

Roughan & O'Donovan

Proposed Development and  
Alterations to N52 Inner Relief  
Road at Crowne Plaza Hotel  
Junction, Dundalk

Stage 1 & 2 Road Safety Audit

Roughan & O'Donovan

# Proposed Development and Alterations to N52 Inner Relief Road at Crowne Plaza Hotel Junction, Dundalk

## Stage 1 & 2 Road Safety Audit

<b>Document Ref:</b>	<b>P19-011-RP-001</b>
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Rev	Prepared By	Reviewed By	Approved By	Issue Date	Reason for Revision
3.0	AOR	PJM	PJM	1 <sup>st</sup> March 2019	Final Report
2.0	AOR	PJM	PJM	28 <sup>th</sup> Feb. 2019	Report layout amended
1.0	AOR	PJM	PJM	27 <sup>th</sup> Feb. 2019	Draft Report

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# 1 Introduction

## 1.1 General

This report results from a Stage 1 & 2 Road Safety Audit of the Proposed Development and Alterations to N52 Inner Relief Road at Crowne Plaza Hotel Junction, Dundalk, carried out at the request of Mr. Eoin Ó Catháin of Roughan & O'Donovan.

The members of the Road Safety Audit Team are independent of the design team, and include:

**Mr. Peter Monahan**

(BE MSc CEng FIEI RSACert)  
Road Safety Audit Team Leader

**Mr. Alan O'Reilly**

(BA BAI MSc MIEI RSACert)  
Road Safety Audit Team Member

The Road Safety Audit took place during March 2019 and comprised an examination of the documents provided by the designers (see Appendix B). In addition to examining the documents supplied the Road Safety Audit Team visited the site of the proposed measures on the 22<sup>nd</sup> February 2019. Weather conditions during the site visit were dry and the road surface was dry. Traffic volumes were considered low, as were pedestrian and cyclist volumes. Traffic speeds were considered low.

Where problems are relevant to specific locations these are shown on drawing extracts within the main body of the report and their locations are shown in Appendix D. Where problems are general to the proposals sample drawing extracts are within the main body of the report where considered necessary.

This has been carried out in accordance with the requirements of GE-STY-01024 - Road Safety Audit (December 2017), contained on the Transport Infrastructure Ireland (TII) Publications website.

The scheme has been examined and this report compiled in respect of the consideration of those matters that have an adverse effect on road safety and considers the perspective of all road users. It has not been examined or verified for compliance with any other standards or criteria. The problems identified in this report are considered to require action in order to improve the safety of the scheme and minimise collision occurrence.

If any of the recommendations within this road safety audit report are not accepted, a written response is required, stating reasons for non-acceptance. Comments made within the report under the heading of Observations are intended to be for information only. Written responses to Observations are not required.

## 1.2 Items Not Submitted for Auditing

Details of the following items were not submitted for audit; therefore no specific problems have been identified at this stage relating to these design elements, however where the absence of this information has given rise to a safety concern it has been commented upon in Section 3: -

- Landscaping
- Cross-sections;
- Traffic signal phasing, post location, aspects;
- Drainage;
- Sign locations;
- Personal Injury Collision data;
- Vehicle swept paths; and
- Visibility splays.

## 2 Project Description

It is proposed to provide a mixed-use non-retail development (including residential, office and leisure uses) in lands located immediately south of the Crowne Plaza Hotel on the existing R215 (formerly the N52), east of its junction with the R132, in Dundalk, Co Louth.

Access to/from the proposed development site is proposed by means of an additional arm onto the existing signalised junction which currently serves as an access to the Crowne Plaza Hotel and to the Dundalk Institute of Technology.

The Audit Team has been advised by the Design Team that a 50kph urban speed limit will apply to the junction as part of the reclassification from the N52 to a Regional Road and that the design has been undertaken on this basis.

It is proposed to provide additional capacity on the section of the R215, west of the development access, on its westbound approach to the existing R132/R215 junction in order to ensure that the existing R132/R215 junction can accommodate the additional traffic generated by the proposed development.

Cyclist facilities are proposed on the westbound carriageways between the R215/R132 junction and just east of the Crowne Plaza Hotel junction. These are off-road facilities and will be segregated along most of its length from the adjacent footpath. Shared surfaces will be provided at pedestrian crossings and to the rear of bus stop locations.

A proposed vulnerable road user (VRU) entrance to the proposed development is located from the R132 approximately 250m to the south of the signalised junction with the R215.



FIGURE 2.1: SITE LOCATION

### 3 Main Report

#### 3.1 External Road Layout

##### 3.1.1 Problem

Location: R215

Summary: Existing items of street furniture will require removal or relocation to facilitate the proposed provision of an additional traffic lane on the westbound carriageway.

It is proposed to provide an additional lane on the R215 westbound carriageway which will be achieved by widening into the existing grass verge. During the site visit the Audit Team noted a number of trees, signage and lighting columns within this grass verge which will require removal or relocation. If these lighting columns are located where they will not adequately illuminate the carriageway and footpath/cycletrack there is a risk of dark spots within the carriageway which could lead to restricted inter-visibility between drivers and VRUS resulting in an increased risk of collisions.

It was also noted that the existing bus layby, on the R215 westbound carriageway downstream of the proposed development access junction, has a public lighting column and an associated mini-pillar located centrally within the footpath close to the bus shelter. The location and proximity of these items of roadside furniture present a hazard/obstacle to visually and mobility impaired road users.

#### Recommendation

All items of existing roadside furniture (public lighting columns, signs, bus shelter etc.) should be relocated to a suitable location where they will not constitute a hazard to road users.

Ensure relocated lighting columns are positioned such that they adequately illuminate the footpath/cycletrack and widened carriageway.

##### 3.1.2 Problem

Location: Westbound right turn lane at the Crowne Plaza Hotel Junction

Summary: Existing channel drain through the central median at the westbound right turn lane is blocked.

During the site visit, the Audit Team noted that the existing channel drain through the central median was blocked by an accumulation of detritus within the westbound right turn lane at the Crowne Plaza Hotel Junction.

This could lead to ponding on the westbound carriageway should surface water be unable to sufficiently drain from the carriageway. The proposals will result in a greater carriageway surface area draining towards this median/splitter island increasing the likelihood of ponding.

During wet and icy weather ponding at this location could result in a loss of traction between tyres and the road surface resulting in loss of control type incidents and increased injury severity to vehicle occupants.

#### Recommendation

Ensure the carriageway can adequately shed surface run-off.



### 3.1.3 Problem

Location: Drawing no. SK-30001 (-)

Summary: The proposed tactile paving arrangement across the gated access to the electrical substation may result in visually impaired pedestrians being insufficiently aware that they are crossing a vehicular access and leaving the VRU facilities.

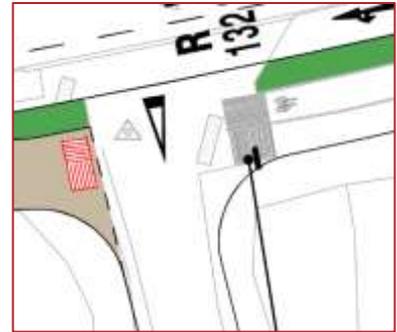
Ladder and tramline tactile paving is indicated on the western side of the vehicular access to the electrical substation at the commencement of the proposed shared surface while there is existing ladder and tramline tactile paving located on the western side of the access.

Visually impaired pedestrians approaching the access may be insufficiently aware that they are entering a carriageway and may perceive the tactile paving to indicate the end of the segregated facilities. This could lead visually impaired pedestrians inadvertently entering the access where there is a risk of being struck by a vehicle.

#### Recommendation

As the access to the electrical substation is gated and is likely to be lightly trafficked priority at this location should be given to vulnerable road users by providing a continuous shared surface across the access.

The proposed ladder and tramline tactile paving on the western side of the access would therefore not be required. The existing warning tactile at the access could then be removed, while the existing "Ladder & Tramline" tactile markings should be retained to define the transition from the shared to the segregated surfaces.



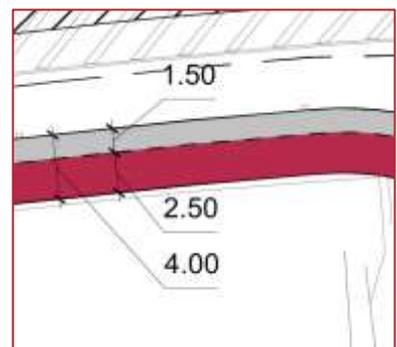
### 3.1.4 Problem

Location: Drawing no. SK-30001 (-)

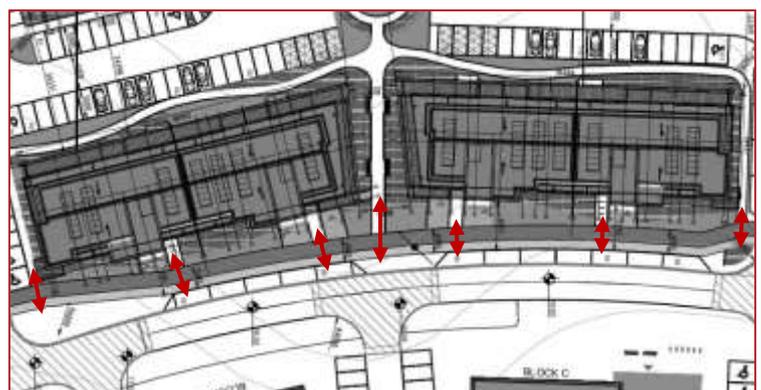
Summary: The cycletrack has been indicated on the inside of the footpath which is not consistent with the National Cycle Manual preferred arrangement or the existing facilities to the east of the Crowne Plaza Hotel junction.

A segregated footpath and cycletrack has been indicated from the proposed development onto the R215 with the cycletrack indicated on the inside of the footpath which is shown adjacent to the carriageway.

The National Cycle Manual, for all types of segregated cycle facility, shows the cycletrack adjacent to the carriageway. There is an existing segregated facility on the southern side of the R215 to the east of the electrical substation access which has the cycletrack adjacent to the carriageway and the footpath on the inside.



The proposed arrangement extends into the development, where the provision of the footpath adjacent to the carriageway facilitates passenger egress from vehicles parked at the kerb. However, the arrangement shown requires all pedestrians entering/exiting the buildings within the development to cross the cycle track to reach the footpath.



It is likely that cyclists and pedestrians already travelling on the existing westbound facilities east of the Crowne Plaza Hotel junction will then continue travelling within the incorrect path/track downstream of the crossing resulting in the potential for pedestrian-cyclist collisions.

### Recommendation

Provide a shared surface instead of separate cycle & pedestrian facilities, which would also remove the need for tactile surfaces at the interfaces with the other shared surfaces along the R215.

Alternatively, amend the segregated pedestrian and cyclist facilities so that the footpath is on the inside and the cycletrack is adjacent the carriageway. The footpath level should be above the level of the cycletrack.

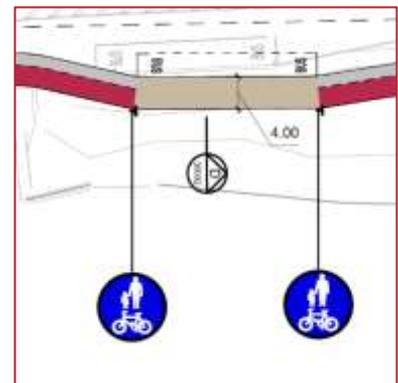
### 3.1.5 Problem

*Location:* Drawing no. SK-30001 (-)

*Summary:* Ladder and tramline tactile paving has not been indicated either side of the proposed shared surface at the westbound bus layby or at the transition to the shared surface on the westbound approach to the R132 junction.

The segregated footpath and cycletrack transitions to a shared surface at the bus layby on the westbound carriageway of the R215 and on the approach to the R132 junction.

Ladder and tramline tactile paving has not been indicated at the start and end of this section of shared surface. This could lead to visually impaired pedestrians approaching the shared surface in the footpath being insufficiently aware that they are entering a shared area where cyclists may also be present which could result in an increased risk of pedestrian-cyclist collisions.



### Recommendation

Provide ladder and tramline tactile paving at the interfaces between shared and segregated surfaces.

Alternatively, as recommended in Problem 3.1.4, a shared surface could be provided throughout the Scheme in lieu of the proposed segregated pedestrian & cyclist facilities.

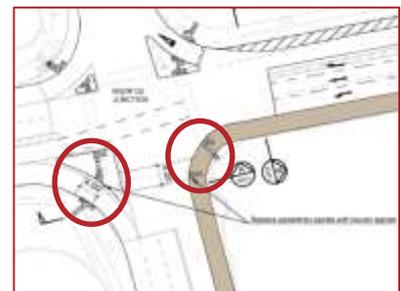
### 3.1.6 Problem

*Location:* Drawing no. SK-30001 (-)

*Summary:* Existing tactile paving provision, as indicated on the drawing, may not be appropriate for the proposed toucan crossings.

It is proposed to replace the existing, although possibly unused, pedestrian crossing of the R132, south of the R215 junction, and the associated segregated left turn slip with toucan crossings to facilitate both pedestrians and cyclists.

The existing tactile paving arrangement is indicated as being retained at these crossings, including one provision where chamber covers encroach into the tactile paving layout.



This existing tactile paving arrangement may not be appropriate for the proposed Toucan crossings, which are 4m wide, as the existing tactile paving will not extend across the full width of the proposed crossing. This could lead to visually impaired pedestrians inadvertently entering the carriageway where the tactile paving does not extend over the full width of the dropped kerb with a resulting increased risk of being struck by a vehicle.

## Recommendation

The existing tactile paving arrangements should be replaced or amended with new tactile paving suitable for the proposed toucan crossing.

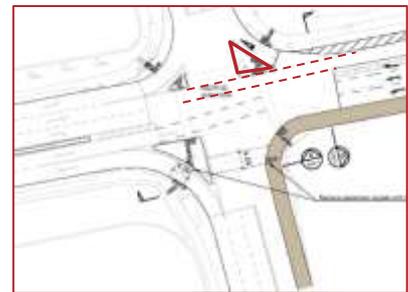
It may also be necessary to change the existing pedestrian crossings of the R215 to the west of the junction to toucan crossings, or to provide 'box turn' arrangements, to facilitate cyclists wishing to travel northbound from the R215 westbound approach.

### 3.1.7 Problem

*Location: Drawing no. SK-30001 (-)*

*Summary: Risk of eastbound drivers entering the incorrect lane downstream of the junction as lane guidance markings have not been provided for this movement.*

The inclusion of an additional third lane on the westbound carriageway of the R215 results in the through traffic lanes being offset from the downstream lane on the other side of the junction. Lane guidance markings have been indicated for westbound drivers travelling straight-ahead at the R132/R215 junction, however no guidance markings have been indicated for eastbound straight-ahead traffic. This could lead to eastbound drivers potentially entering the opposing right turn lane where there is a risk of head-on collisions with vehicles waiting in this lane.



In addition, large eastbound vehicles may strike the existing splitter island in the north-eastern quadrant of the junction as they enter the downstream eastbound lane resulting in material damage collisions.

## Recommendation

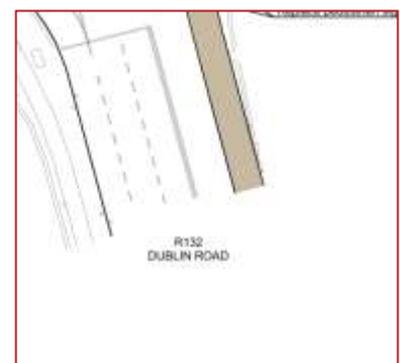
Provide lane guidance markings at the R132/R215 junction for the eastbound through movement. The north-eastern splitter island may also require amendment to ensure all vehicles can safely undertake the through movement within the carriageway extents.

### 3.1.8 Problem

*Location: Drawing no. SK-30001 (-)*

*Summary: Proposed shared surface on the R132 does not tie-in with similar facilities.*

A shared surface of width 3.0m is proposed on the southern side of the R215 carriageway, which extends onto the R132, terminating south of the R132/R215 junction. This proposed facility does not tie-in with an existing facility at this location and the existing footpath at this location is not wide enough to accommodate both pedestrians and cyclists. Should vulnerable road users be directed onto this existing footpath there is a risk of collisions between pedestrians and cyclists.



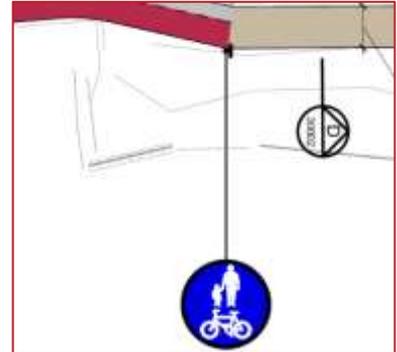
## Recommendation

The arrangement at the tie-in of the proposed shared surface and the existing footpath on the R132 should be amended so that southbound cyclists are safely transitioned onto the southbound R132 carriageway to continue their journey.



### 3.1.9 Observations

1. Advance stacking locations (ASLs) have been indicated on the approaches to the Crowne Plaza Hotel junction. Section 4.4.1 (point no. 6) of the National Cycle Manual states that “ASLs must always be “fed” by a cycle lane to ensure that cyclists can pass stationary traffic and get to them.” No on-road cycle facilities are proposed on the approaches to the ASLs, and it may be preferable to omit them from the design.
2. The shared surface sign indicated at the western side of the shared surface at the bus layby on the westbound carriageway of the R215 is indicated as facing in the incorrect direction. This should be amended to face towards pedestrians and cyclists approaching from the west.



## 3.2 Internal Road Layout

### 3.2.1 Problem

*Location:* Drawing no. 1611-PA-003

*Summary:* Priority at the roundabout island at the entrance to the cluster of apartment blocks within the proposed development is unclear.

A rectangular island has been indicated within one of the development car parks. The Audit Team have assumed that this is intended to function similar to a roundabout. It is however unclear, due to the lack of signs or roadmarkings at this location, who has priority at this junction or what movements are permitted. Should priority at this junction be unclear this could lead to drivers on opposing arms entering the junction simultaneously leading to an increased risk of collisions and injuries to vehicle occupants.



### Recommendation

Provide clear guidance to drivers, through the provision of signs and roadmarkings, as to which arms of the junction have priority and what movements are permitted at this location.

### 3.2.2 Problem

*Location:* Drawing no. 1611-PA-003

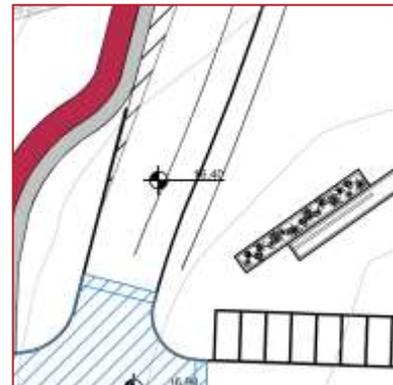
*Summary:* The pedestrian routes through the proposed development are unclear, including where crossings are proposed, the arrangement of the VRU facilities (shared or segregated) and the lack of tactile paving at proposed crossing points.

The footpath on the western side of the access road to the proposed development appears to terminate south of the Crowne Plaza Hotel junction without connecting to other pedestrian routes.

Apart from the primary footpath/cycletrack through the spine of the development, the footpath arrangements within the development, outside the public open space and cluster of apartment blocks, is unclear.

Crossing locations are not clearly indicated and where crossings appear to have been provided these do not line up with an opposing footpath, while some terminate at car parking spaces.

A failure to provide suitable access points to the footpaths could lead to mobility impaired pedestrians, who cannot mount a full-height kerb, becoming stranded within the carriageway or having to travel within the carriageway to the nearest dropped kerb location resulting in an increased risk of being struck by a vehicle.



Tactile paving is also not indicated within the development which increases the difficulty in determining where proposed crossing points are located. If tactile paving is not provided at crossing points this could lead to visually impaired pedestrians inadvertently entering the carriageway where they are at risk of being struck by a vehicle.

### Recommendation

Ensure the pedestrian routes within the proposed development are continuous, clearly defined and include dropped kerbs and tactile paving at all crossing points.

### 3.2.3 Problem

Location: Drawing no. 1611-PA-003

Summary: *Turning heads have not been indicated at the end of cul de sacs within the proposed development.*

Cul de sacs have been indicated throughout the proposed developments. Turning heads have not been indicated at the end of cul de sacs in all instances.

A failure to provide a turning head at these locations could result in large vehicles being unable to undertake a u-turn manoeuvre within the carriageway resulting in them undertaking unsafe reversing manoeuvres where there is a risk of collisions with other road users.



### Recommendation

Turning heads should be provided at the end of cul de sacs.

The ends of some cul de sacs have been indicated as being designated for future access to the proposed development. Nevertheless, in the interim, turning heads should also be provided at these locations.

### 3.2.4 Observations

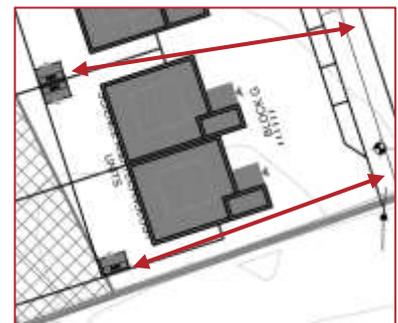
1. It is unclear if the link from the western boundary of the proposed development to the R132 is a shared area for all vulnerable road users or just cyclists. The shared area for motorised and non-motorised road users within the development, if this is what is intended, should be highlighted through the provision of alternative surface materials rather than a cycle symbol to avoid confusion. Also, if the link to the R132 is not intended for motorised vehicles measures should be provided at each end to deter drivers from entering the facility.



2. Bin stores have been indicated adjacent the buildings within the proposed development. Some of the bin-stores are indicated away from the carriageway (e.g. for Science & Technology Units Block G & H or to the rear of parking spaces (Block B)).

Bins could be left in inappropriate locations for collection which could lead to refuse trucks stopping at unsafe locations in order to collect them. Bins left within footpaths or cycle tracks could present a hazard to these road users.

Designated locations should be identified throughout the development, close to the carriageway, where bins can be easily transported to for safe collection.



## 4 Road Safety Audit Team Statement

We certify that we have examined the drawings referred to in this report. The examination 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.

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

No one on the Road Safety Audit Team has been involved with the design of the scheme.

### ROAD SAFETY AUDIT TEAM LEADER

Peter Monahan

Signed:



Dated:

1<sup>st</sup> March 2019

### ROAD SAFETY AUDIT TEAM MEMBER

Alan O'Reilly

Signed:



Dated:

1<sup>st</sup> March 2019

## **Appendix A – Road Safety Audit Brief Checklist**

Have the following been included in the audit brief?: (if 'No', reasons should be given below)

	Yes	No
1. The Design Brief	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2. Departures from Standard	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3. Scheme Drawings	<input checked="" type="checkbox"/>	<input type="checkbox"/>
4. Scheme Details such as signs schedules, traffic signal staging	<input type="checkbox"/>	<input checked="" type="checkbox"/>
5. Collision data for existing roads affected by scheme	<input type="checkbox"/>	<input checked="" type="checkbox"/>
6. Traffic surveys	<input type="checkbox"/>	<input checked="" type="checkbox"/>
7. Previous Road Safety Audit Reports and Designer's Responses/Feedback Form	<input type="checkbox"/>	<input checked="" type="checkbox"/>
8. Previous Exception Reports	<input type="checkbox"/>	<input checked="" type="checkbox"/>
9. Start date for construction and expected opening date	<input type="checkbox"/>	<input checked="" type="checkbox"/>
10. Any elements to be excluded from audit	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**Any other information?**

(if 'Yes', describe below)

<input type="checkbox"/>	<input checked="" type="checkbox"/>
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## **Appendix B – Documents Submitted to the Road Safety Audit Team**

DOCUMENT/DRAWING TITLE	DOCUMENT/DRAWING NO.	REVISION
Proposed Junction layout	SK-30001	-
Proposed Site Plan	1611-PA-003	(08/2018)

## **Appendix C – Feedback Form**

## Road Safety Audit Feedback Form

Scheme: Proposed Development and Alterations to N52 Inner Relief Road at Crowne Plaza Hotel Junction, Dundalk

Route No.: N52 & R132

Audit Stage: Stage 1/2 Road Safety Audit Date Audit Completed: 26<sup>th</sup> Feb. 2019

To Be Completed By Designer				To Be Completed By Audit Team Leader
Paragraph No. in Safety Audit Report	Problem Accepted (Yes/No)	Recommended Measure(s) Accepted (Yes/No)	Describe Alternative Measure(s). Give reasons for not accepting recommended measure	Alternative Measures or Reasons Accepted by Auditors (Yes/No)
3.1.1	Y	Y		
3.1.2	Y	Y		
3.1.3	Y	Y		
3.1.4	Y	Y		
3.1.5	Y	Y		
3.1.6	Y	Y		
3.1.7	Y	Y		
3.1.8	Y	N	Louth County Council has a programme of works to enhance the cycling network in Dundalk. Any interventions here would be premature in advance of same. There is a simple transition onto road for cyclists at the dropped kerb at the access immediately south of the proposed pedestrian crossing.	Yes
3.2.1	Y	N	A shared surface approach has been revised into the design to avoid confusion in this location.	Yes
3.2.2	Y	Y		
3.2.3	Y	N	These roads have been extended from the parking bays to the property boundary at the direction of the Local Authority. They will only be used for car parking and, as such, the provision of turning heads is considered to be unnecessary.	Yes

Signed: 

Designer

Date

1/5/19

**Signed:** Peter J. Monahan      Audit Team Leader      **Date**      1<sup>st</sup> March 2019

**Signed:** Jim van der ...      Employer      **Date**      1<sup>st</sup> March 2019

## Appendix D – Problem Locations

**Problem 3.1.1:** Existing items of street furniture will require removal or relocation to facilitate the proposed provision of an additional traffic lane on the westbound carriageway.

**Problem 3.1.2:** Existing channel drain through the central median at the westbound right turn lane is blocked.

**Problem 3.1.3:** The proposed tactile paving arrangement across the gated access to the electrical substation may result in visually impaired pedestrians being insufficiently aware that they are crossing a vehicular access and leaving the VRU facilities.

**Problem 3.1.4:** The cycletrack has been indicated on the inside of the footpath which is not consistent with the National Cycle Manual preferred arrangement or the existing facilities to the east of the Crowne Plaza Hotel junction.

**Problem 3.1.7:** Risk of eastbound drivers entering the incorrect lane downstream of the junction as lane guidance markings have not been provided for this movement.

**Problem 3.1.6:** Existing tactile paving provision, as indicated on the drawing, may not be appropriate for the proposed toucan crossings.

**Problem 3.1.8:** Proposed shared surface on the R132 does not tie-in with similar facilities.

**Problem 3.1.5:** Ladder and tramline tactile paving has not been indicated either side of the proposed shared surface at the westbound bus layby or at the transition to the shared surface on the westbound approach to the R132 junction.

**Problem 3.2.2:** The pedestrian routes through the proposed development are unclear, including where crossings are proposed, the arrangement of the VRU facilities (shared or segregated) and the lack of tactile paving at proposed crossing points.

**Problem 3.2.1:** Priority at the roundabout island at the entrance to the cluster of apartment blocks within the proposed development is unclear.

**Problem 3.2.3:** Turning heads have not been indicated at the end of cul de sacs within the proposed development.

