

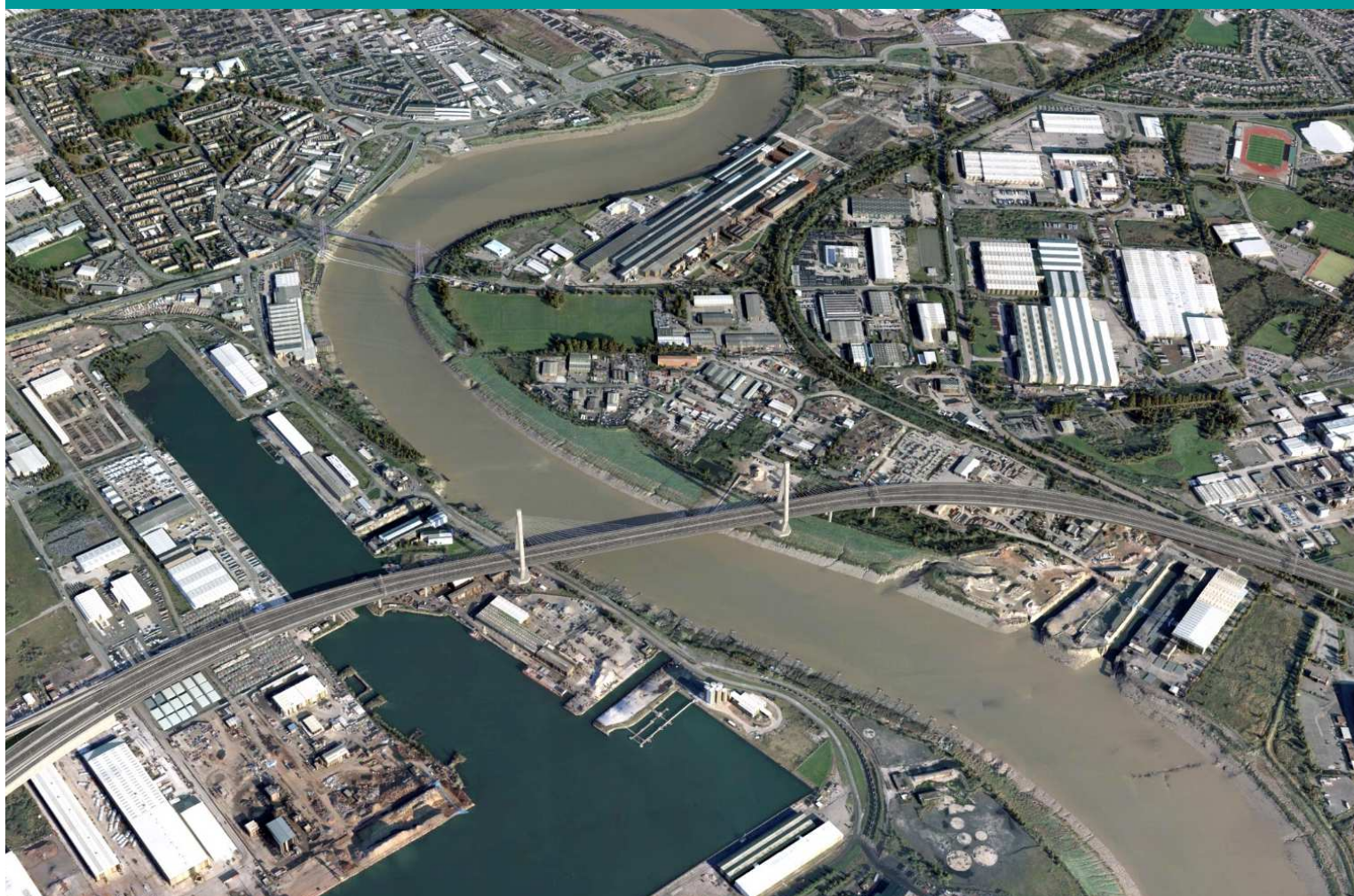


Llywodraeth Cymru  
Welsh Government

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# M4 Corridor around Newport

## Stage 1 Road Safety Audit Exception Report



Welsh Government

**M4 Corridor around Newport**

Stage 1 Road Safety Audit  
Exception Report

M4CaN-DJV-GEN-ZG\_GEN-RP-CH-0006

P03 | 7 December 2016

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## Authorisation Sheet

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**Project:** M4 Corridor around Newport

**Report Title:** Stage 1 Road Safety Audit Exception Report

### Prepared By:

**Name:** Martin W Bates C.Eng MICE

**Position:** Project Director

**Signed:** 

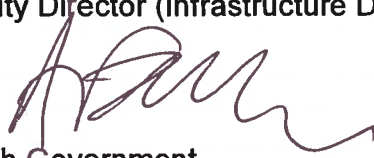
**Organisation:** Welsh Government

**Date:** 20/1/17

### Approved By:

**Name:** Andy Falley

**Position:** Deputy Director (Infrastructure Delivery)

**Signed:** 

**Organisation:** Welsh Government

**Date:** 20/1/17.

**Route Number:** M4

**Scheme:** M4 Corridor around Newport

**Road Safety Audit:** Stage 1

# 1 The Project

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## 1.1 Context

**1.1.1** The Welsh Government has awarded a Professional Services Contract for the next stage of Scheme development and environmental surveys for the M4 Corridor around Newport Project (the “Scheme”) up to publication of draft Orders and an Environmental Statement. The contract has been awarded to a Joint Venture of Costain, Vinci and Taylor Woodrow with consultants Arup and Atkins, supported by sub-consultant RPS. The team shall be developing proposals in anticipation of publishing draft Orders and an Environmental Statement in Spring 2016 and a Public Local Inquiry later that year. This process will then inform the next stage of Ministerial decision making.

**1.1.2** Since 1989 there have been various studies to identify the problems and propose possible solutions. The M4 Corridor around Newport WelTAG Stage 1 (Strategy Level) Appraisal concluded that a new section of 3-lane motorway to the south of Newport following a protected (TR111) route, in addition to complementary measures, would best achieve the goals and address the problems of the M4 Corridor around Newport and should be progressed for further appraisal. These options have subsequently formed the basis for the development of the draft Plan, which was published in September 2013 and was the subject of public consultation from September to December 2013.

**1.1.3** Having taken into account the responses to this participation process, as well as the assessments of the draft Plan, the Welsh Government has decided to publish a Plan for the M4 Corridor around Newport. Alongside this Plan, the Welsh Government has published updated strategy-level reports, including a Strategic Environmental Assessment Statement, to demonstrate how the participation process has informed its decision making. It also announced in July 2014 a revised preferred route, which will protect a corridor for planning purposes. These documents can be accessed from the website <http://m4newport.com>.

## 1.2 Scheme objectives and reason for the Scheme

**1.2.1** The aims of the Welsh Government for the M4 Corridor around Newport are to:

- a) Make it easier and safer for people to access their homes, workplaces and services by walking, cycling, public transport or road.
- b) Deliver a more efficient and sustainable transport network supporting and encouraging long-term prosperity in the region, across Wales, and enabling access to international markets.
- c) To produce positive effects overall on people and the environment, making a positive contribution to the over-arching Welsh Government goals to reduce greenhouse gas emissions and to making Wales more resilient to the effects of climate change.

**1.2.2** The Scheme aims to help to achieve or facilitate these aims as part of a wider transport strategy for South East Wales, as outlined within the Prioritised National Transport Plan.

**1.2.3** The Transport Planning Objectives (TPOs), or goals, are:



- TPO 1: Safer, easier and more reliable travel east-west in South Wales.
- TPO 2: Improved transport connections within Wales and to England, the Republic of Ireland and the rest of Europe on all modes on the international transport network.
- TPO 3: More effective and integrated use of alternatives to the M4, including other parts of the transport network and other modes of transport for local and strategic journeys around Newport.
- TPO 4: Best possible use of the existing M4, local road network and other transport networks.
- TPO 5: More reliable journey times along the M4 Corridor.
- TPO 6: Increased level of choice for all people making journeys within the transport Corridor by all modes between Magor and Castleton, commensurate with demand for alternatives.
- TPO 7: Improved safety on the M4 Corridor between Magor and Castleton.
- TPO 8: Improved air quality in areas next to the M4 around Newport.
- TPO 9: Reduced disturbance to people from high noise levels, from all transport modes and traffic within the M4 Corridor.
- TPO 10: Reduced greenhouse gas emissions per vehicle and/or person kilometre.
- TPO 11: Improved travel experience into South Wales along the M4 Corridor.
- TPO 12: An M4 attractive for strategic journeys that discourages local traffic use.
- TPO 13: Improved traffic management in and around Newport on the M4 Corridor.
- TPO 14: Easier access to local key services and residential and commercial centres.
- TPO 15: A cultural shift in travel behaviour towards more sustainable choices.

#### 1.2.4

The scheme-specific environmental objectives (EO), as set out in the Strategic Environmental Assessment of the Plan, are as follows:

- EO1: Improved air quality in areas next to the existing M4 around Newport;
- EO2a: Reduce greenhouse gas emissions per vehicle and/or person kilometre;
- EO2b: Ensure that effective adaptation measures to climate change are in place;
- EO3: Reduce disturbance to people from high noise levels, from all transport modes and traffic within the existing M4 Corridor;
- EO4: Ensure that biodiversity is protected, valued and enhanced;
- EO5: Improved access to all services and facilities and reduce severance;
- EO6: Protect and promote everyone's physical and mental wellbeing and safety;

- EO7: Reduce transport related contamination and safeguard soil function, quality and quantity;
- EO8: Minimise transport related effects on surface and groundwater quality, flood plains and areas of flood risk;
- EO9: Ensure the prudent and sustainable use of natural resources and energy;
- EO10: Ensure that diversity, local distinctiveness and cultural heritage are valued, protected, celebrated and enhanced;
- EO11: Ensure that landscape and townscape is properly valued, conserved and enhanced.

### 1.2.5

In addition, the Wales Transport Strategy includes the following environmental outcomes (WTSEO):

- Outcome 11: The sustainability of the transport infrastructure - Increase the use of more sustainable materials in our country's transport assets and infrastructure;
- Outcome 12: Greenhouse gas emissions - Reduce the impact of transport on greenhouse gas emissions;
- Outcome 13: Adapting to climate change - Adapt to the impacts of climate change;
- Outcome 14: Air pollution and other harmful emissions - Reduce the contribution of transport to air pollution and other harmful emissions;
- Outcome 15: The local environment - Improve the positive impact of transport on the local environment;
- Outcome 16: Our heritage - Improve the effect of transport on our heritage;
- Outcome 17: Biodiversity - Improve the impact of transport on biodiversity.

## 2 Introduction

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### 2.1 Scope of this Report

**2.1.1** This Road Safety Audit Exception Report relates to the Stage 1 Road Safety Audit Report (document reference: 8002-845-001F) for the proposed new motorway to the south of Newport and side roads as part of the M4 Corridor around Newport Scheme.

**2.1.2** As Project Director I have carefully considered the problems and recommendations in the Stage 1 Road Safety Audit Report and the Design Team's Road Safety Audit Response Report for each problem. As a result, I propose that the recommendations to the following problems should not be implemented:

- Problem 2
- Problem 5
- Problem 6
- Problem 37
- Problem 38
- Problem 39
- Problem 50
- Problem 52
- Problem 56
- Problem 59

**2.1.3** Therefore, I have produced this Exception Report for consideration by the Deputy Director (Infrastructure Delivery) with the request that they sign the Exception Report and indicate their acceptance or rejection. If accepted and signed by the Deputy Director, the Exception Report will be copied and attached to every copy of the Stage 1 Road Safety Audit Report.

**2.1.4** Risk Assessments for each exception are included in **Appendix A**.

### 2.2 Scope of the Stage 1 Road Safety Audit

**2.2.1** Atkins Arup Joint Venture (AAJV) was commissioned by the Joint Venture of Costain, Vinci and Taylor Woodrow on behalf of the client, Welsh Government, to undertake a Stage 1 Road Safety Audit (RSA) on the proposed new section of M4 motorway to the south of Newport. The proposals involve the provision of a new section of motorway and reclassification of the existing M4 motorway. Works associated with the reclassification of the existing M4 motorway are considered in a separate RSA.

**2.2.2** The Stage 1 RSA comprised a desktop review of the information provided in:

- the Stage 1 RSA Brief (document reference: M4CaN-DJV-HGN-ZG-GEN-RP-CH-0007, approved and signed 10/03/2016);



- a subsequent email and associated attachments detailing changes to Lighthouse Road access (dated Wednesday 30/03/2016); and
- a further subsequent email and associated attachments detailing changes to a revised version of the Departures from Standard Report (dated 19/04/2016) which replaces the version as issued with the RSA Brief.

**2.2.3** The RSA was been conducted with reference to the procedures and scope set out in the Welsh Government's 'Design Manual for Roads and Bridges' (DMRB), Volume 5, Section 2, Part 2, 'Road Safety Audit' Standard HD 19/15.

**2.2.4** Details of the information forming the RSA Brief, issued on behalf of the Design Organisation and approved by the Project Director, Martin Bates of Welsh Government, are included in **Appendix B**.

## **2.3 Report Structure**

**2.3.1** Following this introduction, the report is structured as follows:

- Chapter 3 provides information on the Key Personnel from the Overseeing Organisation, the Road Safety Audit Team and the Design Organisation.
- Chapter 4 details the issues raised by the Stage 1 RSA and the Design Team Responses.

## 3 Key Personnel

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### 3.1 Overseeing Organisation

- 3.1.1** Martin Bates  
Project Director Welsh Government
- 3.1.2** Andy Falley  
Deputy Director (Infrastructure Delivery) Welsh Government

### 3.2 Road Safety Audit Team

- 3.2.1** Fraser Arnot  
Team Leader BSc (Hons), MCIHT, CMILT  
Principal Consultant  
Atkins
- 3.2.2** Rob Hunt  
Team Member BEng (Hons), MSc (Eng), CEng, MICE, MCIHT  
Managing Consultant  
Atkins
- 3.2.3** Chris Evans  
Team Member BSc (Hons), PGDip, CEng MICE, MCIHT, MILT  
Associate Director  
Atkins
- 3.2.4** Tansin Brown  
Team Member IEng, AMICE, AMCIHT  
Senior Engineer  
Arup
- 3.2.5** Fraser Arnot, Rob Hunt and Chris Evans all hold a Highways England-approved Certificate of Competency in Road Safety Auditing gained via the TMS Consultancy course route.
- 3.2.6** Following issue of Revision 0 of the Stage 1 Road Safety Audit Report (document reference: 8002-845-001D Rev1), Chris Evans was no longer available to continue as an RSA Team Member. Subsequent revisions are therefore based upon an RSA Team of Fraser Arnot (Team Leader), Tansin Brown and Rob Hunt (Team Members).

### 3.3 Design Organisation

- 3.3.1** Ben Sibert  
BEng CEng FICE MStructE MCIHT  
Design Project Manager  
Arup
- 3.3.2** Andrew Jones  
BEng CEng MICE MIHT  
Highway Design Leader  
Arup

## 4 Items Raised at the Stage 1 Road Safety Audit

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This section details the issues raised by the Stage 1 RSA and the Design Team Responses. The issues have been presented by zone location and issue category, with issues relevant to all locations presented separately.

### 4.1 Zone 1

#### 4.1.1 Junctions

##### **PROBLEM 2**

Drawing: M4CaN-DJV-HGN-ZG-DR-CH-0002.

Location: Proposed Castleton Interchange links, diverges and merges, chainage 1500 to 4300.

Summary: The proximity and number of merges and diverges at the junction.

During quieter times, higher vehicle speeds would be expected through the interchange. The combination of the horizontal and vertical curvature and sequential diverges and merges could lead to loss of control collisions.

Furthermore, there could be differential speeds between vehicles on different links which, at the merges and diverges, could lead to side-swipe collisions.

This could be exacerbated by the differential between the proposed design speed and proposed speed limits where, for example, the links between two high standard roads are designed to 70kph design speeds but a derestricted speed limit is proposed to be in place.

##### **Recommendation**

The proposed Controlled Motorway should be retained as part of the proposals and should cover the entire proposed Castleton Interchange and all approaches. Enforcement of any speed limits should be included in the scheme and consideration should be given to a consistent (and permanent) reduced speed limit throughout the interchange.

##### **Design Team Response**

Disagree – The existing Controlled Motorway does not extend to the existing Junction 29 at Castleton. It begins/terminates at the neighbouring Junction 28 at Tredegar Park further east. The Welsh Government has no further proposals to extend the Controlled Motorway westwards.

The design speeds of Castleton Interchange mainline, interchange links and slip roads are fully in accordance with DMRB TD9/93 and TD22/06, 120kph, 85kph and 70kph respectively. With the exception of the visibility in eastbound lane 3 on the existing carriageway in advance of the interchange, there are no departures from standards. The westbound and eastbound interchange links would have an advisory speed limit of 50mph in accordance with the guidance in TD22/06.

For the reasons given above, the Designer does not agree with the Auditor's recommendation and would therefore seek an exception.

**Ben Sibert** Designer's Project Manager

Signature..... *B. C. Sibert*

Date..... *09/12/2016*

### Project Sponsor's Statement

I agree with the Design Team and consider the Road Safety Audit Recommendation to extend the existing Controlled Motorway to cover the entire proposed Castleton Interchange to be unnecessary.

I agree with the Design Team and consider the Road Safety Audit Recommendation to implement a permanent speed restriction to cover the entire proposed Castleton Interchange to be unnecessary.

Castleton Interchange has been designed in accordance with DMRB TD9/93 and TD22/06 (with the exception of the visibility in eastbound lane 3 on the existing carriageway) so I consider both measures to be unnecessary.

I propose that the Recommendation to extend the Controlled Motorway to cover the entire proposed Castleton Interchange, as suggested in Problem 2 in the Stage 1 Road Safety Audit, is not implemented.

I propose that the Recommendation to implement a permanent speed restriction throughout the entire proposed Castleton Interchange, as suggested in Problem 2 in the Stage 1 Road Safety Audit, is not implemented.

The Exception Report is presented to the Deputy Director (Infrastructure Delivery) for the final decision by:

**Martin W Bates** Project Director

Signature..... *MW Bates*

Date..... *20/1/17*

*On Lane provision on M4 w/B In/Out  
Candiff and A48M into M4 E/B are  
to be reviewed and explanation req'd  
as to why only single lane provision*

### FINAL DECISION

This Exception Report is/is not accepted by (delete as required):

**Andy Falley** Signature..... *AF*  
Deputy Director Infrastructure Delivery

Date..... *20/1/17*

## PROBLEM 5

Drawing: M4CaN-DJV-HGN-ZG\_GEN-DR-CH-0002.

Location: Castleton Interchange, westbound re-classified M4 in the vicinity of Interchange overbridge link C.

Summary: Reduced forward visibility to the diverge towards Cardiff.

On the westbound re-classified M4 alignment, users wishing to diverge towards Cardiff and the A48(M) would pass over the new M4. The combination of horizontal and vertical curvature and the proximity of the diverge raises concerns that users will have insufficient warning of the road layout ahead. This could result in sudden changes of lane or braking, leading to side-swipe or nose-to-tail collisions. At present the design does not incorporate countdown markers at this exit.

### Recommendation

The distance between the Castleton Interchange overbridge link C and the diverge should be increased. Alternatively, the horizontal and vertical radii on the approach to the diverge should be increased to improve visibility.

Notwithstanding the above, users should be provided with sufficient advanced warning about the downstream road layout prior to the overbridge. Information about lane selection and the distance to the bifurcation will be critical in guiding users into the correct lane at the correct time.

### Design Team Response

Disagree – This section of New M4 carriageway has a design speed of 85 kph in accordance with TD22/06 for an Interchange Link. An advisory 50 mph speed limit would be implemented on the interchange link which would help to reinforce this as an appropriate speed for the geometrical layout. The available visibility to the motorist in the nearside lane exceeds the desirable minimum requirements for the design speed. Additionally, there would be greater than 295m forward visibility to the bifurcation nosing from the centre of lane 2 which would be desirable for 120 kph design speed. The layout of the junction ahead would be conveyed via gantry and map type verge mounted signing and additionally, road markings to diagram 1010 would indicate a diverge, all in accordance with current guidance. The visibility to the overhead gantry signing would be in accordance with Local Transport Note 1/94.

As recommended by the auditor, users would be provided with sufficient advanced warning about the downstream road layout prior to the overbridge.

For the reasons given above, the Designer does not agree with the Auditor's recommendation and would therefore **seek an exception**.

**Ben Sibert** Designer's Project ManagerSignature..... Date..... **Project Sponsor's Statement**

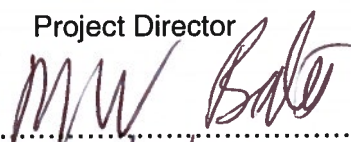

I agree with the Design Team and consider the Road Safety Audit Recommendation to increase the distance between Castleton Interchange overbridge link C and the diverge, or increase horizontal and vertical radii on the approach to the diverge, to be unnecessary.

The proposed visibility is greater than the desirable minimum for the appropriate design speed so I consider any measure to further increase visibility to be unnecessary.

I propose that the Recommendation to increase the distance between Castleton Interchange overbridge link C and the diverge, or increase horizontal and vertical radii on the approach to the diverge, as suggested in Problem 5 in the Stage 1 Road Safety Audit, is not implemented.

In relation to the Recommendation that users should be provided with sufficient advanced warning about the downstream road layout prior to the overbridge, I consider that the current design is in accordance with the Road Safety Audit Recommendation.

The Exception Report is presented to the Deputy Director (Infrastructure Delivery) for the final decision by:

**Martin W Bates** Project DirectorSignature..... Date..... **FINAL DECISION**

This Exception Report is/is not accepted by (delete as required):

Signature.....   
Deputy Director Infrastructure DeliveryDate..... 



## PROBLEM 6

Drawing: M4CaN-DJV-HGN-ZG\_GEN-DR-CH-0002.

Location: Eastbound A48(M) approach to Castleton Interchange.

Summary: Limited forward visibility to a bifurcation could lead to sudden manoeuvres.

Eastbound users entering Castleton Interchange from the A48(M) would pass through a crest curve and right hand bend immediately prior to the bifurcation to either the proposed M4 or the existing M4. The combination of horizontal and vertical curvature and the proximity of the diverge raises concerns that users will have insufficient warning of the road layout ahead. This could result in sudden changes of lane or braking, leading to side-swipe or nose-to-tail collisions.

### Recommendation

The horizontal and vertical radii should be increased on the approach to the diverge to improve visibility.

The proposed Controlled Motorway should be retained as part of the proposals and should cover the entire proposed Castleton Interchange and all approaches. Enforcement of any speed limits should be included in the scheme.

Notwithstanding this, users should be provided with sufficient advanced warning about the downstream road layout prior to the overbridge and crest/horizontal curve. Information about lane selection and the distance to the bifurcation will be critical in guiding users into the correct lane at the correct time.

### Design Team Response

Disagree – This section of carriageway has a design speed of 85 kph. An advisory 50 mph speed limit will be implemented on the interchange link which will help to reinforce this as an appropriate design speed for the geometrical layout. Desirable Minimum SSD to the bifurcation and the right hand bend is provided for the proposed design speed with a widened offside verge accommodating the visibility splay. The layout of the junction ahead will be conveyed via gantry and map type verge mounted signing and additionally, road markings to diagram 1010 will indicate a diverge, all in accordance with current guidance. The visibility to the overhead gantry signing is in accordance with Local Transport Note 1/94.

The existing Controlled Motorway does not extend to the existing Junction 29 at Castleton. It begins/terminates at the neighbouring Junction 28 at Tredegar Park further east. The Welsh Government has no further proposals to extend the Controlled Motorway westwards.

As recommended by the auditor, users would be provided with sufficient advanced warning about the downstream road layout prior to the bifurcation. For the reasons given above, the Designer does not agree with the Auditor's recommendation and would therefore **seek an exception**.

**Ben Sibert** Designer's Project Manager

Signature.....

Date.....

**Project Sponsor's Statement**

I agree with the Design Team and consider the Road Safety Audit Recommendation to increase horizontal and vertical radii to improve visibility on the approach to the diverge to be unnecessary because the proposed geometry complies with the current design standard.

The proposed visibility is greater than the desirable minimum for the appropriate design speed so I consider any measure to further increase visibility to be unnecessary. Additionally signs and road markings will be in place to warn the motorists of the road layout ahead.

Castleton Interchange has been designed in accordance with DMRB TD9/93 and TD22/06 (with the exception of the visibility in eastbound lane 3 on the existing carriageway) so I consider the measure to be unnecessary.

I propose that the Recommendation to increase horizontal and vertical radii to improve visibility on the approach to the diverge, as suggested in Problem 6 in the Stage 1 Road Safety Audit, is not implemented.

I propose that the Recommendation to extend the existing Controlled Motorway to cover the entire proposed Castleton Interchange, as suggested in Problem 6 in the Stage 1 Road Safety Audit, is not implemented.

In relation to the Recommendation that users should be provided with sufficient advanced warning about the downstream road layout prior to the overbridge and crest/horizontal curve, I consider that the current design is in accordance with the Road Safety Audit Recommendation.

The Exception Report is presented to the Deputy Director (Infrastructure Delivery) for the final decision by:

**Martin W Bates**

Project Director

Signature.....

Date.....

**FINAL DECISION**

This Exception Report is/is not accepted by (delete as required):

Andy Falley Signature.....  
Deputy Director Infrastructure Delivery

Date..... 20/1/17

## 4.2 Zone 4

### 4.2.1 Alignment

#### PROBLEM 37

Drawing: M4CaN - DJV - HGN - ZG\_GEN - DR - CH - 0096

Location: Nash Mead-Nash Road link.

Summary: Inadequate lane widths on a tight bend.

The proposed Nash Mead Diversion comprises a tight bend immediately adjacent to an industrial estate. Large vehicles would straddle the centre-line if the lane widths are not wide enough around the bend.

Opposing HGVs could collide if they are straddling the centre-line simultaneously.

#### Recommendation

Swept path analysis should be carried out for opposing HGVs on the bend and the lanes widened to accommodate them where appropriate.

#### Revised Design Team Response

Disagree – Nash road is currently 5.7m wide in the section directly north of the proposed bend and as such isn't suitable for two 2.55m wide HGV's to pass safely. The proposed bend would need to be widened to a minimum of 9m which would mislead HGV drivers regarding the suitability of the road to the north. Also the over wide carriageway would adversely reduce the perception of the layout and would attract debris build up in the relatively unused outer sections. Additionally it is assumed that the current prohibition of HGV's on Nash Road would be maintained as this is in keeping with the residential character of Nash Road to the North.

For the reasons given above, the Designer does not agree with the Auditor's recommendation and would therefore **seek an exception**

**Ben Sibert** Designer's Project Manager

Signature..... B.C. Sibert

Date..... 18/01/17

#### Project Sponsor's Statement

I agree with the Design Team and consider the Road Safety Audit Recommendation to widen the carriageway for two passing HGVs is unnecessary.

The proposed carriageway width is suitable for a car and a HGV to pass however even this is an unlikely scenario due to the character of Nash Road further north.

I propose that the Recommendation to widen lanes further, as suggested in Problem 37 in the Stage 1 Road Safety Audit, is not implemented.

The Exception Report is presented to the Deputy Director (Infrastructure Delivery) for the final decision by:

**Martin W Bates**

Project Director

Signature.....

Date.....

### FINAL DECISION

This Exception Report is/is not accepted by (delete as required):

**Andy Falley** Signature.....

Deputy Director Infrastructure Delivery

Date.....

### PROBLEM 38

Drawing: M4CaN - DJV - HGN -ZG\_GEN - DR - CH - 0099

Location: North Row.

Summary: Inadequate forward visibility on approach to a tight bend.

North Road would provide a link for cyclists, pedestrians and equestrians (to be promoted by Newport City Council) and the proposed alignment includes a tight bend on a 5% gradient.

All NMUs would be required to use the carriageway along North Row with no dedicated facilities provided. Traffic travelling from both directions may not have sufficient forward visibility to see slow-moving NMUs in the carriageway.

There is a risk of cyclists, pedestrians and equestrians being hit by traffic trying to overtake where there is insufficient visibility of oncoming traffic. This is considered to be a significant risk given the proximity of National Cycle Network (NCN Route 4) and an existing traffic free link on the A4810 where North Row could provide a vital link between the two. This is also relevant to the future aspirations of key stakeholders.

Additionally, drivers could lose control of their vehicles and traverse the proposed embankment and collide with vehicles on the proposed motorway, resulting in multiple fatalities.

## Recommendation

Appropriate SSD should be provided on the realigned section of North Row. The design should include dedicated NMU facilities to provide a safe link between NCN 4 and the traffic free link on the A4810.

## Design Team Response

Agreed – For vehicles travelling in a southerly direction, forward SSD of 90m is achieved over the crest curve to the 60m horizontal radius which represents Desirable Minimum SSD for 60kph. This is the maximum SSD achievable within the constraint on the horizontal and vertical alignment. Appropriate warning signs and road markings would be used to emphasise the road layout ahead and help control speeds to that appropriate for this type of road.

Disagree - There is no intention to provide segregated NMU facilities, such as a footpath, along the realigned North Row as agreed with Newport City Council. A dedicated path would be provided from the existing facility along the south of the A4810 and would link to the North Row carriageway via drop kerbs. NMU's would generally use the carriageway of the proposed North Row as they do in the existing situation.

For the reasons given above, the Designer does not agree with the Auditor's second recommendation and would therefore **seek an exception**

**Ben Sibert** Designer's Project Manager

Signature.....

Date.....

## Project Sponsor's Statement

I agree with the Design Team and consider the Road Safety Audit Recommendation to provide a dedicated NMU facility is unnecessary.

The NMU audit does not recommend a dedicated facility at this location and such a facility would add additional and unnecessary cost.

I propose that the Recommendation to provide a dedicated NMU facility on North Row, as suggested in Problem 38 in the Stage 1 Road Safety Audit, is not implemented.

The Exception Report is presented to the Deputy Director (Infrastructure Delivery) for the final decision by:

**Martin W Bates** Project Director

Signature.....

Date.....



**FINAL DECISION**

This Exception Report is ~~is not~~ accepted by (delete as required):

**Andy Falley** Signature.....  
Deputy Director Infrastructure Delivery

Date..... 19/12/16

**PROBLEM 39**

Drawing: M4CaN - DJV - HGN -ZG\_GEN - DR - CH - 0099

Location: North Row.

Summary: Carriageway width on a tight bend.

The horizontal alignment includes a tight bend and swept path analysis is provided for a large car on one side of the road and a light van on the other. Although there is a weight restriction on the road to Pye Corner (west), there are no such restrictions in place on approach to the A4810.

There is a risk of head-on collisions if the road is not wide enough and opposing vehicles cannot be seen around the tight bend in sufficient time to stop or slow down.

**Recommendation**

Swept path analysis should be undertaken for the largest vehicle that is able to use the road and widening included where required.

**Design Team Response**

Disagree – Carriageway widening on the bend has been provided, based on a vehicle tracking analysis representing a car passing a 14.5m articulated HGV. It would be completely unnecessary to provide widening for two HGV's to pass as this scenario is unlikely and would result in an excessive carriageway width prone to debris build up.

For the reasons given above, the Designer does not agree with the Auditor's second recommendation and would therefore **seek an exception**

**Ben Sibert** Designer's Project Manager

Signature..... B. C. Sibert

Date..... 09/12/2016



### Project Sponsor's Statement

I agree with the Design Team and consider the Road Safety Audit Recommendation to provide additional carriageway widening at the bend is unnecessary.

The proposed design includes widening for a car and a HGV to pass which is sufficient for the most likely scenario. Additional widening would be excessive as outlined by the designer.

I propose that the Recommendation to provide additional widening, as suggested in Problem 39 in the Stage 1 Road Safety Audit, is not implemented.

The Exception Report is presented to the Deputy Director (Infrastructure Delivery) for the final decision by:

**Martin W Bates** Project Director

Signature.....

Date.....19/12/16

### FINAL DECISION

This Exception Report is ~~is not~~ accepted by (delete as required):

**Andy Falley** Signature.....  
Deputy Director Infrastructure Delivery

Date.....23/12/16

## 4.3 Zone 5

### 4.3.2 Alignment

#### PROBLEM 50

Drawing: M4CaN-DJV-HGN-ZG\_GEN-DR-CH-0014.

Location: Magor Interchange - M48 eastbound dedicated lane.

Summary: Changes to horizontal and vertical curvature could lead to loss of control.

The M48 eastbound dedicated lane (to the north of the proposed Magor Interchange) encompasses relatively sharp changes to horizontal and vertical curvature. The combination of these changes and the proposed straight alignment on the approach to the Interchange could lead to loss of control collisions.

## Recommendation

The alignment of the dedicated lane should be amended to provide less severe horizontal and vertical deflection for vehicles through the proposed Interchange and appropriate signage should be provided to warn drivers of the road layout ahead.

## Design Team Response

Disagree – TD 51/03 advises that vehicle speeds should be reduced on the approach to segregated lanes at roundabouts and that high speeds through the junctions should be avoided. Making the alignment less severe would be likely to encourage higher speeds. Appropriate speed control measures in the form of signs and road markings on the approach in accordance with the Traffic Signs Regulations and General Directions (TSRGD) would be developed during the detailed design phase.

As recommended by the auditor, users would be provided with sufficient advanced warning about the road layout ahead.

For the reasons given above, the Designer does not agree with the Auditor's recommendation and would therefore **seek an exception**.

**Ben Sibert** Designer's Project Manager

Signature.....

*B. C. Sibert*

Date.....

*09/12/2016*

## Project Sponsor's Statement

I agree with the Design Team and consider the Road Safety Audit Recommendation to amend the alignment of the dedicated lane to provide less severe horizontal and vertical deflection to be inappropriate.

Making the alignment less severe would be likely to encourage higher speeds.

I propose that the Recommendation to amend the alignment of the dedicated lane to provide less severe horizontal and vertical deflection, as suggested in Problem 50 in the Stage 1 Road Safety Audit, is not implemented.

In relation to the Recommendation that appropriate signage should be provided to warn drivers of the road layout ahead, at detailed design the proposal will include appropriate Traffic Signs and Road Marking to warn drivers of the road layout ahead and therefore this element will be in accordance with the Road Safety Audit Recommendation.

The Exception Report is presented to the Deputy Director (Infrastructure Delivery) for the final decision by:

**Martin W Bates** Project Director

Signature.....

Date.....

**FINAL DECISION**This Exception Report is ~~is not~~ accepted by (delete as required):**Andy Falley** Signature.....

Deputy Director Infrastructure Delivery

Date.....

**PROBLEM 52**

Drawing: M4CaN-DJV-HGN-ZG\_GEN-DR-CH-0014.

Location: Proposed M4 westbound diverge loop to Caldicot Road.

Summary: Alignment may lead to loss of control collisions.

The proposed low radius of the diverge loop may be unexpected for some drivers as the approach to the loop is a free-flow link from the M4 to M48. Combined with a proposed downhill gradient, this could lead to loss of control collisions, particularly for HGVs.

**Recommendation**

The alignment of the westbound diverge loop to Caldicot Road should be amended to provide a smoother transition from the M4 to Caldicot Road.

**Design Team Response**

Disagree – The diverge loop radius has been designed to exceed the minimum required by TD22/06. Vehicles negotiating the loop would have made the conscious decision to diverge from the free-flow link following a map type ADS which would indicate to drivers a representation of the upcoming alignment of the loop.

However, appropriate speed control measures in the form of signs and road markings on the approach, in accordance with the TSRGD, would developed during the detailed design phase.

For the reasons given above, the Designer does not agree with the Auditor's recommendation and would therefore **seek an exception**.

**Ben Sibert** Designer's Project Manager

Signature.....

*B. C. Sibert*

Date.....

*09/12/2016*

### Project Sponsor's Statement

I agree with the Design Team and consider the Road Safety Audit Recommendation to amend the alignment of the westbound diverge loop to Caldicot Road to provide a smoother transition from the M4 to Caldicot Road to be unnecessary.

The diverge loop radius and gradient have been designed in accordance with DMRB TD22/06 so I consider the measure to be unnecessary.

I propose that the Recommendation to amend the alignment of the westbound diverge loop to Caldicot Road to provide a smoother transition from the M4 to Caldicot Road, as suggested in Problem 52 in the Stage 1 Road Safety Audit, is not implemented.

The Exception Report is presented to the Deputy Director (Infrastructure Delivery) for the final decision by:

**Martin W Bates** Project Director

Signature.....

*MW Bates*

*an advisory speed limit is to be provided*

Date.....

*19/12/16*

### FINAL DECISION

This Exception Report is ~~is not~~ accepted by (delete as required):

**Andy Falley** Signature.....  
Deputy Director Infrastructure Delivery

*Andy Falley*

Date.....

*8/12/16*

### 4.3.3 Junctions

#### PROBLEM 56

Drawing: M4CaN-DJV-HGN-ZG\_GEN-DR-CH-0014.

Location: Proposed Magor Interchange – M48 westbound approach.

**Summary:** Tight radius for movements from M48 to Caldicot Road roundabout. The contiguous entry and exit radii for the turning movement between the M48 westbound entry and the proposed link to the Caldicot Road roundabout would present a challenging route which could lead to loss of control collisions, particularly for HGVs, if taken at speed.

### Recommendation

The separation and radii of the M48 westbound entry and exit towards the Caldicot Road roundabout should be increased to provide an easier manoeuvre for vehicles.

### Design Team Response

Disagree - The M48 westbound entry and Caldicot Road exit radii (25m and 30m respectively) have been designed in accordance with the requirements of TD16/07 Geometric Design of Roundabouts. These radii are such that they are not considered problematic for the highlighted manoeuvre and are common for normal size roundabouts.

For the reasons given above, the Designer does not agree with the Auditor's recommendation and would therefore **seek an exception** in respect of this issue.

**Ben Sibert** Designer's Project Manager

Signature..... *B. C. Sibert*

Date..... *09/12/2016*

### Project Sponsor's Statement

I agree with the Design Team and consider the Road Safety Audit Recommendation to increase the separation and radii of the M48 westbound entry and exit towards the Caldicot Road roundabout to be unnecessary and may in fact impact adversely on roundabout entry path curvature.

The entry and exit radii have been designed in accordance with DMRB TS16/07 so I consider the measure to be unnecessary.

I propose that the Recommendation to increase the separation and radii of the M48 westbound entry and exit towards the Caldicot Road roundabout, as suggested in Problem 56 in the Stage 1 Road Safety Audit, is not implemented.

The Exception Report is presented to the Deputy Director (Infrastructure Delivery) for the final decision by:

**Martin W Bates** Project Director

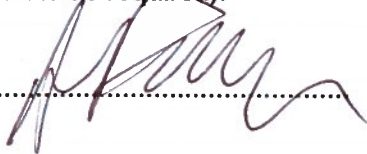
Signature..... *MW Bates* *require signage, contra dam marking & speed reduction measures*

Date..... *19/12/16*

## FINAL DECISION

This Exception Report is/is not accepted by (delete as required):

**Andy Falley** Signature.....  
Deputy Director Infrastructure Delivery



Date..... 9/12/16

## PROBLEM 59

Drawing: M4CaN-DJV-HGN-ZG\_GEN-DR-CH-0013.

Location: Proposed St Brides Road temporary diversion – J23a.

Summary: Additional arm on junction could result in vehicular collisions

The proposed temporary diversion of St Brides Road would add an additional arm to the existing J23a. The visibility from this arm appears constrained from the drawing, and there were relatively high circulatory speeds observed during the site visit. The RSA Team is concerned that an additional arm at this location could result in side swipe collisions.

Furthermore, St Brides Road is an NMU route which, if diverted via J23a, could result in an increase in NMU / vehicle collisions owing to the relatively high circulatory speeds in this location.

## Recommendation

An alternative temporary diversion route for St Brides Road should be provided.

## Design Team Response

An alternative temporary diversion route would need to be via Knollbury Lane or Rockfield Lane. Both of these would be closed for up to 12 months concurrent with the St Brides Road closure. They are also of a lower standard than St Brides Road and are not suitable for the volume of traffic, nor size of vehicles, that currently use St Brides Road.

The temporary layout and temporary traffic management would be developed during the detailed design phase to maximise visibility, minimise circulatory speeds and accommodate NMUs. This could include signalisation of the slip road entry, gyratory and temporary arm for the duration of its use.

However, for the reasons given above, the Designer does not agree with the Auditor's recommendation and would therefore **seek an exception** in respect of this issue.



**Ben Sibert** Designer's Project ManagerSignature..... *B. C. Sibert*Date..... *09/12/2016***Project Sponsor's Statement**

I agree with the Design Team and consider the Road Safety Audit Recommendation to provide an alternative temporary diversion route for St Brides Road to be not viable or proportionate.

The alternative side roads, Knollbury Lane and Rockfield lane, are not suitable for the traffic that uses St Brides Road and they also require closing during construction.

I propose that the Recommendation to provide an alternative temporary diversion route for St Brides Road, as suggested in Problem 59 in the Stage 1 Road Safety Audit, is not implemented. I proposed that the Design Team's alternative proposal to further develop the temporary layout and traffic management during detailed design to maximise visibility, minimise circulatory speeds and accommodate NMUs is implemented instead.

The Exception Report is presented to the Deputy Director (Infrastructure Delivery) for the final decision by:

**Martin W Bates** Project DirectorSignature..... *MW Bates* *access at roundabout needs careful consideration*Date..... *19/12/16***FINAL DECISION**

This Exception Report is ~~is not~~ accepted by (delete as required):

**Andy Falley** Signature..... *[Signature]*  
Deputy Director Infrastructure DeliveryDate..... *19/12/16*

# Appendix A

## Risk Assessments

## A1 Risk Assessments

RSA1 Problem Number	Risk Item	Unmitigated Risk associated with RSA1 Problem (without proposed mitigations)				Mitigated Risk associated with RSA1 Problem (including proposed mitigations)				Mitigation Measures
		Likelihood of Harm 1-5	Severity of Harm 1-5	Risk Score	H,M or L	Likelihood of Harm 1-5	Severity of Harm 1-5	Risk Score	H,M or L	
Existing Controlled Motorway at Castleton Interchange										
Problem 2	The proximity and number of merges and diverges at the junction could lead to loss of control collisions.	2	2	4	L	1	2	2	L	The slip roads are designed to have geometry based on a design speed of 70kph as per the DMRB. The west bound and eastbound interchange links would have an advisory speed limit of 50mph.
Castleton Interchange Geometry										
Problem 5	Combination of horizontal and vertical curvature on the interchange link, combined with the proximity of the diverge, has raised the concern that there would be insufficient warning of the road ahead.	2	2	4	L	1	2	2	L	The interchange links are designed to have geometry based on a design speed of 85kph as per the DMRB. An advisory speed limit of 50mph would be implemented on the interchange link.
Castleton Interchange Geometry										
Problem 6	Limited forward visibility to a bifurcation could lead to sudden manoeuvres.	2	2	4	L	1	2	2	L	The interchange links are designed to have geometry based on a design speed of 85kph as per the DMRB. An advisory speed limit of 50mph would be implemented on the interchange link along with a gantry map style sign to warn of the layout ahead.

RSA1 Problem Number	Risk Item	Unmitigated Risk associated with RSA1 Problem (without proposed mitigations)				Mitigated Risk associated with RSA1 Problem (including proposed mitigations)				Mitigation Measures
		Likelihood of Harm 1-5	Severity of Harm 1-5	Risk Score	H,M or L	Likelihood of Harm 1-5	Severity of Harm 1-5	Risk Score	H,M or L	
Nash Mead Width at Bend										
Problem 37	Inadequate lane widths on a tight bend leading to collisions between opposing HGVs if they are straddling the centre-line simultaneously. The designer considers that the hazard identified by the auditor is unlikely to occur.	1	2	2	L					None proposed – the designer considers that the hazard identified by the auditor is unlikely to occur. Swept path analysis has been undertaken and sufficient width provided for a car and a HGV to pass.None proposed.
Dedicated NMU facilities at North Row										
Problem 38	Risk of cyclists, pedestrians and equestrians being hit by traffic trying to overtake where there is insufficient visibility of oncoming traffic.The designer considers that the hazard identified by the auditor is unlikely to occur.	1	2	2	L					None proposed – the designer considers that the hazard identified by the auditor is unlikely to occur. A dedicated path would be provided from the existing facility along the south of the A4810 and would link to the North Row carriageway via drop kerbs. NMU's would generally use the carriageway of the proposed North Row as they do in the existing situation. None proposed.
North Row Width at Bend										
Problem 39	Risk of head-on collisions if the road is not wide enough and opposing vehicles cannot be seen around the tight bend in sufficient time to stop or slow down.	1	2	4	L					None proposed – the designer considers that the hazard identified by the auditor is unlikely to occur. Swept path analysis has been undertaken and sufficient width provided for a car and a HGV to pass.

RSA1 Problem Number	Risk Item	Unmitigated Risk associated with RSA1 Problem (without proposed mitigations)				Mitigated Risk associated with RSA1 Problem (including proposed mitigations)				Mitigation Measures
		Likelihood of Harm 1-5	Severity of Harm 1-5	Risk Score	H,M or L	Likelihood of Harm 1-5	Severity of Harm 1-5	Risk Score	H,M or L	
Magor Interchange dedicated lane										
Problem 50	Changes to horizontal and vertical curvature could lead to loss of control.	2	2	4	L	1	2	2	L	The designer does not agree with the auditor. The 'severity' of the approach geometry would contribute toward encouraging appropriate speeds on the entrance to the gyratory. Advance warning signs on the approach to the roundabout would be provide.
Magor Interchange diverge loop radius										
Problem 52	Low radius on diverge loop may lead to loss of control collisions.	2	2	4	L	1	2	2	L	Signs and road markings would be used to influence appropriate speeds.
Caldicot Road Roundbaout										
Problem 56	Tight radius for movements from M48 to Caldicot Road roundabout could lead to loss of control collisions.	1	1	1	L					None proposed – the designer considers that the hazard identified by the auditor is unlikely to occur.
St Bridges Road temporary diversion										
Problem 59	Additional temporary arm on junction could result in vehicle collisions.	2	2	4	L	1	2	2	L	Traffic management would be installed and maintained for the duration of the presence of the temporary diversion.

## **Appendix B**

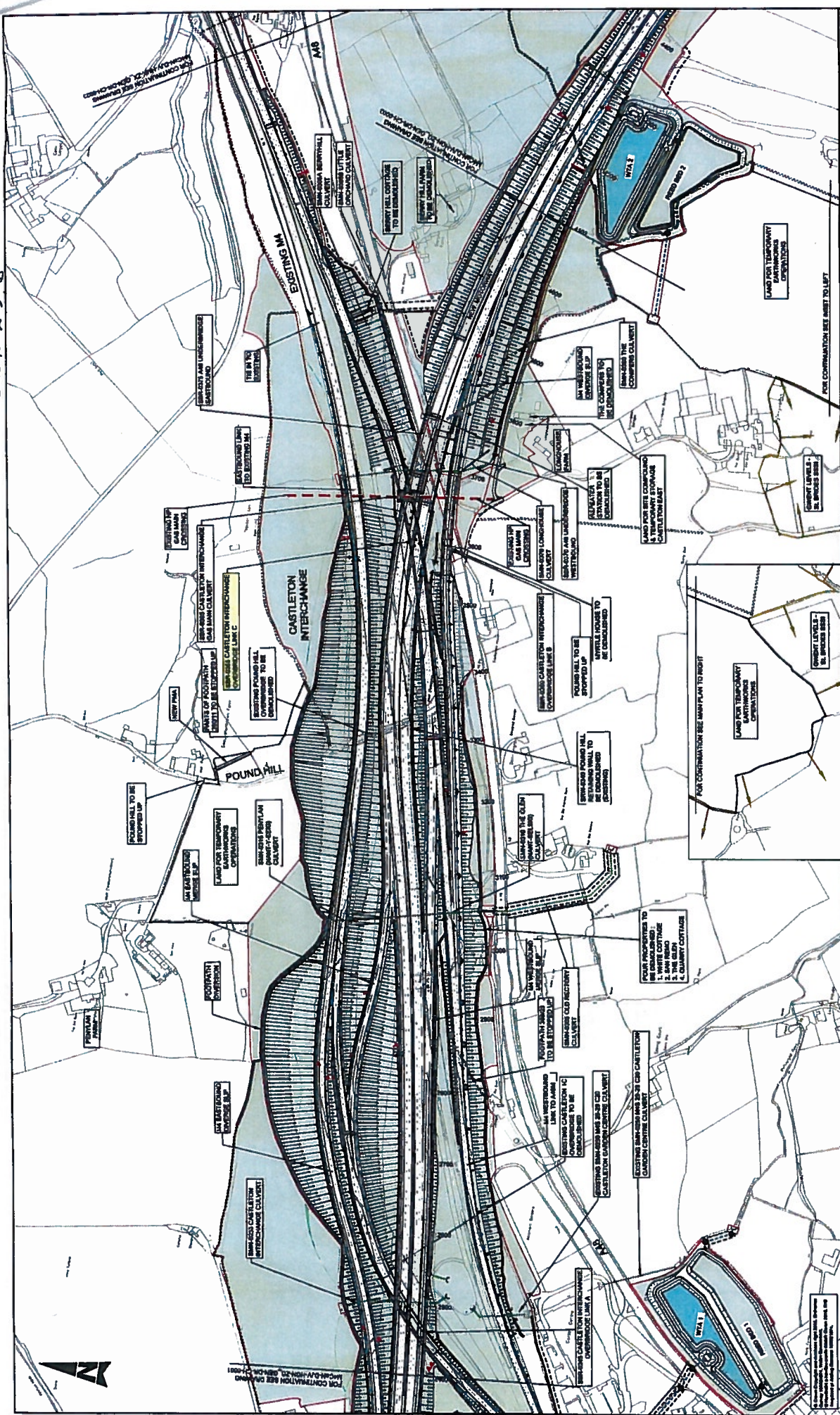
### Location Plans



## **B1      Location Plans**

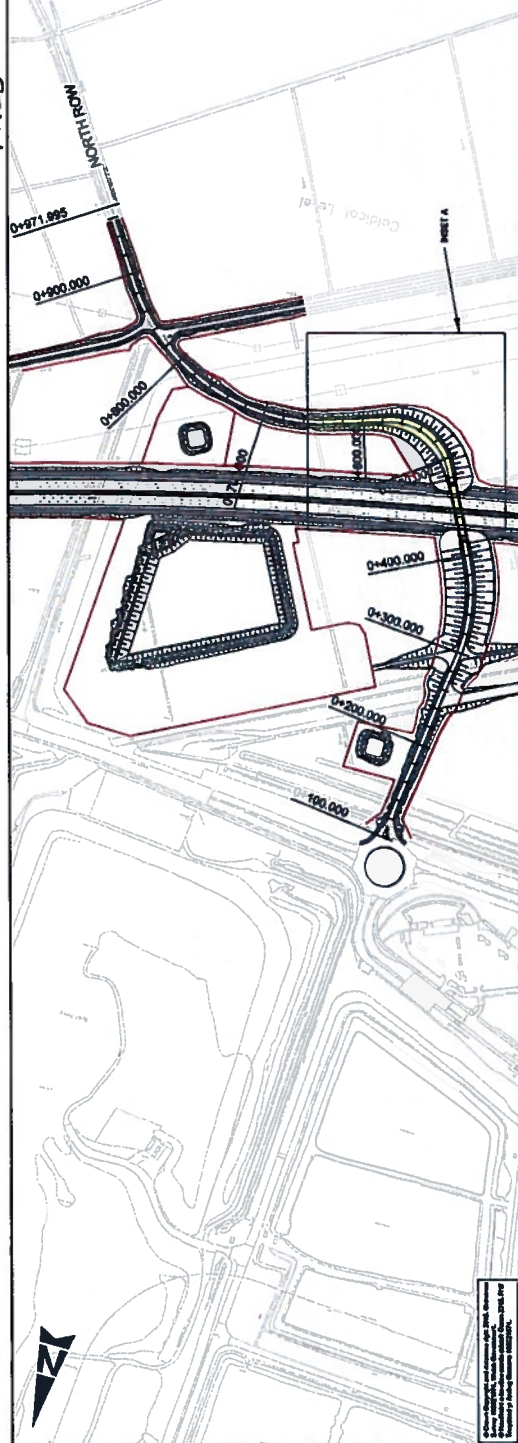
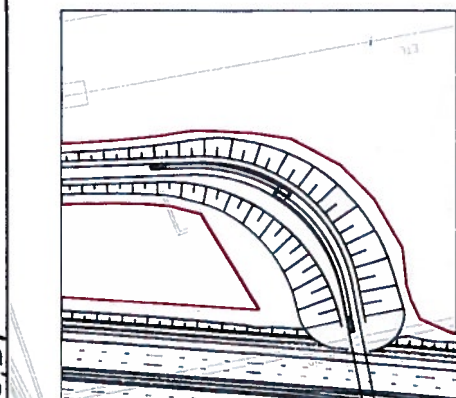
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## PROBLEMS 256

[illegible]

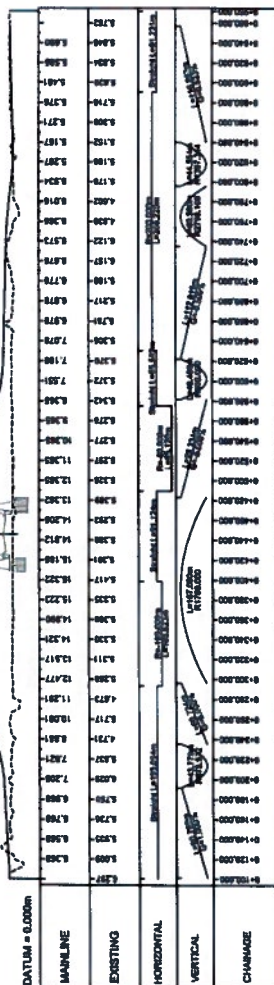






PLAN  
SCALE 1:2500

SEE NORTH ROW  
OVERPASS

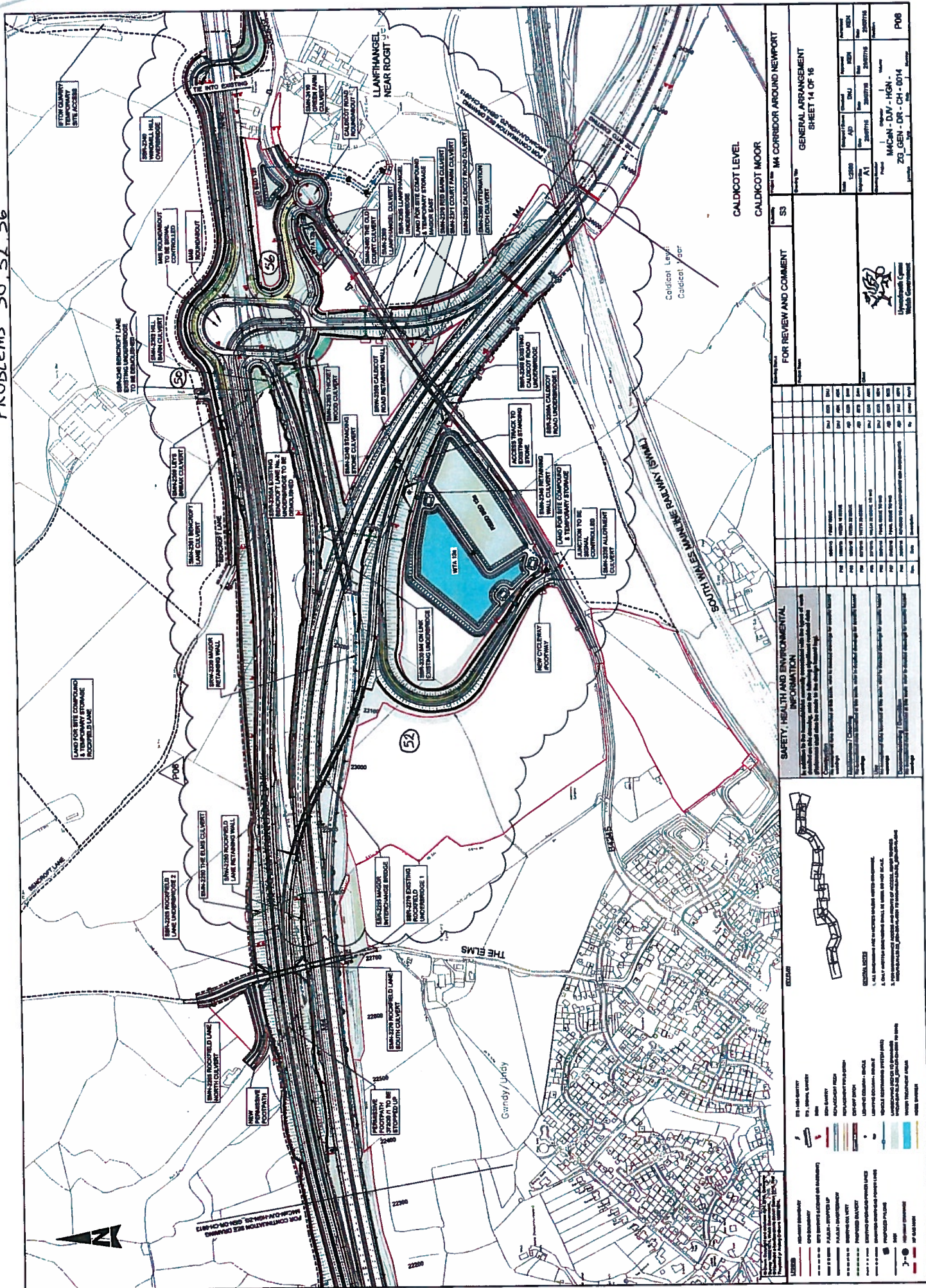


PROFILE  
SCALE 1:2500 HORIZONTAL 1:500 VERTICAL

<p><b>GENERAL NOTES</b></p> <p>1. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SPECIFIED.</p> <p>2. EXISTING CONDITIONS SHALL BE MAINTAINED UNLESS OTHERWISE SPECIFIED.</p> <p>3. THE PROPOSED DESIGN SHALL BE MAINTAINED UNLESS OTHERWISE SPECIFIED.</p> <p>4. THE PROPOSED DESIGN SHALL BE MAINTAINED UNLESS OTHERWISE SPECIFIED.</p>		<p><b>SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION</b></p> <p>1. THE PROPOSED DESIGN SHALL BE MAINTAINED UNLESS OTHERWISE SPECIFIED.</p> <p>2. THE PROPOSED DESIGN SHALL BE MAINTAINED UNLESS OTHERWISE SPECIFIED.</p> <p>3. THE PROPOSED DESIGN SHALL BE MAINTAINED UNLESS OTHERWISE SPECIFIED.</p> <p>4. THE PROPOSED DESIGN SHALL BE MAINTAINED UNLESS OTHERWISE SPECIFIED.</p>		<p><b>FOR REVIEW AND COMMENT</b></p> <p>1. THE PROPOSED DESIGN SHALL BE MAINTAINED UNLESS OTHERWISE SPECIFIED.</p> <p>2. THE PROPOSED DESIGN SHALL BE MAINTAINED UNLESS OTHERWISE SPECIFIED.</p> <p>3. THE PROPOSED DESIGN SHALL BE MAINTAINED UNLESS OTHERWISE SPECIFIED.</p> <p>4. THE PROPOSED DESIGN SHALL BE MAINTAINED UNLESS OTHERWISE SPECIFIED.</p>		<p><b>PLAN AND PROFILE NORTH ROW</b></p> <p>1. THE PROPOSED DESIGN SHALL BE MAINTAINED UNLESS OTHERWISE SPECIFIED.</p> <p>2. THE PROPOSED DESIGN SHALL BE MAINTAINED UNLESS OTHERWISE SPECIFIED.</p> <p>3. THE PROPOSED DESIGN SHALL BE MAINTAINED UNLESS OTHERWISE SPECIFIED.</p> <p>4. THE PROPOSED DESIGN SHALL BE MAINTAINED UNLESS OTHERWISE SPECIFIED.</p>	
<p><b>EXTENSION</b></p> <p>1. THE PROPOSED DESIGN SHALL BE MAINTAINED UNLESS OTHERWISE SPECIFIED.</p> <p>2. THE PROPOSED DESIGN SHALL BE MAINTAINED UNLESS OTHERWISE SPECIFIED.</p> <p>3. THE PROPOSED DESIGN SHALL BE MAINTAINED UNLESS OTHERWISE SPECIFIED.</p> <p>4. THE PROPOSED DESIGN SHALL BE MAINTAINED UNLESS OTHERWISE SPECIFIED.</p>		<p><b>REVISIONS</b></p> <p>1. THE PROPOSED DESIGN SHALL BE MAINTAINED UNLESS OTHERWISE SPECIFIED.</p> <p>2. THE PROPOSED DESIGN SHALL BE MAINTAINED UNLESS OTHERWISE SPECIFIED.</p> <p>3. THE PROPOSED DESIGN SHALL BE MAINTAINED UNLESS OTHERWISE SPECIFIED.</p> <p>4. THE PROPOSED DESIGN SHALL BE MAINTAINED UNLESS OTHERWISE SPECIFIED.</p>		<p><b>APPROVED</b></p> <p>1. THE PROPOSED DESIGN SHALL BE MAINTAINED UNLESS OTHERWISE SPECIFIED.</p> <p>2. THE PROPOSED DESIGN SHALL BE MAINTAINED UNLESS OTHERWISE SPECIFIED.</p> <p>3. THE PROPOSED DESIGN SHALL BE MAINTAINED UNLESS OTHERWISE SPECIFIED.</p> <p>4. THE PROPOSED DESIGN SHALL BE MAINTAINED UNLESS OTHERWISE SPECIFIED.</p>		<p><b>PROJECT INFORMATION</b></p> <p>1. THE PROPOSED DESIGN SHALL BE MAINTAINED UNLESS OTHERWISE SPECIFIED.</p> <p>2. THE PROPOSED DESIGN SHALL BE MAINTAINED UNLESS OTHERWISE SPECIFIED.</p> <p>3. THE PROPOSED DESIGN SHALL BE MAINTAINED UNLESS OTHERWISE SPECIFIED.</p> <p>4. THE PROPOSED DESIGN SHALL BE MAINTAINED UNLESS OTHERWISE SPECIFIED.</p>	

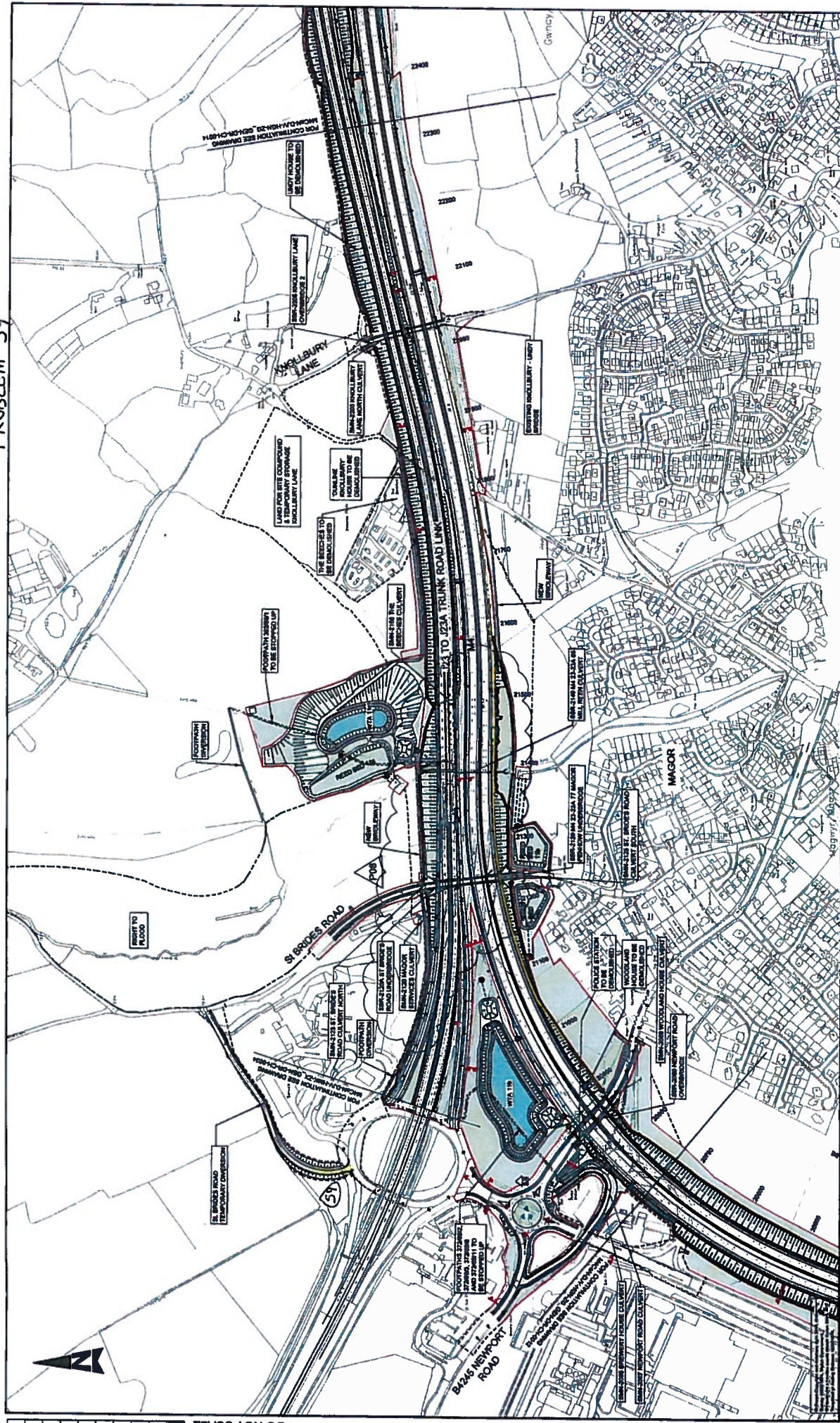


DO NOT SCALE





### PROBLEM 59



DO NOT SCALE

[illegible]