

Roughan & O'Donovan

Proposed Housing Development
in Farrankelly, Co. Wicklow

Stage 1 Road Safety Audit

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4.0	TAG	DOB	TAG	5 th Sept 2019	Final (Minor Amendments)
3.0	TAG	DOB	TAG	30 th August 2019	Final Report (Minor Amendments)
2.0	TAG	DOB	TAG	28 th August 2019	Final Report
1.0	TAG	DOB	TAG	24 th July 2019	Draft Report

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1 Introduction

1.1 General

This report results from a Stage 1 Road Safety Audit on the proposed Housing Development in Farrankelly, Co. Wicklow carried out at the request of Mr John Bell of Roughan & O'Donovan.

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

Mr. Aly Gleeson

(MBA, MEng, BSc, CEng, RSACert, MIEI, MSoRSA)
Road Safety Audit Team Leader

Mr. David O'Brien

(BA, BAI, PgDip(PM), CEng, MIEI, RSACert)
Road Safety Audit Team Member

The Road Safety Audit took place during September 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 15th July 2019. Weather conditions during the site visit were dry. The road surface was dry. Traffic volumes and speeds were considered low, as were pedestrian and cyclist volumes.

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: -

- Signs and road markings
- Public lighting provision
- Tactile paving provision
- Junction priority and control
- Vehicle swept paths (provided at some, but not all junctions)
- Visibility splays (provided at some, but not all junctions)

2 Project Description

A new residential development is proposed in Farrankelly, Greystones, Co. Wicklow. The development will have accesses onto the R761 (Kilcoole Road) and the L5027 (Priory Road).

- **R761** - The R761 is a regional road that extends approximately 23.5km between Bray and Rathnew. Within the vicinity of the development, the R761 extends between the roundabout at the R774 Farrankelly Road and the roundabout at the R762 Mill Road. The R761 is a two-way single carriageway in an urban area with a posted speed limit of 50kph. A wide footway is provided on the eastern side of the R761, which accommodates both pedestrians and cyclists. There is no footway on the western side of the R761. A bus stop is located on the eastern side of the R761, opposite the proposed residential development access.
- **L5027** - The L5027 is a two-way single carriageway local road that extends north from the R774. The local road is rural in character at its interface with the development, just north of the Eden Gate residential development. There are no footways on the L5027 near the proposed development. The speed limit increases to 80kph on the L5027 after the Eden Gate development.



The proposed development is located on a site that is approximately 19ha in area, and is bounded by the R761 to the east, Eden Gate Housing Development to the south, Priory Road to the west and industry to the north. The development includes the following:

- 426 Housing Units - comprising 245No houses (148 no. 3 bedrooms, 93 no. 4 bedrooms and 4 no. 5 bedroom houses), 88No duplex houses and 3No apartment blocks with 93 no. of apartments);
- Active Open Space with sports pitches;
- 2m footways within the development and a green route; and
- Proposed Toucan Crossing on the R761.

3 Main Report

3.1 Problem

Location: Priory Road

Summary: Several direct accesses onto Priory Road may increase the risk of side-on or rear-end-shunt collisions.



The proposed development includes three separate direct accesses onto Priory Road, as well as a new junction between Main Link Street 01 and Priory Road. The three accesses facilitate nine residential properties and 18No parking spaces. Having several direct accesses onto Priory Road, and within a relatively short distance, may lead to an increased risk of rear end shunt and side-on collisions. This issue is exacerbated by existing property accesses to the south of Priory Road, the horizontal alignment, and the rural character of Priory Road.

Recommendation

The proposed development should remove the three direct accesses onto Priory Road through the provision of a service lane that connects with internal residential streets.

3.2 Problem

Location: General Problem

Summary: Unclear if there is sufficient drainage provision within the proposed development.

It is unclear at this early stage in the design process if sufficient drainage provision has been provided within the development. Should inadequate drainage measures be provided, this could lead to ponding on the footpath or carriageway resulting in slips and trips during wet or icy weather.

Recommendation

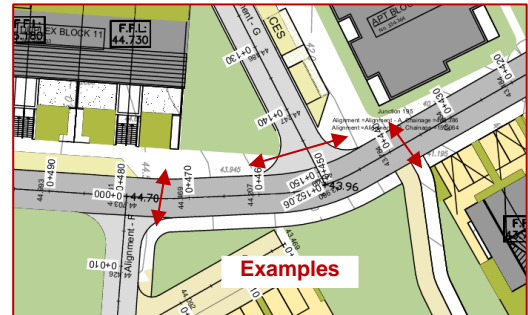
Ensure that the footpath and carriageway is adequately drained.

3.3 Problem

Location: General Problem

Summary: Designated crossing points within the residential road network have not been indicated at junctions.

Pedestrian crossing points, including dropped kerbs and tactile paving, have not been indicated at all junctions within the proposed development. A failure to provide dropped kerbs at crossing points, and along pedestrian desire lines, could result in mobility impaired pedestrians being unable to safely and independently enter the carriageway to cross to the opposite footpath. This could result in slips, trips or falls as these pedestrians attempt to descend the kerb, or an increased risk in visually impaired pedestrians unintentionally entering the carriageway where they could be struck by vehicles.



Recommendation

Pedestrian crossings, including dropped kerbs and tactile paving, should be provided across all junctions within the proposed development. Also, hazard paving should be located at the top and bottom of steps within the development.

3.4 Problem

Location: General Problem

Summary: No junction control or priority type has been indicated at junctions within the development.



The junction control (stop, yield etc.) at junctions within the proposed development has not been indicated. It is therefore unclear who has priority at these junctions. This could result in driver confusion and hesitation leading to collisions should drivers assume that they have priority over vehicles in adjacent roads leading to low speed collisions and material damage.

Recommendation

Ensure the junction control at all junctions is clear and that drivers are sufficiently advised of the priority at junctions.

3.5 Problem

Location: General Problem

Summary: Unclear where public lighting columns will be located relative to the footpath.

At this early stage in the design process, information regarding proposed public lighting columns has not been provided to the Audit Team. It is assumed that public lighting columns will be provided throughout the proposed development. It is unclear, however, if these public lighting columns will be located within grass verges or within the footpath. Should public lighting columns be located within the footpath the effective width of the footpath will be reduced resulting in pedestrians having to enter the carriageway to avoid the obstruction leading to an increased risk of collisions with vehicles and cyclists.

Recommendation

Ensure public lighting columns are located at the back of the footpath or within the grass verge such that they do not constitute a hazard to pedestrians. Care should be taken to ensure that they are not located close to trees and other vegetation.

3.6 Problem

Location: General Problem

Summary: Information regarding signage/roadmarkings not provided to the Audit Team.

Information regarding the proposed signage/roadmarkings within the development has not been provided to the Audit Team. The Audit Team are aware that this is a Stage 1 Road Safety Audit and that this information is likely to be considered as the design progresses. However, if sufficient consideration is not given to the various sign types, their size and location, this could result in signs being insufficiently visible to drivers. This could result in drivers being insufficiently aware of the road layout leading to driver confusion and an increased risk of collisions.

Recommendation

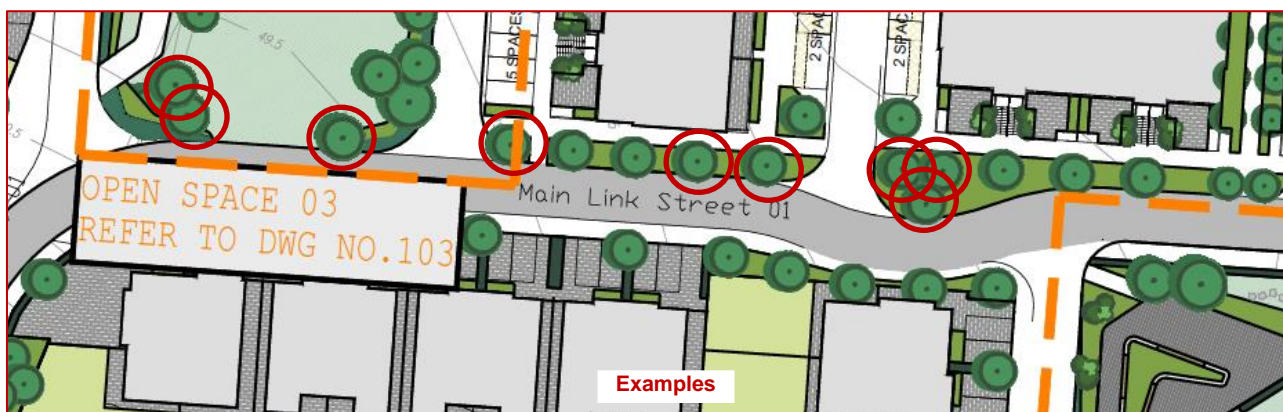
Ensure all necessary signs and roadmarkings are provided during the detailed design stage and that the signage is of sufficient size, and located, such that it is sufficiently visible to drivers.

3.7 Problem

Location: General problem

Examples: Main Link Street 01 junctions with Local Streets 10 and 12

Summary: Visibility exiting side roads could be restricted by trees within the footpath.



Trees have been indicated within the footpath adjacent side road junctions throughout the scheme. These trees could restrict a driver's visibility towards approaching vehicles when stationary at the junction. This could result in drivers entering the carriageway ahead of oncoming vehicles when it is unsafe to do so leading to side-on collisions.

Recommendation

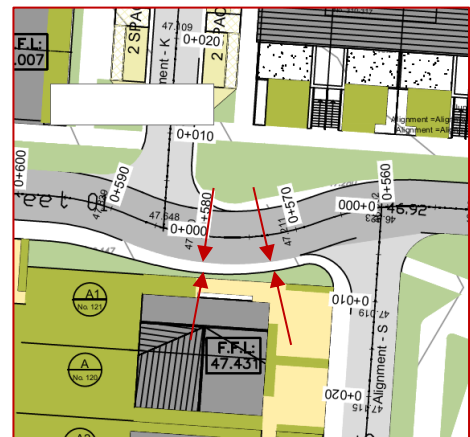
Ensure the trees within the scheme do not impede a driver's visibility when exiting side roads. The trees should be relocated if necessary.

3.8 Problem

Location: Main Link Street 01 junction with Local Street 06

Summary: Footway width appears to include localised narrowing or pinch point.

The footway width appears to fall below the desirable 2m width, which may result in pedestrians being unable to pass each other, especially where mobility impaired or visually impaired pedestrians are using the footway. This may force pedestrians onto the road where they are at a greater risk of being struck by a cyclist or vehicle.



Recommendation

A footway width of at least 1.8m (preferably 2m) should be provided throughout the development, ensuring there are no pinch points or local narrowings.

3.9 Problem

Locations: Local Street 08 and Local Street 14

Summary: Junction mouth width may encourage high entry/exit speeds.

The junction mouth at Local Street 08 and Local Street 14 is wide and may promote high entry and exit speeds. This may lead to loss of control collisions where drivers fail to reduce their speed on approach to the junction. Additionally, the wide junction mouth may lead to longer crossing times for pedestrians, particularly for visually impaired pedestrians, increasing the risk of pedestrians being struck by a vehicle.



Recommendation

The junction mouth should be reduced to passively encourage slower entry/exit speeds, and to minimise the time a pedestrian travels within the carriageway.

3.10 Problem

Location: Development access at R761

Summary: Visibility to junction control signage may be reduced as a result of the approach alignment.

Drivers exiting the development via the access onto the R761 may have limited visibility to the junction control sign, as the horizontal alignment includes two high demand bends. Failure to see the junction control sign (i.e. Stop or Yield) may lead to high approach speeds, and possible overshoot collisions with pedestrians or cyclists using the raised table crossing, or with vehicles on the R761.



Recommendation

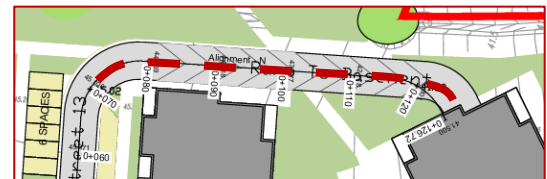
Ensure drivers have sufficient visibility to the junction control sign (i.e. Stop sign) on approach to the R761. If required, an advance Stop sign and supplementary distance plate should be provided in advance of the junction.

3.11 Problem

Location: Local Street 13

Summary: Ramp to basement at the end of Local Street 13 is near a footway, which may increase the risk of falling from height if no edge protection is provided.

Local Street 13 leads to a ramped access to the adjacent apartment block basement. A footway is located near the top of the ramp, which may include a vertical fall. It is unclear if the footway includes edge protection along its interface with the ramp. The absence of edge protection may increase the risk of pedestrians, particularly visually impaired pedestrians, and cyclists falling from height, leading to serious personal injury.



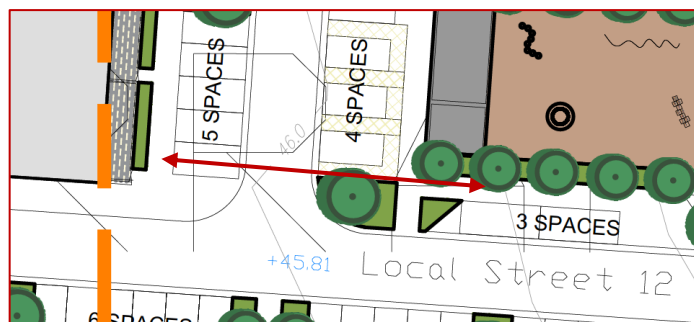
Recommendation

Ensure footways include edge protection when adjacent to steep embankments or vertical falls.

3.12 Problem

Location: Local Street 12 junction with Local Street 13

Summary: Mobility parking provision appears to obstruct or restrict pedestrian movement across the side road.



Mobility parking spaces are provided at the junction of Local Street 12/Local Street 13. However, the mobility parking spaces appear to block pedestrians from continuing along Local Street 12. This may force pedestrians into the carriageway, where there is an increased risk of being struck by a vehicle.

Recommendation

Pedestrians should have unobstructed access across the side road junction, allowing them to safely continue their journey through the development.

3.13 Problem

Location: General Problem

Examples: Main Link Street 01 junction with Local Street 08

Main Link Street 01 junction with Local Street 10

Main Link Street 01 junction with Local Street 05

Summary: The pedestrian footway switches from one side of the road to the other, though no pedestrian crossing has been provided to facilitate pedestrians crossing from one footway to the other.

The pedestrian footway on Main Link Street 01 terminates at various locations within the development, with pedestrians required to cross the road to join the footway on the other side, allowing them to continue their journey through the development. However, no pedestrian crossings have been provided at these locations, which may make it difficult for visually impaired and mobility impaired pedestrians to cross the road. This could lead to mobility impaired pedestrians having to continue along the carriageway until a dropped kerb is provided, which may increase the risk of vehicle/pedestrian collisions. Visually impaired pedestrians may be unable to independently cross the road where a crossing is not provided, leading to slips, trips and falls as they step up or down from the kerb.

Recommendation

Ensure pedestrian crossing facilities are provided along desire lines, particularly where pedestrians need to cross the road to continue their journey through the development.

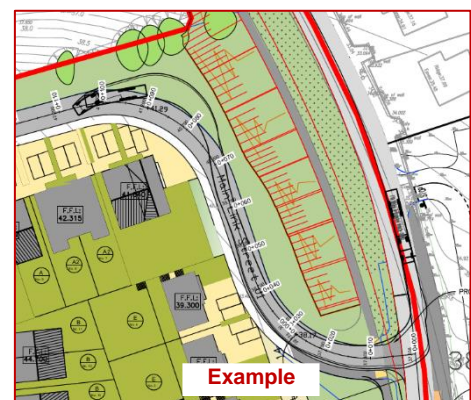
Similarly, crossings should be provided where pedestrians access amenities, such as Public Open Space or playground facilities.

3.14 Problem

Location: General Problem

Summary: It is unclear if there is sufficient swept path for vehicles within the development.

It is unclear if the proposed layout can accommodate the swept path of large vehicles at each junction within the development (i.e. buses using the active open space facility, refuse truck, etc.). If insufficient space is provided this may lead to vehicles mounting the inside kerb when undertaking turning manoeuvres, thus increasing the risk of vehicles striking pedestrians.



Recommendation

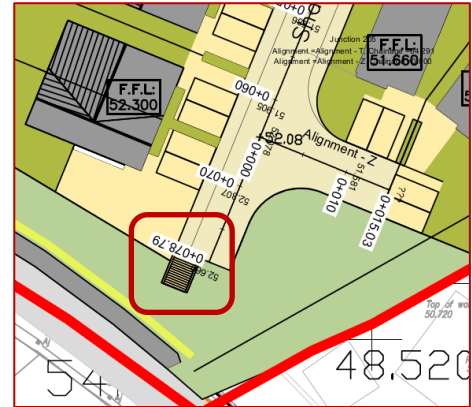
Swept path analysis should be undertaken to ensure sufficient turning space is provided for vehicles within the development, and where horizontal radii is less than outlined in DMURS.

3.15 Problem

Location: Shared Local Street 06

Summary: Proposed steps located at the end of Shared Local Street 06 direct pedestrians into the carriageway.

Steps are located at the end of Shared Local Street 06, and appear to lead pedestrians into the carriageway. Should large vehicles use the turning head to exit the shared street, they may not expect pedestrians to enter the carriageway from the steps, leading to vehicle/pedestrian collisions.



Recommendation

Pedestrians using the steps should be directed onto a dedicated footway, away from turning vehicles.

3.16 Problem

Location: General Problem

Summary: Visibility at private accesses to off-street parking may be insufficient in locations.



The visibility to private accesses is limited in locations due to the proposed horizontal alignment and a strip of vegetation which is used to separate properties. Insufficient visibility to vehicles reversing out of private driveways may lead to possible side-on collisions, as drivers exit their property and enter the carriageway.

A similar issue exists at the ESB substation, as the small building may block visibility to drivers exiting units 52 and 53, which is exacerbated by the horizontal radius on approach to the ESB building.

Recommendation

Ensure vegetation between property driveways does not restrict visibility to exiting vehicles.

Additionally, the ESB Substation should be relocated so that it does not block visibility to property accesses.

4 Observations

- 4.1 Ensure the turnaround facility within the active open space car park (in the northwest corner of the development) is clearly signed so drivers understand the one-way arrangement.
- 4.2 No Mobility Parking Spaces have been provided within the active open space car park in the northwest corner of the development. This may reduce accessibility for mobility impaired users.
- 4.3 Provide pedestrian access paths between the active open space and the playing fields.
- 4.4 Gradients for pedestrians and cycle routes have not been provided. The designer should ensure the gradients of footways and public open space tracks are suitable for elderly pedestrians, mobility impaired pedestrians, and cyclists.

5 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.

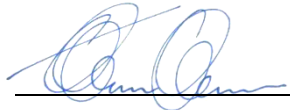
The problems identified have been noted in this report together with associated safety improvement suggestions, which we would recommend should be studied for implementation.

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

ROAD SAFETY AUDIT TEAM LEADER

Aly Gleeson

Signed:



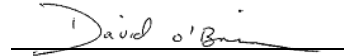
Dated:

05/09/2019

ROAD SAFETY AUDIT TEAM MEMBER

David O'Brien

Signed:



Dated:

05/09/2019

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 checked="" type="checkbox"/>	<input type="checkbox"/>
6. Traffic surveys	<input checked="" type="checkbox"/>	<input 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 Site Layout Plan	1609-P-101-101	-
Landscape Masterplan	0285-101	3.12.18
Proposed Site Layout - Sheet 1	FK-ROD-Z0-XX-DR-C-0001	P4
Proposed Site Layout - Sheet 2	FK-ROD-Z0-XX-DR-C-0002	P4
Proposed Site Layout - Sheet 3	FK-ROD-Z0-XX-DR-C-0003	P4
Proposed Site Layout - Sheet 4	FK-ROD-Z0-XX-DR-C-0004	P4
Proposed Road Profiles	FK-ROD-C-DR-XX-Z0-0010	P4
Proposed Drainage Layout - Sheet 1	FK-ROD-Z0-XX-DR-C-0031	P4
Proposed Drainage Layout - Sheet 2	FK-ROD-Z0-XX-DR-C-0032	P4
Proposed Drainage Layout - Sheet 3	FK-ROD-Z0-XX-DR-C-0033	P4
Proposed Drainage Layout - Sheet 4	FK-ROD-Z0-XX-DR-C-0034	P5
Proposed Drainage Layout - Sheet 5	FK-ROD-Z0-XX-DR-C-0035	P2
Priory Road Accesses	FK-ROD-Z0-XX-DR-C-0094	P1
Kilcoole Proposed Set Back Footpath	FK-ROD-Z0-XX-DR-C-0095	P1
Kilcoole Road/Three Trout Toucan Crossing	FK-ROD-Z0-XX-DR-C-0096	P1
For Information		
Traffic and Transport Assessment Report	16.146 TTA	Issue v2

Appendix C – Feedback Form

Road Safety Audit Feedback Form

Scheme: Proposed Housing Development at Farrankelly, Co. Wicklow

Route No.: R761 & L5027

Audit Stage: Stage 1 Road Safety Audit **Date Audit Completed:** 24th July 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	No	No	The proposal to include direct accesses onto Priory Road has been developed in consultation with Wicklow County Council. The existing road already has a number of direct accesses and as the surrounding area is further developed the road will be upgraded to a suburban road with footpaths and lighting. The provision of the 3 direct accesses will be similarly spaced to the existing accesses on the opposite side of the road and this will help reinforce the suburban road objective. This is in keeping with DMURS and will help maintain appropriate traffic speeds as the road is upgraded.	Yes
3.2	Yes	Yes		
3.3	Yes	Yes		
3.4	Yes	Yes		
3.5	Yes	Yes		
3.6	Yes	Yes		
3.7	Yes	Yes		
3.8	Yes	Yes		
3.9	Yes	Yes		
3.10	Yes	Yes		
3.11	Yes	Yes		
3.12	Yes	Yes		
3.13	Yes	Yes		

Road Safety Audit Feedback Form

Scheme: Proposed Housing Development at Farrankelly, Co. Wicklow

Route No.: R761 & L5027

Audit Stage: Stage 1 Road Safety Audit Date Audit Completed: 24th July 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)
3.14	Yes	Yes		
3.15	Yes	No	Local Street 06 is proposed to be a homezone where pedestrians and traffic will be on a shared surface where pedestrian are given priority. The treatment of the entire street will make this arrangement very clear to traffic. The layout of the stairs and adjacent landscaping areas will be designed so that there is clear visibility between pedestrians coming down the stairs and traffic on the street.	Yes
3.16	Yes	Yes		

Signed:  Designer Date 6/9/2019

Signed:  Audit Team Leader Date 05/09/2019

Signed:  Employer Date 6/9/2019

Appendix D – Problem Locations

- General Problem 3.2:** Unclear if there is sufficient drainage provision within the proposed development.
- General Problem 3.3:** Designated crossing points within the residential road network have not been indicated at junctions.
- General Problem 3.4:** No junction control or priority type has been indicated at junctions within the development.
- General Problem 3.5:** Unclear where public lighting columns will be located relative to the footpath.
- General Problem 3.6:** Information regarding signage/ roadmarkings not provided to the Audit Team.
- General Problem 3.7:** Visibility exiting side roads could be restricted by trees within the footpath.



Problem 3.11: Ramp to basement at the end of Local Street 12 is near a footway, which may increase the risk of falling from height if no edge protection is provided.

Problem 3.9: Junction mouth width may encourage high entry/exit speeds.

Problem 3.16: Visibility at private accesses to off-street parking may be insufficient in locations.

Problem 3.10: Visibility to junction control signage may be reduced as a result of the approach alignment.

General Problem 3.14: It is unclear if there is sufficient swept path for vehicles within the development.

Problem 3.1: Several direct accesses onto Priory Road may increase the risk of side-on or rear-end-shunt collisions.

Problem 3.15: Proposed steps located at the end of Shared Local Street 06 direct pedestrians into the carriageway.

Problem 3.8: Footway width appears to include localised narrowing or pinch point.

Problem 3.12: Mobility parking provision appears to obstruct or restrict pedestrian movement across the side road.

General Problem 3.13: The pedestrian footway switches from one side of the road to the other, though no pedestrian crossing has been provided to facilitate pedestrians crossing from one footway to the other.