



Cork Line Level Crossings Road Safety Audit Stage 1

Iarnród Éireann

Rev. P02

February 2020

32111000

Document history and status

Revision	Date	Description	By	Review	Approved
P01	13/09/2019	Issued	S McVeigh	G Turley	G Turley
P02	08/06/2020		S McVeigh	G Turley	G Turley

Distribution of copies

Revision	Issue approved	Date issued	Issued to	Comments
P01		13/09/2019	Alex Bradley	
P02		08/06/2020	Alex Bradley	

Project

Project No: 32111000
Document Title: Cork Line Level Crossings – Road Safety Audit Stage 1
Document No.: 32111000/CLC/RSA01, Revision 1
Revision: P02
Date: September 2019
Client Name: Iarnród Éireann

Project Manager: Alex Bradley
Author: Stephen McVeigh/ Gary Turley
File Name: 32111000 - Cork Line Level Crossing – RSA 1

Jacobs Engineering Ireland Limited

Merrion House
Merrion Road
Dublin 4, D04 R2C5
Ireland
T +353 1 269 5666
F +353 1 269 5497
www.jacobs.com

© Copyright 2019 Jacobs Engineering Ireland Limited. The concepts and information contained in this document are the property of Jacobs. Use or copying of this document in whole or in part without the written permission of Jacobs constitutes an infringement of copyright.

Limitation: This document has been prepared on behalf of, and for the exclusive use of Jacobs' client, and is subject to, and issued in accordance with, the provisions of the contract between Jacobs and the client. Jacobs accepts no liability or responsibility whatsoever for, or in respect of, any use of, or reliance upon, this document by any third party.

Contents

1.	Executive Summary	1
2.	Items resulting from this Road Safety Audit	2
2.1	XC219 Buttevant	2
2.2	XC215 Shinanagh	3
2.3	XC212 Ballycoskery	4
2.4	XC211 Newtown	5
2.5	XC209 Ballyhay	8
2.6	XC201 Thomastown	9
2.7	General	10
3.	Audit Team Statement.....	11
	Appendix A – Problem Location Plan.....	
	Appendix B List of Documents Provided.....	
	Appendix C Road Safety Audit Feedback Form	

1. Executive Summary

There are 7 remaining manned public road level crossings in operation on the Dublin to Cork line between Limerick Junction and Mallow stations (XC187, XC201, XC209, XC211, XC212, XC215 and XC219). The crossings are located within a 15 mile/24 km section of the line which straddles the Cork/Limerick county boundary.

This report results from a Stage 1 Road Safety Audit of proposed changes to road infrastructure as result of proposed changes / closures of six of these level crossings at the following locations:

- Buttevant (XC219)
- Shinanagh (XC215)
- Ballycoskery (XC212)
- Newtown (XC211)
- Ballyhay (XC209)
- Thomastown (XC201)

The Audit has been prepared in accordance with TII Publication GE-STY-01024 (HD 19/17) Road Safety Audit.

The Audit Team has examined and reported on only the road safety implications of the scheme and has not examined or verified the compliance of the design to any other criteria.

The Audit Team was as follows:

G. Turley Team Leader	MEng, HDip PM, H Dip H'ways & Geo, CEng MIEI, Associate Director, Jacobs Engineering Ireland, 3 rd Floor St Johns House, High Street, Tallaght, Dublin 24, Ireland
--------------------------	--

S. McVeigh Team Member	BSc CMILT MCIHT MSoRSA Senior Road Safety Engineer, First Street, Manchester
---------------------------	---

The audit was carried out between Tuesday 10th September 2019 and 14th February 2020. Weather conditions during the site visits were dry and overcast.

Each of the auditors' responses is classified as a 'Problem' that is likely to result in a significant road safety hazard. All comments and recommendations are referenced to the design drawings (Appendix B) and the locations have been indicated on the plans in Appendix A.

Where recommendations are made these do not comprise design decisions, and it remains the responsibility of the Design Team to incorporate any changes into the scheme and consider any interactions between design elements.

The Design Team and Employer (Client) is reminded that the Road Safety Audit Feedback Form, in Appendix C, shall be completed and returned to the Road Safety Audit Team Leader for sign off.

2. Items resulting from this Road Safety Audit

2.1 XC219 Buttevant

2.1.1 Problem

On the drawing there is a staggered road junction indicated. One side road connects to the existing road, providing access to a property, while the other access appears to be a private access to a field. A driver could mistake the farm access for a side road, resulting in them correcting an unnecessary manoeuvre which could lead to conflict with other road users.

Recommendation:

It is recommended that junction warning signs are provided in accordance with the Traffic Signs Manual.

2.1.2 Problem

Where the new road alignment ties in with the existing road to the eastern extent of the scheme, there is a proposed footpath. This ties in with the existing footpath on southern side of the carriageway, which is currently street lit.

The proposed footpath terminates on southern side of the carriageway and continues a short distance down a new side road to the northern side of the carriageway. Pedestrians could find themselves crossing on a bend, which could result in them being in conflict with vehicles if there is insufficient forward visibility.

Recommendation:

The design team need to ensure there is adequate visibility to safely allow pedestrians cross the road. The design team should ensure that public lighting is provided along the footpath.

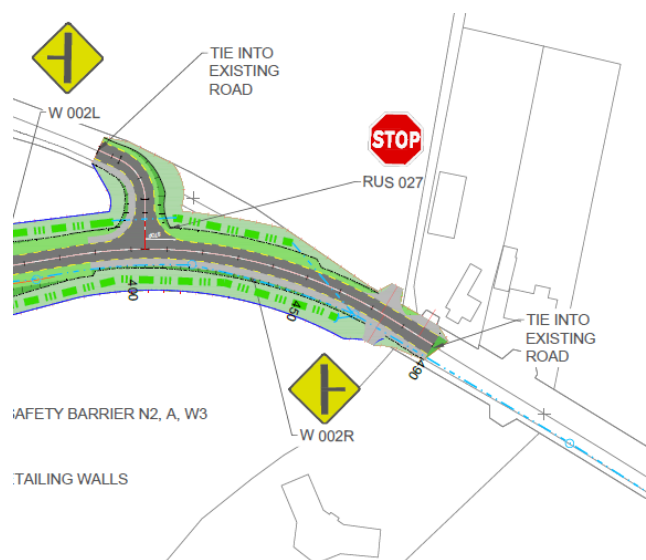


Figure 2-1 Proposed Footpath

2.2 XC215 Shinanagh

2.2.1 Problem

Where the existing road (L1320) ties in with the new road the road deviates to the left, with a junction to the right for a field access. Drivers unfamiliar with the new layout may become confused and take the right turn to gain access onto the N20.

Recommendation:

Install advanced direction signs / chevrons on both approaches on the main road to highlight the direction of travel.

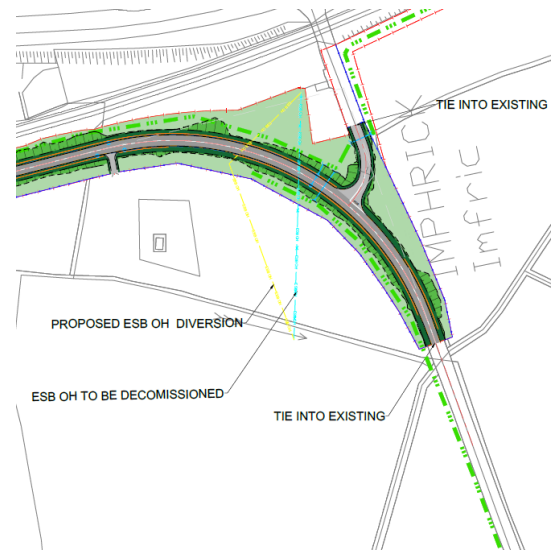


Figure 2-2 New Road Alignment

2.2.2 Problem

On the N20 the junction for the L1320 will be closed as there is no longer access, there is exiting left turn deacceleration lane and right turn pocket as well as associated signs. Drivers on the N20 could mistakenly try and turn in to the old junction, resulting in them being in conflict with other road users.

Recommendation:

The design team must ensure that all existing road markings and signs are removed and ensure the new junction is clearly signed and marked on the N20.

2.2.3 Problem

The access over the rail line will result in the existing westbound approach to the structure being reconfigured. On site the RSA team observed that the Road Restraint System (RRS) had P1 ramped terminals, which could result in a vehicle becoming airborne and flipping over.

Recommendation:

It is recommended that the terminations on the new RRS barrier will have P4 (flat) terminations.

2.2.4 Problem

There is an existing public house with parking bays that front the highway as well as a car park, the Audit Team are concerned that with the removal of the on-street parking and introduction of the verge that drivers will still park on the road, reducing the width of the carriageway, this could result in side swipe or head on collisions.

Recommendation

The Design Team shall ensure that the proposed alignment ties in with existing and that the access to the car park is retained and consider the introduction of parking restrictions.

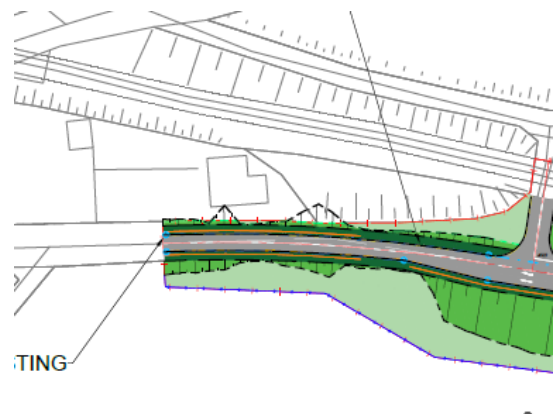


Figure 2-3 Tie in between existing and new road alignment

2.2.5 Problem

The Audit Team are concerned that a Side Road Ahead (left) warning sign is used at a number of locations on the proposed layout as opposed to a T Junction ahead or Side Road Ahead (right) warning sign which may lead to an increased risk of driver confusion.

Recommendation:

It is recommended that junction warning signs are provided in accordance with the Traffic Signs Manual.

2.3 XC212 Ballycoskery

2.3.1 Problem

There is a proposed pedestrian crossing on the access road to the school, no details are provided as to whether this crossing is controlled or uncontrolled, buff tactile paving indicates this an uncontrolled crossing, but appears to look like a Zebra crossing. Confusion over who has priority could result in pedestrians stepping out in front of vehicles.

Recommendation:

It is recommended that a controlled crossing is installed due to the proximity of the school.

2.3.2 Problem

The proposed new road alignment removes the existing access near the school to the Newtown Level crossing as this road will become a cul-de-sac. Drivers wanting to travel north do so via the new road alignment via Beechwood Drive. No signing is proposed to inform drivers of the change in route, therefore drivers could travel in the direction of the school, realise the road is closed and perform a turning manoeuvre potentially in front of the school.

Recommendation:

It is recommended that advanced directional signs are introduced, to reduce the number of vehicles incorrectly travelling in the vicinity of the school.

2.3.3 Problem

The proposed 2m footpath (2.6m footpath on overbridge) links the school to the local residential areas. No details are provided for facilities for cyclists. If there is a demand for cycling on these paths, insufficient widths could result conflict between different users.

Recommendation:

The design team should consider if there is a demand for a shared use facility and whether the footpath should be extended along the realigned L1533.

2.3.4 Problem

The Audit Team are concerned that a desire line may exist along the realigned road that may result in pedestrians walking along the northern verge to reach the footpath at the bellmouth on Beechwood Drive. This may result in an increased risk of trips and falls.

Recommendation:

The design team should consider if there is a demand for a footpath/ shared surface along this section.



Figure 2-4 Potential Desire Line

2.4 XC211 Newtown

2.4.1 Problem

The Audit Team is concerned that between chainage 0+280m and 0+470m, the steep vertical alignment combined with the crest curvature one step below desirable minimum and a 4.0m width carriageway may result in vehicles having to reverse to the passing bay at chainage 0+250m which may lead to a loss of control type collisions.

Recommendation

This design team should consider provision of an additional passing bay between chainage 0+370 and 0+470m.

2.4.2 Problem

The Audit Team is concerned that motorists unfamiliar with the new layout, will be unaware of the closure of the level crossing with no turning head provided to allow vehicles to turn and exit. The lack of a turning head may result in vehicles having to reverse over a long distance leading to a loss of control type collisions.

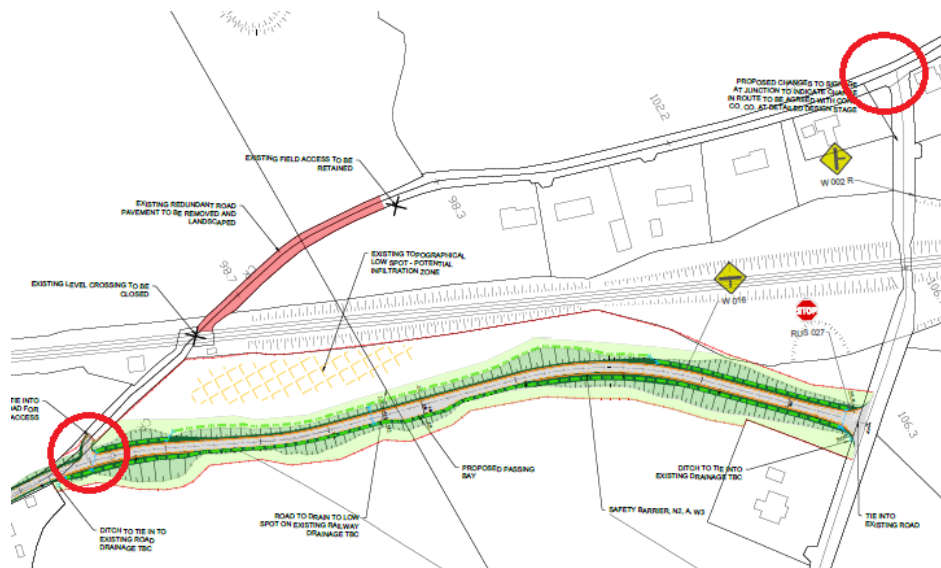


Figure 2-5 Cul De Sac Warning Signs

Recommendation

The design team shall provide a turning head at the end of these proposed cul de sacs. A F 350: Cul-de-sac sign shall be provided in accordance with the Traffic signs Manual at the entrance to each local road.

2.4.3 Problem

The Audit Team note that a vehicle restraint system is proposed between chainage 0+300 and 0+400m on the eastern side of the proposed realigned local road. The Audit Team are concerned that the vehicle restraint system will impinge upon the forward stopping sight distance on the inside of this bend leading to an increased risk of head on collisions.

Recommendation

The design team shall insure the VRS is sufficiently set back so as to not impact upon the forward stopping sight distance.

2.4.4 Problem

The Audit Team note that "Road Narrows on both sides" and "Left Bend Ahead" Warning Signage is provided in advance of the rail overbridge. Its unclear from the drawings whether these warning signs will be retained. There is the risk that motorists will be unaware of the road layout ahead if they are removed.

Recommendation

The warning signage should be retained, and the design team shall consider including Supplementary Plate P 060 – “Oncoming Traffic” to provide further warning of the road layout ahead due to the narrow carriageway/ road overbridge.

2.4.5 Problem

The Audit Team note that the existing L5535-0 is narrow in width and on-site observation indicate rutting of the existing verge. It is assumed this is to facilitate vehicles passing one another. The proposed realignment will generate an increase in traffic along the L5535-0 exacerbating this situation and lead to detritus on the carriageway resulting an increased risk of loss of control type collisions.



Figure 2-6 Rutting of Road Verge

Recommendation

The Design Team should consider the provision of a formal hardstanding area on either side of the overbridge to allow vehicles to pull in off the L5535-0 and allow other vehicles to pass.

2.4.6 Problem

The proposed realignment will result in increased traffic on the L5535-0 and utilisation of the existing narrow rail overbridge. The Audit Team are concerned that the existing forward visibility approaching the existing rail overbridge is compromised by existing vegetation, leading to an increased risk of head on type collisions.



Figure 2-7 Existing vegetation impinging on forward visibility

Recommendation

The existing vegetation is removed to improve forward visibility of the overbridge.

2.4.7 Problem

The Audit Team note that at the junction of the L5534-0 and L5535-0, the road surface is poor and road markings are faded. In addition, a Yield sign is located at the junction resulting in an increased risk of motorists overshooting the junction.



Figure 2-8 Bell mouth in poor condition

Recommendation

The design team shall highlight the issue to Cork County Council for resolution. It is recommended that the “Yield” sign is replaced with a “STOP” warning sign.

2.5 XC209 Ballyhay

2.5.1 Problem

The Audit Team note that the horizontal alignment, combined with vertical alignment and superelevation of the Connector South road is below desirable minimum standards for 42kph Design Speed. The Audit Team is concerned that the new alignment, will be unfamiliar to motorists in the absence of any warning signage this could lead to loss of control type collisions

Recommendation

The Design Team should provide advance warning signage and Chevron Boards to guide the driver around the Connector South Road's sharp changes of direction.

2.5.2 Problem

The Audit Team are concerned that the proposed tie in of the Connector South road may not tie in with the existing alignment leading to an increased risk of loss of control type collisions

Recommendation

The Design Team shall insure that the proposed alignment ties in with existing.



Figure 2-9 Tie in between existing and new road alignment

2.5.3 Problem

The Audit Team are concerned that the proposed alignment of the main road either side of the rail bridge may result in hidden dips limiting forward visibility of oncoming traffic and leading to an increased risk of head on type collisions.

Recommendation

The design team should review the vertical alignment with a view to removing any hidden dips.

2.5.4 Problem

It is noted that an access is proposed at Chainage 100 on the main road and Chainage 290 on the Connector Road. It is unclear from the drawings provided whether all remaining fields will be accessible following the closure of the existing road. The introduction of new accesses, particularly on the inside of bends may lead to poor visibility splays and an increase risk of side impact type collisions.

Recommendation

The design team should ensure that field accesses are provided where appropriate with adequate visibility splays and that field gates are set back from the carriageway edge.

2.5.5 Problem

The Audit Team are concerned that the proposed passing bays on are not sufficiently long enough to facilitate a tractor/ trailer which would prevent two vehicles passing one another and result in a risk of vehicles having to reverse on the narrow road.

Recommendation

The design team shall ensure that passing bays are provided in accordance with DN-GEO-03030.

2.6 XC201 Thomastown

2.6.1 Problem

The Audit Team are concerned that the junction ahead warning sign is in close proximity to the junction itself which will lead to an increased risk of late braking and rear shunt type collisions or loss of control type collisions

Recommendation

The warning sign should be located in advance of the junction in accordance with the Traffic Signs Manual.



Figure 2-10 Location of Warning Sign

2.6.2 Problem

It is unclear from the drawings whether warning signage is proposed on the R515 to highlight the presence of the new junction. There is the risk that existing signage relating to the location of the existing R515/ L8572 junction may cause driver confusion.

Recommendation:

The design team shall ensure that existing signage is relocated on the Regional Road R515 in advance of the proposed new junction.

2.6.3 Problem

It is noted that the new road will split existing farm land, it is unclear from the drawings provided whether the fields will be accessible following the closure of the existing road. The introduction of new accesses particularly may lead to poor visibility splays and an increase risk of side impact type collisions.

Recommendation

The design team should ensure that field accesses are provided where appropriate and that field gates are set back from the carriageway edge.

2.6.4 Problem

At the southern tie in point between the old road and the new road there is a T junction. No details are provided of a warning sign to inform drivers, this could result in overshoot type collisions or side impact collisions, if a driver is not expecting vehicles from either direction.

Recommendation:

It is recommended that a T junction sign W016 is provided along with the STOP sign which is shown in the drawings.

2.6.5 Problem

The Audit Team are concerned that the proposed passing bays are not sufficiently long enough to facilitate a tractor/ trailer which would prevent two vehicles passing one another and result in a risk of vehicles having to reverse on the narrow road.

Recommendation

The design team shall ensure that passing bays are provided in accordance with DN-GEO-03030.

2.7 General

- Ensure there is adequate visibility from all the farm accesses so that farm vehicles can safely turn out;
- Gated farm accesses need to be set back to ensure that farm vehicles can clear the carriageway before stopping;
- On the plan and profile drawings there are no transition sections between the different section of horizontal alignment.
- Ensure that the superelevation is in line with design speed and with the horizontal curvature to ensure vehicles can safely manoeuvre the corners. There appear to be some discrepancies.
- There are no advanced warning signs for the bridges, drivers unaware of the bridge might not adjust their speed accordingly to the road layout.
- All lines as signs should be consistent with the existing, where existing lines and signs are worn and it a poor state of repair they should be refreshed and or replaced.
- No details on footpaths regarding dropped kerbs or tactile paving.
- No corduroy on top or bottom of steps to highlight the hazard (Ballycoskery)
- Ensure the gradient of the ramp is correct and able to be used by all users (Ballycoskery)
- Ensure the Road Restraint Systems in the vicinity of junctions are set back so as to not impinge on visibility splays.

3. Audit Team Statement

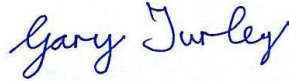
We certify that we have examined the drawings and documents listed in the appendices to this report.

The examination and subsequent report was made with the sole purpose of identifying any features of the scheme that could be removed or modified in order to improve the safety of the proposals.


The problems identified have been noted in this report together with associated safety improvement suggestions, which we recommend should be studied for implementation.

No one on the Audit Team has been involved in any way with the scheme design.

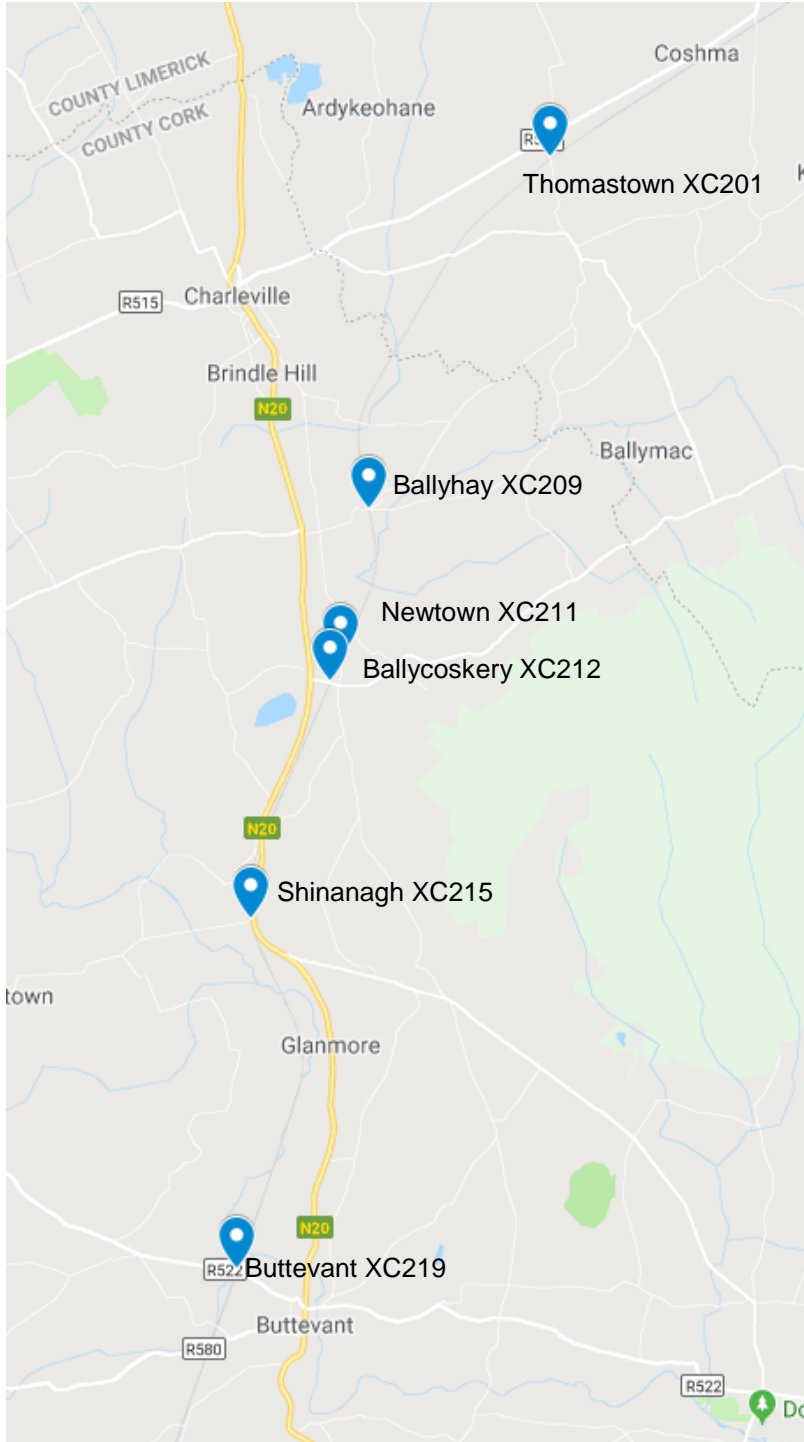
Audit Team Leader

Name:	G Turley	Signed:
	MEng HDip H'ways & Geo, HDip PM, CEng MIEI	
Position:	Associate Director	Dated: 13 th February 2020
Organisation:	Jacobs Engineering	
Address:	3 rd Floor, St. Johns House, High Street, Tallaght Dublin 24	

Audit Team Member

Name:	Stephen McVeigh	Signed:
	BSc CMILT MCIHT MSoRSA	
Position:	Senior Engineer	Dated: 13 th February 2020
Organisation:	Jacobs Engineering	
Address:	Jacobs, Manchester 5 First Street Manchester M15 4GU	

Appendix A – Problem Location Plan



Appendix B List of Documents Provided

32111000-JAC-HGN-XX-RP-CH-0001: Preliminary Design Report – Cork Level Crossings

List of Drawings Provided

Series	Dwg No	Rev	Drawing Title
Preliminary Design	32111000-JAC-HGN-XC201-DR-CH-0001	2	Plan – XC201 Thomastown
Preliminary Design	32111000-JAC-HGN-XC209-DR-CH-0001	0	Plan – XC209 Ballyhay
Preliminary Design	32111000-JAC-HGN-XC211-DR-CH-0002	0	Plan – XC211 Newtown
Preliminary Design	32111000-JAC-HGN-XC212-DR-CH-0001	2	Plan – XC212 Ballycoskery
Preliminary Design	32111000-JAC-HGN-XC215-DR-CH-0001	0	Plan – XC215 Shinanagh
Preliminary Design	32111000-JAC-HGN-XC219-DR-CH-0001	0	Plan – XC219 Buttevant
Preliminary Design	32111000-JAC-HML-XC201-DR-CH-0001	2	Plan and Profile – XC201 Thomastown
Preliminary Design	32111000-JAC-HML -XC209-DR-CH-0001	4	Plan and Profile – XC209 Ballyhay
Preliminary Design	32111000-JAC-HML -XC209-DR-CH-0002	4	Plan and Profile – XC209 Ballyhay
Preliminary Design	32111000-JAC-HML -XC211-DR-CH-0002	0	Plan and Profile – XC211 Newtown
Preliminary Design	32111000-JAC-HML -XC212-DR-CH-0001	2	Plan and Profile – XC212 Ballycoskery
Preliminary Design	32111000-JAC-HML -XC215-DR-CH-0001	0	Plan and Profile – XC215 Shinanagh

Appendix C Road Safety Audit Feedback Form

Scheme: Cork Line Level Crossings
 Audit Stage: Road Safety Audit Stage 1
 Date Audit Completed: 12th February 2020

Paragraph No. in Report	To Be Completed by the Design Team			To Be Completed by the Audit Team
	Problem accepted (yes/no)	Recommended measure accepted (yes/no)	Alternative measures (describe)	Alternative Measures accepted by Auditors (yes/no)
2.1.1	Yes	Yes		
2.1.2	Yes	Yes		
2.2.1	Yes	Yes		
2.2.2	Yes	Yes		
2.2.3	Yes	Yes		
2.2.4	Yes	Yes		
2.2.5	Yes	Yes		
2.3.1	Yes	Yes		
2.3.2	Yes	No	No longer applicable due to revised XC211 alignment	Yes
2.3.3	Yes	Yes		
2.3.4	Yes	Yes		
2.4.1	Yes	Yes		
2.4.2	Yes	No	Ch 0+075 will be a gated private access, so no signage required. North of the closed level crossing, a F 350: Cul-de-sac sign shall be provided at L5534-0 / L5535-0 T-junction. It is also proposed to recommend to Cork Co. Co. to change priority of this junction. There is existing property entrance near end of cul-de-sac with gate set back from road which would allow for vehicle turning. Dedicated turning head will not be included to avoid increased risk of illegal dumping.	Yes
2.4.3	Yes	Yes		

2.4.4	Yes	Yes		
2.4.5	Yes	Yes		
2.4.6	Yes	Yes		
2.4.7	Yes	Yes		
2.5.1	n/a	n/a	Works no longer progressing	
2.5.2	n/a	n/a	Works no longer progressing	
2.5.3	n/a	n/a	Works no longer progressing	
2.5.4	n/a	n/a	Works no longer progressing	
2.5.5	n/a	n/a	Works no longer progressing	
2.6.1	Yes	Yes		
2.6.2	Yes	Yes		
2.6.3	Yes	Yes		
2.6.4	Yes	Yes		
2.6.5	Yes	Yes		

Signed:  Designer

Date 8th June 2020

Signed:  Audit Team Leader

Date 8th June 2020

Signed:  Client

Date 09 June 2020