

**N2 Monaghan Town to Emyvale, County Monaghan  
Proposed Pavement and Minor Improvement Scheme**

**Coolkill East – Corracrin,  
Part 8 Application, July 2011**

**Appendix 4: Road Safety Audits**

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Stage 1 Road Safety Audit, Phase 2

Stage 1 Road Safety Audit, Phase 4

**N2 Monaghan to Emyvale Road Improvements – Phase 2**  
Monaghan County Council

**Stage 1 Road Safety Audit**  
April 2011

# N2 Monaghan to Emyvale Road Improvements

## Phase 2 (Ref. No MN/11/7585)

Ref

## Stage 1 Road Safety Audit

**March 2011**

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### Document History

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A	Text Changes	DOC	TL	DOC	TL	Mar 2011
-		DOC	TL	DOC	TL	Mar 2011
Revision	Purpose Description	Originated	Checked	Reviewed	Authorised	Date

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# 1. INTRODUCTION

- 1.1 In February 2011 Atkins were commissioned by Monaghan County Council to undertake a Stage 1 Road Safety Audit of Phase 2 of the proposed N2 Monaghan to Emyvale Road Improvements, located north of Monaghan Town.
- 1.2 The study was undertaken by Traffic and Transport Engineer, Déaglán O' Connor and Senior Traffic and Transport Engineer, Tom Lyons.
- 1.3 The Audit has been conducted with reference to the procedures and scope set out in the National Roads Authority's Design Manual for Roads and Bridges (NRA DMRB), Volume 5, Section 2, Parts 2 and 3: Standards HD 19/09, 'Road Safety Audits'.

## **Brief**

- 1.4 The Audit comprised a desktop review of the detailed design drawings of the proposed scheme provided by the Design Team. A site visit was undertaken, during daylight hours, on Wednesday 2<sup>nd</sup> March 2011. Conditions were dry and bright with a dry road surface. Appendix A details the material used to undertake the Audit. A site location plan is shown in Figure 2.1.
- 1.5 The scope of the audit covers the proposed realignment of the N2 between the Hacket's Mushrooms access and the L5260 (Drumcaw) local road. The improvement works are shown in the annotated drawings in Appendix B.
- 1.6 The team has examined and reported only on the road safety implications of the measures and existing conditions as presented and has not specifically examined or verified the compliance of the designs to any other criteria.
- 1.7 Details of the proposed road markings, signage, pavement design, and road construction were not provided to the Audit Team and therefore are excluded from the scope of this audit.

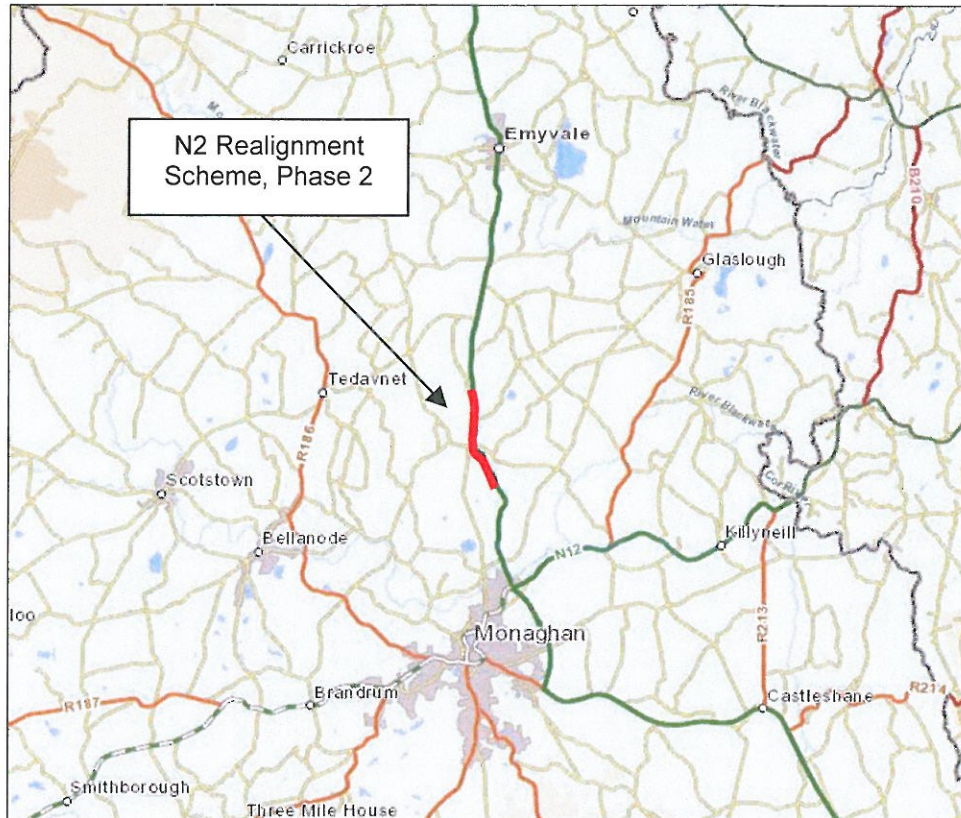
## **Following Sections**

- 1.8 A brief outline of the scheme follows in Section 2. Section 3 contains the issues raised through this Stage 1 Audit together with recommendations to be considered as the design proposals are progressed. Issues raised in Section 3 can be cross-referenced with the annotated scheme plans presented in Appendix B. Section 4 contains the Audit Team Statement.

## 2. Scheme Descriptions

### Existing Road Layout

- 2.1 The existing road network is shown in **Figure 2.1 below**. The N2 is a National Primary, two-way single carriageway road, running largely north-south between Monaghan and Emyvale. There are several side roads and single dwelling accesses onto the N2 within the 1.8km scope of the scheme. The existing speed limit along the N2 is 100kph.



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Figure 2.1 – Site Location Map

### Proposed Road Layout

- 2.2 The horizontal and vertical alignment of the existing N2 are to be improved with a design speed of 85kph, and the proposed cross section is to be RS2 standard comprising 2no 3.5m lanes, 2no 0.5m hard strips and 2no 3m verges.

### Departures from Standard

- 2.3 The Audit Team have not been notified of any Departures from Standard.

## 3. Issues Raised by the Stage 1 Audit

The annotated scheme plans in **Appendix B** are cross-referenced to the paragraph numbers relating to each issue raised below.

### Vulnerable Road Users

- 3.1 Comment: Proposed Hard Strip on Carriageway Verge:** It is envisaged that the hard strip separated from the road edge by a 0.5m soft verge will be utilised by vulnerable road users. These users must be protected from the mainline traffic and it is also considered that the soft verge as proposed is not a suitable divide between motorists and vulnerable road users.

The 2m hard strip should be physically separated from the road edge. An earth bund would be one option that should be considered at the detailed design stage.

### Side Roads

- 3.2 Comment: Gradient:** The existing gradients on approach to the mainline on many of the side roads do not allow for a transition into the edge of the carriageway. In the detailed design, the Design Team should allow for an appropriate gradient for motorists waiting at the Stop line.
- 3.3 Comment: Visibility at Junctions:** The existing visibility at certain junctions is limited by the vertical and horizontal alignment of the existing N2, which will cause difficulty to motorists manoeuvring at these junctions. The Design Team should ensure the proposed changes to the horizontal and vertical alignment will improve sightlines, particularly at the following junctions with the N2.

- L5260 (Drumcaw): The crest and curvature to the north of access are restricting visibility.
- L1155 (Corraghbrack): The existing horizontal and vertical alignment in both directions is substandard. The Design Team should ensure that the proposed alignment will be in accordance with the appropriate NRA design standards.

### Road Layout

- 3.4 Comment: Traffic Volumes:** The Design Team should ensure that the proposed RS2 standard cross section is sufficient for the anticipated levels of traffic on the route up to the design year.
- 3.5 Problem: Speed Limit** The speed limit for the scheme is to remain at 100kph. The speed limit will encourage speeds in excess of the design speed of the scheme, which will result in single vehicle type incidents. There is already a history of single vehicle incidents on this section of the N2, which may be due to the high speed limit combined with substandard vertical and horizontal alignment.

**Recommendation:** The speed limit should be reduced to below the design speed for the scheme.

### General

- 3.6 Comment: Landscaping:** The Design Team should ensure that sightlines are in accordance with the appropriate guidelines with respect to landscaping proposals, especially at or near junctions.

## 4. Audit Team Statement

- 4.1 We certify that we have examined the drawings and documents listed in Appendix A of this Report. The Road Safety Audit has been carried out with the sole purpose of identifying any features of the design, which could be removed or modified in order to improve the safety of the scheme. The problems identified have been noted in the Report together with associated suggestions for safety improvements, which, we recommend, should be studied for implementation. No one on the Audit Team has been otherwise involved with the design of the measures audited.

### Audit Team

#### Audit Team Leader

**Tom Lyons**

Senior Traffic and Transport Engineer  
Traffic, Transport and Road Safety Dept.  
Atkins, Dublin

Signed:



Date:

28-4-2011

#### Audit Team Member

**Déaglán O' Connor**

Traffic and Transport Engineer  
Traffic, Transport and Road Safety Dept.  
Atkins, Dublin

Signed:



Date:

28/04/2011



## Appendix A – Stage 1 Road Safety Audit Brief

- ◆ Site photographs and notes taken on 2<sup>nd</sup> March 2011

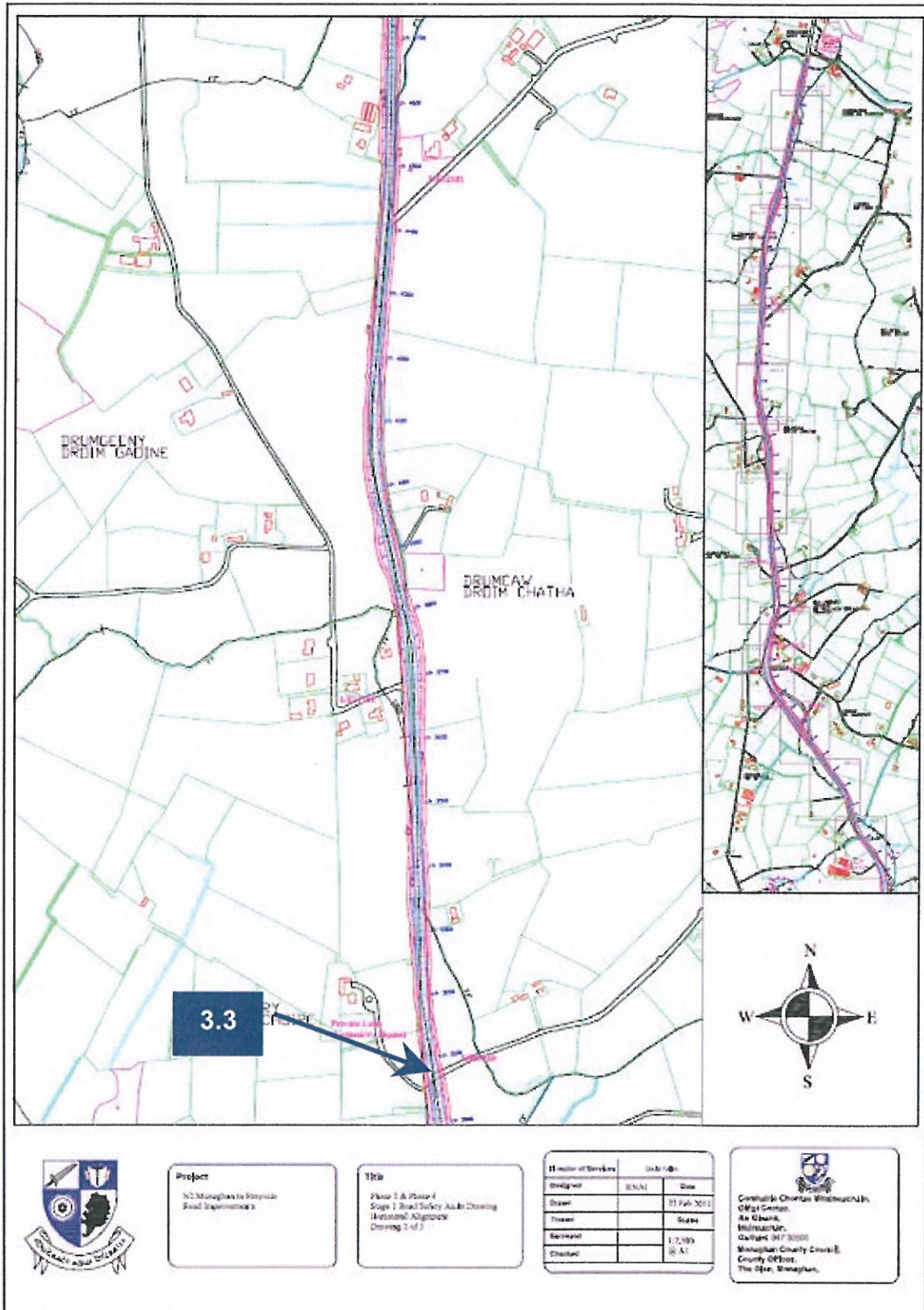
### Documents

- ◆ Accident Data (1996 – 2008)

### Drawings

- ◆ Road layout drawings provided by Design Team, Monaghan County Council
  - Phase 2 & Phase 4 Horizontal Alignment Drawings 1-3
  - Phase 2 & Phase 4 Vertical Alignment

## Appendix B – Annotated Drawings

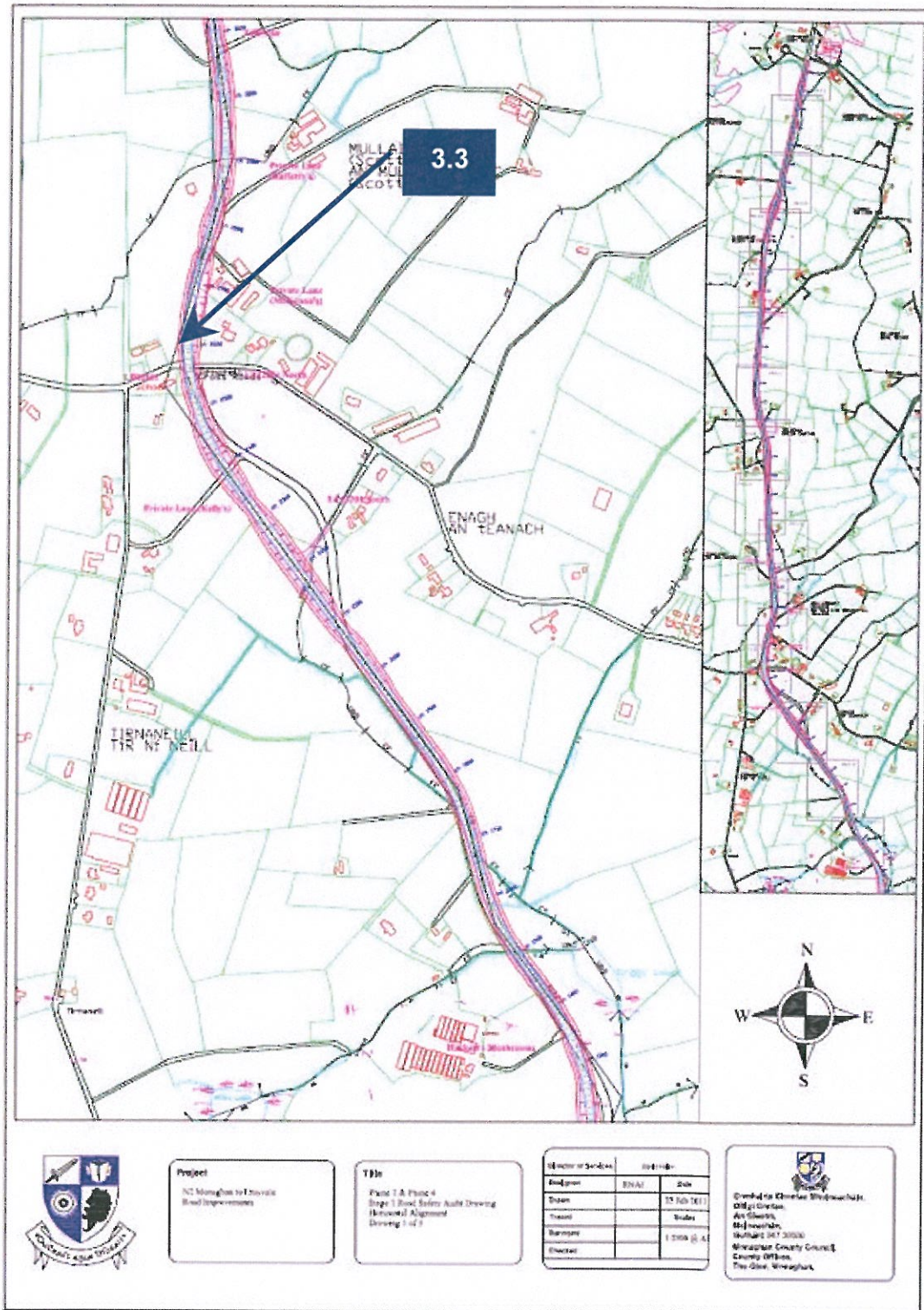


**Project**  
N2 Monaghan to Emyvale  
Road Improvements

**Title**  
Phase 2 & Prior 1  
Stage 1 Road Safety Audit Drawing  
(Annotated) Alignment  
Drawing 2 of 2

History of Revisions		Date
Designed	RNAJ	21 Feb 2011
Drawn		
Traced		
Reviewed		17 Feb 2011
Checked		21 Feb 2011

  
Corkville Chartered Surveyors Ltd.  
City Centre  
No. 40  
Millmount  
Galway G47 3D50  
Monaghan County Council  
County Office  
The Square, Monaghan.



**Project**  
N2 Monaghan to Emyvale  
Road Improvements

**Title**  
Phase 1 & Phase 2  
Stage 1 Road Safety Audit Drawing  
Horizontal Alignment  
Drawing 1 of 1

History of Revisions		
Revision	By	Date
01	ENAI	15 Jul 2011
02		15 Jul 2011
03		15 Jul 2011
04		15 Jul 2011
05		15 Jul 2011
06		15 Jul 2011
07		15 Jul 2011
08		15 Jul 2011
09		15 Jul 2011
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100		15 Jul 2011

**Drawn by** Kieran Sheehan  
**Checked by** An Searc  
**Scale** 1:1000 (A4)  
**Date** 15 Jul 2011  
**Project** N2 Monaghan to Emyvale Road Improvements  
**Client** Monaghan County Council  
**Location** The Glen, Monaghan

## Appendix C – Design Team Response to the Stage 1 Road Safety Audit

NRA HD19/09 'Road Safety Audits' specifies that for schemes impacting on National Roads the Design Team Leader should prepare an Audit Response for consultation with the Design Office Project Manager (DOPM) and/or the NRA. Ultimately, for National Road schemes, the DOPM will produce an Exception Report if the recommendations of the Road Safety Audit report are not to be actioned.

The NRA has stipulated the tabulated format outlined overleaf for the preparation of the Design Team response for National Road schemes. It is recommended that this or a similar format is adopted by all Design Teams in recording discussion and response to the issues raised by the Road Safety Audit and that a copy of this Audit Response and any ensuing Exceptions Report is forwarded to the Auditors.

Please copy completed forms to:

Déaglán O' Connor

Road Safety Team

Atkins

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Swords

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**ROAD SAFETY AUDIT RESPONSE**  
**Feedback on Audit Reports**



**Scheme:** N2 Monaghan to Emyvale Road Improvements  
**Audit Stage:** Phase 2 (Ref. No MN/11/7585)  
 Stage 1 Road Safety Audit  
**Date Audit Completed:** 15/03/2011

Problem No. in Safety Audit Report	Problem accepted (yes/no)	Recommended measure accepted (yes/no)	Alternative measures (describe)	Alternative Measures accepted by Auditors (yes/no)
3.5	Yes	Yes	The 85km/h design speed has been determined with reference to TD9 of the NRA DMRB. The Road Traffic Act 2004 states that the default speed limit on a national road outside a built up area is 100km/h. The application of a special speed limit is a reserved function. In the case of a national road the consent of the National Roads Authority is also required. An application to have a special speed limit of 80km/h applied will be made through the normal procedures.	

Auditors' Comments	Designers' Responses to Comments
3.1	The level of pedestrian usage along this road is low. It is not intended to encourage the use of this high speed national primary road by vulnerable road users. The cross section standard requires the provision of a hard verge - the provision of an earth bund which will effectively reduce the available verge width may create a hazard for the high traffic volumes using this road. Delineation of the hard verge from the carriageway will be considered through the use of verge delineators or virbrolines.
3.2	Improving existing approach gradients to junctions will be considered in the detailed design of the scheme.
3.3	Improving existing sight visibility splays will be considered in the detailed design of the scheme.
3.4	A major realignment of the N2 is proposed under the N2 Clontibret to Northern Ireland Road Scheme – the major road improvement scheme will deliver an upgraded road to ensure Level of Service C. This proposed scheme will offer road improvements until the major road realignment scheme is constructed. The scheme is being undertaken in phases due to funding constraints – the proposed cross section will provide route consistency along the road before, during and after completion of each phase.
3.6	Landscaping will be considered at detailed design stage. Specific consideration will be given to appropriate landscaping at or across junction and access sight visibility splays.

Signed:  Project Team Leader Date: 27/4/2011

Please complete and return to Road Safety Auditor.

Signed:  Project Audit Team Leader Date: 28-4-2011

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**[www.atkinsireland.ie](http://www.atkinsireland.ie)**

**N2 Monaghan to Emyvale Road Improvements – Phase 4**  
Monaghan County Council

**Stage 1 Road Safety Audit**  
April 2011

# N2 Monaghan to Emyvale Road Improvements

## Phase 4 (Ref. No. MN/11/7885)

Ref

### Stage 1 Road Safety Audit

**March 2011**

#### Notice

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#### Document History

JOB NUMBER: 3016			DOCUMENT REF: 3016DG002_Ph4_Stg1_RSA_revA.doc			
A		DOC	TL	DOC	TL	Mar 2011
-		DOC	TL	DOC	TL	Mar 2011
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**Appendix A – Stage 1 Road Safety Audit Brief**

**Appendix B – Annotated Drawings**

**Appendix C – Design Team Response Form**

# 1. INTRODUCTION

- 1.1 In February 2011 Atkins were commissioned by Monaghan County Council to undertake a Stage 1 Road Safety Audit of Phase 4 of the proposed N2 Monaghan to Emyvale Road Improvements, located north of Monaghan Town.
- 1.2 The study was undertaken by Traffic and Transport Engineer, Déaglán O' Connor and Senior Traffic and Transport Engineer, Tom Lyons.
- 1.3 The Audit has been conducted with reference to the procedures and scope set out in the National Roads Authority's Design Manual for Roads and Bridges (NRA DMRB), Volume 5, Section 2, Parts 2 and 3: Standards HD 19/09, 'Road Safety Audits'.

## **Brief**

- 1.4 The Audit comprised a desktop review of the detailed design drawings of the proposed scheme provided by the Design Team. A site visit was undertaken, during daylight hours, on Wednesday 2<sup>nd</sup> March 2011. Conditions were dry and bright with a dry road surface. Appendix A details the material used to undertake the Audit. A site location plan is shown in Figure 2.1.
- 1.5 The scope of the audit covers the proposed realignment of the N2 from the L5260 (Drumcaw) local road to the L5250 (Mullaghpeak) junction to the north. The improvement works are shown in the annotated drawings in Appendix B.
- 1.6 The team has examined and reported only on the road safety implications of the measures and existing conditions as presented and has not specifically examined or verified the compliance of the designs to any other criteria.
- 1.7 Details of the proposed road markings, signage, pavement design, and road construction were not provided to the Audit Team and therefore are excluded from the scope of this audit.

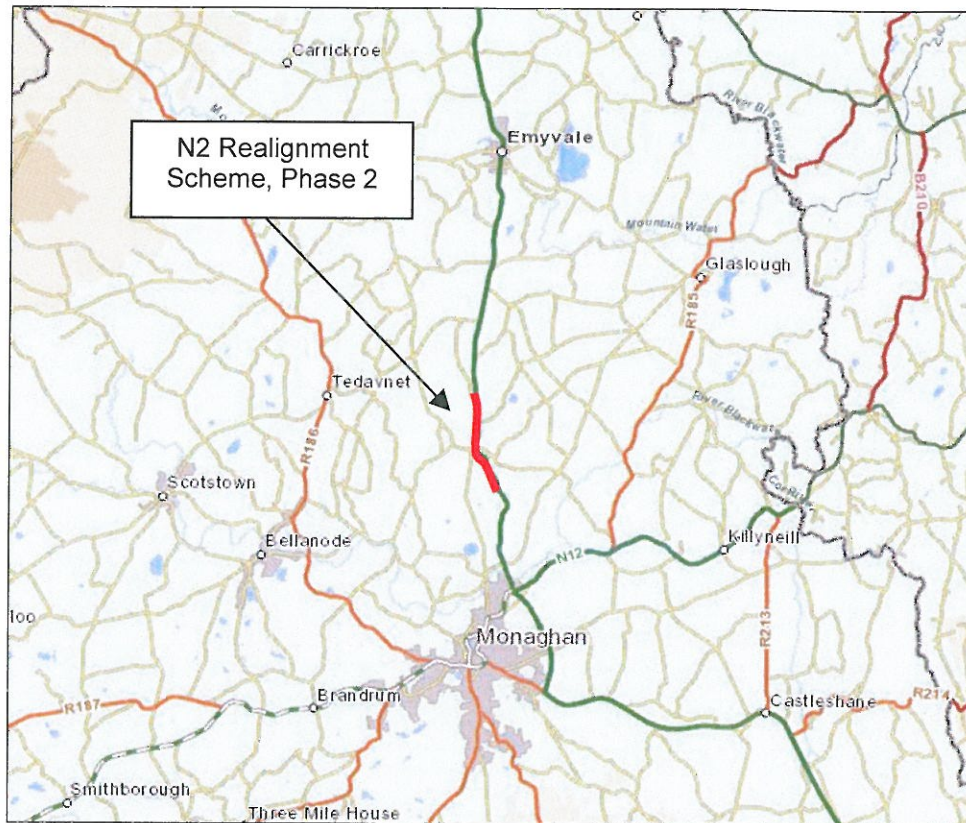
## **Following Sections**

- 1.8 A brief outline of the scheme follows in Section 2. Section 3 contains the issues raised through this Stage 1 Audit together with recommendations to be considered as the design proposals are progressed. Issues raised in Section 3 can be cross-referenced with the annotated scheme plans presented in Appendix B. Section 4 contains the Audit Team Statement.

## 2. Scheme Descriptions

### Existing Road Layout

- 2.1 The existing road network is shown in **Figure 2.1 below**. The N2 is a National Primary, two-way single carriageway road, running largely north-south between Monaghan and Emyvale. There are several side roads and single dwelling accesses onto the N2 within the 2.6km scope of the scheme. The existing speed limit along the N2 is 100kph.



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Figure 2.1 – Site Location Map

### Proposed Road Layout

- 2.2 The horizontal and vertical alignment of the existing N2 are to be improved with a design speed of 85kph, and the proposed cross section is to be RS2 standard comprising 2no 3.5m lanes, 2no 0.5m hard strips and 2no 3m verges.

### Departures from Standard

- 2.3 The Audit Team have not been notified of any Departures from Standard.

## 3. Issues Raised by the Stage 1 Audit

The annotated scheme plans in **Appendix B** are cross-referenced to the paragraph numbers relating to each issue raised below.

### Vulnerable Road Users

- 3.1 Comment: Proposed Hard Strip on Carriageway Verge:** It is envisaged that the hard strip separated from the road edge by a 0.5m soft verge will be utilised by vulnerable road users. These users must be protected from the mainline traffic and it is also considered that the soft verge as proposed is not a suitable divide between motorists and vulnerable road users.

The 2m hard strip should be physically separated from the road edge. An earth bund would be one option that should be considered at the detailed design stage.

### Side Roads

- 3.2 Comment: Gradient:** The existing gradients on approach to the mainline on many of the side roads do not allow for a transition into the edge of the carriageway. In the detailed design, the Design Team should allow for an appropriate gradient for motorists waiting at the Stop line.
- 3.3 Comment: Visibility at Junctions:** The existing visibility at certain junctions is limited by the vertical and horizontal alignment of the existing N2, which will cause difficulty to motorists manoeuvring at these junctions. The Design Team should ensure the proposed changes to the horizontal and vertical alignment will improve sightlines, particularly at the following junctions with the N2.

- L5250 (Mullaghpeak): The visibility to the north of the access is deficient due to the crest at the traffic calming scheme. In addition, the hedging on the southwest corner of the junction is restricting visibility to the south from the access.
- L11701 (Lisboy): The object height for vehicles entering this side road from the mainline may be restricted by the low walls on each side.
- L11701 (Drumgeeny): Crest to north of access. There is an accident cluster at this junction and existing horizontal strips are in place to slow southbound traffic, however it would be preferable to improve the visibility to the north from the side road access.

### Road Layout

- 3.4 Comment: Traffic Volumes:** The Design Team should ensure that the proposed RS2 standard cross section is sufficient for the anticipated levels of traffic on the route up to the design year.
- 3.5 Problem: Speed Limit** The speed limit for the scheme is to remain at 100kph. The speed limit will encourage speeds in excess of the design speed of the scheme, which will result in single vehicle type incidents. There is already a history of single vehicle incidents on this section of the N2, which may be due to the high speed limit combined with substandard vertical and horizontal alignment.

**Recommendation:** The speed limit should be reduced to below the design speed for the scheme.

### General

- 3.6 Comment: Landscaping:** The Design Team should ensure that sightlines are in accordance with the appropriate guidelines with respect to landscaping proposals, especially at or near junctions.

## 4. Audit Team Statement

- 4.1 We certify that we have examined the drawings and documents listed in Appendix A of this Report. The Road Safety Audit has been carried out with the sole purpose of identifying any features of the design, which could be removed or modified in order to improve the safety of the scheme. The problems identified have been noted in the Report together with associated suggestions for safety improvements, which, we recommend, should be studied for implementation. No one on the Audit Team has been otherwise involved with the design of the measures audited.

### Audit Team

#### Audit Team Leader

**Tom Lyons**

Senior Traffic and Transport Engineer  
Traffic, Transport and Road Safety Dept.  
Atkins, Dublin

Signed:



Date:

28-4-2011

#### Audit Team Member

**Déaglán O' Connor**

Traffic and Transport Engineer  
Traffic, Transport and Road Safety Dept.  
Atkins, Dublin

Signed:



Date:

28/04/2011

## Appendix A – Stage 1 Road Safety Audit Brief

- ◆ Site photographs and notes taken on 2<sup>nd</sup> March 2011

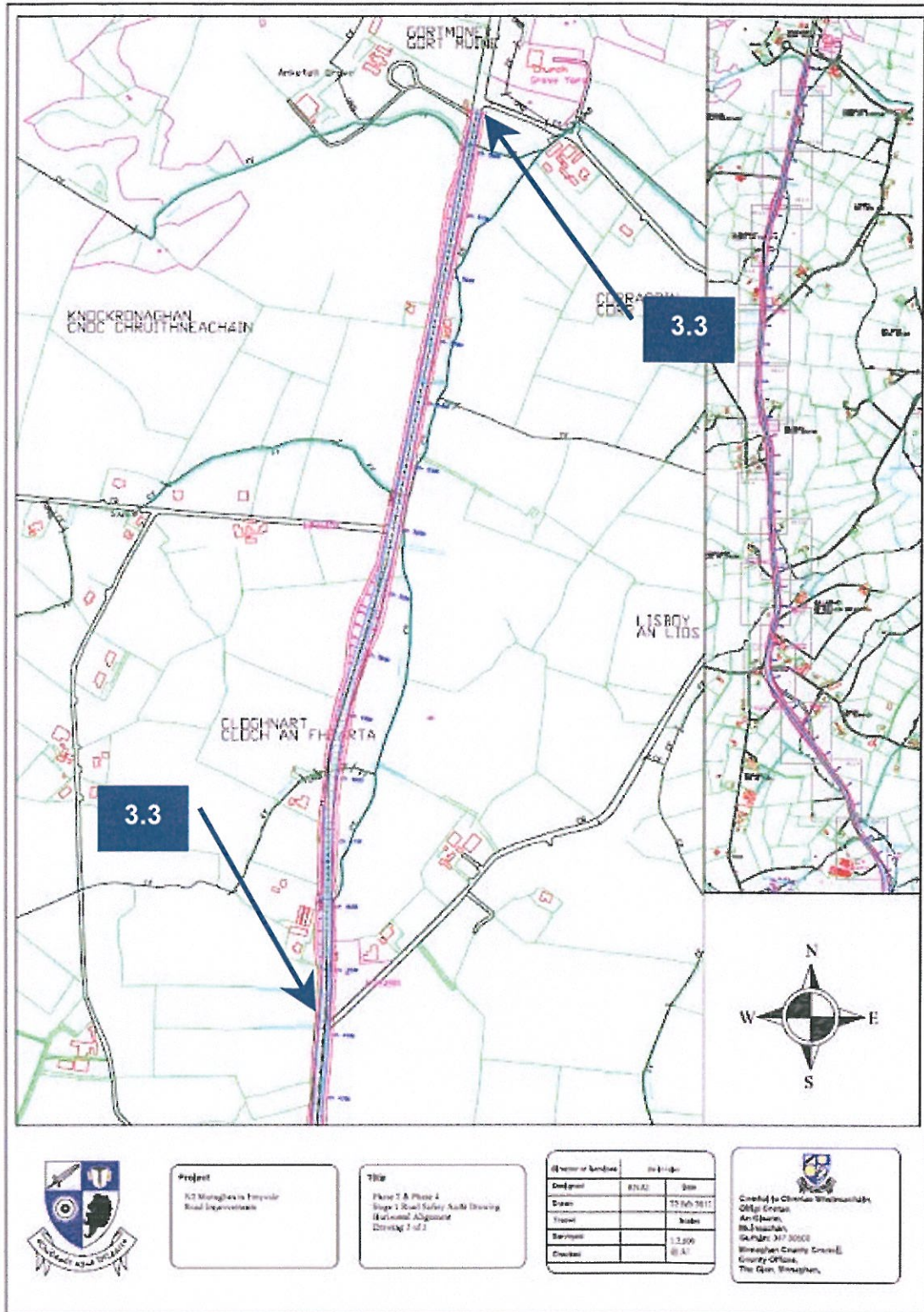
### Documents

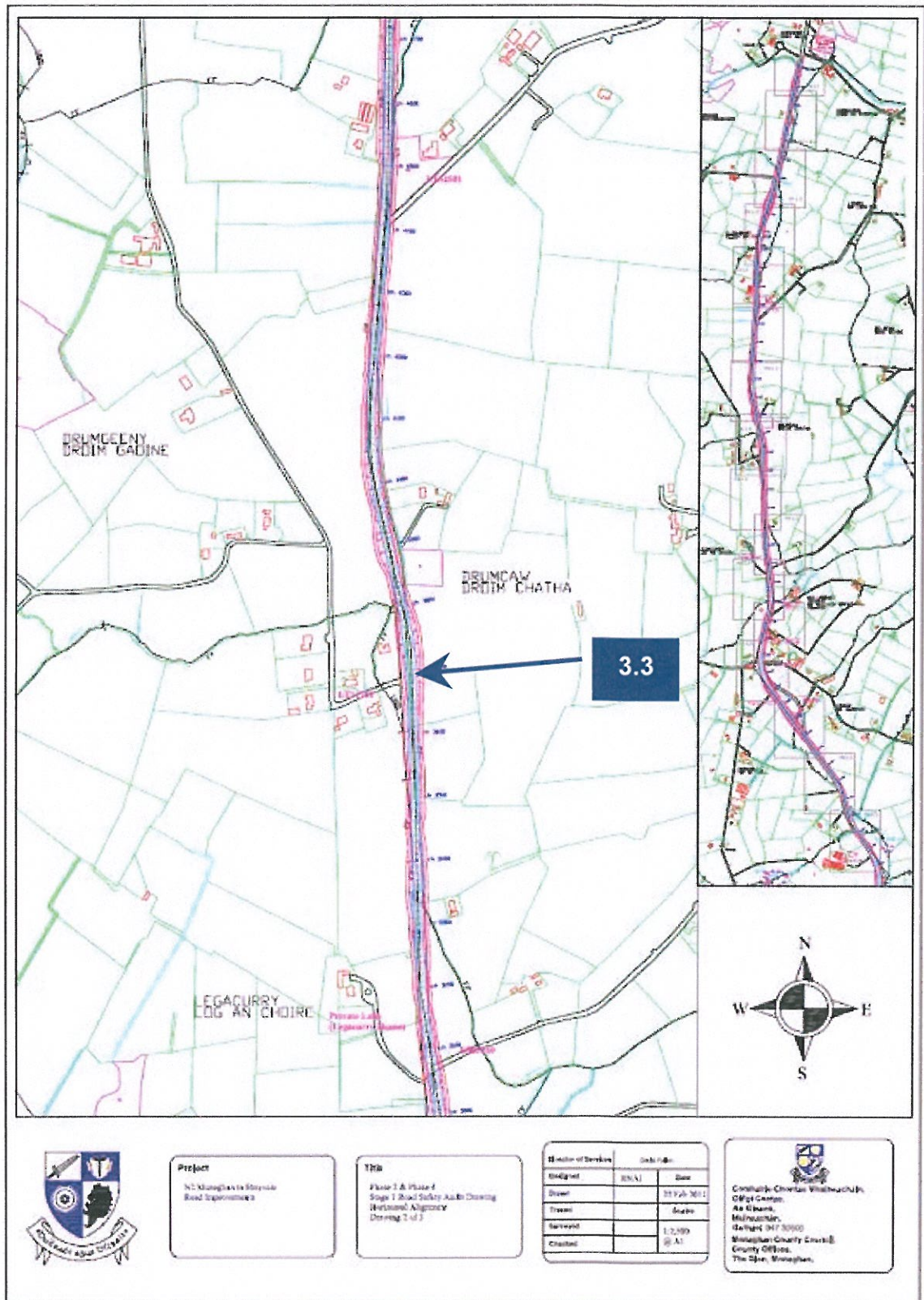
- ◆ Accident Data (1996 – 2008)

### Drawings

- ◆ Road layout drawings provided by Design Team, Monaghan County Council
  - Phase 2 & Phase 4 Horizontal Alignment Drawings 1-3
  - Phase 2 & Phase 4 Vertical Alignment

## Appendix B – Annotated Drawings





**Project**  
N2 Monaghan to Emyvale  
Road Improvements

**Title**  
Phase 3 & Phase 4  
Stage 1 Road Safety Audit Drawing  
(Western/Algebraic  
Drawing 2 of 2)

History of Revisions		Date
Revised	(N/A)	None
Drawn		21 Feb 2011
Traced		None
Reviewed		1.2.2011
Checked		(N/A)

  
Catholic Church, Wicklow Road,  
Office Centre,  
An Gleanna,  
Monaghan,  
County Monaghan,  
Ballyard 047 33900  
Monaghan County Council  
County Offices,  
The Glen, Monaghan.



## Appendix C – Design Team Response to the Stage 1 Road Safety Audit

NRA HD19/09 'Road Safety Audits' specifies that for schemes impacting on National Roads the Design Team Leader should prepare an Audit Response for consultation with the Design Office Project Manager (DOPM) and/or the NRA. Ultimately, for National Road schemes, the DOPM will produce an Exception Report if the recommendations of the Road Safety Audit report are not to be actioned.

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Please copy completed forms to:

Déaglán O' Connor  
Road Safety Team  
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Atkins House  
150 – 155 Airside Business Park  
Swords  
Co. Dublin

Tel: 00 353 01 890 9000

Fax: 00 353 01 890 9001

Email: [deaglan.oconnor@atkinsglobal.com](mailto:deaglan.oconnor@atkinsglobal.com)

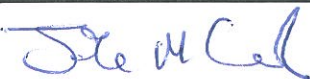
**ROAD SAFETY AUDIT RESPONSE**  
**Feedback on Audit Reports**



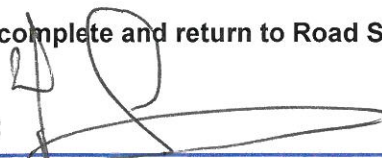
**Scheme:** N2 Monaghan to Emyvale Road Improvements  
**Phase 4 (Ref. No. MN/11/7885)**  
**Audit Stage:** Stage 1 Road Safety Audit  
**Date Audit Completed:** 15/03/2011

Problem No. in Safety Audit Report	Problem accepted (yes/no)	Recommended measure accepted (yes/no)	Alternative measures (describe)	Alternative Measures accepted by Auditors (yes/no)
3.5	Yes	Yes	The 85km/h design speed has been determined with reference to TD9 of the NRA DMRB. The Road Traffic Act 2004 states that the default speed limit on a national road outside a built up area is 100km/h. The application of a special speed limit is a reserved function. In the case of a national road the consent of the National Roads Authority is also required. An application to have a special speed limit of 80km/h applied will be made through the normal procedures.	

Auditors' Comments	Designers' Responses to Comments
3.1	The level of pedestrian usage along this road is low. It is not intended to encourage the use of this high speed national primary road by vulnerable road users. The cross section standard requires the provision of a hard verge - the provision of an earth bund which will effectively reduce the available verge width may create a hazard for the high traffic volumes using this road. Delineation of the hard verge from the carriageway will be considered through the use of verge delineators or vibrolines.
3.2	Improving existing approach gradients to junctions will be considered in the detailed design of the scheme.
3.3	Improving existing sight visibility splays will be considered in the detailed design of the scheme.
3.4	A major realignment of the N2 is proposed under the N2 Clontibret to Northern Ireland Road Scheme – the major road improvement scheme will deliver an upgraded road to ensure Level of Service C. This proposed scheme will offer road improvements until the major road realignment scheme is constructed. The scheme is being undertaken in phases due to funding constraints – the proposed cross section will provide route consistency along the road before, during and after completion of each phase.
3.6	Landscaping will be considered at detailed design stage. Specific consideration will be given to appropriate landscaping at or across junction and access sight visibility splays.

Signed:  Project Team Leader Date: 27/4/2011

Please complete and return to Road Safety Auditor.

Signed:  Project Audit Team Leader Date: 28-4-2011

**Atkins** is a multi-disciplinary organisation that is committed to sustainable design. The simplest way to articulate what we do is "**Plan Design Enable**".

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