

RSA Designer Response

ROAD SAFETY AUDIT STAGE 1/2

Project Title	Llay S278
Client	Bellway/Anwyl
Curtins Job Ref No:	065665
RSA Response Ref:	065665-CUR-00-XX-RP-D-9501-V01 Llay S278 RSA 1/2 Designer Response
RSA Report Ref:	610-2020-112-01 Llay Revised S278 Stage 1-2 RSA FINAL (included as Appendix A)

Problem Identified (Paragraph No)	Problem Accepted (YES/NO)	Recommendation Accepted (YES/NO/PART)	Response/Action (describe)
STRAIGHT MILE			
6.1 Location: Straight Mile at proposed junction Problem Summary: Possible reduced junction intervisibility due to existing vertical road alignment on Straight Mile It was observed during the site visit that the proposed junction is located to the west of an existing blind summit on Straight Mile. This may result in the visibility splay to the east of the junction being reduced due to the blind summit. A reduction in intervisibility at the proposed junction may increase the risk of collisions between those turning out of the access road and those travelling along Straight Mile. Additionally, this may also increase the risk of rear end shunt collisions on Straight Mile due to westbound drivers unaware of vehicles braking for the junction just over the blind summit. Recommendation The appropriate junction intervisibility splays in both the horizontal and vertical planes should be checked to ensure suitable intervisibility is provided between the proposed access and those travelling along Straight Mile. Amendments to the junction location should be carried out if appropriate intervisibility cannot be provided at its current location.	N	P	The location of the junction on Straight Mile is situated on a stretch of road that falls continuously from west to east for greater than 120 metres in each direction (as indicated by the road levels on drg. 9501). Intervisibility splays, both horizontally and vertically, comply with the requirements for a 40mph speed limit. No design modifications required.

Problem Identified (Paragraph No)	Problem Accepted (YES/NO)	Recommendation Accepted (YES/NO/PART)	Response/Action (describe)
STRAIGHT MILE			
6.2 Location: East of proposed junction Problem Summary: Possible reduced pedestrian/driver intervisibility due to existing vertical road alignment on Straight Mile It was observed during the site visit that the proposed uncontrolled pedestrian crossing to the east of the junction is located to the west of an existing blind summit on Straight Mile. This may result in the intervisibility between pedestrians crossing from the south and drivers travelling westbound being reduced due to the blind summit. A reduction in intervisibility between pedestrians and drivers may increase the risk of pedestrian/vehicular collisions. Recommendation In association with item 6.2 above the appropriate pedestrian/driver intervisibility splays in both the horizontal and vertical planes should be checked to ensure suitable intervisibility is provided between these users. Amendments to the uncontrolled crossing location should be carried out if appropriate intervisibility cannot be provided at its current location.	N	P	The location of the junction on Straight Mile is situated on a stretch of road that falls continuously from west to east for greater than 120 metres in each direction (as indicated by the road levels on drg. 9501). Intervisibility splays, both horizontally and vertically, comply with the requirements for a 40mph speed limit. No design modifications required.

Problem Identified (Paragraph No)	Problem Accepted (YES/NO)	Recommendation Accepted (YES/NO/PART)	Response/Action (describe)
STRAIGHT MILE			
6.3 Location: Eastbound approach to proposed junction Problem Summary: Non-standard arrow road marking layout may result in driver confusion Two ahead/turn-right road marking arrows are proposed on the eastbound approach to the junction. The provision of these arrows on a single lane approach to this type of junction is non-standard. This may lead to drivers being confused assuming they need to enter the hatched area in order to turn right and they may collide with the pedestrian refuge island. It is also noted there is a lack of deflection arrows on both approaches to the hatched road markings, which could increase the risk of drivers colliding with the central islands. Recommendation The two ahead/turn-right road marking arrows on the eastbound approach to the junction should be removed from the design. Deflection arrows at appropriate locations should be provided on the Straight Mile approaches to the hatched road markings.	Y	P	Non-standard arrow road marking deleted.
6.4 Location: Junction of proposed access road and Straight Mile Problem Summary: Lack of terminal speed limit signs The drawings provided for audit do not show any terminal speed limit signs at the junction of the proposed access road and Straight Mile. It is noted from the drawings for the Crown Crossroads that the speed limit on Straight Mile is being reduced to 40mph, and it is assumed that the access road will have a lower speed limit. If appropriate terminal speed limit signs are not provided, then vehicles may enter the access road at excessive speeds and may increase the severity of any collisions that may occur. Recommendation Appropriate terminal speed limit signs should be provided on the access road at the junction with Straight Mile.	Y	P	These are included on the S38 design for the estate road.

Problem Identified (Paragraph No)	Problem Accepted (YES/NO)	Recommendation Accepted (YES/NO/PART)	Response/Action (describe)
GRESFORD ROAD			
7.1 Location: South-eastbound carriageway at both proposed refuge islands Problem Summary: Risk of vehicles colliding with kerbs due to proposed carriageway alignment The proposed carriageway alignment on the south-eastbound carriageway both sides of the pedestrian refuge islands creates a severe change in horizontal alignment with relatively short taper lengths. This may increase the risk of vehicles colliding with the main kerblane or the refuge island. Recommendation The taper lengths both before and after the proposed refuge islands should be increased to provide a smoother horizontal alignment for south-eastbound vehicles.	N	N	Horizontal alignment changes use 60m radius curves as agreed with WCBC as a traffic calming measure (these were increased from 30m radii from initial design). Alignment has been tracked. Increasing the radii further to provide a smoother alignment will not have the desired speed reduction effect.

Problem Identified (Paragraph No)	Problem Accepted (YES/NO)	Recommendation Accepted (YES/NO/PART)	Action (describe)
CROWN CROSSROADS			
8.1 Location: Gresford Road northern uncontrolled pedestrian crossing point Problem Summary: Possible reduced pedestrian/driver intervisibility The location of the uncontrolled pedestrian crossing point on the northern side of Gresford Road may result in the intervisibility between pedestrians crossing from the north and drivers turning left from Straight Mile being reduced due to the boundary treatment on the east side of the junction. A reduction in intervisibility between pedestrians and drivers may increase the risk of pedestrian/vehicular collisions. Recommendation The appropriate pedestrian/driver intervisibility splays should be checked to ensure suitable intervisibility is provided between these users. The proposed boundary treatment should not obscure the intervisibility splay and the uncontrolled crossing should be relocated if required.	Y	Y	Boundary fence is Cheshire Rail so has good through visibility. Verge between back of footway and fence to be topsoil and grass seeded. WCBC to maintain verge so grass height does not exceed 600mm.

Problem Identified (Paragraph No)	Problem Accepted (YES/NO)	Recommendation Accepted (YES/NO/PART)	Action (describe)
GENERAL COMMENTS			
9.2 The proposed traffic sign on Gresford Road associated with the northern most refuge is shown on the drawing as Diag. 544.1. This sign is to be used where pedestrians are walking longitudinally along the carriageway where there are no footways. The signs to be used in the proposed situation would usually be Diag. 562 with the supplementary plate "Pedestrians crossing".	N	N	Not raised by the auditor as a safety issue. Clarification sought from WCBC Road Safety Officer and WCBC preference is for VAS to have Diag. 544.1 with ARAF SLOW beneath: 

Signed	
Name	Richard Manock
Job Title	Associate
Date	12.03.2020

Appendix A

610-2020-112-01 Llay Revised S278 Stage 1-2 RSA FINAL Report

STRAIGHT MILE, GRESFORD ROAD AND CROWN CROSSROADS, LLAY PROPOSED SECTION 278 HIGHWAY WORKS (REVISED DESIGN)

STAGE 1/2 ROAD SAFETY AUDIT

610/2020/112/01

23 February 2020

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REV	ISSUE STATUS	PREPARED BY/DATE	CHECKED BY/DATE	APPROVED BY/DATE
0	DRAFT	Jon Preston 22 February 2020	Tristan Brooks 22 February 2020	
1	FINAL	Jon Preston 23 February 2020	Tristan Brooks 23 February 2020	Jon Preston 23 February 2020

Disclaimer note

The client has confirmed that it is entering into the agreement under which this report is being prepared on its own behalf and not on behalf of, or for the benefit of any other party and has agreed that in any event of any claim arising out of or in connection with that agreement and/or the report itself it shall be entitled to recover from six:TEN Highways & Traffic Limited only the losses, if any, it has itself suffered.

This report therefore is for the private and confidential use of the client for whom it was prepared solely for the purposes requested by the client. It should not be reproduced in whole or in part or relied upon by any third party for any use whatsoever without the express written authority of six:TEN Highways & Traffic Limited.

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AUDITOR'S EVALUATION

MATTERS ARISING FROM THIS STAGE 1/2 ROAD SAFETY AUDIT

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1.0 INTRODUCTION

- 1.1 This report is a combined preliminary/detailed design Stage 1/2 Road Safety Audit (RSA) carried out on the proposed revised design Section 278 Highway Works at Llay, at the request of Curtins, who are Project Sponsor and have approved the audit team. The local highway authority is Wrexham County Borough Council.
- 1.2 The RSA team, staff members from six:TEN Highways & Traffic Ltd, present at the RSA were:
- Jon Preston MCIHT MSoRSA
Audit Team Leader
- Tristan Brooks Bsc (Hons), MBA, CMILT, MCIHT, MSoRSA, HE RSA Cert of Comp
Audit Team Member
- 1.3 We confirm that no member of the Audit Team has been involved with the design process.
- 1.4 The original site visit was carried out on 4 March 2019 between 14:15 and 15:15. The weather during the site visit was partially cloudy with a wet carriageway surface. A further site visit has not been carried out for the purpose of this updated RSA.
- 1.5 The RSA brief issued to the team comprised various elements listed at Appendix Two.
- 1.6 The terms of reference of the RSA are as described in the Design Manual for Roads and Bridges GG119 – Road Safety Audit. This standard has been used for guidance only. The RSA team has examined and reported only the road safety issues of the scheme as presented and has not examined or verified the compliance of the design to any other criteria.
- 1.7 All of the problems described in this report are considered by the RSA team to require action in order to improve the safety of the scheme and minimise collision occurrence. However, if any of the problems or recommendations within this Road Safety Audit report are not accepted, a copy of the signed exception report from the Overseeing Organisation should be sent to the Road Safety Audit Team Leader.
- 1.8 A plan showing the location of road safety problems raised in this report is included in Appendix Three.

2.0 PROPOSALS

The revised scheme involves the following Section 278 Highway Works:

- Straight Mile – Provision of a ghost-island right turn junction to provide access to a proposed residential development. Works include the provision of central refuge islands on both sides of the proposed access both with uncontrolled pedestrian crossing facilities;
- Gresford Road – Provision of a pedestrian refuge islands, including carriageway realignment to the northwest of the junction with Meadow Rise and near to the existing access to Oakfield Park Home Estate; and
- Crown Crossroads – Amendments to the existing traffic signal layout, including, widening of the Straight Mile approach to two lanes, upgrade to the traffic signal equipment with MOVA control and amendments to the existing road marking layout.

3.0 PERSONAL INJURY COLLISION HISTORY

- 3.1 Personal injury collision data was for the five-year period 2014 to 2018 was obtained from www.crashmap.co.uk. The location plan is shown in Appendix Six.
- 3.2 The collision data shows two collisions have occurred at the Crown Crossroads and one collision has occurred on Straight Mile in the vicinity of the proposed access.
- 3.3 All the collisions involved two vehicles and were classed as slight in severity.

4.0 TRAFFIC FLOW AND SPEED DATA

- 4.1 Traffic flow and speed data was not provided to the audit team.

5.0 DEPARTURES FROM STANDARD

- 5.1 No Departures from Standard have been highlighted to the RSA team.

MATTERS ARISING FROM THIS (STAGE 1/2) ROAD SAFETY AUDIT**6.0 STRAIGHT MILE PROPOSED ACCESS****6.1 Location: Straight Mile at proposed junction****Problem****Summary: Possible reduced junction intervisibility due to existing vertical road alignment on Straight Mile**

It was observed during the site visit that the proposed junction is located to the west of an existing blind summit on Straight Mile. This may result in the visibility splay to the east of the junction being reduced due to the blind summit. A reduction in intervisibility at the proposed junction may increase the risk of collisions between those turning out of the access road and those travelling along Straight Mile. Additionally, this may also increase the risk of rear end shunt collisions on Straight Mile due to westbound drivers unaware of vehicles braking for the junction just over the blind summit.

Recommendation

The appropriate junction intervisibility splays in both the horizontal and vertical planes should be checked to ensure suitable intervisibility is provided between the proposed access and those travelling along Straight Mile. Amendments to the junction location should be carried out if appropriate intervisibility cannot be provided at its current location.

6.2 Location: East of proposed junction**Problem****Summary: Possible reduced pedestrian/driver intervisibility due to existing vertical road alignment on Straight Mile**

It was observed during the site visit that the proposed uncontrolled pedestrian crossing to the east of the junction is located to the west of an existing blind summit on Straight Mile. This may result in the intervisibility between pedestrians crossing from the south and drivers travelling westbound being reduced due to the blind summit. A reduction in intervisibility between pedestrians and drivers may increase the risk of pedestrian/vehicular collisions.

Recommendation

In association with item 6.2 above the appropriate pedestrian/driver intervisibility splays in both the horizontal and vertical planes should be checked to ensure suitable intervisibility is provided between these users. Amendments to the uncontrolled crossing location should be carried out if appropriate intervisibility cannot be provided at its current location.

6.3 Location: Eastbound approach to proposed junction**Problem****Summary: Non-standard arrow road marking layout may result in driver confusion**

Two ahead/turn-right road marking arrows are proposed on the eastbound approach to the junction. The provision of these arrows on a single lane approach to this type of junction is non-standard. This may lead to drivers being confused assuming they need to enter the hatched area in order to turn right and they may collide with the pedestrian refuge island. It is also noted there is a lack of deflection arrows on both approaches to the hatched road markings, which could increase the risk of drivers colliding with the central islands.

Recommendation

The two ahead/turn-right road marking arrows on the eastbound approach to the junction should be removed from the design. Deflection arrows at appropriate locations should be provided on the Straight Mile approaches to the hatched road markings.

6.4 Location: Junction of proposed access road and Straight Mile**Problem****Summary: Lack of terminal speed limit signs**

The drawings provided for audit do not show any terminal speed limit signs at the junction of the proposed access road and Straight Mile. It is noted from the drawings for the Crown Crossroads that the speed limit on Straight Mile is being reduced to 40mph, and it is assumed that the access road will have a lower speed limit. If appropriate terminal speed limit signs are not provided, then vehicles may enter the access road at excessive speeds and may increase the severity of any collisions that may occur.

Recommendation

Appropriate terminal speed limit signs should be provided on the access road at the junction with Straight Mile.

7.0 GRESFORD ROAD

7.1 Location: South-eastbound carriageway at both proposed refuge islands

Problem

Summary: Risk of vehicles colliding with kerbs due to proposed carriageway alignment

The proposed carriageway alignment on the south-eastbound carriageway both sides of the pedestrian refuge islands creates a severe change in horizontal alignment with relatively short taper lengths. This may increase the risk of vehicles colliding with the main kerblines or the refuge island.

Recommendation

The taper lengths both before and after the proposed refuge islands should be increased to provide a smoother horizontal alignment for south-eastbound vehicles.

8.0 CROWN CROSSROADS

8.1 Location: Gresford Road northern uncontrolled pedestrian crossing point

Problem

Summary: Possible reduced pedestrian/driver intervisibility

The location of the uncontrolled pedestrian crossing point on the northern side of Gresford Road may result in the intervisibility between pedestrians crossing from the north and drivers turning left from Straight Mile being reduced due to the boundary treatment on the east side of the junction. A reduction in intervisibility between pedestrians and drivers may increase the risk of pedestrian/vehicular collisions.

Recommendation

The appropriate pedestrian/driver intervisibility splays should be checked to ensure suitable intervisibility is provided between these users. The proposed boundary treatment should not obscure the intervisibility splay and the uncontrolled crossing should be relocated if required.

9.0 GENERAL COMMENTS

9.1 The following issues are raised; however, they do not constitute a road safety hazard to the highway user and are therefore not classed as part of the Road Safety Audit procedure:

9.2 The proposed traffic sign on Gresford Road associated with the northern most refuge is shown on the drawing as Diag. 544.1. This sign is to be used where pedestrians are walking longitudinally along the carriageway where there are no footways. The signs to be used in the proposed situation would usually be Diag. 562 with the supplementary plate "Pedestrians crossing".

APPENDIX ONE**10.0 ROAD SAFETY AUDIT TEAM STATEMENT**

We certify that the audit has been carried out generally in accordance with the requirements set out in GG119. The problems identified have been noted in this report together with associated safety improvement suggestions which we recommend should be studied for implementation.

AUDIT TEAM LEADER

Jon Preston MCIHT MSoRSA
Director
six:TEN Highways & Traffic Ltd

Signed:



Date: 23 February 2020

AUDIT TEAM MEMBER

Tristan Brooks Bsc (Hons), MBA, CMILT, MCIHT, MSoRSA, HE RSA Cert of Comp

Traffic & Road Safety Engineer
six:TEN Highways & Traffic Ltd

Signed:



Date: 23 February 2020

APPENDIX TWO

11.0 LIST OF DRAWINGS AND DOCUMENTS PROVIDED TO THE AUDIT TEAM

Straight Mile

- 065665/7501 C03 Drainage and Contours
- 065665/9501 C03 General Arrangement
- 065665/9502 C03 Site Clearance
- 065665/9503 P01 Existing Topo Survey
- 065665/9504 C03 Traffic Signs and Road Markings
- 065665/9505 C05 Surfacing Layout
- 065665/9506 C04 Kerbs and Fencing

Gresford Road

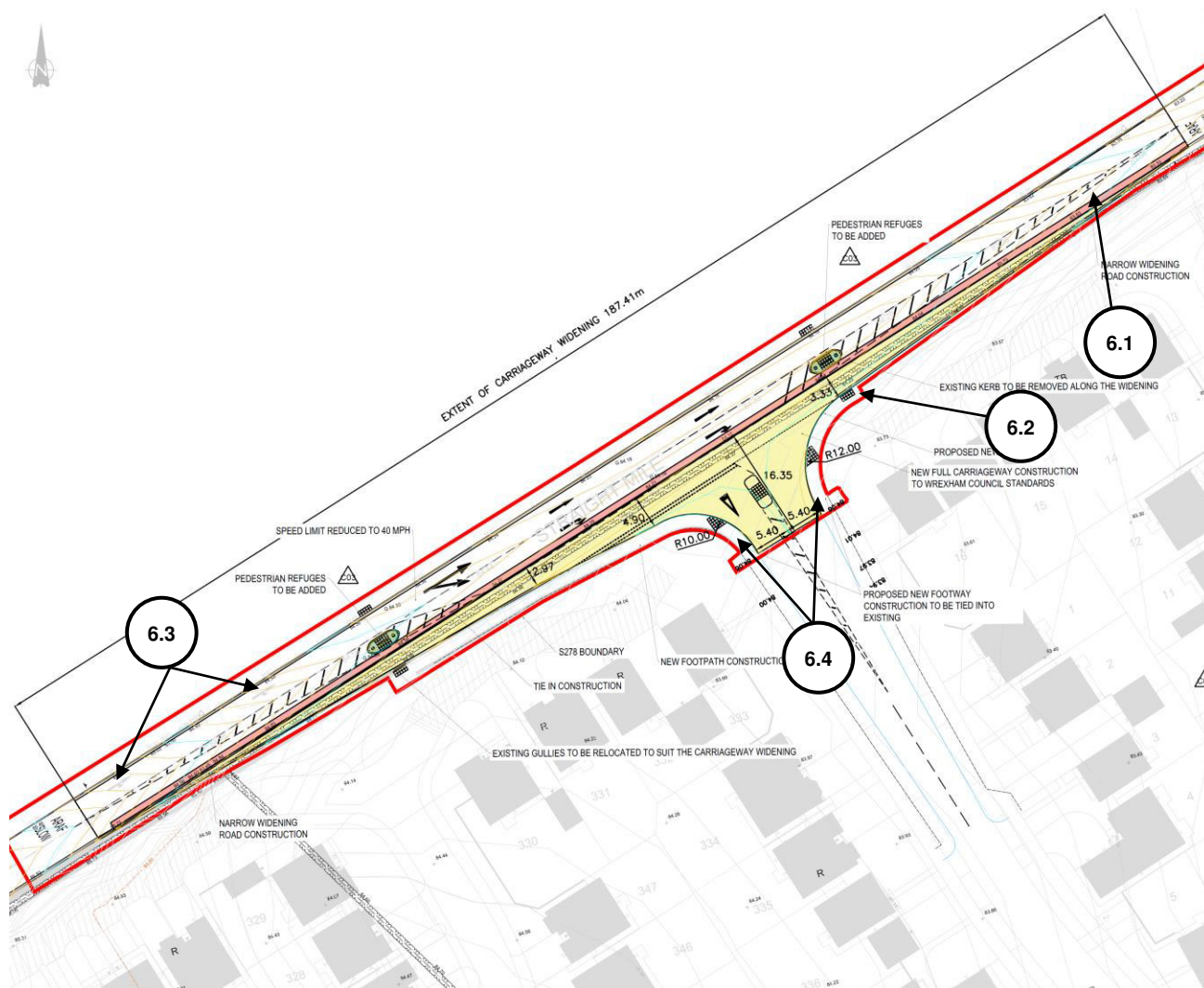
- 065665/9532 C05 Traffic Calming General Arrangement
- 065665/9541 C02 Pedestrian Refuge 1 General Arrangement
- 065665/9542 C03 Pedestrian Refuge 1 Kerbs and Road Markings
- 065665/9543 C04 Pedestrian Refuge 1 Surfacing
- 065665/9544 C02 Pedestrian Refuge 1 Construction Details
- 065665/9545 P01 Pedestrian Refuge 1 Swept Paths
- 065665/9551 C01 Pedestrian Refuge 2 General Arrangement
- 065665/9552 C01 Pedestrian Refuge 2 Kerbs and Road Markings
- 065665/9553 C01 Pedestrian Refuge 2 Surfacing
- 065665/9554 C01 Pedestrian Refuge 2 Construction Details
- 065665/9555 P01 Pedestrian Refuge 2 Swept Paths

Crown Crossroads

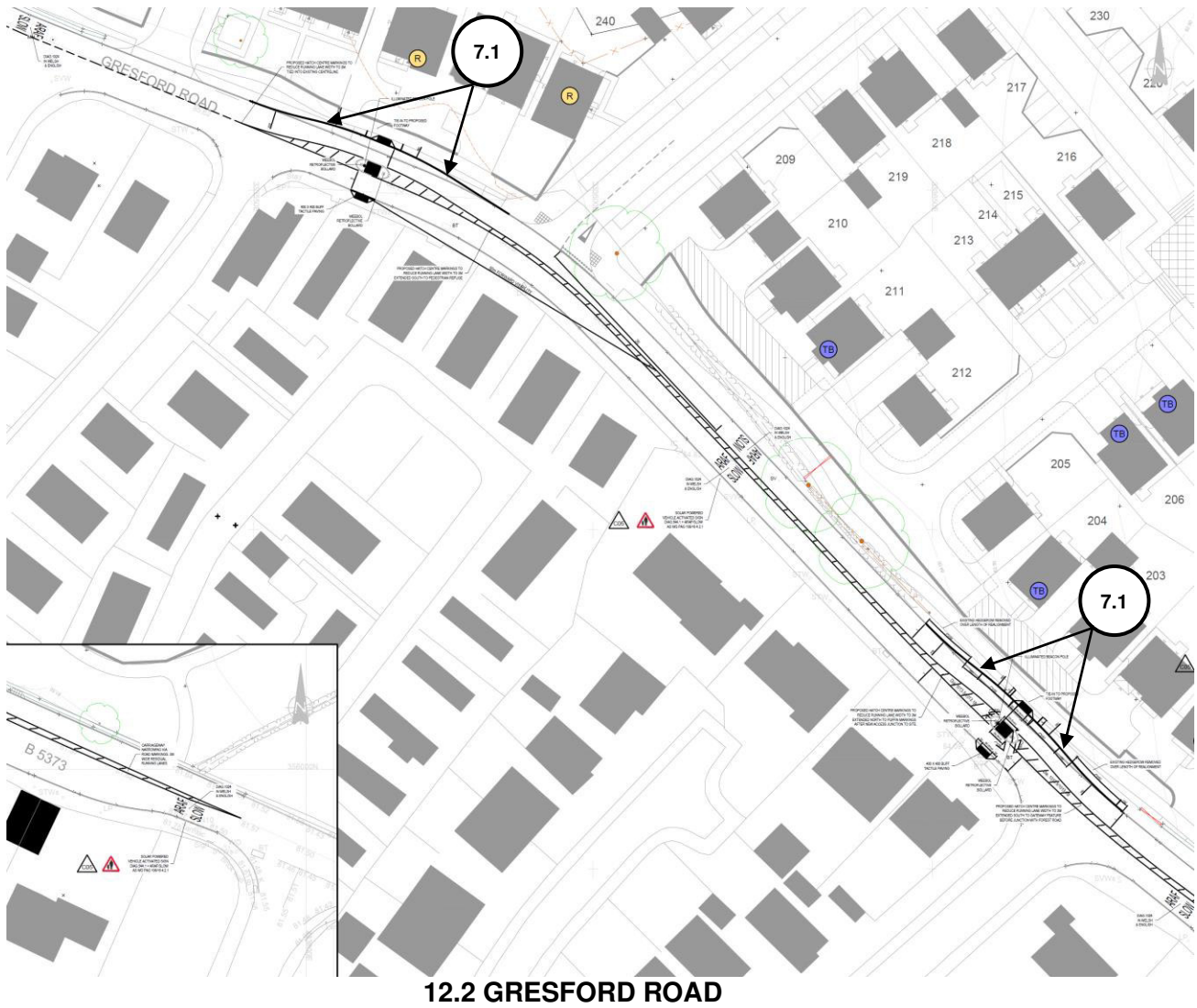
- 065665/9562 C03 MOVA Signal Design
- 065665/9563 C02 MOVA Magnetometer Design
- 065665/9564 C02 Traffic Signs and Road Markings
- 065665/9565 C02 Kerbs and Fencing
- 065665/9566 C02 Surfacing
- 065665/9567 C02 Vehicle Tracking
- 065665/9568 C01 Construction Details
- 065665/9569 P02 Existing Topo Survey

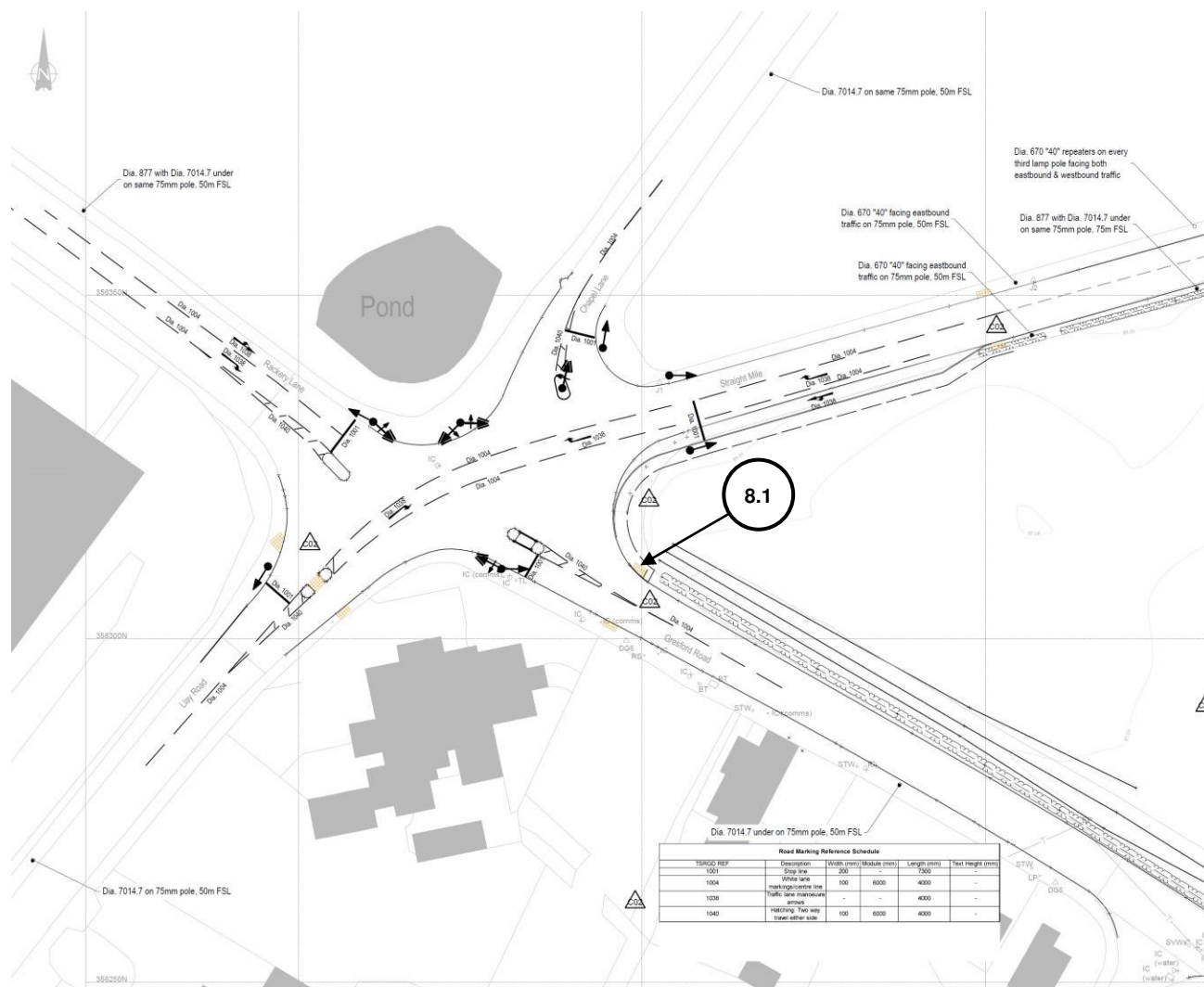
APPENDIX THREE

12.0 PROBLEM LOCATION PLAN



12.1 STRAIGHT MILE





12.3 CROWN CROSSROADS

APPENDIX FOUR

13.0 PERSONAL INJURY COLLISION LOCATION PLAN

