

# 2021

## Stage 1 Road Safety Audit



Prepared by: JdK

## Stage 1 Road Safety Audit

Proposed Residential Development, Coolagad, Greystones, Co Wicklow

### Document Control Sheet

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|---------------------|-------------------------------|
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## 1. Introduction

This report documents the findings of a Stage 1 Road Safety Audit (RSA) carried out with respect to a proposed residential development at Coolagad, Greystones, Co Wicklow.

The audit team conducted the site visit on Monday the 10<sup>th</sup> of January 2022. The audit was carried out in the offices of ORS on Tuesday the 11<sup>th</sup> of January 2022.

The audit team comprised of the following people:

Audit Team Leader:

David McCormack: BEng (Hons), Dip Eng., CEng, MIEI

Team Member:

Adam Price BEng (Hons), CEng, MIEI

Team Member:

Johannes de Klerk BEng, MIEI

During the site visit the weather was dry and partly sunny. The road surface was damp, and the traffic levels were noted to be normal across the audit period.

Previous Road Safety Audits were not available for review. The audit team reviewed the following documents and drawings provided by AECOM.

- 20005 - PL03 Overall Site Layout
- COO-ACM-00-00-DR-CE-00-0002
- COO-ACM-00-00-DR-CE-00-0003
- COO-ACM-00-00-DR-CE-00-0004
- COO-ACM-00-00-DR-CE-00-0005
- COO-ACM-00-00-DR-CE-00-0006
- COO-ACM-00-00-DR-CE-00-0601
- COO-ACM-00-00-DR-CE-00-0602
- COO-ACM-00-00-DR-CE-00-0603
- COO-ACM-00-00-DR-CE-00-0604
- COO-ACM-00-00-DR-CE-00-0605
- COO-ACM-00-00-DR-CE-00-0700

Documents/information not supplied:

(A) Speed Survey

(B) Traffic Count Data

(C) Departures from standards

The terms of reference / procedure for the Audit were as per the relevant sections of the **Transport Infrastructure Ireland Road Safety Audit Standard GE-STY-01024**. The audit

examined only those issues within the design relating to the road safety implications of the scheme and has therefore not examined or verified the compliance of the designs to any other criteria. The Road Safety Audit should not be treated as a design check.

The problems identified and described in this report are considered by the Audit Team to require action to improve the safety of the development and minimise accident occurrence.

All comments, references and recommendations in this safety audit are in respect of the review of information supplied by the AECOM.

## 2. Description of the Proposed Development

The proposed development put forward by AECOM include a combination of duplex units and houses, internal roadways, pedestrian paths and cycle paths and open spaces with a community centre and access roads. The proposed development will connect to the main road network via a new signalised T-junction with Rathdown Road (R761).

The posted speed limit for the Rathdown Road 50 km/hr.

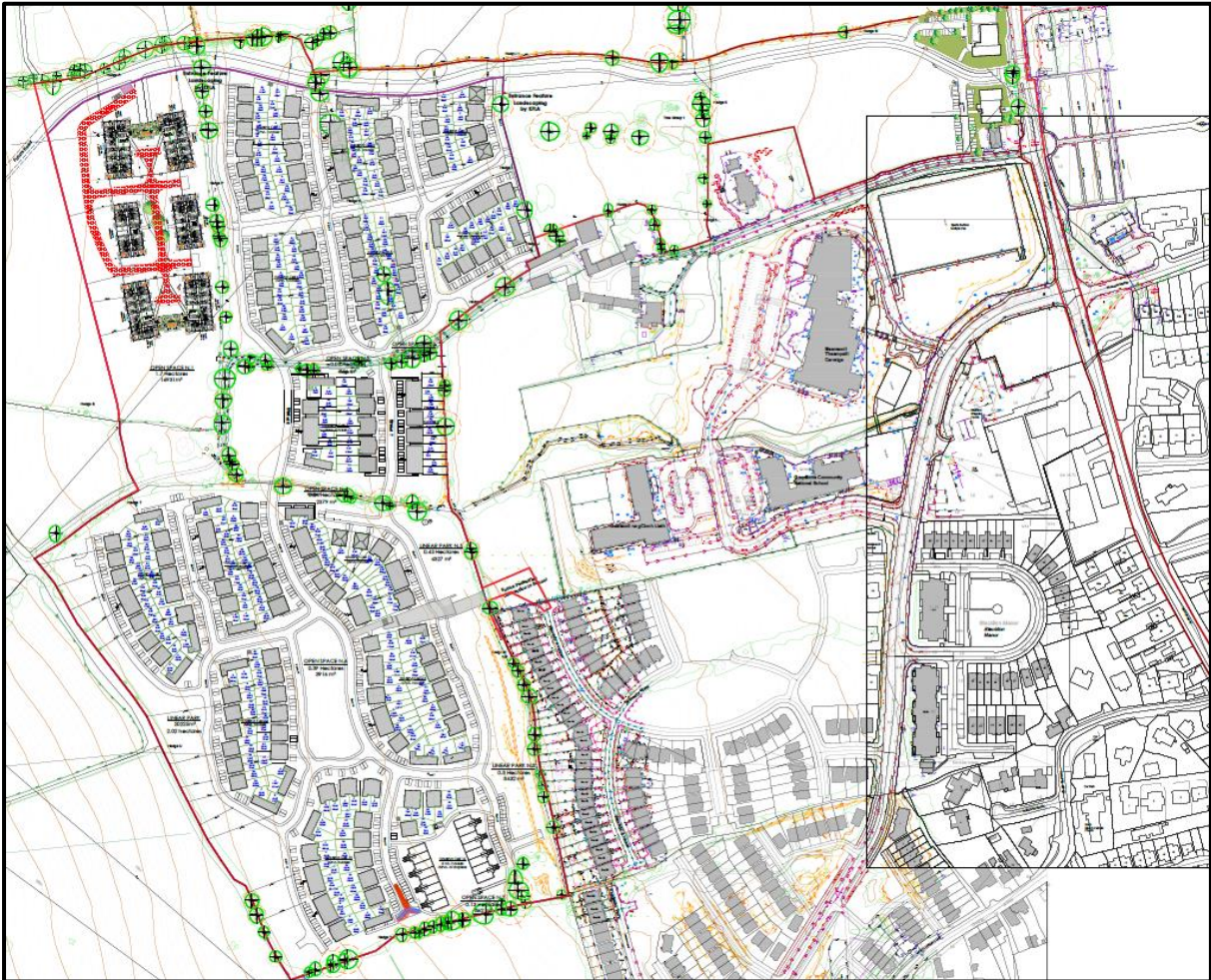
For the period 2006 to 2016 no collisions were recorded in the vicinity of the proposed site access junction. Minor vehicle collisions were recorded to the south and north of the proposed site entrance with a fatal single vehicle collision in 2005 on the corner of Lower Windgate and Rathdown Road.

Please refer to **Figure 2.1** below for the location plan, **Figure 2.2 & 2.3** for proposed scheme layout and signalised junction prepared by the AECOM and **Figure 2.4** for the collision map.

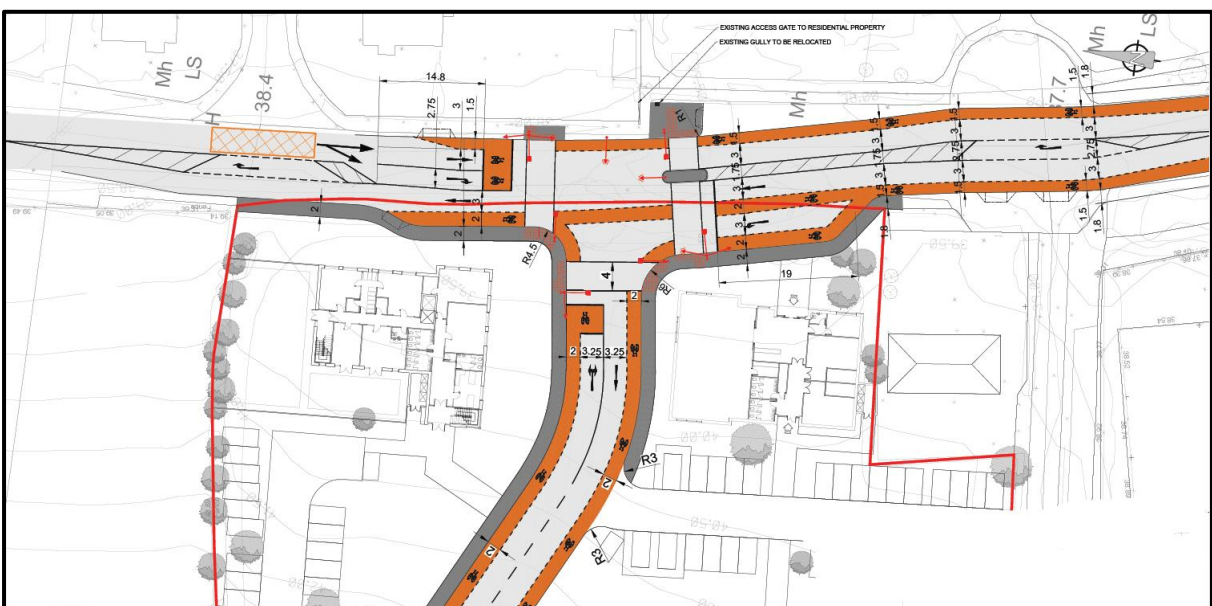


Figure 2.1: Location Plan, Coolagad, Greystones – (source – google maps)





**Figure 2.2: Site Layout – (source – AECOM)**



**Figure 2.3: Development Access Junction (source – AECOM)**

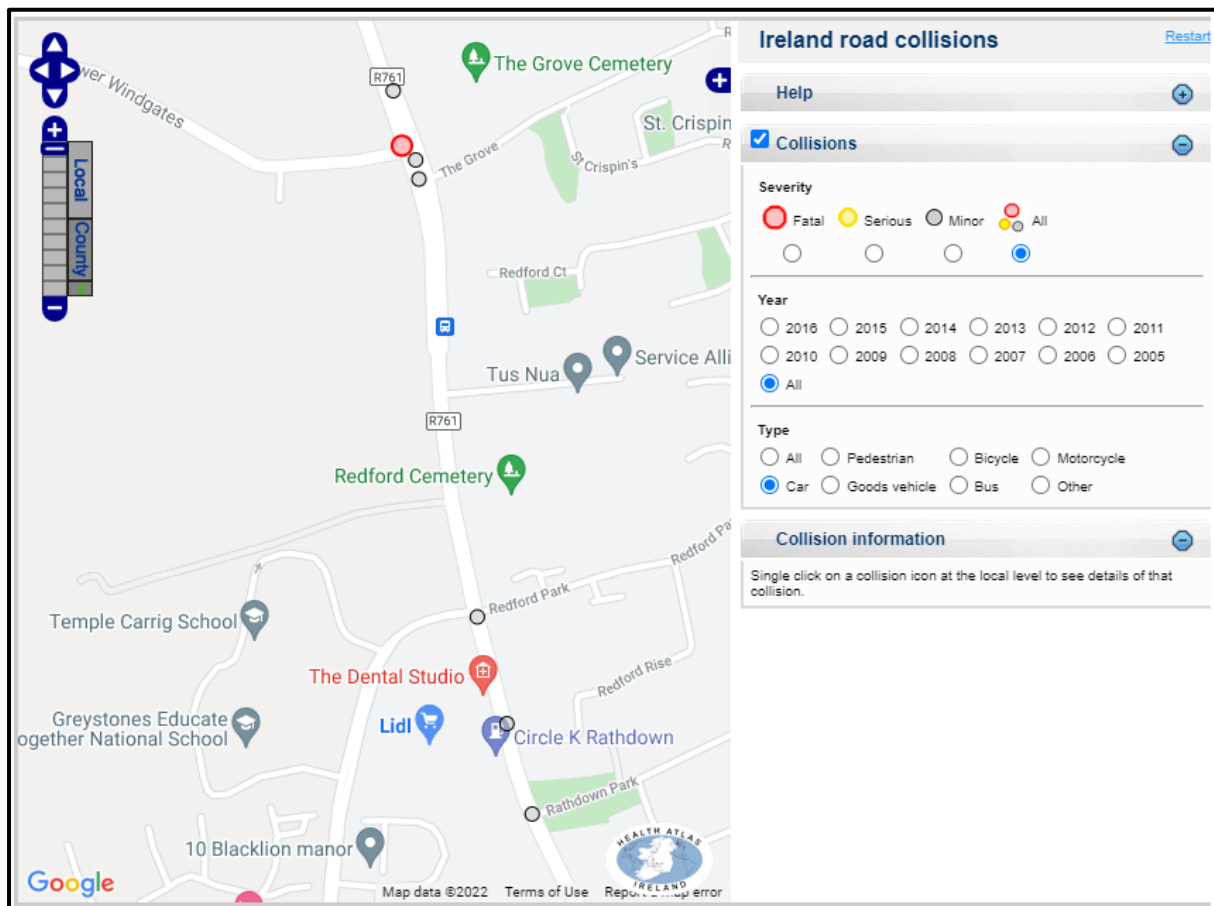


Figure 2.4: Collision Map – (source –RSA)



### 3. Problems Raised from the Road Safety Audit

The following are problems and recommendations to address the safety issues associated with the proposal. The recommendations are proposed to the designer of the scheme to reduce any safety risks associated with it.

#### 3.1 Potential Problem Identified

##### **Problem No. 01: Vertical Alignment**

###### **Location: Site Access Junction**

The audit team note from the proposed drawings and site visit that the new junction is located in the vicinity of a vertical curve crest. New junctions near crests should be avoided where the junction or access would not be immediately apparent to approaching vehicles. Insufficient forward visibility reduces stopping sight distance which may lead to vehicle /vehicle collisions during turning movements at the proposed junction.

###### **Recommendation:**

The design team should demonstrate compliance to national design guidelines in relation to the vertical alignment geometry in the vicinity of the proposed junction location.

##### **Problem No. 02: Clearance between Community Centre Junction and Rathdown Junction**

###### **Location: Site Access Junction**

The audit team note from the proposed drawings that the distance between the major R761 junction and the community centre access junction is not specified. Minimum clearance distances as per National Design Guidelines is required for regional junctions. The audit team are concern that this could pose a risk of traffic backing up onto the main line during peak times

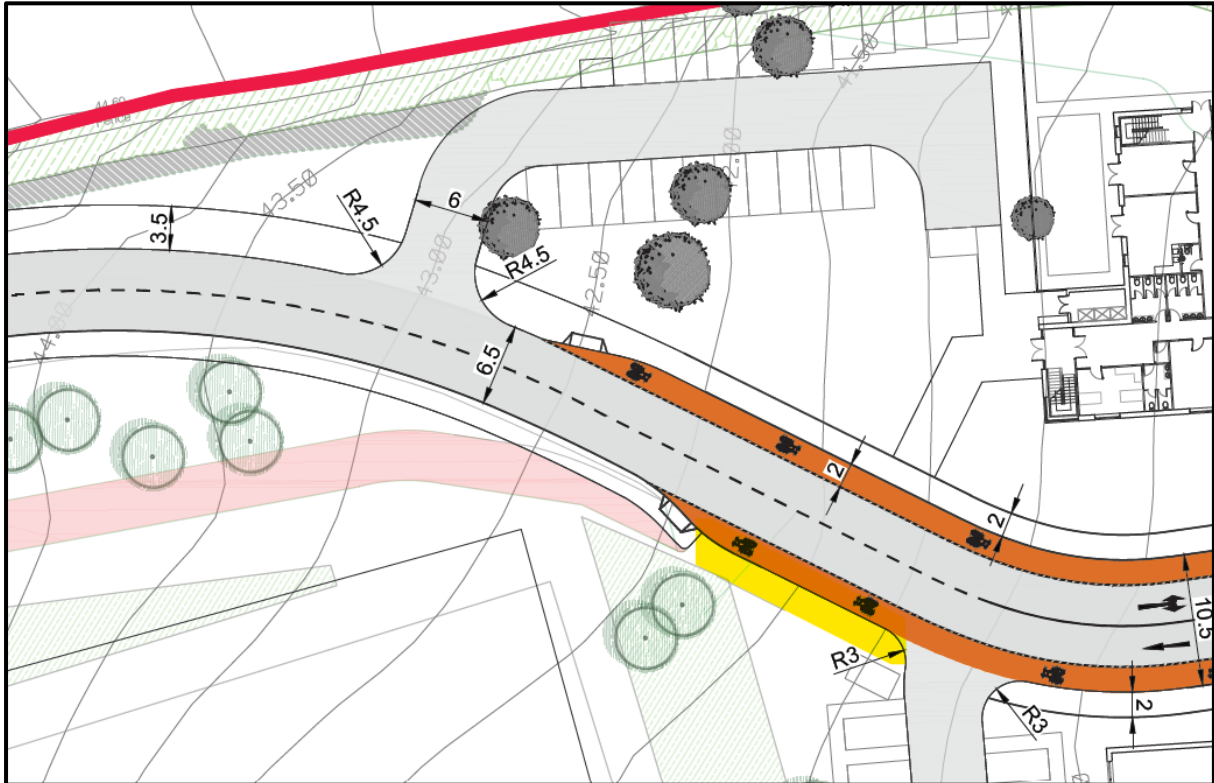
###### **Recommendation:**

The design team should specify the clearance distance between the main junction and minor community centre access junction to demonstrate compliance with applicable guidelines and to ensure that the close proximity of this access to the R761 will not result in traffic building up onto the mainline during peak periods.

### Problem No. 03: Cycle Path Transition

#### Location: Site Access Junction

The audit team note from the proposed drawings that the proposed west bound cycle lane transitions to an offline cycle track. The segregated footpath appears fragmented in the vicinity of the cycle track transition, and it is unclear as to right of way at this location which may result in pedestrian cycle conflicts resulting in injury.



#### Recommendation:

The design team should include additional details to clarify right of way and travel direction for both pedestrians and cyclists in this location.

#### Problem No. 04: Pedestrian Permeability

##### Location: Redford Cemetery Entrance

The audit team note from the drawings provided that proposed pedestrian paths are shown to terminate to the north and south of the cemetery entrance with no drop kerb and tactile paving. Insufficient pedestrian permeability may put vulnerable users at risk. Inadequate disabled facilities may result in slips trips or falls resulting in injury.



##### Recommendation:

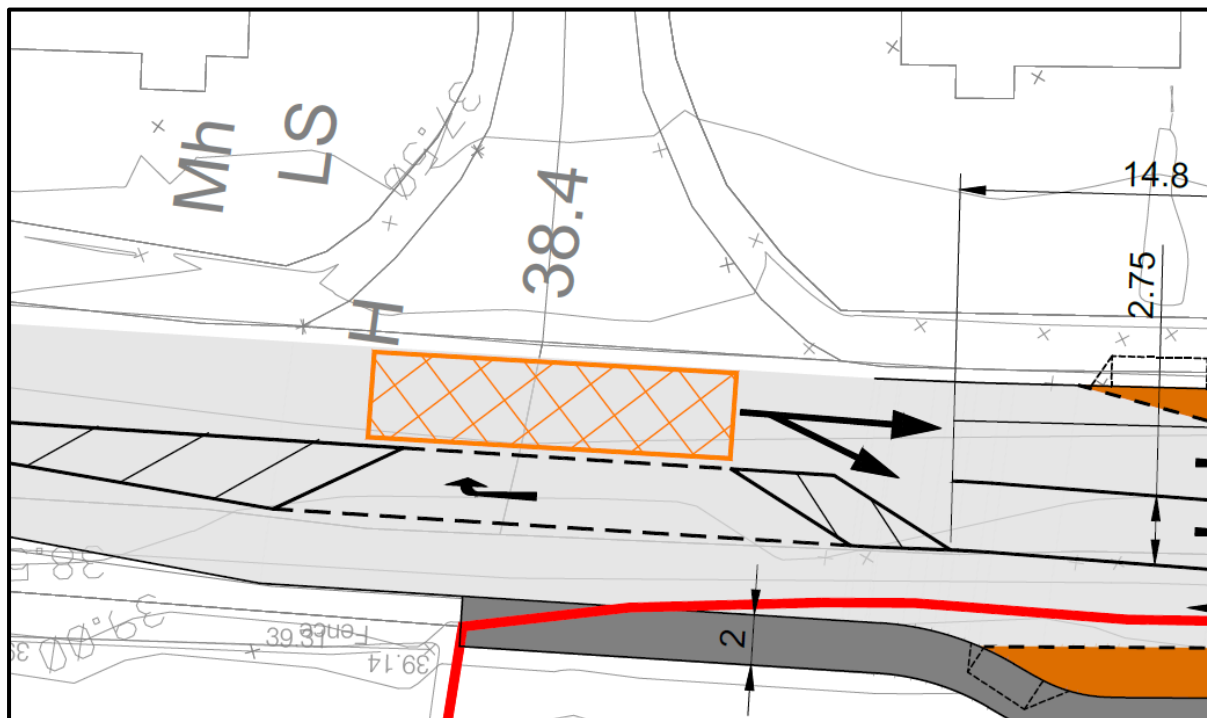
The design team should review the existing footpath layout to ensure continuity of all surrounding paths within the scheme boundary in line with DMURS guidelines.



## Problem No.06: Pedestrian Disabled Access

### Location: Seaview Road Junction

The audit team note that 'drop kerbs' and tactile paving are not identified throughout the scheme. These facilities aid users with specific mobility needs in particular and the omission of dropped kerbs will require vulnerable road users to travel in the roadway to find a suitable location to mount the footpath putting them at risk of conflicts with vehicles.



### Recommendation:

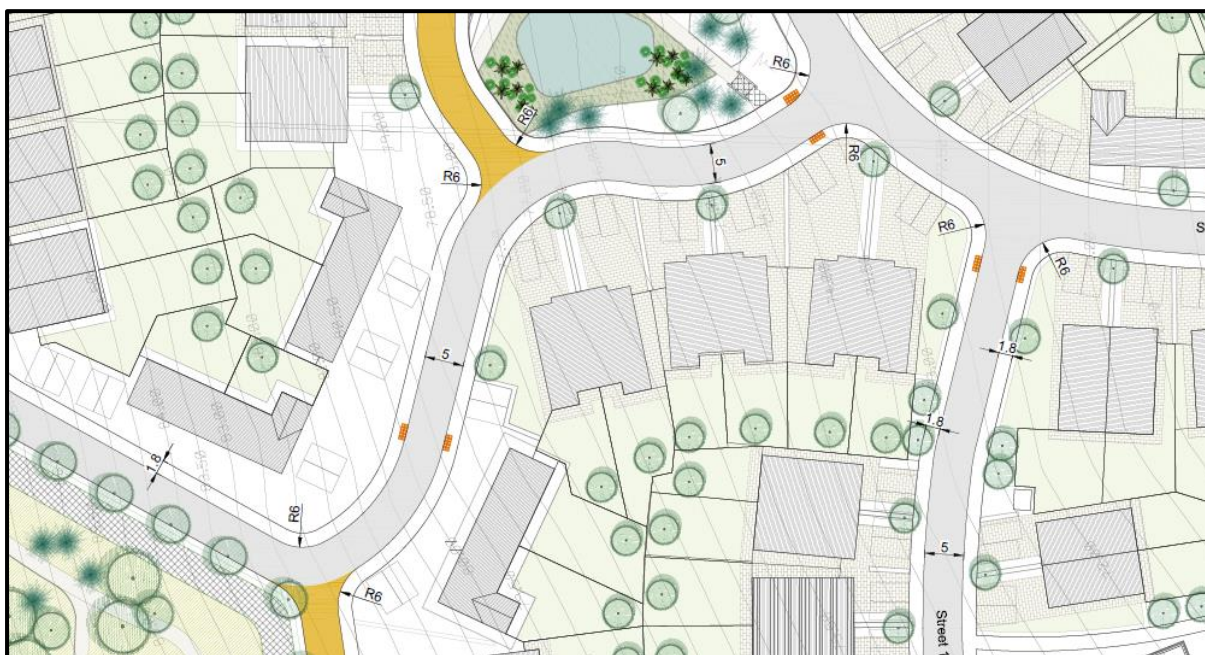
The design team should ensure that details and locations of 'drop kerbs' and tactile paving is provided throughout the scheme at proposed crossing points



## Problem No. 07: Road Markings and Signage

### Location: Internal Roads

The audit team note from the proposed drawings that there is a lack of road markings and signage depicting stop lines, travel direction, lane demarcation, raised table markings, and designated shared roadways. Road markings and signage aid in informing road users of any hazards, locations of Stop and/or Yield lines at pedestrian crossings and shared roadways. Inadequate road markings may lead to motorists becoming confused which could pose a risk of pedestrian/vehicle or vehicle/vehicle collisions resulting in injury.



### Recommendation:

The design team should include additional details for road markings and signage to be installed on the proposed intersections and internal roads throughout the scheme.



**Problem No. 09: Drainage****Location: Extent of Proposed Works**

The audit team note that the proposed drawings do not provide drainage details including gully positions, design contours and/or flow direction details for the proposed works to demonstrate that the roadways are sufficiently drained, including all low points and upstream flows at pedestrian crossings. Ponding in the roadway could result in vehicles to lose control due to reduced friction or freezing during cold periods resulting in vehicle/vehicle or vehicle /pedestrian conflicts which could result in injury. Ponding in the vicinity of pedestrian crossings may divert pedestrians to cross the roadway outside of demarcated safe crossing zones resulting in vehicle/pedestrian conflicts and resultant injury.

**Recommendation:**

The design team should ensure that all drainage is strategically positioned throughout the scheme to ensure that ponding does not occur.

**Problem No. 010: Vehicle Swept Path Analysis****Location: Internal Site Layout**

The audit team note from the drawings provided that there are no provisions for vehicle swept path analysis for design vehicles including passenger vehicles, emergency vehicles and service vehicles for the internal circulatory roads. Insufficient kerb radii, turning heads may result in vehicle/vehicle, vehicle/cyclist or vehicle/pedestrian conflicts due to lane encroachment or kerb mounting during turning movements.

**Recommendation:**

The design team should conduct a vehicle swept path analysis for design vehicle movements for the internal road's layout to ensure that all vehicle types that will use the development can be catered for safely.

**Problem No. 011: Traffic Signal Phasing****Location: Site Access Junction**

The audit team note from the drawings provided that the signalling phasing diagram is not available for review. Incorrect phasing may result in vehicle/pedestrian or vehicle/vehicle conflicts resulting in injury.

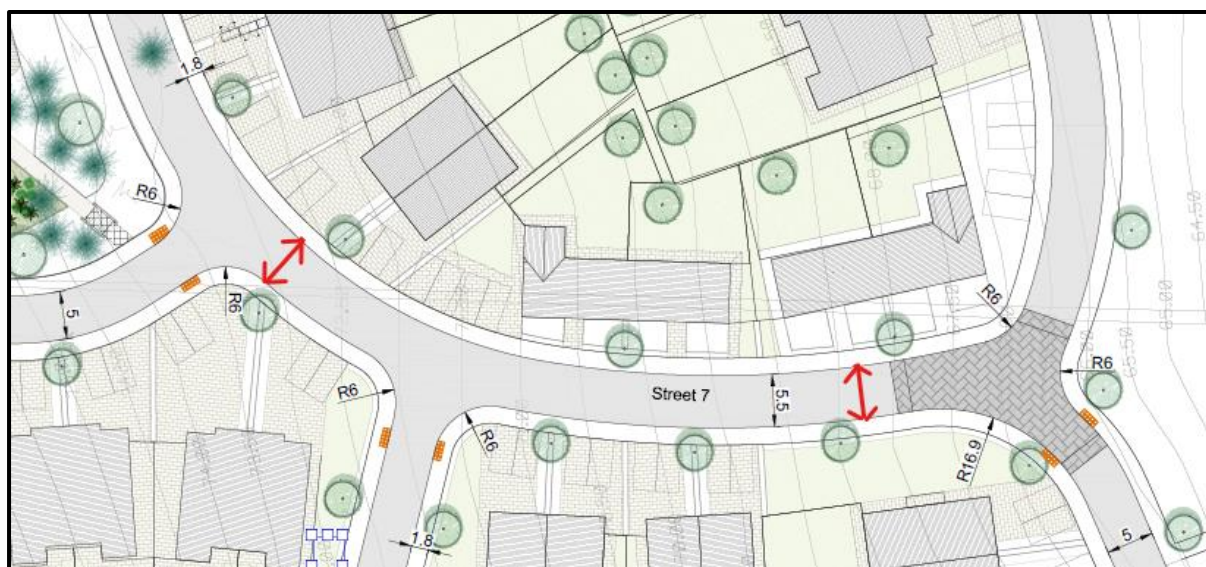
**Recommendation:**

The design team should include the phasing diagram for review at detailed design stage.

## Problem No. 012: Pedestrian Disabled Access Permeability

### Location: Internal Site Layout

The audit team note that 'drop kerbs' and tactile paving are identified throughout the scheme. The positioning and frequency however do not allow for sufficient access throughout the site. These facilities aid users with specific mobility needs in particular and the omission of dropped kerbs will require vulnerable road users to travel in the roadway putting them at risk with vehicle conflicts and injury.



### Recommendation:

The design team should ensure that the frequency and locations of 'drop kerbs' and tactile paving is provided throughout the scheme to allow crossing movements for all probable movements.



### Problem No. 013: Lighting

#### Location: Internal Site Layout and Site Access Junction

The audit team have not received drawings detailing lighting for the development and the access junction and it is not clear if lighting will be specified for the development. Areas in low light conditions may result in slips trips and falls on pedestrian paths. Drivers may be unable to see pedestrians in the internal road network and at pedestrian crossings which has the potential to lead to pedestrian-vehicle collisions resulting in injury to pedestrians.

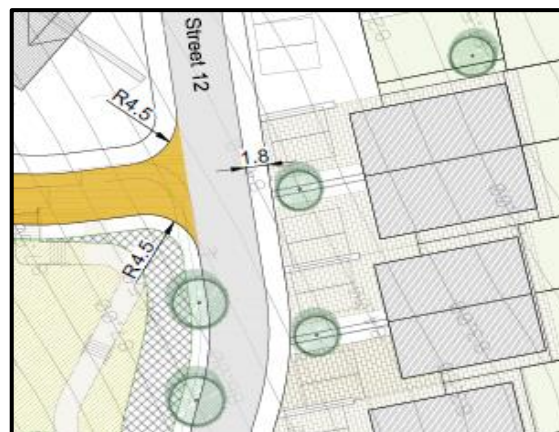
#### Recommendation:

The design team should ensure that details and locations of all public lighting columns are provided for at detailed design and to ensure that positioning of columns does not cause any obstruction or hazard to vulnerable users.

### Problem No. 014: Landscaping

#### Location: Internal site layout

The audit team note from the drawings provided that proposed landscaping within the development may impact the visibility of road users if positioned inappropriately. Trees, high bushes and shrubbery should be avoided in areas where visibility is to be maintained to ensure that drivers are clearly able to see approaching vehicles and pedestrians at junctions and designated pedestrian crossing locations. This could potentially lead to instances of vehicle-vehicle or pedestrian-vehicle collisions resulting in injury.



#### Recommendation:

The design team should ensure that any proposed landscaping does not impact on visibility of the internal roads and junctions or forward visibility at the proposed pedestrian crossings.



**Problem No. 015: Tie in With Existing Infrastructure**

**Location: Along the R761**

The audit team have not received drawings detailing the proposed tie ins of the scheme with the R761 to the south in particular. The audit team are concerned as to the how the cycle lanes will terminate and how the proposed footpath with tie in with the existing footpaths in the area. There is a serious risk of potential conflict at tie ins should they not tie in safely.

**Recommendation:**

The design team should ensure that detailed layout plans and sections are provided at tie ins to ensure that the proposed works tie in safely with the existing footpaths and R761 road network.

#### 4. Audit Team Statement

We certify that we have examined the drawings listed in Appendix A and examined the site by means of a site visit. This examination has been carried out with the sole purpose of identifying any features of the design that could be removed or modified to improve the safety of the scheme. The issues that we have identified have been noted in the report, together with suggestions for improvement, which we recommend should be studied for implementation.

**Audit Team Leader:** David McCormack: BEng (Hons), Dip Eng., CEng, MIEI  
ORS

Signed:

A handwritten signature in black ink, appearing to read 'David McCormack'.

Date: 12<sup>th</sup> January 2022

**Audit Team Member:** Adam Price: BEng (Hons), CEng, MIEI  
ORS

Signed:

A handwritten signature in black ink, appearing to read 'Adam Price'.

Date: 12<sup>th</sup> January 2022

**Audit Team Member:** Johannes de Klerk : BEng, MIEI  
ORS

Signed:

A handwritten signature in black ink, appearing to read 'Johannes de Klerk'.

Date: 12<sup>th</sup> January 2022

## Appendix A – Inspected Documentation

The audit team reviewed the following drawings and documents provided by AECOM.

1. 20005 - PL03 Overall Site Layout
2. COO-ACM-00-00-DR-CE-00-0002
3. COO-ACM-00-00-DR-CE-00-0003
4. COO-ACM-00-00-DR-CE-00-0004
5. COO-ACM-00-00-DR-CE-00-0005
6. COO-ACM-00-00-DR-CE-00-0006
7. COO-ACM-00-00-DR-CE-00-0601
8. COO-ACM-00-00-DR-CE-00-0602
9. COO-ACM-00-00-DR-CE-00-0603
10. COO-ACM-00-00-DR-CE-00-0604
11. COO-ACM-00-00-DR-CE-00-0605
12. COO-ACM-00-00-DR-CE-00-0700

## Appendix B – Designer Response Form

### Road Safety Audit Feedback Form

Job: Proposed Development Coolagad, Greystones

Stage of Audit: Stage 1

Date Audit Completed: 12/01/2021

| Problem Reference in Safety Audit Report | To Be Completed by the Designer |                                  |  | To Be Completed Audit Team Leader                |
|--|---------------------------------|----------------------------------|--|--|
|  | Problem Accepted (Yes/No)       | Recommendation Accepted (Yes/No) | Alternative Option (Describe) (Only complete if recommendation not accepted) | Alternative Option Accepted by Auditors (Yes/No) |
| P1                                       | No                              | Yes                              | Refer next page  | ✓  |
| P2                                       | No                              | Yes                              | Refer next page  | ✓  |
| P3                                       | Yes                             | Yes                              | Refer next page  |  |
| P4                                       | No                              | No                               | Refer next page  | ✓  |
| P5                                       | Yes                             | Yes                              | Refer next page  |  |
| P6                                       | No                              | No                               | Refer next page  | ✓  |
| P7                                       | No                              | No                               | Refer next page  | ✓  |
| P8                                       | Yes                             | Yes                              | Refer next page  |  |
| P9                                       | Yes                             | Yes                              | Refer next page  |  |
| P10                                      | Yes                             | Yes                              | Refer next page  |  |
| P11                                      | Yes                             | Yes                              | Refer next page  |  |
| P12                                      | Yes                             | Yes                              | Refer next page  |  |
| P13                                      | No                              | No                               | Refer next page  | ✓  |
| P14                                      | No                              | Yes                              | Refer next page  | ✓  |
| P15                                      | No                              | Yes                              | Refer next page  | ✓  |

Signed:  Design Team Leader Date: 09/03/2022

Signed Off:  Audit Team Leader Date: 15/3/2022

Signed Off ..... Employer/ Employer's representative

Date: .....

## **Responses for not accepting problem**

### **Problem No. 01: Vertical Alignment**

Vertical sight lines have been undertaken for this junction to demonstrate compliance. Refer to drawing COO-ACM-00-00-DR-CE-00-0103.

### **Problem No. 02: Clearance between Community Centre Junction and Rathdown Junction**

Opposed turning movements to/from the access for the Community Facility are the left turn in and a right turn out. If there is any queuing for the right turn, then this will not impact on the R761. If there is queuing on the right turn out of the Community Facility, then this is held within the access road and does not affect the R761. The left turn into the site is not opposed and therefore as an appropriate provision of parking for the Community Facility is provided, it may be assumed that traffic will not back up onto the road network towards the R761. Also, as the community facility is proposed for the residential facility of the SDH, the majority of trips would be assumed to originate from the residents of this new community, and therefore the majority of trips would be travelling westbound to and from the new residential community.

The proposed junction is designed as a Stop Junction and so an increased precaution will be taken by all users. As this junction is a priority stop junction along an urban link road, the appropriate guidelines would be DMURS. In accordance with DMURS and the UK Manual for Streets referenced throughout DMURS, there is research carried out for the UK Manual for Streets (and referenced directly in DMURS guidance) that a reduced visibility splay at a priority junction does not carry any further risk of injury or collisions. Further to this, it has been suggested that a reduced Y distance visibility splay may cause drivers to act with more caution. As this community centre is not envisioned to have excessively high daily traffic departing from the minor arm of this junction, a reduced visibility splay may be provided, as there is not a great deal of associated traffic from the minor arm to the major arm of this junction. The visibility splay can be drawn to the opposite kerb line on the Regional road as it shows the driver can see the full extent of the junction and therefore meets the 49m required.

The Manual for Streets research concluded that there is no evidence that reduced Stopping Sight Distances (SSDs) are directly associated with increased collision risk, as shown on a variety of street types at a variety of speeds. The Manual for Streets 2 (2010) also refers to research where it was found that higher cycle collision rates occurred at T-Junctions with greater visibility. Given the Stop Junction for the Creche, exiting vehicles should be afforded adequate time and visibility to the Signal Controlled junction to be able to see the junction and assess oncoming vehicles.

### **Problem No. 03: Cycle Path Transition**

The footpath and cycle lane layout has been updated in this location to ensure that the right of way and travel direction for both pedestrians and cyclists in this location is clear. Refer to drawing COO-ACM-00-00-DR-CE-00-0004.



#### **Problem No. 04: Pedestrian Permeability**

Please note that the footpaths north and south of the cemetery are not proposed, the existing footpaths are proposed to remain as is. The existing footpaths are asphalt pavements that ramp down to the area fronting the cemetery entrance. See below.

This area is outside the remit of our scheme, and if brought up by WCC for improvement, it could be considered to be further addressed at detailed design stages.



#### **Problem No. 05: Undefined Use of Roadway**

Further details have been added to the layout to show the car spaces remaining in this area and measures have been incorporated into the design to mitigate illegal parking. Refer to drawing COO-ACM-00-00-DR-CE-00-0004.

#### **Problem No.06: Pedestrian Disabled Access**

This is outside the remit of our scheme, and if brought up by WCC for improvement, it could be considered to be further addressed at detailed design stages.

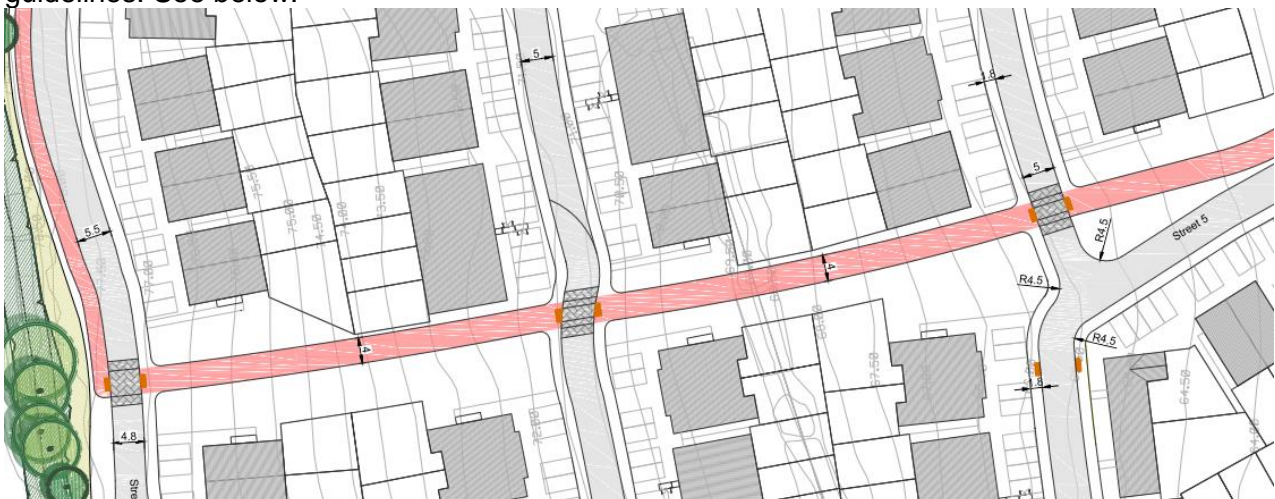
The junction is very wide and has no pedestrian crossing facilities and could be redesigned to provide drop kerbs, tactile and improved radii on corners, but we don't believe it is within the client's remit to upgrade this existing junction.

#### **Problem No. 07: Road Markings and Signage**

Proposed road markings and signage on the proposed internal intersections and roads throughout the scheme will be addressed at the detailed design stage.

#### **Problem No. 08: Markings, Signage and Tactile Paving**

Additional details have been included on the plans for markings and signage and tactile paving to be installed on the proposed shared paths in line with DMURS and the National Cycle manual guidelines. See below.



**Problem No. 09: Drainage**

Refer to drawing COO-ACM-00-00-DR-CE-00-0550 for the flow exceedance route for the site. There are no trapped low points throughout the proposed development. The positioning of the gullies will be addressed at the detailed design stage.

**Problem No. 10: Vehicle Swept Path Analysis**

Refer to drawings COO-ACM-00-00-DR-CE-00-0101 and 0102 for the sight line analysis. Refer to drawings COO-ACM-00-00-DR-CE-00-0105 and 0106 for the bin truck swept path analysis. Refer to drawings COO-ACM-00-00-DR-CE-00-0107 and 0108 for the fire tender swept path analysis.

**Problem No. 11: Traffic Signal Phasing**

Please find attached the phasing diagram.

**Problem No. 12: Pedestrian Disabled Access Permeability**

The general arrangement plans have been updated accordingly. Refer to drawings COO-ACM-00-00-DR-CE-00-0002 to 0006.

**Problem No. 13: Lighting**

The details and locations of all public lighting columns will be provided for at the detailed design stage.

**Problem No. 14: Landscaping**

Refer to drawings COO-ACM-00-00-DR-CE-00-0101 to 0102 for the sight line analysis. Landscaping will be kept out of the sight lines.

**Problem No. 15: Tie in With Existing Infrastructure**

The proposed WCC Redford junction upgrade has been added to drawing COO-ACM-00-00-DR-CE-00-0004, to demonstrate coordination. The proposed junction layout is coordinated with both the existing infrastructure and proposed infrastructure, part of the Redford junction upgrade.