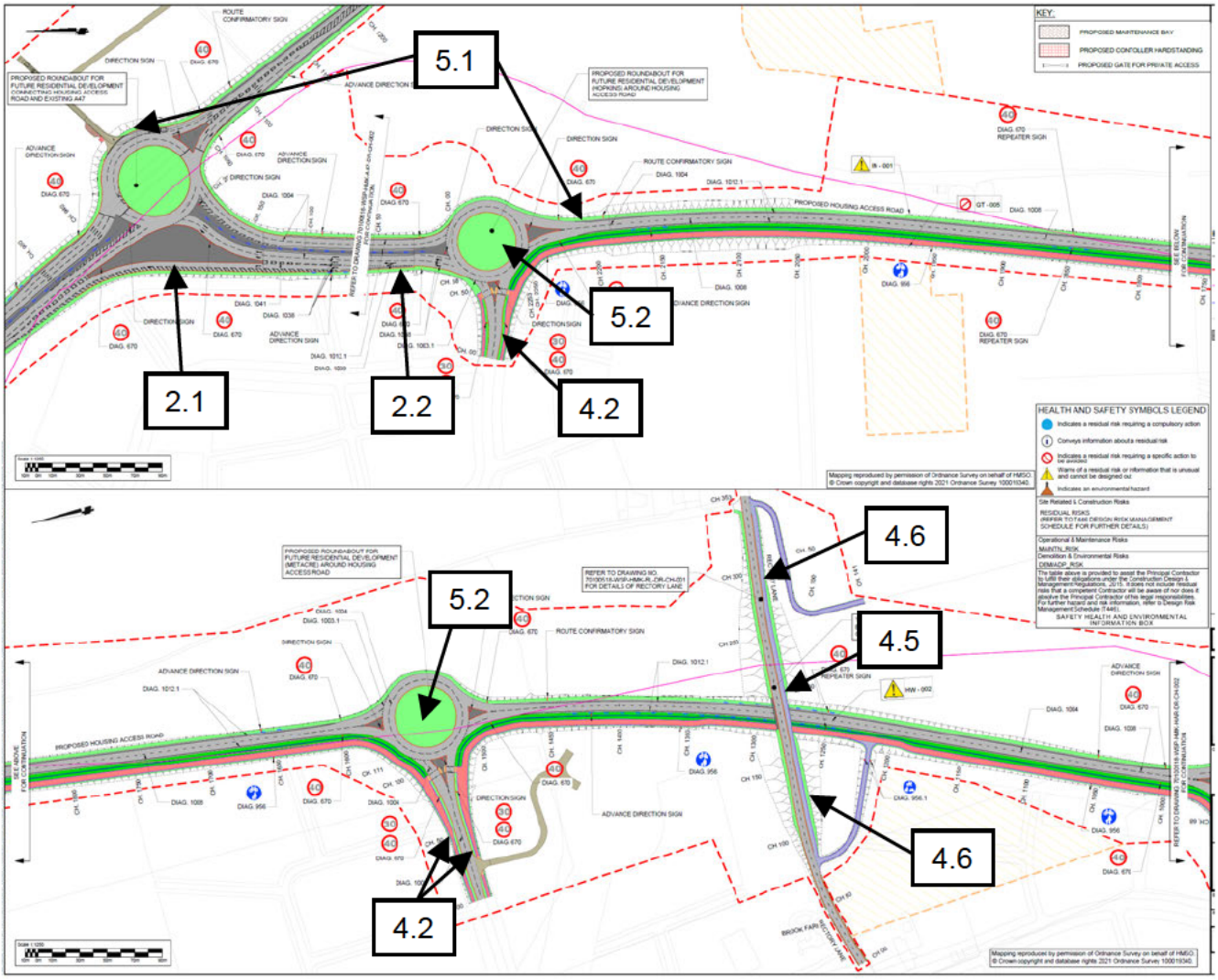
5.3 Problem – Collision with pedestrians in dark conditions

Location – New controlled crossing point CH650

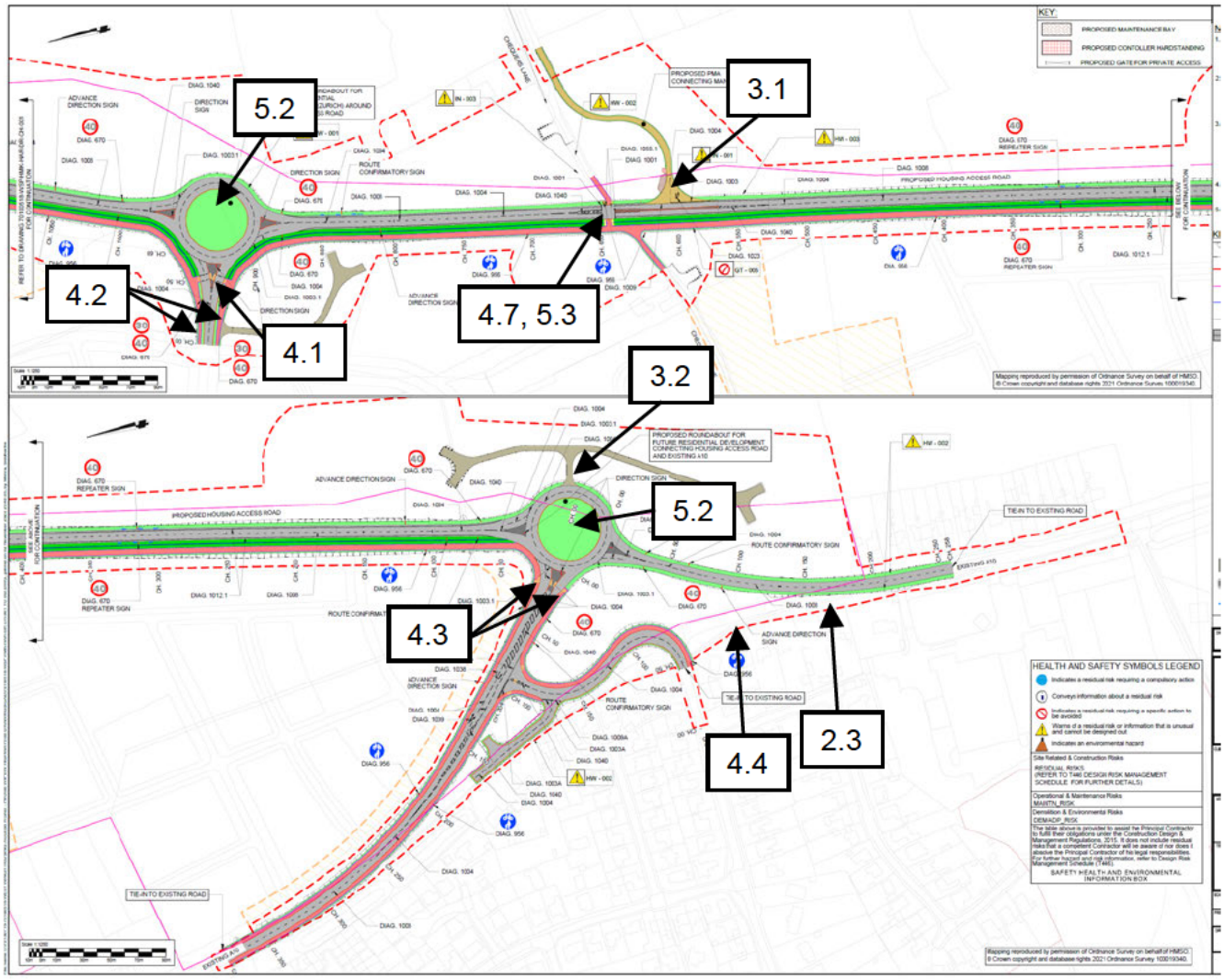
No details have been provided for whether all or part of the link road and its various junctions are to be street lit. It is conventional practice to provide street lighting on the immediate approaches to a controlled pedestrian crossing point. Its omission increases the risk of pedestrian collisions when they step out in to the carriageway in dark conditions.

Recommendation – It is recommended that the controlled crossing point is street lit.

6.0 Problem Location Plans



1.1, 1.2, 1.3, 2.4 – Throughout the housing access road



AUDIT TEAM STATEMENT

We certify that this audit has been carried out in accordance with GG 119 *Road Safety Audit*.

Signed (ATL) [redacted] Kevin Allen

Dated 19 December 2023

Signed [redacted] Julian Fonseka

Dated 01 December 2023

APPENDIX A: Audit Brief

The following documents were submitted for this Road Safety Audit:

Document Ref.	Scale (if applicable)	Title
70100518-WSP-GEN-WW-RP-CH-001	N/A	Audit Brief
70100518 series	various	Scheme drgs as listed in the Brief
3 yr road accident details	N/A	Provided by NCC
70100518-WSP-HRR-HAR-RP-CH-001	N/A	Housing Access Road RRAP Schedule
70100518-WSP-HRR-RL-RP-CH-001	N/A	Rectory Lane RRAP Schedule
WWHAR EIA	N/A	EIA Scoping Report
N/A	N/A	Traffic Modelling