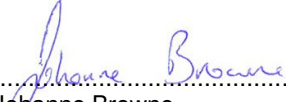
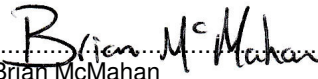


## **Appendix 11.5 AECOM Transportation: Road Safety Audit - Ballyragget**

# ESB Site Access Ballyragget – Stage 1/2 Road Safety Audit



Prepared by:   
Johanne Browne  
Consultant

Checked by:   
Brian McMahan  
Senior Engineer

Rev No	Comments	Checked by	Approved by	Date
0	Internal Review	BMcM		2/10/12
1	Issued to Client	BMcM	JS	3/10/12
Final	Reissued to Client – Minor Text Changes	BMcM	JS	23/10/12

Ground Floor, Grand Canal House, Upper Grand Canal Street, Dublin 4  
Telephone: 01 2383100 Website: <http://www.aecom.com>

Job No 60273241

Date Created Sept 2012

This document has been prepared by AECOM Limited for the sole use of our client (the "Client") and in accordance with generally accepted consultancy principles, the budget for fees and the terms of reference agreed between AECOM Limited and the Client. Any information provided by third parties and referred to herein has not been checked or verified by AECOM Limited, unless otherwise expressly stated in the document. No third party may rely upon this document without the prior and express written agreement of AECOM Limited.

f:\projects\development - esb laois-kilkenny\_ballyragget\reports\rsa\rsa stage 1-2 final.docx

# Table of Contents

<b>1</b>	<b>Introduction.....</b>	<b>1</b>
<b>2</b>	<b>Site Description.....</b>	<b>2</b>
<b>3</b>	<b>Departure from Standards .....</b>	<b>5</b>
<b>4</b>	<b>Items Resulting from Stage 1/2 Road Safety Audit .....</b>	<b>6</b>
<b>5</b>	<b>Audit Team Statement .....</b>	<b>13</b>
	<b>Appendix A – Documents Submitted to the Audit Team.....</b>	<b>14</b>
	<b>Appendix B – Safety Audit Feedback Form.....</b>	<b>15</b>

Capabilities on project:  
Transportation

# 1 Introduction

## 1.1 Overview

AECOM has been commissioned by ESBI to undertake a Road Safety Audit of a proposed access upgrade of the existing 38kV substation. The access is being upgraded to accommodate a 110kV substation, at Moate to the north of Ballyragget village, Co. Kilkenny. Currently there are two access points to the substation, with the northern most access to be upgraded for the purpose of accessing the revised facility.

The scheme comprises the improvement of an existing access to a substation. Vehicles entering the site will be infrequent, and will comprise mainly of vans and trucks, with the occasional visit from larger vehicles for the delivery of replacement transformers etc. A copy of the information provided for the purpose of the audit has been included as Appendix A. A Technical Note was provided which details proposed measures, however these changes have not been reflected on the drawing.

The Safety Audit Report indicates each of the problems identified, provides outline recommendations for solving the problems, presents the Audit Team Statement, and describes a schedule of documents reviewed. The members of the Audit Team were:

### **Audit Team Leader:**

Brian McMahon, BE, MSc, MIEI

Senior Engineer, AECOM

### **Audit Team Member:**

Johanne Browne, BA, BAI (HONS), CEng MIEI

Consultant, AECOM

The audit comprises of an examination of a preliminary design drawing provided to the Audit Team. Such information supplied is outlined in Appendix A of this report. In addition, a site visit was undertaken on the 19<sup>th</sup> September 2012. On the day of the visit the weather was dry and bright. During the time of the site visit, there did not appear to be any circumstances that would suggest a deviation from normal traffic conditions.

This Stage 1/2 Road Safety Audit has been carried out based on the guidance provided by NRA Standard NRA HD 19/12.

On this basis, the team has examined and reported only on the road safety implications of the measures as presented and has not specifically examined or verified the compliance of the designs to any other criteria.

## 1.2 Road Safety Audit

This Safety Audit represents the response of an independent Audit Team on various aspects of the scheme. The recommendations contained therein are therefore the opinions of the Audit Team, and are intended as a guide to the designers on how the scheme as constructed can be improved to address issues of road safety.

The Safety Audit guidelines do not provide a facility for the Audit Team to classify individual problems according to their severity, and hence the level of priority to be attached to each. It is instead the task of the design team and/or their representative to take a view on the validity of each of the recommendations, and decide on an appropriate course of action.

The response of the Design Team to the Safety Audit should be prepared in the form of a Safety Audit Feedback Form, accepting the changes proposed by the Audit Team or providing an alternative solution to the problem. The Feedback Form is then returned to the Audit Team for review and verification. A template for a Safety Audit Feedback Form is included as Appendix B.

Capabilities on project:  
Transportation

## 2 Site Description

### 2.1 Overview

The scheme comprises of the upgrade of an existing access with some minor improvements, to provide access to the proposed 110kV substation. There are currently two access points to the site, with the northern access to be improved for the expansion of the substation.

The scheme is located approximately 1.3km north of Ballyragget village and 15km south of Abbeyleix town on the R432. The road is lightly trafficked with just under 1000 AADT estimated. There is a cemetery located to the north of the existing substation, on the same side of the road as the proposed development.

<b>Location</b>	R432 Moate, Ballyragget, Co. Kilkenny
<b>Classification</b>	Regional Road
<b>Speed Limit</b>	80kph
<b>Local Authority Area</b>	Kilkenny County Council
<b>Type of Road</b>	Single Carriageway, Rural Environment

### 2.2 Site Observations

The site visit was undertaken between 12.30 and 13:30 on the 19<sup>th</sup> September 2012. The weather was dry and bright at the time of the visit, with dry road surfaces.

#### *Road Geometry*

- The road is approximately 5.5m wide in the vicinity of the site, and runs in a north south direction. There is a small dip on the approach from the south to the substation, with the road levelling off as it passes the access points.
- There is good forward visibility to the site access from the south, with in excess of 150m visibility provided, while the road heading north bends slightly to the east approximately 150m from the site access.
- There is a solid white line on the R432, fronting the site, while the dashed yellow lines are well worn and barely visible in parts.



#### *Vehicular Traffic*

- One-way vehicular flow during the period of the site visit was very low, details provided by the client suggest an annual average daily traffic flow of 1000 vehicles.
- The speed limit on the road is 80kph. Free-flow vehicle speeds during the site visit were estimated to be around 80kph.



Capabilities on project:  
Transportation

- Limited HGV activity was observed during the site visit on the road.



*Photo 1: R432 looking north towards site access*



*Photo 2: R432 looking south towards site access, with Cemetery visible*

#### *Pedestrians and Cyclists*

- No pedestrian or cycle facilities are provided in the vicinity of the site. The site is located over 1km outside of the village of Ballyragget, with no pedestrian or cycle activity noted during the site visit.

#### *Street Lighting*

- No street lighting is provided in the vicinity of the proposed scheme.

#### *Accidents*

- The Road Safety Authority database of personal injury accidents was interrogated to establish if there are any existing safety issues in the vicinity of the development that are not evident from the site visit. The period of accident data examined is from 2005-2009.
- The records indicate that there were no accidents in the vicinity of the proposed works.

Capabilities on project:  
Transportation

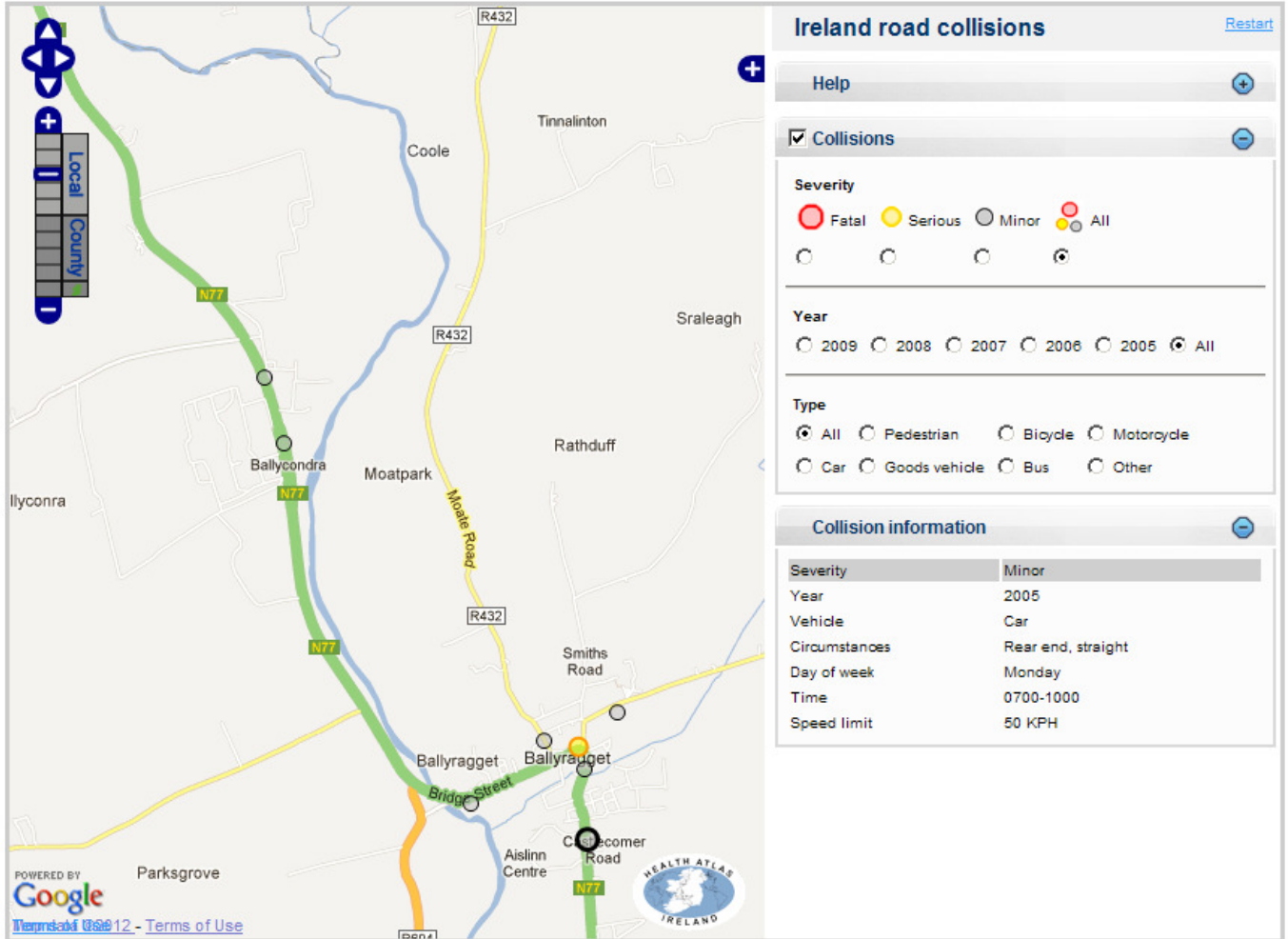


Figure-2: RSA Accident Records (2005-2009) in vicinity of proposed scheme (www.RSA.ie)



Capabilities on project:  
Transportation

## 3 Departure from Standards

### 3.1 General

No departures from standards have been notified to the audit team.

Capabilities on project:  
Transportation

## 4 Items Resulting from Stage 1/2 Road Safety Audit


### 4.1 Overview

This Safety Audit has reported on issues relating to proposed access upgrades to a 110kV substation. On site currently is a 38kV substation, with two vehicular accesses. This is classified as a Stage 1/2 Road Safety Audit, as defined within the NRA Road Safety Audit Guidelines. While this is sufficient to provide a general overview of the key issues to be taken into account, it is not intended to provide a final schedule of safety issues associated with the scheme. Such would require a further review of the designs at Stage 3 (Construction).


The following details were not provided and therefore could not be commented upon:


- Full details of Signing and Lining;
- Longitudinal and Cross Sections;
- Vehicle Swept Paths;
- Drainage;
- Services; and
- Lighting.

### 4.2 Road Geometry


<b>4.2.1 Problem</b>		
<i>Location:</i>	Proposed Site Access	
<i>Drawing:</i>	60273241-002	
<i>Summary:</i>	Visibility to the south	
<i>Description:</i>		
<p>Visibility to the south (right), from an approximate 3m setback for drivers exiting from the site access is restricted due to trees/fence located along the R432. This may lead to vehicles encroaching into the carriageway to achieve adequate visibility resulting in side-impact collisions and/or head on collisions as a result of vehicles on the R432 swerving to avoid exiting vehicles.</p>		
<b>Recommendation:</b>		
<p>Provide adequate visibility for vehicles exiting the substation access. This should take account of the speeds on the R432. Guidance is available in the Design Manual for Roads and Bridges. This could be achieved by removing/cutting back on vegetation, as well as repositioning of the fence line. A maintenance plan is required to ensure that this trimming and cutting back is carried out at regular intervals to ensure adequate visibility is maintained.</p>		


Capabilities on project:  
Transportation

<b>4.2.2 Problem</b>		
<i>Location:</i>	Proposed Site Access	
<i>Drawing:</i>	60273241-002	
<i>Summary:</i>	Visibility to north	
<i>Description:</i>		
<p>Visibility to the north (left), from an approximate 3m setback for drivers exiting from the site access is restricted due to trees located along the R432. This may lead to vehicles encroaching into the carriageway to achieve adequate visibility resulting in side-impact collisions and/or head on collisions as a result of vehicles on the R432 swerving to avoid exiting vehicles.</p>		
<b>Recommendation:</b>		
<p>Provide adequate visibility for vehicles exiting the substation access. This should take account of the speeds on the R432. Guidance is available in the Design Manual for Roads and Bridges. This could be achieved by removing/cutting back on vegetation. A maintenance plan is required to ensure that this trimming and cutting back is carried out at regular intervals to ensure adequate visibility is maintained.</p>		

<b>4.2.3 Problem</b>		
<i>Location:</i>	Proposed Site Access	
<i>Drawing:</i>	60273241-002	
<i>Summary:</i>	Turning Movements	
<i>Description:</i>		
<p>It is expected that large vehicles will access the site on occasion. No autotracks have been provided to show that these large vehicles are capable of making this movement. Failure to provide adequate space for these vehicles to make the turning movement may increase the risk of collision with vehicles already on the R432.</p>		
<b>Recommendation:</b>		
<p>Ensure all turning radii are designed to allow appropriate HGV movements. These should be reviewed prior to construction.</p>		

Capabilities on project:  
Transportation

<b>4.2.4 Problem</b>		
<i>Location:</i>	Proposed Site Access	
<i>Drawing:</i>	60273241-002	
<i>Summary:</i>	Access control	
<i>Description:</i>		
<p>It is not clear from the drawing if a gated access will be provided to the proposed development. Access to the existing substation is restricted with gates, set back from the carriageway. Should gates be provided close to the road edge, visitors to the facility will be forced to park on the road, while opening/closing the gates. This would increase the conflict between parked cars and passing motorists, thus increasing the risk of collision.</p>		
<b>Recommendation:</b>		
<p>Clarify the proposals for the access control. Provision should be made to allow a vehicle pull in off the road and access the gates in a safe manner, similar to the existing situation.</p>		

<b>4.2.5 Comment</b>		
<i>Location:</i>	Existing Southern Site Access	
<i>Drawing:</i>	60273241-002	
<i>Summary:</i>	Clarification for Southern Access	
<i>Description:</i>		
<p>It is not clear from the drawings if the existing southern access is to be extinguished or maintained. Similar to the northern access, foliage infringes on sight lines for vehicles exiting at this point. This may lead to vehicles encroaching into the carriageway to achieve adequate visibility resulting in side-impact collisions and/or head on collisions as a result of vehicles on the R432 swerving to avoid exiting vehicles.</p>		
<b>Recommendation:</b>		
<p>Clarify the proposals for the southern access. Similar to the problems above, adequate visibility must be provided if the access is to be maintained. This should take account of the speeds on the R432. Guidance is available in the Design Manual for Roads and Bridges. A maintenance plan may need to be put in place to ensure regular trimming and cutting back occurs.</p>		

Capabilities on project:  
Transportation

**4.3 Signing & Lining**

<b>4.3.1 Problem</b>		No Photo
<i>Location:</i>	Northbound and Southbound Approaches to the Access	
<i>Drawing:</i>	60273241-002	
<i>Summary:</i>	Temporary Signs during Construction	
<i>Description:</i>		
<p>Due to the nature of the proposed development, large and oversized vehicles will be accessing the site, particularly during the construction phase. These vehicles may be slow moving and require additional time and manoeuvres to access the site. Inadequate levels of signage may lead drivers to overtake at inappropriate time or locations, thus increasing the risk of collision.</p>		
<b>Recommendation:</b>		
<p>It is recommended that adequate signage be provided, particularly at construction stage, with consideration given to appointing a flag man to aid larger vehicles into the site, while controlling traffic movements at times when larger vehicles are entering the site.</p>		

<b>4.3.2 Problem</b>		No Photo
<i>Location:</i>	R432 fronting the site	
<i>Drawing:</i>	60273241-002	
<i>Summary:</i>	Road Markings	
<i>Description:</i>		
<p>It is not clear from the drawing if new road markings are to be provided in the vicinity of the site. As noted in the site description, some road markings fronting the proposed access are worn and barely visible. This may cause confusion for some drivers, which may lead to an increased risk of collision.</p>		
<p>The report provided suggests existing road markings are to be replaced, with the installation of marker studs. The provision of marker studs would be out of character for the area and would be seen as unnecessary by the Audit team.</p>		
<b>Recommendation:</b>		
<p>Proposed road markings should be provided in accordance with the Traffic Signs Manual.</p>		

Capabilities on project:  
Transportation

<b>4.3.3 Problem</b>		No Photo
<i>Location:</i>	North of proposed site access	
<i>Drawing:</i>	60273241-002	
<i>Summary:</i>	Location of Bend Ahead Sign	
<i>Description:</i>		
<p>It is proposed to provide a "Bend Ahead" sign to the north of the proposed site access. The position of this sign may restrict the visibility for drivers exiting the proposed site. This may lead to vehicles encroaching into the carriageway to achieve adequate visibility resulting in side-impact collisions and/or head on collisions as a result of vehicles on the R432 swerving to avoid exiting vehicles.</p>		
<b>Recommendation:</b>		
<p>Provide adequate visibility for drivers exiting the proposed development. This should take account of the speeds on the R432. Guidance is available in the Design Manual for Roads and Bridges.</p>		

<b>4.3.4 Comment</b>		No Photo
<i>Location:</i>	North of proposed site access	
<i>Drawing:</i>	60273241-002	
<i>Summary:</i>	Bend Ahead Sign	
<i>Description:</i>		
<p>The Auditors would question the need to provide the "Bend Ahead" sign. The speed at which motorists approach the bend does not suggest they would be unable to negotiate the bend successfully, without requiring them to slow down severely. The provision of this sign may cause some vehicles to slow down suddenly, thus increasing the risk of rear end type collisions.</p>		
<b>Recommendation:</b>		
<p>Consideration should be given to the requirements for the "Bend Ahead" sign.</p>		



Capabilities on project:  
Transportation

**4.4 Pedestrians & Cyclists**

<b>4.4.1</b>		No Photo
<i>Location:</i>	Site Access	
<i>Drawing:</i>		
<i>Summary:</i>	No Issues Relating to Cyclists and Pedestrians	
		Due to the nature of the proposed development, and the lack of existing facilities to tie into, there are no comments on facilities for pedestrians or cyclists.

**4.5 Street Lighting**

<b>4.5.1 Comment</b>		No Photo
<i>Location:</i>	Site Access	
<i>Drawing:</i>		
<i>Summary:</i>	No Details Provided	
<i>Description:</i>		
		No details have been provided on the proposed public lighting for the scheme. Due to the nature of the development and the location of the site, street lighting may not be required.

**4.6 Drainage & Maintenance**

<b>4.6.1 Comment</b>		
<i>Location:</i>	Site Access	
<i>Drawing:</i>		
<i>Summary:</i>	No Details Provided	
<i>Description:</i>		
		No details of the proposed drainage network have been provided to the audit team.

Capabilities on project:  
Transportation

**4.7 Construction, Operation and Maintenance**

<b>4.7.1 Comment</b>		
<i>Location:</i>	Site Access	
<i>Drawing:</i>		
<i>Summary:</i>	Construction Stage	
<i>Description:</i>		
<p>No details are provided. A Traffic Management Plan for the works should be prepared by the contractor and agreed with the Local Authority prior to the commencement of any works which involve any occupation of or infringement into the public highway.</p>		

Capabilities on project:  
Transportation

## 5 Audit Team Statement

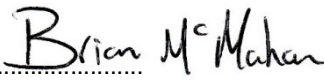
I certify that the site was visited and that this audit has been carried out in accordance with the National Roads Authority Road Safety Audit Guidelines NRA Standard NRA HD 19/12.

The Road Safety Audit has been carried out with the sole purpose of identifying any features of the design that could be removed or modified in order to improve the safety of the scheme.

No one on the audit team has been involved with scheme design.

### AUDIT TEAM LEADER: SENIOR ROAD SAFETY AUDITOR

Name: B McMahon ME, MSc, MIEI  
Position: Senior Engineer  
Organisation: AECOM  
Address: Grand Canal House,  
Upper Grand Canal Street,  
Dublin 4.

Signed  .....  
Date ....3/10/12.....

### AUDIT TEAM MEMBER: ROAD SAFETY AUDITOR

Name: J. Browne BA, BAI (HONS), MA, CEng MIEI  
Position: Consultant  
Organisation: AECOM  
Address: Grand Canal House,  
Upper Grand Canal Street,  
Dublin 4.



Capabilities on project:  
Transportation

## Appendix B – Safety Audit Feedback Form

**NOTE: THE TEXT BELOW REPRESENTS AN EXAMPLE OF A SAFETY ADUIT FEEDBACK FORM. THE SAFETY AUDIT FEEDBACK FORM SHOULD BE COMPLETED BY THE DESIGN TEAM IN RESPONSE TO THE ISSUES RAISED IN THIS AUDIT AND SUBMITTED TO THE OVERSEEING ORGANISATION AS A SUPPLEMENT TO THE SAFETY AUDIT REPORT.**

Scheme Name:			
Stage:			
Date Completed:			
Paragraph No. in Safety Audit Report	Problem Accepted (yes/no)	Recommendation accepted (yes/no)	Alternative measures (describe)
SAMPLE ONLY			


## Designer's Response to Stage 1/2 Road Safety Audit Report

<b>Scheme Name: ESB Substation Site Moate, Ballyragget – Revised Access to Existing ESB site on R432 north of Ballyragget, Co Kilkenny</b>			
<b>Stage: 1 /2 Road Safety Audit</b>			
<b>Date Completed:03.10.2012</b>			
Paragraph No. in Safety Audit Report	Problem Accepted (yes/no)	Recommendation accepted (yes/no)	Designer's Comments / Alternative measures (describe)
4.2.1	Yes	Yes	The existing screen planting vegetation to the south of the proposed access location within the site frontage is to be removed and the boundary fence is to be located behind the sightline to improve visibility, as shown on the amended drawing 60272341_002 'Site Access Proposed Improvements'.
4.2.2	Yes	Yes	The vegetation and boundary features which are in the ownership of the applicant to the north of the northern access location are to be removed to ensure to improve the sightline for visibility to the north, as shown on the amended drawing 60272341_002 'Site Access Proposed Improvements'.
4.2.3	No	No	The access gate is currently set back within the site and is therefore not to be relocated, and is in accordance with Fig 7/5 of NRA DMRB TD41-42/11. During normal operations only light vehicle/van access is expected to the upgraded substation. In the unlikely event of a larger vehicle being required to access the substation for maintenance reasons, appropriate measures such as banksmen and temporary signage will be implemented on the R432 during movements to/from the site.
4.2.4	Yes	Yes	The gates are inward opening and are set back from the road edge as illustrated on the drawing 60272341_002 'Site Access Proposed Improvements' appended to this response. This allows adequate space for a van to be positioned fully off the road while the gate is being opened or closed.
4.2.5	No	No	It not proposed that the existing southern access will be removed as part of this development. The southern access currently provides access for ESB Telecoms to the communications compound located inside the southern gate and for this reason it is planned to be maintained. The new development associated with this planning submission (110kV Substation) will be accessed solely by the northern gate which is to be improved by providing the required sightlines as part of this development. It is noted that the screen planting vegetation and boundary fence along the site frontage (to the north of the existing southern access) is to be removed and relocated to the rear of the northern access sightline as part of the improvement works to the northern access and this will provide a positive secondary benefit and an improvement on the existing conditions for the existing southern access, as illustrated on drawing 60272341_002 'Site Access Proposed Improvements'.



Paragraph No. in Safety Audit Report	Problem Accepted (yes/no)	Recommendation accepted (yes/no)	Designer's Comments / Alternative measures (describe)
4.3.1	Yes	Yes	Temporary signage and appropriate access control measures will be provided in accordance with the requirements of Chapter 8, Traffic Signs Manual, and will be subject to a detailed Construction Traffic Management Plan to be submitted for approval by Laois County Council prior to commencement of works on site.
4.3.2	Yes	Yes	The existing road markings are to be refreshed, and in accordance with the comments from the RSA Team and the requirements of the Kilkenny County Council Roads Department, the road studs will not be provided in this location for the road type.
4.3.3	Yes	Yes	This proposed sign has been omitted as illustrated on the appended drawing 60272341_002 'Site Access Proposed Improvements'. (see also response to 4.3.4).
4.3.4	Yes	Yes	This proposed sign has been omitted as illustrated on the appended drawing 60272341_002 'Site Access Proposed Improvements'. (see also response to 4.3.3).
4.4.1	Noted	N/A	Rural location and existing/proposed use – no provision required
4.5.1	Noted	N/A	Rural location and existing/proposed use – no provision required
4.6.1	Noted	Yes	Free draining road edges – designer/RE to review with Area Engineer at detail design stage prior to construction work. AECOM note that the proposed measures will not increase the amount of carriageway so the run-off will be unchanged.
4.7.1	Noted	Yes	Construction Traffic Management Plan to be submitted to Kilkenny County Council for approval prior to commencement of development works on site.

Reviewed by:   
 Stephen Reid \_\_\_\_\_  
 (Design Team Leader, AECOM)

Approved by:   
 Cormac O'Brien \_\_\_\_\_  
 (Project Director, AECOM)